DISTRICT SURVEY REPORT
OF
PURBA BARDHAMAN DISTRICT

(For mining of minor minerals)
As per Notification No.S.O.141 (E) New Delhi Dated 15th of January 2016, S.O.3611 (E) New Delhi Dated 25th of July 2018 and Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by Ministry of Environment, Forest and Climate Change (MoEF&CC)

SEIAA Approval Date:

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PREPARED BY
Department of Industry, Commerce & Enterprises
Government of West Bengal

GOVERNMENT OF WEST BENGAL
DIRECTORATE OF MINES & MINERALS
4, ABANINDRANATH TAGORE ROAD
KOLKATA-700016

No. 1333 MD

Kolkata, 6th January, 2022.

TO WHOM IT MAY CONCERN

This is to certify that DSRs of concerned districts of West Bengal have been duly validated by respective district authorities and their suggestions/inputs, if any, have been duly incorporated in the DSRs. The DSRs have been finally scrutinised and accepted by the scrutiny committee of DMM, WB and the same have been forwarded to the Dept. of Industry, Commerce and Enterprises along with respective scrutiny reports for onward transmission to SEAC for necessary action.

Director of Mines and Minerals

Govt. of West Bengal

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Abbreviations

% DEP – Departures

° C – Degree Centigrade

BGL – Below Ground Level

CD - Community Development

Cft- Cubic Feet

CGWB - Central Ground water Board

CRIS - Customized Rainfall Information System

Cum - Cubic meter

DGMS - Directorate General of Mines Safety

DGPS - Differential Global Positioning system.

DL&LRO - District Land & Land Reform officer

DSR - District Survey Report

EC – Environmental Clearance

EIA- Environment Impact Assessment

EMGSM - Enforcement and Monitoring Guideline for Sand Mining

ENVIS - Environmental Information System

ft – Feet

GIS - Geographical Information System

GMEC - Global Management and Engineering Consultant

GSI - Geological Survey of India

Ha – Hectare

hr - Hour

IMD – Indian Meteorological Department

ISRO - The Indian Space Research Organization

KM - Kilometer

LISS - Linear Imaging Self-Scanning Sensor

LOI - Letter of Intent

LULC - Land Use Land Cover

m^2 - Square meter

MBT - Main Boundary Thrust

MCT - Main Central Thrust

MFT - Main Frontal Thrust

Mcum – Million Cubic Meters

MMDR - Mines & Minerals (Development and Regulation) Act

MMR - Metalliferous Mines Regulation

MOEF & CC - Ministry of Environment, forest & Climate Change

Mph- miles per hour

M-Sand - Mineral Sand

MSME - Micro, Small & Medium Enterprises

Mt - Metric Ton

MT – Million Tons

NGT - National Green Tribunal

NH – National Highway

NIC - National Informatics Centre

OC - Officer In Charge

OGL - Original Ground level

PSU - Public Sector Unit

R/F – Rain Fall

SSMG - Sustainable Sand Mining Guidelines

WBMDTCL- West Bengal Mineral Development and Trading Corporation Limited

The WBMMCR 2016 – The West Bengal Minor Mineral Concession Rules, 2016

Definitions

Riverbed: A riverbed is the area between two banks of river where sediment deposited. During the normal flow period, river water is contained in and flows along the riverbed. However, during a flood, the river overflows the riverbed and flows onto the floodplain.

Sandbars: The sandbar is the ridge of sand or coarse sediment that is built over a period of time.

Pre monsoon Sandbars: Sandbars which are identified from satellite imagery of pre monsoon period.

Post monsoon Sandbars: Sandbars which are identified from satellite imagery of post monsoon period.

Restricted Area: Sandbars or part of sandbars which are falling within restricted area. As per the Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 the restricted zone for mining is a distance from the bank is ¼th of river width and not be less than 7.5 meters. Also, there is a no mining zone up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side. No mining zone has been marked for an area up to a width of 100 meters from the active edge of embankments.

Potential Zone: Sandbars which are falling within the central $3/4^{th}$ part of the riverbed and which are not falling within the restricted area.

Potential Block: Each individual sand bars of potential zone is Potential Block.

River bed occurrence: River bed occurrence means sand, stone, boulder, pebbles, gravel accumulated in the river bed by natural phenomenon.

Replenishment: Quantum of sand deposited in a mined out void during monsoon period.

Aggradations: Aggradation (or alluviation) is the term used in geology for the increase in land elevation, typically in a river system, due to the deposition of sediment. Aggradation occurs in areas in which the supply of sediment is greater than the amount of material that the system is able to transport.

Act: It means the Mines and Minerals (Development and Regulation) Act, 1957(67 of 1957), as subsequently amended.

Mineral: It means minor minerals as defined in clause (e) of section 3 of the Act.

Sand: A natural resource, is a minor mineral as defined under S 3(e) of the Mines and Minerals (Development and Regulation) Act, 1957 (" MMDR Act").

Lease: It means a mining lease granted under West Bengal Minor Mineral Concession Rules, 2016.

Mining: Excavation of mineral by manual method or using machineries.

EXECUTIVE SUMMARY

The district Purba Bardhaman, one of the important districts of the Burdwan Division, is situated between 23053′ N to 22056′ N Latitude and 88025′ E to 87056′ E Longitude. It contains an area of 5432.69 sq.km. The district is bounded on the north by Birbhum and Murshidabad, on the east by Nadia, on the south by Hooghly and Bankura, and on the west by Paschim Bardhaman districts.

Purba Bardhaman district is a flat alluvial plain area that can be divided into four prominent topographical regions. On the north, the Kanksa Ketugram Plain lies along with the Ajay, which joins the Bhagirathi. The Bardhaman Plain occupies the central area of the district, with the Damodar on the south and the south-east. On the southern part is the Khandaghosh Plain. The Bhagirathi flows along the eastern boundary of the district, and the Bhagirathi Basin occupies the eastern part of the district. The undulating laterite topography of Paschim Bardhaman district extends up to the Ausgram area of this district.

The district has considerable area close to river basins that are characterized by Holocene alluvium deposits, which are likely to soften and hence are susceptible to liquefaction during an earthquake. The district falls under the Seismic Zone III indicating the district under moderate seismic intensity zone.

The river system in Barddhaman includes the Bhagirathi-Hooghly in the east, the Ajoy and its tributaries in the north and the Damodar and its branches in the south-west. Besides, there are innumerable Khals and old river beds all over the area.

In Purba Bardhaman district, as per the report published by Directorate of Mines and Minerals, Government of West Bengal, there is no major or minor in-situ minerals noted except lateritic deposits in the western part. The district is having riverbed deposits which are generating revenue for the district mainly.

The district is generating considerable revenue from mining of minor minerals such as riverbed sand deposits. Revenue generated in the district of Purba Bardhaman from Minor minerals during the period of April 2017 to September 2021 is Rs. 79.77 crores.

Potential minor mineral blocks of sand have been identified based on satellite imagery study along with ground truthing and are listed in this District Survey Report. Restriction zones are defined as per the EMGSM guidelines 2020. In Purba Bardhaman district, total 44.21 Mcum potential river bed deposits estimated.

1 Preface

The need for District Survey Report (DSR) have been necessitated by Ministry of Environment, Forest and Climate Change (MoEF&CC) vide there Notification No. 125 (Extraordinary, Part II Section 3, Sub-section ii), S.O. 141 (E), dated 15th January 2016. The notification was addressed to bring certain amendments with respect to the EIA notification 2006 and in order to have a better control over the legislation. District level committee's have been introduced in the system. As a part of this notification, preparation of District Survey Reports has been introduced. Subsequently, MOEF& CC has published Notification No. 3611 (E), dt. 25thJuly, 2018 regarding inclusion of the "Minerals Other than Sand" and format for preparation of the DSR has been specified. Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by MoEF & CC is prepared in consideration of various orders/directions issued by Hon'ble NGT in matters pertaining to illegal sand mining and also based on the reports submitted by expert committees and investigation teams. This DSR has been prepared in conformity with the S O 141 (E), S O 3611 (E) and other sand mining guidelines published by MOEF& CC time to time as well as the requirement specified in West Bengal Minor Mineral Concession Rule, 2016.

The purpose of DSR is to identify the mineral potential areas where mining can be allowed; and also, to distinguish areas where mining will not be allowed due to proximity to infrastructural structures and installations, areas of erosion, areas of environmental sensitivities etc.

The DSR would also help to estimate the annual rate of replenishment wherever applicable.

Preparation of this DSR involved both primary and secondary data generation. The primary data generation involved the site inspection, survey, ground truthing etc. while secondary data has been acquired through various authenticated sources and satellite imagery studies. The secondary data related to district profile, local geology, mineralization and other activities are available in rather a piecemeal fashion.

The district survey report of Purba Bardhaman district also describes the general geographical profile of the district, distribution of natural resources, livelihood, climatic condition, inventory of minor minerals and revenue generation.

2 Introduction

The District Survey Report of Purba Bardhaman District has been prepared as per the guide line of Ministry of Environment, Forests and Climate Change (MoEF& CC), Government of India vide Notification S.O.-1533(E) dated 14th Sept, 2006 and subsequent MoEF& CC Notification S.O. 141(E) dated 15th Jan, 2016. This report shall guide systematic and scientific utilization of natural resources, so that present and future generation may be benefitted at large. Further, MoEF& CC published a notification S.O. 3611(E) Dated 25th July, 2018 and recommended the format for District Survey Report.

The main objective of DSR is identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area. The DSR would also help to calculate the annual rate of replenishment wherever applicable and allow time for replenishment. Besides the sand mining, the DSR also include the potential development scope of in-situ minor minerals.

The objectives of the District Survey Report are as follows:

1. To identify and quantify minor mineral resources for its optimal utilization.
2. To regulate sand and gravel mining, identification of site-specific end-use consumers and reduction in demand and supply gaps.
3. To facilitate use information technology (IT) for surveillance of the sand mining at each step.
4. To enable environmental clearance for cluster of sand and gravel mines.
5. To restrict illegal mining.
6. To reduce occurrences of flood in the area.
7. To maintain the aquatic habitats.
8. To protect ground water in the area by limiting extraction of material in riverbeds to an elevation above the base flow.
9. To maintain data records viz. details of mineral resource, potential area, lease, approved mining plan, co-ordinates of lease hold areas, and revenue generation.
10. To design a scientific mining plan and estimate ultimate pit limit.
11. To frame a comprehensive guideline for mining of sand and other minor minerals.

The District Survey Report (DSR) comprises secondary data on geology, mineral resources, climate, topography, land form, forest, rivers, soil, agriculture, road, transportation, irrigation etc of the district collected from various published and un-published literatures and reports as well as various websites. Data on lease and mining activities in the district, revenue etc. have been collected from the DL&LRO office of the district and from West Bengal Mineral Development Corporation Limited.

2.1 Statutory Framework

Ministry of Environment, Forest and Climate Change (MoEF& CC) has published several notifications time to time to formulate and implement the District Survey Report (DSR) for every district. Statutory Frameworkandits legal aspect with respect to DSR is tabulated in Table 2.1.

Table 2.1: Statutory Framework and guidelines on DSR with time scale

Year	Particulars
1994	The Ministry of Environment, Forest & Climate Change (MoEF&CC) published Environmental Impact Assessment Notification 1994 which is only applicable for the Major Minerals more than 5 ha.
2006	In order to cover the minor minerals also into the purview of EIA, the MoEF&CChasissued EIA Notification SO 1533 (E), dated 14th September 2006, made mandatory to obtain environmental clearance for both Major & Minor Mineral more than 5 Ha.
2012	Further, Hon'ble Supreme Court wide order dated the 27th February, 2012 in I.A. No.12- 13 of 2011 in Special Leave Petition (C) No.19628-19629 of 2009, in the matter of Deepak Kumar etc. Vs. State of Haryana and Others etc., ordered that "leases of minor minerals including their renewal for an area of less than five hectares be granted by the States/Union Territories only after getting environmental clearance from MoEF"; and Hon'ble National Green Tribunal, order dated the 13th January, 2015 in the matter regarding sand mining has directed for making a policy on environmental clearance for mining leases in cluster for minor Minerals.
2016	The MoEF&CC in compliance of above Hon'ble Supreme Court's and NGT'S order has prepared "Sustainable Sand Mining Guidelines (SSMG), 2016" in consultation with State governments, detailing the provisions on environmental clearance (EC) for cluster, creation of District Environment Impact Assessment Authority, preparation of District survey report and proper monitoring of minor mineral. There by issued Notification dated 15.01.2016 for making certain amendments in the EIA Notification, 2006, and made mandatory to obtain EC for all minor minerals. Provisions have been made for the preparation of District survey report (DSR) forRiver bed mining and other minor minerals.
2016	West Bengal Minor Minerals Concession Rules,2016 amended the Mines and Minerals (Developmentand Regulation) Act, 1957 (Act 67 of 1957), to make the rules regulating the grant of mining licenses, prospecting license-cum-mining leases and mining leases in respect of minor minerals by auction process.The rule also incorporates EIA 2016 also includes SSMG 2016 for minor mineral mining.

2018	MoEF& CC published a notification S.O. 3611(E) Dated 25th July, 2018 and recommended the format for District Survey Report .The notification stated about the objective of DSRi.e."Identification of areas of aggradations or deposition where mining can be allowed; and identification of areas of erosion and proximity to infrastructural structures and installations where mining should be prohibited and calculation of annual rate of replenishment and allowing time for replenishment after mining in that area".
2020	Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) 2020 has been published modifying Sustainable sand Mining Guidelines, 2016 by MoEF& CC for effective enforcement of regulatory provisions and their monitoring.TheEMGSM 2020 directed the states to carry out river audits, put detailed survey reports of all mining areas online and in the public domain, conduct replenishment studies of river beds, constantly monitor mining with drones, aerial surveys, ground surveys and set up dedicated task forces at district levels.The guidelines also push for online sales and purchase of sand and other riverbed materials to make the process transparent. They propose night surveillance of mining activity through night-vision drones.

Important statutory Guidelines for sand mining in India:

- **The West Bengal Minor Minerals Concession Rules (WBMMCR), 2016**

1) (a) No person shall undertake mining operation in any area prohibited by the 'State Government in the public interest by notification in the *Official Gazette*.
Provided that nothing in the sub-rule shall affect any mining operation undertaken in any area in accordance with the terms and conditions of a mining lease or mineral concession already granted.
(b) No person shall transport or store or cause to be transported or stored any mineral otherwise than in accordance with the provisions of these rules and the West Bengal Minerals (Prevention of Illegal Mining, Transportation and Storage) Rules, 2002.

(2) No minor mineral coming out in course of digging of wells or excavation of tanks shall be disposed of by the person digging or excavating without informing the District Authority as well as the Executive Officer of the *Panchayat Samiti* or the Executive Officer of the Municipality concerned, as the case may be, about such occurrence.
Provided that disposal of such minor mineral may be allowed on pre-payment of prices of such minor mineral at the prevailing market rate as determined on the basis of the rates published by the Public Works Department / concerned department of the State Government for the concerned area from time to time.

(3) No mining of river bed occurrences shall be allowed within 300 meters, upstream and downstream, measured from the centre line of any bridge, regulator or similar hydraulic structure and from the end point of bank protection works.

(4) No river bed mining shall be allowed beneath 3 meters of the river bed or ground water Ievel, whichever is less.

(5) No mining operation in case of river bed occurrence shall be done within a distance of three (3) kilometers of a barrage axis or dam on a river unless otherwise permitted by the concerned Executive Engineer or Revenue Officer or authorized officer and such distance shall be reckoned across an imaginary line parallel to the 'barrage, or dam axis, as the case maybe.

(6) No extraction of river bed occurrence shall 'be allowed beyond the central one third of the river bed, or keeping a distance of 100 meter from the existing bank line whichever is less, unless otherwise permitted by the concerned Executive Engineer or Revenue Officer.

(7) No extraction of minerals other than river bed occurrence shall be allowed within fifty (50) meters from any road, public structure, embankment, railway line, bridge canal, road and other public works or buildings.

(8) No mining lease shall be granted without proof of existence of mineral contents in the area for which the application for a mining lease has been made in accordance with such parameters as may be prescribed by the Government from time to time.

N.B- The aforesaid application for mining lease shall succeed the competitive bidding for mining lease for a specified mineral(s).

- **Sustainable Sand Mining Management Guidelines (SSMMG), 2016by MoEF& CC.**

  The sustainable sand Mining Management Guidelines 2016 has been prepared after extensive consultation with the States and Stakeholders over a period of one year. The main objective of the Guideline is to ensure sustainable sand mining and environment friendly management practices in order to restore and maintain the ecology of river and other sand sources.

a) Parts of the river reach that experience deposition or aggradation shall be identified first. The Lease holder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.

b) The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.

c) Sand and gravel may be extracted across the entire active channel during the dry season.

d) Abandoned stream channels on terrace and inactive flood plains be preferred rather than active channels and their deltas and flood plains. Stream should not be diverted to form inactive channel.

e) Layers of sand and gravel which could be removed from the river bed shall depend on the width of the river and replenishment rate of the river.

f) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.

g) Segments of braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.

h) Sand and gravel shall not be extracted within 200 to 500 meter from any crucial hydraulic structure such as pumping station, water intakes, and bridges. The exact distance should be ascertained by the local authorities based on local situation. The cross-section survey should cover a minimum distance of 1.0 km upstream and 1.0 km downstream of the potential reach for extraction. The sediment sampling should include the bed material and bed material load before, during and after extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross- section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.

h) Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.

Flood discharge capacity of the river could be maintained in areas where there are significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross- section history.

i) Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.

j) The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for ground water recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.

k) Mining depth should be restricted to 3 meter and distance from the bank should be 3 meter or 10 percent of the river width whichever less.

The borrow area should preferably be located on the river side of the proposed embankment, because they get silted up in course of time. For low embankment less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In case of higher embankment the distance should not be less than 50 m. In order to obviate development of flow parallel to embankment, cross bars of width eight times the depth of borrow pits spaced 50 to 60 meters centre-to-centre should be left in the borrow pits.

l) Demarcation of mining area with pillars and geo-referencing should be done prior to start of mining.

- **Enforcement & Monitoring Guidelines for sand Mining, 2020 (MoEF& CC)**

The Ministry of Environment Forest & Climate Change formulated the Sustainable Sand Management Guidelines 2016 which focuses on the Management of Sand Mining in the Country. But in the recent past, it has been observed that apart from management and systematic mining practices there is an urgent need to have a guideline for effective enforcement of regulatory provision and their monitoring. Section 23 C of MMDR, Act 1957 empowered the State Government to make rules for preventing illegal mining, transportation and storage of minerals. But in the recent past, it has been observed that there was large number of illegal mining cases in the Country and in some cases, many of the officers lost their lives while executing their duties for curbing illegal mining incidence. The

illegal and uncontrolled illegal mining leads to loss of revenue to the State and degradation of the environment.

a) Parts of the river reach that experience deposition or aggradation shall be identified. The Leaseholder/ Environmental Clearance holder may be allowed to extract the sand and gravel deposit in these locations to manage aggradation problem.
b) The distance between sites for sand and gravel mining shall depend on the replenishment rate of the river. Sediment rating curve for the potential sites shall be developed and checked against the extracted volumes of sand and gravel.
c) Sand and gravel may be extracted across the entire active channel during the dry season.
d) Abandoned stream channels on the terrace and inactive floodplains be preferred rather than active channels and their deltas and flood plains. The stream should not be diverted to form the inactive channel.
e) Layers of sand and gravel which could be removed from the river bed shall depend on the width of the river and replenishment rate of the river.
f) Sand and gravel shall not be allowed to be extracted where erosion may occur, such as at the concave bank.
g) Segments of the braided river system should be used preferably falling within the lateral migration area of the river regime that enhances the feasibility of sediment replenishment.
h) Sand and gravel shall not be extracted up to a distance of 1kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.
i) The sediment sampling should include the bed material and bed material load before, during and after the extraction period. Develop a sediment rating curve at the upstream end of the potential reach using the surveyed cross-section. Using the historical or gauged flow rating curve, determine the suitable period of high flow that can replenish the extracted volume. Calculate the extraction volume based on the sediment rating curve and high flow period after determining the allowable mining depth.
j) Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two-thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.
k) The flood discharge capacity of the river could be maintained in areas where there is a significant flood hazard to existing structures or infrastructure. Sand and gravel mining may be allowed to maintain the natural flow capacity based on surveyed cross-section history. Alternatively, off-channel or floodplain extraction is recommended to allow rivers to replenish the quantity taken out during mining.
l) The Piedmont Zone (Bhabhar area) particularly in the Himalayan foothills, where riverbed material is mined, this sandy-gravelly track constitutes excellent conduits and holds the greater potential for groundwater recharge. Mining in such areas should be preferred in locations selected away from the channel bank stretches.
m) Mining depth should be restricted to 3 meters and distance from the bank should be ¼th or river width and should not be less than 7.5 meters.

n) The borrow area should preferably be located on the riverside of the proposed embankment because they get silted in the course of time. For low embankment, less than 6 m in height, borrow area should not be selected within 25 m from the toe/heel of the embankment. In the case of the higher embankment, the distance should not be less than 50 m. In order to obviate the development of flow parallels to the embankment, crossbars of width eight times the depth of borrow pits spaced 50 to 60 meter center-to-center should be left in the borrow pits.

o) Demarcation of mining area with pillars and geo-referencing should be done prior to the start of mining.

p) A buffer distance /un-mined block of 50 meters after every block of 1000 meters over which mining is undertaken or at such distance as may be the directed/prescribed by the regulatory authority shall be maintained.

q) A buffer distance /unmined block of 50 meters after every block of 1000 meters over which mining is undertaken or at such distance as may be the directed/prescribed by the regulatory authority shall be maintained.

r) River bed sand mining shall be restricted within the central 3/4th width of the river/rivulet or 7.5 meters (inward) from river banks but up to 10% of the width of the river, as the case may be and decided by regulatory authority while granting environmental clearance in consultation with irrigation department. Regulating authority while regulating the zone of river bed mining shall ensure that the objective to minimize the effects of riverbank erosion and consequential channel migration are achieved to the extent possible. In general, the area for removal of minerals shall not exceed 60% of the mine lease area, and any deviation or relaxation in this regard shall be adequately supported by the scientific report.

s) Mining Plan for the mining leases(non-government) on agricultural fields/Patta land shall only be approved if there is a possibility of replenishment of the mineral or when there is no riverbed mining possibility within 5 KM of the Patta land/Khatedari land. For government projects mining could be allowed on Patta land/Khatedari land but the mining should only be done by the Government agency and material should not be used for sale in the open market.

The minerals reserve for riverbed area is calculated on the basis of maximum depth of 3 meters and margins, width and other dimensions as mentioned in para (s) above. The area multiplied by depth gives the volume and volume multiplied with bulk density gives the quantity in Metric Ton. In case of riverbed, mineable material per hectare area available for actual mining shall not exceed the maximum quantity of 60,000 MT per annum.

Demand and Utilisation of Sand

Sand is a multi-purpose topographical material. It is known as one of the three fundamental ingredients in concrete. The composition of sand is diverse. Mostly sand is made of silica which is a common element. It can also come from another source of minerals like quartz, limestone, or gypsum.

From beds to flood plains to coastlines- we can find the sand at almost everywhere. The robustness of sand has played a significant role in everyday life. We use sand practically every other day.

Sand extraction from river beds and brick earth mining for making raw bricks are the main mining activities in the district. With a spurt in construction of real estate sectors and various govt. sponsored projects, the demand for both sand and bricks has increased manifold. The extraction of sand is carried out either manually or through semi- mechanized system. The depth of mining for both river bed sand and brick earth is restricted due to statutory provision in the regulations pertaining to conservation and development of minor minerals.

River sand mining is a common practice as habitation concentrates along the rivers and the mining locations are preferred near the markets or along the transportation route, for reducing the transportation cost.

In the real world, there are a lot of situations where we can find uses of sand. Followings are the common sand uses.

1. While bunging metal, we can mix sand with clay binder for frameworks used in the foundries.
2. Sand can be used for cleaning up oil leak or any spill by dredging sand on that spill. The material will form clumps by soaking up, and we can quickly clean the mess.
3. Sand can be used as a road base which is a protective layer underneath all roads
4. Industrial sand is used to make glass, as foundry sand and as abrasive sand.
5. One creative usage of sand is serving as a candle holder. We can try putting some sand before pouring tea light or any candle in a glass. It holds the candle still and refrain the candle from rolling by giving it an excellent decoration.
6. Adds texture and aesthetic appeal to space.
7. Sand is mostly pure to handle, promptly available and economically wise.
8. We use sand in aquariums, fabricating artificial fringing reefs, and in human-made beaches
9. Sandy soils are ideal for growing crops, fruits and vegetables like watermelon, peaches, peanuts, etc.
10. Sand can light a path by filling mason jars with sand and tea light which is another inexpensive way to make a walkway glow.
11. Sand helps to improve resistance (and thus traffic safety) in icy or snowy conditions.
12. We need sand in the beaches where tides, storms or any form of preconceived changes to the shoreline crumble the first sand.
13. Sand containing silica is used for making glass in the automobile and food industry- even household products for the kitchen.
14. Sand is a strong strand which is used for plaster, mortar, concrete, and asphalt.
15. The usual bricks formulated of clay only are way weaker and lesser in weight than blocks made of clay mixed with sand.

2.2 Methodology of DSR Preparation

The steps followed during the preparation of District Survey Report are given in Figure 2.1. The individual steps are discussed in following paragraphs.

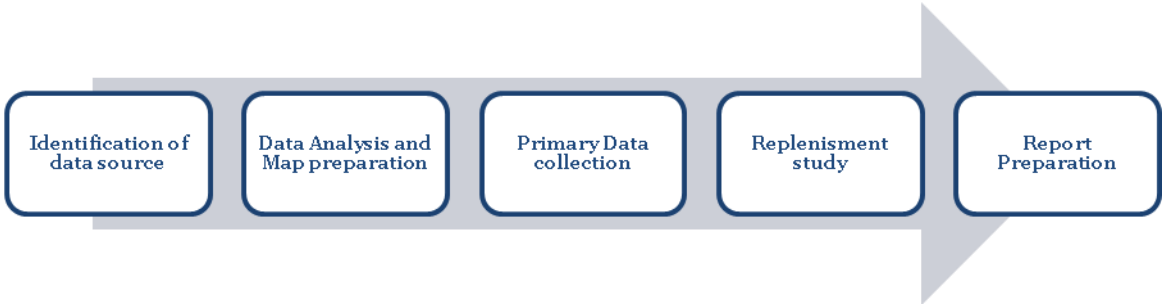


Figure 2.2.1: Steps followed in preparation of DSR

Data source Identification: District Survey Report has been prepared based on the Primary data base and secondary data base collected and collated from different sources. This is very critical to identify authentic data sources before compiling thedata set. The secondary data sources which are used in this DSR are mostly taken from public domain and or fromthe published report in reputed journal. Information related to district profile has been taken from District Census report,2011 and District Statistical Handbook published by the Govt. of West Bengal. Potential mineral resources of the district have been described based on the published report of Geological Survey of India (GSI) or any other govt. agencies like MECL etc. List of Mining lease, name of lease holder, lease/Block area, resource in already allotted mining lease, revenue from minor mineral sector etc. have been collected fromthe concern DL&LRO offices of the district. Satellite images have been used for map preparation related to physiography and land use/land cover of the district.

Data Analysis and Map preparation: Dataset which are captured during the report preparation, are gone through detail analysis work. District Survey Report involves the analytical implication of the captured dataset to prepare relevant maps.

Methodology adopted for preparation of relevant maps is explained below.

Land Use and Land Cover Map: Land Use and Land Cover classification is a complex process and requires consideration of many factors. The major steps of image classification may include determination of a suitable classification system via Visual Image Interpretation, selection of training samples, Satellite image (FCC-False Color Composite) pre-processing, selection of suitable classification approaches, postclassification processing, and accuracy assessment.

Here LISS-III satellite Imagery has been taken for Supervised Classification as supervised classification can be much more accurate than unsupervised classification, but depends heavily on the training sites, the skill of the individual processing the image, and the spectral distinctness of the classes in broader scale.

According to the Visual Image Interpretation (Tone, Pattern, Texture, Shape, Color etc.) training set of the pixel has been taken. Pictorial descriptions of Land Use classification are explained in Figure 2.2.

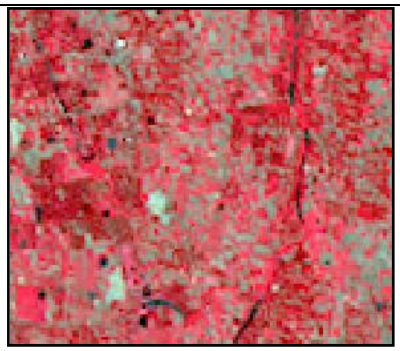
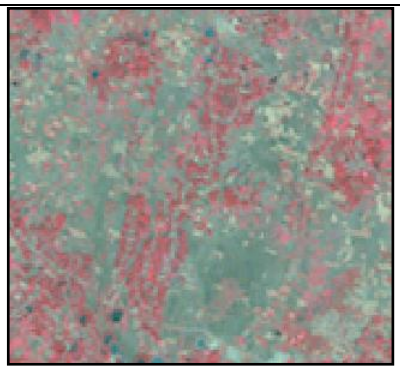
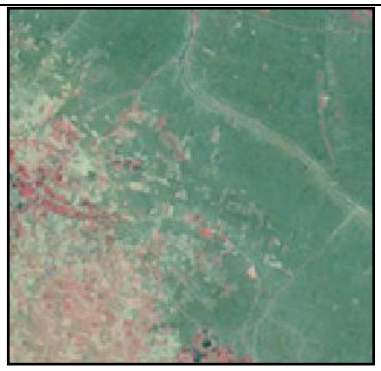
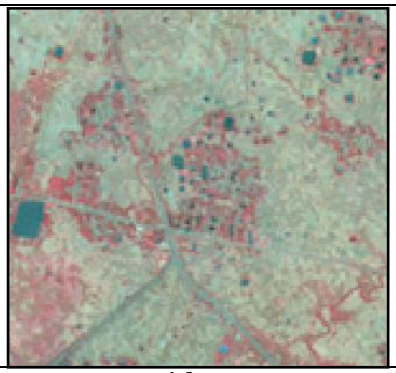
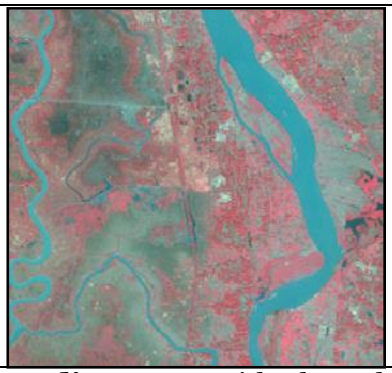
	
Agricultural Land - Based on their Geometrical shape, Red and Pink color tone, Agricultural Land has been identified.	**Vegetation Covered Area** - Area with continuous Red color tone, Vegetation Covered Area has been classified.
	
Agricultural Fallow Land - Based on their Geometrical shape, Yellowish green color tone, Agricultural Fallow Land has been identified.	**Badland Topography**- Area with Non geometrical shape and Yellowish green colortonehas been identified as Bad Land Topography.
	
Settlement – Area with some geometrical shape in a Linear Pattern including Light Cyan Colorhas been recognized as Settlement Area.	**Water Bodies –** Area with Blue color has been classified as Water Bodies.

Figure 2.2.2: Pictorial description of Land Use Classification methods

Geomorphological Map: The major step of preparing Geomorphological Map is identifying features like – Alluvial Fan, Alluvial Plain, Hilly Region etc. from Satellite Imagery

(FCC-False Colour Composite) via Visual Image Interpretation and then digitisation has been taken into the consideration to prepare map including all the Geomorphological features according to their location. Pictorial descriptions of Geomorphological unit's classification are explained in Figure 2.3.

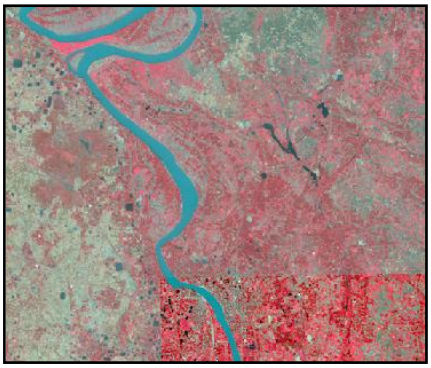
	
Flood plain-Floodplainis a generally flat area of land next to a river or stream. It stretches from the banks of the river to the outer edges of the valley.	**OX-BOW Lake-** An ox-bow lake starts out as a curve, or meander, in a river. This "U" shaped body of water identified as Ox-Box Lake from Satellite Imagery.

Figure 2.2.3: Pictorial description of Geomorphological Units Classification methods

Physiographical Map: The major step of preparing Physiographical Map is generating contour at a specific interval to show the elevation of the area using Cartosat DEM.

Block Map/Transportation Map/Drainage Map:

- Raw Data collected from **National Informatics Centre (NIC Website) during Sept 2020.**
- Data has been geo-referenced using GIS software.
- Digitization of block boundary, district boundary, state boundary, international boundary, and district headquarter, sub–district headquarter, places, road, railway, river, nala etc.
- Road name, River name, Railway name has been filled in attribute table of the Layers
- Final layout has been prepared by giving scale, legend, north arrow, etc.

Earthquake Map:

- Raw data collected from **Ministry of Earth Science.**
- Data has been geo-referenced using GIS software.
- Digitization of Earthquake zone and superimposed it over Block Boundary.
- Zone name has been filled in attribute table of the Layers
- Final layout has been prepared by giving scale, legend, north arrow, etc.

Soil Map:

- Raw data collected from **National Bureau of Soil Survey and Land Use Planning during Sept 2020.**
- Data has been geo-referenced using GIS software.
- Digitization of Soil classification zone and superimposed it over District Boundary.
- Soil classification has been filled in attribute table of the Layers.
- Final layout has been prepared by giving scale, legend, north arrow, etc.

Wildlife Sanctuary and National Park location Map:

- Raw data obtained from **ENVIS Centre on Wildlife & Protected Areas during August 2020.**
- Data has been geo-referenced using GIS software.
- Digitization of Wildlife Sanctuary & National Park and superimposed it over Block Boundary.
- Wildlife Sanctuary & National Park name has been filled in attribute table of the Layers

Final layout has been prepared by giving scale, legend, north arrow, etc.

Primary Data Collection: To prepare DSR, primary data has been collected and field work has also been carried out for the district. Field study involves assessment of the mineral resources of the district by means of pitting / trenching in specific interval. This provides clear picture of mineral matters characterization and their distribution over the area.

Replenishment study: One of the principal causes of environmental impacts river bed mining is the removal of more sediment than the system can replenish. Therefore, there is a need for replenishment study for riverbed sand in order to nullify the adverse impacts arising due to excess sand extraction. The annual rate of replenishment carried out on every river of the district to have proper assessment of the potential sand reserve.

Four times physical survey has been carried out by GPS/DGPS/ Total Station to define the topography, contours and offsets of the riverbed. The surveys clearly depict the important attributes of the stretch of the river and its nearby important civil and other feature of importance. This information will provide the eligible spatial area for mining.

Report Preparation: The district survey report portrays general profile, geomorphology, land use pattern and geology of the district. The report then describes the availability and distribution of riverbed sands and other minor minerals in the district. Apart from delineation the potential mining blocks, the report also includes inventorization of the minerals, recent trends of production of minor minerals and revenue generation there from. Annual replenishment of the riverbed sand has been estimated using field observation, satellite imagery and empirical formula. The road network connecting arterial road to potential mining blocks has been identified. Potential environmental impacts of mining of these minerals, their mitigation measures along with risk assessment and disaster management plan have also been discussed. Finally, the reclamation strategy for already mined out areas is also chalked out.

3 General Profile of the district

a) General Information

Purba Bardhaman district is one of the twenty-three districts of West Bengal. It has come into existence on 7th April 2017, after bifurcation of erstwhile Burdwan district and its head quarter is Bardhaman. Purba Bardhaman is an agriculturally prosperous district of West Bengal. This part of the West Bengal is traditionally familiar as the agriculturally developed is known as the '*Granary of the West Bengal*'. It contains an area 5432.69 *km*2 (2097.57 sq miles) as ascertained by the bifurcation, and population (according to 2011 census) is 4,835,532, density of population is 890/*km*2. The district lies mainly between the river Ajay, the Bhagirathi and the Damodar. The river Barakar forms the State boundary to the west; the Ajay separetes Birbhum and Dumka to the north with exception of a portion of Katwa subdivision; the Damodar forms a southern boundary with Purulia and Bankura, while Bhagirathi forms the main eastern boundary with a few exceptions. The maximum length from east to west is 208 Km while the maximum breadth from north to south is 112 Km.

The district falls under Survey of India Toposheet No.- 73M/10, 73M/11, 73M/12, 73/14, 73M/15, 73M/16, 73N/13, 79A/1, 79A/2, 79 A/4, 79A/5, 79A/6, 79A/7, 79A/8, 79B/1, 81A/3, and 75M/13.

	LATITUDE	**LONGITUDE**
EAST	23028'52.063"N	87027'9.521"E
WEST	23012'45.047"N	88025'15.183"E
NORTH	23050'28.432"N	87059'39.005"E
SOUTH	22056'53.233"N	87050'42.352"E

EAST	Nadia District
WEST	Paschim Bardhman District
NORTH	Murshidabad & Birbhum District
SOUTH	Hooghly & Bankura District

The district comprises four subdivisions: -

- Kalna subdivision consists of one municipality at Kalna and five CD blocks: Kalna I, Kalna II, Manteswar, Purbasthali I and Purbasthali II.
- Katwa subdivision consists of two municipalities at Katwa and Dainhat and five CD blocks: Katwa I, Katwa II, Ketugram I, Ketugram II and Mongakote.
- Bardhaman Sadar North subdivision consists of two municipalities at Bardhaman and Guskara and seven CD blocks: Ausgram I, Ausgram II, Bhatar, Burdwan I, Burdwan II, Galsi I and Galsi II.
- Bardhaman Sadar South subdivision consists of one municipality at Memari and six CD blocks: Khandaghosh, Jamalpur, Memari I, Memari II, Raina I and Raina II

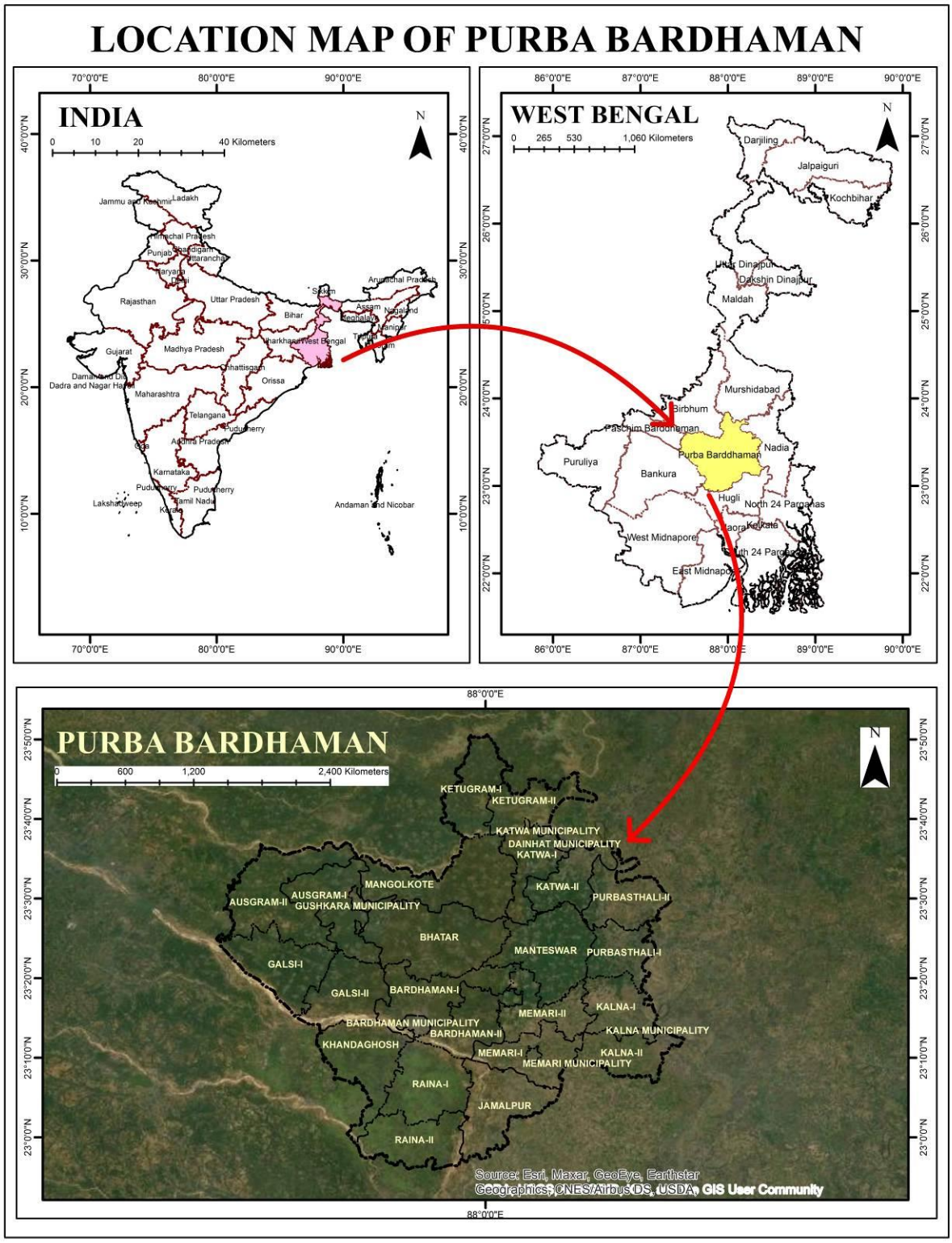


Figure 3.1: Location Map of Purba Bardhaman
(Source: National Informatics Centre and ESRI Base Map)

Table 3.1: Block distribution of the District

Sub-division:	Blocks/ Municipality/ Municipal Corporation	Panchayat		
		Samity	Gram	Gram Sansad
Burdwan Sadar (South)	Memari-I	1	10	150
	Memari-II	1	9	109
	Memari(M)	-	-	-
	Jamalpur	1	13	189
	Raina-I	1	8	128
	Raina-II	1	8	116
	Khandaghosh	1	10	134
Burdwan Sadar (North)	Burdwan-I	1	9	144
	Burdwan-II	1	9	105
	Burdwan(M)	-	-	-
	Ausgram-I	1	7	90
	Guskara(M)	-	-	-
	Ausgram-II	1	7	105
	Bhatar	1	14	193
	Galsi-II	1	9	119
Kalna	Purbathali-I	1	7	138
	Purbasthali-II	1	10	141
	Kalna-I	1	9	141
	Kalna-II	1	8	110
	Kalna(M)	-	-	-
	Monteshwar	1	13	171
	Purbathali-I	1	7	138
Katwa	Mongolkote	1	15	186
	Ketugram-I	1	8	114
	Ketugram-II	1	7	82
	Katwa-I	1	9	116
	Katwa-II	1	7	100
	Katwa(M)	-	-	-
	Dainhat(M)	-	-	-

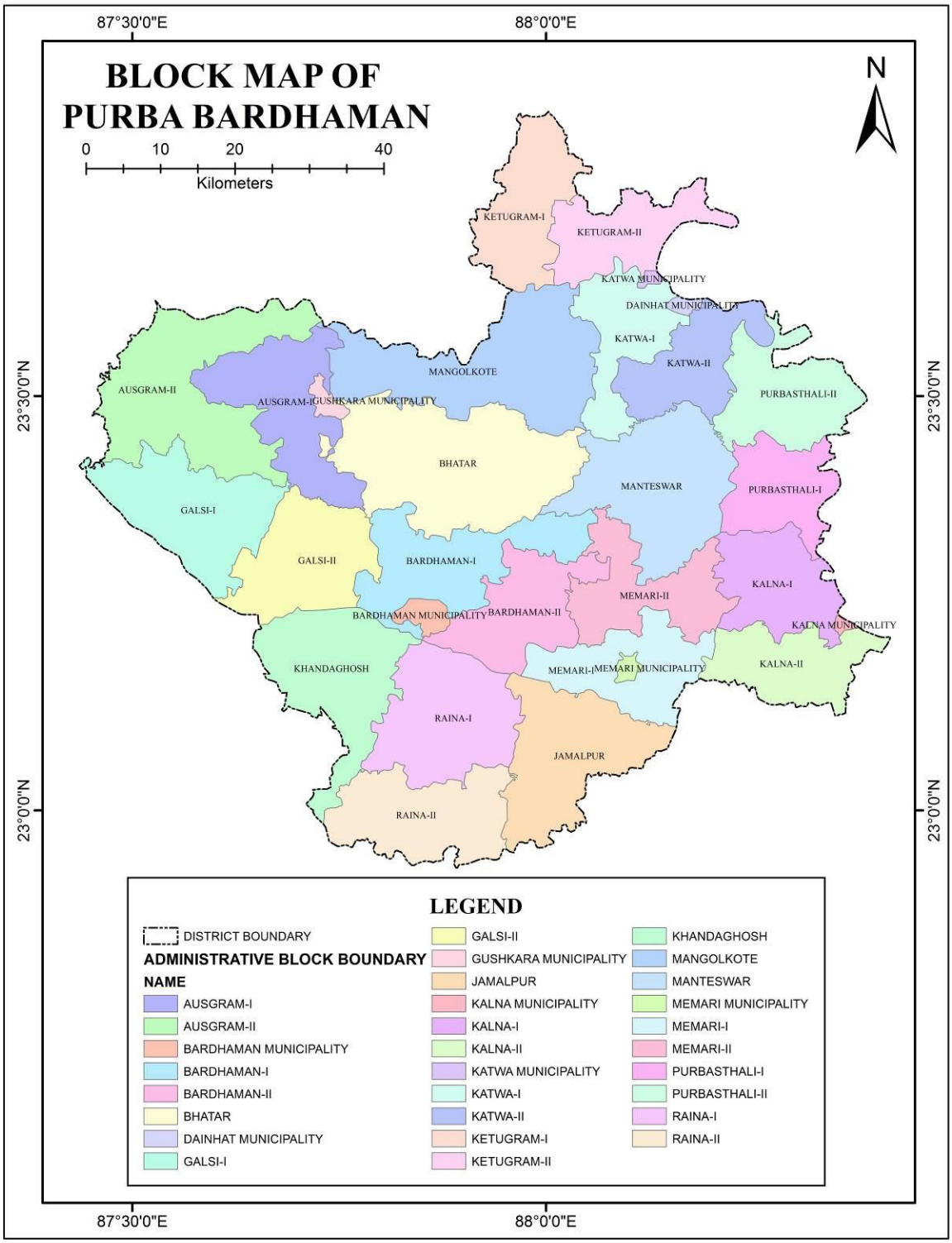


Figure 3.2: Block divisional map of Purba Bardhaman
(Source: National Informatics Centre)

b) Climate Condition

Purba Bardhaman district has a tropical climate – hot and humid. While the hottest month is May, the coldest is January. The monsoon season is from June to September, with an annual average rainfall of 1,400 mm, 75% of it falling in the monsoon months. Localised thunderstorms, called kalbaisakhi in Bengali, are a special feature from March until the monsoon sets in.

The cold season starts from about the middle of November and continues till the end of February. March to May is dry summer intervened by tropical cyclones and storms. June to September is wet summer while October and November are autumn.

https://purbabardhaman.nic.in/geography/

c) Rainfall

The average annual rainfall in the district is 1400mm. The variations in the annual rainfall within the district and from year to year are not large. The rainfall during the monsoon season – June to September – constitutes 75 percent of the annual rainfall; July and August are the rainiest months.

(https://hydro.imd.gov.in/hydrometweb/(S(c31xot2fu1lahs45tplr2vuh))/DistrictRaifall.aspx)

The information on annual rainfall for the five years from 2016 to 2020 for the district is given in Table 3.2. Average rainfall of the district explained graphically in Figure 3.3.

Table 3.2: Annual rainfall (in milimeter) recorded in the District

The District Rainfall in mm (R/F) shown below are the arithmetic averages of Rainfall of Stations under the District						
YEAR	**JAN**	**FEB**	**MAR**	**APR**	**MAY**	**JUN**
2016	13.5	29.3	15	0	120	182.5
2017	1.2	0	32.6	28.3	171.2	255.8
2018	0	0.1	15.1	82.6	43.5	158.1
2019	0	64	16.3	47.8	129.9	90.9
2020	26.6	1.1	64.6	65.8	212	298.4
YEAR	**JUL**	**AUG**	**SEPT**	**OCT**	**NOV**	**DEC**
2016	263.9	463.5	274.5	44.3	1.9	0
2017	464.1	252.9	178.2	260.1	14.5	9.1
2018	329.7	174.7	154.3	16	0	26.7
2019	195.8	233.1	215.8	191.7	16.8	11.1
2020	338.2	262.2	128.2	81	1.7	0

https://hydro.imd.gov.in/hydrometweb/(S(5mg03haiyer0tp45adbukh3i))/DistrictRaifall.aspx
Website of Indian Meteorological Department, Govt. of India

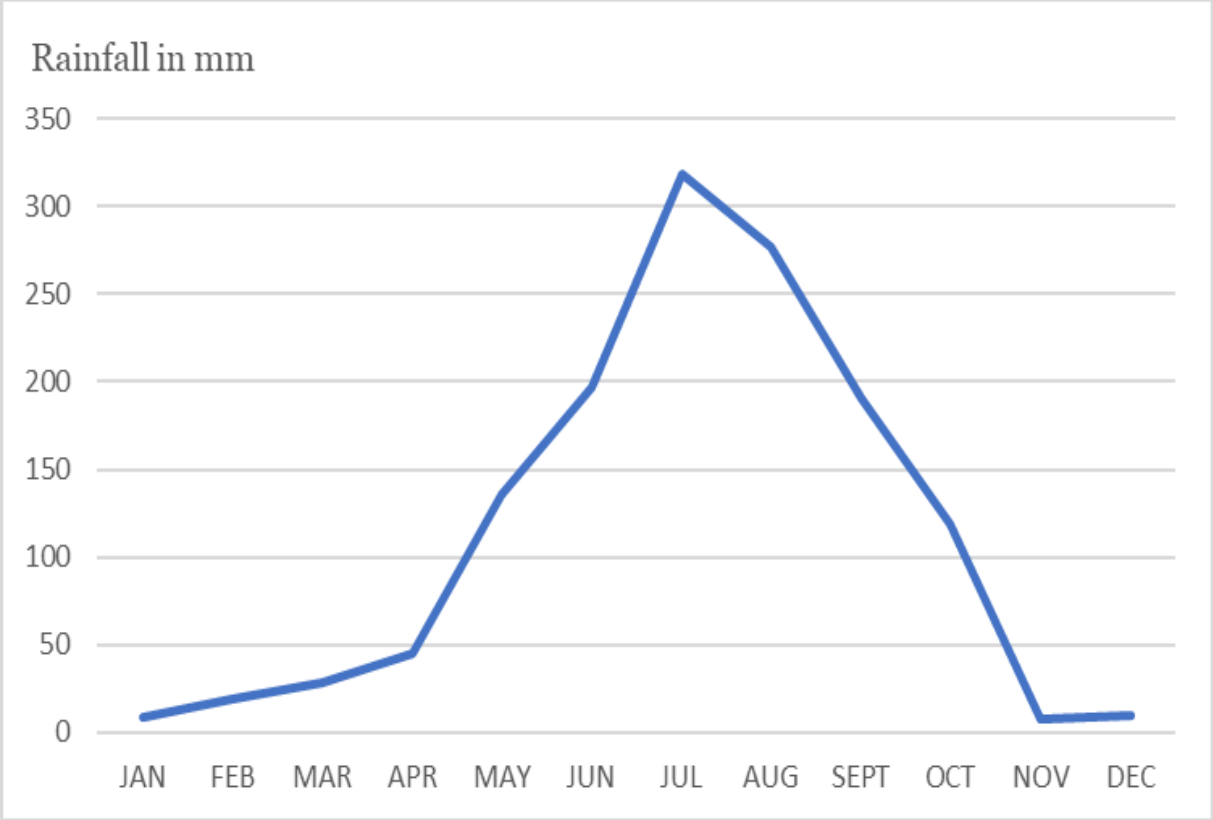


Figure 3.3: Graphical representation of the District rainfall

- **Temperature:**

Summer

Paschim Bardhaman district experiences dry and hot summer with maximum temperature of near about≈ 40°C during summer. The district shows a fierce dry heat in the warmer months. The summers in Purba Bardhaman usually start from month of March and last till the middle of June.

Monsoon

The arrival of the month of June marks the onset of monsoon in Purba Bardhaman. The district receives a high average rainfall. June to September has shown maximum average rainfall with moderate temperature. The district received average rainfall of 1400 mm.

Winter

Winters in Paschim Bardhaman are pleasant and enjoyable, with mercury dropping to about 14°C or below. The winter starts from December and last till the month of February.

The average maximum and minimum temperature recorded is given in Table 3.3.

Table 3.3: Monthly mean temperature (in °C) distribution of the District

Month	Min Temp (˚C)	Max Temp (˚C)
JAN	10	24
FEB	13	28
MAR	18	32
APR	22	38
MAY	23	36
JUN	25	34
JUL	24	32
AUG	24	32
SEPT	22	32
OCT	20	31
NOV	13	29
DEC	10	26

- **Relative Humidity, Wind speed & Wind direction**

The maximum and minimum relative humidity of the district during summer season varies from 75% to 85 % and 40% to 60% respectively. In winter time district's humidity varies from maximum 80% to 90 % and minimum 30% to 55% *(District Disaster Management Plan, 2015-2016).*

d) Topography & Terrain

Purba Bardhaman district is a flat alluvial plain area that can be divided into four prominent topographical regions. On the north, the Kanksa Ketugram Plain lies along with the Ajay, which joins the Bhagirathi. The Bardhaman Plain occupies the central area of the district, with the Damodar on the south and the south-east. On the southern part is the Khandaghosh Plain. The Bhagirathi flows along the eastern boundary of the district, and the Bhagirathi Basin occupies the eastern part of the district. The undulating laterite topography of Purba Bardhaman district extends up to the Ausgram area of this district.

The gradient is westerly to the west and to the east, it is northerly towards Ajay and southerly towards Damodar below the latitude. The Ajay- Damodar inter-stream tract is made up of several stows consisting of vales and low convex spurs which run in almost all directions except north-east and thus lends a very complicated character to local relief.

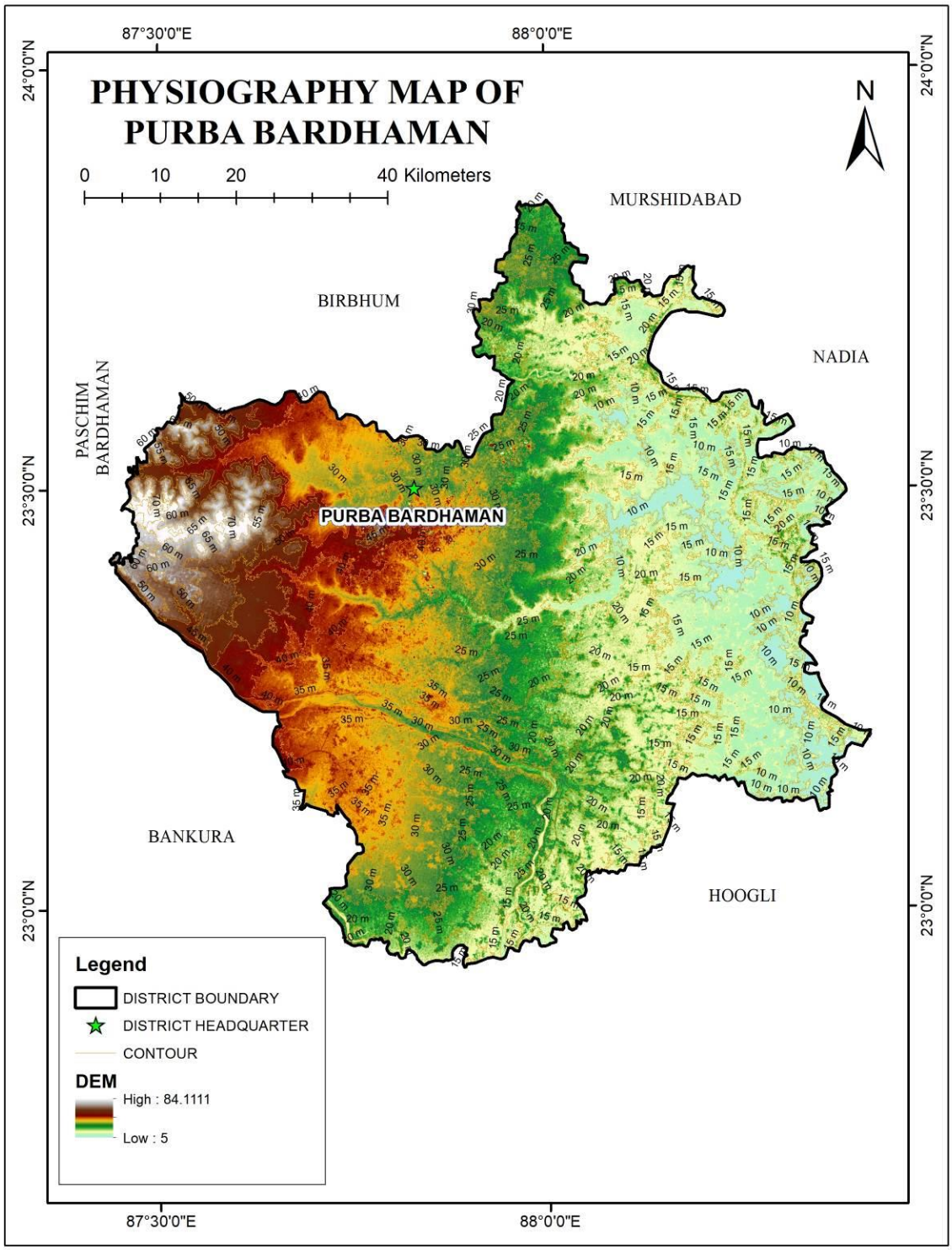


Figure 3.4: Physiographic map of the District

(Source: Cartosat-1, Bhuvan India)

e) Water Course & Hydrology

Figure 3.5 represents hydrogeological map of the district which includes Purba Bardhaman district. Rock type of the district mainly consist of Granite Gneisses, Migmatite, Schist, Sandstone with shale, Laterite, Sand, Silt and Clay. This rock group chiefly comprises the district profile. Thickness of the rock type is about 50 m and having yield value of 150 cum/day.

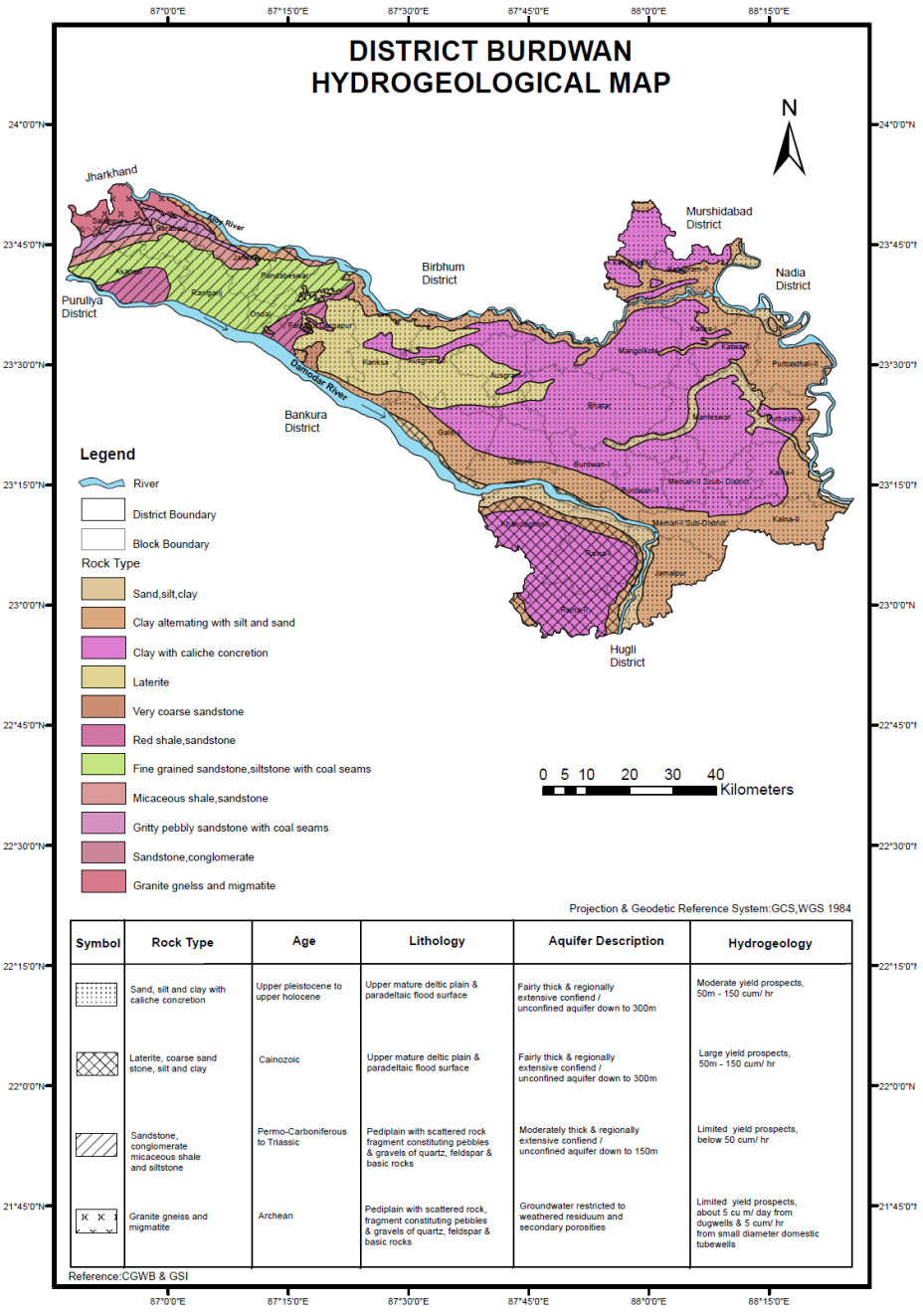


Figure 3.5: Hydrogeological map of the district
http://wbwridd.gov.in/swid/mapimages/BARDDHAMAN.pdf

f) Ground Water Development

Ground water systems are the result of complex combination of different lithological and structural types within an area that together constitutes an aquifer within which ground water accumulates and moves. In the major part of the district, ground water in thick unconsolidated Quaternaries and Tertiaries deposited under fluviatile environment, the sand and/or gravel in different proportions of this formation constitute the main aquifer and they occur down to 295 mbgl in the central and eastern part of the district. Deeper aquifers occur under semi-confined to confined condition. Groundwater in the western part of Upper- Palaeozoic- Mesozoic- Tertiary sequences of Gondwana Supergroup of sedimentaries occur under both unconfined and confined conditions down to 150.35 mbgl. Groundwater in the extreme north western small part of Salanpur Block occupied by the Archaean metamorphics occurs down to a depth of about 82 mbgl under both unconfined and confined conditions down to 150.35 mbgl. It mainly occurs under unconfined condition in the dug well zone and under semi confined to confined condition in the deeper horizons. In Bardhaman district, ground water occurs in semi-confined to confined aquifer conditions in the depth span of 12.00-38.00 mbgl, 31.00-55.00 mbgl and 70.00-88.00 mbgl.

http://cgwb.gov.in/Regions/GW-year-Books/GWYB-%202016-17/WB%20&%20Andaman.pdf

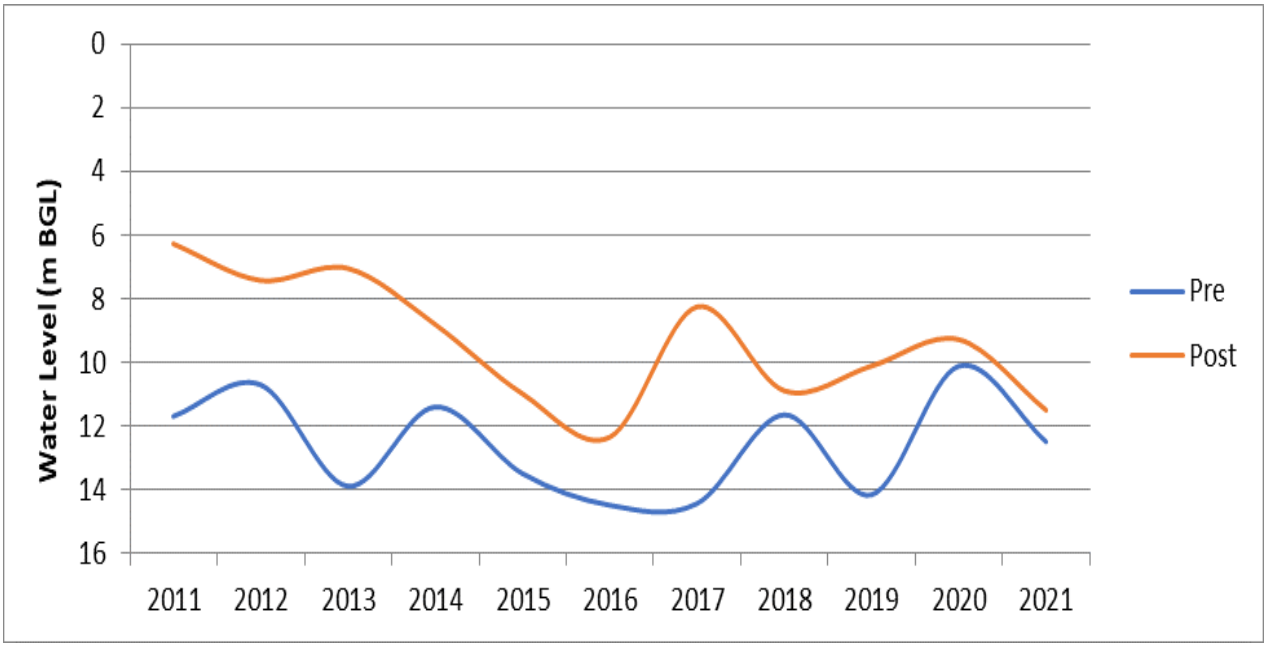
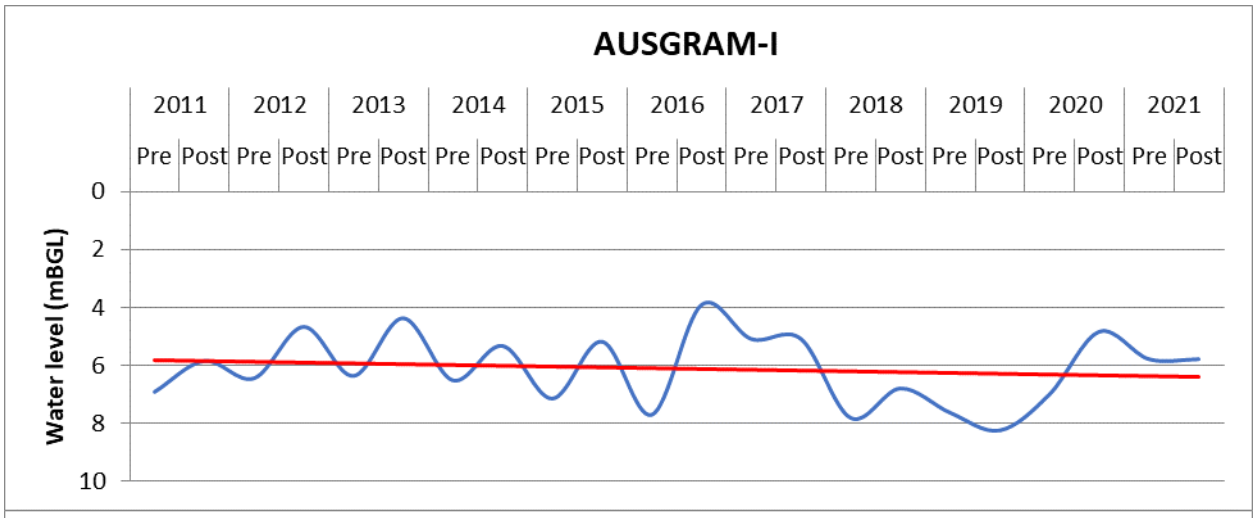
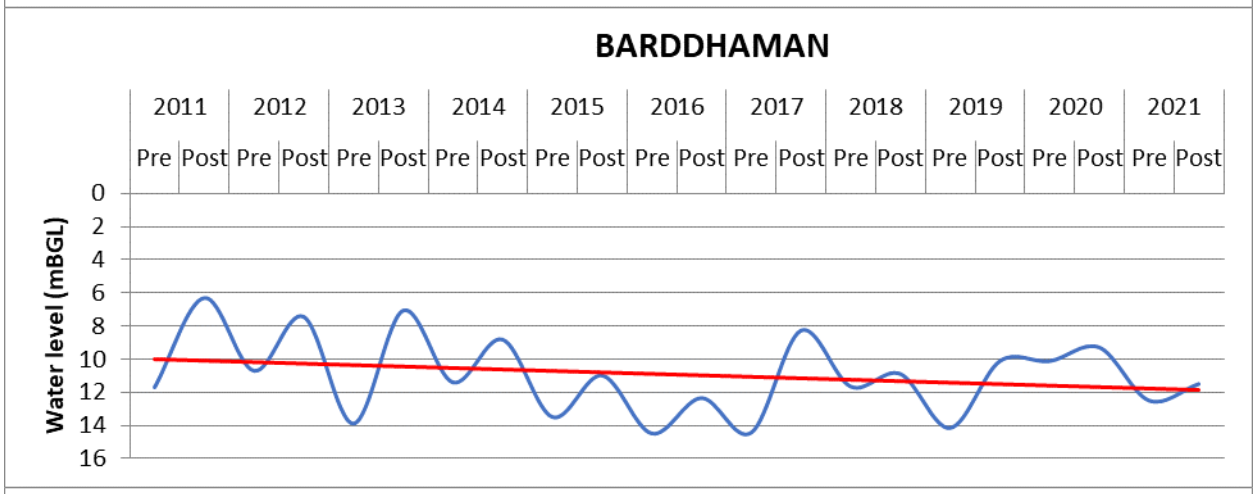
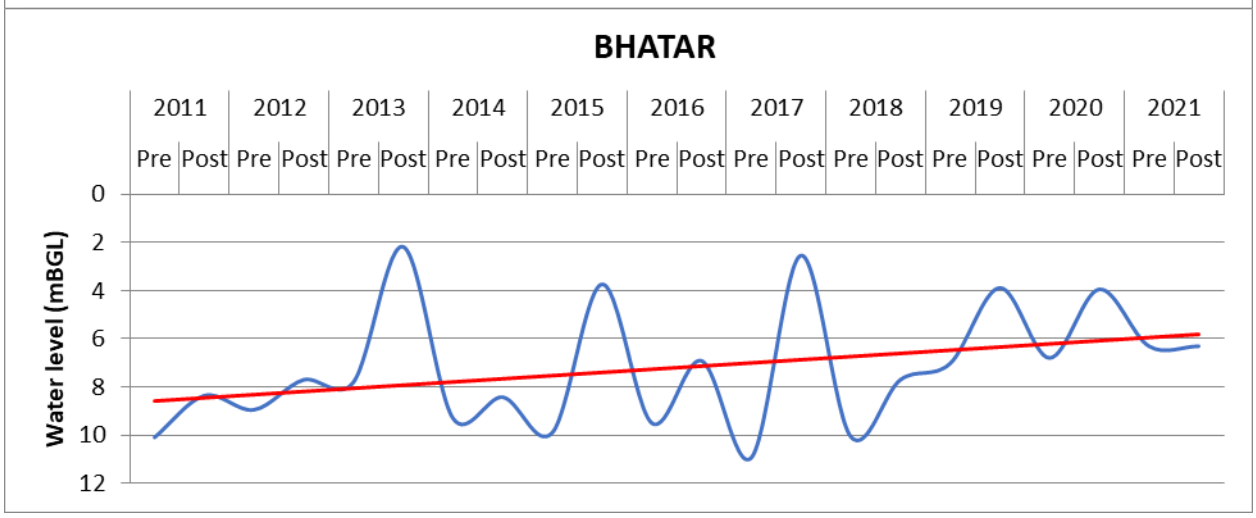


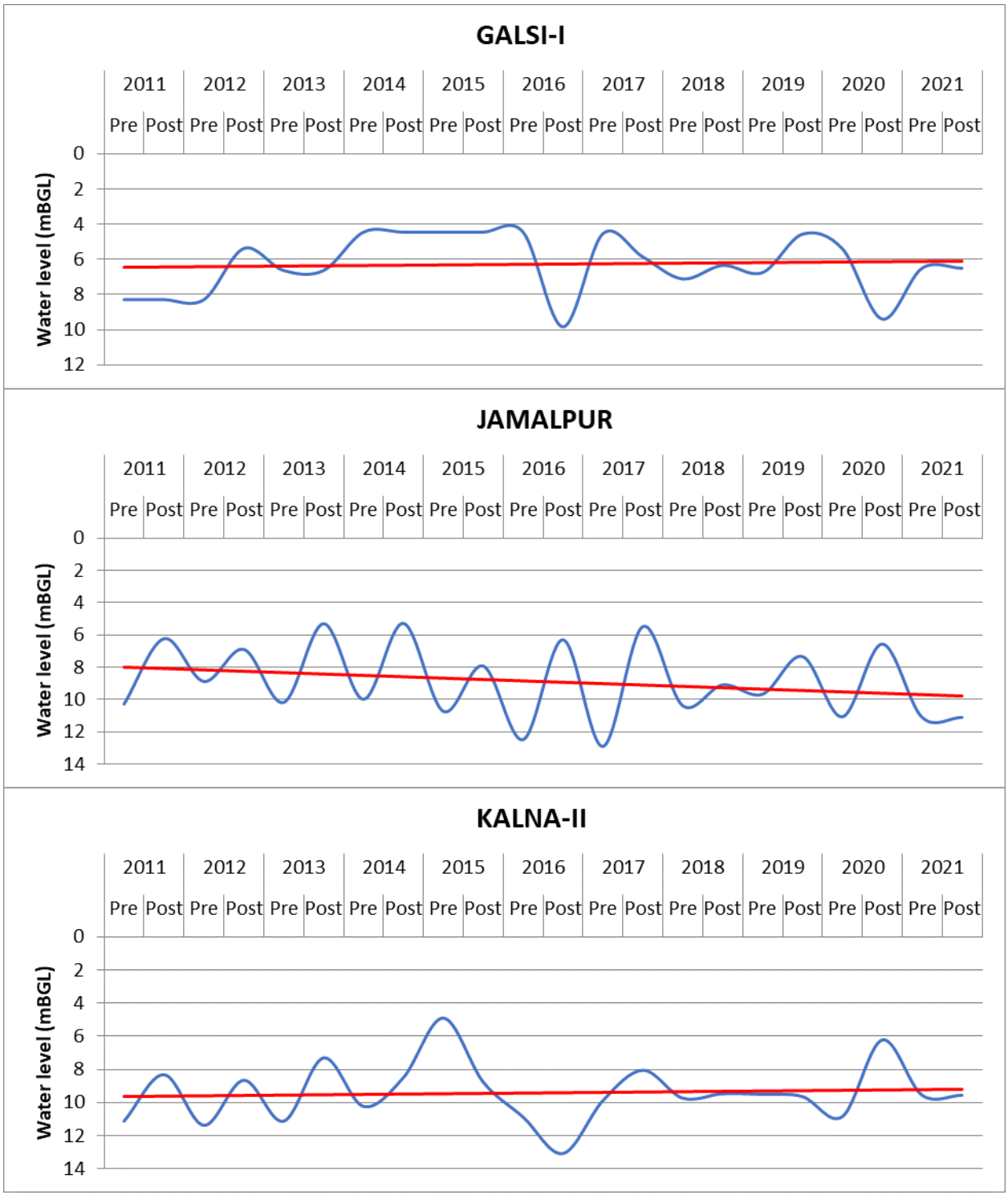
Figure 3.6: Graphical representation of pre-monsoon and post-monsoon water level data

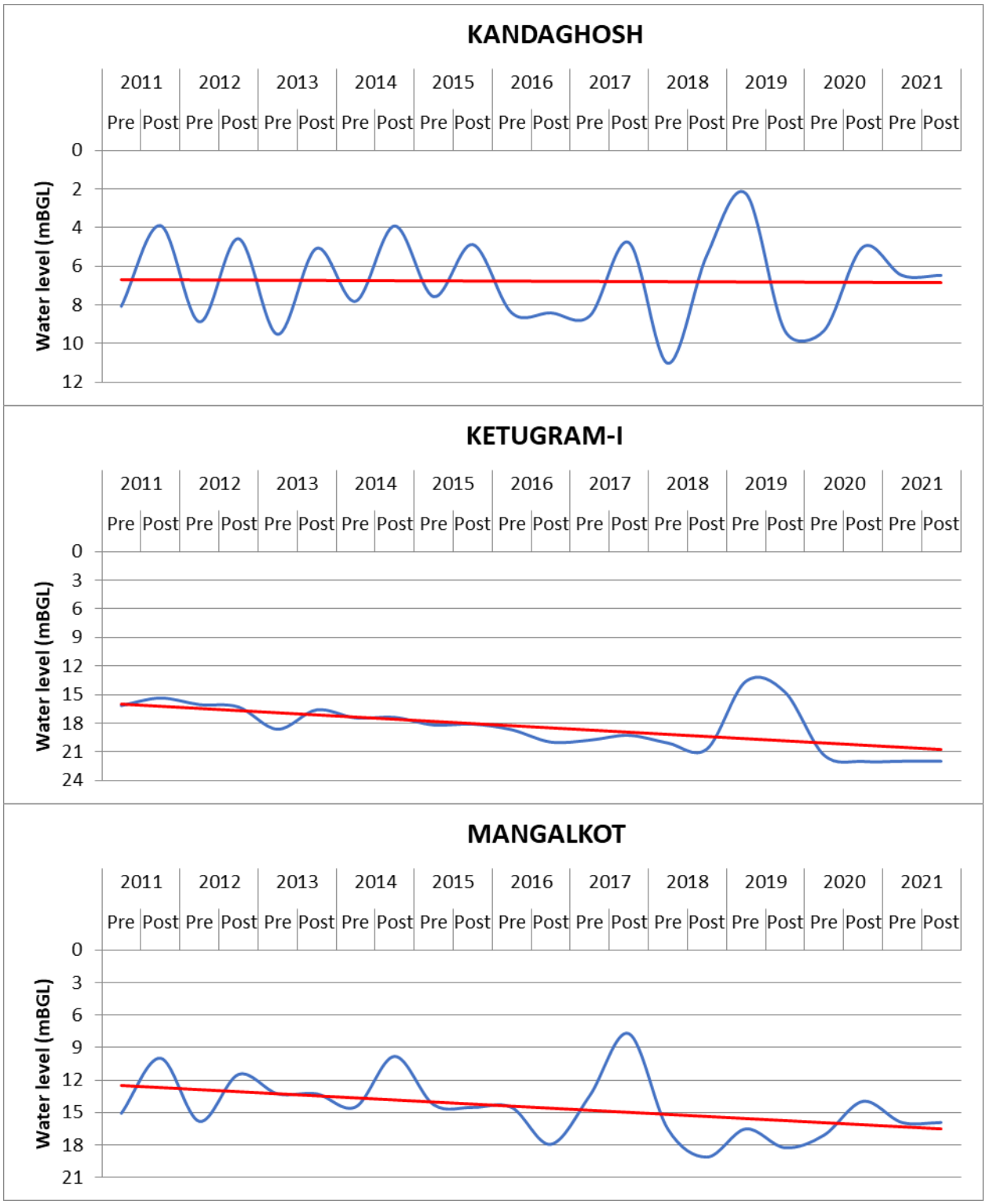
Hydrographs showing variation in water level observed in between 2011 to 2021 in the district is given in Figure 3.7.


AUSGRAM-I
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0
2
4
6
8
10


BARDDHAMAN
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0
2
4
6
8
10
12
14
16


BHATAR
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0
2
4
6
8
10
12


GALSI-I
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0 2 4 6 8 10 12
JAMALPUR
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0 2 4 6 8 10 12 14
KALNA-II
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0 2 4 6 8 10 12 14


KANDAGHOSH
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0 2 4 6 8 10 12
KETUGRAM-I
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0 3 6 9 12 15 18 21 24
MANGALKOT
2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021
Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post Pre Post
Water level (mBGL)
0 3 6 9 12 15 18 21

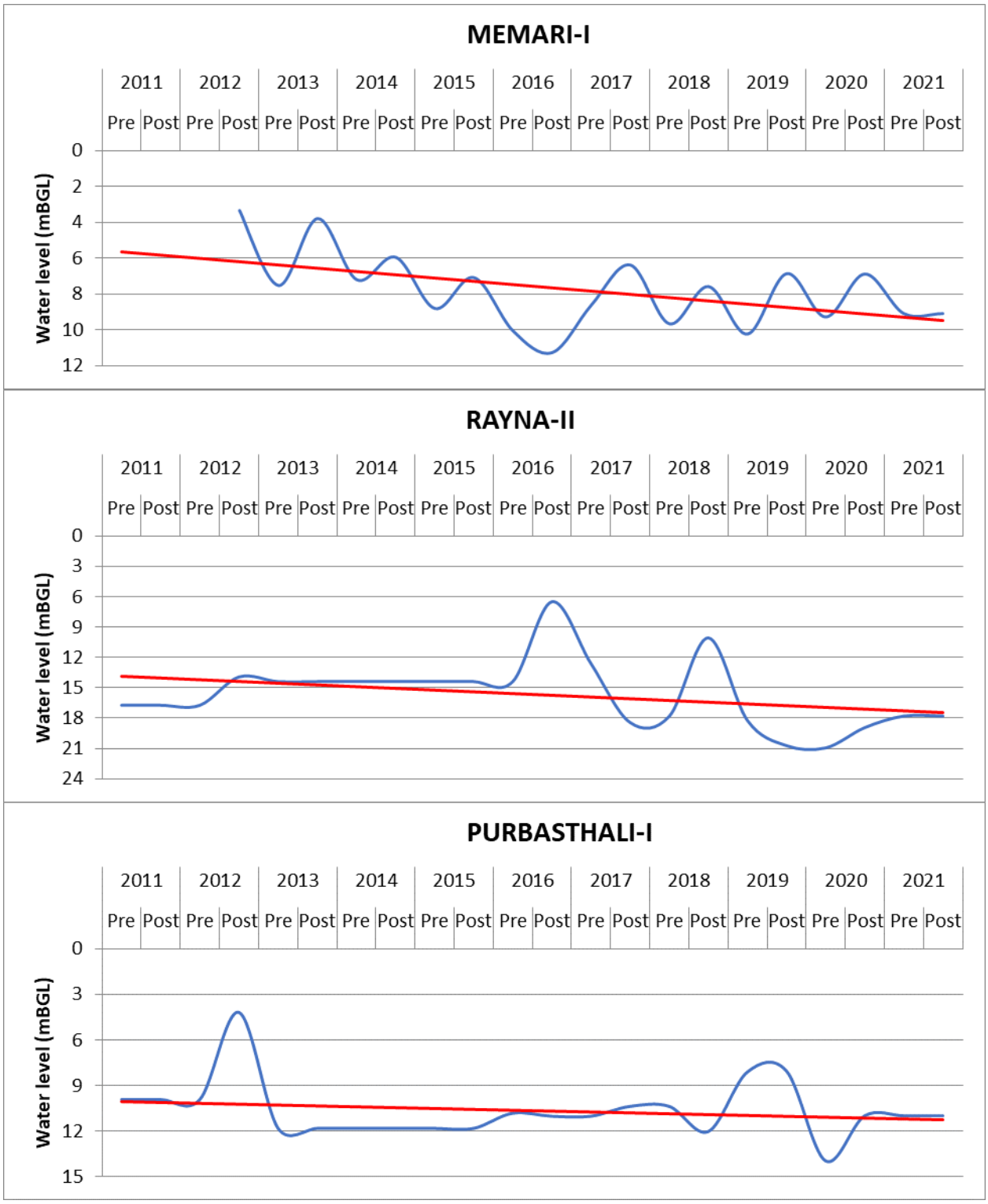


Figure 3.7: Block wise Hydrograph showing variation of water level during 2011 to 2021

g) Drainage System

The river system in Barddhaman includes the Bhagirathi-Hooghly in the east, the Ajay and its tributaries in the north and the Damodar and its branches in the south-west. Besides, there are innumerable Khals and old river beds all over the area.

The notable rivers and khals are Damodar, Bhagirathi, Ajay, Singaram, Kukua, Kunur, Tumuni, Khari, Banka, Chanda-kanki nala, Behula, Gangur, Brahmani, Khandesvari, Karulia nala, Dwaraka or Babla, Koiya nala, Kandarkahal, Kanadamodar, Kananadi, Ghea, Kakinadi etc.

Drainage map of the district is furnished as Figure 3.8 and in Plate 1A.

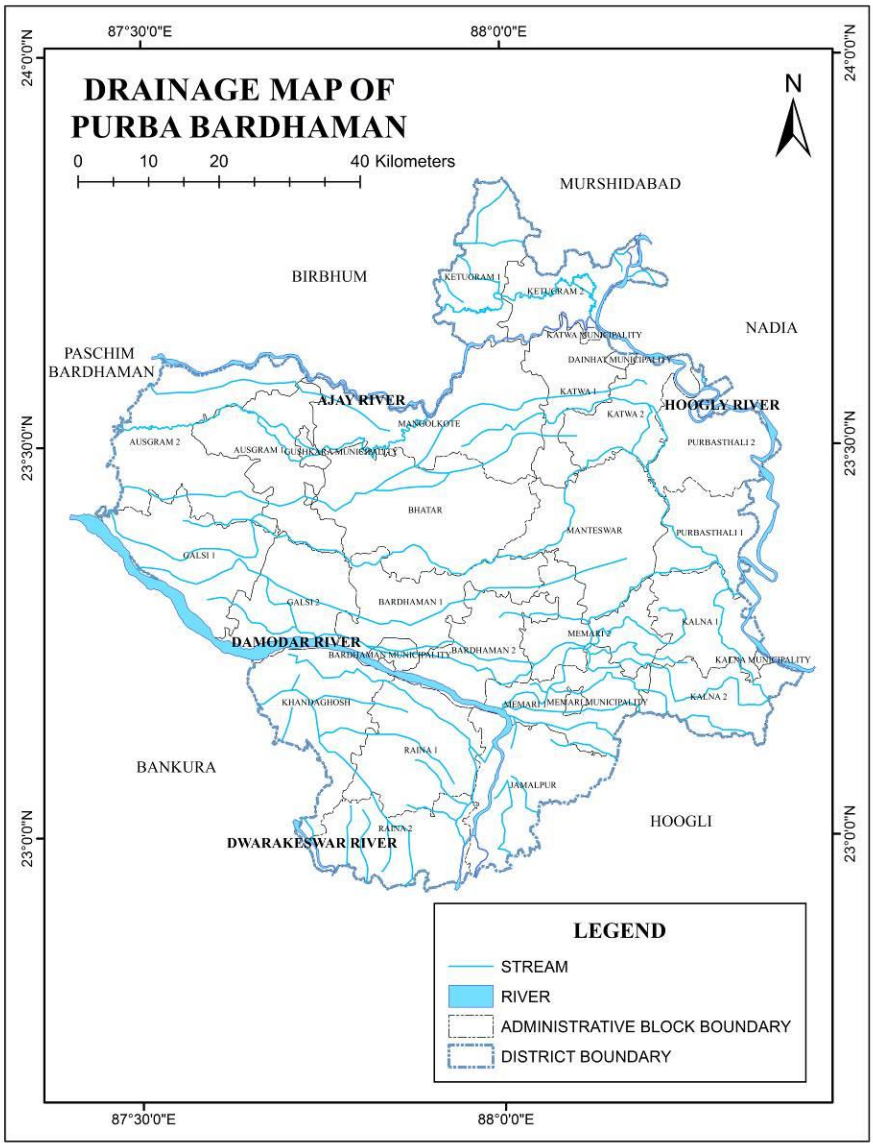


Figure 3.8: Drainage map of the District
(Source: National Informatics Centre)

h) Demography

As per the 2011 Census of India data, recast after bifurcation of Bardhaman district in 2017, Purba Bardhaman district had a total population of 4,835,532. There were 2,469,310 (51%) males and 2,366,222 (49%) females. Population below 6 years was 509,855.

As per the 2011 census data, recast after bifurcation of Bardhaman district in 2017, the total number of literates in Purba Bardhaman district was 3,232,452 (74.73% of the population over 6 years) out of which males numbered 1,781,090 (80.60% of the male population over 6 years) and females numbered 1,453,362 (68.66% of the female population over 6 years).

As per the 2011 census data, recast after bifurcation of Bardhaman district, Hindus numbered 3,566,068 and formed 73.75% of the population in Purba Bardhaman district. Muslims numbered 1,251,737 and formed 25.89% of the population. Christians numbered 8,582 and formed 0.18% of the population. Others numbered 9,145 and formed 0.19% of the population. Scheduled Castes and Scheduled Tribes made up 1,487,151 and 327,501 which is 30.75% and 6.77% of the population respectively.

According to the 2011 census, 92.86% of the population in what is now Purba Bardhaman district spoke Bengali, 5.03% Santali and 1.66% Hindi as their first language.

Table 3.4: Demographic distribution of the District
https://en.wikipedia.org/wiki/Purba_Bardhaman_district

Catagory	District	Total	Males	Females
Population	Purba Bardhaman	4835532	2,469,310	2,366,222
Literacy	Purba Bardhaman	3,232,452	1,781,090	1,453,362

(Source: Census, 2011)

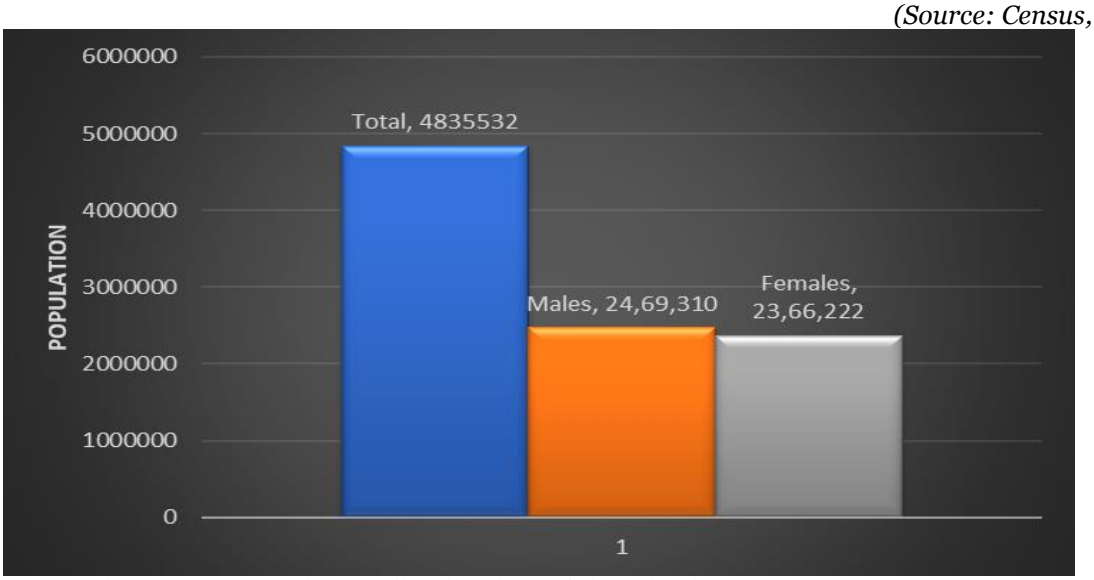


Figure 3.9: Population distribution of the District *(Source: Census, 2011)*

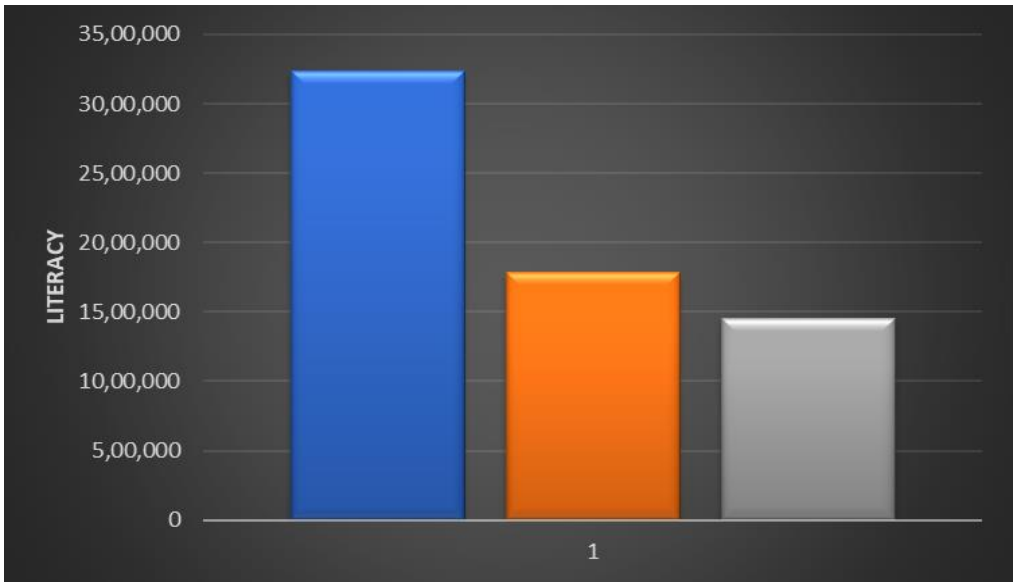


Figure 3.10: Demographic map showing Block-wise Literacy rate of the District
(Source: Census, 2011)

i) Cropping pattern

Purba Bardhaman is an agriculturally prosperous district of West Bengal. The soil and climate of the district favour the production of food grains. The undivided Bardhaman district was the largest producer of rice in West Bengal, and bulk of it was produced in what is now Purba Bardhaman district. Rice, the major crop has three varieties – Aus (in autumn), Aman (in winter) and Boro (in summer). Other than cereals and pulses, cash crops such as mustard, til, jute and potatoes are also grown.

j) Land Form and Seismicity

Purba Bardhaman district is categorized under seismically active zone - III i.e., moderate seismic intensity zone. Bureau of Indian Standards, based on the past seismic history, grouped the country into four seismic zones, viz. Zone - II, Zone –III, Zone-IV and Zone-V. Of these, Zone V is the most seismically active region, while Zone II is the least.

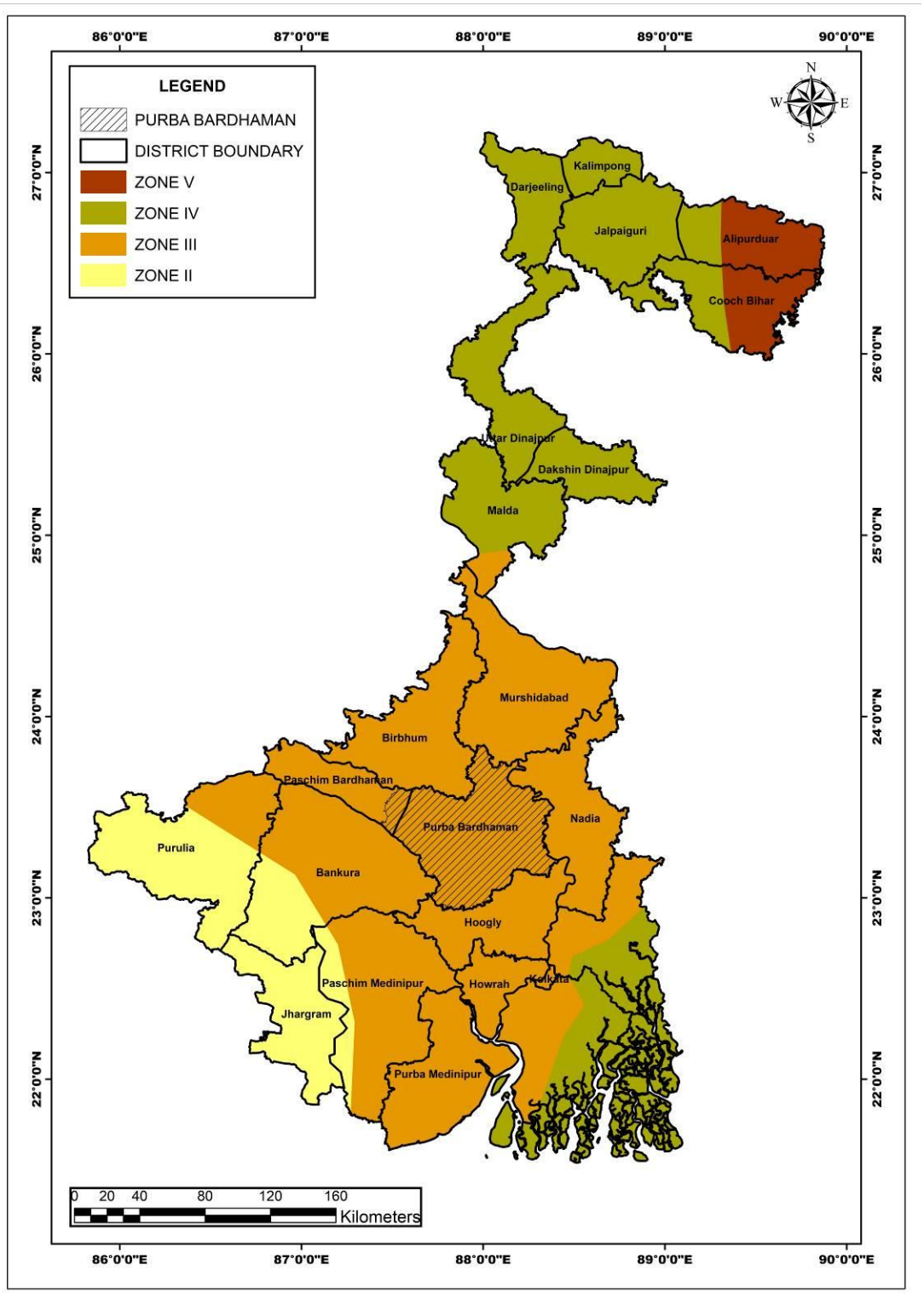


Figure 3.11: Earthquake zonation map of West Bengal highlighting the district position

(Source: https://pib.gov.in/PressReleasePage.aspx?PRID=1740656)

Floods:

The Damodar River was once upon a time known as “Sorrow of Bengal” since this is flooded almost every year which receives huge quantum of water from the upland of the Chhotanagpur Plateau. Along with the catchment water, the river also receives a huge quantum of sediment loads. Several attempts have been undertaken from the historic period for flood control which has affected only after the Independence in 1948 when “Damodar Valley Corporation” has been formed. Damodar River was earlier known as the "River of Sorrows" as it used to flood many areas of Bardhaman, Hooghly, Howrah and Medinipur districts. Even now the floods sometimes affect the lower Damodar Valley, but the havoc it wreaked in earlier years is now a matter of history. The floods were virtually an annual ritual. In some years the damage was probably more. Many of the great floods of the Damodar are recorded in history — 1770, 1855, 1866, 1873–74, 1875–76, 1884–85, 1891–92, 1897, 1900, 1907, 1913, 1927, 1930, 1935 and 1943. In four of these floods (1770, 1855, 1913 and 1943) most of Bardhaman town was flooded. The first dam was built across the Barakar River, a tributary of the Damodar River at Tilaiya in 1953. The second one was built across the Konar River, another tributary of the Damodar River at Konar in 1955. Two dams across the rivers Barakar and Damodar were built at Maithon in 1957 and Panchet in 1958 respectively. Both the dams are some 8 kilometres (5 mi) upstream of the confluence point of the rivers. These four major dams are controlled and maintained by DVC. Durgapur Barrage was constructed downstream of the four dams in 1955, across the Damodar River at Durgapur, with head regulators for canals on either side for feeding an extensive system of canals and distributaries. In 1978, the government of Bihar (that was before the formation of the state of Jharkhand) constructed the Tenughat Dam across the Damodar River outside the control of DVC. These dams restrict the regular water flow of the river which has definitely affected in the flood management of the downstream areas. However, the upper dams receive huge sediment loads from the uphill plateau region and get obstructed in the dams. Almost every year, during late monsoon, the upper dams releases water due bankfull situation of the river. The discharge water contains loads of sediments together. Usually, the river sediments are being divided into, bed load, suspended load and dissolved load. The sand depositions are form of bed load. These sediments ultimately got deposited in the lower regime of the river. The sediment load is mostly fine sands which has a potential for development as a construction material. Since the river is traversing coal mining potential areas, sands are also used for stowing as well.

https://en.wikipedia.org/wiki/Damodar_River

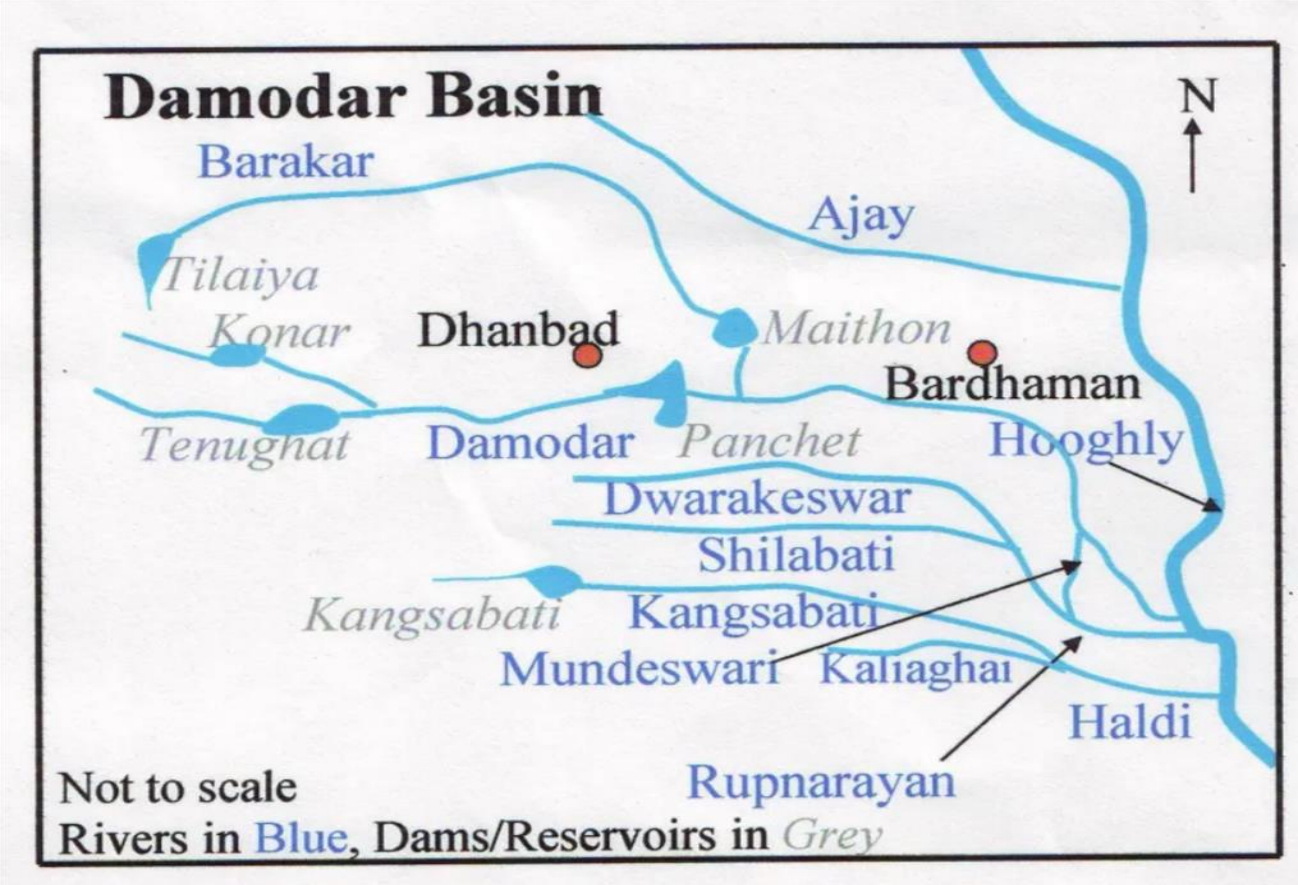


Figure 3.12: Map showing Dams/Reservoirs on Damodar River

k) Flora

The flora of Purba Bardhaman district is composed mostly of woody plants. Amongst the flora are: Simul (Salmalia malabarica), neem (Azadirachta indica, amlaki (Phyllanthus emblica), Indian ash tree (Lannea coromandelica), coconut, date palm, tal (Palmyra palm / Borassus flabellifer), bat (banyan/ Ficus benghalensis), asvattha (pipal/ Ficus religiosa), palash (Butea monosperma), krishnachuda (Caesalpinia pulcherrima) and am (mango/ mangifera indica). There are some shrubby plants: ashsheoda (orangeberry/ Glycosmis pentaphylla, pianj (onion), rasun (garlic), rajanigandha (tube rose/Agave amica), gulancha (Tinospora cordifolia), tulsi (basil/ Ocimum tenuiflorum) etc.

The common aquatic or marsh weeds found in jheels (lakes) and swamps of the eastern part of the district (in the Bhagirathi Basin) are: bena (andropogon squarrosos), water hyacinth (Eichhornia crassipes), padma (nelumbo nucifera), hogla (Typha domingensis) etc. (Census, 2011).

l) Fauna

The mammals of the district include wolf and golden jackal whilst wild boar and monkeys (including hanuman) are seen frequently. Poisonous snakes such as Indian cobra, common krait and Russell's viper, as well as dhamnas and harmless grass snakes are very

common. The common avifauna of the district include red-vented bulbul, bluethroat, Indian robin and common myna. Other bird species include fowls, crows, munia, sparrow, cuckoo, Asian koel, parakeet, woodpecker, kingfisher, owl, vulture, eagle, kite, hawk, stork, duck, pigeon, falco n and heron. The low-lying swampy areas are home to migratory birds in winter.

The principal varieties fish caught are rohu, mrigala, catla, kharke bata (reba), bhangan bata (bata), shrimp (smaller variety of prawn), maurala, pabda, tengra, bele, chela, punti, boal, aid, galda (large variety of prawn), vacha, chital, pholoi, khaira, fensa, silon, and bhola. (Census, 2011).

Location of Wild Life Sanctuary and National Parks are shown in the Map of West Bengal (Figure 3.13).

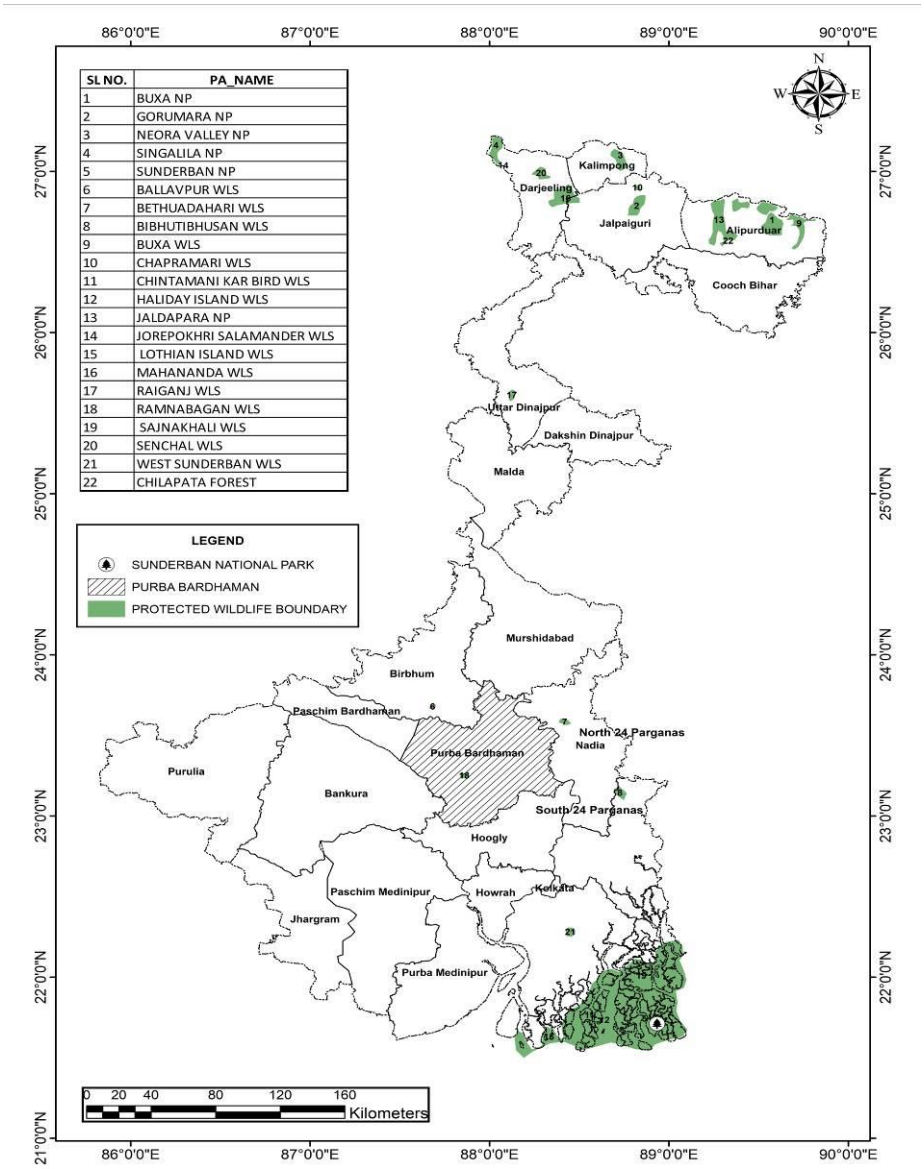


Figure 3.13: District location with respect to Wild LifeSanctuary of West Bengal
(Source: http://wiienvis.nic.in/)

The Ramnabagan Wildlife Sanctuary was declared as a reserved forest in the year 1960 and is known for its abundance of chital and barking deer. The Ramnabagan Mini Zoo is a part of the wildlife sanctuary and spreads over an area of 14.31 hectares in the area of Mouza Baburbag in Bardhaman. This is under the control of Divisional Forest Officer, in Bardhaman division.

4 Geomorphology

4.1 General Landforms

Barddhaman district with its varied tectonic elements and riverine features, is a transitional zone between the Jharkhand plateau which constitutes a portion of peninsular shield in the west and Ganga-Brahamaputra alluvial plain in the north and east. In general the Jharkhand plateau consists of the metasedimentary rocks of pre-cambrian age, Gondwana sedimentary rocks, Rajmahal basalts and upper tertiary sediments. Laterite has developed on these older rocks as well as on early Quaternary sediments. Towards south, the alluvial plain merges with Damodar-kasain-Subarnarekha deltaic plains.

The western half of the district resembles a promontory jutting out from the hill ranges of Chotonagpur plateau and consists of barren, rocky and rolling country with a laterite soil rising into rocky hillocks, the highest being 227 m. These diversify the otherwise monotonous landscape and lend a special charm to the skyline arround Asansol subdivision.

Ajay-barakar divide is a convex plateau, the avarage altitude being 150 m. The gradient is westerly to the west and to the east it is northerly towards Ajay and southerly towards Damodar below the latitude. The Ajay- Damodar inter-stream tract is made up of several stows consisting of vales and low convex spurs which run in almost all directions except north-east and thus lends a very complicated character to local relief.

4.2 Soil and rock pattern

Different types of soil are encountered in different topographical biological and hydrological as well as geological condition within the Barddhaman district. In the west coarse gritty soil blended with rock fragments is formed from the weathering of pegmatites, quartz veins and conglomeratic sandstones, where as sandy soil characteristic of granitic rocks and sandstones. This soil is of reddish colour, medium to coarse in texture, acidic in reaction, low in nitrogen, calcium, phosphate and other plant nutrients. Water holding capacity of this soil increases with depth as well as with the increase of clay portions. Towards the east alluvial soil attains an enormous thickness in the low level plains to the east. This alluvial soil is formed of alluvium brought down by the Ajay, Damodar, Bhagirathi and numerous other rivers. These soils are sandy, well drained and slightly acidic in nature.

Depending upon the soil Bardhaman district is divided into three separated zones:-

i. Gangetic soil, which is found along the Ganga River.

ii. Vindhyan soil, between Ajay and Damodar Rivers in the central and eastern parts.

iii. Red soils, occurring in the undulgating and coal field areas in the western parts of the district.

A soil map and their distribution is furnished in table 4.1 and figure 4.1.

Table 4.1: Description of District soil type

Code	Description	Soil Type
W036	Very deep, poorly drained,fine cracking soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, imperfectly drained, fine soils	Fine, Vertic Ochraqualfs
		Fine, Typic Ustochrepts
W037	Very deep, poorly drained,fine soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, imperfectly drained, fine soils	Fine, Typic Haplaquepts
		Fine, Typic Ustochrepts
W038	Very deep, very poorly drained, fine cracking soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, poorly drained, fine soils	Very Fine, Vertic Haplaquepts
		Fine, Typic Haplaquepts
W039	Very deep, imperfectly drained, fine soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, moderately well drained, coarse loamy soils	Fine, Typic Ustochrepts
		Coarse loamy, Typic Ustifluvents
W040	Very deep, poorly drained, fine cracking soils occuring on level to nearly level low lying alluvial plains with loamy surface associated with very deep, poorly drained, fine soils	Fine, Vertic Ochraqualfs
		Fine, Aeric Haplaquepts
W041	Very deep, poorly drained, fine cracking soils occuring on level to nearly level low lying alluvial plain with loamy surface associated with very deep, poorly drained, fine soils	Fine, Vertic Haplaquepts
		Fine, Typic Haplaquepts
W042	Very deep, poorly drained,fine soils occuring on level to nearly level low lying alluvial plains with clayey surface associated with very deep, imperfectly drained, fine cracking soils	Fine, Aeric Haplaquepts
		Fine, Vertic Ochraqualfs
W043	Very deep, poorly drained, fine soils occuring on very gently sloping low lying alluvial plain with loamy surface associated with very deep, poorly drained, fine creacking soils	Fine, Typic Ochraqualfs
		Fine, Vertic Ochraqualfs
W046	Very deep, poorly drained, fine soils occuring on very gently sloping low lying alluvial plain with clayey surface and moderately flooding associated with very deep, poorly drained, fine loamy soils	Fine, Typic Haplaquepts
		Fine, Typic Ustochrepts
W047	Very deep, poorly drained, fine soils occuring on level to nearly level low lying alluvial plain with clayey surface and severely flooding associated with very deep, moderately well drained, fine loamy soils	Very Fine, Aeric Haplaquepts
		Fine loamy, Typic Ustochrepts
W060	Very deep, moderately well drained, coarse loamy soils occuring on level to nearly level meander plain with loamy surface and	Coarse loamy, Typic Fluvaquents

Code	Description	Soil Type
	moderate flooding associated with very deep, imperfectly drained, fine loamy soils	Fine loamy, Typic Ustochrepts
W061	Very deep, moderately well drained, coarse loamy soils occuring on level to nearly level meander plain with loamy surface and moderate flooding associated with very deep, poorly drained, fine soils	Coarse loamy, Typic Ustifluvents
		Fine, Aeric Haplaquepts
W064	Very deep, moderately well drained, coarse loamy soils occuring on very gently sloping flood plain with loamy surface,moderate erosion and moderate flooding associated with very deep, moderately well drained, fine loamy soils	Coarse loamy, Typic Ustifluvents
		Fine loamy, Typic Ustifluvents
W065	Very deep, moderately well drained, fine loamy soils occuring on very gently sloping flood plain with loamy surface,moderate erosion and moderate flooding associated with very deep, well drained, sandy soils	Fine loamy, Typic Ustifluvents
		Typic Ustifluvents
W067	Very deep, imperfectly drained, coarse loamy soils occuring on very gently sloping to undulating dissected upland with loamy surface and moderate erosion associated with very deep, moderately well drained, fine loamy soils	Coarse loamy, Typic Haplaquepts
		Fine loamy, Typic Haplaquepts
W068	Very deep, imperfectly drained, fine loamy soils occuring on very gently sloping to undulating dissected upland with loamy surface and moderate erosion associated with very deep, moderately well drained, fine loamy soils	Fine loamy, Ultic Paleaustalfs
		Fine loamy, Rhodic Paleaustalfs

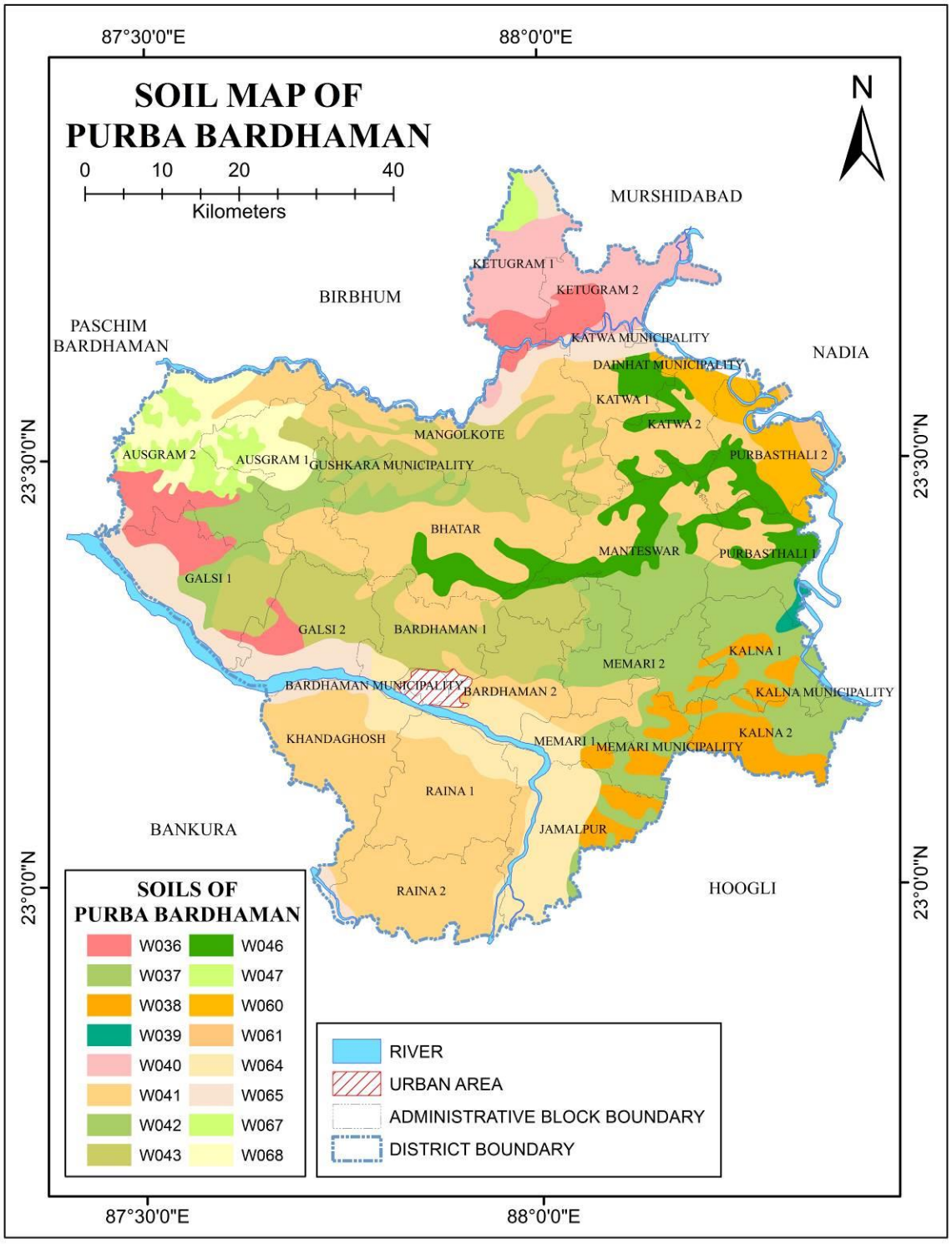


Figure 4.1: Soil Map of the District
(https://esdac.jrc.ec.europa.eu/content/west-bengal-soils-sheet-2)

4.3 Different geomorphologic units

Purba Bardhaman district is a flat alluvial plain area that can be divided into four prominent topographical regions. On the north, the Kanksa Ketugram Plain lies along the Ajay, which joins the Bhagirathi. The Bardhaman Plain occupies the central area of the district, with the Damodar on the south and the south-east. On the southern part is the Khandaghosh Plain. The Bhagirathi flows along the eastern boundary of the district, and the Bhagirathi Basin occupies the eastern part of the district. The undulating laterite topography of Paschim Bardhaman district extends up to Ausgram area of this district.

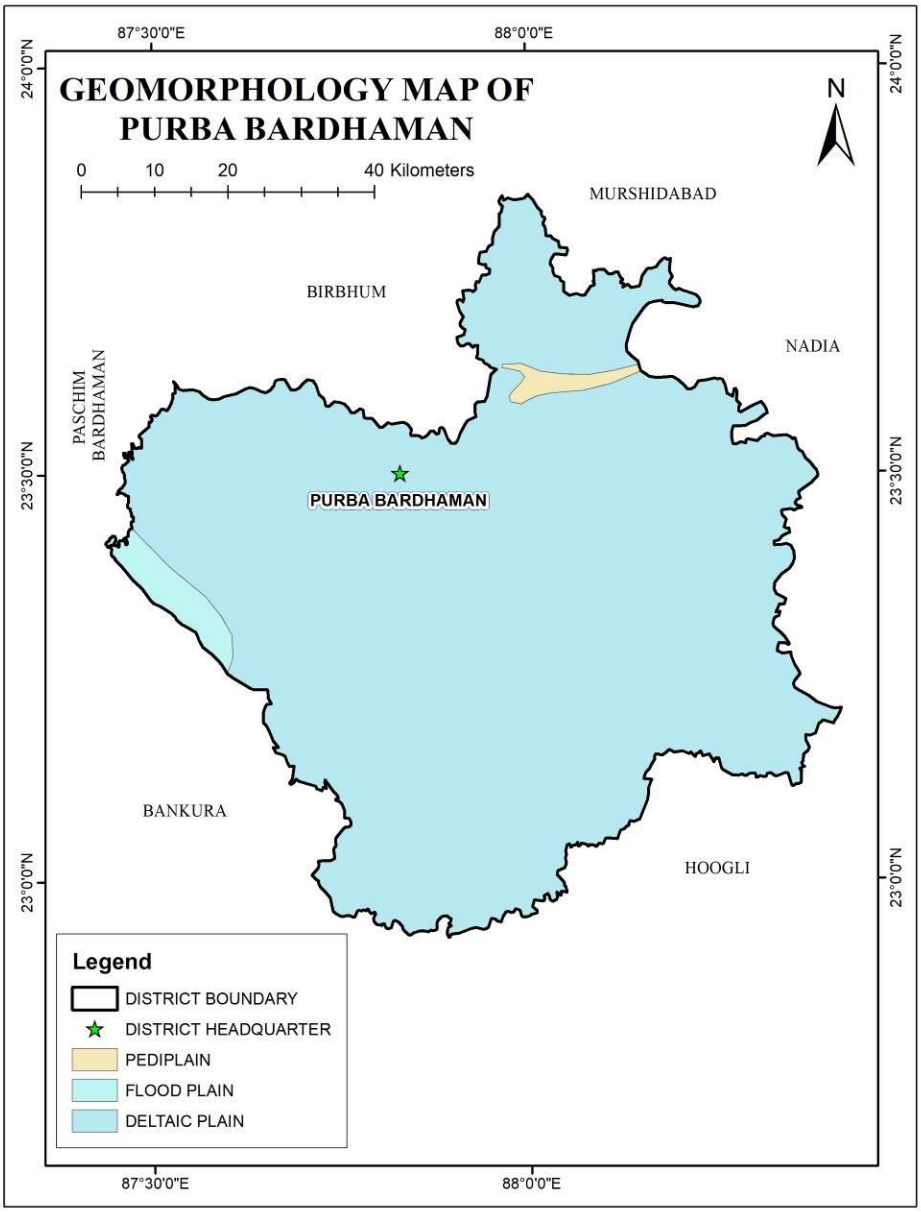


Figure 4.2: Geomorphological map of the District

(Resourcesat-1and2 – Liss-3, Bhuvan India)

5 Land use pattern of the district

Table 5.1 gives land utilization static of Purba Bardhaman district. Figure 5.1 is pie diagram representing broad land use pattern of the district and Figure 5.2 is Land Use Land Cover map of the district.

Table 5.1: Classification of Land Utilisation Statistics in the district

(In thousand hectares)

Year	2009-10	2010-11	2011-12	2012-13	2013-14
Reporting Area	698.76	698.76	698.76	698.76	698.76
Forest Area	21.16	21.16	21.16	21.16	21.16
Area under Non-agricultural use	208.53	211.56	211.92	213.77	214.19
Barren & unculturable land	1.37	0.86	0.65	0.57	0.44
Permanent pastures & other grazing land	0.22	0.26	0.33	0.15	0.06
Land under misc. tree groves not included in Net area sown	1.42	1.99	0.87	0.83	0.98
Culturable waste land	5.6	4.88	6.09	4.45	3.74
Fallow land other than Current fallow	1.37	1.24	1.46	1.25	1.09
Current fallow	4.98	4.35	4.31	3.7	3.31
Net area sown	454.11	452.46	451.97	452.88	453.79

http://wbpspm.gov.in/publications/District%20Statistical%20Handbook

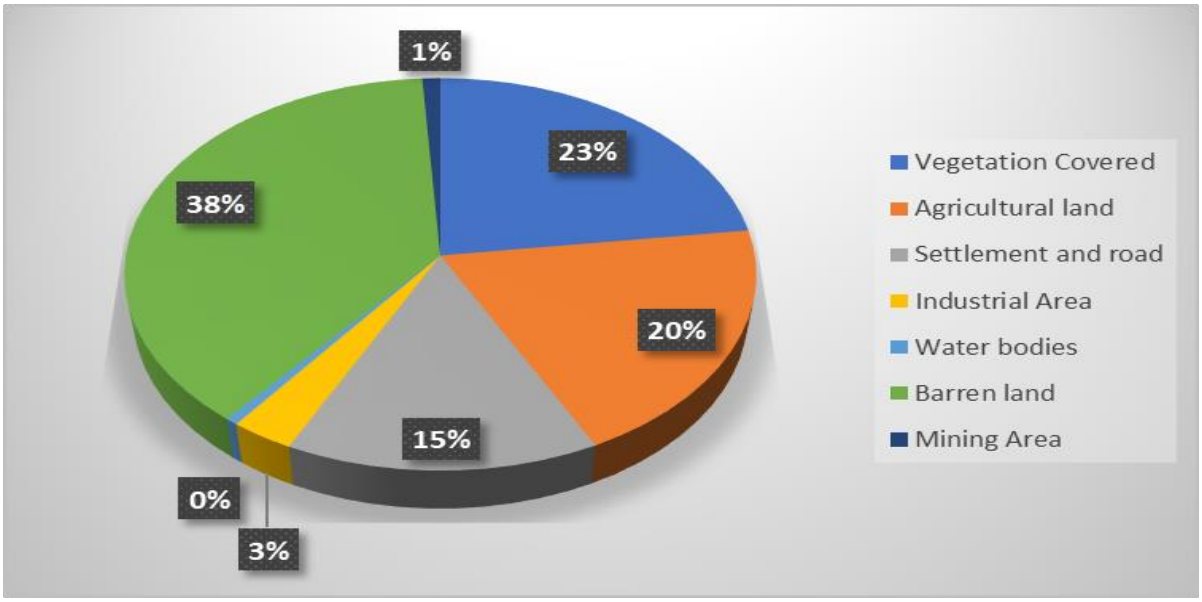
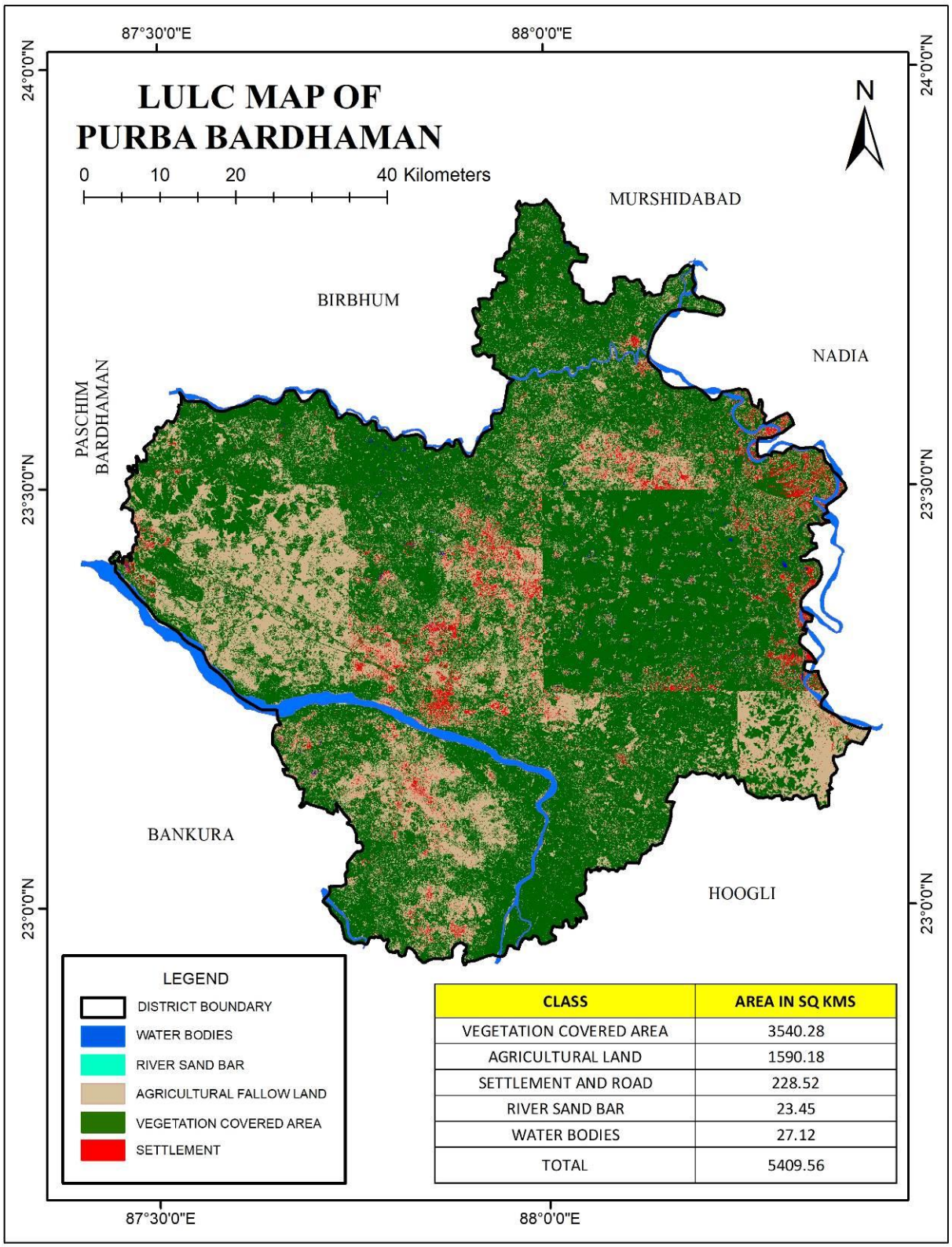


Figure 5.1: Land use pattern of Purba Bardhaman District



CLASS	AREA IN SQ KMS
VEGETATION COVERED AREA	3540.28
AGRICULTURAL LAND	1590.18
SETTLEMENT AND ROAD	228.52
RIVER SAND BAR	23.45
WATER BODIES	27.12
TOTAL	5409.56

Figure 5.2: Land Use Land Cover map of Purba Bardhaman District
(Resourcesat-1 and 2 – Liss-3, Bhuvan India)

a) Forest

The Ramnabagan Wildlife Sanctuary was declared as a reserved forest in the year 1960 and is known for its abundance of chital and barking deer. The Ramnabagan Mini Zoo is a part of the wildlife sanctuary and spreads over an area of 14.31 hectares in the area of Mouza Baburbag in Bardhaman. This is under the control of Divisional Forest Officer, in Bardhaman division.

The Ramnabagn Wildlife sanctuary has a wide variety of animals and birds like spotted deer, leopard, sloth bear, crocodile, peafowl, adjutant stork, rosy pelican and blackbuck, which are a recent inclusion. Common langurs are abundant in the zoo area. Few other birds like the parakeets, cuckoos, storks, snakes, mongooses, owls, spotted dove martins thrive in a remarkable habitat in this sanctuary cum mini zoo area. The Ramna garden forest has tall stately teak trees and Sal forests with a variety of plants like Kadbels, Dumur, Jam, etc.

Table 5.2: Classification of Forest Area, Out-turn of Forest Produce, Revenue and Expenditure of Forest Department

Item	Unit	2009-10	2010-11	2011-12	2012-13	2013-14
(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. Area by class of Forest	-	-	-	-	-	-
Reserved forest	hectare	2762.58	2762.58	2762.58	3367.46	3367.46
Protected forest	"	19361.71	19361.71	19361.71	20567.33	20567.33
Unclassed state forest	"	5544.94	5544.94	5544.94	5386.65	5386.65
Khas forest	"	-	-	-	-	-
Vested waste land	"	-	-	-	-	-
Forest owned by corporate bodies	"	-	-	-	-	-
Forest owned by private individuals	"	-	-	-	-	-
Forest owned by civil authorities	"	-	-	-	-	-
Total		**27669.23**	**27669.23**	**27669.23**	**29321.44**	**29321.44**
2. Forest Produce	-		-	-	-	-
Timber	Thousand Cu. Metre	0.77	0.71	0.62	1.72	1.53
Fuel	"	4.65	1.85	2.14	8.51	7.07
Pulpwood	"	4.45	4.09	0.49	0.55	0.49
Pole	Number	9573	6864	12265	85406	81097
Post	"	23949	1246	42295	32909	1145

3. Revenue & Expenditure	-					
Revenue	Rs. in thousand	11,482.83	18,254.19	16815.74	34623.85	27886.02
Expenditure	"	1,04,857.32	124689.85	1,33,219.33	110065.53	134894.02

(http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

b) Agriculture and Irrigation

On an average about 58% of the total population belongs to the agricultural population while the non-agricultural sector accounts for the remaining 42%. The eastern, northern, southern and central areas of the district are extensively cultivated but the soils of the western portion being extreme lateritic type are unfit for cultivation except in the narrow valleys and depressions having rich soil. Rice is the most important crop of the district and covers maximum of the gross cropped area. Among commercial crops, jute, sugarcane, potato and oilseeds are major crops. Productivity of the major crops grown in the district is indicated below. Major cropping patterns include paddy, wheat, vegetables, paddy, potato, sesame, paddy, vegetable, mustard, jute *etc*. Irrigation is the application of controlled amounts of water to plants at needed intervals. Irrigation helps to grow agricultural crops, maintain landscapes, and re-nutritioning the sequestrated soils in dry areas and during dry periods and/or the time of less than average rainfall. Currently, Government attempts to minimize the drawbacks of agricultural issues by certain extent of advancement in the economic condition, education, technology manures, pesticides, irrigation facilities *etc*. The major sources of irrigation in the district are ponds, dug wells, LI points, drift/shallow tube-wells, rivers, creeks and canals [*District Disaster Management Plan, 2015-2016*].

As per "Agriculture Contingency Plan of Bardhaman" the major agricultural crops grown in the district are rice, wheat, pulses, oilseeds, jute and potato. Jute and rice are the kharif crops grown in the district, whereas rice, wheat, pulses, oilseeds and potato are the rabi crops grown in the district.

Apart from this, livestock rising, poultry farming and fisheries form major part of the agriculture of the district. The sources of irrigation in the district are canals, tanks, open wells, bore-wells; lift irrigation schemes, micro irrigation practices etc.

Table 5.3: Production of Principal Crops in the district of Purba Bardhaman

(Kilogram per hectare)

Crops	2009-10	2010-11	2011-12	2012-13	2013-14
(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Foodgrains :					
1. **Rice**	**3050**	**2960**	**2951**	**3240**	**3338**
Aus	2912	2852	3013	3095	2690
Aman	2960	2893	3006	3092	3161
Boro	3225	3093	2813	3628	3793

2.	Wheat	2443	2193	2413	2864	2691
3.	Barley	-	-	980	997	988
4.	Maize	2152	2080	2091	2097	2091
5.	Other Cereals	-	-	-	-	-
Total Cereals		**3048**	**2958**	**2948**	**3237**	**3335**
6.	Gram	618	1731	996	1585	1193
7.	Tur	214	911	329	1325	1250
8.	Other Pulses	767	985	1117	957	960
Total Pulses		**759**	**997**	**1094**	**1027**	**984**
Total Foodgrains		**3042**	**2947**	**2939**	**3228**	**3324**
Oil Seeds :						
1.	Rapeseed & Mustard	945	991	866	1168	1013
2.	Linseed	216	293	149	263	-
3.	Other Oil seeds	848	909	1069	1154	1077
Total Oil seeds		**901**	**951**	**955**	**1163**	**1041**
Fibres * :						
1.	Jute	17.2	21.1	18.3	15.5	21.2
2.	Mesta	11.6	0.3	0.9	12.5	13.2
3.	Other Fibres	3.0	7.8	5.0	5.1	5.0
Total Fibres		**17.1**	**20.8**	**18.3**	**15.48**	**21**
Miscellaneous crops :						
1.	Sugarcane	80830	95064	45180	45524	64403
2.	Potato	41117	37645	27675	32578	22336
3.	Tobacco	-	-	-	-	-
4.	Tea	-	-	-	-	-
5.	Chillies (dry)	1498	1501	1542	1461	1466
6.	Ginger	1910	1910	1901	1994	1944
Total Miscellaneous crops		**40042**	**37225**	**26876**	**31547**	**22532**

(http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

c) Horticulture

Practice of garden cultivation and management is known as Horticulture. Horticultural crops, i.e., fruits and vegetables acquire a place of importance as protective

food. Horticulture provides much needed health supporting vitamins, minerals enriched foods. Besides, their value in human consumption, horticultural crops play an important role in commerce, particularly in export trade and processing industry in Paschim Bardhaman district. The major horticulture vegetable crops grown in the district are brinjal, cabbage, cauliflower, cucurbits, ladies finger, tomatoes and the major horticulture fruit crops grown in the district are mango, banana, papaya, guava, jackfruit etc.

Table 5.4: Production of Fruits in the district

Name of Fruits / Vegetables	Prouduction (Thousand tonnes)				
	2009-10	2010-11	2011-12	2012-13	2013-14
(1)	(7)	(8)	(9)	(10)	(11)
A. Fruits :					
Mango	16.54	17.54	17.63	17.90	10.00
Banana	16.49	16.89	16.76	16.80	19.86
Pineapple	0.96	0.96	0.87	0.60	0.55
Papaya	14.23	14.33	14.51	14.54	17.50
Guava	8.93	9.13	9.36	9.40	9.46
Jackfruit	6.99	6.99	7.10	6.75	6.88
Litchi	2.85	2.85	2.89	2.90	2.91
Mandarin Orange	-	-	-	-	-
Other Citrus	3.16	3.26	3.87	3.88	3.95
Sapota	0.25	0.25	0.25	0.26	0.29
Others	3.92	3.96	4.15	4.20	4.25
Total	**74.32**	**76.16**	**77.39**	**77.23**	**75.65**

(http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

Located principally in temperate climate the district possesses an excellent floral diversity. The important flowers grown in the district and their production during 2009-2014 are shown in Table 5.5.

Table 5.5: Production of Flowers in the district

Name of Flower	Production					
	Unit	2009-10	2010-11	2011-12	2012-13	2013-14
(1)	(8)	(9)	(10)	(11)	(12)	(13)
Rose	Crore Cut flower	0.150	0.150	0.150	0.104	0.092
Chrysanthemum	"	-	-	-	-	-

Gladiolus	"	0.039	0.039	0.040	0.050	0.046
Tuberose	"	0.059	0.059	0.059	0.065	0.056
Marigold	' 000 MT	0.223	0.203	0.203	0.231	0.238
Jasmine	"	-	-	-	-	-
Seasonal Flower	"	0.058	0.038	0.040	0.051	0.050
Misc. Flower	"	0.039	0.035	0.035	0.039	0.039

(http://wbpspm.gov.in/publications/District%20Statistical%20Handbook)

d) Mining

At the time of bifurcation of Bardhaman district in 2017, the mining and industrial areas of the district were placed in Paschim Bardhaman district and the Purba Bardhaman district was composed of rural/ agricultural areas.

Sand mining from river bed is most popular in Purba Bardhaman district.

6 Geology

Archaean granite gneisses and migmatites of the Chotanagpur Gneissic Complex are exposed in a narrow east-west belt fringing the north-western part and constitute the oldest basement rocks. Over these, in a faulted, subsided semi-graben type structural trough, deposited the thick bedded sedimentary sequence of Gondwana Super Group comprising sandstone, shale, siltstone with prolific commercial coal seams. All these rocks are cut across by a number of high angle, transverse, gravity faults. Mostly the Lower Gondwana sequence is developed in this district, comprising the Talchir, Barakar, Barren Measure, Raniganj and Panchet Formations. Durgapur beds constitute the youngest unit above the Panchet Formation which is considered equivalent to Mahadeva Formation of Upper Gondwana developed elsewhere. The Gondwana sequence rocks are exposed in the western part of the district area. In parts of the central and in the broad, oval area of eastern part, laterite cover with red soil and Quaternary sequence of riverine sediments grouped under Sijua, Panskura and Diara formations are exposed. The Sijua formation is mainly clay with caliche concretions; Panskura formation constitute clay alternations with silt and sand at the bottom and Diara formation comprise bedded interfingering sand, silt and clay in the present-day shifting river channel courses. Geological succession of Bardhaman district is furnished below.

Table 6.1: Geological succession of Bardhaman (Purba and Paschim)

District Resource Map, Geological Survey of India, 2001
https://www.gsi.gov.in/webcenter/portal/OCBIS/pageMAPS/pageMapsSeries?_adf.ctrl-state=lekbxmwix_5

Lithology	Geologic Unit	Age	
Sand, Silt, Clay	Diara Formation	Quaternary	Upper Holocene to Recent
Clay Alternating with Silt and Sand	Paskura Formation		Middle to Upper Holocene
Clay with Caliche Aoncretion	Sijua Formation		Upper Pleistocene to Middle Holocene
Laterite	Laterite		Cainozoic
Very Coarse Sandstone	Durgapur Bed	Gondwana Super Group	Jurassic
Red Shale, Sandstone	Panchet Formation		Triassic
Fine Grained Sandstone, Siltstone with Coal Seams	Raniganj Formation		Permian
Micaceous Shale, Sandstone	Barren Measure Formation		Permian
Gritty Pebbly Sandstone with Coal Seams	Barakar Formation		Permian
Sandstone, Conglomerate	Talchir Formation		Carboniferous-Permian(?)
Granite Gneiss and Migmatite	Chhotanagpur Granite Gneissic Complex		Achaean(?)-Proterozoic

A District Resource Map of undivided Bardhaman district is furnished below in Figure No. 6.1.

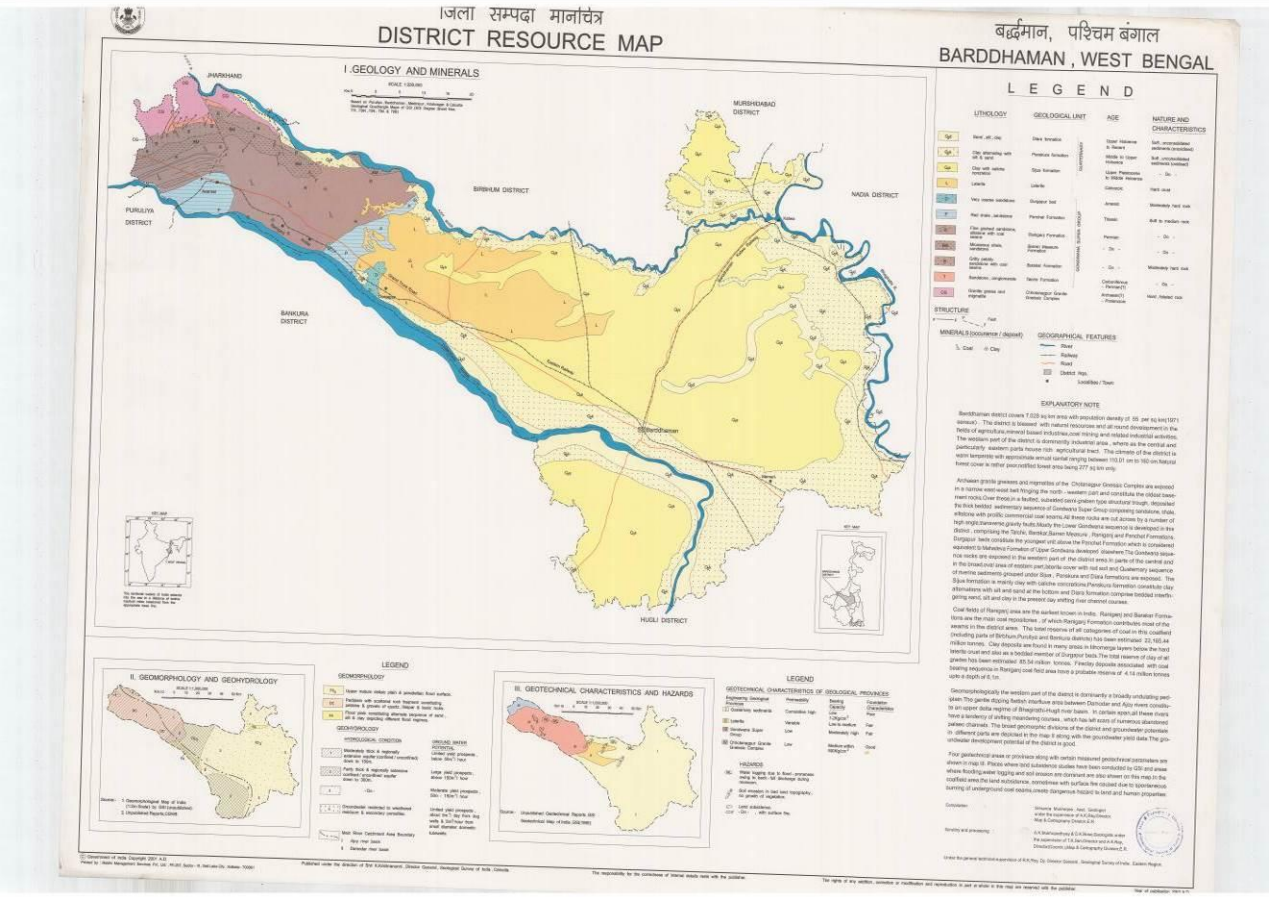


Figure No 6.1: District Resource Map of Paschim Bardhaman and Purba Bardhaman District (*District Resource Map, Geological Survey of India, 2001* *https://www.gsi.gov.in/webcenter/portal/OCBIS/pageMAPS/pageMapsSeries?_adf.ctrl-state=lekbxmwix_5*)

7 Mineral wealth

7.1 Overview of mineral resources:

The geological formation of Purba Bardhaman District indicates the presence of quite a number of major minerals and minor minerals.

7.2 Details of Resources:

The mineral resources of the district whose categorization and estimation have been done are furnished in this section.

7.2.1. Sand and other riverbed minerals:

I. Drainage

The river system in Bardhaman includes the Bhagirathi-Hooghly in the east, the Ajay and its tributaries in the north and the Dwarakeswar, the Damodar and its branches in the south-west. Besides, there are innumerable Khals and old river beds all over the area.

On the north, the Kanksa Ketugram Plain lies along the Ajay, which joins the Bhagirathi. The Bardhaman Plain occupies the central area of the district, with the Damodar on the south and the south-east. The Bhagirathi flows along the eastern boundary of the district, and the Bhagirathi Basin occupies the eastern part of the district. The notable rivers and khals are Damodar, Bhagirathi, Barakar, Ajay, Dwarakeswar, Nonia, Singaram, Tamla, Kukua, Kunur, Tumuni, Khari, Banka, Chanda-kanki nala, Behula, Gangur, Brahmani, Khandesvari, Karulia nala, Dwaraka or Babla, Koiya nala, Kandarkahal, Kanadamodar, Kananadi, Ghea, Kakinadi etc.

Ajay River

Ajay River originates from Batpar from Chakai block of Jamui district in Bihar. It then enters Jharkhand near Devipur (a proposed industrial area of Deoghar) and flows through Jharkhand and enters West Bengal at Simjuri, near Chittaranjan. It first forms the border between Paschim Bardhaman district and Jharkhand and then between Paschim Bardhaman district and Birbhum district, and finally it enters Katwa subdivision of Purba Bardhaman district at Nareng village in Ketugram police station. It then joins the Bhagirathi River at Katwa Town. Total length of the Ajay is 288 kilometres (179 mi), out of which 152 kilometres (94 mi) are in West Bengal. The catchment area of Ajay River is 6,000 square kilometres (2,300 sq mi).

Damodar River

The city of Bardhaman is situated on the banks of the river Damodar and acts as an anchor for this town. The river is considered to be a holy and sacred river by the aborigines of the Chotanagpur Plateau. The river Damodar originates from the Sonajuria Falls of the Bijonsa Hill which is located in the district of Palampur in Bihar. The river joins Barakar at the town of Dishergarh in the Asansol subdivision of the Bardhaman district and then flows through the rest of the district of Bardhaman. It continues to flow through the districts of Hooghly and Howrah in West Bengal before finally joining the Bhagirathi River, which is the other name for the Ganges in Murshidabad. Bardhaman takes up the shape of a delta along with the branch rivers

of the Damodar surrounding it, namely Balluka, Behula, Gangur, Banka and so on, some of which have almost become extinct at present. The civilization of 'Rarh-Bangla' has also developed with this river as its centre. A bridge has been constructed over the River Damodar at Sadarghat which is known as 'Krishok Setu' (as pronounced in Bangla).

Hoogly River

Bhagirathi River, river in West Bengal state, northeastern India, forming the western boundary of the Ganges-Brahmaputra delta. A distributary of the Ganges (Ganga) River, it leaves that river just northeast of Jangipur, flows south, and joins the Jalangi at Nabadwip to form the Hoogly River after a total course of 120 miles (190 km). Until the 16th century, when the Ganges shifted eastward to the Padma, the Bhagirathi formed the original bed of the Ganges. The Bhagirathi River originally flowed down the west of Nabadwip in the past, forming a natural boundary between the districts of Purba Bardhaman and Nadia. With time it has shifted its course to where it is at present, cutting the city off from the rest of the Nadia district.

Dwarakeswar River

Dwarakeswar River (also known as Dhalkisor) is a major river in the western part of the Indian state of West Bengal. The river originates near Madhabpur in Purulia district and enters Bankura district near Chhatna. It cuts across the district flowing past the district headquarters and enters the southeastern tip of East Bardhaman District. It then passes through Hooghly District. The Silai joins it near Ghatal and the two together are known as Rupnarayan River, which flows into the Hooghly River near Gadiara in Howrah District. Dwarakeswar River has much sedimentation from low water (any season). In rainy seasons it is filled up with water; then huge sedimentations are blocked the channel, even near Arambagh the channel basin reduced by garbage and anthropogenic (man made).

a) Drainage System with description of main rivers

Table 7.1: Drainage system with description of main rivers

Sl.No.	Name of the River	Area drained (Sq.km)
1	Damodar	100049200.5970
2	Dwarakeswar	3340571.5927
3	Ajay	22159459.9255
4	Hoogly	48107612.6196

b) Salient Features of important rivers and streams

Table.7.2: Salient Features of important rivers and streams

S.No.	Name of the River or Stream	Total Length in District (in Km)	Place of origin	Altitude at Origin
1	Damodar	98,911.49	ChulhaPani, Lohardaga district, Chota Nagpur Plateau, Jharkhand	2000.49 ft

S.No.	Name of the River or Stream	Total Length in District (in Km)	Place of origin	Altitude at Origin
2	Dwarakeswar	10,486.62	Tilaboni hills of Madhavpur village, Purulia	1000 ft
3	Ajay	90,463.61	Chakai block of Jamui, Bihar	980 ft
4	Hoogly	1,21,945.16	Giria, Murshidabad	12769 ft

II. Annual deposition of riverbed minerals

Annual deposition of riverbed minerals is dependent on various factors which are explained below.

A) Geomorphological studies

Geomorphological characteristic of a river is foremost factor for annual deposition of sedimentary load. The study includes following parameter:

i) Place of Origin

Details of origin of rivers of Purba Bardhaman District are furnished in Table 7.3.

Table 7.3: Place of Origin of important rivers and streams

S.No.	Name of the River or Stream	Place of origin
1	Damodar	ChulhaPani, Lohardaga district, Chota Nagpur Plateau, Jharkhand
2	Dwarakeswar	Tilaboni hills of Madhavpur village, Purulia
3	Ajay	Chakai block of Jamui, Bihar
4	Hoogly	Giria, Murshidabad

ii) Catchment Area

The Purba Bardhaman district is mainly drained by the Damodar, Dwarakeswar, Hoogly and Ajay. These rivers and its tributary rivers are forming the main catchment area.

iii) General profile of river stream

River profile has been studied along the cross-section lines which was chosen based on the drastic variation of the river widths, proximity of the operating sand 'ghats' and the position of the sand bars.

Relative disposition of rivers in Purba Bardhaman district along with the distribution of the section lines are shown in Figure 7.1. River profile section and cross section views are presented in Figures 7.2 and 7.3.

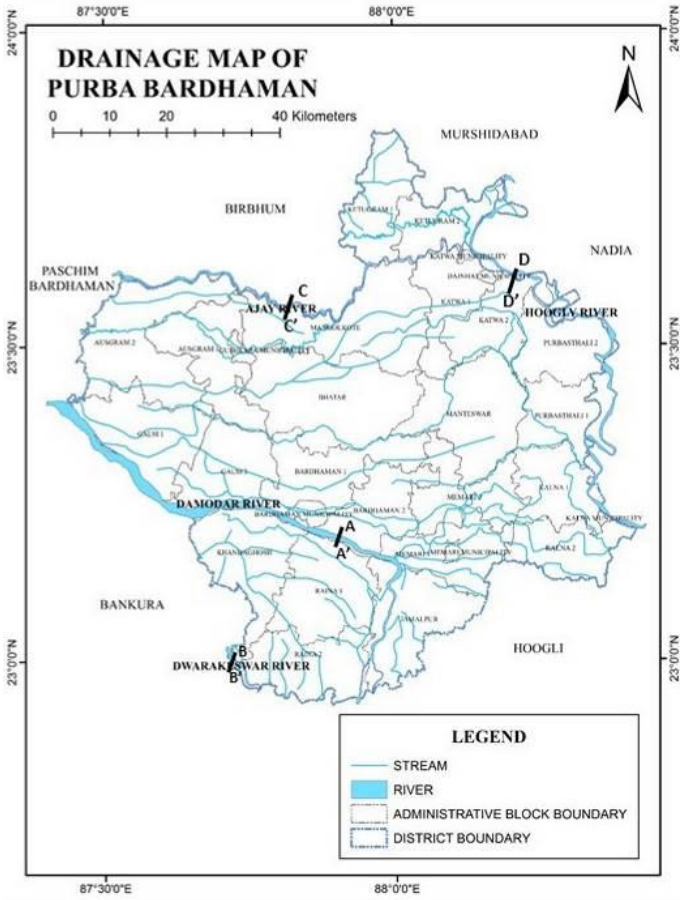


Figure 7.1: Map showing the major rivers along which profile section drawn

Figure 7.2A: Profile section of Damodar River

Figure 7.2B: Profile section of Dwarakeswar River

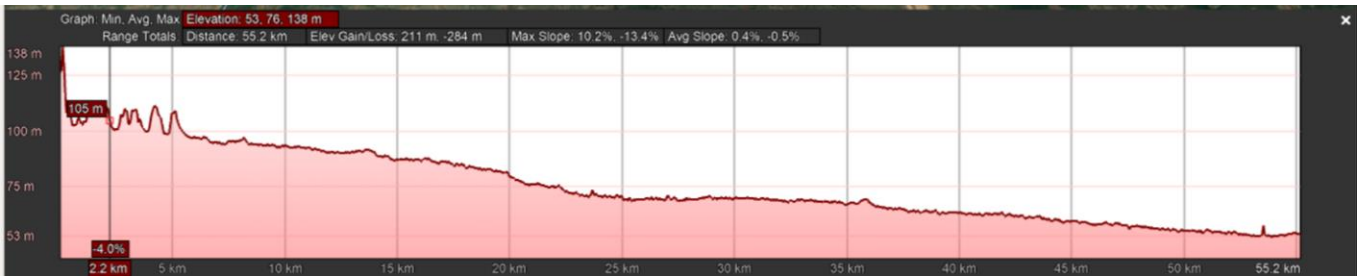


Figure 7.2C: Profile section of Ajay River

Figure 7.2D: Profile section of Hoogly River

iv) Annual deposition factor

Annual deposition of riverbed materials depends on various factors, such as process of deposition, mode of sediment transport, sediment transportrate, and sediment yield of the river.

1. Process of deposition

Deposition is the processes where material being transported by a river is deposited. Deposition occurs when the forces responsible for sediment transportation are no longer sufficient to overcome the forces of gravity and friction, creating a resistance to motion; this is known as the null-point hypothesis. This can be when a river enters a shallow area or towards its mouth where it meets another body of water.

The principle underlying the null point theory is due to the gravitational force; finer sediments remain in the water column for longer durations allowing transportation outside the surf zone to deposit under calmer conditions. The gravitational effect or settling velocity determines the location of deposition for finer sediments, whereas a grain's internal angle of friction determines the deposition of larger grains on a shore profile.

Deposition of non-cohesive sediments: Large-grain sediments transported by either bedload or suspended load. In case of bedload, when there is insufficient bed shear stress and fluid turbulence are insufficient to keep the sediment moving, the grain cease horizontal movement and rapidly come to rest. In case of suspended load the grain settle longer distance vertically through the fluid before coming to rest.

Deposition of cohesive sediments: The cohesion of sediment occurs with the small grain sizes associated with silts and clays, or particles smaller than 4Φ or 62.5 μm. If these fine particles remain dispersed in the water column, Stokes law applies to the settling velocity of the

individual grains. The face of a clay platelet has a slight negative charge where the edge has a slight positive charge when two platelets come into close proximity with each other the face of one particle and the edge of the other are electrostatically attracted, and then have a higher combined mass which leads to quicker deposition through a higher fall velocity.

2. Mode of sediment transport in rivers

Sediment transport in rivers provides a dynamic linkage between flow and channel form. Mainly there are three processes by which sediment load is transported and these are (i) rolling or traction, in which the particle moves along a sedimentary bed but is too heavy to be lifted from it; (ii) saltation; and (iii) suspension, in which particles remain permanently above the bed, sustained there by the turbulent flow of the water.

Another name for sediment transport is sediment load. The total load includes all particles moving as bedload, suspended load, and wash load.

Bed load: Bedload is the portion of sediment transport that rolls, slides or bounces along the bottom of a waterway. This sediment is not truly suspended, as it sustains intermittent contact with the streambed, and the movement is neither uniform nor continuous. Bedload occurs when the force of the water flow is strong enough to overcome the weight and cohesion of the sediment. While the particles are pushed along, they typically do not move as fast as the water around them, as the flow rate is not great enough to fully suspend them. Bedload transport can occur during low flows (smaller particles) or at high flows (for larger particles). Approximately 5-20% of total sediment transport is bedload. In situations where the flow rate is strong enough, some of the smaller bedload particles can be pushed up into the water column and become suspended.

Suspended load: While there is often overlap, the suspended load and suspended sediment are not the same thing. Suspended sediment are any particles found in the water column, whether the water is flowing or not. The suspended load, on the other hand, is the amount of sediment carried downstream within the water column by the water flow. Suspended loads require moving water, as the water flow creates small upward currents (turbulence) that keep the particles above the bed. The size of the particles that can be carried as suspended load is dependent on the flow rate. Larger particles are more likely to fall through the upward currents to the bottom, unless the flow rate increases, increasing the turbulence at the streambed. In addition, suspended sediment will not necessarily remain suspended if the flow rate slows.

Wash load: The wash load is a subset of the suspended load. This load is comprised of the finest suspended sediment (typically less than 0.00195 mm in diameter). The wash load is differentiated from the suspended load because it will not settle to the bottom of a waterway during a low or no flow period. Instead, these particles remain in permanent suspension as they are small enough to bounce off water molecules and stay afloat. However, during flow periods, the wash load and suspended load are indistinguishable.

3. Sediment Transport Rate

The rate at which sediment is moved past a cross section of the flow is called either the sediment transport rate or the sediment discharge. It‘s related to the sediment load, but it‘s different, just because different fractions of the sediment load are transported at different rates.

It can be measured in mass per unit time, or in weight per unit time, or in volume per unit time. The sediment transport rate is commonly denoted by Qs.

4. Estimation of Sedimentation

There are two approaches to obtaining values describing sediment loads in streams. One is based on direct measurement of the quantities of interest, and the other on relations developed between hydraulic parameters and sedimenttransport potential.

The total bed material load is equal to the sum of the bedload and the bed material part of the suspended load; in terms of volume transport per unit width, qt = qb + qs. Here wash load, i.e. that part of the suspended load that is too fine to be contained in measurable quantities in the river bed, is excluded from qs.

There are number of equations to compute the total sediment load. Most of these equations have some theoretical and empirical bases.

In 1973, Ackers and White developed a general theory for sediment transport which was calibrated against the flume-transport data then available. Their functions have been widely accepted as one of the best available procedures for estimating the total bed over the full width of the flow section.

Dendy Bolton formula is often used to calculate the sedimentation yield. But use of these equations to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equations development. However, they may provide a quick, rough approximation of mean sediment yields on a regional basis. Computed sediment yields normally would be low for highly erosive areas and high for well stabilized drainage basins with high plant density because the equations are derived from average values. The equations express the general relationships between sediment yield, runoff, and drainage area.

5. Sediment Yield

The water that reaches a stream and its tributaries carries sediment eroded from the entire area drained by it. The total amount of erosional debris exported from such a drainage basin is its sediment load or sediment discharge and the sediment yield is the sediment discharge divided by the total drainage area of the river upstream of the cross section at which the sediment discharge is measured or estimated. Sediment yield is generally expressed as a volume or weight per unit area of drainage basin—e.g., as tons per square kilometre. Further, sediment yield is usually measured during a period of years, and the results are thus expressed as an annual average.

v) Replenishment Study (As per EMGSM guidelines, 2020):

Replenishment study for a river solely depends on estimation of sediment load for any river system and the estimation is a time consuming and should be done over a period. The process in general is very slow and hardly measurable on season-to-season basis except otherwise the effect of flood is induced which is again a cyclic phenomenon. Usually, replenishment or sediment deposition quantities can be estimated in the following ways as given below:

A. Replenishment study based on satellite imagery involves demarcation of sand bars potential for riverbed mining. Both pre and post monsoon images need to be analysed to established potential sand bars. Volume estimation of sand is done by multiplying Depth and Area of the sand bar. The sand bars are interpreted with the help of satellite imagery. Ground truthing has been done for 100% of the total identified sand bars. During ground truthing, width and length of each segment were physically measured. It has also been observed that in few cases, sand bars have attained more than 3 meters height from the average top level of the river beds. Considerations of sand resources have been restricted within 3 meters from the average top surface of the river bed.
B. Direct field measurement of the existing leases involving estimation of the volume diference of sand during pre and post-monsoon period. With systematic data acquisition, a model has developed for calculation of sediment yield and annual replenishment with variable components.
C. The replenishment estimation based on a theoretical empirical formula with the estimation of bed-load transport comprising of analytical models to calculate the replenishment estimation.

A. Replenishment estimation based on satellite imagery study

Sedimentation in any river is dependent on sediment yield which depends on soil erosion in river's catchment area. Catchment yield is computed using Strange's Monsoon runoff tables for runoff coefficient against rainfall return period. Peak flood discharge is calculated by using Dickens, Jarvis and Rational formula at 25, 50 and 100 years return period. The estimation of bed load transport is done using Ackers and White Equation.

Methodology Adopted: To delineate replenishment percentage in the river bed of the district, below mentioned steps have been followed.

- **Field data collation:**

Field data collations were done during June 2020 for pre monsoon period and during December 2020 for post monsoon period for the river ghats on continuous basis. Figure 7.3 shows the site view of Dwarakeswar River. However, the non-operational areas were covered through traverses. In both the cases, relative elevation levels were captured through GPS/DGPS/ Electronic Total Station. Thickness of the sand bars was measured through sectional profiles. In few instances, sieve analysis of the sands was carried out to assess their particle size distribution.

Figure 7.3: Site View of River Dwarakeswar (Monsoon 2020)

- **Selection of Study profiles:**

  Study profiles are selected based on the occurrence of the sand bars in the channel profiles. Aerial extents of each of the profiles are mapped from satellite imagery.

- **Data Compilation:**

  Following data were compiled for generation of the annual replenishment report:

  - Elevation levels of the different sand ghats and sand bars as measured at site.
  - Extent of the sand bars are measured from the pre monsoon satellite imagery.
  - Sand production data of the district.

- **Assessment of sediment load in the river:**

  Assessment of sediment load in a river is subjective to study of the whole catchment area, weathering index of the various rock types which acts as a source of sediments in the specific river bed, rainfall data over a period not less than 20 years, and finally the detail monitoring of the river bed upliftment with time axis. Again, the sediment load estimation is not a dependent variable of the district boundary, but it largely depends upon the aerial extent of the catchment areas, which crosses the district and state boundaries.

- **Estimation of annual sand deposition:**

  The major sand producing rivers of Purba Bardhaman district are Damodar, Dwarakeswar, Ajay and Hoogly Rivers. Planning has been done for systematic sand mining in the rivers.

While calculation of the areas of sand bar, a classification system has been adopted with three categories of land identified within the channel areas which is as follows:

a. The untapped sand bars.
b. The sand bars worked in the pre-monsoon period.
c. Main channel course within the channel.

A summary of sediment load comparison between pre- and post-monsoon periods for different rivers Purba Bardhaman district is given in Table 7.4 and details of each sand bars along with their sand resources in pre monsoon and post monsoon period are provided in Annexure-2. Maps showing distribution of sand bars on rivers of the the district during pre- and post-monsoon periods are depicted in Plate-2A and 2B respectively.

Table 7.4: Sediment Load comparison between Pre- and Post-monsoon periods for different rivers

River Name	Pre-Monsoon Sediment Load (MCum)	Post Monsoon Sediment Load (MCum)	Variance (MCum)	Variance (%)
Ajay	5.51	7.62	2.10	38.18
Damodar	74.80	76.15	1.35	1.81
Hoogly	0.52	0.00	-0.52	0.00
Dwarakeswar	3.50	3.17	-0.33	-9.38
Total	**84.33**	**86.94**	**2.61**	**3.09**

About 2.61 million cum of sand has been found as an incremental volume increase when compared between pre- and post-monsoon sand reserve data. Percentage difference is about 103% which is replenishment and aggradation rate for the year.

Long-term satellite imagery study has also been carried out for sand producing rivers of Purba Bardhaman district to analyse the changes in river course. A representative map, showing long-term erosion-accretion areas on both the banks of Ajay River, Purba Bardhaman has been prepared and furnished in Plate No. 5.

B. Replenishment estimation based on field investigation

The study was carried out on existing mining leases. In order to assess the annual replenishment rate, an approach of direct measurement methodology has been adopted. The depth and area of the mining leases are measured through DGPS/Total station just before the closure of the mines in pre-monsoon period and the same areas are resurveyed in the post-monsoon period. The differences between the depths of the surveyed areas are accounted for the volumetric measurement of the replenished sand.

Table 7.5 represents field measurement of replenishment rate estimated for major rivers.

Table 7.5: Replenishment rate of the district

River Name	Location (Mauza)	Area	Surface RL	Thickness	Volume	After mining floor RL	Surface RL after Replenishment	Thickness Replenished	Volume Replenished	Difference in RL	Replenishment Rate
		m2	m	m	cum	m	m	m	cum	m	%
Ajay	Malcha	19800.00	43.00	2.90	57420.00	40.10	42.94	2.84	56271.60	0.06	98.00%
Ajay	Harinathpur	28700.00	42.00	2.95	84665.00	39.05	41.94	2.89	82802.37	0.06	97.80%
Ajay	Churpuni	39600.00	17.00	3.00	118800.00	14.00	16.93	2.93	115948.80	0.07	97.60%
Damodar	Naricha	15100.00	34.00	2.88	43488.00	31.12	33.93	2.81	42357.31	0.07	97.40%
Damodar	Bangpur	27100.00	23.00	2.90	78590.00	20.10	22.94	2.84	77018.20	0.06	98.00%
Damodar	Jafrabad	20200.00	20.00	2.94	59388.00	17.06	19.96	2.90	58497.18	0.04	98.50%

Based on field investigation, the average replenishment rate for the year 2020 is about 97.88%.

C. Replenishment estimation based on a empirical formula:

The river reaches with sand provide the resource and thus it is necessary to ascertain the rate of replenishment of the mineral. Regular replenishment study needs to be carried out to keep a balance between deposition and extraction.

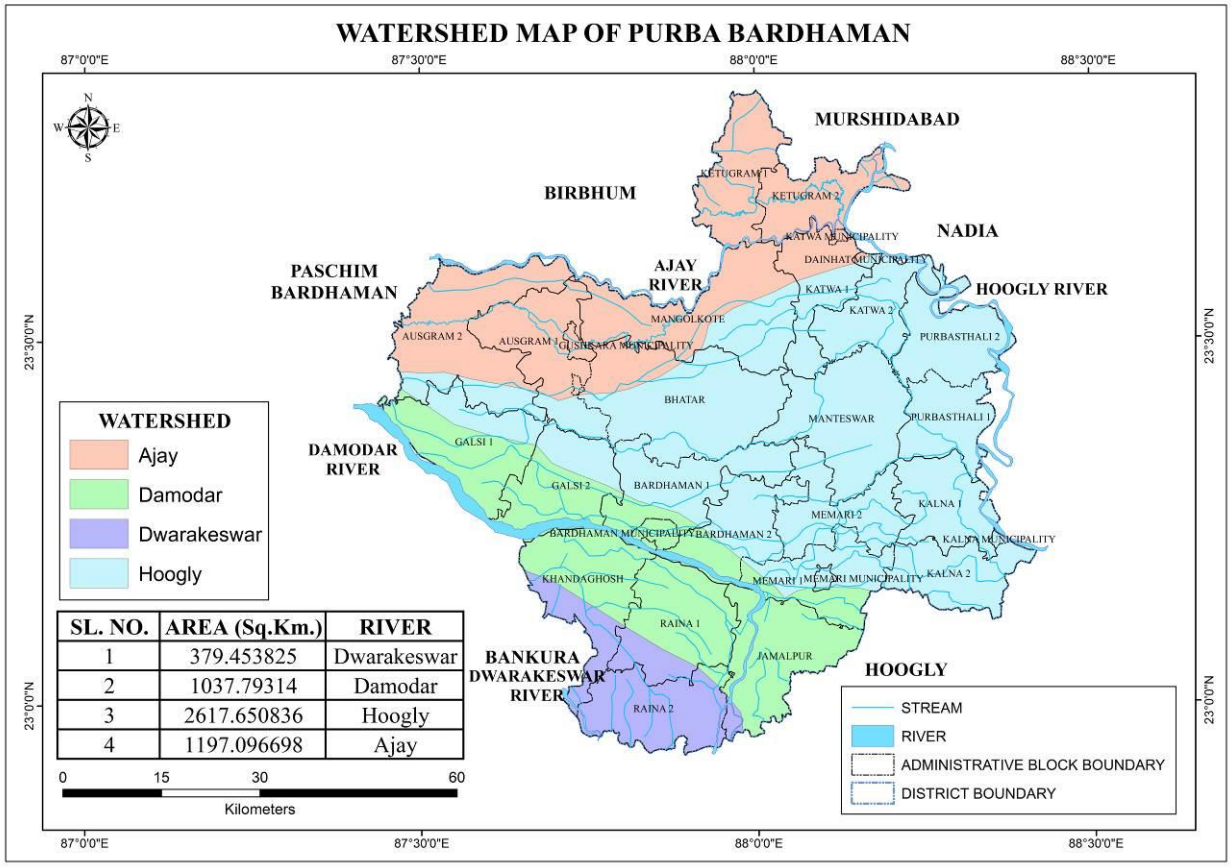
Sediment load deposition in a river is dependent on catchment area, weathering index of the various rock types of the catchment area, land-use pattern of the area, rainfall data and grain size distribution of the sediments. Again, the sediment load estimation is not a dependent variable of the district boundary, but it largely depends upon the aerial extents of the catchment areas, which crosses the district and state boundaries.

i. Methodology of the study:

The replenishment estimation is based on a theoretical empirical formula with the estimation of bedload transport comprising of analytical models to calculate the replenishment estimation. Sedimentation in riverbed depends on catchment yield, peak flood discharge due to rainfall, bed load transport rates and sediment yield characteristic of the river. Some of the common methods used for replenishment study are explained below.

a. Catchment Yield Calculation:

The total quantity of surface water that can be expected in a given period from a stream at the outlet of its catchment is known as yield of the catchment in that period. The annual yield from a catchment is the end product of various processes such as precipitation, infiltration and evapotranspiration operating on the catchment.



SL. NO.	AREA (Sq.Km.)	RIVER
1	379.453825	Dwarakeswar
2	1037.79314	Damodar
3	2617.650836	Hoogly
4	1197.096698	Ajay

Figure 7.4: Watershed map of Purba Bardhaman district

Catchment Yield can be estimated using following formula:

Catchment Yield (m^3) =Catchment area (m^2) × Runoff coefficient (%)×Rainfall (m)

The runoff generated from the watershed is analyzed using Strange's Table to get the reliable yield results. Runoff from a catchment is dependent upon annual rainfall as well as catchment characteristics such as soil types and the type of groundcover / land usage. Remote sensing was used for demarcation of catchment area relevant to the drainage system. Runoff coefficient of the catchment has been established based on Strange's Table.

Strange (1892) studied the available rainfall and runoff and obtained yield ratios as functions of indicators representing catchment characleris1ics (Subramanya, 2008). Catchments are classified as good, average and bad according to the relative magnitudes of yield of sediment. For example, catchment with good forest cover and having soils of high permeability would be classified as bad, while catchment having soils of low permeability and having little or no vegetal cover is termed good. Based on the study Strange established runoff coefficient table as givennin Table 7.6.

Table 7.6: Runoff coefficient of the catchment based on Strange's table

Total monsoon rainfall (mm)	Runoff coefficient (%)			Total monsoon rainfall (mm)	Runoff coefficient (%)		
	Good catchment	Average catchment	Bad catchment		Good catchment	Average catchment	Bad catchment
25.4	0.1	0.1	0.1	787.4	27.4	20.5	13.7
50.8	0.2	0.2	0.1	812.8	28.5	21.3	14.2
76.2	0.4	0.3	0.2	838.2	29.6	22.2	14.8
101.6	0.7	0.5	0.3	863.6	30.8	23.1	15.4
127	1	0.7	0.5	889	31.9	23.9	15.9
152.4	1.5	1.1	0.7	914.4	33	24.7	16.5
177.8	2.1	1.5	1	939.8	34.1	25.5	17
203.2	2.8	2.1	1.4	965.2	35.3	26.4	17.6
228.6	3.5	2.6	1.7	990.6	36.4	27.3	18.2
254	4.3	3.2	2.1	1016	37.5	28.1	18.7
279.4	5.2	3.9	2.6	1041.4	38.6	28.9	19.3
304.8	6.2	4.6	3.1	1066.8	39.8	29.8	19.9
330.2	7.2	5.4	3.6	1092.2	40.9	30.6	20.4
355.6	8.3	6.2	4.1	1117.6	42	31.5	21
381	9.4	7	4.7	1143	43.1	32.3	21.5
406.4	10.5	7.8	5.2	1168.4	44.3	33.2	22.1
431.8	11.6	8.7	5.8	1193.8	45.4	34	22.7
457.2	12.8	9.6	6.4	1219.2	46.5	34.8	23.2
482.6	13.9	10.4	6.9	1244.6	47.6	35.7	23.8
508	15	11.3	7.5	1270	48.8	36.6	24.4
533.4	16.1	12	8	1295.4	49.9	37.4	24.9
558.8	17.3	12.9	8.6	1320.8	51	38.2	25.5
584.2	18.4	13.8	9.2	1346.2	52.1	39	26
609.6	19.5	14.6	9.7	1371.6	53.3	39.9	26.6
635	20.6	15.4	10.3	1397	54.4	40.8	27.2
660.4	21.8	16.3	10.9	1422.4	55.5	41.6	27.7
685.8	22.9	17.1	11.4	1447.8	56.6	42.4	28.3
711.2	24	18	12	1473.2	57.8	43.3	28.9
736.6	25.1	18.8	12.5	1498.6	58.9	44.4	29.4
762	26.3	19.7	13.1	1524	60	45	30

Rainfalls return period for 25, 50 and 100 years calculated as below:

As per Weibull's Formula (Subramanya, 2008)**,**

Return period/Recurrence interval = (n+1)/m

Where: n number of years on record;
m is the rank of observed occurrences when arranged in descending order.

b. Peak Flood Discharge Calculation:

The term "peak discharge" stands for the highest concentration of runoff from the basin area. The accurate estimation of flood discharge remains one of the major challenges as it depends upon physical characteristic of the catchment area and the flood intensity, duration and distribution pattern. There have been many different approaches for determining the peak runoff from an area. As a result many different models (equations) for peak discharge estimation have been developed. Formulas used for Peak Discharge calculation areas below:

As per Dicken's formula (Subramanya, 2008)**,**

$$Q = CA^{3/4}$$

Where: Q is Maximum flood discharge (m^3/sec) in a river

A is Area of catchment in Sq. Km

C is Constant whose value varies widely between 2.8 to 5.6 for catchments in plains and 14 to 28 for catchments in hills

As per Jarvis formula (Subramanya, 2008)**,**

$$Q = CA^{1/2}$$

Where: Q is Maximum flood discharge (m^3/sec) in a river

A is Area of catchment in Sq. Km

C is Constant whose value varies between 1.77 as minimum and 177 as maximum. Limiting or 100 percent chance floods are given by the value of C of 177

As per Rational formula ((Subramanya, 2008)**,**

$$Q = CIA$$

Where: Q is Maximum flood discharge (m^3/sec) in a river

A is Area of catchment in Sq. Km

C is Runoff coefficient which depends on the characteristics of the catchment area. It is a ratio of runoff: rainfall

I is Intensity of rainfall (in m/sec)

c. Bed Load Transport Calculation:

The most important problems in river engineering are to predict bed load transport rates in torrential floods flowing from mountainous streams. Three modes of transport namely; rolling, sliding and saltation may occur simultaneously in bed load transport. The different modes of transportation are closely related and it is difficult, if not impossible, to separate them completely. There are number of equations to compute the total sediment load. Most of these equations have some theoretical and empirical bases.

Ackers and White Equation:

Ackers and White (1973) used dimensional analysis based on flow power concept and their proposedformula is as follows.

$$C_t = C_s G_s \left(d_{50}/h\right) \left(V/U_*\right)^{n'} \left[\left(F_{gr}/A_1\right) - 1\right]^{m}$$

The dimensionless particle d_{gr} is calculated by:

$$d_{gr} = {}^{d}{}_{50}\,(g(G_s-1)/v^2)^{1/3}$$

The particle mobility factor $F_{gr}$is calculated by:

$$F_{gr}=(U_{\times} n\,'/(Gs-1)g\,d_{50})^{1/2}{}_{\times}\,(V/(5.66\log(10h/d_{50}))^{1-n'}$$

Where,

A_1 = Critical particle mobilityfactor
C_s = Concentration coefficient in the sediment transportfunction
C_t = Total sediment concentration
d_{50} = Median grainsize
d_{gr} = Dimensionless particle diameter
F_{gr} = Particle mobilityparameter
g = Acceleration ofgravity
D_s, S_g = Specific gravity
h = Waterdepth
m = Exponent in the sediment transportfunction
n' = Manning roughnesscoefficient
U_* = Shear velocity
V = Mean flowvelocity
ν = Kinematic viscosity

Meyer – Peter's equation (Source: Hydrologic Engineering Center):

Meyer-Peter's equation (Ponce, 1989) is based on experimental work carried out at the Federal Institute ofTechnology, Zurich. Mayer-Peter gave a dimensionless equation based on rational laws. Mayer- Peter equation gave an empirical formula of bed load transport rates in flumes and natural rivers. The simplified Meyer-Peter's equation is given below:

$$g_b = 0.417[\tau 0\,(\eta'/\eta)^{1.5} - \tau c]^{1.5}$$

Where,
gb = Rate of bed load transport (by weight) in N per m width of channel per second.

η' = Manning's coefficient pertaining to grain size on an unrippled bed and Strickler formula i.e. η' = (1/24) x d1/6 where d is the median size (d_{50}) of the bed sediment in m.

η = The actual observed value of the rugosity coefficient on rippled channels. Its value is generally taken as 0.020 for discharges of more than 11cumecs, and 0.0225 for lower discharges.

τc = Critical shear stress required to move the grain in N/m2 and given by equationτc = 0.687da, where da is mean or average size of the sediment in mm. This arithmetic average size is usually found to vary between d_{50} and d_{60}.

τ0= Unit tractive force produced by flowing water i.e.γwRS. Truly speaking, its value should be taken as the unit tractive force produced by the flowing water on bed = 0.97γwRS. R is the hydraulic mean depth of the channel (depth of flow for wider channel) and S is the bed slope.

d. Sediment Yield Estimation:

Sedimentation occurs as the velocity decreases along with its ability to carry sediment. Coarse sediments deposit first, then interfere with the channel conveyance, and may cause additional river meanders and distributaries. The area of the flowing water expands, the depth decreases, the velocity is reduced, and eventually even fine sediments begin to deposit. As a result, deltas may be formed in the upper portion of reservoirs. The deposited material may later be moved to deeper portions of the reservoir by hydraulic processes within the water body.

There are many sediment transport equations which are suitable for use in the prediction of the rate of replenishment of river. Some of the famous sediment transport equations are:

1. Dendy – Bolton Equation
2. Yang Equations
3. Engelund-Hansen Equation
4. Modified Universal Soil Loss Equation (MUSLE) developed by Williams and Berndt (1977)

Dendy – Bolton Equation:

Dendy – Bolton formula (Dendy and Bolton 1976) is often used to calculate the sedimentation yield because:

- The formula uses catchment area and mean annual runoff as key determinants.
- It does not differentiate in basin wide smaller streams and their characteristics.
- Dendy and Bolton equation calculates all types of sediment yield i.e. sheet and rill erosion sediments, gully erosion sediments, channel bed and bank erosion sediments and mass movement etc.

Dendy-Bolton determined the combined influence of runoff and drainage area on sediment yield to compute the sediment yield. They developed two equations i.e. for run off less than 2 inch and for run off more than 2 inch, which are given below:

For run off less than 2 inch:

$(Q<2in)\ S=1289\times (Q)^{0.46}\times [1.43-0.26\ Log\ (A)]$

For run off more than 2 inches:

$(Q > 2\ in):\ S= 1958\times (e^{-0.055\times Q})\times [1.43-0.26\ Log\ (A)]$

Where: S = Sediment yield (tons/sq miles/yr)

Q = Mean Annual runoff (inch)

A = Net drainage are in sq mile

Dendy-Bolton formula is often used to calculate the sediment yield. But use of these equations to predict sediment yield for a specific location would be unwise because of the wide variability caused by local factors not considered in the equations development. However, they may provide a quick, rough approximation of mean sediment yields on a regional basis for preliminary watershed planning. Computed sediment yields normally would be low for highly erosive areas and high for well stabilized drainage basins with high vegitation density because the equations are derived from average values. The equations express the general relationships

between sediment yield, runoff, and drainage area. Many variables influence sediment yield from a drainage basin. They include climate, drainage area, soils, geology, topography, vegetation and land use. The effect of any of these variables may vary greatly from one geographic location to another, and the relative importance of controlling factors often varies within a given land resource area. Studies revealed that sediment yield per unit area generally decreases as drainage area increases. As drainage area increases, average land slope usually decreases; and there is less probability of an intense rainstorm over the entire basin. Both phenomena tend to decrease sediment yield per unit area.

Modified Universal Soil Loss Equation (MUSLE):

Modified universal soil loss equation (MUSLE) for estimation of sediment yield is also widely used. MUSLE is a modification of the Universal Soil Loss Equation (USLE). USLE is an estimate of sheet and rill soil movement down a uniform slope using rainfall energy as the erosive force acting on the soil (Wischmeier and Smith 1978). Depending on soil characteristics (texture, structure, organic matter, and permeability) some soils erode easily while others are inherently more resistant to the erosive action of rainfall.

MUSLE is similar to USLE except for the energy component. USLE depends strictly upon rainfall as the source of erosive energy. MUSLE uses storm-based runoff volumes and runoff peak flows to simulate erosion and sediment yield (Williams 1995). The use ofrunoff variables rather than rainfall erosivity as the driving force enables MUSLE to estimate sediment yields for individual storm events. The generalized formula of MUSLE is as below:

$$Y=11.8 \times (Q \times qP).56 \times K \times Ls \times C \times P$$

Where,
Y = sediment yield of stream (t/yr/km2),
Q = average annual runoff (m3),
K = soil erodibility factor,
qP = Highest discharge recorded (m3/s),
Ls = gradient/slope length,
C = cover management factor,
P = erosion control practice

ii. Estimation of Replenishment:

Purba Bardhaman district is mainly drained by the Damador, Dwarakeswar, Ajay and Hoogly Rivers. These rivers and its tributary rivers are forming the main catchment area.

For replenishment study, following assumption/calculation are taken in to consideration:

- Catchment area (Watershed area) against each river has been calculated based on remote sensing data.
- Rainfall runoff coefficient as per Strange's table for the catchment area is consider 45%, as the rainfall in the district is more than 1524mm and the characteristic of the catchment of the district is average in nature.
- Peak flood discharge of the river of the district calculated based on Dicken's formula which is more applicable to north Indian and central Indian catchment. Here Dicken constant C is taken as 12 in present study as per published literature by Saha (2002).

- Bed load transport has not been computed in the regional aspect of the district, as the values are highly dependent on local factors such as particle mobility factor, roughness coefficient, Shear velocity, Mean flow velocity, Kinematic viscosity etc.
- Sedimentation yield calculated as per Dendy and Bolton formula as the equations express the general relationships between sediment yield, runoff, and drainage area.
- Computed sediment yields by Dendy Bolton formula normally would be low for highly erosive areas and high for well stabilized drainage basins with high plant density because the equations are derived from average values.
- Dendy and Boltan formula also says that actual sediment yield from individual drainage basin may vary 10-fold or even 100-fold from computed yields. Since the district river basins comprise sedimentary rocks with good average rainfall therefore the estimated replenishment is considered as 50-fold of computed results sediment yield.

The data estimated for each river in the district are given in Table 7.7.

Table 7.7: Replenishment parameter estimated for each river in the district

Estimation parameter	Damodar	Ajay
Catchment Area (m^2)	1037800000	1197000000
Annual Rainfall (m) (in 2020)	1.48	1.48
Strange Runoff coefficient (%)	43%	43%
Annual Run-off (m) (in 2020)	0.3256	0.3256
Catchment Yield (m^3)	665063752	767085480
Peak Flood Discharge (m^3/sec)	69385144.30	77223922.77
Flow depth d (m)	1.6	1.2
Channel width b (m)	655	240
Mean velocity v (m/s)	0.06	0.05
Channel slope S_o (m/m)	0.001	0.001
Sediment Yield (Tons/year)	21666.01	25544.31
Estimated Annual Replenishment (in million m3)	0.57016	0.67222

Sedimentation rate of a river is dependent on the annual rainfall of the district. Sedimentation rate for the period 2016-2020 of each river is presented in Table 7.8 and Figure 7.5.

Table 7.8: Year-wise sedimentation rate for last 5 years of each river

Year	Damodar	Ajay	Annual Rainfall
2016	24.61	26.46	1408.4
2017	14.03	17.24	1668
2018	51.48	43.36	1000.8
2019	33.55	23.9	1213.2
2020	21.08	22.55	1479.8

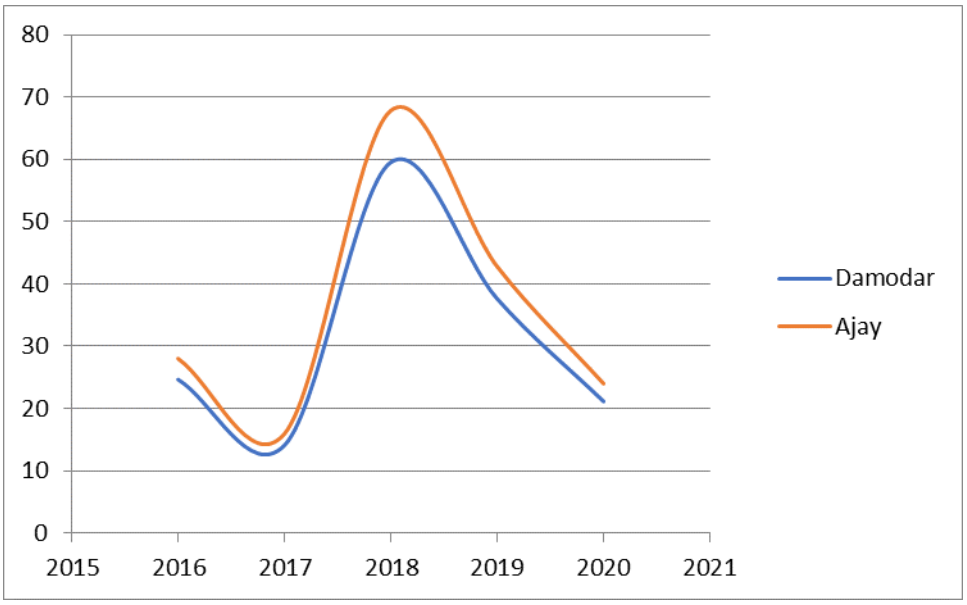


Figure 7.5: Graphical representation of year-wise sedimentation rate

The estimation of sedimentation rate based on empirical formula need critical analysis of different factors related to the LULC property of the catchment area, slope geometry, sediment erosion factor of catchment litho-type. This will help to assess replenishment rate more precisely.

Replenishment studies based on empirical formula for existing mining leases have also been conducted and are given in Table 7.9.

Table 7.9: River wise replenishment rate estimation based on empirical formula

River Name	Location	Lease Area	Surface RL Before mining	Mine out Thickness	Mine out Volume	Annual Rainfall-2020	Estimated Replenished Volume as per Dandy-Bolton	Replenishment Rate
		m2	m	m	cum	m	cum	%
Ajay	Malcha	19800.00	43.00	2.90	57420.00	1.48	40194.00	70.00%
Ajay	Harinathpur	28700.00	42.00	2.95	84665.00		61382.13	72.50%
Ajay	Churpuni	39600.00	17.00	3.00	118800.00		86724.00	73.00%
Damodar	Naricha	15100.00	34.00	2.88	43488.00		32616.00	75.00%
Damodar	Bangpur	27100.00	23.00	2.90	78590.00		60907.25	77.50%
Damodar	Jafrabad	20200.00	20.00	2.94	59388.00		45134.88	76.00%

Illustration of Replenishment Estimation is given in Table 7.10.

Table 7.10: Illustration of replenishment rate calculation based on 3 methods

Based on Satellite imageries		Based on field investigation		Based on empirical formula	
Particulars	Estimation	Particulars	Estimation	Particulars	Estimation
		River Name	Ajay	River Name	Ajay
River	Ajay	Location	Harinathpur	Location	Harinathpur
Total Premonsoon Sand Bar Area	21402205.97 (sq.m)	Mining Area	28700 (Sq.m)	Lease Area	28700 (Sq.m)
Average Pre monsoon Thickness	2.8 (m)	Pre monsoon RL	42 (m)	Surface RL Before mining	42 (m)
Total Volume	5.51 (Mcum)	Sand Thickness	2.95 (m)	Mine out Thickness	2.95 (m)
Total Postmonsoon Sand Bar Area	22044530.76 (sq.m)	Volume excavated (Cum)	84665.00 (Cum)	Mine out Volume (Cum)	84665.00 (Cum)
Average Postmonsoon Thickness	3 (m)	Post monsoon RL	41.94 (m)	Drainage area for lease block	0.078 (Sq.km)
Total Volume	7.62 (M.cum)	Thickness	2.89 (m)	Monsoon Rainfall-2020	1.48 (m)
Total Pre and Post monsoon Volume Difference	2.10 (M.cum)	Volume deposited (Cum)	82802.37 (Cum)	Estimated Volume as per Dendy- Bolton (S = 1280 Q0.46[1.43 - 0.26 log(A)]) Where, Q is runoff, A is drainage area)	61382.13 (Cum)
Replenishment and Agrredation %	138%	Replenishment Rate	97.80%	Replenishment Rate	72.5%

Replenishment studies have been carried out in the district based on three different methodologies as illustrated in Table 7.10. Table 7.11 explained comparison of the outcome of these three methodologies adopted for the district.

vi) Total potential of minor mineral in the river bed

The major sand producing rivers of the Purba Bardhaman district are Damodar, Dwarakeswar, Ajay and Hoogly rivers.

B. Geological studies

i) Lithology of the catchment area

Archaean granite gneisses and migmatites of the Chotanagpur Gneissic Complex are exposed in a narrow east-west belt fringing the north-western part and constitute the oldest basement rocks. Over these, in a faulted, subsided semi-graben type structural trough,

deposited the thick bedded sedimentary sequence of Gondwana Super Group comprising sandstone, shale, siltstone with prolific commercial coal seams. All these rocks are cut across by a number of high angle, transverse, gravity faults. Mostly the Lower Gondwana sequence is developed in this district, comprising the Talchir, Barakar, Barren Measure, Raniganj and Panchet Formations. Durgapur beds constitute the youngest unit above the Panchet Formation which is considered equivalent to Mahadeva Formation of Upper Gondwana developed elsewhere. The Gondwana sequence rocks are exposed in the western part of the district area. In parts of the central and in the broad, oval area of eastern part, laterite cover with red soil and Quaternary sequence of riverine sediments grouped under Sijua, Panskura and Diara formations are exposed. The Sijua formation is mainly clay with caliche concretions; Panskura formation constitute clay alternations with silt and sand at the bottom and Diara formation comprise bedded interfingering sand, silt and clay in the present-day shifting river channel courses. Geological succession of Bardhaman district is furnished below.

ii) Tectonics and structural behavior of rocks

Purba Bardhaman is an agriculturally prosperous district of West Bengal. The soil and climate of the district favour the production of food grains. The undivided Bardhaman district was the largest producer of rice in West Bengal, and bulk of it was produced in what is now Purba Bardhaman district. Rice, the major crop has three varieties – Aus (in autumn), Aman (in winter) and Boro (in summer). Other than cereals and pulses, cash crops such as mustard, til, jute and potatoes are also grown

C. Climate Factors

i) Intensity of rainfall

The average annual rainfall of the area is about 1044 mm. Rainfall during the monsoon period (June to September) constitutes 75 % of the annual rainfall. The driest month is December, with 2 mm or 0.1 inch of rain. The greatest amount of precipitation occurs in July, with an average of 309 mm or 12.2 inch. On an average the district has 70 rainy days in a year. The most prominent special weather phenomena of the district are the Nor'westers or Kalbaisakhis. Most of them strike with speed of 65 to 100 km/hr with rainfall ranging from 10 mm to 50 mm and marked by a consequent fall of temperature.

ii) Climate zone

The district has a tropical climate - hot and humid. While the hottest month is May, the coldest is January. The monsoon season is from June to September with an annual average rainfall of 1,044 mm. Localised thunderstorms, called "Kalbaisakhi" in Bengali, are a special feature from March until the monsoon sets in. In monsoon period from June to September, wind blows from the south-west direction recognized as south-west monsoon. During winter, i.e., from December to February winds are mainly northerly or north-easterly with clear or patchily clouded sky. Temperatures are fairly cool between winter and spring.

iii) Temperature variation

The district experiences dry and hot summer with maximum temperature of near about≈ 40°C during summer. The district shows a fierce dry heat in the warmer months. The summers

in Paschim Bardhaman usually start from month of March and last till the middle of June. The arrival of the month of June marks the onset of monsoon in Paschim Bardhaman. The district receives a high average rainfall. June to September has shown maximum average rainfall with moderate temperature. Winters are pleasant and enjoyable, with mercury dropping to about 14°C or below. The winter starts from December and last till the month of February.

Annual Deposition:

Annual deposition of riverbed minerals has been calculated on post-monsoon sand volume. The pre-monsoon sand volume of the river is the depleted resources and is replenished by the monsoon rainfall. For the purpose of estimating mineable mineral potential, the thickness of the sand bar considered extractable based on base flow level is given in Table 7.11.

Table 7.11: River wise Thickness of sand bar considered mineable

River Name	Considered Mining Thickness (m)
Damodar	2.70
Dwarakeswar	3.00
Ajay	3.00
Hoogly	1.00

Based on geomorphology, geology, climate and mineable thickness of sand bar the annual deposition of riverbed minerals has been estimated. Sand bar area recommended for mineral concession in the table is calculated as per the Enforcement and Monitoring Guidelines for Sand Mining (EMGSM) 2020. As per guidelines, mining depth restricted to 3 meters depth and distance from the bank is ¼th of river width and not less than 7.5 meters. Also mining is prohibitated up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side. The annual minable mineral potential is given in Table 7.12.

Table 7.12: Annual mineable mineral potential

Sl. No.	River or Stream	Portion of the river stream recommended for mineral concession	Length of area recommended for mineral concession (in meter)	Average width of area recommended for mineral concession (in meters)	Area recommended for mineral concession (in Sqm)	Mineable mineral potential (in Mcum) (60% of total mineral potential
1	AJAY RIVER	9.81	18239.75	119.19	2173987.64	3.91
2	DAMODAR RIVER	23.87	54904.28	434.90	23877665.77	38.68
3	DWARAKESWAR RIVER	26.81	7442.00	120.36	895699.61	1.61
4	HOOGLY RIVER	0.00	0.00	0.00	0.00	0.00

III. Riverbed Mineral Potential

Process of disposition etc:

Sand: Huge quantities of quality sands are found to occur in part of rivers. Smaller patches are also available locally in the other smaller rivers as well. Table 7.13 summarizes the potential riverbed mineral deposits of the district.

Table 7.13: Resources of Potential Riverbed Mineral

Boulder (Mcum)	Pebbles/Gravel (Mcum)	Sand/White sand (Mcum)	Total Mineable, Mineral Potential (Mcum)
-	-	44.21	44.21

Based on satellite imagery study and field investigation, potential zones for riverbed deposits for each river of the district have been identified and the details of the zones are provided in Table 7.14.

Table 7.14: Potential Zone of Riverbed Mineral

RIVER NAME	ZONE	BLOCK NAME	MOUZA NAME	JL NO.	AREA (SQMTS)	LENGTH (MTS)	WIDTH (MTS)
AJAY RIVER	AJ ZONE 1	MANGOLKOTE	BAKULIA, MADHPUR	83, 86	338235.4976	5,466.63	1,582
	AJ ZONE 2	KETUGRAM 1	NARENGA, CHAKDAHA	54,55	420152.7546	2,117.30	725
	AJ ZONE 3	MANGOLKOTE	KOWARPUR	96	44965.60657	290.45	239
	AJ ZONE 4	KETUGRAM 1	NOYAPARA, GONFUL	56, 62	498119.4174	3,117.91	479
	AJ ZONE 5	MANGOLKOTE	KHERUA	97	44159.08159	740.89	135
	AJ ZONE 6	KETUGRAM 2	TEORA, BILLESWAR ROSUI	74, 75	440613.2358	3,468.25	572
	AJ ZONE 7	MANGOLKOTE	DHANYARUKHI	100	41195.50977	236.43	285
	AJ ZONE 8	KATWA 1	CHURPUNI	3	26760.20175	489.11	156
	AJ ZONE 9	KETUGRAM 2	BILLESWAR ROSUI	75	204371.2696	598.99	147
	AJ ZONE 10	KETUGRAM 2	CHARKHI	76	48634.33887	406.63	204
	AJ ZONE 11	KATWA 1	SUNEA	1	38530.53525	638.80	226
	AJ ZONE 12	KETUGRAM 2	SENPARA	91	21467.93885	436.13	189
	AJ ZONE 13	KATWA 1	SUNEA	1	6782.253528	232.22	90
DAMODAR RIVER	DA ZONE 1	GALSI 1	BAMUNARA, RAMGOPALPUR, MALLASARUL	22,27,26	2276926.507	11,413.96	527
	DA ZONE 2	GALSI 2	GOHOGRAM, SONDA, SIKARPUR, KONARPUR	37,81,82,126	12493204.07	17,789.55	1,601
	DA ZONE 3	KHANDAGHOSH	KUMIRKOLA	9	1155345.533	4,180.67	948
	DA ZONE 4	BARDHAMAN 1	BAHARPUR	22	2485054.449	6,930.57	854

RIVER NAME	ZONE	BLOCK NAME	MOUZA NAME	JL NO.	AREA (SQMTS)	LENGTH (MTS)	WIDTH (MTS)
	DA ZONE 5	BARDHAMAN 2	HATSHIMUL,KATHALGACHI	81,83	5001947.015	12,789.36	1,213
	DA ZONE 6	MEMARI 1	CHANCHAI	46	465188.1966	1,800.17	1,073
DWARAKESWAR RIVER	DW ZONE 1	KHANDAGHOSH	RAUTARA	110	451289.6267	2,453.71	432
	DW ZONE 2	RAINA 2	MANDALGHATI	-	444409.9826	4,988.30	429
HOOGLY RIVER	-	-	-	-	-	-	-

NO MINING ZONE:

As per the Enforcement and Monitoring Guidelines for Sand Mining (EMGSM) 2020 the restricted zone for mining is a distance from the bank is ¼th of river width and not be less than 7.5 meters. Also there is a no mining zone up to a distance of 1 kilometre (1 km) from major bridges and highways on both sides, or five times (5x) of the span (x) of a bridge/public civil structure (including water intake points) on up-stream side and ten times (10x) the span of such bridge on down-stream side, subjected to a minimum of 250 meters on the upstream side and 500 meters on the downstream side.

No mining zone has been marked for an area up to a width of 100 meters from the active edge of embankments. Also the concave side of the rive is marked as no mining zone, as mining is this area will affect the course of river in future and will erode the river bank. A representative map of no mining zone shown on River Ajay of Purba Bardhaman district is given in Figure 7.6. Table 7.15 summarized the area of no mining zones demarcated for each river of the district.

Table 7.15: No mining zone in the district

RIVER NAME	ZONE	RESTRICTED AREA (SQ MTS)
AJAY RIVER	AJ ZONE 1	102940.9846
	AJ ZONE 2	141266.3107
	AJ ZONE 3	9312.634819
	AJ ZONE 4	128944.7216
	AJ ZONE 5	9485.359898
	AJ ZONE 6	119162.9941
	AJ ZONE 7	10307.63064
	AJ ZONE 8	6560.450667
	AJ ZONE 9	59554.98772
	AJ ZONE 10	15716.78694
	AJ ZONE 11	12109.45769
	AJ ZONE 12	1327.116441
	AJ ZONE 13	2157.940975
DAMODAR	DA ZONE 1	519447.7191

RIVER NAME	ZONE	RESTRICTED AREA (SQ MTS)
RIVER	DA ZONE 2	2456797.692
	DA ZONE 3	143637.9324
	DA ZONE 4	554050.4318
	DA ZONE 5	768854.9394
	DA ZONE 6	85511.52529
DWARAKESWAR RIVER	DW ZONE 1	54892.19506
	DW ZONE 2	73987.4643
HOOGLY RIVER	-	-

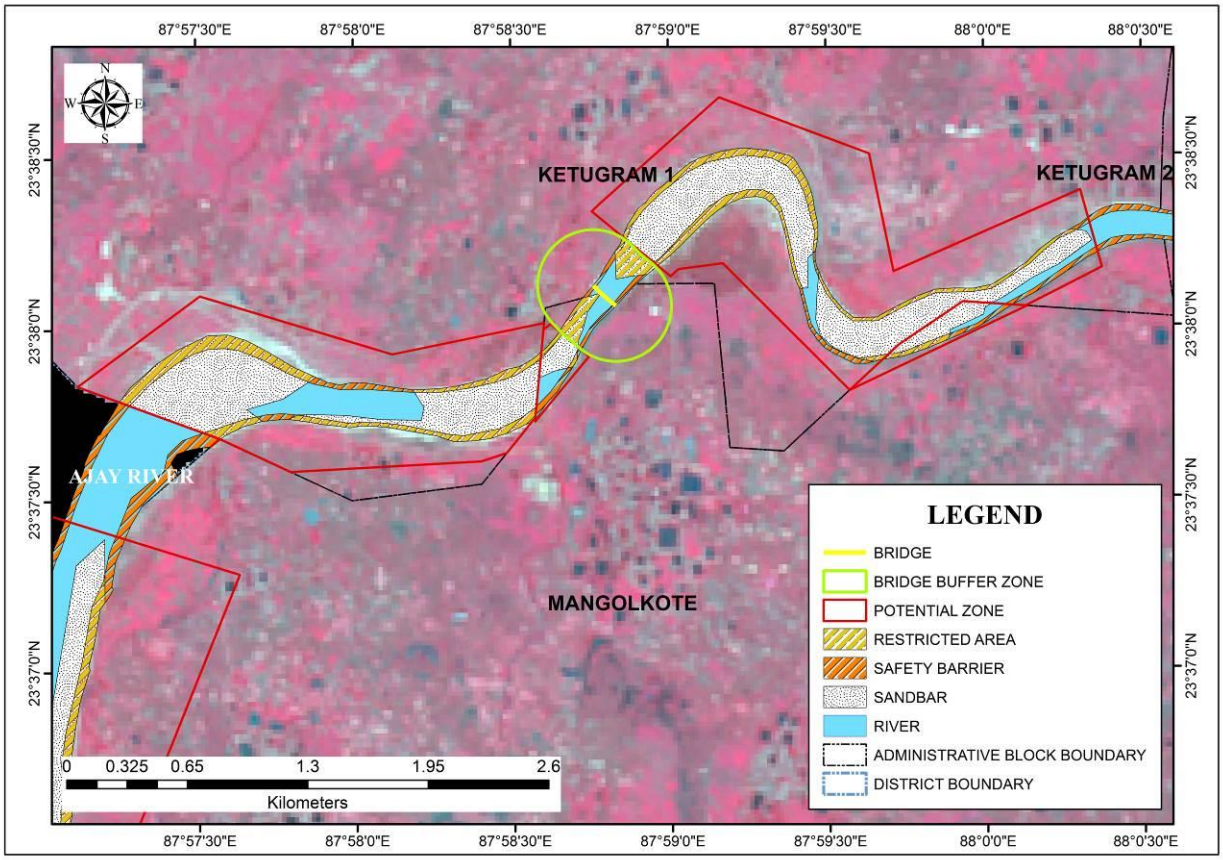


Figure 7.6: A representative map showing no-mining zone demarcated on Ajay River

7.2.2. In-situ Minerals:

I. Mineral Reserve

Mineral resources of the district are still not well established, the district does not have reserve of any major mineral deposits.

II. Mineral Potential

Sand is the important riverbed mineral found to be potential for mining. Considerable quantity of quality sands is found to occur in the riverbed of the district.

The district also has potential deposits of Laterite located western part of the district. The undulating laterite topography of Paschim Bardhaman district extends up to the Ausgram of Purba Bardhman district.

The lists of identified potential zones with respect to in-situ minor minerals are furnished in Table 7.16 and in Figure 7.7.

Table 7.16: In-situ Minerals Occurrences

Name of mineral	Name of associated minerals, if any	Host rock of mineralization	Area of mineralization	Depth of mineralization	Whether virgin or partially excavated	Name of land (whether free for mining/forest/agricultural	Mineral reserve (approximate) mentioning grade	Location of potential mineralized zones				Area within prohibited zone as per rule 3(7) of WBMMC Rules, 2016	Infrastructure available near the mineralized zone
								Administrative Block	Mouza	Plot Nos.	Co-ordinates		
1	2	3	4	5	6	7	8	9				10	11
Morrum	Nil	Laterite	72.79ha	15m	Partially excavated	Agricultural land	Partialy explored	Ausgram			23° 26' 48.776" N 87° 34' 0.309" E 23° 26' 49.707" N 87° 34' 39.433" E 23° 26' 29.518" N 87° 34' 41.428" E 23° 26' 28.374" N 87° 33' 58.351" E	Nil	Road network available

Figure 7.7: In-situ mineral occurrences shown on geological map of the district (Source: GSI, 2001)

7.3 Mineral development prospect of the district with respect to Minor Mineral

The district is not very rich in mineral resources and there are no mines in the district. However, collections of sand from the river-bed are the minor mineral sources. In this district some of big rivers are flowing like Ajay, Damodar, Hoogly and Dwarakeswar, so in this region it has seen that the different geomorphic features like Alluvium Plain, Alluvial Fan etc, which are create by river deposition activity. So, in this region there is huge deposition of sand, clay has found, so the sand mining or the sand industry should the very useful for this district.

7.4 Exploration requirement of the district

In this district the sand industry might be very much useful. Therefore, there is a need more scientific sand mining procedure. Alongwith sand, lateritic deposits also noted in the western part. So the scope Exploration in this district is very high. It is highly recommended to conduct detailed exploration (G2 level) to establish mineral resources of the district.

8 Overview of mining activity in the district

8.1 General overview

In Purba Bardhaman district collection of sand from river-bed is one of the main minor mineral sources of the district. These materials are primarily utilized for construction purpose.

8.2 List of existing mining leases of the districts

Details of List of existing mining leases of the districts are furnished in Table 8.1.

Table 8.1: Details of Sand mining leases of the districts

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
986/SB 2021	KHANDOGHOSH	NARICHA	13	Damodar	No Approach Road	4123 P	2.14	23° 14' 52.88"N	87° 44' 3.49"E	SWAPAN KUMAR PAN	2/3/2017	2/6/2017	3/17/2017	16-Mar-22	72798.165	
280/SB 2021	BARDHAMAN-1	BANGPUR	32	Damodar	Metal/Black top/Pitch/Pucca Road	1830 P, 1836 P, 1838, 1839, 1840 P, 1871 P AND ORS	2.71	23° 12' 53.72"N	87° 50' 2.08"E	MONIRUL MONDAL	4/24/2018	5/31/2018	6/1/2018	31-May-23	92201.835	
288/SB 2021	BARDHAMAN-1	FAKIRPUR	25	Damodar	Metal/Black top/Pitch/Pucca Road	1293 P, 1377 P, 1372 P, 1373 P AND ORS	4.99	23° 13' 11.96"N	87° 49' 35.71"E	Mohan Choudhury					0	EC Awaiting
291/SB 2021	BARDHAMAN-1	FAKIRPUR	25	Damodar	Metal/Black top/Pitch/Pucca Road	1293 P, 1377 P AND ORS	4.95	23° 13' 6.06"N	87° 49' 39.97"E	Subhas Kumar Poddar					0	EC Awaiting
686/SB 2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	1101 P	3.69	23° 15' 1.85"N	87° 43' 33.07"E	Raja Ghosh					0	EC Awaiting
294/SB 2021	BARDHAMAN-1	IDILPUR	24	Damodar	Metal/Black top/Pitch/Pucca Road	1268 P , 1267 P AND ORS	4.99	23° 13' 32.77"N	87° 48' 58.79"E	NAMITA ENTERPRISE					0	EC Awaiting
328/SB 2021	BARDHAMAN-1	MIRCHOBA	33	Damodar	Metal/Black top/Pitch/Pucca Road	543 P	2.1	23° 12' 31.88"N	87° 51' 2.91"E	HALDER CONDEV PVT LTD	7/19/2018	2/5/2018	11/28/2018	27-Nov-23	71284.404	
820/SB 2021	RAINA-1	HARIPUR	36	Damodar	Metal/Black top/Pitch/Pucca Road	4891 P AND ORS	2.97	23° 10' 26.08"N	87° 56' 13.58"E	Lokenath Estates Pvt Ltd					0	EC Awaiting
323/SB 2021	BARDHAMAN-1	IDILPUR	24	Damodar	Metal/Black top/Pitch/Pucca Road	1420 P, 1425 P AND ORS	4.98	23° 13' 30.56"N	87° 49' 4.53"E	NAMITA ENTERPRISE					0	EC Awaiting
373/SB 2021	GALSI-2	DBHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	793 P	3.65	23° 13' 51.03"N	87° 39' 35.22"E	ROSHAN KUMAR	5/16/2017	12/13/2017	1/25/2018	24-Jan-23	123990.826	
414/SB 2021	GALSI-2	SHIKARPUR	82	Damodar	Metal/Black top/Pitch/Pucca Road	1837 P	3	23° 13' 54.54"N	87° 39' 56.18"E	RAJESH KR SINGH	2/3/2017	3/25/2017	4/24/2017	23-Apr-22	101972.477	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
415/SB 2021	GALSI-2	TAHERPUR	88	Damodar	Metal/Black top/Pitch/Pucca Road	1192 P	2.7	23° 15' 4.81"N	87° 42' 2.13"E	JITENDRA KR SINGH	2/3/2017	3/25/2017	1/2/2018	1-Jan-23	91651.376	
1203/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	3.21	23° 9' 34.20"N	87° 59' 47.40"E	Santilata Roy					0	EC Awaiting
492/SB 2021	GALSI-2	D Bhasapur	79	Damodar	Metal/Black top/Pitch/Pucca Road	765 P	2.91	23° 14' 26.41"N	87° 39' 19.56"E	Samir Mondal	12/18/2017	12/16/2019	1/24/2020	23-Jan-25	98807.339	
500/SB 2021	GALSI-2	D Bhasapur	79	Damodar	Metal/Black top/Pitch/Pucca Road	439 P	2.62	23° 14' 39.81"N	87° 39' 24.17"E	Matribbumi Developer	1/30/2017	3/16/2017	3/24/2017	23-Mar-22	95779.817	
1459/SB2021	MONGALKOT	Kheruа	97	Ajay	Metal/Black top/Pitch/Pucca Road	827 P, 1870 P	2.18	23° 38' 1.18"N	87° 59' 28.77"E	Razaul Haque	4/19/2017	4/19/2017	5/2/2017	1-May-22	74036.697	
586/SB 2021	GALSI-2	DADPUR	88	Damodar	Metal/Black top/Pitch/Pucca Road	2151 P AND ORS	2.63	23° 15' 11.23"N	87° 42' 23.39"E	Maa Sarbamangala Quality Sand	12/29/2017	1/16/2018	2/2/2018	1-Feb-23	89587.156	
589/SB 2021	GALSI-2	GOPALPUR	87	Damodar	Metal/Black top/Pitch/Pucca Road	321 P	4.29	23° 14' 59.87"N	87° 41' 49.68"E	Manik Chandra Mondal	9/21/2017	9/25/2017	9/25/2017	24-Sep-22	145733.945	
594/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2083 P AND ORS	2.92	23° 15' 17.38"N	87° 42' 42.32"E	Amar Pal	12/18/2017	12/21/2017	1/15/2018	14-Jan-23	99220.183	
534/SB 2021	GALSI-2	Taherpur	88	Damodar	Metal/Black top/Pitch/Pucca Road	1192 P	3.92	23° 15' 14.10"N	87° 42' 2.00"E	Sukumar Sarkar	2/3/2017	2/11/2017	2/16/2017	15-Feb-22	133211.009	
543/SB 2021	GALSI-2	Jujuti	123	Damodar	Metal/Black top/Pitch/Pucca Road	951 P, 1101 P	3.61	23° 15' 6.88"N	87° 43' 17.96"E	Goutam Pal	2/3/2017	2/17/2017	3/2/2017	1-Mar-22	122614.679	
551/SB 2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	3.98	23° 15' 8.77"N	87° 43' 46.03"E	Joydeb Mal	2/3/2017	2/6/2017	2/9/2017	8-Feb-22	135412.844	
557/SB 2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	3.75	23° 15' 12.19"N	87° 44' 30.58"E	Baskinath Singh	3/1/2017	3/16/2017	3/29/2017	28-Mar-22	127431.193	
608/SB	GALSI-	TAHE	88	Damodar	Metal/Black	1192 P	3.78	23° 15'	87° 42'	Alok Sen					0	EC

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
2021	2	RPUR			top/Pitch/Pucca Road			13.90''N	2.23''E							Awaiting
605/SB 2021	GALSI-2	D BHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	439 P AND ORS	3.53	23° 14' 30.78''N	87° 39' 13.29''E	Maiher Developer					0	EC Awaiting
754/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1867 P	4.61	23° 14' 27.08''N	87° 40' 40.32''E	JOGENDRA BARMAN					0	EC Awaiting
598/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2778 P AND ORS	2.8	23° 15' 19.30''N	87° 42' 55.80''E	Ambey Abasan Pvt Ltd	11/27/2017	2/1/2018	2/2/2018	1-Feb-23	95229.358	
599/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2764 P AND ORS	3.23	23° 15' 14.83''N	87° 42' 55.94''E	Probhat Bauri	11/27/2017	12/4/2018	4/3/2019	2-Apr-24	109954.128	
601/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2151 P AND ORS	3.08	23° 15' 11.24''N	87° 42' 22.93''E	Ambey Abasan Pvt Ltd	11/27/2017	12/1/2018	2/2/2018	1-Feb-23	104587.156	
628/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1901 P AND ORS	4.06	23° 14' 28.53''N	87° 40' 41.85''E	Anita Barman					0	EC Awaiting
638/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1901 P, 1540 P	4.29	23° 14' 42.77''N	87° 40' 54.32''E	Maa Sarbamangala Quality Sand	2/22/2018	2/27/2018	3/6/2018	5-Mar-23	146009.174	
641/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2073, 2074 P AND ORS	2.49	23° 15' 15.68''N	87° 42' 28.60''E	Katyani Contractor Pvt	2/22/2018	2/23/2018	3/7/2018	6-Mar-23	84633.028	
648/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2850 P	3.72	23° 15' 10.14''N	87° 42' 59.14''E	Ramkrishna Steal Furniture	12/5/2018	12/26/2019	10/15/2020	14-Oct-25	126605.505	
359/SB2021	GALSI-2	GOHOGRAM	70	Damodar	Metal/Black top/Pitch/Pucca Road	6001 P	3.84	23° 14' 40.07''N	87° 37' 53.73''E	Satyanand Ray					0	EC Awaiting
368/SB 2021	GALSI-2	GOHOGRAM	70	Damodar	Metal/Black top/Pitch/Pucca Road	6002 P	3.97	23° 14' 31.36''N	87° 37' 55.35''E	Yogendra Kr Singh					0	EC Awaiting
657/SB	GALSI-	D	79	Damodar	Metal/Black	765 P	2.79	23° 14'	87° 39'	NEMAI KUMAR					0	EC

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
2021	2	BHASAPUR			top/Pitch/Pucca Road			27.88''N	25.79''E	MAHATO						Awaiting
606/SB 2021	GALSI-2	D BHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	793 P	3.41	23° 13' 49.31''N	87° 39' 29.48''E	Ramkrishna Choudhury					0	EC Awaiting
677/SB 2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	951 P, 1101 P	3.69	23° 15' 8.10''N	87° 43' 22.20''E	Mukunda Mohan Khan					0	EC Awaiting
705/SB 2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	1114 P	3.93	23° 15' 4.91''N	87° 44' 33.79''E	MONA HEMBRAM					0	EC Awaiting
1946/SB2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	1698 P 1712 P	4.01	23° 11' 54.98''N	87° 53' 51.39''E						0	
720/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2108 P AND ORS	3.29	23° 15' 17.86''N	87° 42' 42.84''E	Triumph Sales Service	12/29/2017	2/18/2021	2/25/2021	24-Feb-25	111880.734	
727/SB 2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2828 P, 2830 P AND ORS	4.16	23° 15' 16.90''N	87° 43' 5.70''E	Ambey Abasan Pvt Ltd					0	EC Awaiting
732/SB 2021	GALSI-2	DUMUR	86	Damodar	Metal/Black top/Pitch/Pucca Road	930 P	3.81	23° 14' 59.88''N	87° 41' 11.49''E	MAA SARADA ENTERPRISE					0	EC Awaiting
737/SB 2021	GALSI-2	DUMUR	86	Damodar	Metal/Black top/Pitch/Pucca Road	930 P	3.5	23° 15' 1.21''N	87° 41' 17.41''E	Haque Mercantile					0	EC Awaiting
741/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1901 P, 1540 P	4.45	23° 14' 50.98''N	87° 40' 49.17''E	Mukul Kundu					0	EC Awaiting
744/SB 2021	GALSI-2	GOPALPUR	87	Damodar	Metal/Black top/Pitch/Pucca Road	321 P	4.97	23° 15' 0.64''N	87° 41' 32.47''E	Probhat Bauri					0	EC Awaiting
763/SB 2021	RAINA-2	NARATAMBATI	136	Darakeswar	Metal/Black top/Pitch/Pucca Road	2502 P	3.16	22° 58' 9.09''N	87° 44' 37.72''E	SHYAMALI PANJA					0	EC Awaiting
751/SB 2021	GALSI-2	DUMUR	86	Damodar	Metal/Black top/Pitch/Pu	1001 P	4.58	23° 14' 51.45''N	87° 41' 12.82''E	Innaya Enterprise					0	EC Awaiting

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
					cca Road											
760/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1867 P	4.9	23° 14' 19.52''N	87° 40' 32.67''E	Maa Sarbamangala Quality Sand					0	EC Awaiting
1910/SB2021	BARDHAMAN-2	Sriram pur	80	Damodar	Metal/Black top/Pitch/Pucca Road	548 P, 545 P, 543 P, 542 P, 546 P, 547 P, 551 P, 588 P	2.06	23° 12' 1.04''N	87° 52' 53.03''E						0	
781/SB 2021	GALSI-2	DUMUR	86	Damodar	Metal/Black top/Pitch/Pucca Road	1001 P	3.74	23° 14' 54.14''N	87° 41' 21.00''E	Madhusudan Roy					0	EC Awaiting
271/SB 2021	BARDHAMAN-1	BANGPUR	32	Damodar	Metal/Black top/Pitch/Pucca Road	1804 P, 1812 P, 1813 P, 1814 P, 1815 P AND ORS	2.83	23° 12' 56.83''N	87° 49' 57.65''E	Dinanath Chawdhery					0	EC Awaiting
1917/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Black top/Pitch/Pucca Road	1564 P, 1575 P, 1576 P, 1581, 1594 P, 1595 P, 1582, 1583, 1584 P, 1580, 1579, 1578, 1561 P, 1562 P	4.29	23° 13' 52.36''N	87° 48' 5.79''E						0	
810/SB 2021	RAINA-1	Natu	37	Damodar	Metal/Black top/Pitch/Pucca Road	1225 P ORS	1.41	23° 10' 25.70''N	87° 56' 15.13''E	Molay Samanta	11/27/2017	12/18/2017	12/22/2017	21-Dec-22	47889.908	
1027/SB2021	KHANDOGHOSH	Nabagram	7	Damodar	Metal/Black top/Pitch/Pucca Road	945 P	4.08	23° 14' 37.65''N	87° 41' 19.04''E	Maa Sarbamangala Quality Sand	9/21/2017	9/20/2017	9/21/2017	20-Sep-22	138715.596	
831/SB 2021	RAINA-2	NARASINHAPUR	206	Mundeswari	Metal/Black top/Pitch/Pucca Road	380 P	2.3	22° 58' 43.90''N	87° 56' 33.78''E	Basudev Majhi	3/26/2018	6/8/2018	6/15/2018	14-Jun-23	78165.138	
1959/SB2021	GALSI-2	JHUJITI	158	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	2.02	23° 15' 0.69''N	87° 44' 8.31''E						0	
844/SB 2021	RAINA-2	KOTSIMUL	208	Mundeswari	Metal/Black top/Pitch/Pu	1349 P	2.51	22° 56' 41.40''N	87° 56' 12.08''E	Panchanan Hardware	2/22/2018	2/23/2018	3/5/2018	4-Mar-23	85458.716	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
					cca Road											
847/SB 2021	RAINA-2	KOTSIMUL	208	Mundeswari	Metal/Black top/Pitch/Pucca Road	1349 P	3.34	22° 56' 38.92"N	87° 56' 22.12"E	Matribbumi Developer	2/22/2018	1/18/2020	2/28/2020	27-Feb-25	113669.725	
880/SB 2021	RAINA-2	NARASINHAPUR	206	Mundeswari	Metal/Black top/Pitch/Pucca Road	380 P	2.07	22° 58' 52.28"N	87° 56' 44.06"E	Srijonee Engineers Co Op Society					0	EC Awaiting
881/SB 2021	RAINA-2	NARASINHAPUR	206	Mundeswari	Metal/Black top/Pitch/Pucca Road	380 P	2.13	22° 58' 38.20"N	87° 56' 41.59"E	Uttam Samanta	2/22/2018	3/21/2018	3/27/2018	26-Mar-23	14477.064	
883/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	663 P AND OTHERS	2.42	23° 12' 21.43"N	87° 52' 26.18"E	NARU GOPAL BHAKAT	11/27/2017	1/15/2021	3/9/2021	8-Mar-26	82293.578	
884/SB 2021	AUSHGRAM-2	BUDRA	132	Ajay	Metal/Black top/Pitch/Pucca Road	202 P	0.95	23° 37' 6.09"N	87° 42' 44.07"E	SK ABDUL LALAN	3/6/2017	3/21/2017	4/7/2017	6-Apr-17	19321.101	
887/SB 2021	RAINA-2	KOTSIMUL	208	Mundeswari	Metal/Black top/Pitch/Pucca Road	834 P, 1349 P	2.5	22° 57' 18.44"N	87° 56' 21.99"E	Dibyendu Dey					0	EC Awaiting
890/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	1198 P AND OTHERS	2.81	23° 12' 21.31"N	87° 52' 14.33"E	PUSPA RANI MONDAL	11/27/2017	12/10/2018	1/2/2019	1-Jan-24	95504.587	
893/SB 2021	RAINA-2	KOTSIMUL	208	Mundeswari	Metal/Black top/Pitch/Pucca Road	1349 P	2.19	22° 57' 2.41"N	87° 56' 20.47"E	Maa Tara Builders					0	EC Awaiting
894/SB 2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	1020 P AND OTHERS	2.23	23° 12' 5.07"N	87° 53' 12.70"E	MD MOINUDDINSHA	9/21/2017	2/2/2020	6/4/2020	3-Jun-25	75963.303	
901/SB 2021	RAINA-2	KOTSIMUL	208	Mundeswari	Metal/Black top/Pitch/Pucca Road	1349 P	2.35	22° 56' 58.95"N	87° 56' 19.23"E	R S Construction					0	EC Awaiting
913/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	1199 P AND OTHERS	2.27	23° 12' 17.81"N	87° 52' 14.10"E	A R ENTERPRISE	9/21/2017	11/23/2017	5/15/2019	14-May-24	77064.22	
949/SB 2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1665 P	3.99	23° 15' 4.51"N	87° 42' 36.14"E	Matribbumi Developer	1/18/2017	1/31/2017	2/2/2017	1-Feb-22	135825.688	

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950/SB 2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1665 P	3.82	23° 15' 4.73"N	87° 42' 33.79"E	Debnath Enterprise	1/18/2017	2/9/2017	2/15/2017	14-Feb-22	130045.872	
952/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	496 P AND OTHERS	2.54	23° 12' 18.24"N	87° 52' 25.62"E	PROMITA GHOSH	11/27/2017	7/6/2020	8/4/2020	3-Aug-25	86284.404	
956/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	819 P AND OTHERS	2.48	23° 12' 19.12"N	87° 52' 47.77"E	PURNIMA BHAKAT	11/27/2017	2/23/2020	6/4/2020	3-Jun-25	84357.798	
932/SB 2021	BARDHAMAN-2	BAJESHALEPUR	161	Damodar	Metal/Black top/Pitch/Pucca Road	291 P AND OTHERS	1.53	23° 10' 13.37"N	87° 57' 21.71"E	BIDYUT GHOSH	12/29/2017	1/5/2018	1/8/2018	7-Jan-23	52155.963	
926/SB 2021	AUSHGRAM-2	Puruchа	126	Ajay	Metal/Black top/Pitch/Pucca Road	955P, 967 P	2.92	23° 37' 1.37"N	87° 40' 0.57"E	SAHAJAHAN SEKH	3/6/2017	4/21/2017	4/28/2017	27-Apr-22	99220.183	
944/SB 2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1665 P	3.97	23° 15' 8.58"N	87° 42' 36.40"E	Sujit Kumar Roy	1/18/2017	8/28/2017	3/4/2021	3-Mar-26	134862.385	
960/SB 2021	KHANDOGHOSH	TILDANGA	66	Damodar	Metal/Black top/Pitch/Pucca Road	311 P, 333 P	1.01	23° 13' 32.38"N	87° 48' 33.17"E	Reshma Khatun	3/6/2017	10/17/2017	11/21/2017	20-Nov-22	34266.055	
972/SB 2021	AUSHGRAM-2	MALCHA	48	Ajay	Metal/Black top/Pitch/Pucca Road	3 P, 4 P	1.98	23° 36' 27.17"N	87° 37' 50.94"E	Rizaul Haque General Order Supplier	3/26/2018	3/29/2018	4/11/2018	10-Apr-23	67293.578	
1100/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Black top/Pitch/Pucca Road	735 P	1.4	23° 11' 1.90"N	87° 55' 38.90"E	PINTU BAURI	9/21/2017	11/30/2017	4/10/2018	9-Apr-23	19266.055	
1102/SB2021	JAMALPUR	Sanchara	19	Damodar	Metal/Black top/Pitch/Pucca Road	1259	2.23	23° 8' 31.27"N	88° 0' 31.67"E	Jubika Singh	2/22/2018	5/17/2018	8/14/2018	13-Aug-23	75688.073	
1103/SB2021	AUSHGRAM-2	HARINATHPUR	4	Ajay	Metal/Black top/Pitch/Pucca Road	1P	1.3	23° 36' 27.67"N	87° 33' 31.10"E	PRASENJIT MAHATTAM					0	EC Awaiting
976/SB 2021	KHANDOGHOSH	RAUTARA	110	Damodar	Metal/Black top/Pitch/Pucca Road	2040 P	0.89	23° 0' 3.00"N	87° 43' 33.20"E	Ms Shri Mataji Builders	1/18/2017	1/24/2017	2/15/2017	14-Feb-22	30550.459	
263/SB	BARDH	KHAR	23	Damodar	Metal/Black	637 P, 602 P,	4.07	23° 13'	87° 48'	RITESH SAND	7/19/20	10/4/2	12/7/2	6-Dec-23	138440.3	

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2021	AMAN-1	GESWAR			top/Pitch/Pucca Road	622 P, 631 P, 634 P, 636 P		46.05''N	41.78''E	AND BRICK SUPPLIER	18	018	018		67	
983/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	1204 P AND OTHERS	2.39	23° 12' 9.33''N	87° 52' 33.85''E	SARKAR CONSTRUCTION	9/21/2017	3/12/2020	6/15/2020	14-Jun-25	81192.661	
1055/SB2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	471 P, 472 P AND ORS	3.79	23° 14' 42.00''N	87° 41' 47.29''E	Alam Enterprises					0	EC Awaiting
978/SB 2021	AUSHGRAM-2	MOUKHIRA	1	Ajay	Metal/Black top/Pitch/Pucca Road	4228 P	2.94	23° 36' 29.20''N	87° 32' 48.60''E	Debnath Enterprise	1/18/2017	1/27/2017	2/3/2017	2-Feb-22	102660.55	
990/SB 2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4132, 4133, 4275, 4134 P, 4274 P	3.48	23° 14' 45.60''N	87° 44' 23.00''E	RAJSONS COMMODITIES PVT LTD	3/6/2017	11/29/2017	12/8/2017	7-Dec-22	118211.009	
992/SB 2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4135 P	1.51	23° 14' 48.25''N	87° 44' 2.58''E	BANSHIDHAR CONSTRUCTION PRIVATE LIMITED	10/24/2017	12/19/2017	8/14/2019	13-Aug-24	51467.89	
995/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	391 P AND OTHERS	2.84	23° 12' 24.78''N	87° 52' 14.62''E	HALDER CONDEV PVT LTD	11/27/2017	3/16/2020	6/15/2020	14-Jun-25	96467.89	
998/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	663 P AND OTHERS	2.55	23° 12' 24.82''N	87° 52' 26.45''E	EXCELL MOVERS	9/21/2017	11/8/2017	12/20/2017	19-Dec-22	86697.248	
1001/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Black top/Pitch/Pucca Road	1892 AND ORS	2.74	23° 13' 47.87''N	87° 48' 31.05''E	ARUP KUMAR GHOSH	7/27/2017	8/23/2017	9/14/2017	13-Sep-22	93027.523	
996/SB 2021	AUSHGRAM-2	BANKUL	49	Ajay	Metal/Black top/Pitch/Pucca Road	1 P	1.98	23° 36' 17.86''N	87° 39' 3.79''E	Manish Kr Agarwal	4/6/2017	11/10/2017	12/29/2017	28-Dec-22	90688.073	
1003/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Black top/Pitch/Pucca Road	1903 P AND ORS	2.7	23° 13' 51.16''N	87° 48' 33.14''E	NEW KALIMATA SAND SUPPLY					0	EC Awaiting
957/SB 2021	AUSHGRAM-2	BANKUL	49	Ajay	Metal/Black top/Pitch/Pucca Road	1 P	1.98	23° 36' 18.69''N	87° 39' 16.51''E	Niraj Singhal	4/19/2017	11/8/2017	12/29/2017	28-Dec-22	67293.578	
1004/S	KHAND	KAMA	74	Damodar	Metal/Black	10292 P AND	2.87	23° 13'	87° 48'	Mohan	9/21/20	11/10/	11/15/	14-Nov-	9816.514	

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B2021	OGHOSH	LPUR			top/Pitch/Pucca Road	ORS		30.59''N	43.44''E	Chowdhury	17	2017	2017	22		
1009/SB2021	KHANDOGHOSH	KAMALPUR	74	Damodar	Metal/Blacktop/Pitch/Pucca Road	10292 P ORS	3.01	23° 13' 34.04''N	87° 48' 35.03''E	S G Projects Limited Director Ajay Singh	9/21/2017	11/16/2017	11/22/2017	21-Nov-22	20449.541	
1010/SB2021	AUSHGRAM-2	BALSHINDA	127	Ajay	Metal/Blacktop/Pitch/Pucca Road	1 P, 1097 P	2.83	23° 37' 9.90''N	87° 40' 17.50''E	MS P MUKHERJEE AND CO	3/6/2017	3/16/2017	3/29/2017	28-Mar-22	96192.661	
1016/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Blacktop/Pitch/Pucca Road	911 P AND ORS	4.56	23° 14' 17.28''N	87° 47' 21.13''E	Limelight Dealers Pvt Ltd Director Sri Sajan Kumar Bajaj	10/24/2017	11/13/2017	11/15/2017	14-Nov-22	155091.743	
1021/SB2021	KHANDOGHOSH	NABAGRAM	7	Damodar	Metal/Blacktop/Pitch/Pucca Road	901 P	3.93	23° 14' 21.02''N	87° 40' 47.58''E	Maa Sarbamangala Quality Sand	9/21/2017	9/20/2017	9/21/2017	20-Sep-22	133761.468	
1019/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Blacktop/Pitch/Pucca Road	995 P AND ORS	2.6	23° 14' 12.04''N	87° 47' 33.67''E	Corum Trade And Services	10/24/2017	11/8/2017	11/27/2017	20-Nov-22	88348.624	
1018/SB2021	BARDHAMAN-2	KANTHALGACHI	83	Damodar	Metal/Blacktop/Pitch/Pucca Road	854 P AND OTHERS	2	23° 11' 43.64''N	87° 54' 16.51''E	New Madina Marbel	9/21/2017	5/30/2019	7/10/2019	9-Jul-24	68119.266	
1029/SB2021	KHANDOGHOSH	TILDANGA	66	Damodar	Metal/Blacktop/Pitch/Pucca Road	299 P, 300 P, 301 P AND ORS	1.26	23° 13' 38.77''N	87° 48' 36.57''E	KARTICK CHANDRA GHOSH					0	EC Awaiting
1033/SB2021	AUSHGRAM-2	MALCHA	48	Ajay	Metal/Blacktop/Pitch/Pucca Road	1451 P, 2006 P	2.77	23° 36' 15.30''N	87° 39' 3.00''E	MS P MUKHERJEE AND CO	3/22/2017	8/28/2017	8/28/2017	27-Aug-17	94266.055	
1032/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Blacktop/Pitch/Pucca Road	1552 P, 1551 P AND ORS	4.14	23° 13' 58.26''N	87° 47' 54.18''E	Corum Trade And Services					0	EC Awaiting
1030/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Blacktop/Pitch/Pucca Road	970 P 735 P AND OTHERS	3.59	23° 11' 14.70''N	87° 55' 32.30''E	K NINETY PROP DEAL PVT LTD	4/25/2017	12/13/2017	2/28/2018	23-Feb-23	122201.835	
1036/SB2021	KHANDOGHOS	GAITANPUR	65	Damodar	Metal/Blacktop/Pitch/Pu	1585 P, 1556 P, 1557 AND	4.13	23° 13' 55.44''N	87° 47' 59.69''E	Anupam Panja	12/5/2018	12/21/2018	3/7/2019	6-Mar-24	14036.697	

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	H				cca Road	ORS										
1038/SB2021	BARDHAMAN-2	CHAITPUR	84	Damodar	Metal/Black top/Pitch/Pucca Road	1480 P, 1474 P	2.45	23° 11' 10.53''N	87° 55' 18.64''E	S G Projects Limited Director Ajay Singh	3/22/2017	4/11/2017	1/21/2019	20-Jan-24	83256.881	
1039/SB2021	KHANDOGHOSH	RUPSA	10	Damodar	Metal/Black top/Pitch/Pucca Road	3027 P, 3070 P, 3066 P, 3067 P, 3069 P	3.95	23° 14' 51.09''N	87° 43' 0.78''E	HAQUE INDUSTRIES PRIVATE LIMITED	2/22/2018	2/23/2018	3/8/2018	7-Mar-23	134174.312	
1041/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	2.87	23° 9' 37.53''N	87° 59' 28.32''E	Jubika Singh	2/27/2017	2/21/2017	2/22/2018	21-Feb-23	91926.606	
1043/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832 P	3.81	23° 10' 13.50''N	87° 57' 39.75''E	S G Projects Limited Director Ajay Singh	2/27/2017	3/3/2017	2/28/2018	27-Feb-23	129495.413	
1044/SB2021	KHANDOGHOSH	Atkulla	64	Damodar	Metal/Black top/Pitch/Pucca Road	1328 P, 1318 P, 1388 P, 1289 P, 1339 P AND ORS	1.91	23° 14' 20.46''N	87° 47' 12.91''E	Abhishek Mondal	4/24/2018	10/10/2018	10/31/2018	30-Oct-23	64816.514	
987/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832	3.97	23° 10' 12.47''N	87° 57' 33.98''E	Success Niriyat Pvt Ltd	4/6/2017	4/19/2017	11/22/2017	21-Nov-22	127981.651	
1046/SB2021	KHANDOGHOSH	Atkulla	64	Damodar	Metal/Black top/Pitch/Pucca Road	1332 P, 1333 P,1286 P AND ORS	1.79	23° 14' 17.50''N	87° 47' 12.58''E	Sunil Das	4/24/2018	9/25/2018	11/14/2018	13-Nov-23	60963.303	
1040/SB2021	AUSHGRAM-2	MOUKHIRA	1	Ajay	Metal/Black top/Pitch/Pucca Road	4226P, 4227 P	2.57	23° 36' 28.00''N	87° 33' 24.30''E	MS VARSHA AND CO	1/25/2017	3/7/2017	3/15/2017	14-Mar-17	87247.706	
977/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832P	3.14	23° 10' 4.14''N	87° 58' 12.27''E	TIRUPATI ROADWAYS	2/3/2017	11/10/2017	1/5/2018	4-Jan-23	106651.376	
1047/SB2021	JAMALPUR	Sanchara	19	Damodar	Metal/Black top/Pitch/Pucca Road	1258	2.1	23° 8' 46.21''N	88° 0' 30.87''E	S G Projects Limited Director Ajay	2/2/2017	3/3/2017	3/7/2017	6-Mar-22	71559.633	

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										Singh						
1049/SB2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	1405 P, 1095 P AND OTHERS	2.56	23° 12' 5.16''N	87° 53' 12.74''E	SAYED NEAJUDDIN	7/21/2017	8/16/2017	9/21/2017	20-Sep-22	86972.477	
1050/SB2021	AUSHGRAM-2	MALCHA	48	Ajay	Metal/Black top/Pitch/Pucca Road	201P, 212P, 2061P	2.28	23° 36' 16.10''N	87° 38' 56.30''E	MS VARSHA AND CO	3/6/2017	3/16/2017	3/31/2017	30-Mar-22	77614.679	
1053/SB2021	BARDHAMAN-2	CHAITPUR	84	Damodar	Metal/Black top/Pitch/Pucca Road	1474 P, 1655 P	2.56	23° 11' 18.12''N	87° 55' 22.03''E	S G Projects Limited Director Ajay Singh	3/22/2017	1/9/2019	1/21/2019	20-Jan-24	87110.092	
1052/SB2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1462 P, 1463 P AND ORS	3.32	23° 14' 40.53''N	87° 41' 40.44''E	ASIM KUMAR PANJA					0	EC Awaiting
1058/SB2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1665 P, 1608 P AND ORS	3.64	23° 14' 55.18''N	87° 42' 29.34''E	BIKASH GHOSH					0	EC Awaiting
1060/SB2021	JAMALPUR	Berugram	32	Damodar	Metal/Black top/Pitch/Pucca Road	2103	3	23° 6' 4.62''N	87° 59' 50.06''E	Neha Singh	3/22/2017	3/30/2017	3/7/2017	6-Mar-22	102110.092	
1063/SB2021	AUSHGRAM-2	Purucha	126	Ajay	Metal/Black top/Pitch/Pucca Road	955 P, 967 P	3.37	23° 37' 10.18''N	87° 40' 7.04''E	MS SANTOSH PROMOTERS PVT LTD	2/27/2017	3/3/2017	3/9/2017	8-Mar-22	114633.028	
1064/SB2021	BARDHAMAN-2	BECHARHAT	79	Damodar	Metal/Black top/Pitch/Pucca Road	1614 P, 1615 P AND OTHERS	2.93	23° 12' 29.08''N	87° 52' 10.03''E	SUDARSHAN GUPTA	11/27/2017	12/22/2017	12/28/2017	27-Dec-22	99495.413	
1066/SB2021	JAMALPUR	Sanchara	19	Damodar	Metal/Black top/Pitch/Pucca Road	1259 P	2.02	23° 8' 37.99''N	88° 0' 31.77''E	Mahabat Traders Pvt Ltd					0	EC Awaiting
1069/SB2021	BARDHAMAN-2	DAKSHINGOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832 P	3.76	23° 10' 8.88''N	87° 57' 51.47''E	Success Niriyat Pvt Ltd	4/6/2017	11/8/2017	1/10/2018	9-Jan-23	134862.385	
1070/SB2021	AUSHGRAM-2	HARINATHPUR	4	Ajay	Metal/Black top/Pitch/Pucca Road	1 P, 1170 P	2.87	23° 36' 15.81''N	87° 33' 50.40''E	SK AFJAL RAHAMAN	12/5/2018	3/13/2019	5/21/2019	20-May-23	97568.807	

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1072/SB2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	765 P, 798 P, 799 P, 830, 831 P, 832 P AND ORS	4.88	23° 14' 42.10''N	87° 42' 29.80''E	Goutam Pal					0	EC Awaiting
1076/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	3.01	23° 9' 50.67''N	87° 59' 22.23''E	Maa Durga Coal Traders	7/27/2017	11/3/2017	11/20/2017	19-Nov-22	102385.321	
1075/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Black top/Pitch/Pucca Road	830, 834 P, 835, 838, 840	2.02	23° 14' 1.00''N	87° 47' 57.00''E	MANJUSHREE MONDAL	2/27/2017	4/21/2017	6/16/2017	15-Jun-22	68807.339	
1079/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1	2.75	23° 9' 45.95''N	87° 59' 7.87''E	Ramprosad Ghosh	11/27/2017	5/14/2018	12/29/2018	28-Dec-23	93577.982	
1083/SB2021	JAMALPUR	Sanchara	19	Damodar	Metal/Black top/Pitch/Pucca Road	1258	1.11	23° 8' 58.60''N	88° 0' 26.70''E	A R ENTERPRISE	9/21/2017	11/10/2017	12/11/2017	10-Dec-22	37844.037	
1086/SB2021	KHANDOGHOSH	TILDANGA	66	Damodar	Metal/Black top/Pitch/Pucca Road	313 P, 314 P, 316 P, 319 P, 331 P, 332 P AND 333 P	2.02	23° 13' 35.00''N	87° 48' 42.00''E	SWAPAN SARKAR	3/6/2017	8/3/2016	10/25/2016	24-Oct-21	68807.339	
1087/SB2021	JAMALPUR	Sanchara	19	Damodar	Metal/Black top/Pitch/Pucca Road	1258 P	2.83	23° 8' 56.46''N	88° 0' 33.32''E	Goutam Roy	11/27/2017	9/10/2019	1/10/2020	9-Jan-25	96330.275	
1089/SB2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Black top/Pitch/Pucca Road	1862 P, 1863 P, 1876 TO 1879 P, 1884 P AND ORS	2.02	23° 13' 48.50''N	87° 48' 17.62''E	ANJALI DAS	4/19/2017	8/23/2017	9/15/2017	14-Sep-22	68807.339	
1092/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Black top/Pitch/Pucca Road	351 P, 363 P AND OTHERS	2.02	23° 10' 46.19''N	87° 56' 4.45''E	NARAN BAURI	11/27/2017	1/15/2018	4/11/2018	10-Apr-23	68807.339	
1093/SB2021	AUSHGRAM-2	GERAI	9	Ajay	Metal/Black top/Pitch/Pucca Road	1893 P	0.53	23° 51' 50.57''N	87° 33' 59.92''E	SOMRITH ENTERPRISE					0	EC Awaiting
1095/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Black top/Pitch/Pucca Road	735 P	0.57	23° 11' 5.05''N	87° 55' 41.04''E	Probhat Bauri	9/21/2017	10/16/2017	3/9/2018	8-Mar-23	19541.284	
1099/S	JAMAL	Chalb	5	Damodar	Metal/Black	906 P	2.21	23° 8' 13.50''N	88° 0'	SUDARSHAN	10/24/2	11/10/	11/27/	26-Nov-	75137.61	

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B2021	PUR	alpur			top/Pitch/Pucca Road				13.96"E	GUPTA	017	2019	2019	24	5	
1106/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Blacktop/Pitch/Pucca Road	1832 P	1.21	23° 10' 22.96"N	87° 57' 46.27"E	SUPADA MONDAL	7/27/2017	2/21/2018	3/14/2018	13-Mar-23	68807.339	
1109/SB2021	JAMALPUR	Chalkhanjadi	2	Damodar	Metal/Blacktop/Pitch/Pucca Road	2800 P	3.14	23° 9' 56.65"N	87° 58' 47.57"E	Baidyanath Pal	12/5/2018	3/15/2019	4/8/2019	7-Apr-24	106651.376	
1113/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Blacktop/Pitch/Pucca Road	363 P	2.02	23° 11' 4.73"N	87° 55' 46.68"E	SANTU BAURI	4/19/2017	4/21/2017	4/25/2017	22-Apr-22	68807.339	
1119/SB2021	KALNA-1	Krishnadebpur	91	Bhagirathi-Hooghly	Metal/Blacktop/Pitch/Pucca Road	2251 P AND ORS	1.91	23° 14' 45.07"N	88° 20' 59.85"E	Anjar Hossain Mondal	4/24/2018	4/13/2018	5/7/2018	6-May-23	65091.743	
1121/SB2021	MONGALKOT	Majkhara	1	Ajay	Metal/Blacktop/Pitch/Pucca Road	751 P	1.11	23° 35' 30.24"N	87° 45' 13.03"E	Kolkata Group One Manpower Management Pvt Ltd	1/25/2017	2/22/2017	3/16/2017	15-Mar-22	37706.422	
1122/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Blacktop/Pitch/Pucca Road	1 P	3.26	23° 9' 26.30"N	87° 59' 58.55"E	Rainbow Infrastructure	11/27/2017	12/13/2017	1/18/2018	17-Jan-23	110917.431	
1123/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Blacktop/Pitch/Pucca Road	363 P	2.02	23° 11' 2.81"N	87° 55' 45.37"E	BIJALI BAURI	4/19/2017	4/21/2017	9/8/2017	7-Sep-22	68807.339	
1126/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Blacktop/Pitch/Pucca Road	363 P	2.02	23° 10' 57.70"N	87° 55' 55.70"E	PARAN BAURI	11/27/2017	1/15/2018	4/11/2018	10-Apr-23	68807.339	
1127/SB2021	JAMALPUR	Chalkhanjadi	2	Damodar	Metal/Blacktop/Pitch/Pucca Road	2800	2.83	23° 9' 54.97"N	87° 59' 0.78"E	Rajsons Comodities Trading Pvt Ltd	4/24/2018	5/8/2018	5/16/2018	15-May-23	96330.275	
1129/SB2021	MONGALKOT	Nabagram	60	Ajay	Metal/Blacktop/Pitch/Pucca Road	1071 P	0.82	23° 34' 0.13"N	87° 55' 10.35"E	SK RAHAMAN ENTERPRISE	12/5/2018	12/20/2018	6/11/2019	10-Jan-24	27935.78	
1130/SB2021	BARDHAMAN-	MANIKHATI	158	Damodar	Metal/Blacktop/Pitch/Pu	363 P	2.02	23° 11' 0.88"N	87° 55' 43.52"E	SUKLA BAURI	4/19/2017	4/21/2017	3/6/2017	5-Mar-22	68807.339	

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	2				cca Road											
1132/SB2021	MONGALKOT	Jaykrishnapur	85	Ajay	Metal/Black top/Pitch/Pucca Road	892 P, 1021 P ORS	0.96	23° 36' 4.81"N	87° 56' 54.21"E	RAHIM MALLICK	12/29/2017	1/5/2018	1/9/2018	8-Jan-23	32752.294	
1133/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Black top/Pitch/Pucca Road	735 P	1.44	23° 11' 7.40"N	87° 55' 42.60"E	RAMA BAURI	9/21/2017	10/16/2017	3/9/2018	8-Mar-23	19816.514	
1135/SB2021	JAMALPUR	Chalbalpur	5	Damodar	Metal/Black top/Pitch/Pucca Road	906 P	2.21	23° 8' 19.70"N	88° 0' 21.68"E	Santilata Roy	11/27/2017	5/23/2018	8/30/2018	29-Aug-23	75137.615	
1136/SB2021	KALNA-1	Krishnadebpur	91	Bhagirathi-Hooghly	Metal/Black top/Pitch/Pucca Road	2251 P AND ORS	1.84	23° 14' 40.70"N	88° 21' 3.91"E	Basiruddin Seikh					0	EC Awaiting
1139/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	2.76	23° 9' 40.06"N	87° 59' 35.62"E	S G Projects Limited Director Ajay Singh	2/22/2018	1/7/2019	1/21/2019	20-Jan-24	93715.596	
1140/SB2021	JAMALPUR	Sahhossainpur	39	Damodar	Metal/Black top/Pitch/Pucca Road	1751 P Ors	2.2	23° 1' 6.23"N	87° 57' 40.98"E	Sk Jakir Hossain	10/24/2017	10/31/2017	11/8/2017	7-Nov-22	74724.771	
1142/SB2021	JAMALPUR	Chalkhanjadi	2	Damodar	Metal/Black top/Pitch/Pucca Road	2800	3.94	23° 9' 49.44"N	87° 58' 40.03"E	Ms Mondal Traders	3/26/2018	4/18/2018	4/26/2018	25-Apr-23	134036.697	
1143/SB2021	KETUGRAM-1	NARENGA	54	Ajay	Metal/Black top/Pitch/Pucca Road	147 P, 566 P AND ORS	0.99	23° 37' 57.40"N	87° 57' 42.55"E	Munshi Md Hasanuzzaman	4/24/2018	5/3/2018	5/10/2018	9-May-23	33577.982	
1141/SB2021	KETUGRAM-1	NARENGA	54	Ajay	Metal/Black top/Pitch/Pucca Road	818 P	0.9	23° 37' 56.27"N	87° 57' 38.47"E	VARDHAMAN SALTS PVT LTD	12/5/2018	2/19/2019	3/6/2019	5-Mar-24	30275.229	
1144/SB2021	JAMALPUR	Dadpur	9	Damodar	Metal/Black top/Pitch/Pucca Road	442 P	0.66	23° 7' 14.93"N	87° 59' 17.59"E	SAYED NEAJUDDIN					0	EC Awaiting
1138/SB2021	KETUGRAM-2	Begunkola	121	Ajay	Metal/Black top/Pitch/Pucca Road	753 P	0.83	23° 39' 32.93"N	88° 7' 9.58"E	KALU ROY ENTERPRISE	3/22/2017	3/24/2017	4/4/2017	3-Apr-22	28211.009	
1152/SB2021	JAMALPUR	Dadpur	9	Damodar	Metal/Black top/Pitch/Pu	443 P	0.72	23° 6' 50.83"N	87° 59' 31.84"E	Kamal Kr Ghosh					0	EC Awaiting

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					cca Road											
1155/SB2021	JAMALPUR	Selimabad	30	Damodar	Metal/Black top/Pitch/Pucca Road	953 P	1.89	23° 4' 59.75"N	87° 59' 25.03"E	SK Islam Hossen					0	EC Awaiting
1182/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	3.51	23° 9' 31.90"N	87° 59' 51.09"E	Rainbow Infrastructure					0	EC Awaiting
1185/SB2021	KATWA-1	SAHAPUR	2	Ajay	Metal/Black top/Pitch/Pucca Road	947 P	1.98	23° 38' 57.60"N	88° 4' 31.46"E	Upen Pandit	3/26/2018	10/4/2018	11/1/2018	31-Oct-23	27247.706	
1147/SB2021	KETUGRAM-1	NARENGA	54	Ajay	Metal/Black top/Pitch/Pucca Road	147 P, 818 P	1.02	23° 37' 53.93"N	87° 57' 41.82"E	Amirul Islam	12/5/2018	8/8/2019	9/27/2019	26-Sep-24	34678.899	
1149/SB2021	KETUGRAM-1	NARENGA	54	Ajay	Metal/Black top/Pitch/Pucca Road	147 P, 535 P	0.91	23° 37' 58.78"N	87° 57' 36.40"E	Gora Chand Ghosh	7/19/2018	6/12/2018	6/13/2018	12-Jun-23	30963.303	
1150/SB2021	JAMALPUR	Kansra	44	Damodar	Metal/Black top/Pitch/Pucca Road	1345 P	1.74	23° 3' 7.06"N	87° 58' 49.58"E	Soumitra Adhikary					0	EC Awaiting
1153/SB2021	KATWA-1	CHURPUNI	3	Ajay	Metal/Black top/Pitch/Pucca Road	498 P	3.96	23° 38' 34.52"N	88° 2' 39.81"E	Faujder Choudhuri	3/6/2017	11/23/2017	12/27/2017	26-Dec-22	134724.771	
1158/SB2021	JAMALPUR	Haibatpur	4	Damodar	Metal/Black top/Pitch/Pucca Road	819 P	0.92	23° 9' 10.45"N	88° 0' 23.22"E	Santilata Roy					0	EC Awaiting
1156/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 38.18"N	87° 57' 21.82"E	BAKUL DAS	9/21/2017	11/23/2017	4/10/2018	9-Apr-23	68807.339	
1162/SB2021	JAMALPUR	Selimabad	30	Damodar	Metal/Black top/Pitch/Pucca Road	952 P Ors	2.18	23° 5' 3.80"N	87° 59' 25.84"E	Maa Durga Coal Traders					0	EC Awaiting
1163/SB2021	KATWA-1	SUNEA	1	Ajay	Metal/Black top/Pitch/Pucca Road	1010 P, 1011 P	4.01	23° 38' 57.92"N	88° 4' 40.87"E	Ainal Haque	3/22/2017	6/2/2017	1/8/2017	7-Jan-22	136513.761	
1164/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 27.14"N	87° 56' 41.80"E	SUKLA BAURI	9/21/2017	10/16/2017	2/22/2018	21-Feb-23	68807.339	

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1190/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 21.48''N	87° 56' 38.73''E	PINTU BAURI	9/21/2017	10/16/2017	10/30/2017	29-Oct-22	68807.339	
1166/SB2021	JAMALPUR	Kansra	44	Damodar	Metal/Black top/Pitch/Pucca Road	1345 P	1.74	23° 2' 56.43''N	87° 58' 51.49''E	Basudev Majhi					0	EC Awaiting
1169/SB2021	KATWA-1	GOAI	15	Ajay	Metal/Black top/Pitch/Pucca Road	1 P	2.74	23° 39' 36.39''N	88° 6' 38.92''E	Sabina Nasrin	3/22/2017	5/17/2017	5/17/2017	16-May-22	93027.523	
1173/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 26.50''N	87° 56' 30.50''E	MANJU DHARA	1/18/2017	3/17/2017	3/21/2017	20-Mar-22	68807.339	
1175/SB2021	KATWA-1	Sunea	1	Ajay	Metal/Black top/Pitch/Pucca Road	511 P	0.92	23° 39' 43.10''N	88° 5' 31.67''E	KALU ROY ENTERPRISE	3/22/2017	5/17/2017	5/17/2017	16-May-22	93027.523	
1179/SB2021	KATWA-1	SAHAPUR	2	Ajay	Metal/Black top/Pitch/Pucca Road	947 P	1.31	23° 97' 7.72''N	88° 3' 48.23''E	Rafik Sekh	9/21/2017	10/23/2017	10/25/2017	24-Oct-22	44587.156	
1186/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 31.00''N	87° 56' 32.95''E	Probhat Bauri	4/19/2017	4/21/2017	4/25/2017	24-Apr-22	68807.339	
1187/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 33.05''N	87° 56' 29.05''E	RAMA BAURI	4/19/2017	4/21/2017	8/8/2017	7-Aug-22	68807.339	
1908/SB2021	BARDHAMAN-2	Becharhat	79	Damodar	Metal/Black top/Pitch/Pucca Road	1632 P, 1620 P	2.74	23° 12' 19.46''N	87° 51' 57.36''E						0	
1198/SB2021	MEMARI-1	Chanchai	46	Damodar	Metal/Black top/Pitch/Pucca Road	566 P AND 565 P	1.83	23° 9' 25.84''N	88° 0' 13.80''E	Sri Ramen Sain	2/3/2017	2/15/2017	2/16/2017	15-Feb-22	62339.45	
1202/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Black top/Pitch/Pucca Road	351P, 363 P	2.02	23° 10' 46.19''N	87° 56' 4.44''E	SANJOY BAG	11/27/2017	1/15/2018	4/11/2018	10-Apr-23	68807.339	
1247/SB2021	MEMARI-1	Palla	45	Damodar	Metal/Black top/Pitch/Pucca Road	4005 P AND ORS	2.17	23° 9' 40.63''N	88° 0' 0.24''E	Santilata Roy					0	EC Awaiting
1906/S	BARDH	Becha	79	Damodar	Metal/Black	1632 P, 1620	2.65	23° 12'	87° 51'						0	

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B2021	AMAN-2	rhat			top/Pitch/Pucca Road	P		10.86''N	53.29''E							
1227/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	2.97	23° 9' 37.25''N	87° 59' 41.43''E	Birjunath Hansda					0	EC Awaiting
1232/SB2021	JAMALPUR	Sanchara	19	Damodar	Metal/Black top/Pitch/Pucca Road	1258 P Ors	1	23° 8' 49.25''N	88° 0' 34.09''E	Uttam Roy					0	EC Awaiting
1292/SB2021	JAMALPUR	Chalbalpur	6	Damodar	Metal/Black top/Pitch/Pucca Road	905 P	2.43	23° 8' 37.47''N	88° 0' 18.04''E	Sri Lachman Shaw	3/6/2017	8/10/2017	8/25/2017	24-Aug-22	82568.807	
1226/SB2021	MEMARI-1	Chanchai	46	Damodar	Metal/Black top/Pitch/Pucca Road	529 P, 521 P, 566 P	2.16	23° 9' 11.70''N	88° 0' 28.50''E	SOMESWAR THAKUR	1/18/2017	1/25/2017	2/3/2017	2-Feb-22	73348.624	
1236/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1	2.78	23° 9' 53.47''N	87° 59' 5.75''E	Quantam Sales	11/27/2017	12/10/2018	12/29/2018	28-Dec-23	94403.67	
1210/SB2021	BARDHAMAN-2	BECHARHAT	79	Damodar	Metal/Black top/Pitch/Pucca Road	1560 P, 1554 P	1.01	23° 12' 40.64''N	87° 51' 22.57''E	Raja Ghosh	6/21/2017	7/13/2017	11/16/2017	15-Nov-22	34403.67	
1238/SB2021	MEMARI-1	PALLA	45	Damodar	Metal/Black top/Pitch/Pucca Road	4020 P, 4027, 4028, 4029, 4030 P, 4031 P, 4037 P, 4039 P	1.47	23° 9' 47.20''N	87° 59' 43.25''E	Chandan Garai					0	EC Awaiting
1242/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832 P	2.02	23° 10' 3.00''N	87° 57' 58.00''E	PURNIMA POREL	6/21/2017	2/19/2018	3/14/2018	13-Jun-23	68807.339	
1244/SB2021	MEMARI-1	Palla	45	Damodar	Metal/Black top/Pitch/Pucca Road	4031 P, 4037 P, 4038 P, 4039 P, 4049 P, 4097 P, 4098 P	2.05	23° 9' 44.82''N	87° 59' 48.88''E	Maa Durga Coal Traders					0	EC Awaiting
1235/SB2021	MEMARI-1	Chanchai	46	Damodar	Metal/Black top/Pitch/Pucca Road	565, 566, 529 P	1.77	23° 9' 16.01''N	88° 0' 23.90''E	Sumeswar Thakur	1/18/2017	1/25/2017	2/3/2017	2-Feb-22	73348.624	

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1249/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1 P	3.25	23° 9' 28.90"N	87° 59' 54.50"E	Triumph Sales Service	11/27/2017	1/16/2018	2/2/2018	1-Feb-23	110504.587	
1256/SB2021	MEMARI-1	PALLA	46	Damodar	Metal/Black top/Pitch/Pucca Road	495 P, 496 P, 518 P	1.02	23° 9' 29.40"N	88° 0' 4.62"E	SHRI SOUMEN BASU	3/6/2017	5/23/2017	5/31/2017	30-May-22	34816.514	
1319/SB2021	MONGALKOT	Jhilera	36	Ajay	Metal/Black top/Pitch/Pucca Road	1369 P	1.19	23° 34' 10.35"N	87° 50' 11.10"E	Subrata Dey	1/25/2017	3/6/2017	5/11/2017	10-May-22	40596.33	
1287/SB2021	MEMARI-1	PALLA	45	Damodar	Metal/Black top/Pitch/Pucca Road	4033 P, 4035 P, 4115 P	0.81	23° 9' 34.70"N	88° 0' 1.30"E	SHRI SOUMEN BASU	2/27/2017	5/23/2017	5/31/2017	30-May-22	27522.936	
743/SB2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2047 P	3.56	23° 15' 14.80"N	87° 42' 15.78"E	Variety Vyapaar Pvt Ltd					0	EC Awaiting
1926/SB2021	BARDHAMAN-2	Manikhati	158	Damodar	Metal/Black top/Pitch/Pucca Road	363 P,	4.05	23° 10' 42.86"N	87° 55' 50.25"E						0	
1396/SB2021	MONGALKOT	Shyambazar	99	Ajay	Metal/Black top/Pitch/Pucca Road	906 P	4.01	23° 38' 25.20"N	88° 1' 44.25"E	Binoy Dhara	3/22/2017	3/25/2017	5/2/2017	1-May-22	136238.532	
1398/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Black top/Pitch/Pucca Road	735 P, 975 P AND OTHERS	3.48	23° 11' 9.90"N	87° 55' 38.91"E	K NINETY PROP DEAL PVT LTD					0	EC Awaiting
1387/SB2021	MONGALKOT	KANKORA	84	Ajay	Metal/Black top/Pitch/Pucca Road	967 P	1.47	23° 35' 30.89"N	87° 56' 9.19"E	Pradip Arora	5/16/2017	12/4/2018	1/1/2019	31-Dec-23	122064.22	
1402/SB2021	MONGALKOT	Halimpur	61	Ajay	Metal/Black top/Pitch/Pucca Road	331 P, 300 P And Ors	2.36	23° 33' 38.25"N	87° 54' 48.82"E	RAHIM MALLICK	12/28/2017	1/5/2018	1/9/2018	8-Jan-23	173009.45	
1392/SB2021	MONGALKOT	Uttar Banpara	98	Ajay	Metal/Black top/Pitch/Pucca Road	1026 P	3.47	23° 38' 15.95"N	88° 0' 41.94"E	Arsed Ali Sekh	2/22/2018	2/26/2018	3/9/2018	8-Mar-23	118073.394	
1336/SB2021	MONGALKOT	Taldanga	34	Ajay	Metal/Black top/Pitch/Pucca Road	714 P, 809 P, 812 P	1.47	23° 33' 58.30"N	87° 49' 0.81"E	Pradip Arora	5/16/2017	11/26/2018	12/18/2018	17-Dec-23	20229.358	
1339/S	MONG	KONA	96	Ajay	Metal/Black	1256 P AND	2.53	23° 37'	87° 58'	Manirul	12/29/2	2/1/20	2/5/20	4-Feb-23	85871.56	

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B2021	ALKOT	RPUR			top/Pitch/Pucca Road	ORS		57.03''N	38.94''E	Mondal	017	18	18			
1342/SB2021	MONGALKOT	Uttar Banpara	87	Ajay	Metal/Black top/Pitch/Pucca Road	810 P, 818 P, 1 P Ors	1.92	23° 37' 30.98''N	87° 57' 18.50''E	GS Trading Supplier Pvt Ltd	12/29/2017	3/22/2018	3/29/2018	28-Mar-23	65366.972	
1358/SB2021	GALSI-2	Gohogram	70	Damodar	Metal/Black top/Pitch/Pucca Road	6001 P	3.37	23° 14' 39.74''N	87° 37' 44.01''E	Ashok Kumar					0	EC Awaiting
1351/SB2021	MONGALKOT	Kowarpur	96	Ajay	Metal/Black top/Pitch/Pucca Road	1256 P Ors	3.22	23° 38' 20.59''N	87° 58' 59.24''E	Five Star Stevedores Pvt Ltd	7/19/2018	6/15/2018	10/26/2018	25-Oct-23	109541.284	
1193/SB2021	BARDHAMAN-2	BECHARHAT	79	Damodar	Metal/Black top/Pitch/Pucca Road	1632 P	2.02	23° 12' 17.07''N	87° 51' 17.12''E	ATANU KUMAR GANGULY	3/22/2017	4/26/2017	5/3/2017	2-May-22	68807.339	
1356/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Black top/Pitch/Pucca Road	363 P	2.02	23° 10' 48.58''N	87° 55' 55.60''E	Sayed Neajuddin	6/21/2017	7/24/2017	7/25/2017	24-Jul-22	68807.339	
1365/SB2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	1427 P AND OTHERS	2.44	23° 12' 6.98''N	87° 53' 25.30''E	Lokenath Estates Pvt Ltd					0	EC Awaiting
457/SB2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	3.63	23° 15' 8.32''N	87° 43' 39.03''E	Smt Anita Barman	1/25/2017	2/9/2017	2/15/2017	14-Feb-22	123165.138	
1368/SB2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	463 P AND OTHERS	2.45	23° 12' 12.90''N	87° 52' 35.30''E	Lokenath Estates Pvt Ltd					0	EC Awaiting
1369/SB2021	JAMALPUR	Kansra	44	Damodar	Metal/Black top/Pitch/Pucca Road	1345 P	0.61	23° 3' 8.15''N	87° 58' 54.72''E	SUBRATA CHAKRABORTY	2/27/2017	3/31/2017	4/17/2017	16-Apr-22	20642.202	
1372/SB2021	BARDHAMAN-1	Bangpur	32	Damodar	Metal/Black top/Pitch/Pucca Road	1859 P ORS	3.22	23° 12' 52.34''N	87° 50' 12.99''E	Sanjay Bhakat					0	EC Awaiting
1373/SB2021	BARDHAMAN-2	KALINAGAR	160	Damodar	Metal/Black top/Pitch/Pucca Road	181 P	2.13	23° 10' 15.85''N	87° 57' 11.65''E	G S INDUSTRIES					0	EC Awaiting
1375/SB2021	JAMALPUR	Berugram	32	Damodar	Metal/Black top/Pitch/Pu	2103 P	1.01	23° 6' 18.05''N	87° 59' 51.10''E	SK SAJAHAN	9/21/2017	10/26/2017	11/15/2017	14-Nov-22	34403.67	

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					cca Road											
1376/SB2021	BARDHAMAN-1	Mirchoba	33	Damodar	Metal/Black top/Pitch/Pucca Road	543 P ORS	2.24	23° 12' 42.14"N	87° 51' 12.91"E	Raja Ghosh					0	EC Awaiting
1560/SB2021	BARDHAMAN-2	Jafrabad	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P, 377 P	3.1	23° 10' 28.60"N	87° 56' 54.78"E	SAYED NEAJUDDIN					0	EC Awaiting
1379/SB2021	BARDHAMAN-1	Bangpur	32	Damodar	Metal/Black top/Pitch/Pucca Road	1704 P ORS	2.19	23° 12' 54.73"N	87° 50' 20.22"E	Manirul Mondal					0	EC Awaiting
1381/SB2021	BARDHAMAN-1	Bangpur	32	Damodar	Metal/Black top/Pitch/Pucca Road	1887 P ORS	2.44	23° 12' 53.78"N	87° 50' 8.42"E	Shib Narayan Show					0	EC Awaiting
1385/SB2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	1375 P	2.23	23° 12' 3.18"N	87° 53' 18.28"E	SUDARSHAN GUPTA					0	EC Awaiting
1390/SB2021	BARDHAMAN-2	CHAITPUR	84	Damodar	Metal/Black top/Pitch/Pucca Road	1157	2.15	23° 11' 16.69"N	87° 55' 14.45"E	S G Projects Limited Director Ajay Singh					0	EC Awaiting
1404/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832 P	3.29	23° 10' 7.11"N	87° 57' 59.34"E	PAWAN ARORA					0	EC Awaiting
1428/SB2021	MONGALKOT	Bakulia	83	Ajay	Metal/Black top/Pitch/Pucca Road	1003 P	2.56	23° 35' 1.40"N	87° 55' 52.80"E	Ashok Kr Saha	1/18/2017	2/11/2017	2/20/2017	19-Feb-22	86972.477	
1431/SB2021	MONGALKOT	Paschim Nabagram	2	Ajay	Metal/Black top/Pitch/Pucca Road	479 P	1.27	23° 35' 2.42"N	87° 46' 47.49"E	Tapan Kr Saha	9/21/2017	10/23/2017	12/15/2017	14-Dec-22	43348.624	
1444/SB2021	MONGALKOT	Sagira	56	Ajay	Metal/Black top/Pitch/Pucca Road	839 P AND ORS	2.31	23° 33' 30.47"N	87° 53' 20.18"E	Ankur Biochem Pvt Ltd	9/21/2017	12/1/2017	12/12/2017	11-Dec-22	78577.982	
1451/SB2021	MONGALKOT	Puratan Kurgr	55	Ajay	Metal/Black top/Pitch/Pucca Road	230 P,231 P, 184 P	2.82	23° 33' 24.06"N	87° 52' 26.66"E	Group One	1/25/2017	2/6/2017	2/14/2017	13-Feb-22	95779.817	

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		am														
1527/SB2021	MONGALKOT	Madhpur	86	Ajay	Metal/Black top/Pitch/Pucca Road	1416 P	1.21	23° 36' 40.75''N	87° 57' 3.40''E	Manirul Mondal					0	EC Awaiting
1531/SB2021	MONGALKOT	Maliara	89	Ajay	Metal/Black top/Pitch/Pucca Road	1091 P	2	23° 37' 45.82''N	87° 58' 3.18''E	Jiaur Rahaman					0	EC Awaiting
1530/SB2021	MONGALKOT	Kogram	58	Ajay	Metal/Black top/Pitch/Pucca Road	380 P ORS	0.87	23° 32' 26.71''N	87° 53' 53.84''E	Papia Enterprise					0	EC Awaiting
1533/SB2021	MONGALKOT	Maliara	89	Ajay	Metal/Black top/Pitch/Pucca Road	1091 P	1.92	23° 37' 43.62''N	87° 58' 2.69''E	Munshi Hardwear					0	EC Awaiting
1467/SB2021	MONGALKOT	Shyambazar	99	Ajay	Metal/Black top/Pitch/Pucca Road	906 P	2.16	23° 38' 20.75''N	88° 1' 19.17''E	Nazmul Haque	3/22/2017	3/30/2017	5/2/2017	1-May-22	73486.239	
1535/SB2021	MONGALKOT	NATUNHAT	59	Ajay	Metal/Black top/Pitch/Pucca Road	369 P, 1276 P, 391 P, 23 P, 24 P AND ORS	2.91	23° 32' 54.29''N	87° 54' 35.79''E	ISRAIL SK	3/26/2018	4/6/2018	4/12/2018	11-Apr-23	98807.339	
1539/SB2021	BARDHAMAN-2	Chaitpur	84	Damodar	Metal/Black top/Pitch/Pucca Road	1475 P, 1477 P, 1479 P, 1480 P	2.72	23° 11' 26.11''N	87° 55' 1.57''E	Anil Adhikari					0	EC Awaiting
1528/SB2021	MONGALKOT	Keotsa	88	Ajay	Metal/Black top/Pitch/Pucca Road	444P, 445 P, 662 P	3	23° 37' 50.45''N	87° 57' 34.03''E	Munshi Md Hasanuzzaman					0	EC Awaiting
1561/SB2021	BARDHAMAN-2	Becharhat	79	Damodar	Metal/Black top/Pitch/Pucca Road	1632 P,1620 P	3.38	23° 12' 18.15''N	87° 52' 9.03''E	Prasanta Kr Hait					0	EC Awaiting
1536/SB2021	MONGALKOT	Sagira	56	Ajay	Metal/Black top/Pitch/Pucca Road	841 P, 842 P, 857 P	1.19	23° 33' 30.03''N	87° 53' 21.68''E	Ashok Kr Saha					0	EC Awaiting
1557/SB2021	BARDHAMAN-2	Chaitpur	84	Damodar	Metal/Black top/Pitch/Pucca Road	1481 P, 1531 AND ORS	3.86	23° 11' 33.50''N	87° 54' 46.32''E	MS Sabina Yesmin Begum					0	EC Awaiting
1558/SB2021	MONGALKOT	Kogram	58	Ajay	Metal/Black top/Pitch/Pucca Road	284 P, 285 P AND ORS	3.4	23° 32' 49.90''N	87° 53' 35.90''E	Ashok Kr Saha					0	EC Awaiting

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1559/SB2021	BARDHAMAN-2	Chaitpur	84	Damodar	Metal/Black top/Pitch/Pucca Road	1520 P, 1521 P, 1518 P AND ORS	4.04	23° 11' 35.28''N	87° 54' 39.56''E	MS Sayed Samad Hossain					0	EC Awaiting
1562/SB2021	BARDHAMAN-2	Becharhat	79	Damodar	Metal/Black top/Pitch/Pucca Road	1632 P, 1620 P	2.86	23° 12' 18.65''N	87° 52' 4.62''E	Matiar Rahaman					0	EC Awaiting
1564/SB2021	BARDHAMAN-2	Jafrabad	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.08	23° 10' 25.69''N	87° 56' 58.30''E	Ms Mondal Traders					0	EC Awaiting
1565/SB2021	BARDHAMAN-2	Dakshin Gopalpur	165	Damodar	Metal/Black top/Pitch/Pucca Road	2019 P	2.03	23° 10' 7.36''N	87° 57' 59.53''E	G S INDUSTRIES					0	EC Awaiting
1568/SB2021	BARDHAMAN-2	Becharhat	79	Damodar	Metal/Black top/Pitch/Pucca Road	1632 P AND ORS	3.19	23° 12' 18.56''N	87° 52' 5.15''E	Achinta KUMAR Hait					0	EC Awaiting
1577/SB2021	BARDHAMAN-2	Kalinagar	160	Damodar	Metal/Black top/Pitch/Pucca Road	181 P, 205 P	2.44	23° 10' 21.51''N	87° 57' 11.71''E	Himansu Santra					0	EC Awaiting
1579/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Black top/Pitch/Pucca Road	1832 P	1.21	23° 9' 56.41''N	87° 58' 7.71''E	PROMILA DHALI	3/22/2017	8/3/2017	8/3/2017	2-Aug-22	41284.404	
1580/SB2021	BARDHAMAN-2	Hatsimul	81	Damodar	Metal/Black top/Pitch/Pucca Road	993 P AND ORS	2.41	23° 12' 2.15''N	87° 53' 4.63''E	EXCELL MOVERS	9/21/2017	7/10/2021	8/2/2021	1-Aug-26	82018.349	
954/SB2021	KHANDOGHOSH	RUPSA	10	Damodar	Metal/Black top/Pitch/Pucca Road	3001 P	2.99	23° 15' 13.16''N	87° 42' 46.98''E	MAA LAXMI ENTERPRISE	1/18/2017	3/24/2017	4/3/2017	2-Apr-22	101834.862	
909/SB2021	RAINA-2	Eklakshi	135	Darakeswar	Metal/Black top/Pitch/Pucca Road	21 P	1.21	22° 59' 49.14''N	87° 43' 40.29''E	ABANTI GHOSH	11/27/2017	7/3/2013	12/1/2017	30-Nov-22	41284.404	
1393/SB2021	GALSI-2	JUJUTI	158	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	2.02	23° 14' 57.69''N	87° 43' 46.19''E	ASIM KUMAR PANJA	6/21/2017	7/31/2017	11/14/2017	13-Nov-22	68807.339	
1110/SB2021	GALSI-2	MERUAL	159	Damodar	Metal/Black top/Pitch/Pu	3043 P, 3055 P, 3060 P	2.02	23° 14' 41.54''N	87° 45' 7.23''E	ASIM KUMAR PANJA	6/21/2017	7/13/2017	11/11/2017	10-Nov-22	68807.339	

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1394/SB2021	GALSI-2	JUJUTI	158	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	2.02	23° 14' 57.49''N	87° 43' 51.11''E	SHYAMALI PANJA	6/21/2017	7/13/2017	11/20/2017	19-Nov-22	68807.339	
1104/SB2021	GALSI-2	MERUAL	159	Damodar	Metal/Black top/Pitch/Pucca Road	3040 P, 3043 P, 2801 P AND ORS	4.05	23° 14' 38.45''N	87° 45' 16.34''E	SHYAMALI PANJA	6/15/2017	7/31/2017	11/21/2017	20-Nov-22	137614.679	
603/SB2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2151 P AND ORS	3.45	23° 15' 11.06''N	87° 42' 49.11''E	Golden Enterprise	12/5/2018	12/29/2019	2/19/2020	18-Feb-25	117385.321	
602/SB2021	GALSI-2	D BHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	439 P AND ORS	3.35	23° 14' 44.77''N	87° 39' 46.89''E	Katyani Contractor Pvt	2/22/2018	5/7/2019	5/10/2019	9-May-24	113944.954	
1348/SB2021	GALSI-2	Gohogram	70	Damodar	Metal/Black top/Pitch/Pucca Road	6001 P	3.66	23° 14' 39.07''N	87° 37' 38.80''E	TENI YADAV	1/18/2017	1/25/2017	2/3/2017	2-Feb-22	124541.284	
1278/SB2021	MEMARI-1	PALLA	45	Damodar	Metal/Black top/Pitch/Pucca Road	4115 P	0.81	23° 9' 31.13''N	88° 0' 2.21''E	SAYED NEAJUDDIN	9/21/2017	3/21/2018	4/5/2018	4-Apr-23	27522.936	
1493/SB2021	JAMALPUR	DADPUR	09	Damodar	Metal/Black top/Pitch/Pucca Road	442 P	1.21	23° 1' 5.79''N	87° 57' 40.92''E	ABDUL RAFIQ	1/18/2017	7/26/2016	10/27/2016	26-Oct-21	41284.404	
1909/SB2021	MONGALKOT	KONARPUR	96	Ajay	Metal/Black top/Pitch/Pucca Road	1784 P, 1313 P AND ORS	2.26	23° 38' 25.02''N	87° 59' 11.98''E						0	
1209/SB2021	MONGALKOT	MAJHKHANRA	1	Ajay	Metal/Black top/Pitch/Pucca Road	672 P, 4777 P	0.84	23° 35' 36.84''N	87° 44' 38.53''E	Group One					0	EC Awaiting
1384/SB2021	JAMALPUR	Dadpur	9	Damodar	Metal/Black top/Pitch/Pucca Road	442 P	0.81	23° 7' 9.23''N	87° 59' 23.80''E	SAYED MOMINUDDIN	1/18/2017	5/19/2017	5/22/2017	21-May-22	27522.936	
1811/SB2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	384 P , 385 P AND OTHERS	2.86	23° 12' 28.28''N	87° 52' 15.01''E	GHOSH INSFRASTRUCTURE PVT LTD	2/22/2018	2/25/2021	6/18/2021	17-Jun-26	97155.963	
1442/SB2021	GALSI-2	GOPALPUR	87	Damodar	Metal/Black top/Pitch/Pucca Road	321 P	4.93	23° 15' 0.53''N	87° 41' 28.55''E	ASIM KUMAR PANJA					0	EC Awaiting

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1945/SB2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	1174 P, 1175 P 1660 ORS	3.23	23° 11' 58.24''N	87° 53' 41.84''E						0	
1949/SB2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4102P, 4103P, 4163 P ORS	4.2	23° 14' 45.44''N	87° 43' 43.11''E						0	
1951/SB2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4134 P, 4274 P, 4279 P	4.49	23° 14' 53.79''N	87° 44' 10.44''E						0	
1952/SB2021	KHANDOGHOSH	ATKULYA	64	Damodar	Metal/Black top/Pitch/Pucca Road	1264P, 1263P, 1262P ORS	4.49	23° 14' 25.89''N	87° 47' 7.67''E						0	
1953/SB2021	KHANDOGHOSH	ATKULYA	64	Damodar	Metal/Black top/Pitch/Pucca Road	1234P, 1208P, 1223 P, 1222P, 1227 ORS	4.96	23° 14' 28.08''N	87° 46' 59.74''E						0	
1954/SB2021	KHANDOGHOSH	ATKULYA	64	Damodar	No Approach Road	1158 , 1159 ORS	4.94	23° 14' 31.73''N	87° 46' 49.64''E						0	
1955/SB2021	KHANDOGHOSH	RUPSA	10	Damodar	Metal/Black top/Pitch/Pucca Road	3032 P, 3003 P AND ORS	4.99	23° 14' 54.01''N	87° 42' 41.45''E						0	
1956/SB2021	KHANDOGHOSH	RUPSA	10	Damodar	Metal/Black top/Pitch/Pucca Road	3029P, 3039P, AND ORS	4.61	23° 14' 52.71''N	87° 42' 49.29''E						0	
1957/SB2021	KHANDOGHOSH	RUPSA	10	Damodar	Metal/Black top/Pitch/Pucca Road	3014P, 3017P AND ORS	4.65	23° 15' 2.50''N	87° 42' 53.64''E						0	
1894/SB2021	BARDHAMAN-1	Idilpur	24	Damodar	Metal/Black top/Pitch/Pucca Road	1441 P, 1450 P, 1465 P AND ORS	3.99	23° 13' 27.60''N	87° 49' 16.47''E						0	
1896/SB2021	BARDHAMAN-1	Idilpur	24	Damodar	Metal/Black top/Pitch/Pucca Road	1601 P, 1595 P, 1592 P AND ORS	3.28	23° 13' 20.06''N	87° 49' 32.12''E						0	
1897/SB2021	BARDHAMAN-1	Idilpur	24	Damodar	Metal/Black top/Pitch/Pucca Road	1464 P, 1478 P, 1471 AND ORS	4.85	23° 13' 26.00''N	87° 49' 22.39''E						0	

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1899/SB2021	RAINA-2	Naratambati	136	Darakeswar	Metal/Blacktop/Pitch/Pucca Road	2173 P, 2502 P	1.15	22° 59' 2.59"N	87° 44' 28.49"E						0	
348/SB2021	RAINA-2	BABLA	137	Darakeswar	Metal/Blacktop/Pitch/Pucca Road	1791 P	3.37	22° 57' 43.52"N	87° 45' 7.34"E						0	
1900/SB2021	RAINA-2	NARATAMBATI	136	Darakeswar	Metal/Blacktop/Pitch/Pucca Road	2502 P	3.16	22° 58' 9.09"N	87° 44' 37.72"E						0	
1903/SB2021	RAINA-2	Maniwari	138	Darakeswar	Metal/Blacktop/Pitch/Pucca Road	334 P	1.77	22° 57' 45.90"N	87° 45' 50.51"E						0	
1912/SB2021	BARDHAMAN-2	Srirampur	80	Damodar	Metal/Blacktop/Pitch/Pucca Road	1199 P, 392 P, 393 P, 394 P, 395 P, 396, 397, 398 P, 399 P, 400 P, 1204 P, 505 P, 506 P, 507 P	2.4	23° 12' 11.44"N	87° 52' 13.29"E						0	
1913/SB2021	RAINA-2	BARABAINAN	195	Mundeswari	Metal/Blacktop/Pitch/Pucca Road	7413 P, 7467 P, 7468 P, 7469 P	2.66	22° 59' 21.02"N	87° 56' 50.02"E						0	
1919/SB2021	AUSHGRAM-2	Malcha	48	Ajay	Metal/Blacktop/Pitch/Pucca Road	50 P, 4 P	1.85	23° 36' 29.53"N	87° 37' 47.19"E						0	
1920/SB2021	AUSHGRAM-2	Malcha	48	Ajay	Metal/Blacktop/Pitch/Pucca Road	3 P, 4 P, 2060 P	3.97	23° 36' 27.23"N	87° 38' 2.59"E						0	
1922/SB2021	BARDHAMAN-2	KATHALGACHI	83	Damodar	Metal/Blacktop/Pitch/Pucca Road	847 P, 846 P	2.65	23° 11' 58.37"N	87° 54' 3.45"E						0	
1923/SB2021	RAINA-2	Narasinhapur	206	Mundeswari	Metal/Blacktop/Pitch/Pucca Road	380 P	2.07	22° 58' 49.29"N	87° 56' 35.44"E						0	
1925/SB2021	MONGALKOT	Taldanga	34	Ajay	Metal/Blacktop/Pitch/Pucca Road	350 P, 351 P, 352 P, 349 P, 353, 776 P,	2.72	23° 33' 53.78"N	87° 48' 55.49"E						0	

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						358, 354 P, 359 P, 366 p										
1928/SB2021	MONGALKOT	Kherua	97	Ajay	Metal/Black top/Pitch/Pucca Road	827 P, 138, 140, 139, 32, 609, 612, 245 P	3.15	23° 38' 2.09"N	87° 59' 50.90"E						0	
1929/SB2021	BARDHAMAN-2	CHAITPUR	84	Damodar	Metal/Black top/Pitch/Pucca Road	1480 P	2.87	23° 11' 35.30"N	87° 54' 23.02"E						0	
1931/SB2021	BARDHAMAN-2	CHAITPUR	84	Damodar	Metal/Black top/Pitch/Pucca Road	1480 P, 1521 AND ORS	2.49	23° 11' 32.57"N	87° 54' 31.30"E						0	
1932/SB2021	MONGALKOT	Dhanyarukhi	100	Ajay	Metal/Black top/Pitch/Pucca Road	1581 P	3.14	23° 38' 1.26"N	88° 2' 11.09"E						0	
1933/SB2021	KHANDOGHOSH	Gaitanpur	65	Damodar	Metal/Black top/Pitch/Pucca Road	1509 P, 1511 P AND ORS	4.2	23° 14' 12.48"N	87° 47' 53.85"E						0	
1934/SB2021	BARDHAMAN-1	Idilpur	24	Damodar	Metal/Black top/Pitch/Pucca Road	831 P, 1609 P, 1595 P, 1590 P, 1591 P, 1592 P, 1576 P, 1577 P, 1578 P, 1574 P, 1568 P	4.35	23° 13' 18.78"N	87° 49' 24.39"E						0	
1936/SB2021	JAMALPUR	Chalbalpur	5	Damodar	Metal/Black top/Pitch/Pucca Road	905 P	2.43	23° 8' 36.31"N	88° 0' 16.31"E						0	
1937/SB2021	JAMALPUR	Dadpur	9	Damodar	Metal/Black top/Pitch/Pucca Road	443 P	0.81	23° 7' 2.29"N	87° 59' 35.04"E						0	
1935/SB2021	JAMALPUR	Kalera	34	Damodar	Metal/Black top/Pitch/Pucca Road	4523 P	0.73	23° 10' 20.05"N	87° 59' 22.14"E						0	
1948/SB2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4102 P, 4170 P	4.3	23° 14' 45.93"N	87° 43' 38.23"E						0	

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1960/SB2021	GALSI-2	JHUJUTI	158	Damodar	Metal/Black top/Pitch/Pucca Road	1102 P	2.02	23° 15' 6.46"N	87° 44' 7.85"E						0	
581/SB2021	GALSI-2	D BHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	439 P, 765 P	3.84	23° 14' 37.02"N	87° 39' 44.16"E	Computer World	9/21/2017	10/11/2017	10/18/2017	17-Oct-22	130458.716	
338/SB2021	GALSI-1	SIMASIMI	65	Damodar	Metal/Black top/Pitch/Pucca Road	1450 P, 2013 P	0.44	23° 16' 33.21"N	87° 35' 5.95"E	R S P M PROJECT PVT LTD					0	EC Awaiting
430/SB2021	GALSI-2	JUJUTI	123	Damodar	Metal/Black top/Pitch/Pucca Road	1101 P	4.04	23° 15' 5.37"N	87° 43' 25.97"E	BALAI GHOSH	3/6/2017	3/6/2017	3/14/2017	13-Mar-22	137477.064	
441/SB2021	GALSI-2	MERUAL	124	Damodar	Metal/Black top/Pitch/Pucca Road	3044 P	2.7	23° 14' 45.25"N	87° 44' 51.21"E	SRI BABAN SINGH	2/3/2017	3/25/2017	4/28/2017	27-Apr-22	91926.606	
467/SB2021	GALSI-2	GOHOGRAM	70	Damodar	Metal/Black top/Pitch/Pucca Road	6008 P, 5553 P	4	23° 14' 36.16"N	87° 38' 8.53"E	Radha Bhattad	3/6/2017	3/28/2017	4/6/2017	5-Apr-22	136100.917	
473/SB2021	GALSI-2	Gohogram	70	Damodar	Metal/Black top/Pitch/Pucca Road	5553 P	3.95	23° 14' 34.74"N	87° 38' 8.92"E	Lime Lite Mineral Pvt	2/27/2017	3/16/2017	3/28/2017	27-Mar-22	134174.312	
487/SB2021	GALSI-2	D Bhasapur	79	Damodar	Metal/Black top/Pitch/Pucca Road	765 P	3.03	23° 38' 0.92"N	88° 1' 55.56"E	Pawan Arora	5/16/2017	11/8/2017	11/21/2017	20-Nov-22	102935.78	
510/SB2021	GALSI-2	D Bhasapur	79	Damodar	Metal/Black top/Pitch/Pucca Road	439 P	3.04	23° 14' 40.55"N	87° 39' 28.20"E	Anand Traders	2/27/2017	3/6/2017	3/7/2017	6-Mar-22	103348.624	
567/SB2021	GALSI-2	D BHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	94 P	4.05	23° 14' 26.50"N	87° 38' 37.60"E	Dilip Mondal	11/27/2017	12/13/2017	12/18/2017	17-Dec-22	137614.679	
604/SB2021	GALSI-2	DADPUR	89	Damodar	Metal/Black top/Pitch/Pucca Road	2850 P	4.08	23° 15' 10.36"N	87° 42' 50.52"E	Uttam Debnath	12/5/2018	12/2/2019	2/12/2020	11-Feb-25	138577.982	
607/SB2021	GALSI-2	D BHASAPUR	79	Damodar	Metal/Black top/Pitch/Pucca Road	793 P	3.52	23° 13' 54.45"N	87° 39' 47.17"E	Joydev Pal					0	EC Awaiting
610/SB	GALSI-	D	79	Damodar	Metal/Black	439 P AND	3.78	23° 14'	87° 39'	Ambey Abasan					0	EC

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2021	2	BHASAPUR			top/Pitch/Pucca Road	765 P		39.18''N	51.16''E	Pvt Ltd						Awaiting
627/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1901 P ORS	4.59	23° 14' 35.02''N	87° 40' 48.16''E	JOGENDRA BARMAN					0	EC Awaiting
630/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1540 P	3.32	23° 14' 57.12''N	87° 40' 57.05''E	Subrata Saha	4/24/2018	10/26/2018	11/14/2018	13-Nov-23	112981.651	
633/SB 2021	GALSI-2	SHIKARPUR	117	Damodar	Metal/Black top/Pitch/Pucca Road	1901 P, 1540 P	4.36	23° 14' 43.15''N	87° 40' 54.66''E	Pal Enterprise	2/22/2018	2/27/2018	3/6/2018	5-Mar-23	148348.624	
650/SB 2021	GALSI-2	DUMUR	86	Damodar	Metal/Black top/Pitch/Pucca Road	1001 P	4.18	23° 14' 52.81''N	87° 41' 16.94''E	Probhat Bauri	12/5/2018	7/25/2018	1/28/2019	27-Jan-24	142155.963	
839/SB 2021	RAINA-2	NARASINHAPUR	206	Mundeswari	Metal/Black top/Pitch/Pucca Road	380 P	2.05	22° 58' 35.07''N	87° 56' 39.46''E	Basudev Majhi					0	EC Awaiting
882/SB 2021	RAINA-2	NARASINHAPUR	206	Mundeswari	Metal/Black top/Pitch/Pucca Road	380 P	2.23	22° 58' 58.12''N	87° 56' 44.06''E	Sajal Santra	3/26/2018	12/4/2018	6/21/2019	20-Jun-24	75825.688	
899/SB 2021	AUSHGRAM-2	Aogram	86	Ajay	Metal/Black top/Pitch/Pucca Road	1034 P, 1035P, 1036P, 1037P, 1038P	1.39	23° 36' 15.81''N	87° 33' 50.40''E	MALAY KANTI GUPTA	12/5/2018	12/20/2018	1/4/2019	3-Jan-24	47201.835	
905/SB 2021	BARDHAMAN-2	CHAITPUR	84	Damodar	Metal/Black top/Pitch/Pucca Road	1472 P, 1474 P, 1480 P AND OTHERS	3.43	23° 11' 24.17''N	87° 54' 58.32''E	JOY LAXMI TRADERS	3/20/2017	1/3/2019	3/13/2019	12-Mar-24	116697.248	
919/SB 2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	Metal/Black top/Pitch/Pucca Road	968 P AND OTHERS	2.4	23° 12' 7.09''N	87° 53' 6.56''E	SHYAMAL SINGHA ROY	9/21/2017	1/15/2021	3/16/2021	15-Mar-26	81743.119	
939/SB 2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	1185 P AND OTHERS	2.74	23° 12' 11.43''N	87° 52' 54.75''E	SHYAMAL SINGHA ROY	9/21/2017	1/15/2021	3/16/2021	15-Mar-26	93165.138	
971/SB 2021	KHANDOGHOSH	KAMALPUR	74	Damodar	Metal/Black top/Pitch/Pucca Road	3078 P	0.42	23° 57' 21.47''N	87° 39' 35.40''E	DHIREN CHANDRA SETH	2/3/2017	3/29/2017	5/24/2017	23-May-22	15000	
982/SB 2021	KHANDOGHOS	NARICHA	13	Damodar	Metal/Black top/Pitch/Pu	4120 P	2.26	23° 14' 46.61''N	87° 44' 1.48''E	SWAPAN KUMAR PAN	2/3/2017	3/3/2017	3/17/2017	16-Mar-22	76788.991	

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	H				cca Road											
999/SB 2021	KHANDOGHOSH	GAITANPUR	65	Damodar	Metal/Black top/Pitch/Pucca Road	1576 P, 1604 P AND ORS	4.12	23° 13' 55.39"N	87° 47' 59.97"E	NEW KALIMATA SAND SUPPLY					0	EC Awaiting
1002/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Black top/Pitch/Pucca Road	735 P AND OTHERS	3.49	23° 11' 12.28"N	87° 55' 35.62"E	RABINDRANATH DAS	4/21/2017	4/17/2017	2/16/2018	15-Feb-23	118623.853	
1005/SB2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	497 P AND OTHERS	2.45	23° 12' 12.44"N	87° 52' 34.59"E	SHYAMAL SINGHA ROY	9/21/2017	1/15/2021	3/16/2021	15-Mar-26	83256.881	
1011/SB2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	915 P AND OTHERS	2.29	23° 12' 12.12"N	87° 52' 45.39"E	JITENDRA KUMAR MISHRA	9/21/2017	1/7/2020	3/2/2020	1-Mar-25	77752.294	
1014/SB2021	BARDHAMAN-2	HATSHIMUL	81	Damodar	No Approach Road	1320 P, 959 P AND OTHERS	2.89	23° 12' 11.04"N	87° 53' 14.11"E	Ambey Abasan Pvt Ltd	9/2/2017	1/25/2021	2/1/2021	31-Jan-26	98256.881	
1028/SB2021	KHANDOGHOSH	KAMLAPUR	74	Damodar	Metal/Black top/Pitch/Pucca Road	10400 P AND ORS	2.59	23° 13' 21.96"N	87° 48' 44.72"E	JHM LOGISTIC PVT LTD	9/21/2017	9/25/2017	9/25/2017	24-Sep-22	88211.009	
1031/SB2021	JAMALPUR	Chalkhanjadi	2	Damodar	Metal/Black top/Pitch/Pucca Road	2800 P	2.4	23° 9' 56.10"N	87° 58' 55.80"E	TTL Mineral Export Pvt Ltd	2/27/2017	3/3/2017	3/7/2017	6-Mar-22	81743.119	
1034/SB2021	BARDHAMAN-2	BECHARHAT	79	Damodar	Metal/Black top/Pitch/Pucca Road	1591 P, 1596 P AND OTHERS	2.95	23° 12' 30.89"N	87° 51' 58.29"E	S G Projects Limited Director Ajay Singh	11/27/2017	1/18/2018	2/2/2018	1-Feb-23	100183.486	
1048/SB2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1404 P, 1405 P AND ORS	3.25	23° 14' 50.14"N	87° 41' 34.07"E	Manik Chandra Mondal					0	EC Awaiting
1054/SB2021	JAMALPUR	Sadipur	7	Damodar	Metal/Black top/Pitch/Pucca Road	1861	3.12	23° 7' 25.36"N	87° 59' 23.74"E	Neha Singh	2/27/2017	3/3/2017	3/7/2017	6-Mar-22	105963.303	
1062/SB2021	KHANDOGHOSH	KUMIRKHOLA	9	Damodar	Metal/Black top/Pitch/Pucca Road	1608 P, 1665 P AND ORS	4.72	23° 15' 3.45"N	87° 42' 33.98"E	Ms Rajen Roy					0	EC Awaiting
1068/SB2021	KHANDOGHOS	KUMIRKHO	9	Damodar	Metal/Black top/Pitch/Pu	699 P, 670, 742, 750 AND	4.91	23° 14' 41.80"N	87° 42' 2.00"E	Packhorse Traders Pvt Ltd					0	EC Awaiting

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1071/SB2021	JAMALPUR	D Mohanpur	74	Damodar	Metal/Black top/Pitch/Pucca Road	2041 P	0.63	22° 58' 13.82''N	87° 58' 24.47''E	Rabindranath Garang					0	EC Awaiting
1074/SB2021	BARDHAMAN-2	AMIRPUR	85	Damodar	Metal/Black top/Pitch/Pucca Road	735 P	1.42	23° 11' 10.09''N	87° 55' 43.40''E	NEPAL BAURI	9/21/2017	11/30/2017	4/10/2018	9-Apr-23	19541.284	
1085/SB2021	JAMALPUR	Haibatpur	4	Damodar	Metal/Black top/Pitch/Pucca Road	819 P	1.54	23° 9' 7.96''N	88° 0' 19.20''E	Indivisual	4/24/2018	5/8/2018	8/14/2018	13-Aug-23	52293.578	
1091/SB2021	JAMALPUR	Habaspur	10	Damodar	Metal/Black top/Pitch/Pucca Road	212 P	3.68	23° 8' 14.92''N	88° 0' 26.19''E	Sayed Neajuddin	2/22/2018	3/6/2018	3/28/2018	27-Mar-23	125229.358	
1097/SB2021	KHANDOGHOSH	ATKULLA	64	Damodar	Metal/Black top/Pitch/Pucca Road	1263 P, 1264 , 1265, 1266, 1267, 1268 AND ORS	4.05	23° 14' 16.69''N	87° 46' 51.69''E	KALYANI SAHA	1/25/2017	1/27/2017	2/8/2017	7-Feb-22	137614.679	
1105/SB2021	JAMALPUR	Habaspur	10	Damodar	Metal/Black top/Pitch/Pucca Road	212 P	3.48	23° 1' 14.91''N	88° 0' 26.19''E	New Madina Marbel	12/5/2018	1/15/2019	2/14/2019	13-Feb-24	118348.624	
1108/SB2021	AUSHGRAM-2	KURUL	34	Ajay	Metal/Black top/Pitch/Pucca Road	801 P	1.32	23° 36' 16.09''N	87° 37' 0.88''E	Maa Sarada Enterprise	2/22/2018	2/26/2018	2/28/2018	27-Feb-23	44724.771	
1114/SB2021	JAMALPUR	Sahhossainpur	39	Damodar	Metal/Black top/Pitch/Pucca Road	2015 P Ors	2.04	23° 1' 1.51''N	87° 57' 41.20''E	Joydev Garang	11/27/2017	2/5/2018	4/9/2018	8-Apr-23	69357.798	
1117/SB2021	JAMALPUR	Muidipur	67	Damodar	Metal/Black top/Pitch/Pucca Road	190 P	1.7	23° 0' 6.64''N	87° 57' 16.35''E	Tapan Kumar Samanta	12/5/2018	1/7/2020	1/14/2020	13-Jan-25	57798.165	
1128/SB2021	KATWA-2	AGRADWIP	112	Bhagirathi-Hooghly	Metal/Black top/Pitch/Pucca Road	1078 P, 819 AND ORS	3.11	23° 35' 49.71''N	88° 14' 53.93''E	ASIT SARKAR	12/5/2018	12/14/2018	1/2/2019	1-Jan-24	105825.688	
1131/SB2021	BARDHAMAN-2	MANIKHATI	158	Damodar	Metal/Black top/Pitch/Pucca Road	351 P	2.02	23° 10' 44.20''N	87° 56' 13.54''E	BAKUL DAS	11/27/2017	1/15/2018	4/11/2018	10-Apr-23	68807.339	
1134/SB2021	MONGALKOT	Jaykrishnap	85	Ajay	Metal/Black top/Pitch/Pu	892 P	0.95	23° 35' 50.04''N	87° 56' 51.75''E	PRADIP ARORA	5/16/2017	12/4/2018	1/1/2019	31-Dec-23	32201.835	

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1137/SB2021	JAMALPUR	Jamdaha	3	Damodar	Metal/Black top/Pitch/Pucca Road	1	3.02	23° 9' 51.61"N	87° 59' 14.21"E	SANTOSH PROMOTERS PVT LTD	12/29/2017	1/11/2018	1/15/2018	14-Jan-23	102798.165	
1148/SB2021	JAMALPUR	Selimabad	30	Damodar	Metal/Black top/Pitch/Pucca Road	953 P	1.97	23° 4' 49.58"N	87° 59' 31.60"E	Manas Kr Dhara					0	EC Awaiting
1151/SB2021	MONGALKOT	DHANYARUKHI	100	Ajay	Metal/Black top/Pitch/Pucca Road	1581 P	2.11	23° 38' 0.92"N	88° 1' 55.56"E	Adyama Tradelink	5/16/2017	11/2/2018	12/18/2018	17-Dec-23	71834.862	
1157/SB2021	KATWA-1	CHURPUNI	3	Ajay	Metal/Black top/Pitch/Pucca Road	498 P	2.92	23° 38' 34.63"N	88° 2' 41.29"E	Jharkhand Enterprises	4/6/2017	10/17/2017	12/27/2017	26-Dec-22	99220.183	
1160/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 28.63"N	87° 56' 26.08"E	NEPAL BAURI	9/21/2017	10/23/2017	2/15/2018	14-Feb-23	68807.339	
1168/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	2.02	23° 10' 24.94"N	87° 56' 46.19"E	SANTU BAURI	9/21/2017	10/31/2017	11/2/2017	1-Nov-22	68807.339	
1171/SB2021	JAMALPUR	Haibatpur	4	Damodar	Metal/Black top/Pitch/Pucca Road	819 P	2.57	23° 9' 17.49"N	88° 0' 10.28"E	Nirupam Roy					0	EC Awaiting
1177/SB2021	JAMALPUR	Sahhossainpur	39	Damodar	Metal/Black top/Pitch/Pucca Road	2019 P Ors	2.15	23° 1' 5.89"N	87° 57' 40.92"E	Corum Trade And Services	12/29/2017	2/20/2018	3/28/2018	27-Mar-23	73211.009	
1208/SB2021	MEMARI-1	Chanchai	46	Damodar	Metal/Black top/Pitch/Pucca Road	565 P, 566 P	1.81	23° 9' 21.26"N	88° 0' 18.79"E	Samir Mondal					0	EC Awaiting
1243/SB2021	JAMALPUR	Chalbalpur	5	Damodar	Metal/Black top/Pitch/Pucca Road	906 P	2.19	23° 8' 25.34"N	88° 0' 24.17"E	Corum Trade And Services	11/27/2017	1/16/2018	2/2/2018	1-Feb-23	74449.541	
1251/SB2021	MEMARI-1	Palla	45	Damodar	Metal/Black top/Pitch/Pucca Road	4099, 4098 P, 4097 P, 4000 P, 4002 P	1.94	23° 9' 42.68"N	87° 59' 54.95"E	Abhishek Arora					0	EC Awaiting
1257/SB2021	JAMALPUR	Kelera	34	Damodar	Metal/Black top/Pitch/Pucca Road	45229 P Ors	2.46	23° 4' 33.96"N	87° 59' 23.72"E	Chanchal Bag	9/21/2017	11/16/2017	11/29/2017	28-Nov-22	83532.11	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
1283/SB2021	MONGALKOT	MAJHKHANRA	1	Ajay	Metal/Blacktop/Pitch/Pucca Road	123 P, 722 P	2.19	23° 35' 19.70''N	87° 44' 8.01''E	KOLKATA GROUP ONE MANPOWER MANAGEMENT PVT LTD					0	EC Awaiting
1300/SB2021	JAMALPUR	Chalkhanjadi	2	Damodar	Metal/Blacktop/Pitch/Pucca Road	2800 P	0.81	23° 9' 58.81''N	87° 58' 19.19''E	Soumen Sarkar	3/6/2017	4/21/2017	5/11/2017	10-May-22	27522.936	
1323/SB2021	MONGALKOT	Maliara	89	Ajay	Metal/Blacktop/Pitch/Pucca Road	1091 P AND ORS	1.3	23° 37' 43.25''N	87° 58' 23.23''E	Manirul Mondal	11/27/2017	11/29/2017	11/30/2017	29-Nov-22	44311.927	
1354/SB2021	MONGALKOT	Paschim Nabagram	2	Ajay	Metal/Blacktop/Pitch/Pucca Road	479 Ors	3.83	23° 34' 47.63''N	87° 46' 9.33''E	Subrata Dey	2/22/2018	3/26/2018	3/28/2018	27-Mar-23	130321.101	
1360/SB2021	JAMALPUR	Chalkhanjadi	2	Damodar	Metal/Blacktop/Pitch/Pucca Road	2800	0.81	23° 9' 58.81''N	87° 58' 19.19''E	Kalpana Das	3/6/2017	4/21/2017	5/11/2017	10-May-22	27522.936	
1363/SB2021	GALSI-2	D Bhasapur	79	Damodar	Metal/Blacktop/Pitch/Pucca Road	793 P	3.57	23° 13' 54.40''N	87° 39' 46.90''E	Rajesh Mahato	1/18/2017	1/25/2017	2/3/2017	2-Feb-22	121238.532	
1374/SB2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Blacktop/Pitch/Pucca Road	705 P	2.63	23° 12' 21.85''N	87° 52' 37.32''E	Raja Ghosh					0	EC Awaiting
1377/SB2021	MONGALKOT	MAJKHARA	01	Ajay	Metal/Blacktop/Pitch/Pucca Road	751 P, 1393 P	1.67	23° 35' 24.38''N	87° 45' 27.95''E	Group One					0	EC Awaiting
1386/SB2021	RAINA-2	Kotsimul	208	Mundeswari	Metal/Blacktop/Pitch/Pucca Road	1349 P	2.11	22° 56' 48.23''N	87° 56' 15.67''E	Brijnandan Gupata					0	EC Awaiting
1397/SB2021	GALSI-2	MERUAL	159	Damodar	Metal/Blacktop/Pitch/Pucca Road	3043 P	2.02	23° 14' 41.00''N	87° 44' 58.00''E	PARITOSH MONDAL	1/18/2017	1/31/2017	2/23/2017	22-Feb-22	68807.339	
1400/SB2021	BARDHAMAN-2	DAKSHIN GOPALPUR	165	Damodar	Metal/Blacktop/Pitch/Pucca Road	1832 P	3.16	23° 10' 5.63''N	87° 58' 5.90''E	Success Nirayat Pvt Ltd					0	EC Awaiting

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
1423/SB2021	MONGALKOT	Maliara	89	Ajay	Metal/Black top/Pitch/Pucca Road	1091 P,1 P	1.71	23° 37' 51.96''N	87° 57' 45.14''E	Sk Ardesh	2/22/2018	2/26/2018	2/28/2018	27-Feb-23	58073.394	
1469/SB2021	MONGALKOT	Keotsa	88	Ajay	Metal/Black top/Pitch/Pucca Road	671, 675 AND ORS	2.79	23° 37' 44.98''N	87° 57' 26.69''E	Md Hasibul Hossen					0	EC Awaiting
1529/SB2021	MONGALKOT	Kheruа	97	Ajay	Metal/Black top/Pitch/Pucca Road	827 P AND ORS	3.15	23° 37' 55.37''N	87° 59' 40.32''E	Binoy Dhara					0	EC Awaiting
1532/SB2021	MONGALKOT	Keotsa	88	Ajay	Metal/Black top/Pitch/Pucca Road	444 P, 647 P, 648 P, 649 P, 650 P, 651 P, 652 P, 653 P, 654 P, 656 P, 657 P, 659 P, 662 P	3.52	23° 37' 47.00''N	87° 57' 26.62''E	Raikamal Chakraborty					0	EC Awaiting
1549/SB2021	BARDHAMAN-2	Hatsimul	81	Damodar	Metal/Black top/Pitch/Pucca Road	1171,1649, 1684 AND ORS	4.1	23° 12' 0.11''N	87° 53' 36.62''E	SHYAMAL SINGHA ROY					0	EC Awaiting
1563/SB2021	BARDHAMAN-2	Jafrabad	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	3.09	23° 10' 28.30''N	87° 56' 47.08''E	Geetanjali Infrastructure Earth Movers					0	EC Awaiting
1566/SB2021	BARDHAMAN-2	Chaitpur	84	Damodar	Metal/Black top/Pitch/Pucca Road	1453 P, 1454 P, 1480 P, 1564 P, 1581 P, 1585 P	3.14	23° 11' 30.10''N	87° 54' 46.65''E	Buddhadeb Adhikari					0	EC Awaiting
1775/SB2021	BARDHAMAN-2	JAFRABAD	159	Damodar	Metal/Black top/Pitch/Pucca Road	251 P	3.25	23° 10' 28.21''N	87° 56' 51.26''E	GEETANJANJALI INFRUSTRUCTURE AND EARTH MOVERS					0	EC Awaiting
1895/SB2021	BARDHAMAN-1	Idilpur	24	Damodar	Metal/Black top/Pitch/Pucca Road	1584 P, 1562 P, 1561 P AND ORS	4.39	23° 13' 18.99''N	87° 49' 36.78''E						0	
1898/SB2021	BARDHAMAN-	Idilpur	24	Damodar	Metal/Black top/Pitch/Pu	830 P, 1606 P, 1607 P AND	4.56	23° 13' 29.42''N	87° 49' 11.05''E						0	

ID	Block	Mouza	JL No	River	Road	Plot No	Area in Hectares	Latitude	Longitude	Bidder Name	Date of Issuance of Environmental Clearance (E.C.)	Date of Execution of Lease Deed	Lease Agreement Start Date (date of effect)	Lease Agreement Expiry Date	Quantum of Sand Extraction permissible as per Mining Plan (tonnes)	Reasons for non-execution of lease deed
	1				cca Road	ORS										
1901/SB2021	RAINA-2	Narat ambati	136	Darakeswar	Metal/Black top/Pitch/Pucca Road	2502 P	2.81	22° 57' 58.24"N	87° 44' 41.83"E						0	
1915/SB2021	BARDHAMAN-2	Sriram pur	80	Damodar	Metal/Black top/Pitch/Pucca Road	1204 P, 509, 508 P, 510 P, 511 P, 512 P, 1205 P, 548 P	2.49	23° 12' 8.56"N	87° 52' 23.75"E						0	
1918/SB2021	KHANDOGHOSH	Rupsa	10	Damodar	Metal/Black top/Pitch/Pucca Road	3049, 3050, 3028, 3027 P, 3029 P, 3046 P, 3047 P, 3048 P, 3055 P, 3054 P, 3056 P, 3059 P, 3051 P	3.91	23° 14' 51.62"N	87° 42' 55.02"E						0	
1924/SB2021	BARDHAMAN-2	KATHALGACHI	83	Damodar	Metal/Black top/Pitch/Pucca Road	846 P	2.58	23° 11' 57.17"N	87° 54' 9.51"E						0	
1927/SB2021	BARDHAMAN-2	SRIRAMPUR	80	Damodar	Metal/Black top/Pitch/Pucca Road	548 P, 544 P, 543 P, 545 P	2.1	23° 12' 1.67"N	87° 52' 43.86"E						0	
1930/SB2021	MONGALKOT	Shyambazar	99	Ajay	Metal/Black top/Pitch/Pucca Road	906 P	3.47	23° 38' 16.35"N	88° 0' 47.97"E						0	
1947/SB2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4029 P 4030 P ORS	4.46	23° 14' 45.12"N	87° 43' 11.31"E						0	
1950/SB2021	KHANDOGHOSH	NARICHA	13	Damodar	Metal/Black top/Pitch/Pucca Road	4103P, 4104 P, 4105, 4106 ORS	4.41	23° 14' 44.30"N	87° 43' 48.04"E						0	
1958/SB2021	KHANDOGHOSH	RUPSA	10	Damodar	Metal/Black top/Pitch/Pucca Road	3017P, 3019P, 3021P, 3022 P ORS	4.69	23° 15' 1.27"N	87° 43' 0.76"E						0	

The district generated revenueu from other in-situ minor minerals and is given in Table 8.2.

Table 8.2: List of existing mining leases of the district (other than sand)

Sl.No.	Auction ID	Bidder Name	Mineral	Lat-Long	Name of Block	Mouza	JL No.	Plot No.	Area (in Hectars)
1	2018_WB_974	M/s National Traders	Morrum	A. 23°26'35.54"N 87°34'24.06"E B. 23°26'37.46"N 87°34'24.58"E C. 23°26'39.45"N 87°34'25.29"E D. 23°26'40.21"N 87°34'25.32"E E. 23°26'42.49"N 87°34'26.56"E F. 23°26'43.19"N 87°34'27.41"E G. 23°26'43.97"N 87°34'27.56"E H. 23°26'43.77"N 87°34'29.89"E I. 23°26'42.91"N 87°34'30.12"E J. 23°26'38.85"N 87°34'26.92"E K. 23°26'38.02"N 87°34'27.21"E L. 23°26'35.25"N 87°34'24.57"E	Ausgram-II	Amaragarh	57	202	1.68

8.3 Detail of production of sand and other minerals during last three years

Last 3 years production of minor mineral of the District is furnished in Table 8.3.

Table 8.3: Details of production of sand as per mine plan in the district

Sl. No.	Year	Name of mineral	Total Production (inCft.)	Total Production in cum
1	2016-2017	Sand	64972074	1839787
2	2017-2018	Sand	126800961	3590569
3	2018-2019	Sand	112087089	3173923
4	2019-2020	Sand	112287191	3179589
5	2020-2021	Sand	104672467	2963966
6	2021-2022 (As on Sept, 2021)	Sand	26884723	761283.4
			547704505	15509118

Conversion factor: 1cum=35.315 cft

9 Details of revenue generated from mineral sector during last three years

Revenue generated for last 3 years in Purba Bardhaman District is furnished in Table 9.1.

Table 9.1: District revenue generation from mineral sector (In cr.)

Financial Year	Royalty (Rupees)
2017-18	210390039
2018-19	185317113
2019-20	184479730
2020-21	173506070
2021-22 (As on Sept'21)	44075894
Total	797768846

10 Transport

Kolkata-Agra National Highway 19 (old numbering NH 2), covering a large part of the old Grand Trunk Road passes through this district. The other highways passing through the district are: National Highway 114, State Highway 6, State Highway 7, State Highway 13 (covering a large part of the old Grand Trunk Road), State Highway 14 and State Highway 15 (Figure 10.1).

The Howrah-Bardhaman main line and Howrah-Bardhaman chord, both part of Kolkata Suburban Railway System, enter this district and converge at Saktigarh Railway Station. The Bardhaman-Asansol Section, which is part of Howrah-Delhi main line, Howrah-Gaya-Delhi line and Howrah-Allahabad-Mumbai line, and the Bardhaman-Kiul Sahibganj Loop leave at the other end of the district. The Bardhaman-Katwa line, after conversion from narrow gauge to electrified broad gauge, was opened to the public on 12 January 2018.

A transportation map demarcating approach road to the potential sand blocks from the nearest National Highway/ Sate Highway has been prepared and presented in Figure 10.2.

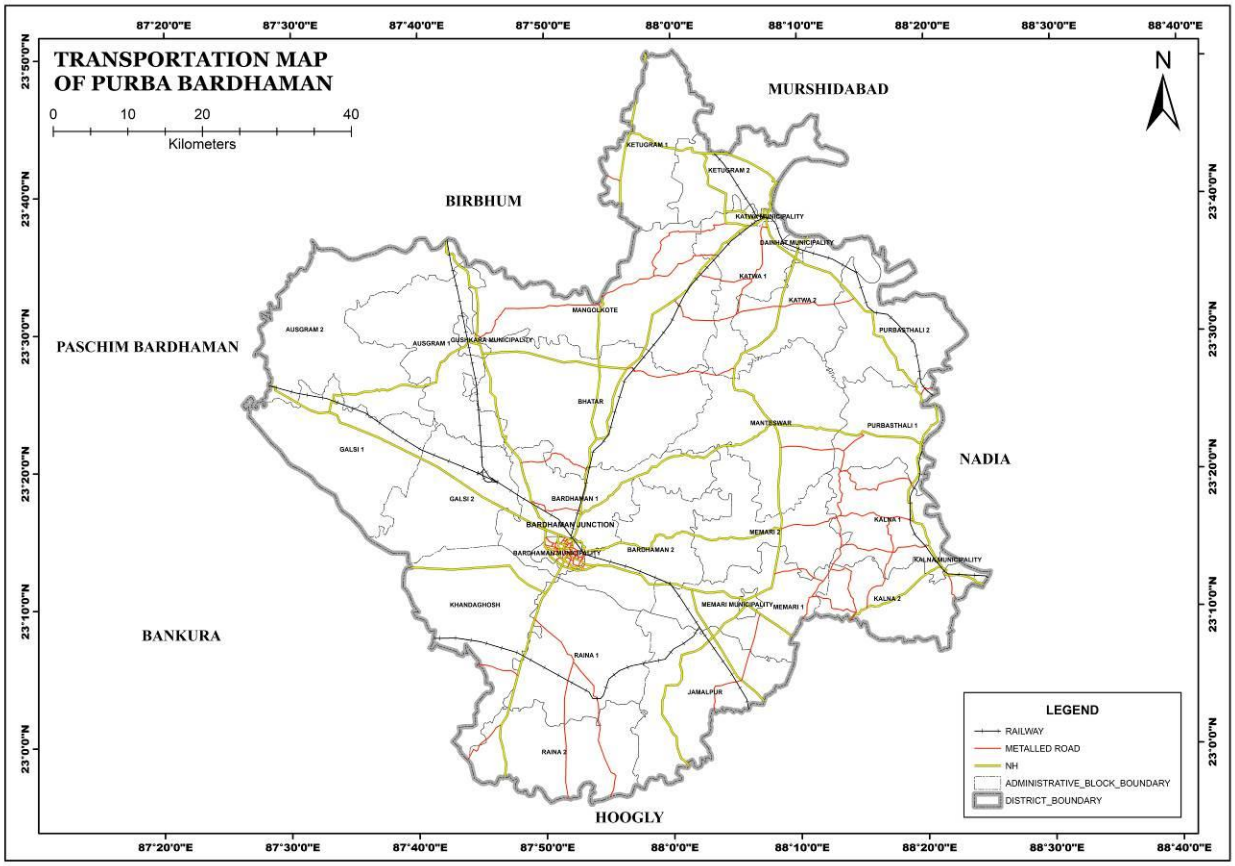

Figure 10.1: Transportation map of Purba Bardhaman District
(Source: National Informatics Centre)

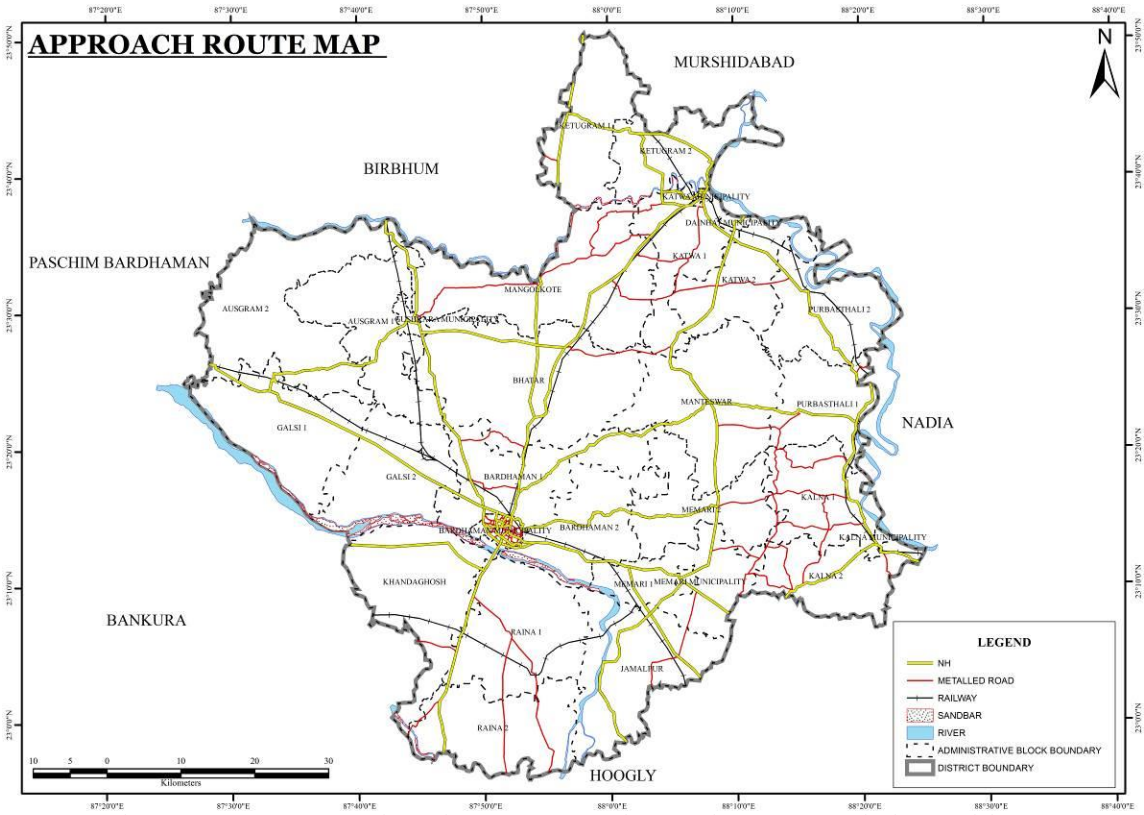

Figure 10.2: Map showing approach road to potential sand bars
(Source: National Informatics Centre)

11 Remedial measure to mitigate the impact of mining

11.1Environmental Sensitivity

Purba Bardhaman district represents a unique geo-environmental setup. As human population increases, forests are being depleted for the extension of agricultural lands, introduction of new settlements, roadways etc

Due to unprecedented growth of population during the last few decades, nature has started reacting sharply to the accumulated human guilt. Soil erosion and its conservation play an important role.

The land use practices play the most important role in determining the stability factors in respect of landslide hazards. Stone quarrying from the slope is another way of human intervention that causes occasional slope failure.

11.2 Sand mining Impact

Another serious environmental problem around the globe in recent years is of sand and gravel mining. Sand mining is a process of extraction of sand from an open pit, river bed, sea beaches, ocean floor, river banks, deltas and island dunes. The extracted sand could be utilised for various types of manufacturing, such as concrete used in the construction of building and other structures. The sand can also be used as an abrasive. The demand for sand will increase with population growth and urbanization. The high demand of sand has has led to unsustainable sand mining process resulting in illegal mining.

Although most jurisdictions have legal limit on the location and volume of sand that can be mined, illegal sand extraction is taking place in many parts of the country due to rapid urbanisation and industrialisation.

Removal or extraction of too much sand from rivers leads to erosion of river banks. Deltas can recede due to sand mining. These destructive effects of sand mining ultimately results in loss of fertile land and property. It also destabilizes the ground and causes failure of engineering structures.

In-stream mining directly alters the channel geometry and bed elevation. Removing sediment from the channel disrupts the pre-existing balance between sediment supply and transporting capacity, typically inducing incision upstream and downstream of the extraction site. The resultant incision alters the frequency of floodplain inundation along the river courses, lowers valley floor water table and frequently leads to destruction of bridges and channelization structures.

Sand Mining in beaches disturbs the ecosystem of different fauna of the beaches. The sand mining from natural barriers, made up of sand, causes flooding of the natural habitat. The sand mining activity destroys the aesthetic beauty of beaches and river bank and makes the ecosystem unstable. If there are popular tourist destination, tourism potential of such areas will decline.

It can be concluded that there has been little in-depth research on the environmental, social and political effects of land use practices and calls for urgent attention by the competent authority.

11.3 Remedial measure

11.3.1 Sustainable Mining Practices:

- The depth of mining in riverbed shall not exceed 3 meter or base flow level whichever is less, provided that where the Joint Inspection Committee certifies about excessive deposit or over accumulation of mineral in certain reaches requiring channelization, it can go above 3 meters.
- Mining shall be done in layers of 1 meter depth to avoid ponding effect and after first layer is excavated, the process will be repeated for the next layers.
- No stream should be diverted for the purpose of sand mining. No natural water course and/ or water resources are obstructed due to mining operations.
- No blasting shall be resorted to in river mining and without permission at any other place.

11.3.2 Monitoring the Mining of Mineral and its Transportation:

- For each mining lease site the access should be controlled in a way that vehicles carrying mineral from that area are tracked and accounted for.
- There should be regular monitoring of the mining activities in the State to ensure effective compliance of stipulated EC conditions and of the provisions under the Minor Mineral Concessions Rules framed by the State Government.

11.3.3 Noise Management:

- Noise arising out of mining and processing shall be abated and controlled at source to keep within permissible limit.
- Restricted sand mining operation has to be carried out between 6 am to 7 pm.

11.3.4 Air Pollution and Dust Management:

- The pollution due to transportation load on the environment will be effectively controlled and water sprinkling will also be done regularly.

- Air pollution due to dust, exhaust emission or fumes during mining and processing phase should be controlled and kept in permissible limits specified under environmental laws.
- The mineral transportation shall be carried out through covered trucks only and the vehicles carrying the mineral shall not be overloaded. Wheel washing facility should be installed and used.

11.3.5 Bio-Diversity Protection:

- Restoration of flora affected by mining should be done immediately. Five times the number of trees destroyed by mining to be planted preferably of indigenous species. Each EC holder shall have to undertake plantation of trees over at least 20% of the total area of lease in the same plot or plots utilised for such working.
- No mining lease shall be granted in the forest area without forest clearance in accordance with the provisions of the Forest Conservation Act, 1980 and the rules made there under.
- Protection of natural home of any wild animal shall have to be ensured.
- No felling of tree near quarry is allowed. For mining lease within 10km of the National Park / Sanctuary or in Eco-Sensitive Zone of the Protected Area, recommendation of Standing Committee of National Board of Wild Life (NBWL) have to be obtained as per the Hon'ble Supreme Court order in I.A. No. 460 of 2004.
- Spring sources should not be affected due to mining activities. Necessary protection measures are to be incorporated.

11.3.6 Management of Instability and Erosion:

- Removal, stacking and utilization of top soil should be ensured during mining. Where top soil cannot be used concurrently, it shall be stored separately for future use keeping in view that the bacterial organism should not die and should be spread nearby area.
- The EC should stipulate conditions for adequate steps to check soil erosion and control debris flow etc. by constructing engineering structures
- Use of oversize material to control erosion and movement of sediments
- No overhangs shall be allowed to be formed due to mining and mining shall not be allowed in area where subsidence of rocks is likely to occur due to steep angle of slope.
- No extraction of stone / boulder / sand in landslide prone areas.
- Controlled clearance of riparian vegetation to be undertaken.

11.3.7 Waste Management:

- Site clearance and tidiness is very much needed to have less visual impact of mining.
- Dumping of waste shall be done in earmarked places as approved in Mining Plan.
- Rubbish burial shall not be done in the rivers.

11.3.8 Pollution Prevention:

- Take all possible precautions for the protection of environment and control of pollution.
- Effluent discharge should be kept to the minimum and it should meet the standards prescribed.

11.3.9 Protection of Infrastructure:

- Mining activities shall not be done for mine lease where mining can cause danger to site of flood protection works, places of cultural, religious, historical, and archeological importance.
- For carrying out mining in proximity to any bridge or embankment, appropriate safety zone should be worked out on case to case basis, taking into account the structural parameters, location aspects and flow rate, and no mining should be carried out in the safety zone so worked out.

Mining shall not be undertaken in a mining lease located in 300-500 meter of bridge, 300 meter upstream and downstream of water supply / irrigation scheme, 100 meters from the edge of National Highway and railway line, 50 meters from a reservoir, canal or building, 25 m from the edge of State Highway and 10 meters from the edge of other roads except on special exemption by the Sub-Divisional level Joint Inspection Committee.

12 Suggested reclamation plan for already mined out areas

As per statute all mines/quarries are to be properly reclaimed before final closure of the mine. Reclamation plans should include:

a) A baseline survey of river cross section. The study of cross section is basis for delineating channel form. Cross-sections must be surveyed between two monumented endpoints set on the river banks, and elevations should be referenced based on benchmark set in the area;

b) The proposed mining cross-section data should be plotted over the baseline data to illustrate the vertical extent of the proposed excavation;

c) The cross-section of the replenished bar should be the same as the baseline data. This illustrates that the bar elevation after the bar is replenished will be the same as the bar before extraction;

d) A planimetric map showing the aerial extent of the excavation and extent of the riparian buffers;

e) A planting plan developed by a plant ecologist familiar with the flora of the river for any areas such as roads that need to be restored;

f) Each EC holder shall have to undertake plantation of trees over at least 20% of the total area of the plot or plots of land as subject to such working in accordance with a plan approved by the concerned Divisional Forest Officer holding jurisdiction, provided further the competent authority l.e, The Divisional Forest Officer may fix up norms for plantation of trees in a particular area regarding choice of species, spacing, nos of trees and maintenance etc.

f) A monitoring plan has to establish.

13 Risk assessment and disaster management plan

Risk analysis is the systematic study of risks encountered during various stages of mining operation. Risk analysis seek to identify the risks involved in mining operations, to understand how and when they arise, and estimate the impact (financial or otherwise) of adverse outcomes. The sand mining operation in the district is mainly done manually.

13.1 Identification of risk due to river sand mining

There is no land degradation due to mining activities as mining is done only on river bed dry surface. There will be no OB or waste generation as the sand is exposed in the river bed and is completely saleable. There will be neither any stacking of soil nor creation of OB dumps. The mining activity will be carried out upto a maximum depth of 3m below the surface level. So there is no chance of slope failure, bench failure in the mines. However there are some identified risks in the mining activity which are as follows:

1. Accident during sand loading and transportation
2. Inundation/ Flooding
3. Quick Sand Condition

13.2 Mitigation measures

13.2.1 Measures to prevent accidents during loading and transportation:

- During the loading, trucks should be brought to a lower level so that the loading operation suits the ergonomic condition of the workers.
- The workers will be provided with gloves and safety shoes during loading.
- Opening of the side covers of the truck should be done carefully and with warning to prevent injury to the loaders.
- Mining operations will be done during daylight only.
- The truck will be covered with tarpaulin and maintained to prevent any spillage.
- To avoid danger while reversing the trackless vehicles especially at the embankment and tipping points, all areas for reversing of lorries should be made man free as far as possible.
- All transportation within the main working will be carried out directly under the supervision and control of the management.
- Overloading should not be permitted and the maximum permissible speed limit should be ensured.
- There will be regular maintenance of the trucks and the drivers will have valid driving license.

13.2.2Measures to prevent incidents during Inundation/ Flooding:

To minimize the risk of flooding/ inundation following measures should be under taken:

- Mining will be completely closed during the monsoon months.
- Proper weather information particularly on rain should be kept during the operational period of mines so that precautionary measures will be undertaken.

13.2.3 Measures for mitigation to quick sand condition:

- Quick sand zone and deep water zone will be clearly demarcated and all the mine workers will be made aware of the location.
- Mining will be done strictly as per the approved mining plan.

13.3 Disaster management plan

As the depth of mining will be maximum of 3m below the surface level considering local condition, the risk related to mining activity is much less. The mining operation will be carried out under the supervision of experienced and qualified Mines Manager having Certificate of Competency to manage the mines granted by DGMS. All the provisions of Mines Act 1952, MMR 1961 and MinesRules 1955 and other laws applicable to mine will strictly be complied. During heavy rainfall and during the monsoon season the mining activities will be closed. Proper coordination with Irrigation Department should be maintained so that at the time of releasing water, if any, from the dam suitable warning/information is given in advance. Special attention and requisite precautions shall be taken while working in areas of geological weakness like existence of slip, fault etc. The mining site will be supplied with first aid facilities and the entire mines worker will have access to that.

14 Conclusions and Recommendations

The District Survey Report has been prepared in conformity with the S O 141 (E), S O 3611 (E) and other sand mining guidelines published by MoEF&CC time to time as well as the requirement specified in WBMMCR, 2016.

Potential areas of economic mineralization and mineral deposition have been identified and list is furnished in the report. Estimation of annual sand deposition by replenishment study has been incorporated in the report.

The district survey report has been prepared by utilizing both primary and secondary data. The primary data generation involved the satellite imagery study, site inspection, survey, ground truthing etc. while secondary data has been acquired through various authenticated sources and satellite imagery studies.

The land of Purba Bardhaman district is a quaternary alluvial deposition and alluvial plain of the district divided into four prominent topographical regions. In the north, the Kanksa Ketugram Plain, Bardhaman Plain occupies the central area of the district, with the Damodar on the south and the south-east. On the southern part is the Khandaghosh Plain. The Damodar, Ajay, Hoogly and Dwarakeswar Rivers are the important rivers of Purba Bardhaman district.

In Purba Bardhaman district, as per the report published by Directorate of Mines and Minerals, Government of West Bengal, there is no major minerals deposits noted. The district is having riverbed deposits which are generating revenue for the district mainly. Presence of lateritic deposits at the western part of the district also marked as a potential zone for mining.

The district is generating considerable revenue from mining of minor minerals such as riverbed sand deposits. Revenue generated in the district of Purba Bardhaman from Minor minerals during the period of April 2017 to September 2021 is Rs. 79.77 crores.

The district has an upside potential for development of riverbed sand. The occurrence has been reported by Directorate of Mines and Minerals, Government of West Bengal and others in previous instances. It requires further systematic and scientific approach to quantify the resource along with their grade assessment. The occurrences are mostly observed in the river Damodar and Ajay River. This report also recommends undertaking detail exploration (G2 level) program to assess the mineral occurrences in the major rivers of the district and should have a proper development and production plan for the specified minerals.

14.1. Conclusion

I. The river beds of the district are enriched with sand which is highly potential for mining.

II. The replenishment study has been carried out during the preparation of this DSR. Both field-based surveys coupled with satellite imagery study and empirical studies were carried out to determine the rate of replenishment in each river of the district.

III. The determined values of various methods as adopted for replenishment study gives a comparable value and in all cases the values are found to be much more as compared to the capping limit (60%) as suggested in the Enforcement & Monitoring Guidelines for Sand Mining (EMGSM) January 2020, Issued by Ministry of Environment, Forest and Climate Change (MoEF&CC) 2020.

IV. Field base study shows variation of replenishment from 97.4 to 98.5% in the district and for theoretical replenishment study based on mining lease shows variation from 70% to 77.50% with an average of 74% of replenishment rate in the district.

V. The total potential river bed deposit for the district comes to about 44.21 Mcum.

14.2. Recommendation:

1. The mining lease distribution for the district must be carried out by involving a district level committee constituted with inter-disciplinary members of various departments including irrigation and waterways, DL&LRO, forest, biodiversity, wetland management, SWID or any other relevant department which the district authority may find suitable to include.
2. While recommending for Mining Leases, the District Level Committee should ensure the protection of Biodiversity Zones as recorded by relevant Government Agenesis from time to time.
3. During finalization of mining leases for the district, strict adherence of Supreme Court orders No 1501 dated 03/06/2022 should be followed.
4. Efforts should be given to restrict distribution of mining leases along the confluence zone of the rivers where rich aquatic habitats are reported.
5. Since the state of West Bengal has royalty system in volumetric measurement, specific gravity for sand and gravel has not been determined during this study. However, during the finalization of mining lease if it is found necessary to conduct such test may be initiated by the state government on case-to-case basis.
6. It is recommended to have a periodical review along with primary data collection during pre - and post-monsoon periods to record the seasonal variance of the sedimentation rate on annual basis and update replenishment rate of the district.

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PLATE 1

DRAINAGE MAP OF THE DISTRICT

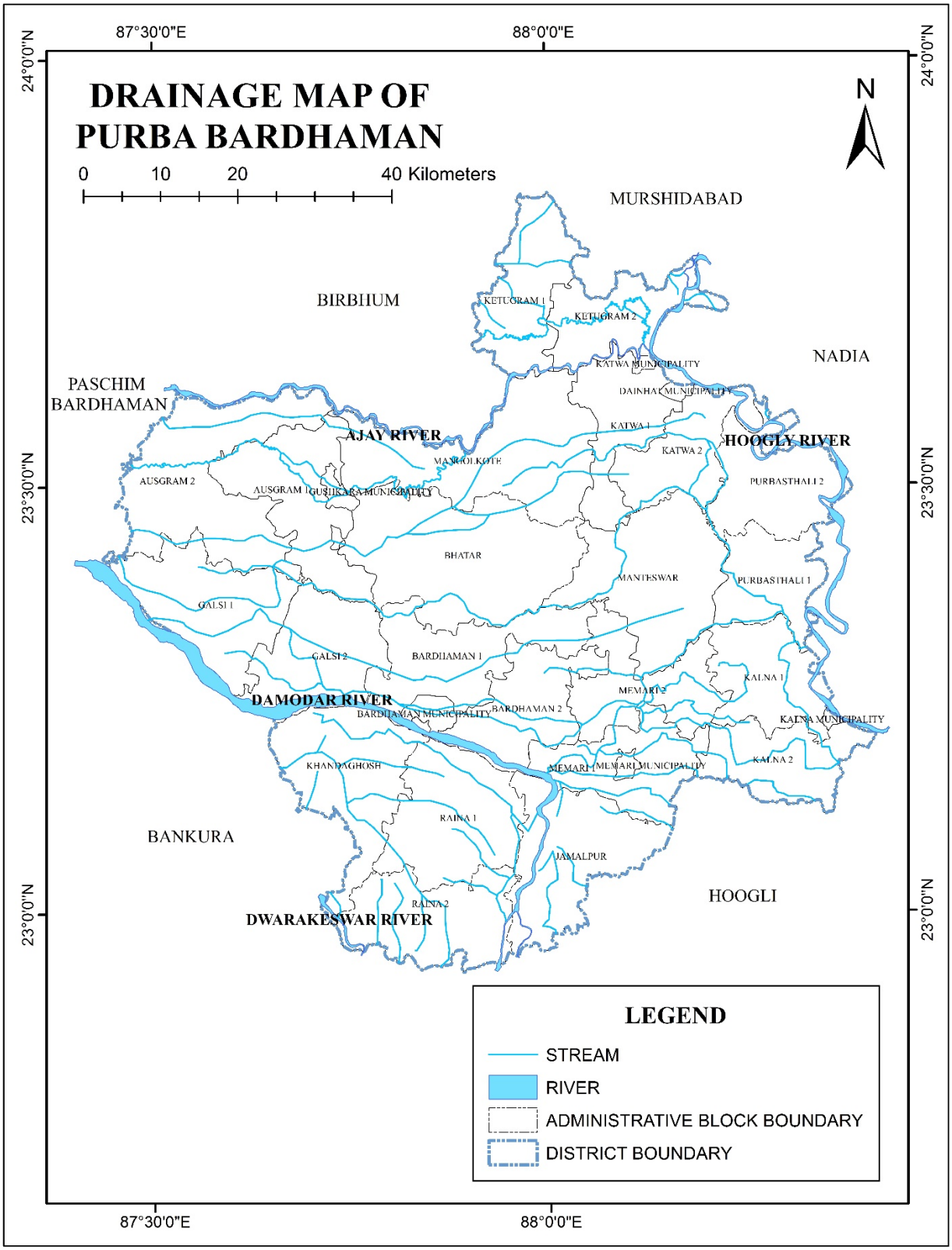
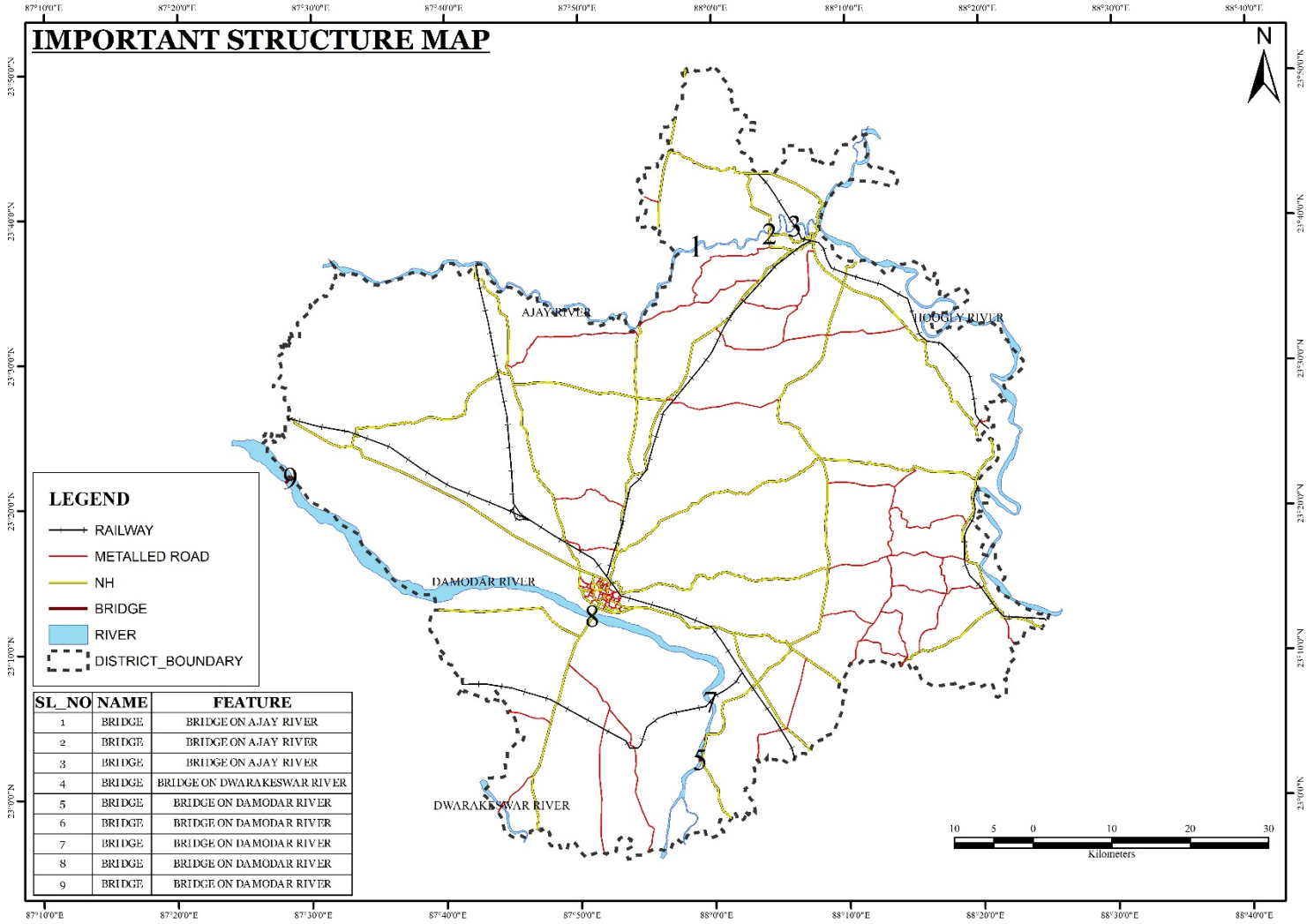


Plate 1A: Drainage Map of the District *(Source: National Informatics Centre -NIC Website, Sept 2020)*



SL_NO	NAME	FEATURE
1	BRIDGE	BRIDGE ON AJAY RIVER
2	BRIDGE	BRIDGE ON AJAY RIVER
3	BRIDGE	BRIDGE ON AJAY RIVER
4	BRIDGE	BRIDGE ON DWARAKESWAR RIVER
5	BRIDGE	BRIDGE ON DAMODAR RIVER
6	BRIDGE	BRIDGE ON DAMODAR RIVER
7	BRIDGE	BRIDGE ON DAMODAR RIVER
8	BRIDGE	BRIDGE ON DAMODAR RIVER
9	BRIDGE	BRIDGE ON DAMODAR RIVER

Plate No 1B: Location Map of dams, barrages, bridge showing on drainage system of the district *(Source: National Informatics Centre -NIC Website, Sept 2020)*

PLATE 2A

DISTRIBUTION MAP OF SAND BARS ON RIVERS DURING PRE-MONSOON PERIOD OF PURBA BARDHAMAN DISTRICT

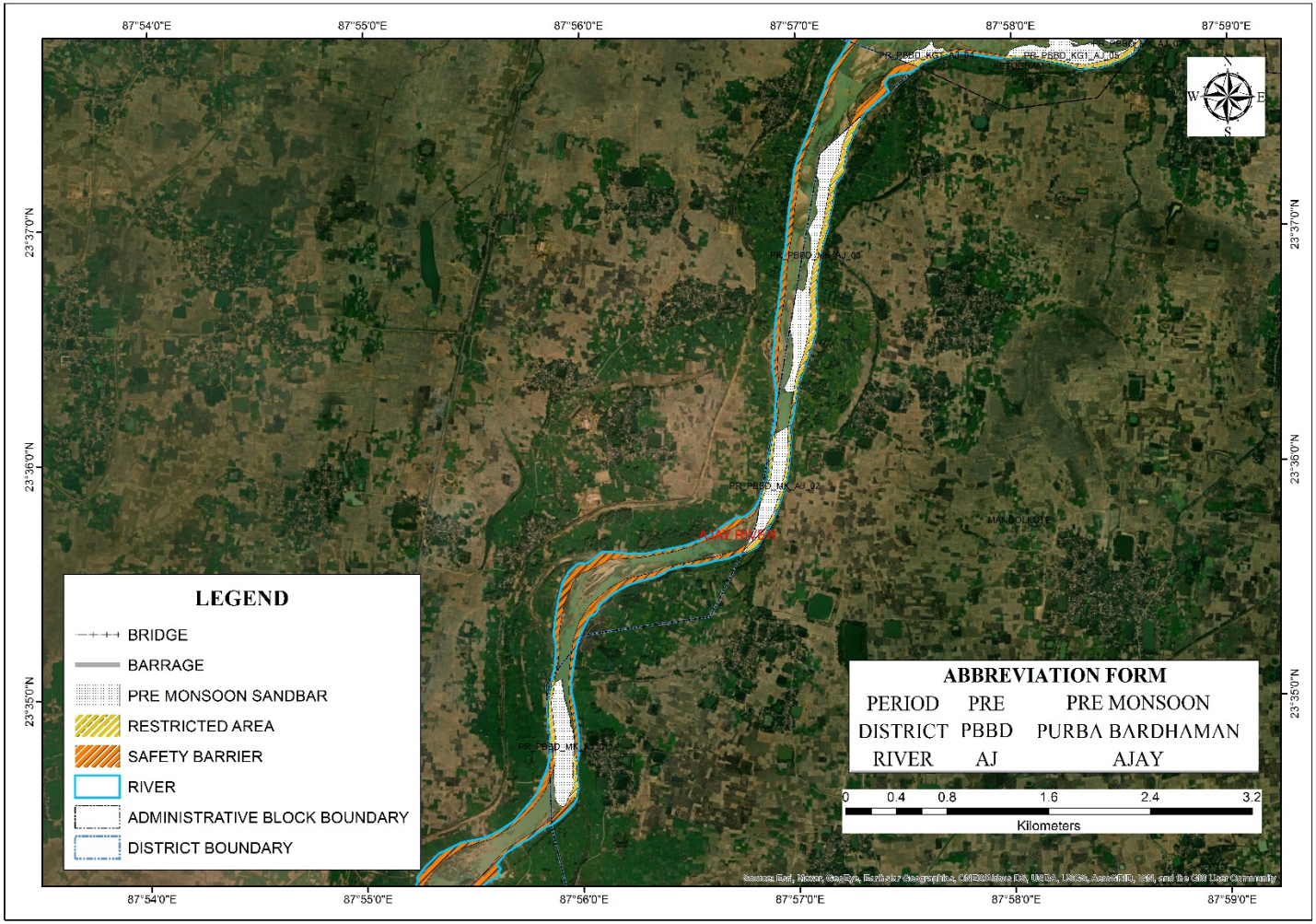


Plate 2A1: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

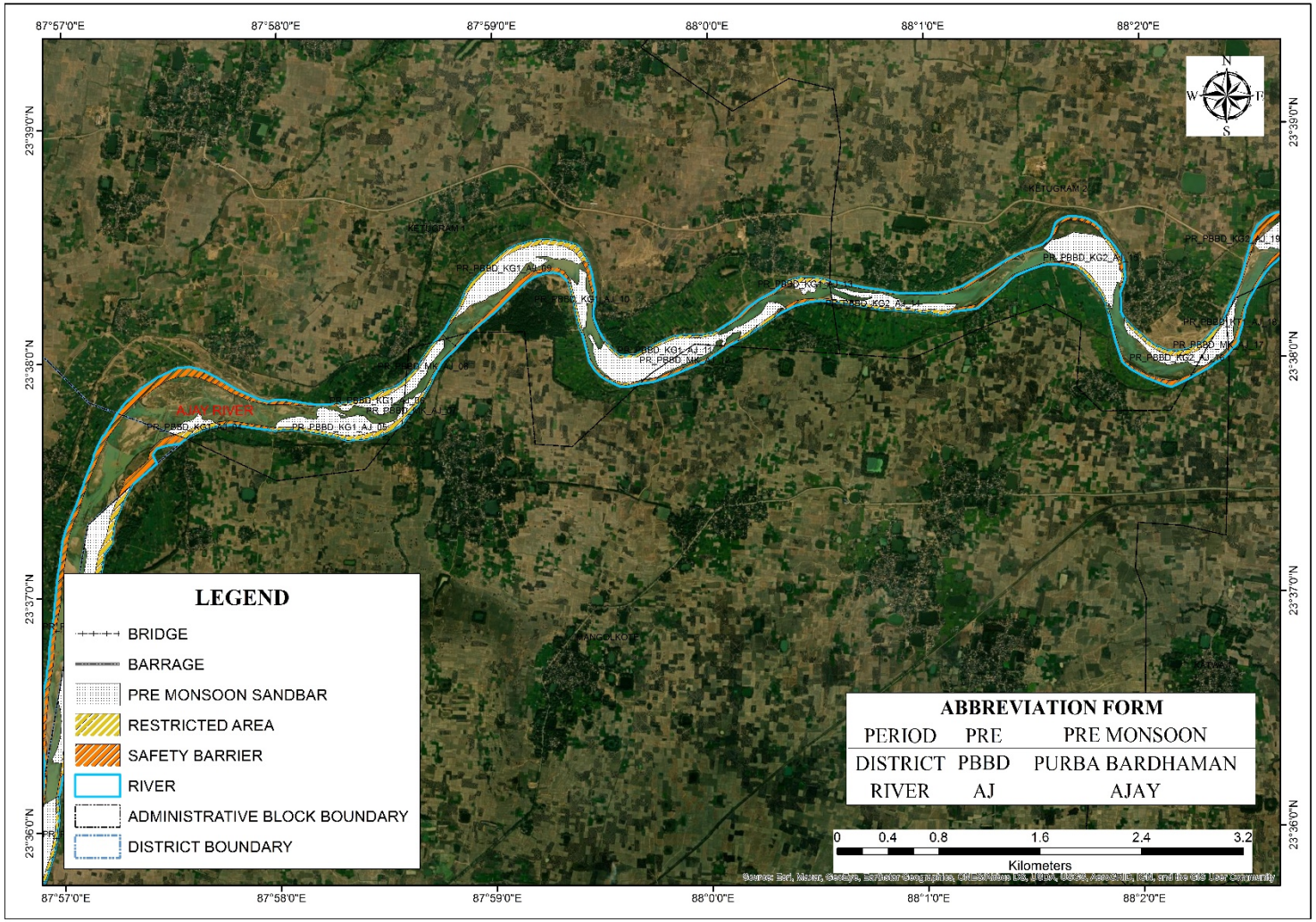


Plate 2A2: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

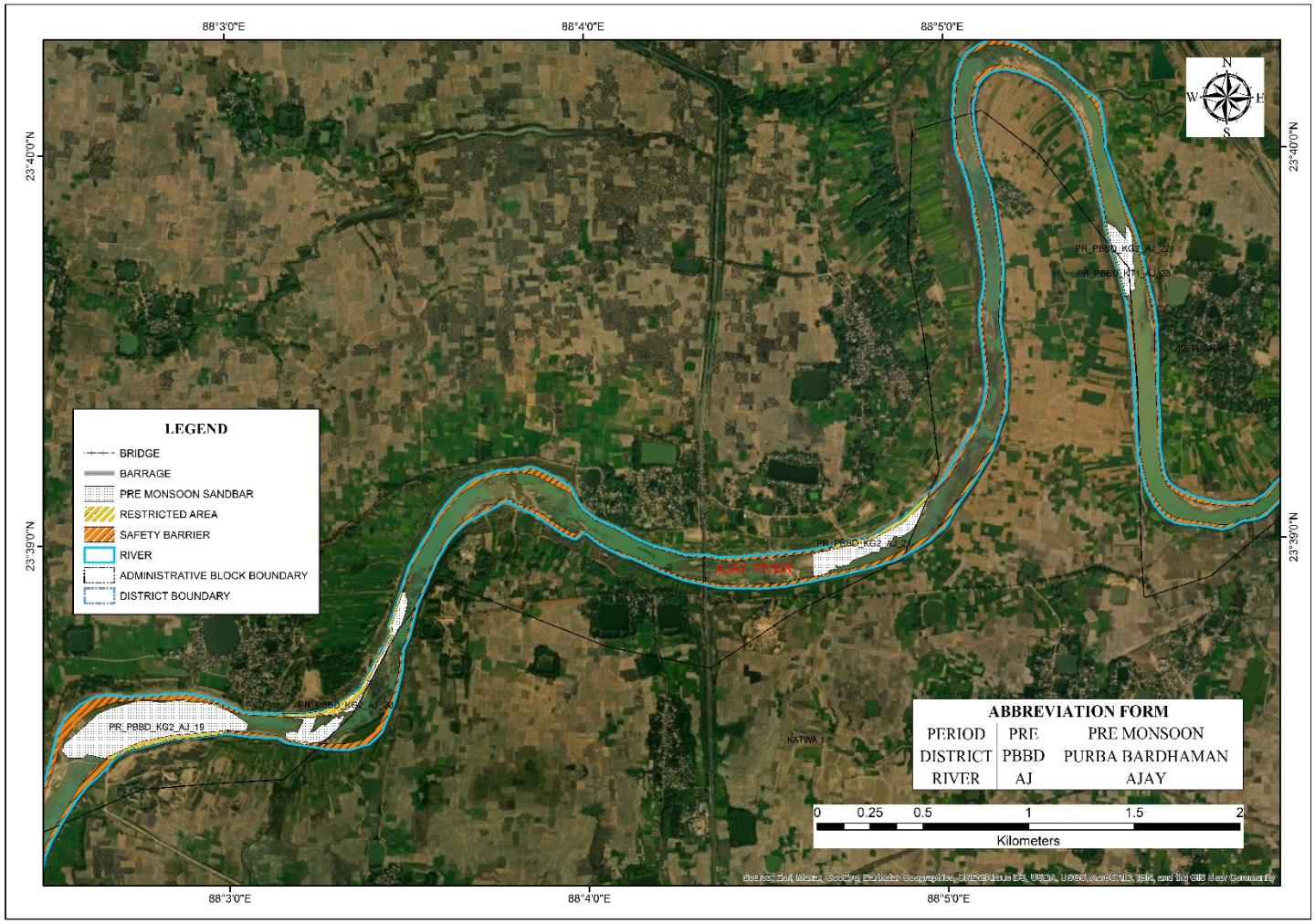


Plate 2A3: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

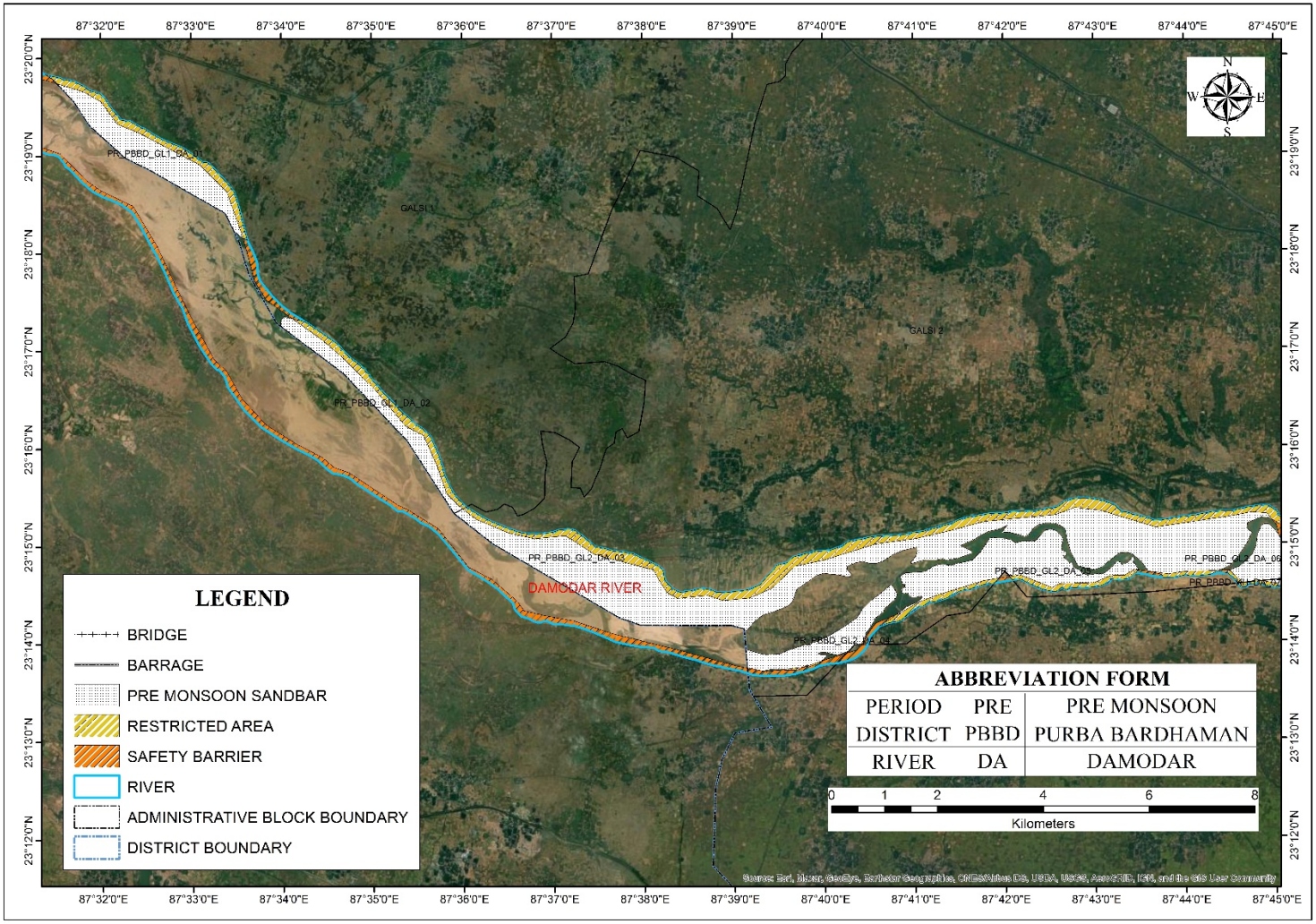


Plate 2A4: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

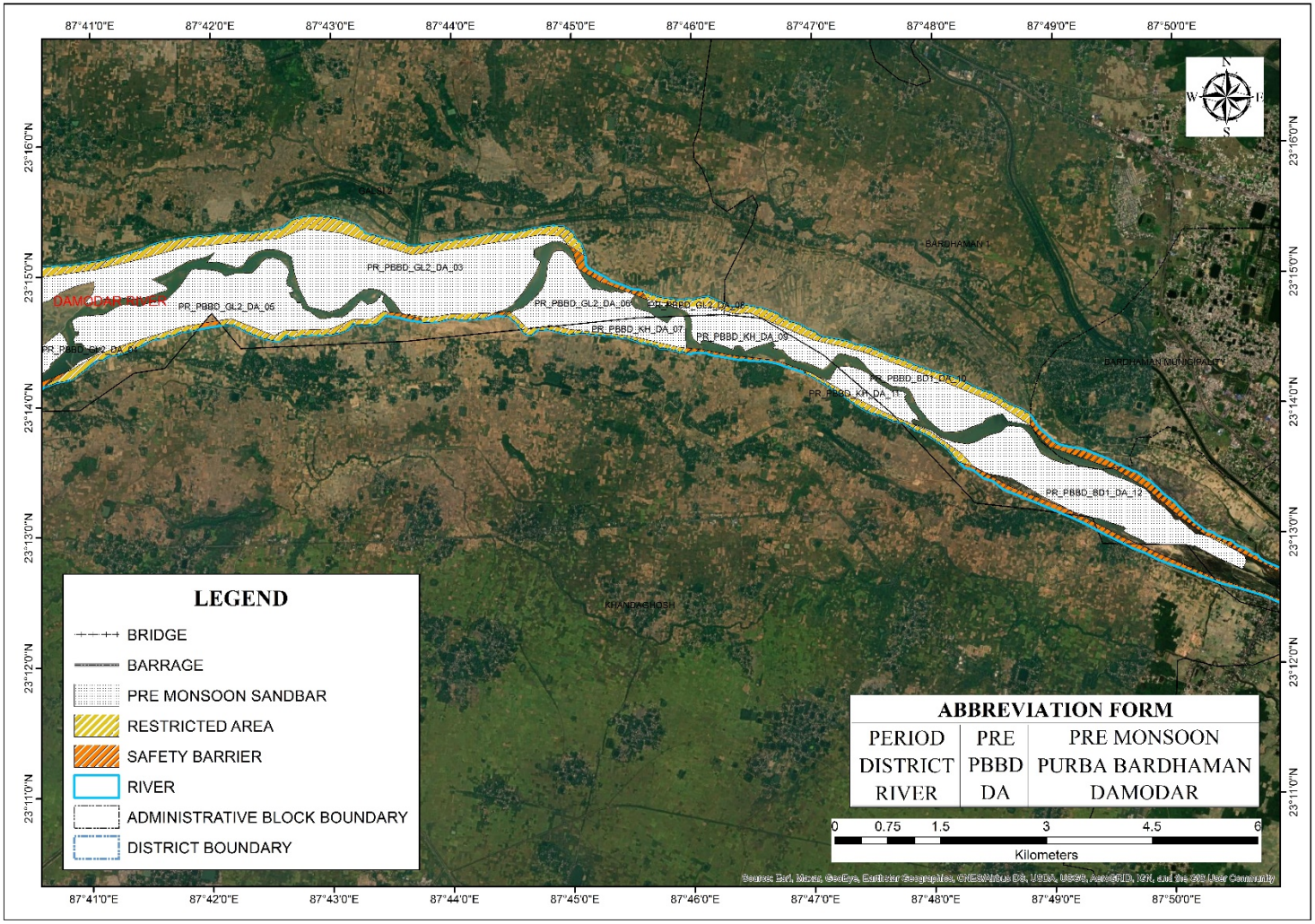


Plate 2A5: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

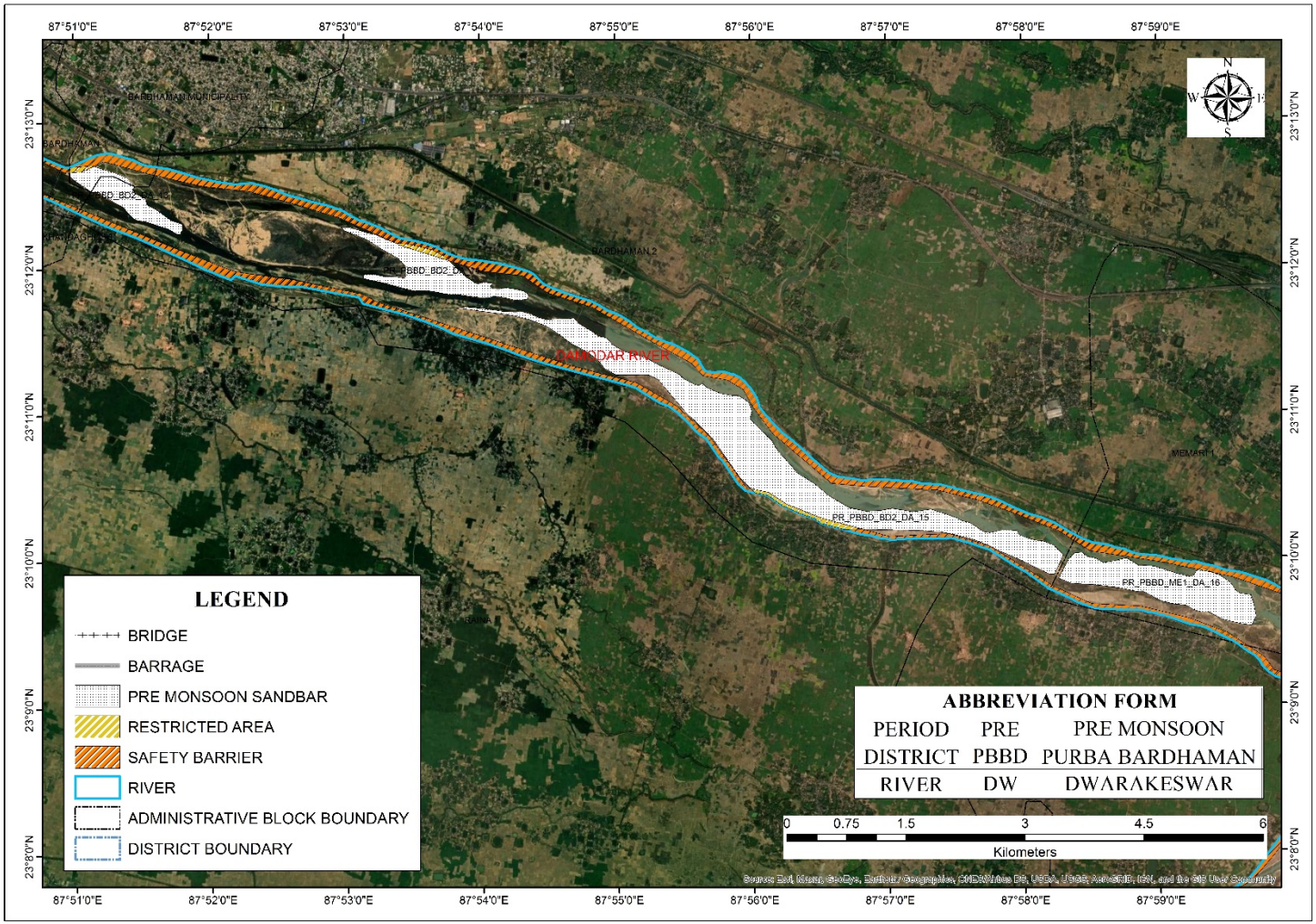


Plate 2A6: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

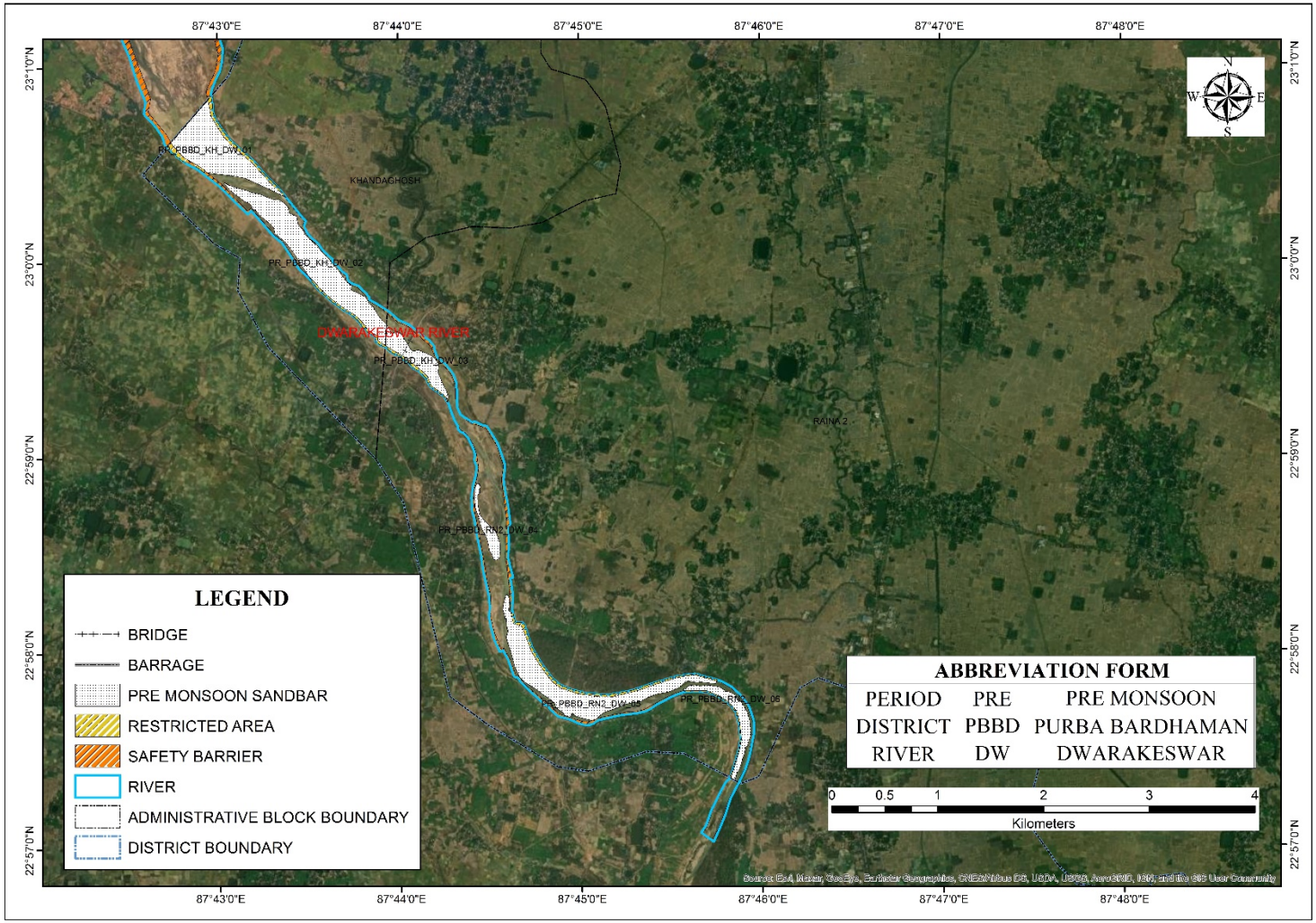


Plate 2A7: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

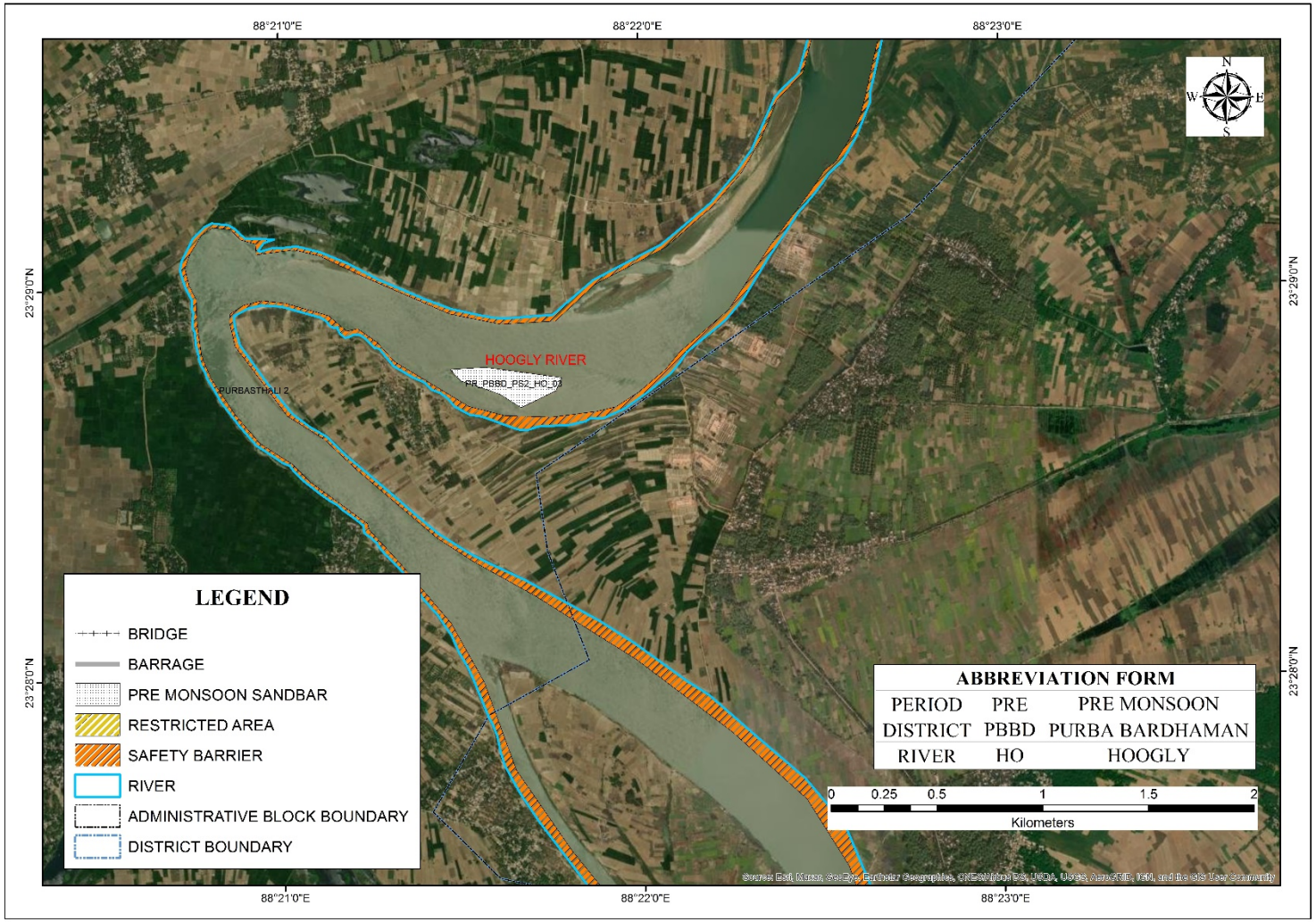


Plate 2A8: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

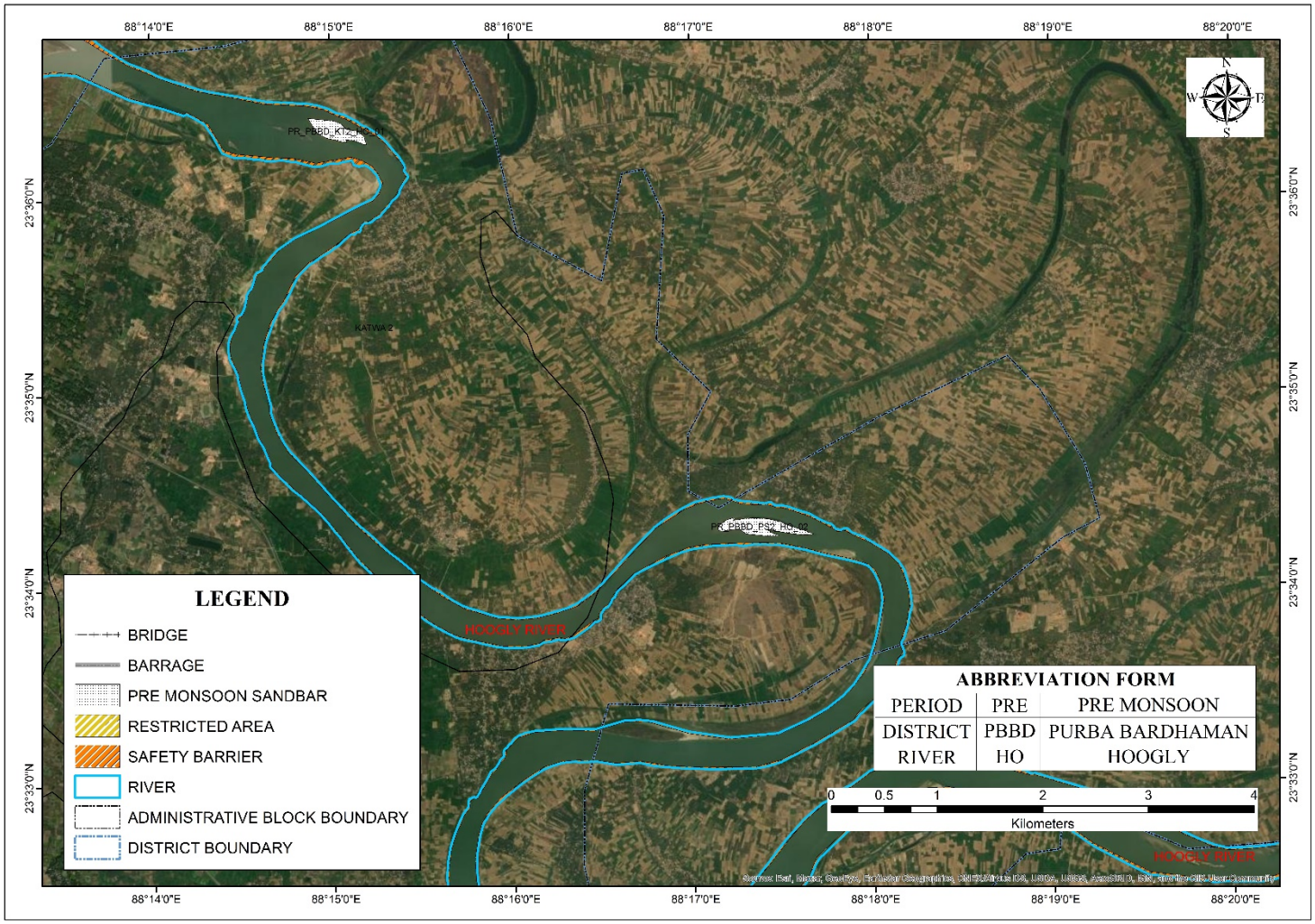


Plate 2A9: Distribution Map of Sand Bars on Rivers During Pre-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, March 2020)

PLATE 2B

DISTRIBUTION MAP OF SAND BARS ON RIVERS DURING POST-MONSOON PERIOD OF PURBA BARDHAMAN DISTRICT

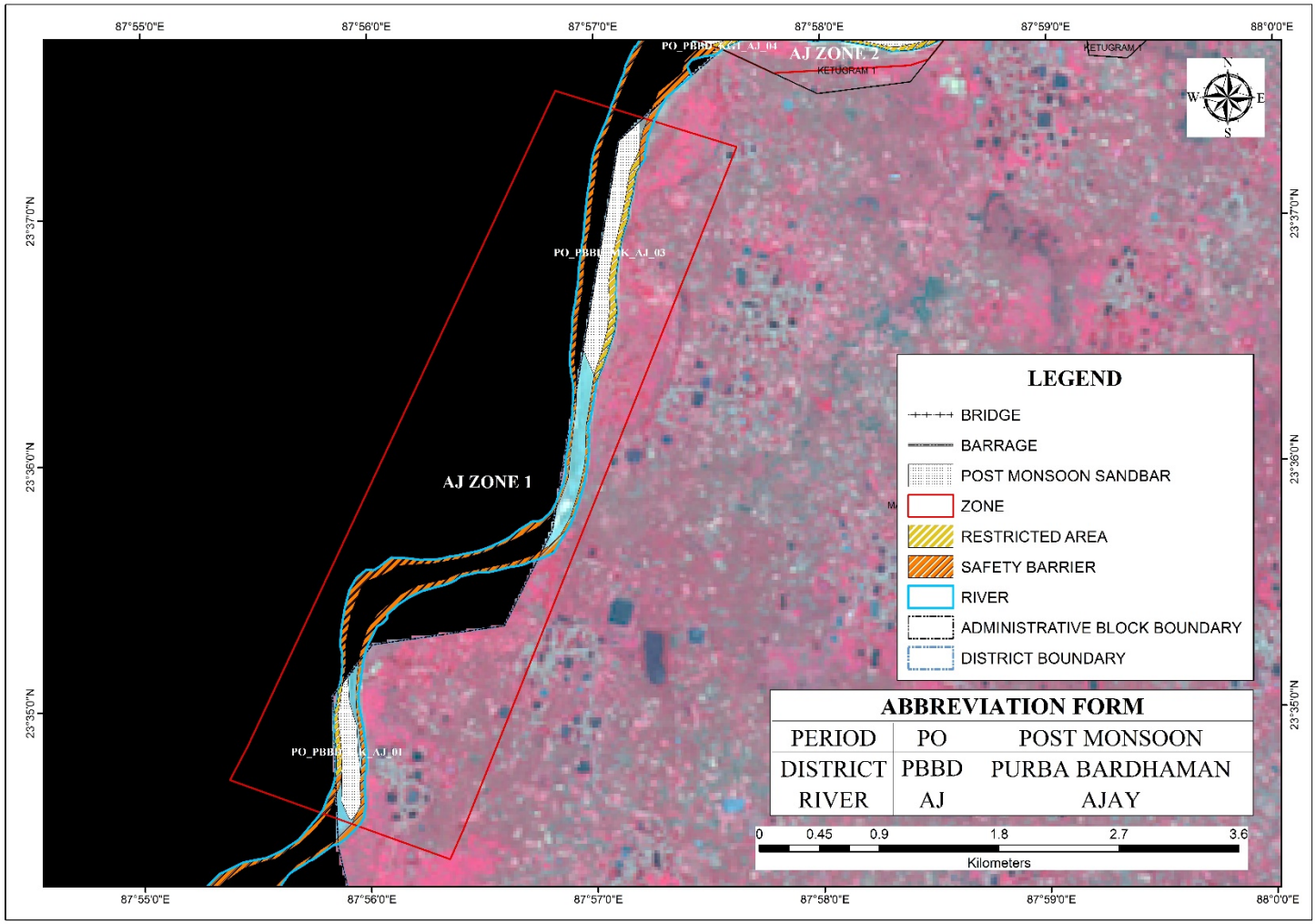


Plate 2B1: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

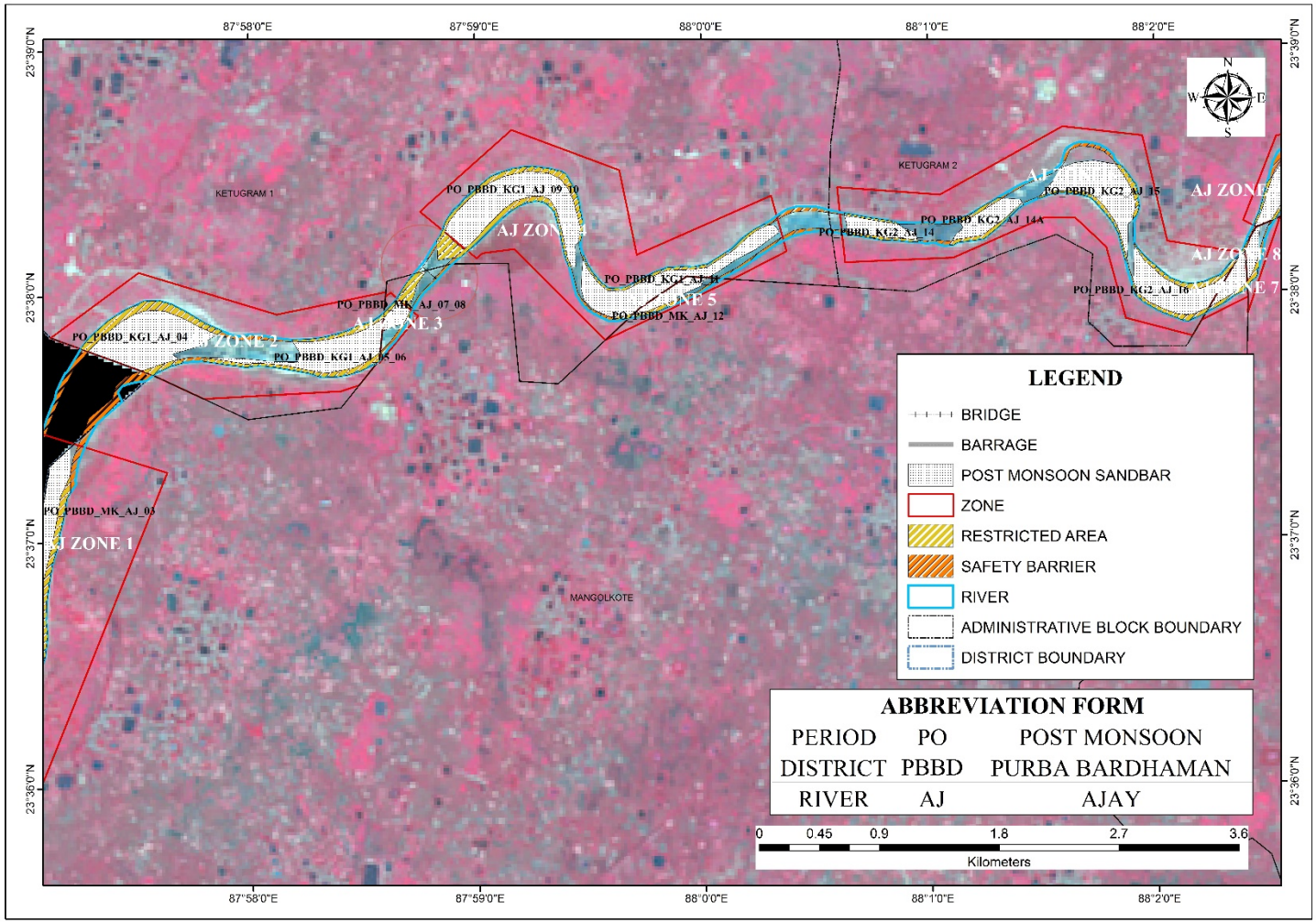


Plate 2B2: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

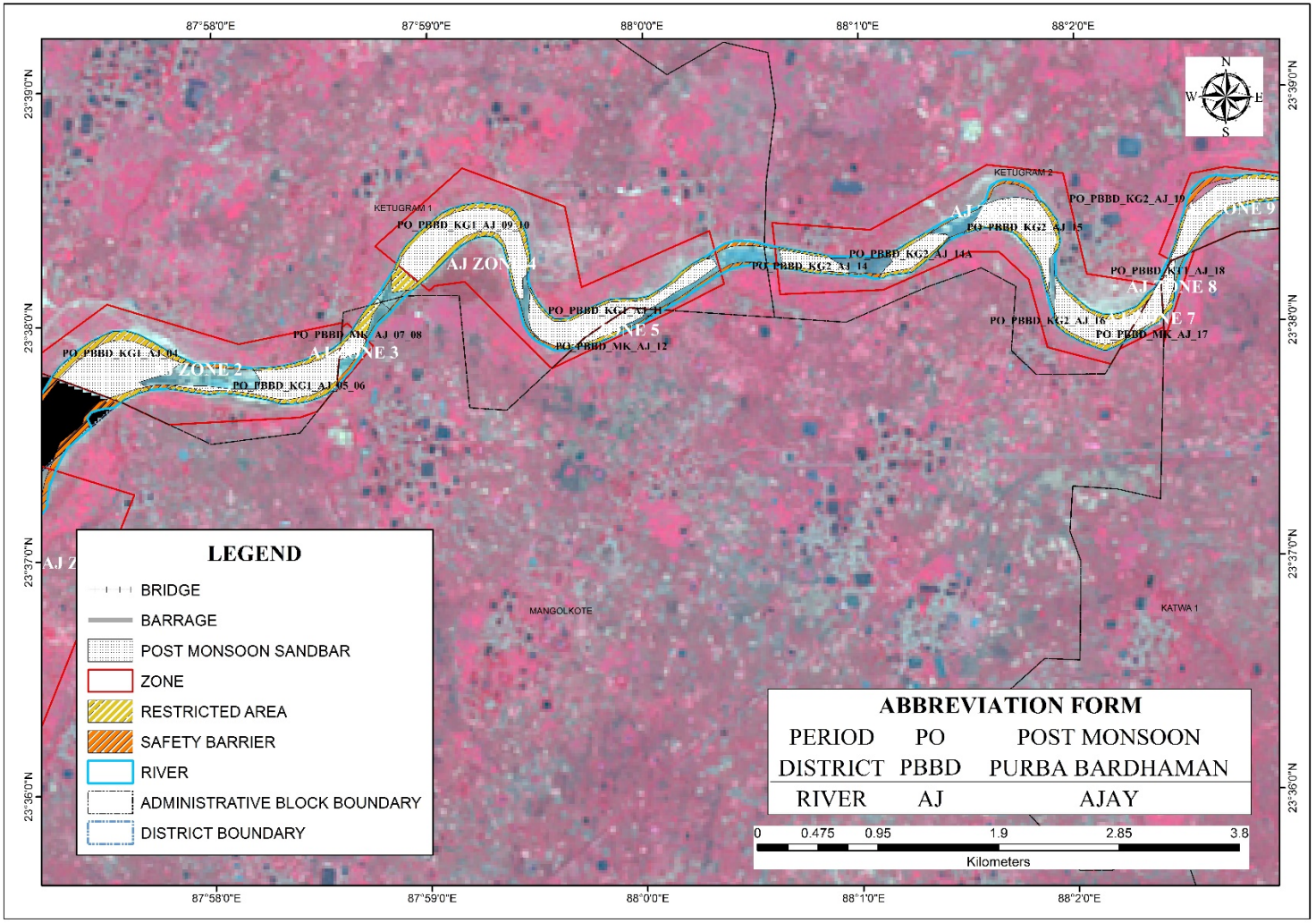
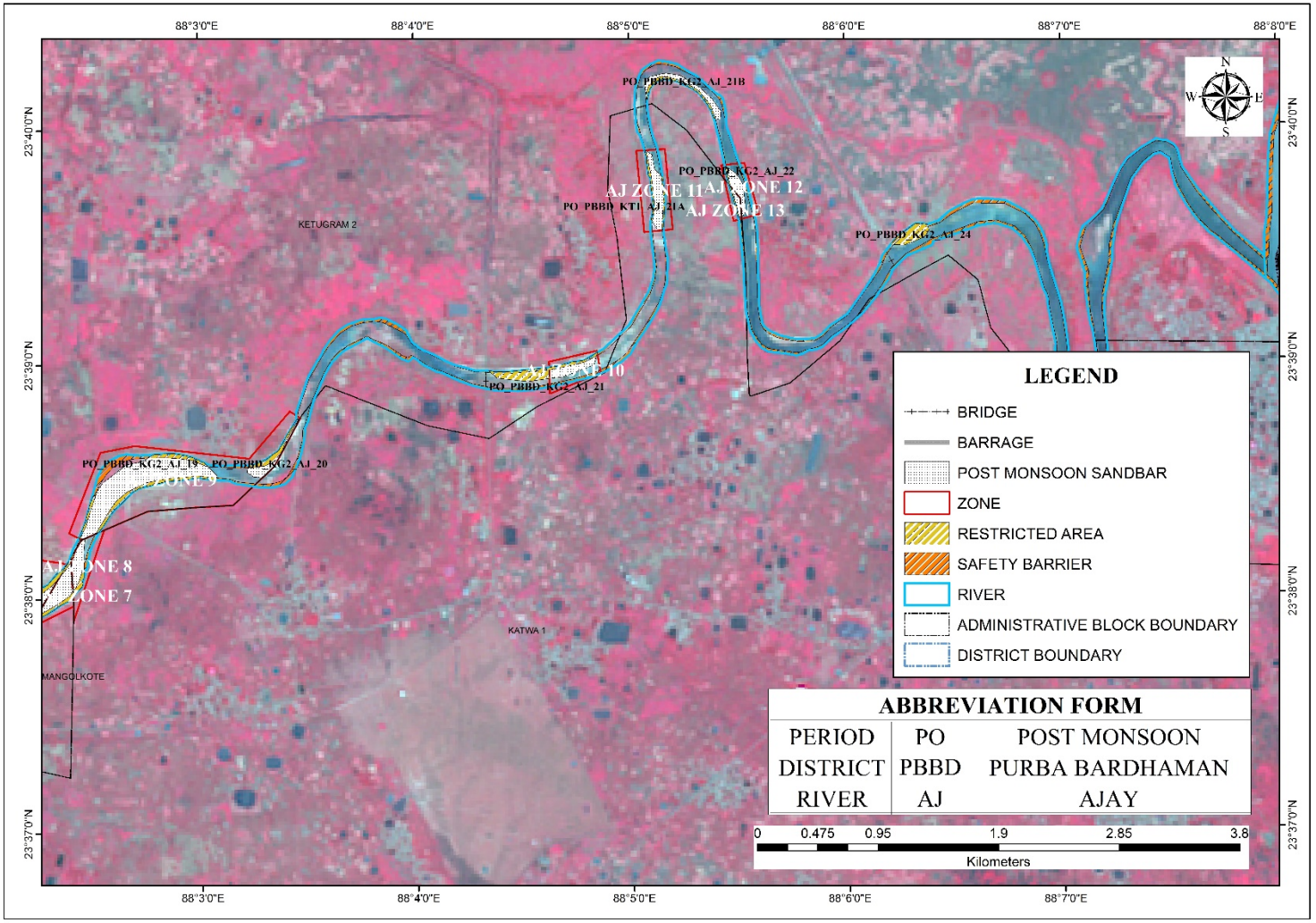


Plate 2B3: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)



\ Plate 2B4: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

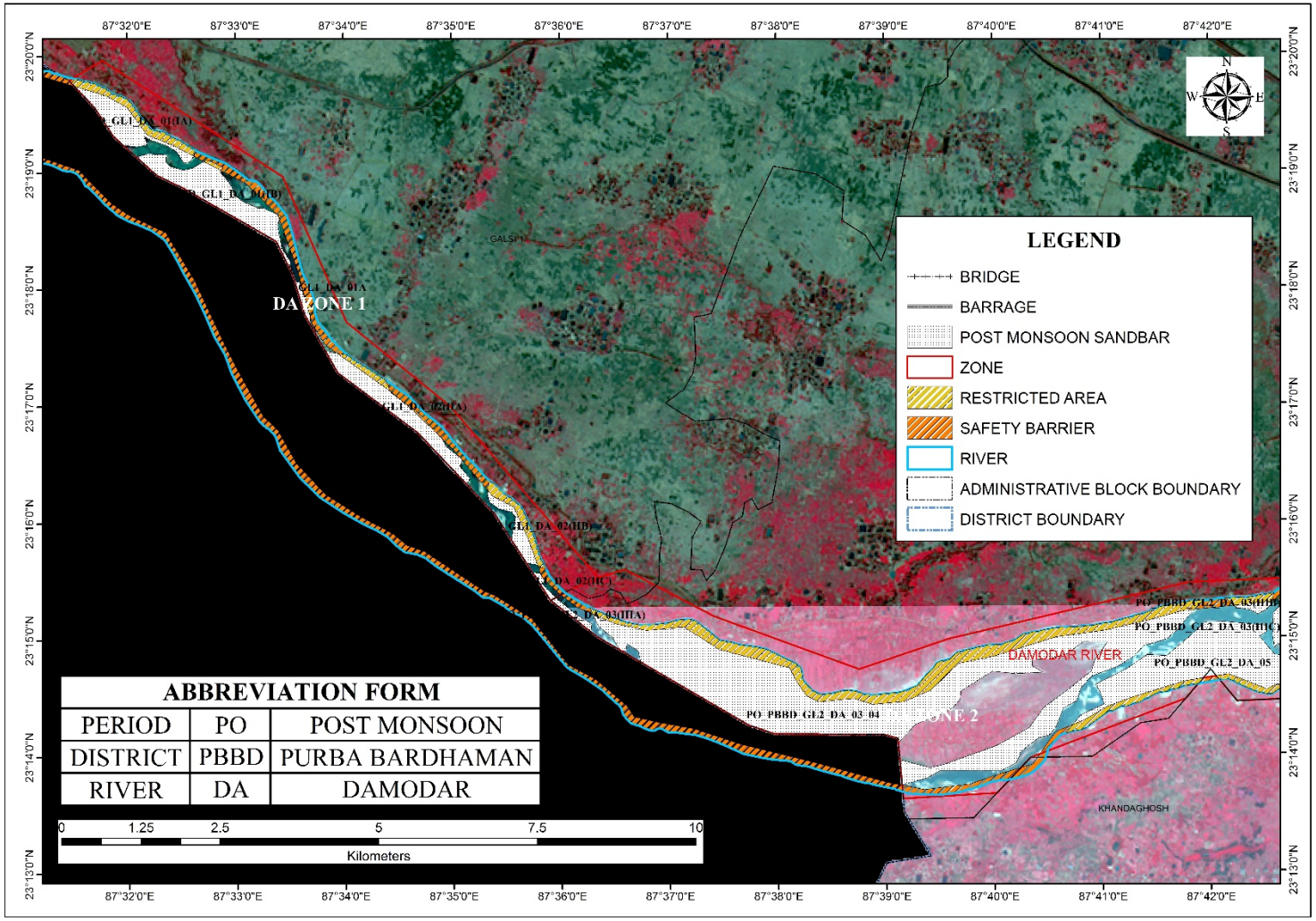


Plate 2B5: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

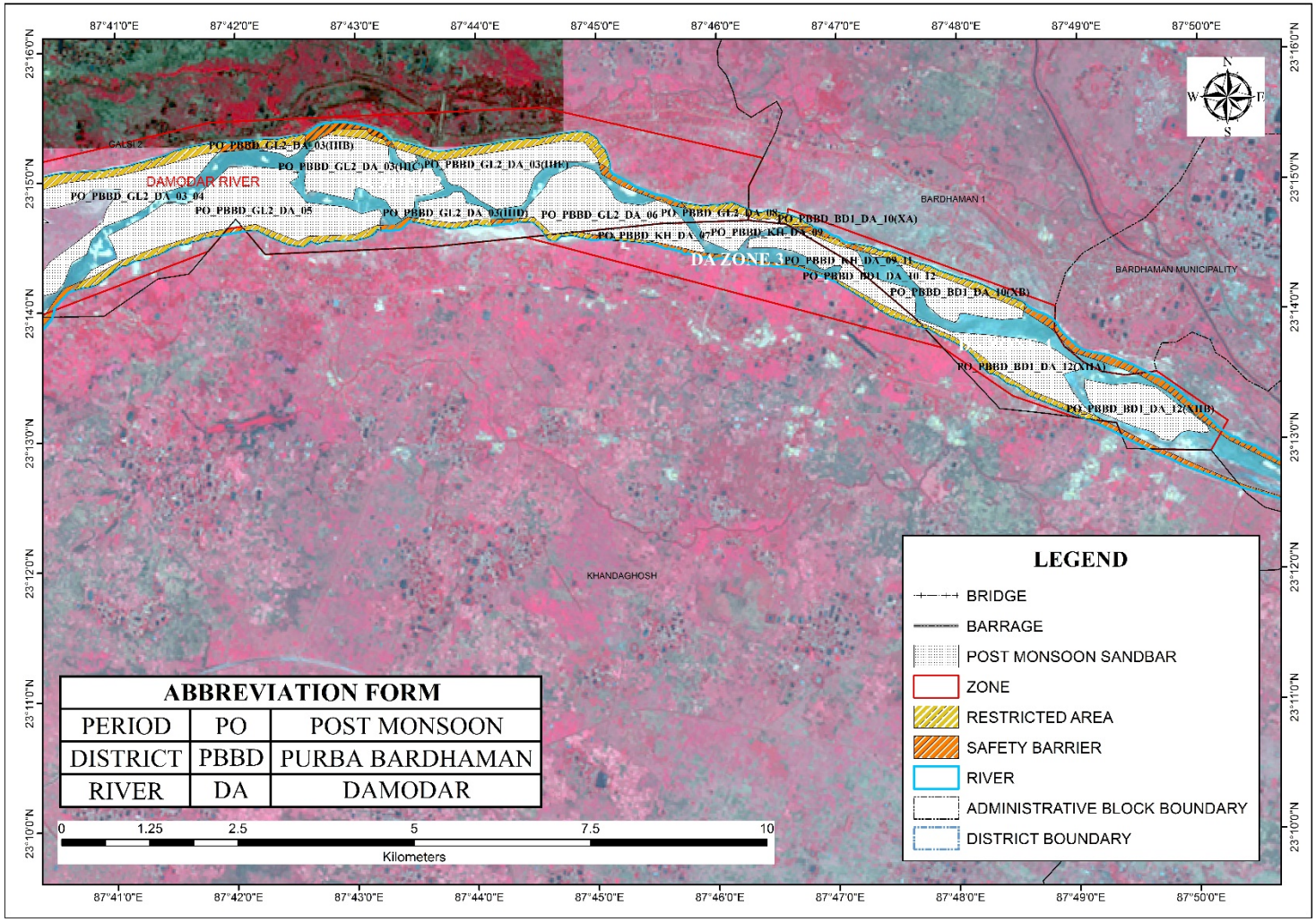


Plate 2B6: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

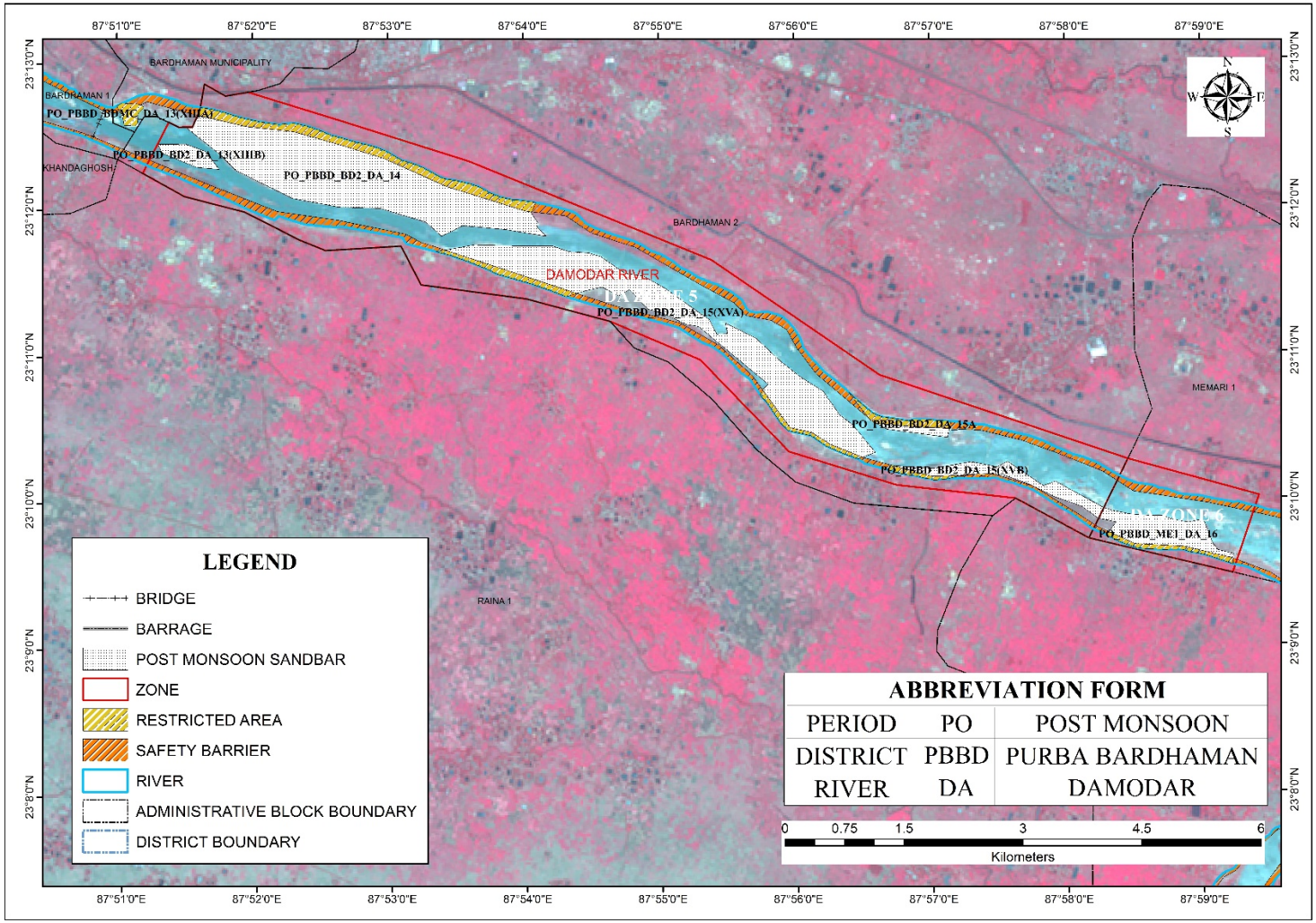


Plate 2B7: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

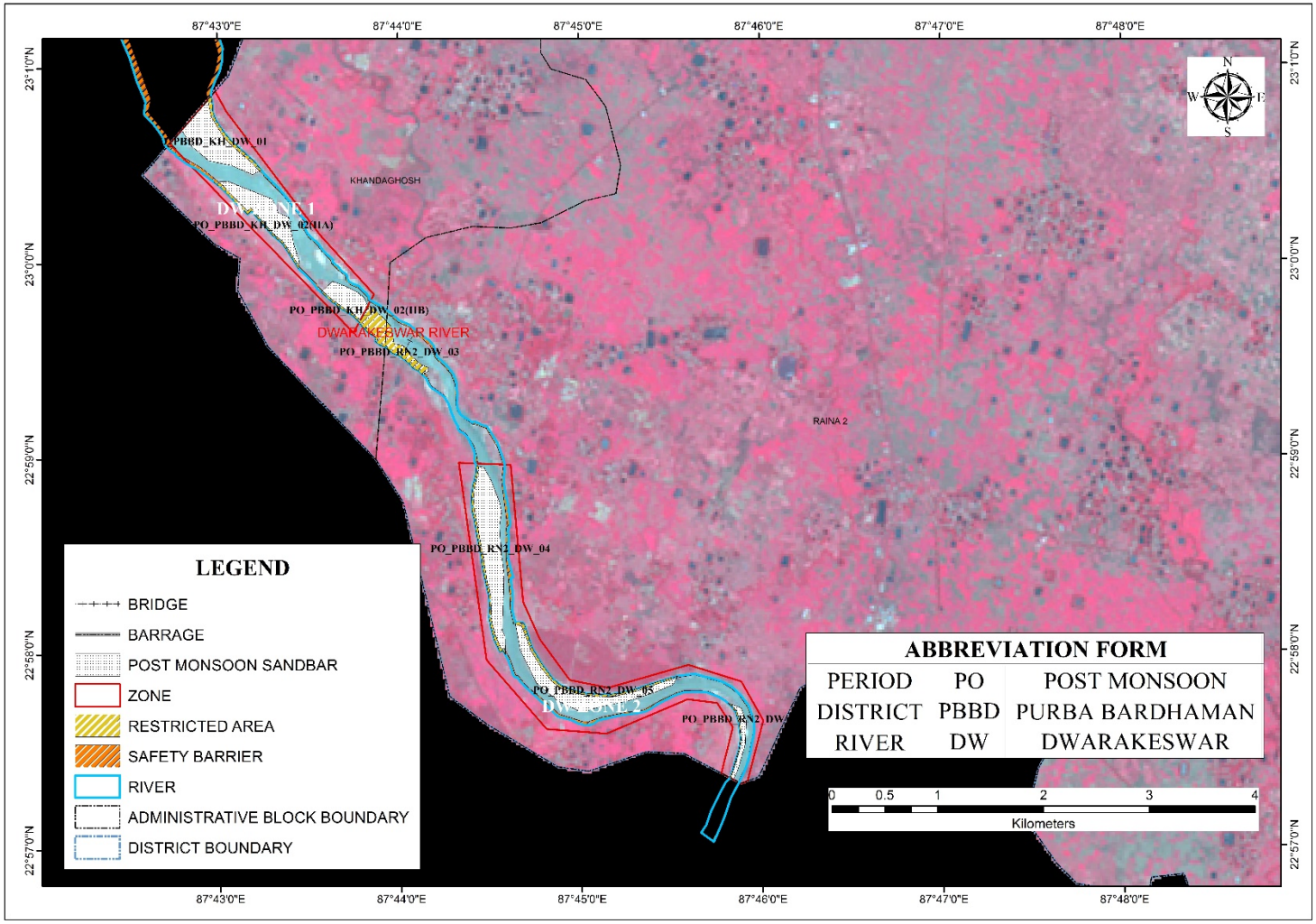


Plate 2B8: Distribution Map of Sand Bars on Rivers During Post-Monsoon Period of Purba Bardhaman District
(Source: ISRO RESOURCE Sat 2 LISS III Sensor, November 2020)

PLATE 3

WATERSHED MAP OF THE DISTRICT

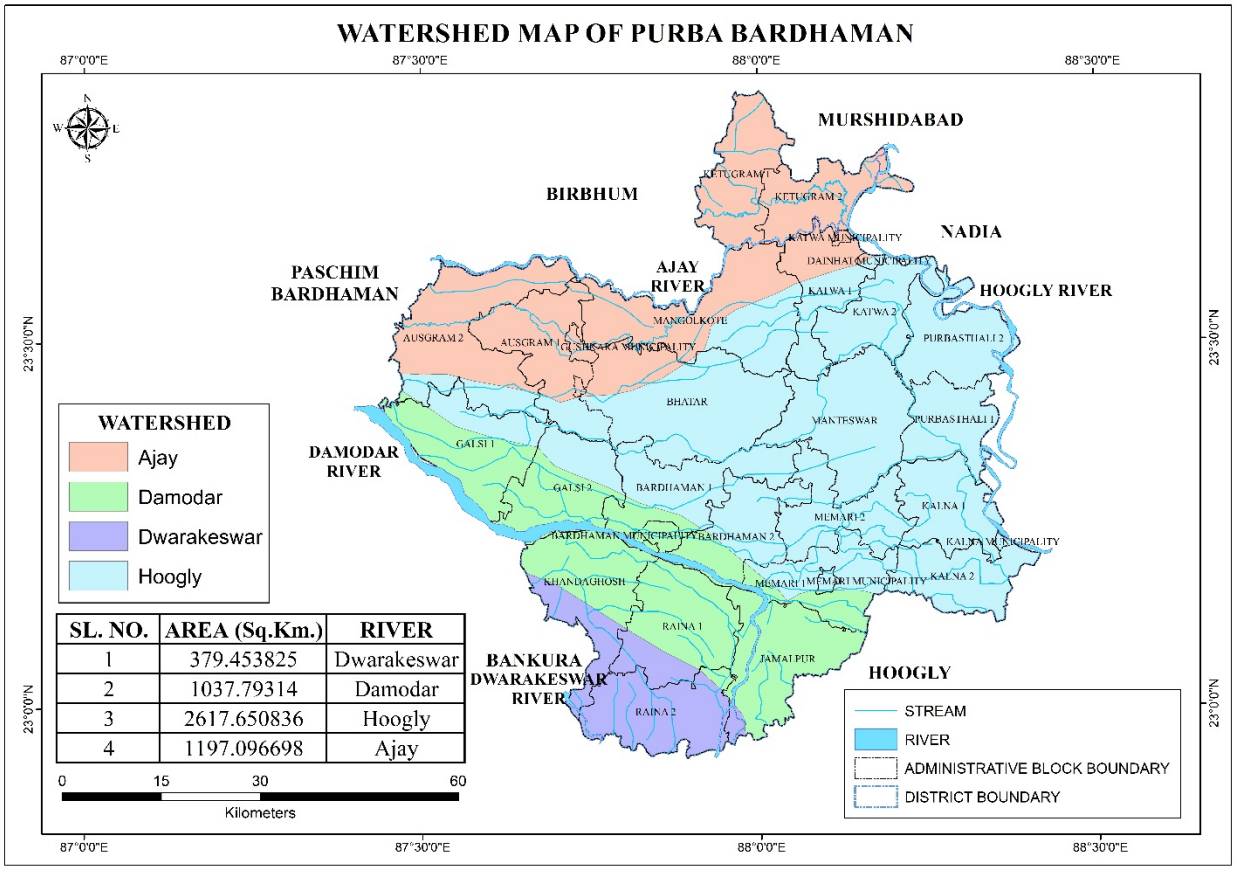


Plate 3A: Watershed Map of Purba Bardhaman District *(Source: World Wild Fund for Nature, September 2020)*

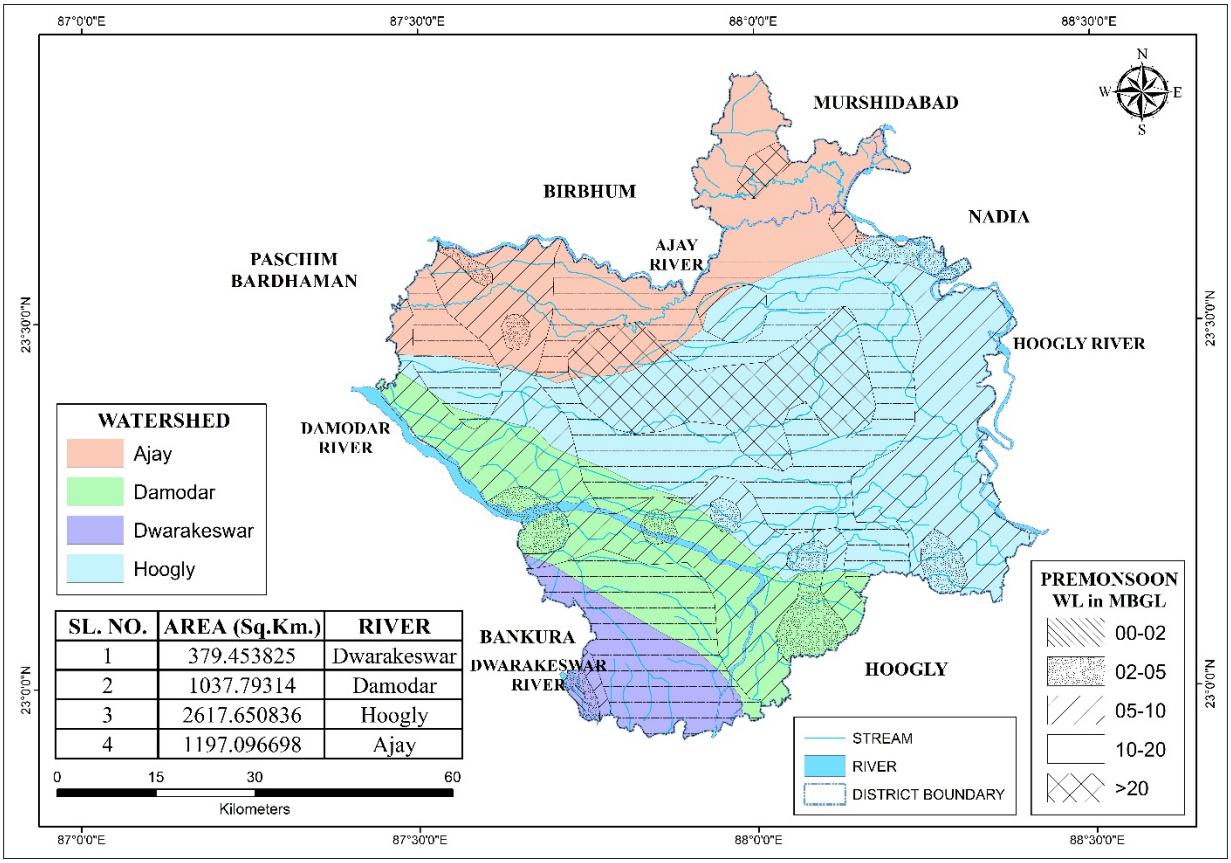


Plate 3B: District Watershed map showing ground water level during Pre-monsoon period *(Source: World Wild Fund for Nature, September 2020)*

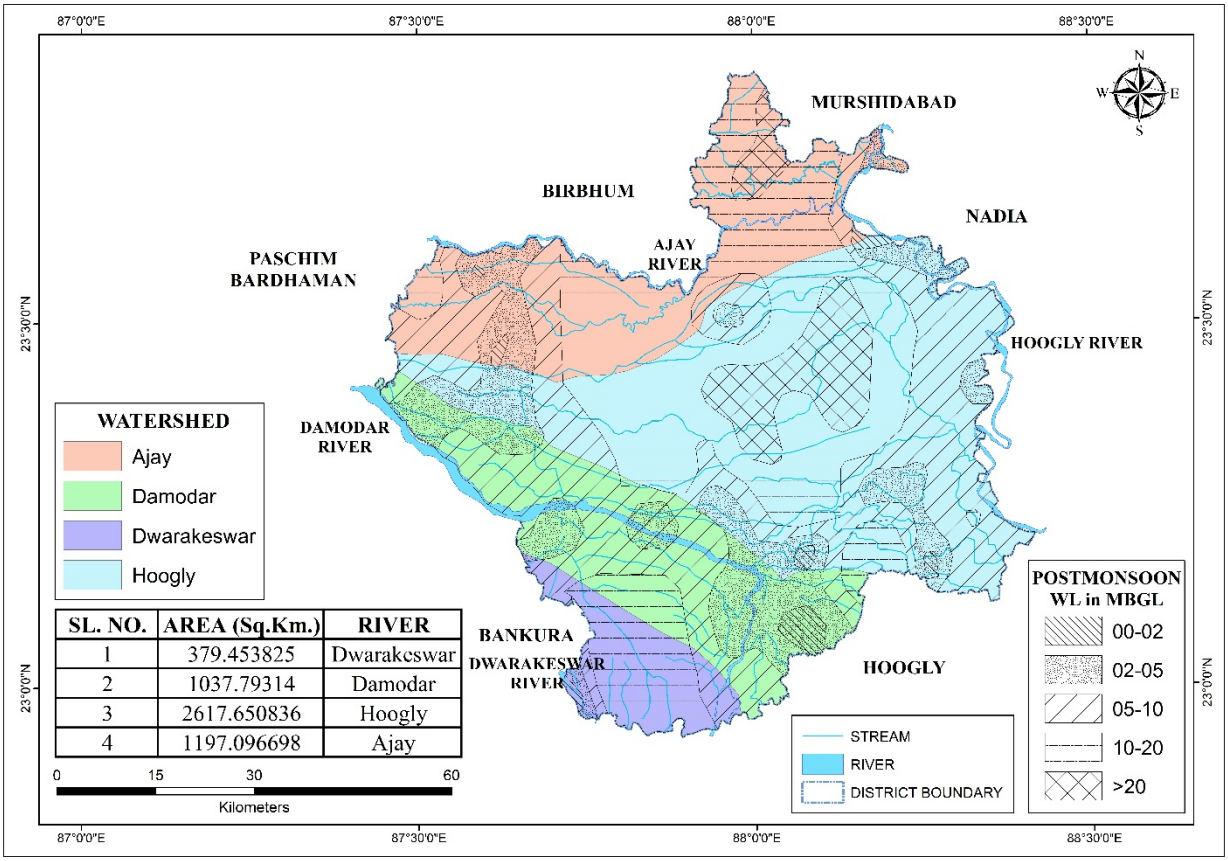


Plate 3C: District Watershed map showing ground water level during Post-monsoon period *(Source: World Wild Fund for Nature, September 2020)*

PLATE 4

FIELD SURVEY PHOTOGRAPHS

	
4A: Picture of Damodar Riverbed deposit (Date: 16-05-22, Lat: 23° 14' 12" N and Long: 87° 47' 59" E)	**4A: Picture of Dwarakeswar Riverbed deposit (Date: 16-05-22, Lat: 22° 57' 33" N and Long: 87° 45' 52" E)**

PLATE 5

LONG TERM EROSION-ACCRETION MAP OF RIVER BANK

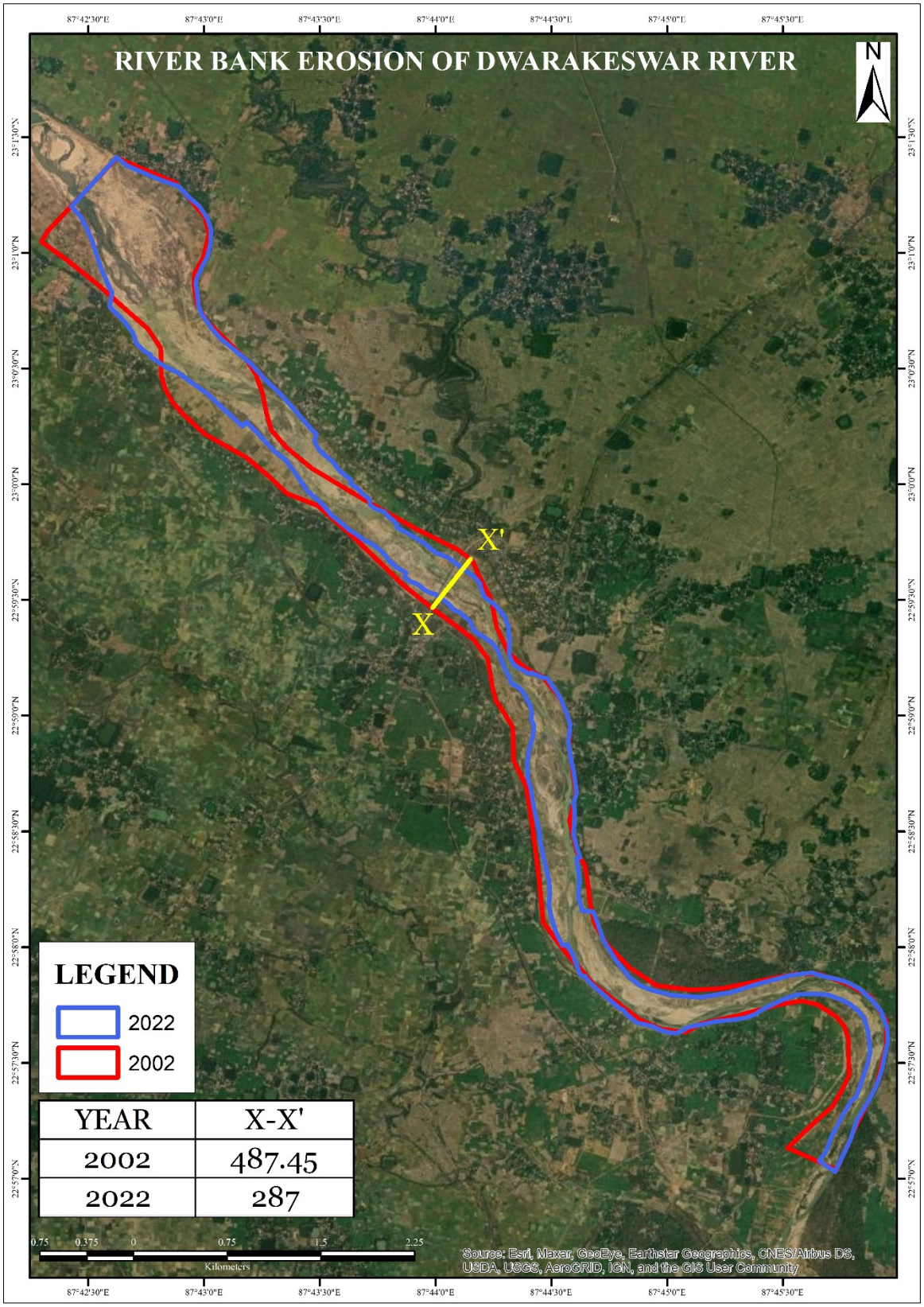


Plate 5: Map showing long-term (10-year or more) erosion-accretion areas on both the banks of Dwarakeswar River, Purba Bardhaman
(Source: ISRO RESOURCE Sat 2 LISS III Sensor)

Annexure 1
Compliance as per Enforcement & Monitoring Guidelines for sand Mining, 2020 (MoEF& CC) for preparation of District Survey Report

Sl. No.	Particulars	Status
1	District Survey Report for sand mining shall be prepared before the auction/e-auction/grant of the mining lease/Letter of Intent (LoI) by Mining department or department dealing the mining activity in respective states.	Noted.
2	In order to make the inventory of River Bed Material, a detailed survey of the district needs to be carried out, to identify the source of River Bed Material and alternative source of sand (M-Sand). The source will include rivers, de-siltation of reservoir/dams, Patta lands/Khatedari Land, M-sand etc.	Complied with and explained in Chapter 7.
3	District Survey Report is to be prepared in such a way that it not only identifies the mineral-bearing area but also define the mining and no mining zones considering various environmental and social factors.	Complied with and furnished in pg no 74-76.
4	Identification of the source of Sand & M-Sand. The sources may be from Rivers, Lakes, Ponds, Dams, De-silting locations, Patta land/Khtedari lands. The details in case of Rivers such as [name, length of river, type (Perennial or Non-Perennial), Villages, Tehsil, District], in case of Lakes, Ponds, Dams, De-silting locations [Name, owned/maintained by (State Govt./PSU), area, Villages, Tehsil, District] in case of Patta land/Khtedari lands [Owner Name, Sy No, Area, Agricultural/Non-Agricultural, Villages, Tehsil, District], in case of M-Sand Plant [Owner Name, Sy No, Area, Quantity/Annum, Villages, Tehsil, District], needs to be recorded.	Complied with and given in table 7.3.
5	Defining the sources of Sand/M-Sand in the district is the next step for identification of the potential area of deposition/aggradation wherein mining lease could be granted. Detailed survey needs to be carried out for quantification of minerals. The purpose of mining in the river bed is for channelization of rivers so as to avoid the possibility of flooding and to maintain the flow of the rivers. For this, the entire river stretch needs to be surveyed and original ground level (OGL) to be recorded and area of aggradation/deposition needs to be ascertained by comparing the level difference between the outside riverbed OGL and water level. Once the area of aggradation/deposition is identified, then the quantity of River Bed Material available needs to be calculated. The next step is channelization of the river bed and for this central ¾ th part of the river, width needs to be identified on a map. Out of the ¾ th part area, where there is a deposition/aggradation of the material needs to be identified. The remaining ¼ th area needs to be kept as no mining zone for the protection of banks. The specific gravity of the material also needs to be ascertained by analyzing the sample from a NABL accredited lab. Thus, the quantity of material available in metric ton needs to be calculated for mining and no mining zone.	Complied with and given in table 7.11.

Sl. No.	Particulars	Status
6	The permanent boundary pillars need to be erected after identification of an area of aggradation and deposition outside the bank of the river at a safe location for future surveying. The distance between boundary pillars on each side of the bank shall not be more than 100 meters.	Benchmark Pillars are established in strategic locations while boundary pillars will be fixed while fixation of the mining lease boundary subsequent to district level verification.
7	Identifying the mining and no mining zone shall follow with defining the area of sensitivity by ascertaining the distance of the mining area from the protected area, forest, bridges, important structures, habitation etc. and based on the sensitivity the area needs to be defined in sensitive and non-sensitive area.	Complied with and furnished in pg no 93 to 96.
8	Demand and supply of the Riverbed Material through market survey needs to be carried out. In addition to this future demand for the next 5 years also needs to be considered.	Complied with and given in pg no 8.
9	It is suggested that as far as possible the sensitive areas should be avoided for mining, unless local safety condition arises. Such deviation shall be temporary & shall not be a permanent feature.	Complied with and furnished in pg no 93 to 96.
10	Sand and gravel could be extracted from the downstream of the sand bar at river bends. Retaining the upstream one to two-thirds of the bar and riparian vegetation is accepted as a method to promote channel stability.	Noted. The DSR is compose of all the potential sand zones for defining the resources. In a subsequent phase blocking of potential zones shall be done in due consultation with the district level committee. The areas mentioned in the observation points shall be excluded while blocking of sand mining leases which are part of these potential zones marked in this DSR.
11	The final area selected for the mining should be then divided into mining lease as per the requirement of State Government. It is suggested the mining lease area should be so selected as to cover the entire deposition area. Dividing a large area of deposition/aggradation into smaller mining leases should be avoided as it leads to loss of mineral and indirectly promote illegal mining.	Shall be Complied with.
12	Cluster situation shall be examined. A cluster is formed when one mining lease of homogenous mineral is within 500 meters of the other mining lease. In order to reduce the cluster formation mining lease size should be defined in such a way that distance between any two clusters preferably should not be less than 2.5 Km. Mining lease should be defined in such a way that the total area of the mining leases in a cluster should not be more than 10 Ha.	Noted. Due care will be taken while distribution of mining leases either to prevent cluster situation or keeping the prescribed distance in between two mining clusters.
13	The number of a contiguous cluster needs to be ascertained. Contiguous cluster is formed when one cluster is at a distance of 2.5 Km from the other cluster.	Noted and shall be complied with.

Sl. No.	Particulars	Status
14	The mining outside the riverbed on Patta land/Khatedari land be granted when there is possibility of replenishment of material. In case, there is no replenishment then mining lease shall only be granted when there is no riverbed mining possibility within 5 KM of the Patta land/Khatedari land. For government projects, mining could be allowed on Patta land/Khatedari land but the mining should only be done by the Government agency and material should not be used for sale in the open market. Cluster situation as mentioned in para k above is also applicable for the mining in Patta land/Khatedari land.	Noted.
15	The State Government should define the transportation route from the mining lease considering the maximum production from the mines as at this stage the size of mining leases, their location, the quantity of mineral that can be mined safely etc. is available with the State Government. It is suggested that the transportation route should be selected in such a way that the movement of trucks/tippers/tractors from the villages having habitation should be avoided. The transportation route so selected should be verified by the State Government for its carrying capacity.	Noted and final transport route will be submitted during preparation of mine plan.
16	Potential site for mining having its impact on the forest, protected area, habitation, bridges etc, shall be avoided. For this, a sub-divisional committee may be formed which after the site visit shall decide its suitability for mining.	Shall be Complied with.
17	Public consultation-The Comments of the various stakeholders may be sought on the list of mining lease to be auctioned. The State Government shall give an advertisement in the local and national newspaper for seeking comments of the general public on the list of mining lease included in the DSR. The DSR should be placed in the public domain for at least one month from the date of publication of the advertisement for obtaining comments of the general public. The comments so received shall be placed before the sub-divisional committee for active consideration. The final list of sand mining areas [leases to be granted on riverbed &Patta land/Khatedari land, de-siltation location (ponds/lakes/dams), M-Sand Plants (alternate source of sand)] after the public hearing needs to be defined in the final DSR.	After publication of the West Bengal Sand Mining Policy, 2021, it is now eminent that State owned The West Bengal Mineral Development and Trading Corporation Limited (WBMDTCL) shall be responsible for mining of sand/ gravel/ river bed materials in whole state of West Bengal. However, the existing mining leases which were in effect before hand of this Gazzate notification July 2021 will be in operation till the year 2027-28. In order to have the rational distribution of mining leases as per the prevailing norms and guidelines grant of mining leases in the state of West Bengal shall be carried out in phases till all the blocks are under the ambit of WBMDTCL. This DSR thus consist of the identified potential sand deposite areas within which the existing and future mining leases shall occur. The details of the mining leases as and when granted shall follow the procedure described in EMGSM 2020 and prevailing norms.
18	The LOI should not be granted for mining area falling on both riverbed and outside riverbed. Therefore, in the same lease, both types of area should not be included.	Shall be Complied with.

Annexure 2

Estimation of Sand Resources based on sediment load comparison between Pre and Post Monsoon period of Purba Bardhaman District

Abbreviation used in the table as below

ABBREVIATION FORM		
PERIOD	PRE	PRE MONSOON
	PO	POST MONSOON
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	MK	MANGOLKOTE
	KG1	KETUGRAM 1
	KG2	KETUGRAM 2
	KT1	KATWA 1
	KT2	KATWA 2
	PS2	PURBASTHALI 2
	GL1	GALSI 1
	GL2	GALSI 2
	KH	KHANDAGHOSH
	BD1	BARDHAMAN 1
	BD2	BARDHAMAN 2
	ME1	MEMARI 1
	RN2	RAINA 2
	BDMC	BARDHAMAN MUNICIPALITY
RIVER	AJ	AJAY
	DA	DAMODAR
	DW	DWARAKESWAR
	HO	HOOGLY

Pre monsoon						Post monsoon						Difference in Mcum
SL No	Sand Bar_Code	RL (m)	Area in sq.m.	Sand Thickness in m.	Sand Volume in M. Cum	SL No	Sand Bar_Code	RL (m)	Area in sq.m.	Sand Thickness in m.	Sand Volume in M. Cum	
Estimation of Sand Resources in Pre monsoon period & Post monsoon period in sand bar regions of Ajay River												
1	PR_PBBD_MK_AJ_01	15.7	157182.6692	2.7	0.42	1	PO_PBBD_MK_AJ_01	16	86179.5558	3	0.26	-0.17
2	PR_PBBD_MK_AJ_02	15.7	134143.3588	2.7	0.36	2	PO_PBBD_MK_AJ_02	0	0	3	0.00	-0.36
3	PR_PBBD_MK_AJ_03	12.7	294584.7254	2.7	0.80	3	PO_PBBD_MK_AJ_03	13	302250.3898	3	0.91	0.11
4	PR_PBBD_KG1_AJ_04	11.7	33616.17897	2.7	0.09	4	PO_PBBD_KG1_AJ_04	12	331680.7832	3	1.00	0.90
5	PR_PBBD_KG1_AJ_05	10.7	135760.6966	2.7	0.37	5	PO_PBBD_KG1_AJ_05_06	11	229738.282	3	0.69	0.32
6	PR_PBBD_KG1_AJ_06	10.7	56440.38214	2.7	0.15					3	0.00	-0.15
7	PR_PBBD_MK_AJ_07	10.7	18826.42183	2.7	0.05	6	PO_PBBD_MK_AJ_07_08	11	54278.24139	3	0.16	0.11
8	PR_PBBD_MK_AJ_08	10.7	40408.94681	2.7	0.11					3	0.00	-0.11
9	PR_PBBD_KG1_AJ_09	10.7	193728.2676	2.7	0.52	7	PO_PBBD_KG1_AJ_09_10	11	388647.2888	3	1.17	0.64
10	PR_PBBD_KG1_AJ_10	10.7	42951.55683	2.7	0.12					3	0.00	-0.12
11	PR_PBBD_KG1_AJ_11	11.7	214319.5123	2.7	0.58	8	PO_PBBD_KG1_AJ_11	12	238416.8502	3	0.72	0.14
12	PR_PBBD_MK_AJ_12	10.7	42353.53704	2.7	0.11	9	PO_PBBD_MK_AJ_12	11	50458.31538	3	0.15	0.04
13	PR_PBBD_KG1_AJ_13	10.7	24154.02421	2.7	0.07	10	PO_PBBD_KG1_AJ_13	0	0	3	0.00	-0.07
14	PR_PBBD_KG2_AJ_14	10.7	77150.04447	2.7	0.21	11	PO_PBBD_KG2_AJ_14	11	71158.20536	3	0.21	0.01
				2.7	0.00	12	PO_PBBD_KG2_AJ_14A	11	90246.43057	3	0.27	0.27
15	PR_PBBD_KG2_AJ_15	10.7	174895.2488	2.7	0.47	13	PO_PBBD_KG2_AJ_15	11	206508.3115	3	0.62	0.15
16	PR_PBBD_KG2_AJ_16	9.7	71735.68015	2.7	0.19	14	PO_PBBD_KG2_AJ_16	10	188955.8838	3	0.57	0.37
17	PR_PBBD_MK_AJ_17	11.7	37562.34007	2.7	0.10	15	PO_PBBD_MK_AJ_17	12	51503.14041	3	0.15	0.05
18	PR_PBBD_KT1_AJ_18	12.7	15936.72813	2.7	0.04	16	PO_PBBD_KT1_AJ_18	13	33320.65242	3	0.10	0.06
19	PR_PBBD_KG2_AJ_19	12.7	146213.8331	2.7	0.39	17	PO_PBBD_KG2_AJ_19	0	0	3	0.00	-0.39
20	PR_PBBD_KG2_AJ_20	9.7	51749.5164	2.7	0.14	18	PO_PBBD_KG2_AJ_20	10	33118.36508	3	0.10	-0.04
21	PR_PBBD_KG2_AJ_21	10.7	50731.37202	2.7	0.14	19	PO_PBBD_KG2_AJ_21	11	64351.12582	3	0.19	0.06
		9.7		2.7	0.00	20	PO_PBBD_KT1_AJ_21A	10	50639.99295	3	0.15	0.15
		10.7		2.7	0.00	21	PO_PBBD_KG2_AJ_21B	11	39181.35235	3	0.12	0.12
22	PR_PBBD_KG2_AJ_22	11	18402.5577	2.7	0.05	22	PO_PBBD_KG2_AJ_22	0	0	3	0.00	-0.05
23	PR_PBBD_KT1_AJ_23	11	8512.576853	2.7	0.02	23	PO_PBBD_KT1_AJ_23	0	0	3	0.00	-0.02
24	PR_PBBD_KG2_AJ_24	0	0	2.7	0.00	24	PO_PBBD_KG2_AJ_24	11	28118.04796	3	0.08	0.08
Estimation of Sand Resources in Pre monsoon period & Post monsoon period in sand bar regions of Hoogly River												
1	PR_PBBD_KT2_HO_01	24	66877.55311	2.5	0.17	1	PO_PBBD_KT2_HO_01	0	0	0	0	-0.17
2	PR_PBBD_PS2_HO_02	24	88265.49911	2.5	0.22	2	PO_PBBD_PS2_HO_02	0	0	0	0	-0.22
3	PR_PBBD_PS2_HO_03	24	52580.75032	2.5	0.13	3	PO_PBBD_PS2_HO_03	0	0	0	0	-0.13
Estimation of Sand Resources in Pre monsoon period & Post monsoon period in sand bar regions of Damodar River												
1	PR_PBBD_GL1_DA_01	45.8	2316786.163	2.5	5.79	1	PO_PBBD_GL1_DA_01(IA)	46	716647.0574	2.7	1.93	-3.86
				2.5	0.00	2	PO_PBBD_GL1_DA_01(IB)	45	897169.0432	2.7	2.42	2.42
				2.5	0.00	3	PO_PBBD_GL1_DA_01A	42	54429.43279	2.7	0.15	0.15

Pre monsoon						Post monsoon						Difference in Mcum
SL No	Sand Bar_Code	RL (m)	Area in sq.m.	Sand Thickness in m.	Sand Volume in M. Cum	SL No	Sand Bar_Code	RL (m)	Area in sq.m.	Sand Thickness in m.	Sand Volume in M. Cum	
2	PR_PBBD_GL1_DA_02	40.8	1563002.879	2.5	3.91	4	PO_PBBD_GL1_DA_02(IIA)	41	727277.7751	2.7	1.96	-1.94
				2.5	0.00	5	PO_PBBD_GL1_DA_02(IIB)	38	364832.3638	2.7	0.99	0.99
				2.5	0.00	6	PO_PBBD_GL1_DA_02(IIC)	37	36018.55328	2.7	0.10	0.10
3	PR_PBBD_GL2_DA_03	37.8	11127325.4	2.5	27.82	7	PO_PBBD_GL2_DA_03(IIIA)	38	65398.54118	2.7	0.18	-27.64
				2.5	0.00	8	PO_PBBD_GL2_DA_03(IIIB)	32	140506.6482	2.7	0.38	0.38
				2.5	0.00	9	PO_PBBD_GL2_DA_03(IIIC)	33	1351353.509	2.7	3.65	3.65
				2.5	0.00	10	PO_PBBD_GL2_DA_03(IIID)	33	374761.3205	2.7	1.01	1.01
				2.5	0.00	11	PO_PBBD_GL2_DA_03(IIIE)	31	1521938.963	2.7	4.11	4.11
				2.5	0.00	12	PO_PBBD_GL2_DA_03_04	37	7464881.371	2.7	20.16	20.16
4	PR_PBBD_GL2_DA_04	37.5	1121896.084	2.5	2.80					2.7	0.00	-2.80
5	PR_PBBD_GL2_DA_05	32.8	2684532.079	2.5	6.71	13	PO_PBBD_GL2_DA_05	33	2634362.5	2.7	7.11	0.40
6	PR_PBBD_GL2_DA_06	30.8	1016693.906	2.5	2.54	14	PO_PBBD_GL2_DA_06	31	1170613.716	2.7	3.16	0.62
7	PR_PBBD_KH_DA_07	30.8	530903.3661	2.5	1.33	15	PO_PBBD_KH_DA_07	31	218041.8979	2.7	0.59	-0.74
8	PR_PBBD_GL2_DA_08	30.8	194804.0144	2.5	0.49	16	PO_PBBD_GL2_DA_08	31	193147.7291	2.7	0.52	0.03
9	PR_PBBD_KH_DA_09	29.8	668181.4301	2.5	1.67	17	PO_PBBD_KH_DA_09	30	297318.2333	2.7	0.80	-0.87
10	PR_PBBD_BD1_DA_10	31.8	1496218.904	2.5	3.74	18	PO_PBBD_BD1_DA_10(XA)	32	115308.9291	2.7	0.31	-3.43
				2.5	0.00	19	PO_PBBD_BD1_DA_10(XB)	27	821003.1186	2.7	2.22	2.22
11	PR_PBBD_KH_DA_11	26.8	246141.3802	2.5	0.62	20	PO_PBBD_KH_DA_09_11	27	586834.4591	2.7	1.58	0.97
12	PR_PBBD_BD1_DA_12	26.8	2512252.106	2.5	6.28	21	PO_PBBD_BD1_DA_10_12	27	266503.5816	2.7	0.72	-5.56
				2.5	0.00	22	PO_PBBD_BD1_DA_12(XIIA)	27	1122156.186	2.7	3.03	3.03
				2.5	0.00	23	PO_PBBD_BD1_DA_12(XIIB)	25	808104.842	2.7	2.18	2.18
13	PR_PBBD_BD2_DA_13	21.8	381535.7933	2.5	0.95	24	PO_PBBD_BDMC_DA_13	22	64048.18627	2.7	0.17	-0.78
14	PR_PBBD_BD2_DA_14	23.8	620994.1855	2.5	1.55	25	PO_PBBD_BD2_DA_14	24	2916694.449	2.7	7.88	6.32
15	PR_PBBD_BD2_DA_15	22.8	2489070.561	2.5	6.22	26	PO_PBBD_BD2_DA_15(XVA)	23	2181408.314	2.7	5.89	-0.33
				2.5	0.00	27	PO_PBBD_BD2_DA_15(XVB)	21	367610.0891	2.7	0.99	0.99
				2.5	0.00	28	PO_PBBD_BD2_DA_15A	20	174365.9744	2.7	0.47	0.47
16	PR_PBBD_ME1_DA_16	22.8	948177.2996	2.5	2.37	29	PO_PBBD_ME1_DA_16	23	550699.7218	2.7	1.49	-0.88
Estimation of Sand Resources in Pre monsoon period & Post monsoon period in sand bar regions of Dwarakeswar River												
1	PR_PBBD_KH_DW_01	17.5	331691.6516	2.5	0.83	1	PO_PBBD_KH_DW_01	18	203264.2285	3	0.61	-0.22
2	PR_PBBD_KH_DW_02	18.5	408087.8824	2.5	1.02	2	PO_PBBD_KH_DW_02(IIA)	19	164532.0787	3	0.49	-0.53
				2.5	0.00	3	PO_PBBD_KH_DW_02(IIB)	15	85646.56693	3	0.26	0.26
3	PR_PBBD_RN2_DW_03	13.5	117943.3879	2.5	0.29	4	PO_PBBD_RN2_DW_03	14	47404.26257	3	0.14	-0.15
4	PR_PBBD_RN2_DW_04	14.5	47066.22317	2.5	0.12	5	PO_PBBD_RN2_DW_04	15	301296.9472	3	0.90	0.79
5	PR_PBBD_RN2_DW_05	12.5	397067.2501	2.5	0.99	6	PO_PBBD_RN2_DW_05	13	217100.4998	3	0.65	-0.34
6	PR_PBBD_RN2_DW_06	10.5	99065.18194	2.5	0.25	7	PO_PBBD_RN2_DW_06	11	38686.40184	3	0.12	-0.13

Annexure 3
Boundary Coordinates of Potential Blocks of Purba Bardhaman District

Abbreviation used in the table as below

ABBREVIATION FORM		
PERIOD	PRE	PRE MONSOON
	PO	POST MONSOON
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	MK	MANGOLKOTE
	KG1	KETUGRAM 1
	KG2	KETUGRAM 2
	KT1	KATWA 1
	KT2	KATWA 2
	PS2	PURBASTHALI 2
	GL1	GALSI 1
	GL2	GALSI 2
	KH	KHANDAGHOSH
	BD1	BARDHAMAN 1
	BD2	BARDHAMAN 2
	ME1	MEMARI 1
	RN2	RAINA 2
	BDMC	BARDHAMAN MUNICIPALITY
RIVER	AJ	AJAY
	DA	DAMODAR
	DW	DWARAKESWAR
	HO	HOOGLY

NAME	POINT_NO	LATITUDE	LONGITUDE
PBBD_BD1_DA_10(XA)	1	23° 14' 38.540" N	87° 46' 36.397" E
	2	23° 14' 39.621" N	87° 46' 34.451" E
	3	23° 14' 41.420" N	87° 46' 15.749" E
	4	23° 14' 43.226" N	87° 46' 15.798" E
	5	23° 14' 41.667" N	87° 46' 21.554" E
	6	23° 14' 42.215" N	87° 46' 28.407" E
	7	23° 14' 38.497" N	87° 46' 37.704" E
PBBD_BD1_DA_10(XB)	1	23° 13' 58.842" N	87° 48' 32.880" E
	2	23° 13' 56.882" N	87° 48' 32.429" E
	3	23° 13' 55.633" N	87° 48' 32.142" E
	4	23° 13' 54.935" N	87° 48' 21.993" E
	5	23° 13' 56.221" N	87° 48' 12.840" E
	6	23° 13' 57.919" N	87° 48' 3.913" E
	7	23° 13' 57.933" N	87° 48' 1.009" E
	8	23° 13' 55.459" N	87° 48' 0.324" E
	9	23° 13' 53.815" N	87° 47' 58.750" E
	10	23° 13' 56.123" N	87° 47' 51.614" E
	11	23° 14' 1.733" N	87° 47' 44.720" E
	12	23° 14' 8.973" N	87° 47' 42.082" E
	13	23° 14' 11.881" N	87° 47' 38.748" E
	14	23° 14' 15.407" N	87° 47' 35.640" E
	15	23° 14' 21.629" N	87° 47' 30.091" E
	16	23° 14' 23.470" N	87° 47' 25.984" E
	17	23° 14' 12.063" N	87° 47' 59.687" E
	18	23° 14' 0.002" N	87° 48' 30.936" E
	20	23° 14' 24.124" N	87° 47' 24.052" E
	21	23° 14' 23.939" N	87° 47' 24.599" E
	22	23° 14' 24.170" N	87° 47' 17.593" E
	23	23° 14' 26.083" N	87° 47' 15.431" E
	24	23° 14' 24.124" N	87° 47' 24.052" E
PBBD_BD1_DA_10_12	1	23° 13' 55.935" N	87° 47' 38.697" E
	2	23° 14' 22.489" N	87° 47' 5.289" E
	3	23° 14' 34.621" N	87° 46' 43.452" E
	4	23° 14' 34.879" N	87° 46' 42.989" E
	5	23° 14' 35.230" N	87° 46' 42.356" E
	6	23° 14' 35.833" N	87° 46' 44.363" E
	7	23° 14' 29.606" N	87° 46' 59.930" E
	8	23° 14' 28.074" N	87° 47' 6.672" E
	9	23° 14' 26.478" N	87° 47' 10.233" E
	10	23° 14' 23.372" N	87° 47' 12.002" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	11	23° 14' 17.169" N	87° 47' 13.753" E
	12	23° 14' 13.618" N	87° 47' 21.776" E
	13	23° 14' 11.096" N	87° 47' 30.699" E
	14	23° 14' 10.041" N	87° 47' 35.162" E
	15	23° 14' 6.909" N	87° 47' 38.659" E
	16	23° 14' 0.519" N	87° 47' 39.098" E
PBBD_BD1_DA_12(XIIA)	1	23° 13' 54.047" N	87° 47' 40.585" E
	2	23° 13' 55.935" N	87° 47' 38.697" E
	3	23° 13' 52.935" N	87° 47' 48.026" E
	4	23° 13' 49.273" N	87° 47' 57.500" E
	5	23° 13' 47.981" N	87° 48' 14.622" E
	6	23° 13' 45.993" N	87° 48' 33.229" E
	7	23° 13' 44.055" N	87° 48' 41.968" E
	8	23° 13' 40.402" N	87° 48' 49.580" E
	9	23° 13' 36.415" N	87° 48' 55.328" E
	10	23° 13' 33.804" N	87° 49' 1.084" E
	11	23° 13' 31.567" N	87° 49' 1.070" E
	12	23° 13' 31.069" N	87° 48' 57.529" E
	13	23° 13' 29.547" N	87° 48' 52.493" E
	14	23° 13' 25.922" N	87° 48' 54.705" E
	15	23° 13' 21.436" N	87° 48' 57.098" E
	16	23° 13' 14.695" N	87° 49' 2.829" E
	17	23° 13' 10.076" N	87° 49' 8.925" E
	18	23° 13' 10.197" N	87° 49' 8.673" E
	19	23° 13' 21.505" N	87° 48' 38.041" E
	20	23° 13' 31.064" N	87° 48' 19.641" E
	21	23° 13' 37.026" N	87° 48' 13.782" E
	22	23° 13' 47.100" N	87° 47' 58.260" E
PBBD_BD1_DA_12(XIIB)	1	23° 13' 27.276" N	87° 49' 2.921" E
	2	23° 13' 24.561" N	87° 49' 16.845" E
	3	23° 13' 25.490" N	87° 49' 28.648" E
	4	23° 13' 23.289" N	87° 49' 38.822" E
	5	23° 13' 15.635" N	87° 49' 49.320" E
	6	23° 13' 11.137" N	87° 49' 56.620" E
	7	23° 13' 5.148" N	87° 50' 4.447" E
	8	23° 13' 2.665" N	87° 50' 5.504" E
	9	23° 13' 2.357" N	87° 50' 1.391" E
	10	23° 13' 3.385" N	87° 49' 54.427" E
	11	23° 13' 2.411" N	87° 49' 51.025" E
	12	23° 12' 58.633" N	87° 49' 47.070" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	13	23° 12' 59.489" N	87° 49' 41.356" E
	14	23° 13' 2.816" N	87° 49' 36.909" E
	15	23° 13' 4.672" N	87° 49' 29.592" E
	16	23° 13' 7.187" N	87° 49' 22.458" E
	17	23° 13' 10.198" N	87° 49' 15.149" E
	18	23° 13' 12.042" N	87° 49' 10.156" E
	19	23° 13' 17.188" N	87° 49' 5.183" E
	20	23° 13' 23.146" N	87° 49' 3.074" E
PBBD_BD2_DA_13(XIIIB)	1	23° 12' 23.798" N	87° 51' 39.046" E
	2	23° 12' 16.538" N	87° 51' 45.049" E
	3	23° 12' 17.367" N	87° 51' 35.095" E
	4	23° 12' 23.301" N	87° 51' 19.682" E
	5	23° 12' 26.924" N	87° 51' 18.030" E
	6	23° 12' 26.944" N	87° 51' 30.130" E
PBBD_BD2_DA_14	1	23° 11' 53.932" N	87° 54' 6.124" E
	2	23° 11' 51.869" N	87° 54' 5.887" E
	3	23° 11' 48.336" N	87° 54' 9.884" E
	4	23° 11' 51.123" N	87° 53' 51.810" E
	5	23° 11' 52.883" N	87° 53' 32.835" E
	6	23° 11' 51.046" N	87° 53' 29.025" E
	7	23° 11' 48.600" N	87° 53' 23.425" E
	8	23° 11' 54.421" N	87° 53' 16.539" E
	9	23° 12' 0.108" N	87° 52' 56.472" E
	10	23° 12' 0.832" N	87° 52' 37.937" E
	11	23° 12' 4.456" N	87° 52' 17.409" E
	12	23° 12' 16.158" N	87° 51' 52.243" E
	13	23° 12' 22.804" N	87° 51' 45.137" E
	14	23° 12' 33.870" N	87° 51' 30.244" E
	15	23° 12' 33.870" N	87° 51' 30.911" E
	16	23° 12' 33.870" N	87° 51' 33.261" E
	17	23° 12' 38.693" N	87° 51' 35.672" E
	18	23° 12' 33.930" N	87° 51' 57.344" E
	19	23° 12' 31.737" N	87° 52' 17.903" E
	20	23° 12' 26.255" N	87° 52' 38.735" E
	21	23° 12' 20.498" N	87° 52' 58.197" E
	22	23° 12' 8.985" N	87° 53' 25.609" E
	23	23° 11' 58.569" N	87° 54' 0.969" E
	24	23° 11' 58.297" N	87° 54' 3.453" E
	25	23° 11' 57.872" N	87° 54' 3.247" E
PBBD_BD2_DA_15(XVA)	1	23° 11' 44.937" N	87° 53' 38.217" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	2	23° 11' 44.408" N	87° 53' 58.540" E
	3	23° 11' 44.328" N	87° 54' 12.612" E
	4	23° 11' 42.016" N	87° 54' 19.744" E
	5	23° 11' 41.345" N	87° 54' 28.675" E
	6	23° 11' 39.870" N	87° 54' 33.802" E
	7	23° 11' 32.993" N	87° 54' 44.700" E
	8	23° 11' 31.706" N	87° 54' 52.956" E
	9	23° 11' 26.487" N	87° 55' 2.748" E
	10	23° 11' 17.530" N	87° 55' 16.089" E
	11	23° 11' 13.780" N	87° 55' 21.870" E
	12	23° 11' 7.772" N	87° 55' 25.179" E
	13	23° 11' 7.951" N	87° 55' 29.871" E
	14	23° 11' 12.292" N	87° 55' 29.007" E
	15	23° 11' 6.018" N	87° 55' 42.589" E
	16	23° 10' 56.456" N	87° 55' 53.466" E
	17	23° 10' 50.211" N	87° 56' 1.910" E
	18	23° 10' 44.162" N	87° 56' 12.142" E
	19	23° 10' 34.414" N	87° 56' 19.444" E
	20	23° 10' 30.458" N	87° 56' 25.000" E
	21	23° 10' 23.401" N	87° 56' 31.204" E
	22	23° 10' 19.041" N	87° 56' 35.193" E
	23	23° 10' 17.082" N	87° 56' 29.414" E
	24	23° 10' 22.440" N	87° 56' 15.160" E
	25	23° 10' 27.374" N	87° 56' 7.039" E
	26	23° 10' 29.327" N	87° 55' 57.377" E
	27	23° 10' 44.807" N	87° 55' 45.378" E
	28	23° 10' 45.146" N	87° 55' 45.571" E
	29	23° 10' 47.197" N	87° 55' 47.819" E
	30	23° 11' 10.917" N	87° 55' 17.160" E
	31	23° 11' 11.833" N	87° 55' 11.738" E
	32	23° 11' 16.854" N	87° 55' 0.275" E
	33	23° 11' 18.124" N	87° 54' 54.924" E
	34	23° 11' 26.226" N	87° 54' 46.491" E
	35	23° 11' 23.775" N	87° 54' 41.784" E
	36	23° 11' 27.328" N	87° 54' 34.437" E
	37	23° 11' 26.125" N	87° 54' 28.175" E
	38	23° 11' 24.837" N	87° 54' 23.277" E
	39	23° 11' 35.525" N	87° 53' 48.989" E
	40	23° 11' 42.916" N	87° 53' 24.900" E
PBBD_BD2_DA_15(XVB)	1	23° 9' 55.778" N	87° 58' 16.191" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	2	23° 9' 51.444" N	87° 58' 13.850" E
	3	23° 9' 51.376" N	87° 58' 13.813" E
	4	23° 9' 56.393" N	87° 58' 6.446" E
	5	23° 10' 0.600" N	87° 57' 53.821" E
	6	23° 10' 4.501" N	87° 57' 45.523" E
	7	23° 10' 4.862" N	87° 57' 44.898" E
	8	23° 10' 4.969" N	87° 57' 44.526" E
	9	23° 10' 5.831" N	87° 57' 42.693" E
	10	23° 10' 9.512" N	87° 57' 31.553" E
	11	23° 10' 9.502" N	87° 57' 28.750" E
	12	23° 10' 10.002" N	87° 57' 27.012" E
	13	23° 10' 9.591" N	87° 57' 13.135" E
	14	23° 10' 8.974" N	87° 57' 0.697" E
	15	23° 10' 13.531" N	87° 56' 42.834" E
	16	23° 10' 12.281" N	87° 57' 0.493" E
	17	23° 10' 14.931" N	87° 57' 17.634" E
	18	23° 10' 12.797" N	87° 57' 28.971" E
	19	23° 10' 15.005" N	87° 57' 33.639" E
	20	23° 10' 4.928" N	87° 57' 49.572" E
	21	23° 10' 6.789" N	87° 57' 54.796" E
PBBD_BD2_DA_15A	1	23° 10' 28.584" N	87° 57' 8.083" E
	2	23° 10' 25.043" N	87° 57' 7.172" E
	3	23° 10' 28.508" N	87° 56' 40.396" E
	4	23° 10' 30.787" N	87° 56' 35.812" E
	5	23° 10' 29.482" N	87° 56' 51.468" E
PBBD_GL1_DA_01(IA)	1	23° 19' 19.618" N	87° 32' 10.979" E
	2	23° 19' 13.862" N	87° 32' 26.055" E
	3	23° 19' 8.478" N	87° 32' 37.052" E
	4	23° 19' 8.340" N	87° 32' 37.056" E
	5	23° 19' 5.595" N	87° 32' 34.623" E
	6	23° 19' 4.917" N	87° 32' 31.639" E
	7	23° 19' 5.780" N	87° 32' 30.897" E
	8	23° 19' 10.955" N	87° 32' 27.378" E
	9	23° 19' 14.245" N	87° 32' 21.429" E
	10	23° 19' 16.681" N	87° 32' 13.427" E
	11	23° 19' 18.759" N	87° 32' 9.522" E
	12	23° 19' 14.452" N	87° 32' 11.182" E
	13	23° 19' 13.440" N	87° 32' 5.216" E
	14	23° 19' 14.456" N	87° 31' 57.557" E
	15	23° 19' 18.975" N	87° 31' 52.170" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	16	23° 19' 33.669" N	87° 31' 41.926" E
	17	23° 19' 44.692" N	87° 31' 30.713" E
	18	23° 19' 39.629" N	87° 31' 48.502" E
	19	23° 19' 33.598" N	87° 32' 0.014" E
PBBD_GL1_DA_01(IB)	1	23° 19' 3.222" N	87° 32' 24.179" E
	2	23° 19' 1.478" N	87° 32' 30.880" E
	3	23° 19' 2.321" N	87° 32' 36.100" E
	4	23° 19' 5.871" N	87° 32' 42.377" E
	5	23° 19' 1.164" N	87° 32' 51.989" E
	6	23° 19' 0.547" N	87° 32' 51.371" E
	7	23° 18' 56.059" N	87° 32' 55.452" E
	8	23° 18' 52.435" N	87° 32' 58.232" E
	9	23° 18' 48.819" N	87° 32' 58.962" E
	10	23° 18' 44.841" N	87° 33' 4.722" E
	11	23° 18' 41.889" N	87° 33' 12.348" E
	12	23° 18' 41.878" N	87° 33' 15.329" E
	13	23° 18' 38.620" N	87° 33' 22.897" E
	14	23° 18' 37.953" N	87° 33' 23.619" E
	15	23° 18' 35.980" N	87° 33' 24.366" E
	16	23° 18' 33.074" N	87° 33' 23.304" E
	17	23° 18' 21.365" N	87° 33' 25.491" E
	18	23° 18' 14.293" N	87° 33' 30.305" E
	19	23° 18' 10.514" N	87° 33' 29.929" E
	20	23° 18' 10.858" N	87° 33' 29.748" E
	21	23° 18' 24.730" N	87° 33' 22.423" E
	22	23° 18' 51.983" N	87° 32' 31.282" E
	23	23° 18' 58.651" N	87° 32' 16.395" E
	24	23° 19' 6.930" N	87° 32' 6.527" E
	25	23° 19' 8.177" N	87° 32' 5.041" E
	26	23° 19' 9.806" N	87° 32' 10.977" E
	27	23° 19' 9.425" N	87° 32' 21.782" E
	28	23° 19' 5.469" N	87° 32' 21.394" E
PBBD_GL1_DA_01A	1	23° 17' 46.200" N	87° 33' 41.130" E
	2	23° 17' 42.524" N	87° 33' 40.821" E
	3	23° 17' 42.934" N	87° 33' 40.572" E
	4	23° 17' 46.930" N	87° 33' 38.134" E
	5	23° 18' 1.059" N	87° 33' 33.582" E
	6	23° 18' 4.122" N	87° 33' 32.596" E
	7	23° 18' 3.537" N	87° 33' 35.529" E
	8	23° 17' 55.599" N	87° 33' 37.999" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	9	23° 17' 54.843" N	87° 33' 38.624" E
PBBD_GL1_DA_02(IIA)	1	23° 16' 22.427" N	87° 35' 9.516" E
	2	23° 16' 19.576" N	87° 35' 7.618" E
	3	23° 16' 20.408" N	87° 35' 6.772" E
	4	23° 16' 31.730" N	87° 34' 55.271" E
	5	23° 16' 46.128" N	87° 34' 40.646" E
	6	23° 16' 58.636" N	87° 34' 22.757" E
	7	23° 17' 17.123" N	87° 33' 56.316" E
	8	23° 17' 27.242" N	87° 33' 50.144" E
	9	23° 17' 28.314" N	87° 33' 49.490" E
	10	23° 17' 27.154" N	87° 33' 55.968" E
	11	23° 17' 7.448" N	87° 34' 25.637" E
	12	23° 17' 6.528" N	87° 34' 26.076" E
	13	23° 17' 2.832" N	87° 34' 31.481" E
	14	23° 16' 56.531" N	87° 34' 39.275" E
	15	23° 16' 43.137" N	87° 34' 53.971" E
	16	23° 16' 38.663" N	87° 34' 56.713" E
	17	23° 16' 33.297" N	87° 35' 4.099" E
	18	23° 16' 31.835" N	87° 35' 5.422" E
	19	23° 16' 29.056" N	87° 35' 3.823" E
PBBD_GL1_DA_02(IIB)	1	23° 15' 50.744" N	87° 35' 42.047" E
	2	23° 15' 37.818" N	87° 35' 46.917" E
	3	23° 15' 38.350" N	87° 35' 45.618" E
	4	23° 15' 38.984" N	87° 35' 40.655" E
	5	23° 15' 50.531" N	87° 35' 32.663" E
	6	23° 15' 50.931" N	87° 35' 32.387" E
	7	23° 15' 58.547" N	87° 35' 33.907" E
	8	23° 16' 2.674" N	87° 35' 34.819" E
	9	23° 16' 5.325" N	87° 35' 32.507" E
	10	23° 16' 7.004" N	87° 35' 25.362" E
	11	23° 16' 10.327" N	87° 35' 20.370" E
	12	23° 16' 14.792" N	87° 35' 19.138" E
	13	23° 16' 16.442" N	87° 35' 19.367" E
	14	23° 16' 13.495" N	87° 35' 22.036" E
	15	23° 16' 7.739" N	87° 35' 33.823" E
PBBD_GL1_DA_02(IIC)	1	23° 15' 21.288" N	87° 35' 56.906" E
	2	23° 15' 19.810" N	87° 35' 53.925" E
	3	23° 15' 28.294" N	87° 35' 48.053" E
	4	23° 15' 33.368" N	87° 35' 44.542" E
	5	23° 15' 34.290" N	87° 35' 43.904" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	6	23° 15' 33.843" N	87° 35' 48.091" E
	7	23° 15' 32.692" N	87° 35' 48.849" E
	8	23° 15' 31.830" N	87° 35' 49.174" E
	9	23° 15' 31.281" N	87° 35' 49.777" E
	10	23° 15' 30.048" N	87° 35' 50.588" E
	11	23° 15' 27.987" N	87° 35' 49.555" E
PBBD_GL2_DA_03(IIIA)	1	23° 15' 19.810" N	87° 35' 53.925" E
	2	23° 15' 21.288" N	87° 35' 56.906" E
	3	23° 15' 20.211" N	87° 35' 58.087" E
	4	23° 15' 12.679" N	87° 36' 8.128" E
	5	23° 15' 7.690" N	87° 36' 16.710" E
	6	23° 15' 3.540" N	87° 36' 16.288" E
	7	23° 15' 4.044" N	87° 36' 15.594" E
	8	23° 15' 4.834" N	87° 36' 14.509" E
PBBD_GL2_DA_03(IIIB)	1	23° 15' 13.407" N	87° 42' 30.801" E
	2	23° 15' 11.362" N	87° 42' 26.320" E
	3	23° 15' 13.446" N	87° 42' 22.085" E
	4	23° 15' 14.719" N	87° 42' 14.494" E
	5	23° 15' 15.789" N	87° 42' 13.069" E
	6	23° 15' 17.576" N	87° 42' 34.040" E
	7	23° 15' 17.751" N	87° 42' 34.543" E
	8	23° 15' 16.694" N	87° 42' 34.393" E
PBBD_GL2_DA_03(IIIC)	1	23° 15' 7.185" N	87° 43' 22.166" E
	2	23° 15' 4.681" N	87° 43' 27.739" E
	3	23° 15' 6.114" N	87° 43' 30.428" E
	4	23° 15' 6.079" N	87° 43' 38.026" E
	5	23° 14' 59.867" N	87° 43' 41.791" E
	6	23° 14' 56.965" N	87° 43' 44.234" E
	7	23° 14' 54.310" N	87° 43' 37.739" E
	8	23° 14' 53.523" N	87° 43' 29.466" E
	9	23° 14' 48.362" N	87° 43' 29.215" E
	10	23° 14' 44.457" N	87° 43' 25.172" E
	11	23° 14' 42.817" N	87° 43' 22.705" E
	12	23° 14' 47.589" N	87° 43' 17.591" E
	13	23° 14' 51.732" N	87° 43' 14.708" E
	14	23° 14' 53.413" N	87° 43' 8.460" E
	15	23° 14' 56.736" N	87° 43' 4.232" E
	16	23° 14' 57.788" N	87° 43' 0.000" E
	17	23° 14' 51.599" N	87° 42' 58.618" E
	18	23° 14' 53.284" N	87° 42' 51.476" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	19	23° 14' 55.182" N	87° 42' 42.771" E
	20	23° 14' 56.031" N	87° 42' 37.636" E
	21	23° 14' 54.389" N	87° 42' 35.393" E
	22	23° 15' 1.002" N	87° 42' 34.310" E
	23	23° 15' 3.683" N	87° 42' 34.995" E
	24	23° 15' 9.466" N	87° 42' 34.579" E
	25	23° 15' 11.531" N	87° 42' 34.590" E
	26	23° 15' 20.373" N	87° 42' 42.905" E
	27	23° 15' 21.273" N	87° 42' 44.669" E
	28	23° 15' 21.962" N	87° 42' 46.649" E
	29	23° 15' 20.043" N	87° 43' 3.918" E
	30	23° 15' 16.510" N	87° 43' 16.030" E
	31	23° 15' 15.883" N	87° 43' 16.402" E
	32	23° 15' 8.861" N	87° 43' 16.811" E
PBBD_GL2_DA_03(IIID)	1	23° 14' 42.402" N	87° 44' 0.192" E
	2	23° 14' 40.860" N	87° 43' 48.679" E
	3	23° 14' 43.138" N	87° 43' 30.701" E
	4	23° 14' 44.627" N	87° 43' 32.994" E
	5	23° 14' 47.731" N	87° 43' 31.670" E
	6	23° 14' 50.625" N	87° 43' 31.015" E
	7	23° 14' 52.033" N	87° 43' 39.067" E
	8	23° 14' 53.033" N	87° 43' 46.000" E
	9	23° 14' 55.291" N	87° 43' 48.917" E
	10	23° 14' 55.272" N	87° 43' 52.940" E
	11	23° 14' 52.787" N	87° 43' 54.490" E
	12	23° 14' 50.100" N	87° 43' 55.146" E
	13	23° 14' 48.412" N	87° 44' 2.958" E
	14	23° 14' 45.916" N	87° 44' 6.743" E
	15	23° 14' 42.528" N	87° 44' 7.321" E
PBBD_GL2_DA_03(IIIE)	1	23° 15' 9.621" N	87° 43' 31.118" E
	2	23° 15' 8.617" N	87° 43' 25.079" E
	3	23° 15' 11.319" N	87° 43' 21.071" E
	4	23° 15' 15.455" N	87° 43' 19.733" E
	5	23° 15' 12.670" N	87° 43' 29.598" E
	6	23° 15' 10.449" N	87° 45' 0.691" E
	7	23° 15' 8.389" N	87° 45' 1.225" E
	8	23° 15' 8.827" N	87° 44' 52.456" E
	9	23° 15' 8.670" N	87° 44' 41.953" E
	10	23° 15' 6.229" N	87° 44' 34.118" E
	11	23° 15' 2.122" N	87° 44' 29.402" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	12	23° 14' 58.206" N	87° 44' 27.816" E
	13	23° 14' 51.405" N	87° 44' 25.097" E
	14	23° 14' 48.732" N	87° 44' 22.624" E
	15	23° 14' 47.139" N	87° 44' 10.102" E
	16	23° 14' 51.100" N	87° 44' 2.079" E
	17	23° 14' 57.961" N	87° 43' 52.060" E
	18	23° 14' 58.600" N	87° 43' 47.818" E
	19	23° 15' 0.055" N	87° 43' 45.815" E
	20	23° 15' 3.985" N	87° 43' 44.272" E
	21	23° 15' 9.372" N	87° 43' 40.279" E
	22	23° 15' 10.219" N	87° 43' 35.814" E
	23	23° 15' 12.564" N	87° 43' 29.973" E
	24	23° 15' 9.626" N	87° 43' 40.375" E
	25	23° 15' 15.931" N	87° 44' 27.523" E
	26	23° 15' 18.672" N	87° 44' 44.518" E
	27	23° 15' 17.850" N	87° 44' 54.386" E
PBBD_GL2_DA_03_04	1	23° 14' 58.921" N	87° 41' 36.124" E
	2	23° 14' 56.482" N	87° 41' 27.470" E
	3	23° 14' 55.400" N	87° 41' 22.995" E
	4	23° 14' 49.917" N	87° 41' 17.604" E
	5	23° 14' 44.727" N	87° 41' 8.341" E
	6	23° 14' 42.280" N	87° 41' 1.178" E
	7	23° 14' 39.833" N	87° 40' 54.015" E
	8	23° 14' 33.802" N	87° 40' 48.025" E
	9	23° 14' 27.205" N	87° 40' 45.608" E
	10	23° 14' 23.383" N	87° 40' 38.141" E
	11	23° 14' 14.039" N	87° 40' 34.220" E
	12	23° 14' 9.651" N	87° 40' 30.325" E
	13	23° 14' 8.300" N	87° 40' 24.360" E
	14	23° 14' 1.458" N	87° 40' 14.792" E
	15	23° 13' 55.687" N	87° 40' 12.082" E
	16	23° 13' 51.592" N	87° 40' 4.018" E
	17	23° 13' 51.624" N	87° 39' 56.570" E
	18	23° 13' 51.736" N	87° 39' 29.758" E
	19	23° 13' 47.912" N	87° 39' 22.590" E
	20	23° 13' 44.341" N	87° 39' 8.565" E
	21	23° 13' 55.193" N	87° 39' 7.551" E
	22	23° 13' 57.279" N	87° 39' 7.356" E
	23	23° 13' 53.137" N	87° 39' 24.105" E
	24	23° 13' 54.757" N	87° 39' 31.561" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	25	23° 14' 4.270" N	87° 40' 0.804" E
	26	23° 14' 13.552" N	87° 40' 19.322" E
	27	23° 14' 23.706" N	87° 40' 27.119" E
	28	23° 14' 31.366" N	87° 40' 38.479" E
	29	23° 14' 42.312" N	87° 40' 53.729" E
	30	23° 14' 47.811" N	87° 40' 55.545" E
	31	23° 14' 57.247" N	87° 41' 2.759" E
	32	23° 14' 57.447" N	87° 40' 49.285" E
	33	23° 14' 51.290" N	87° 40' 40.501" E
	34	23° 14' 48.753" N	87° 40' 30.246" E
	35	23° 14' 48.277" N	87° 40' 20.933" E
	36	23° 14' 45.179" N	87° 40' 21.104" E
	37	23° 14' 41.885" N	87° 40' 26.860" E
	38	23° 14' 41.261" N	87° 40' 11.773" E
	39	23° 14' 42.520" N	87° 39' 58.931" E
	40	23° 14' 32.270" N	87° 39' 41.376" E
	41	23° 14' 28.142" N	87° 39' 40.797" E
	42	23° 14' 24.542" N	87° 39' 37.613" E
	43	23° 14' 21.464" N	87° 39' 33.129" E
	44	23° 14' 18.063" N	87° 39' 23.430" E
	45	23° 14' 15.683" N	87° 39' 16.529" E
	46	23° 14' 6.097" N	87° 39' 6.532" E
	47	23° 14' 8.337" N	87° 39' 6.323" E
	48	23° 14' 10.287" N	87° 38' 58.330" E
	49	23° 14' 10.528" N	87° 38' 29.344" E
	50	23° 14' 10.788" N	87° 37' 57.795" E
	51	23° 14' 15.396" N	87° 37' 43.486" E
	52	23° 14' 24.241" N	87° 37' 27.265" E
	53	23° 14' 47.855" N	87° 36' 43.951" E
	54	23° 14' 47.901" N	87° 36' 43.868" E
	55	23° 14' 53.652" N	87° 36' 42.569" E
	56	23° 14' 57.393" N	87° 36' 36.217" E
	57	23° 14' 53.576" N	87° 36' 35.641" E
	58	23° 14' 54.001" N	87° 36' 32.402" E
	59	23° 15' 0.522" N	87° 36' 28.298" E
	60	23° 15' 6.437" N	87° 36' 20.503" E
	61	23° 15' 12.778" N	87° 36' 17.258" E
	62	23° 15' 7.708" N	87° 36' 30.017" E
	63	23° 15' 4.144" N	87° 36' 47.012" E
	64	23° 15' 5.789" N	87° 37' 7.844" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	65	23° 15' 1.403" N	87° 37' 15.520" E
	66	23° 14' 54.276" N	87° 37' 27.306" E
	67	23° 14' 44.682" N	87° 38' 6.505" E
	68	23° 14' 38.103" N	87° 38' 10.068" E
	69	23° 14' 30.428" N	87° 38' 15.550" E
	70	23° 14' 27.139" N	87° 38' 22.403" E
	71	23° 14' 28.783" N	87° 38' 42.140" E
	72	23° 14' 25.768" N	87° 38' 52.556" E
	73	23° 14' 27.139" N	87° 39' 9.825" E
	74	23° 14' 32.895" N	87° 39' 24.627" E
	75	23° 14' 46.601" N	87° 39' 40.252" E
	76	23° 14' 50.164" N	87° 39' 59.440" E
	77	23° 15' 0.032" N	87° 40' 34.252" E
	78	23° 15' 3.322" N	87° 41' 1.389" E
	79	23° 15' 8.256" N	87° 41' 24.689" E
	80	23° 15' 13.464" N	87° 41' 45.796" E
	81	23° 15' 13.947" N	87° 41' 51.464" E
	82	23° 15' 10.433" N	87° 41' 47.804" E
	83	23° 15' 3.577" N	87° 41' 41.809" E
PBBD_GL2_DA_05	1	23° 14' 50.672" N	87° 42' 35.373" E
	2	23° 14' 48.378" N	87° 42' 55.621" E
	3	23° 14' 45.317" N	87° 43' 2.756" E
	4	23° 14' 47.479" N	87° 43' 11.706" E
	5	23° 14' 44.719" N	87° 43' 13.181" E
	6	23° 14' 41.971" N	87° 43' 11.974" E
	7	23° 14' 40.078" N	87° 43' 12.216" E
	8	23° 14' 40.038" N	87° 43' 10.440" E
	9	23° 14' 35.721" N	87° 42' 59.339" E
	10	23° 14' 35.104" N	87° 42' 36.313" E
	11	23° 14' 32.843" N	87° 42' 31.173" E
	12	23° 14' 40.723" N	87° 42' 9.834" E
	13	23° 14' 39.733" N	87° 42' 3.095" E
	14	23° 14' 43.133" N	87° 42' 0.052" E
	15	23° 14' 38.674" N	87° 41' 55.894" E
	16	23° 14' 37.126" N	87° 41' 45.369" E
	17	23° 14' 28.902" N	87° 41' 16.279" E
	18	23° 14' 24.174" N	87° 41' 2.402" E
	19	23° 14' 17.389" N	87° 40' 49.861" E
	20	23° 14' 14.968" N	87° 40' 43.418" E
	21	23° 14' 20.037" N	87° 40' 47.956" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	22	23° 14' 25.487" N	87° 41' 0.794" E
	23	23° 14' 31.830" N	87° 40' 58.443" E
	24	23° 14' 35.695" N	87° 40' 56.079" E
	25	23° 14' 40.057" N	87° 41' 5.934" E
	26	23° 14' 43.603" N	87° 41' 13.401" E
	27	23° 14' 50.712" N	87° 41' 24.759" E
	28	23° 14' 50.114" N	87° 41' 35.482" E
	29	23° 15' 0.516" N	87° 41' 48.944" E
	30	23° 15' 7.363" N	87° 41' 57.025" E
	31	23° 15' 7.592" N	87° 42' 7.454" E
	32	23° 15' 5.561" N	87° 42' 30.685" E
	33	23° 15' 2.254" N	87° 42' 31.263" E
	34	23° 15' 0.071" N	87° 42' 27.080" E
	35	23° 14' 55.648" N	87° 42' 30.930" E
PBBD_GL2_DA_06	1	23° 14' 40.492" N	87° 45' 44.500" E
	2	23° 14' 40.362" N	87° 45' 40.120" E
	3	23° 14' 40.200" N	87° 45' 34.647" E
	4	23° 14' 40.186" N	87° 45' 34.198" E
	5	23° 14' 40.135" N	87° 45' 32.490" E
	6	23° 14' 39.903" N	87° 45' 29.876" E
	7	23° 14' 36.462" N	87° 44' 51.131" E
	8	23° 14' 36.852" N	87° 44' 49.018" E
	9	23° 14' 35.515" N	87° 44' 37.814" E
	10	23° 14' 43.328" N	87° 44' 28.974" E
	11	23° 14' 42.931" N	87° 44' 21.767" E
	12	23° 14' 48.836" N	87° 44' 26.181" E
	13	23° 14' 57.263" N	87° 44' 34.496" E
	14	23° 15' 1.998" N	87° 44' 37.428" E
	15	23° 15' 6.897" N	87° 44' 48.534" E
	16	23° 15' 7.046" N	87° 44' 52.110" E
	17	23° 15' 4.700" N	87° 44' 59.069" E
	18	23° 15' 0.553" N	87° 45' 2.621" E
	19	23° 14' 55.039" N	87° 45' 7.780" E
	20	23° 14' 51.728" N	87° 45' 9.326" E
	21	23° 14' 49.644" N	87° 45' 13.336" E
	22	23° 14' 48.565" N	87° 45' 22.939" E
	23	23° 14' 50.398" N	87° 45' 28.312" E
	24	23° 14' 50.946" N	87° 45' 30.614" E
	25	23° 14' 49.053" N	87° 45' 35.925" E
	26	23° 14' 49.122" N	87° 45' 35.903" E

NAME	POINT_NO	LATITUDE	LONGITUDE
PBBD_GL2_DA_08	1	23° 14' 43.226" N	87° 46' 15.798" E
	2	23° 14' 41.420" N	87° 46' 15.749" E
	3	23° 14' 40.662" N	87° 45' 50.200" E
	4	23° 14' 40.642" N	87° 45' 49.546" E
	5	23° 14' 46.636" N	87° 45' 45.448" E
	6	23° 14' 47.126" N	87° 45' 44.972" E
	7	23° 14' 45.230" N	87° 45' 55.239" E
	8	23° 14' 45.230" N	87° 46' 8.397" E
PBBD_KG1_AJ_04	1	23° 37' 41.964" N	87° 57' 31.024" E
	2	23° 37' 46.778" N	87° 57' 16.962" E
	3	23° 37' 46.783" N	87° 57' 16.967" E
	4	23° 37' 47.910" N	87° 57' 18.163" E
	5	23° 37' 50.398" N	87° 57' 20.802" E
	6	23° 37' 54.023" N	87° 57' 25.824" E
	7	23° 37' 55.808" N	87° 57' 29.292" E
	8	23° 37' 56.608" N	87° 57' 32.099" E
	9	23° 37' 56.763" N	87° 57' 34.808" E
	10	23° 37' 56.444" N	87° 57' 37.654" E
	11	23° 37' 54.607" N	87° 57' 42.589" E
	12	23° 37' 52.343" N	87° 57' 47.055" E
	13	23° 37' 50.760" N	87° 57' 51.131" E
	14	23° 37' 47.835" N	87° 57' 46.243" E
	15	23° 37' 46.020" N	87° 57' 39.282" E
	16	23° 37' 44.728" N	87° 57' 41.175" E
	17	23° 37' 44.288" N	87° 57' 38.870" E
	18	23° 37' 43.244" N	87° 57' 35.202" E
	19	23° 37' 43.022" N	87° 57' 34.729" E
PBBD_KG1_AJ_05_06	1	23° 37' 51.240" N	87° 58' 34.969" E
	2	23° 37' 46.268" N	87° 58' 34.437" E
	3	23° 37' 45.939" N	87° 58' 34.084" E
	4	23° 37' 44.201" N	87° 58' 31.419" E
	5	23° 37' 42.402" N	87° 58' 27.447" E
	6	23° 37' 41.207" N	87° 58' 20.529" E
	7	23° 37' 41.430" N	87° 58' 17.879" E
	8	23° 37' 42.177" N	87° 58' 13.962" E
	9	23° 37' 43.101" N	87° 58' 9.226" E
	10	23° 37' 43.578" N	87° 58' 4.598" E
	11	23° 37' 43.672" N	87° 58' 0.565" E
	12	23° 37' 43.440" N	87° 57' 59.032" E
	13	23° 37' 44.084" N	87° 57' 55.115" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	14	23° 37' 44.995" N	87° 57' 48.931" E
	15	23° 37' 45.132" N	87° 57' 49.248" E
	16	23° 37' 44.870" N	87° 57' 58.210" E
	17	23° 37' 44.105" N	87° 58' 4.927" E
	18	23° 37' 43.954" N	87° 58' 12.545" E
	19	23° 37' 46.223" N	87° 58' 13.010" E
	20	23° 37' 48.838" N	87° 58' 11.273" E
	21	23° 37' 48.848" N	87° 58' 16.442" E
	22	23° 37' 49.545" N	87° 58' 21.816" E
	23	23° 37' 50.588" N	87° 58' 26.959" E
	24	23° 37' 51.812" N	87° 58' 30.750" E
	25	23° 37' 54.463" N	87° 58' 35.315" E
	26	23° 37' 54.040" N	87° 58' 35.269" E
	27	23° 37' 51.956" N	87° 58' 35.046" E
PBBD_KG1_AJ_09_10	1	23° 38' 25.883" N	87° 59' 24.416" E
	2	23° 38' 23.121" N	87° 59' 25.796" E
	3	23° 38' 19.976" N	87° 59' 26.659" E
	4	23° 38' 16.442" N	87° 59' 27.660" E
	5	23° 38' 13.735" N	87° 59' 27.313" E
	6	23° 38' 12.750" N	87° 59' 27.305" E
	7	23° 38' 11.960" N	87° 59' 26.237" E
	8	23° 38' 6.695" N	87° 59' 26.309" E
	9	23° 38' 6.645" N	87° 59' 25.158" E
	10	23° 38' 7.227" N	87° 59' 25.002" E
	11	23° 38' 8.677" N	87° 59' 24.303" E
	12	23° 38' 15.707" N	87° 59' 22.675" E
	13	23° 38' 20.567" N	87° 59' 21.367" E
	14	23° 38' 23.124" N	87° 59' 19.705" E
	15	23° 38' 23.927" N	87° 59' 17.918" E
	16	23° 38' 24.015" N	87° 59' 14.931" E
	17	23° 38' 22.942" N	87° 59' 10.515" E
	18	23° 38' 20.795" N	87° 59' 7.212" E
	19	23° 38' 16.625" N	87° 59' 2.699" E
	20	23° 38' 14.334" N	87° 59' 0.553" E
	21	23° 38' 12.659" N	87° 58' 58.710" E
	22	23° 38' 11.065" N	87° 58' 56.757" E
	23	23° 38' 11.094" N	87° 58' 56.725" E
	24	23° 38' 11.367" N	87° 58' 56.376" E
	25	23° 38' 12.142" N	87° 58' 55.344" E
	26	23° 38' 13.159" N	87° 58' 54.065" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	27	23° 38' 14.092" N	87° 58' 53.113" E
	28	23° 38' 14.258" N	87° 58' 52.939" E
	29	23° 38' 14.698" N	87° 58' 52.437" E
	30	23° 38' 15.106" N	87° 58' 51.904" E
	31	23° 38' 15.275" N	87° 58' 51.652" E
	32	23° 38' 17.911" N	87° 58' 52.841" E
	33	23° 38' 20.521" N	87° 58' 55.055" E
	34	23° 38' 23.511" N	87° 58' 58.392" E
	35	23° 38' 27.220" N	87° 59' 3.556" E
	36	23° 38' 28.916" N	87° 59' 7.444" E
	37	23° 38' 30.038" N	87° 59' 13.708" E
	38	23° 38' 29.571" N	87° 59' 19.401" E
	39	23° 38' 28.175" N	87° 59' 22.426" E
PBBD_KG1_AJ_11	1	23° 38' 3.821" N	88° 0' 1.220" E
	2	23° 38' 3.883" N	88° 0' 0.291" E
	3	23° 38' 4.189" N	87° 59' 55.776" E
	4	23° 37' 56.651" N	87° 59' 43.441" E
	5	23° 37' 55.012" N	87° 59' 41.498" E
	6	23° 37' 54.977" N	87° 59' 41.082" E
	7	23° 37' 54.515" N	87° 59' 38.016" E
	8	23° 37' 54.357" N	87° 59' 35.848" E
	9	23° 37' 54.743" N	87° 59' 34.514" E
	10	23° 37' 56.134" N	87° 59' 31.160" E
	11	23° 37' 58.318" N	87° 59' 28.599" E
	12	23° 38' 1.215" N	87° 59' 27.724" E
	13	23° 38' 5.549" N	87° 59' 27.981" E
	14	23° 38' 8.628" N	87° 59' 28.298" E
	15	23° 38' 5.675" N	87° 59' 29.773" E
	16	23° 38' 2.475" N	87° 59' 32.504" E
	17	23° 38' 0.842" N	87° 59' 34.778" E
	18	23° 38' 0.867" N	87° 59' 39.367" E
	19	23° 38' 4.024" N	87° 59' 46.039" E
	20	23° 38' 5.715" N	87° 59' 50.683" E
	21	23° 38' 5.843" N	87° 59' 57.482" E
	22	23° 38' 6.363" N	88° 0' 1.166" E
	23	23° 38' 10.717" N	88° 0' 8.516" E
	24	23° 38' 13.193" N	88° 0' 11.383" E
	25	23° 38' 15.196" N	88° 0' 14.247" E
	26	23° 38' 16.603" N	88° 0' 17.463" E
	27	23° 38' 16.368" N	88° 0' 19.271" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	28	23° 38' 14.812" N	88° 0' 20.380" E
	29	23° 38' 10.621" N	88° 0' 14.073" E
	30	23° 38' 8.279" N	88° 0' 9.013" E
	31	23° 38' 5.112" N	88° 0' 3.834" E
PBBD_KG2_AJ_14	1	23° 38' 14.473" N	88° 0' 56.571" E
	2	23° 38' 12.662" N	88° 0' 56.933" E
	3	23° 38' 13.098" N	88° 0' 52.298" E
	4	23° 38' 13.292" N	88° 0' 48.863" E
	5	23° 38' 14.263" N	88° 0' 42.521" E
	6	23° 38' 14.946" N	88° 0' 38.256" E
	7	23° 38' 16.141" N	88° 0' 38.319" E
	8	23° 38' 18.836" N	88° 0' 37.652" E
	9	23° 38' 17.397" N	88° 0' 46.292" E
	10	23° 38' 16.544" N	88° 0' 51.795" E
	11	23° 38' 16.541" N	88° 0' 51.889" E
	12	23° 38' 15.422" N	88° 0' 53.553" E
PBBD_KG2_AJ_14A	1	23° 38' 12.757" N	88° 1' 7.460" E
	2	23° 38' 12.502" N	88° 1' 6.159" E
	3	23° 38' 13.888" N	88° 1' 7.099" E
	4	23° 38' 15.526" N	88° 1' 9.129" E
	5	23° 38' 17.116" N	88° 1' 8.131" E
	6	23° 38' 17.796" N	88° 1' 10.760" E
	7	23° 38' 22.746" N	88° 1' 19.551" E
	8	23° 38' 22.447" N	88° 1' 24.198" E
	9	23° 38' 21.558" N	88° 1' 24.844" E
	10	23° 38' 21.420" N	88° 1' 24.447" E
	11	23° 38' 18.108" N	88° 1' 20.537" E
	12	23° 38' 15.552" N	88° 1' 16.857" E
	13	23° 38' 13.746" N	88° 1' 14.154" E
PBBD_KG2_AJ_15	1	23° 38' 25.503" N	88° 1' 53.418" E
	2	23° 38' 21.744" N	88° 1' 54.658" E
	3	23° 38' 19.989" N	88° 1' 54.719" E
	4	23° 38' 18.505" N	88° 1' 54.135" E
	5	23° 38' 17.371" N	88° 1' 54.019" E
	6	23° 38' 16.146" N	88° 1' 52.790" E
	7	23° 38' 12.740" N	88° 1' 52.763" E
	8	23° 38' 8.199" N	88° 1' 52.504" E
	9	23° 38' 7.862" N	88° 1' 52.350" E
	10	23° 38' 11.332" N	88° 1' 51.374" E
	11	23° 38' 14.607" N	88° 1' 50.428" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	12	23° 38' 16.775" N	88° 1' 49.414" E
	13	23° 38' 20.870" N	88° 1' 46.322" E
	14	23° 38' 22.672" N	88° 1' 44.431" E
	15	23° 38' 24.014" N	88° 1' 41.974" E
	16	23° 38' 24.276" N	88° 1' 40.120" E
	17	23° 38' 24.537" N	88° 1' 37.134" E
	18	23° 38' 24.392" N	88° 1' 33.024" E
	19	23° 38' 23.146" N	88° 1' 29.428" E
	20	23° 38' 26.705" N	88° 1' 32.815" E
	21	23° 38' 27.604" N	88° 1' 33.962" E
	22	23° 38' 30.221" N	88° 1' 35.452" E
	23	23° 38' 31.209" N	88° 1' 38.565" E
	24	23° 38' 31.794" N	88° 1' 43.724" E
	25	23° 38' 30.817" N	88° 1' 49.665" E
	26	23° 38' 29.825" N	88° 1' 50.351" E
	27	23° 38' 28.406" N	88° 1' 51.498" E
PBBD_KG2_AJ_16	1	23° 38' 0.997" N	88° 2' 6.188" E
	2	23° 38' 0.290" N	88° 2' 9.031" E
	3	23° 38' 0.400" N	88° 2' 11.926" E
	4	23° 38' 1.622" N	88° 2' 15.624" E
	5	23° 38' 3.710" N	88° 2' 18.629" E
	6	23° 38' 5.756" N	88° 2' 20.533" E
	7	23° 38' 5.117" N	88° 2' 20.122" E
	8	23° 38' 5.115" N	88° 2' 20.121" E
	9	23° 38' 4.811" N	88° 2' 19.924" E
	10	23° 38' 3.909" N	88° 2' 19.343" E
	11	23° 37' 55.735" N	88° 2' 14.073" E
	12	23° 37' 54.174" N	88° 2' 10.063" E
	13	23° 37' 53.946" N	88° 2' 8.157" E
	14	23° 37' 54.237" N	88° 2' 5.731" E
	15	23° 37' 55.397" N	88° 2' 2.118" E
	16	23° 37' 57.178" N	88° 1' 58.210" E
	17	23° 37' 59.400" N	88° 1' 55.165" E
	18	23° 38' 2.433" N	88° 1' 54.065" E
	19	23° 38' 11.074" N	88° 1' 54.415" E
	20	23° 38' 7.382" N	88° 1' 56.948" E
	21	23° 38' 2.916" N	88° 2' 2.282" E
PBBD_KG2_AJ_19	1	23° 38' 15.655" N	88° 2' 27.733" E
	2	23° 38' 15.560" N	88° 2' 27.489" E
	3	23° 38' 15.284" N	88° 2' 26.784" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	4	23° 38' 15.517" N	88° 2' 26.331" E
	5	23° 38' 17.216" N	88° 2' 27.207" E
	6	23° 38' 18.831" N	88° 2' 28.039" E
	7	23° 38' 22.026" N	88° 2' 29.097" E
	8	23° 38' 23.165" N	88° 2' 29.474" E
	9	23° 38' 27.895" N	88° 2' 31.215" E
	10	23° 38' 29.912" N	88° 2' 32.822" E
	11	23° 38' 34.438" N	88° 2' 39.432" E
	12	23° 38' 35.235" N	88° 2' 43.741" E
	13	23° 38' 36.179" N	88° 2' 45.445" E
	14	23° 38' 36.183" N	88° 2' 50.868" E
	15	23° 38' 35.972" N	88° 2' 53.451" E
	16	23° 38' 35.855" N	88° 2' 54.881" E
	17	23° 38' 35.567" N	88° 2' 57.109" E
	18	23° 38' 35.018" N	88° 2' 58.432" E
	19	23° 38' 34.630" N	88° 2' 59.601" E
	20	23° 38' 33.828" N	88° 3' 2.008" E
	21	23° 38' 33.823" N	88° 3' 2.124" E
	22	23° 38' 31.460" N	88° 3' 4.629" E
	23	23° 38' 30.962" N	88° 3' 4.489" E
	24	23° 38' 31.488" N	88° 2' 59.251" E
	25	23° 38' 30.759" N	88° 2' 50.019" E
	26	23° 38' 29.842" N	88° 2' 44.971" E
	27	23° 38' 27.493" N	88° 2' 39.470" E
	28	23° 38' 25.119" N	88° 2' 36.450" E
	29	23° 38' 23.222" N	88° 2' 34.944" E
	30	23° 38' 22.040" N	88° 2' 34.157" E
	31	23° 38' 16.801" N	88° 2' 30.667" E
PBBD_KG2_AJ_20	1	23° 38' 31.247" N	88° 3' 17.607" E
	2	23° 38' 30.956" N	88° 3' 17.267" E
	3	23° 38' 31.106" N	88° 3' 14.782" E
	4	23° 38' 32.323" N	88° 3' 12.924" E
	5	23° 38' 33.440" N	88° 3' 13.187" E
	6	23° 38' 33.444" N	88° 3' 14.285" E
	7	23° 38' 33.935" N	88° 3' 18.024" E
	8	23° 38' 35.080" N	88° 3' 20.415" E
	9	23° 38' 37.430" N	88° 3' 22.675" E
	10	23° 38' 39.018" N	88° 3' 23.248" E
	11	23° 38' 42.232" N	88° 3' 24.954" E
	12	23° 38' 45.705" N	88° 3' 27.310" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	13	23° 38' 45.656" N	88° 3' 27.585" E
	14	23° 38' 33.732" N	88° 3' 20.505" E
PBBD_KG2_AJ_21	1	23° 38' 56.205" N	88° 4' 41.140" E
	2	23° 38' 55.746" N	88° 4' 37.207" E
	3	23° 38' 57.986" N	88° 4' 37.157" E
	4	23° 38' 58.033" N	88° 4' 37.735" E
	5	23° 38' 58.945" N	88° 4' 42.739" E
	6	23° 38' 59.903" N	88° 4' 47.136" E
	7	23° 39' 1.496" N	88° 4' 50.386" E
	8	23° 38' 59.174" N	88° 4' 49.681" E
PBBD_KG2_AJ_22	1	23° 39' 37.068" N	88° 5' 31.036" E
	2	23° 39' 38.412" N	88° 5' 30.939" E
	3	23° 39' 41.575" N	88° 5' 30.709" E
	4	23° 39' 43.951" N	88° 5' 28.584" E
	5	23° 39' 44.386" N	88° 5' 28.194" E
	6	23° 39' 44.480" N	88° 5' 28.110" E
	7	23° 39' 45.768" N	88° 5' 27.673" E
	8	23° 39' 47.166" N	88° 5' 27.339" E
	9	23° 39' 48.850" N	88° 5' 26.936" E
	10	23° 39' 49.637" N	88° 5' 26.817" E
	11	23° 39' 49.660" N	88° 5' 26.814" E
	12	23° 39' 47.815" N	88° 5' 29.913" E
	13	23° 39' 45.245" N	88° 5' 31.415" E
	14	23° 39' 39.872" N	88° 5' 32.058" E
	15	23° 39' 37.479" N	88° 5' 31.859" E
PBBD_KH_DA_07	1	23° 14' 36.462" N	87° 44' 51.131" E
	2	23° 14' 39.903" N	87° 45' 29.876" E
	3	23° 14' 40.135" N	87° 45' 32.490" E
	4	23° 14' 40.186" N	87° 45' 34.198" E
	5	23° 14' 40.200" N	87° 45' 34.647" E
	6	23° 14' 40.362" N	87° 45' 40.120" E
	7	23° 14' 40.492" N	87° 45' 44.500" E
	8	23° 14' 28.382" N	87° 45' 53.653" E
	9	23° 14' 26.487" N	87° 45' 53.709" E
	10	23° 14' 26.572" N	87° 45' 52.853" E
	11	23° 14' 31.095" N	87° 45' 32.397" E
	12	23° 14' 31.742" N	87° 45' 28.097" E
	13	23° 14' 32.843" N	87° 45' 20.781" E
	14	23° 14' 33.768" N	87° 45' 11.427" E
	15	23° 14' 34.004" N	87° 45' 8.956" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	16	23° 14' 35.069" N	87° 45' 8.587" E
	17	23° 14' 36.187" N	87° 45' 5.167" E
	18	23° 14' 35.116" N	87° 44' 58.755" E
	19	23° 14' 35.070" N	87° 44' 58.677" E
PBBD_KH_DA_09	1	23° 14' 38.540" N	87° 46' 36.397" E
	2	23° 14' 37.353" N	87° 46' 25.795" E
	3	23° 14' 34.095" N	87° 46' 16.481" E
	4	23° 14' 30.480" N	87° 46' 12.706" E
	5	23° 14' 27.518" N	87° 46' 10.365" E
	6	23° 14' 27.540" N	87° 46' 5.897" E
	7	23° 14' 31.552" N	87° 45' 56.088" E
	8	23° 14' 32.558" N	87° 45' 53.054" E
	9	23° 14' 37.022" N	87° 45' 52.186" E
	10	23° 14' 40.662" N	87° 45' 50.200" E
	11	23° 14' 41.420" N	87° 46' 15.749" E
	12	23° 14' 39.621" N	87° 46' 34.451" E
PBBD_KH_DA_09_11	1	23° 13' 55.935" N	87° 47' 38.697" E
	2	23° 13' 54.047" N	87° 47' 40.585" E
	3	23° 13' 55.221" N	87° 47' 37.599" E
	4	23° 14' 3.238" N	87° 47' 20.124" E
	5	23° 14' 13.849" N	87° 46' 59.973" E
	6	23° 14' 15.380" N	87° 46' 59.889" E
	7	23° 14' 19.910" N	87° 47' 2.374" E
	8	23° 14' 20.138" N	87° 46' 58.129" E
	9	23° 14' 18.531" N	87° 46' 53.979" E
	10	23° 14' 19.262" N	87° 46' 51.004" E
	11	23° 14' 23.579" N	87° 46' 46.441" E
	12	23° 14' 27.310" N	87° 46' 37.783" E
	13	23° 14' 28.748" N	87° 46' 28.908" E
	14	23° 14' 28.609" N	87° 46' 15.276" E
	15	23° 14' 32.734" N	87° 46' 16.194" E
	16	23° 14' 33.944" N	87° 46' 22.011" E
	17	23° 14' 35.130" N	87° 46' 32.743" E
	18	23° 14' 35.230" N	87° 46' 42.356" E
	19	23° 14' 34.879" N	87° 46' 42.989" E
	20	23° 14' 34.621" N	87° 46' 43.452" E
	21	23° 14' 22.489" N	87° 47' 5.289" E
PBBD_KH_DW_01	1	23° 0' 28.323" N	87° 43' 13.904" E
	2	23° 0' 27.278" N	87° 43' 11.566" E
	3	23° 0' 30.063" N	87° 43' 4.740" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	4	23° 0' 31.612" N	87° 42' 57.015" E
	5	23° 0' 36.181" N	87° 42' 51.240" E
	6	23° 0' 41.076" N	87° 42' 48.110" E
	7	23° 0' 41.860" N	87° 42' 48.850" E
	8	23° 0' 50.288" N	87° 42' 56.805" E
	9	23° 0' 45.137" N	87° 42' 57.922" E
	10	23° 0' 38.888" N	87° 43' 2.034" E
	11	23° 0' 36.462" N	87° 43' 4.418" E
	12	23° 0' 30.747" N	87° 43' 11.532" E
PBBD_KH_DW_02(IIA)	1	23° 0' 19.677" N	87° 43' 18.218" E
	2	23° 0' 15.539" N	87° 43' 19.980" E
	3	23° 0' 14.146" N	87° 43' 23.542" E
	4	23° 0' 5.741" N	87° 43' 25.133" E
	5	23° 0' 0.777" N	87° 43' 26.891" E
	6	22° 59' 59.280" N	87° 43' 26.789" E
	7	23° 0' 1.613" N	87° 43' 25.139" E
	8	23° 0' 6.835" N	87° 43' 21.439" E
	9	23° 0' 8.398" N	87° 43' 19.095" E
	10	23° 0' 16.933" N	87° 43' 10.995" E
	11	23° 0' 16.076" N	87° 43' 9.796" E
	12	23° 0' 24.128" N	87° 43' 1.487" E
	13	23° 0' 25.101" N	87° 43' 0.221" E
	14	23° 0' 25.251" N	87° 43' 3.376" E
PBBD_KH_DW_02(IIB)	1	22° 59' 46.928" N	87° 43' 50.018" E
	2	22° 59' 42.315" N	87° 43' 47.299" E
	3	22° 59' 42.412" N	87° 43' 47.219" E
	4	22° 59' 44.056" N	87° 43' 45.205" E
	5	22° 59' 45.701" N	87° 43' 42.326" E
	6	22° 59' 46.182" N	87° 43' 41.618" E
	7	22° 59' 46.876" N	87° 43' 40.596" E
	8	22° 59' 48.744" N	87° 43' 37.845" E
	9	22° 59' 51.464" N	87° 43' 34.556" E
	10	22° 59' 54.431" N	87° 43' 37.931" E
	11	22° 59' 52.800" N	87° 43' 42.472" E
	12	22° 59' 51.090" N	87° 43' 46.121" E
	13	22° 59' 49.386" N	87° 43' 48.387" E
	14	22° 59' 47.419" N	87° 43' 49.340" E
PBBD_KT1_AJ_18	1	23° 38' 2.103" N	88° 2' 24.290" E
	2	23° 38' 3.347" N	88° 2' 24.160" E
	3	23° 38' 9.692" N	88° 2' 23.769" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	4	23° 38' 12.824" N	88° 2' 25.091" E
	5	23° 38' 15.229" N	88° 2' 26.642" E
	6	23° 38' 15.284" N	88° 2' 26.784" E
	7	23° 38' 15.560" N	88° 2' 27.489" E
	8	23° 38' 15.655" N	88° 2' 27.733" E
	9	23° 38' 12.437" N	88° 2' 27.370" E
	10	23° 38' 9.408" N	88° 2' 27.421" E
	11	23° 38' 8.883" N	88° 2' 27.412" E
	12	23° 38' 7.687" N	88° 2' 27.052" E
	13	23° 38' 4.872" N	88° 2' 26.021" E
	14	23° 38' 3.020" N	88° 2' 25.036" E
PBBD_KT1_AJ_21A	1	23° 39' 33.911" N	88° 5' 8.855" E
	2	23° 39' 33.664" N	88° 5' 8.887" E
	3	23° 39' 33.694" N	88° 5' 7.597" E
	4	23° 39' 35.843" N	88° 5' 6.202" E
	5	23° 39' 35.858" N	88° 5' 6.203" E
	6	23° 39' 39.423" N	88° 5' 6.933" E
	7	23° 39' 41.016" N	88° 5' 6.806" E
	8	23° 39' 47.172" N	88° 5' 6.016" E
	9	23° 39' 53.116" N	88° 5' 4.804" E
	10	23° 39' 53.870" N	88° 5' 4.558" E
	11	23° 39' 52.974" N	88° 5' 6.169" E
	12	23° 39' 49.183" N	88° 5' 6.978" E
	13	23° 39' 47.681" N	88° 5' 8.621" E
	14	23° 39' 44.129" N	88° 5' 9.164" E
	15	23° 39' 41.478" N	88° 5' 9.366" E
	16	23° 39' 36.903" N	88° 5' 9.104" E
PBBD_KT1_AJ_23	1	23° 39' 37.068" N	88° 5' 31.036" E
	2	23° 39' 36.815" N	88° 5' 30.476" E
	3	23° 39' 36.876" N	88° 5' 30.445" E
	4	23° 39' 37.492" N	88° 5' 30.137" E
	5	23° 39' 37.505" N	88° 5' 30.134" E
	6	23° 39' 38.373" N	88° 5' 29.917" E
	7	23° 39' 38.412" N	88° 5' 29.908" E
	8	23° 39' 39.070" N	88° 5' 29.744" E
	9	23° 39' 39.357" N	88° 5' 29.672" E
	10	23° 39' 41.319" N	88° 5' 29.183" E
	11	23° 39' 44.480" N	88° 5' 28.110" E
	12	23° 39' 44.386" N	88° 5' 28.194" E
	13	23° 39' 43.951" N	88° 5' 28.584" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	14	23° 39' 41.575" N	88° 5' 30.709" E
	15	23° 39' 38.412" N	88° 5' 30.939" E
PBBD_ME1_DA_16	1	23° 9' 51.444" N	87° 58' 13.850" E
	2	23° 9' 55.778" N	87° 58' 16.191" E
	3	23° 9' 54.410" N	87° 58' 21.133" E
	4	23° 9' 52.985" N	87° 58' 28.939" E
	5	23° 9' 52.601" N	87° 58' 35.449" E
	6	23° 9' 52.562" N	87° 58' 41.776" E
	7	23° 9' 50.632" N	87° 58' 47.717" E
	8	23° 9' 49.735" N	87° 58' 53.666" E
	9	23° 9' 50.731" N	87° 58' 59.442" E
	10	23° 9' 49.863" N	87° 59' 0.738" E
	11	23° 9' 45.032" N	87° 59' 2.750" E
	12	23° 9' 40.892" N	87° 59' 4.394" E
	13	23° 9' 38.296" N	87° 59' 6.795" E
	14	23° 9' 36.705" N	87° 59' 13.668" E
	15	23° 9' 34.736" N	87° 59' 13.489" E
	16	23° 9' 35.052" N	87° 59' 12.580" E
	17	23° 9' 39.883" N	87° 58' 51.302" E
	18	23° 9' 41.014" N	87° 58' 29.921" E
	19	23° 9' 45.942" N	87° 58' 18.399" E
	20	23° 9' 49.933" N	87° 58' 21.659" E
PBBD_MK_AJ_01	1	23° 34' 35.197" N	87° 55' 56.021" E
	2	23° 34' 33.570" N	87° 55' 54.668" E
	3	23° 34' 33.904" N	87° 55' 53.983" E
	4	23° 34' 35.561" N	87° 55' 53.159" E
	5	23° 34' 38.101" N	87° 55' 51.982" E
	6	23° 34' 42.230" N	87° 55' 52.101" E
	7	23° 34' 44.900" N	87° 55' 52.149" E
	8	23° 34' 45.383" N	87° 55' 52.015" E
	9	23° 34' 45.396" N	87° 55' 52.031" E
	10	23° 34' 49.409" N	87° 55' 52.247" E
	11	23° 34' 59.020" N	87° 55' 51.065" E
	12	23° 35' 1.590" N	87° 55' 51.630" E
	13	23° 35' 7.248" N	87° 55' 52.631" E
	14	23° 35' 8.546" N	87° 55' 53.881" E
	15	23° 35' 2.074" N	87° 55' 54.255" E
	16	23° 34' 56.591" N	87° 55' 56.120" E
	17	23° 34' 49.776" N	87° 55' 56.408" E
	18	23° 34' 48.148" N	87° 55' 56.791" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	19	23° 34' 44.004" N	87° 55' 57.076" E
	20	23° 34' 43.989" N	87° 55' 57.074" E
	21	23° 34' 43.051" N	87° 55' 56.993" E
	22	23° 34' 42.104" N	87° 55' 56.922" E
	23	23° 34' 41.829" N	87° 55' 56.934" E
	24	23° 34' 40.983" N	87° 55' 56.968" E
	25	23° 34' 39.673" N	87° 55' 57.021" E
	26	23° 34' 37.646" N	87° 55' 57.104" E
	27	23° 34' 36.581" N	87° 55' 56.779" E
	28	23° 34' 36.112" N	87° 55' 56.479" E
PBBD_MK_AJ_03	1	23° 36' 28.053" N	87° 57' 1.906" E
	2	23° 36' 21.755" N	87° 56' 59.607" E
	3	23° 36' 25.330" N	87° 56' 57.878" E
	4	23° 36' 27.888" N	87° 56' 56.807" E
	5	23° 36' 28.178" N	87° 56' 56.863" E
	6	23° 36' 41.515" N	87° 56' 59.443" E
	7	23° 36' 43.290" N	87° 56' 59.786" E
	8	23° 37' 18.842" N	87° 57' 6.663" E
	9	23° 37' 21.850" N	87° 57' 10.276" E
	10	23° 37' 23.368" N	87° 57' 12.100" E
	11	23° 37' 17.259" N	87° 57' 12.101" E
	12	23° 37' 16.058" N	87° 57' 11.826" E
	13	23° 37' 11.689" N	87° 57' 9.564" E
	14	23° 37' 1.667" N	87° 57' 7.611" E
	15	23° 36' 49.794" N	87° 57' 4.527" E
	16	23° 36' 44.192" N	87° 57' 3.602" E
	17	23° 36' 38.384" N	87° 57' 3.911" E
	18	23° 36' 33.296" N	87° 57' 3.294" E
PBBD_MK_AJ_07_08	1	23° 37' 51.240" N	87° 58' 34.969" E
	2	23° 37' 51.956" N	87° 58' 35.046" E
	3	23° 37' 54.040" N	87° 58' 35.269" E
	4	23° 37' 54.463" N	87° 58' 35.315" E
	5	23° 37' 54.535" N	87° 58' 35.439" E
	6	23° 37' 58.298" N	87° 58' 39.015" E
	7	23° 37' 58.990" N	87° 58' 39.498" E
	8	23° 37' 58.818" N	87° 58' 39.695" E
	9	23° 37' 58.724" N	87° 58' 39.811" E
	10	23° 37' 57.285" N	87° 58' 41.620" E
	11	23° 37' 57.106" N	87° 58' 41.853" E
	12	23° 37' 56.669" N	87° 58' 42.435" E

NAME	POINT_NO	LATITUDE	LONGITUDE
	13	23° 37' 56.155" N	87° 58' 42.380" E
	14	23° 37' 53.878" N	87° 58' 41.165" E
	15	23° 37' 52.965" N	87° 58' 40.458" E
	16	23° 37' 52.466" N	87° 58' 38.043" E
PBBD_MK_AJ_12	1	23° 38' 3.821" N	88° 0' 1.220" E
	2	23° 38' 3.064" N	87° 59' 59.977" E
	3	23° 38' 1.876" N	87° 59' 59.645" E
	4	23° 37' 59.190" N	87° 59' 53.230" E
	5	23° 37' 58.531" N	87° 59' 53.182" E
	6	23° 37' 57.196" N	87° 59' 49.241" E
	7	23° 37' 55.674" N	87° 59' 45.121" E
	8	23° 37' 55.137" N	87° 59' 42.988" E
	9	23° 37' 55.012" N	87° 59' 41.498" E
	10	23° 37' 56.651" N	87° 59' 43.441" E
	11	23° 38' 4.189" N	87° 59' 55.776" E
	12	23° 38' 3.883" N	88° 0' 0.291" E
PBBD_MK_AJ_17	1	23° 38' 9.692" N	88° 2' 23.769" E
	2	23° 38' 3.347" N	88° 2' 24.160" E
	3	23° 38' 2.103" N	88° 2' 24.290" E
	4	23° 38' 0.933" N	88° 2' 23.338" E
	5	23° 37' 58.924" N	88° 2' 20.111" E
	6	23° 37' 55.764" N	88° 2' 14.147" E
	7	23° 37' 55.735" N	88° 2' 14.073" E
	8	23° 38' 4.811" N	88° 2' 19.924" E
	9	23° 38' 3.909" N	88° 2' 19.343" E
	10	23° 38' 5.115" N	88° 2' 20.121" E
	11	23° 38' 5.117" N	88° 2' 20.122" E
	12	23° 38' 5.757" N	88° 2' 20.534" E
	13	23° 38' 7.301" N	88° 2' 21.972" E
	14	23° 38' 9.569" N	88° 2' 23.717" E
PBBD_RN2_DW_04	1	22° 58' 5.206" N	87° 44' 34.624" E
	2	22° 58' 0.860" N	87° 44' 34.693" E
	3	22° 58' 1.538" N	87° 44' 34.298" E
	4	22° 58' 1.236" N	87° 44' 33.366" E
	5	22° 58' 6.088" N	87° 44' 31.201" E
	6	22° 58' 10.995" N	87° 44' 29.967" E
	7	22° 58' 13.571" N	87° 44' 30.050" E
	8	22° 58' 18.067" N	87° 44' 29.885" E
	9	22° 58' 21.905" N	87° 44' 28.816" E
	10	22° 58' 29.963" N	87° 44' 27.473" E

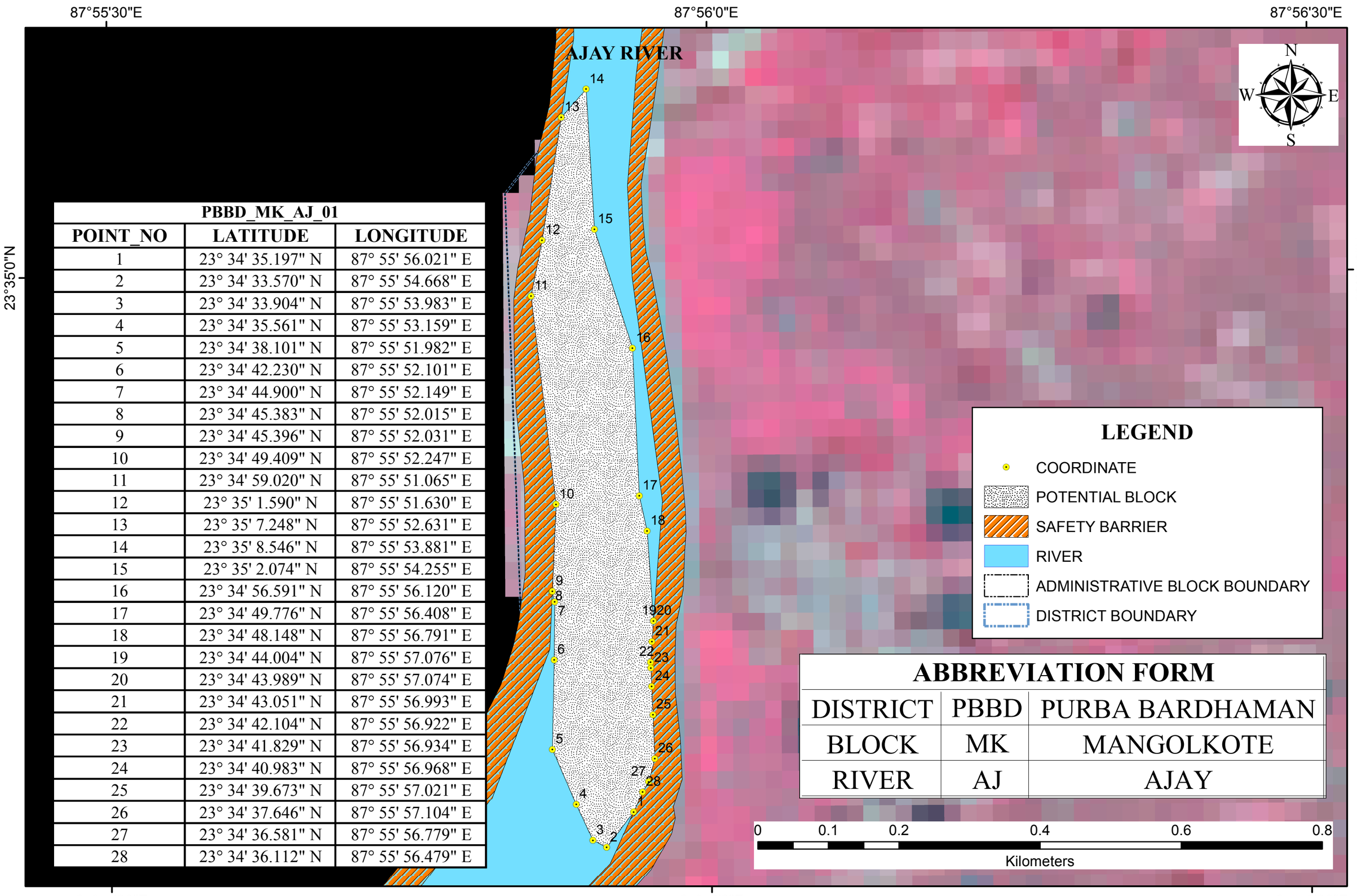
NAME	POINT_NO	LATITUDE	LONGITUDE
	11	22° 58' 33.828" N	87° 44' 26.651" E
	12	22° 58' 39.256" N	87° 44' 25.636" E
	13	22° 58' 43.422" N	87° 44' 24.787" E
	14	22° 58' 47.616" N	87° 44' 24.403" E
	15	22° 58' 51.015" N	87° 44' 24.787" E
	16	22° 58' 53.811" N	87° 44' 25.554" E
	17	22° 58' 56.881" N	87° 44' 26.130" E
	18	22° 58' 57.399" N	87° 44' 26.051" E
	19	22° 58' 57.067" N	87° 44' 27.882" E
	20	22° 58' 52.926" N	87° 44' 30.313" E
	21	22° 58' 46.409" N	87° 44' 32.954" E
	22	22° 58' 43.411" N	87° 44' 33.718" E
	23	22° 58' 39.182" N	87° 44' 32.914" E
	24	22° 58' 35.361" N	87° 44' 33.116" E
	25	22° 58' 29.887" N	87° 44' 33.644" E
	26	22° 58' 24.617" N	87° 44' 34.396" E
	27	22° 58' 18.527" N	87° 44' 34.251" E
	28	22° 58' 10.785" N	87° 44' 33.874" E
	29	22° 58' 6.862" N	87° 44' 33.741" E
PBBD_RN2_DW_05	1	22° 57' 46.607" N	87° 45' 4.727" E
	2	22° 57' 46.402" N	87° 45' 10.031" E
	3	22° 57' 48.211" N	87° 45' 18.501" E
	4	22° 57' 50.225" N	87° 45' 24.669" E
	5	22° 57' 52.166" N	87° 45' 31.543" E
	6	22° 57' 50.075" N	87° 45' 30.289" E
	7	22° 57' 47.729" N	87° 45' 24.256" E
	8	22° 57' 45.189" N	87° 45' 15.545" E
	9	22° 57' 43.477" N	87° 45' 6.504" E
	10	22° 57' 41.753" N	87° 44' 59.917" E
	11	22° 57' 45.197" N	87° 44' 52.131" E
	12	22° 57' 50.703" N	87° 44' 45.025" E
	13	22° 58' 0.742" N	87° 44' 39.729" E
	14	22° 58' 8.839" N	87° 44' 38.120" E
	15	22° 58' 8.194" N	87° 44' 40.180" E
	16	22° 58' 2.643" N	87° 44' 42.483" E
	17	22° 58' 0.587" N	87° 44' 43.305" E
	18	22° 57' 55.365" N	87° 44' 46.635" E
	19	22° 57' 51.048" N	87° 44' 50.295" E
	20	22° 57' 49.197" N	87° 44' 52.885" E
	21	22° 57' 47.471" N	87° 44' 58.436" E

NAME	POINT_NO	LATITUDE	LONGITUDE
PBBD_RN2_DW_06	1	22° 57' 23.542" N	87° 45' 51.548" E
	2	22° 57' 20.847" N	87° 45' 50.185" E
	3	22° 57' 21.260" N	87° 45' 49.347" E
	4	22° 57' 30.070" N	87° 45' 52.284" E
	5	22° 57' 33.140" N	87° 45' 52.887" E
	6	22° 57' 35.113" N	87° 45' 52.722" E
	7	22° 57' 38.540" N	87° 45' 52.393" E
	8	22° 57' 41.610" N	87° 45' 51.516" E
	9	22° 57' 43.529" N	87° 45' 49.817" E
	10	22° 57' 44.084" N	87° 45' 49.163" E
	11	22° 57' 42.842" N	87° 45' 52.882" E
	12	22° 57' 38.808" N	87° 45' 54.532" E
	13	22° 57' 31.376" N	87° 45' 54.156" E

Annexure 4
Map showing of Potential Blocks of Purba Bardhaman District

POTENTIAL BLOCK PBBD_MK_AJ_01 OF AJAY RIVER

PBBD_MK_AJ_01		
POINT_NO	LATITUDE	LONGITUDE
1	23° 34' 35.197" N	87° 55' 56.021" E
2	23° 34' 33.570" N	87° 55' 54.668" E
3	23° 34' 33.904" N	87° 55' 53.983" E
4	23° 34' 35.561" N	87° 55' 53.159" E
5	23° 34' 38.101" N	87° 55' 51.982" E
6	23° 34' 42.230" N	87° 55' 52.101" E
7	23° 34' 44.900" N	87° 55' 52.149" E
8	23° 34' 45.383" N	87° 55' 52.015" E
9	23° 34' 45.396" N	87° 55' 52.031" E
10	23° 34' 49.409" N	87° 55' 52.247" E
11	23° 34' 59.020" N	87° 55' 51.065" E
12	23° 35' 1.590" N	87° 55' 51.630" E
13	23° 35' 7.248" N	87° 55' 52.631" E
14	23° 35' 8.546" N	87° 55' 53.881" E
15	23° 35' 2.074" N	87° 55' 54.255" E
16	23° 34' 56.591" N	87° 55' 56.120" E
17	23° 34' 49.776" N	87° 55' 56.408" E
18	23° 34' 48.148" N	87° 55' 56.791" E
19	23° 34' 44.004" N	87° 55' 57.076" E
20	23° 34' 43.989" N	87° 55' 57.074" E
21	23° 34' 43.051" N	87° 55' 56.993" E
22	23° 34' 42.104" N	87° 55' 56.922" E
23	23° 34' 41.829" N	87° 55' 56.934" E
24	23° 34' 40.983" N	87° 55' 56.968" E
25	23° 34' 39.673" N	87° 55' 57.021" E
26	23° 34' 37.646" N	87° 55' 57.104" E
27	23° 34' 36.581" N	87° 55' 56.779" E
28	23° 34' 36.112" N	87° 55' 56.479" E



POTENTIAL BLOCK PBBD_MK_AJ_03 OF AJAY RIVER

87°56'30"E 87°57'0"E 87°57'30"E 87°58'0"E

23°37'0"N

23°36'30"N

PBBD_MK_AJ_03		
POINT_NO	LATITUDE	LONGITUDE
1	23° 36' 28.053" N	87° 57' 1.906" E
2	23° 36' 21.755" N	87° 56' 59.607" E
3	23° 36' 25.330" N	87° 56' 57.878" E
4	23° 36' 27.888" N	87° 56' 56.807" E
5	23° 36' 28.178" N	87° 56' 56.863" E
6	23° 36' 41.515" N	87° 56' 59.443" E
7	23° 36' 43.290" N	87° 56' 59.786" E
8	23° 37' 18.842" N	87° 57' 6.663" E
9	23° 37' 21.850" N	87° 57' 10.276" E
10	23° 37' 23.368" N	87° 57' 12.100" E
11	23° 37' 17.259" N	87° 57' 12.101" E
12	23° 37' 16.058" N	87° 57' 11.826" E
13	23° 37' 11.689" N	87° 57' 9.564" E
14	23° 37' 1.667" N	87° 57' 7.611" E
15	23° 36' 49.794" N	87° 57' 4.527" E
16	23° 36' 44.192" N	87° 57' 3.602" E
17	23° 36' 38.384" N	87° 57' 3.911" E
18	23° 36' 33.296" N	87° 57' 3.294" E

AJAY RIVER

N W E S

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

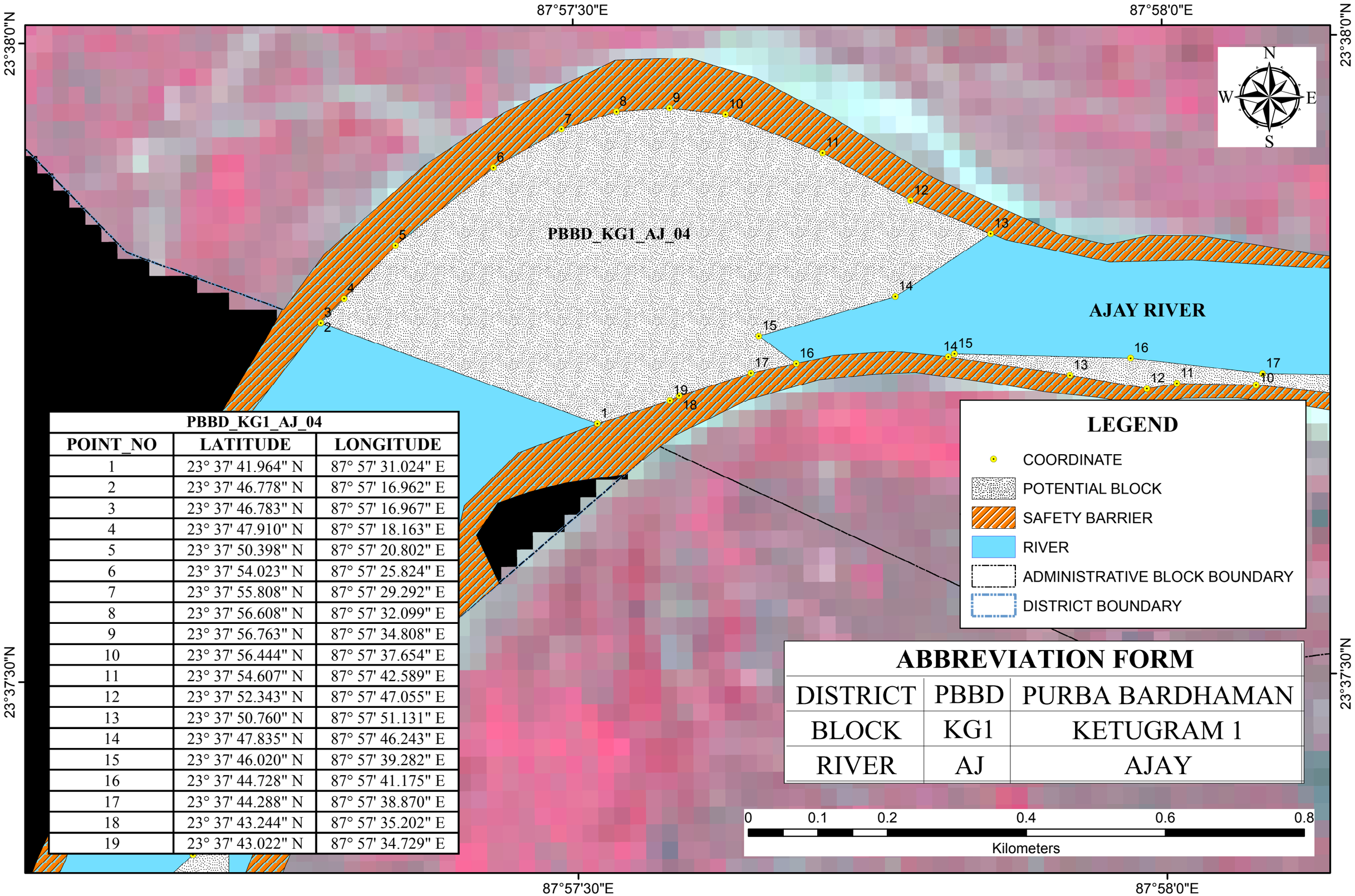
ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	MK	MANGOLKOTE
RIVER	AJ	AJAY

0 0.175 0.35 0.7 1.05 1.4

Kilometers

POTENTIAL BLOCK PBBD_KG1_AJ_04 OF AJAY RIVER



PBBD_KG1_AJ_04		
POINT_NO	LATITUDE	LONGITUDE
1	23° 37' 41.964" N	87° 57' 31.024" E
2	23° 37' 46.778" N	87° 57' 16.962" E
3	23° 37' 46.783" N	87° 57' 16.967" E
4	23° 37' 47.910" N	87° 57' 18.163" E
5	23° 37' 50.398" N	87° 57' 20.802" E
6	23° 37' 54.023" N	87° 57' 25.824" E
7	23° 37' 55.808" N	87° 57' 29.292" E
8	23° 37' 56.608" N	87° 57' 32.099" E
9	23° 37' 56.763" N	87° 57' 34.808" E
10	23° 37' 56.444" N	87° 57' 37.654" E
11	23° 37' 54.607" N	87° 57' 42.589" E
12	23° 37' 52.343" N	87° 57' 47.055" E
13	23° 37' 50.760" N	87° 57' 51.131" E
14	23° 37' 47.835" N	87° 57' 46.243" E
15	23° 37' 46.020" N	87° 57' 39.282" E
16	23° 37' 44.728" N	87° 57' 41.175" E
17	23° 37' 44.288" N	87° 57' 38.870" E
18	23° 37' 43.244" N	87° 57' 35.202" E
19	23° 37' 43.022" N	87° 57' 34.729" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG1	KETUGRAM 1
RIVER	AJ	AJAY

POTENTIAL BLOCK PBBD_KG1_AJ_05_06 OF AJAY RIVER

87°58'0"E

87°58'30"E

23°37'30"N

PBBD_KG1_AJ_05_06		
POINT_NO	LATITUDE	LONGITUDE
1	23° 37' 51.240" N	87° 58' 34.969" E
2	23° 37' 46.268" N	87° 58' 34.437" E
3	23° 37' 45.939" N	87° 58' 34.084" E
4	23° 37' 44.201" N	87° 58' 31.419" E
5	23° 37' 42.402" N	87° 58' 27.447" E
6	23° 37' 41.207" N	87° 58' 20.529" E
7	23° 37' 41.430" N	87° 58' 17.879" E
8	23° 37' 42.177" N	87° 58' 13.962" E
9	23° 37' 43.101" N	87° 58' 9.226" E
10	23° 37' 43.578" N	87° 58' 4.598" E
11	23° 37' 43.672" N	87° 58' 0.565" E
12	23° 37' 43.440" N	87° 57' 59.032" E
13	23° 37' 44.084" N	87° 57' 55.115" E
14	23° 37' 44.995" N	87° 57' 48.931" E
15	23° 37' 45.132" N	87° 57' 49.248" E
16	23° 37' 44.870" N	87° 57' 58.210" E
17	23° 37' 44.105" N	87° 58' 4.927" E
18	23° 37' 43.954" N	87° 58' 12.545" E
19	23° 37' 46.223" N	87° 58' 13.010" E
20	23° 37' 48.838" N	87° 58' 11.273" E
21	23° 37' 48.848" N	87° 58' 16.442" E
22	23° 37' 49.545" N	87° 58' 21.816" E
23	23° 37' 50.588" N	87° 58' 26.959" E
24	23° 37' 51.812" N	87° 58' 30.750" E
25	23° 37' 54.463" N	87° 58' 35.315" E
26	23° 37' 54.040" N	87° 58' 35.269" E
27	23° 37' 51.956" N	87° 58' 35.046" E

AJAY RIVER

PBBD_KG1_AJ_05_06

N

W

E

S

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG1	KETUGRAM 1
RIVER	AJ	AJAY

0 0.1 0.2 0.4 0.6 0.8

Kilometers

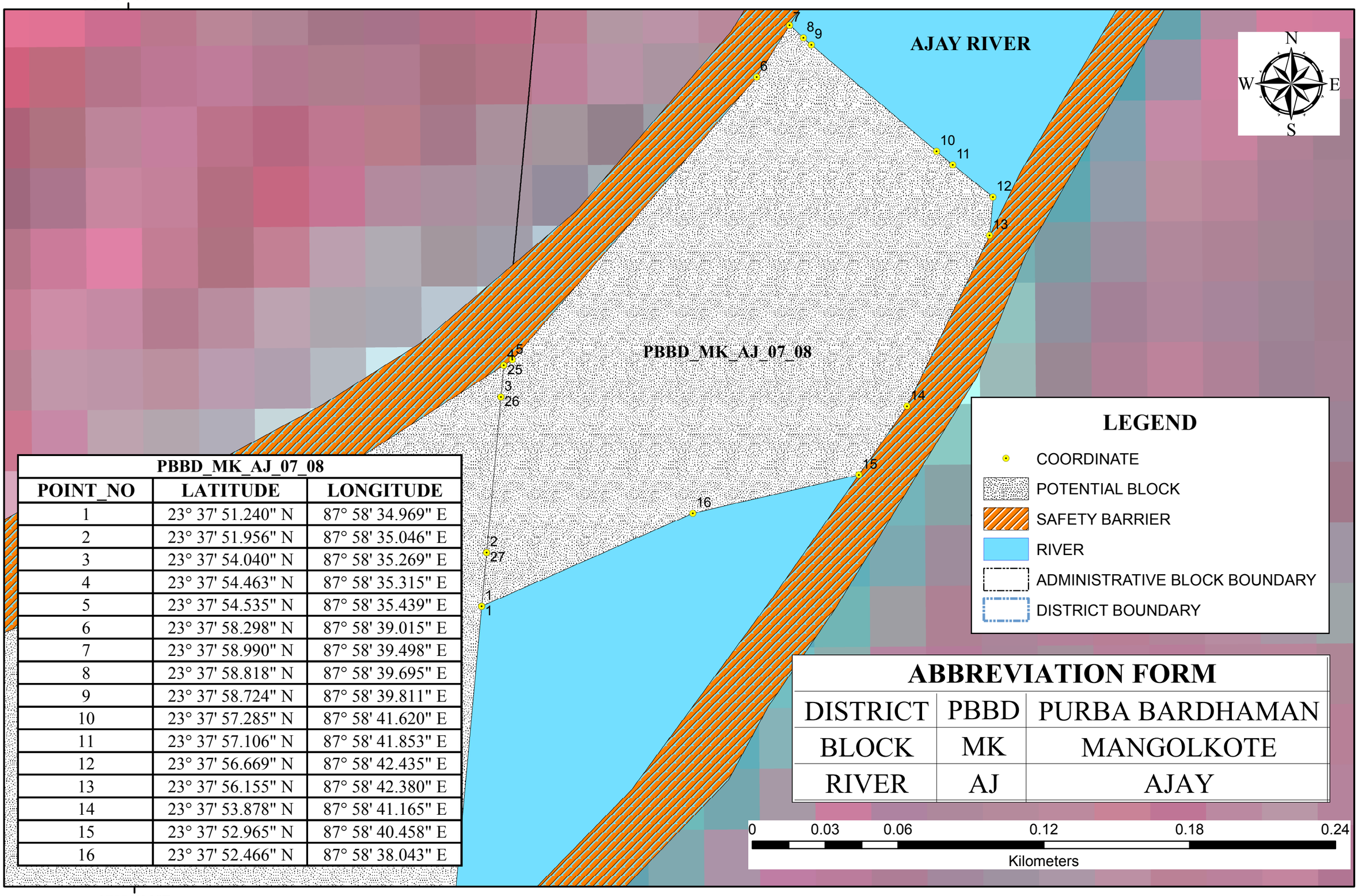
23°37'30"N

87°58'0"E

87°58'30"E

POTENTIAL BLOCK PBBD_MK_AJ_07_08 OF AJAY RIVER

87°58'30"E



PBBD_MK_AJ_07_08		
POINT_NO	LATITUDE	LONGITUDE
1	23° 37' 51.240" N	87° 58' 34.969" E
2	23° 37' 51.956" N	87° 58' 35.046" E
3	23° 37' 54.040" N	87° 58' 35.269" E
4	23° 37' 54.463" N	87° 58' 35.315" E
5	23° 37' 54.535" N	87° 58' 35.439" E
6	23° 37' 58.298" N	87° 58' 39.015" E
7	23° 37' 58.990" N	87° 58' 39.498" E
8	23° 37' 58.818" N	87° 58' 39.695" E
9	23° 37' 58.724" N	87° 58' 39.811" E
10	23° 37' 57.285" N	87° 58' 41.620" E
11	23° 37' 57.106" N	87° 58' 41.853" E
12	23° 37' 56.669" N	87° 58' 42.435" E
13	23° 37' 56.155" N	87° 58' 42.380" E
14	23° 37' 53.878" N	87° 58' 41.165" E
15	23° 37' 52.965" N	87° 58' 40.458" E
16	23° 37' 52.466" N	87° 58' 38.043" E

87°58'30"E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	MK	MANGOLKOTE
RIVER	AJ	AJAY

0 0.03 0.06 0.12 0.18 0.24

Kilometers

POTENTIAL BLOCK PBBD_KG1_AJ_09_10 OF AJAY RIVER

87°59'0"E 87°59'30"E

23°38'30"N 23°38'0"N

AJAY RIVER

PBBD_KG1_AJ_09_10					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 25.883" N	87° 59' 24.416" E	20	23° 38' 14.334" N	87° 59' 0.553" E
2	23° 38' 23.121" N	87° 59' 25.796" E	21	23° 38' 12.659" N	87° 58' 58.710" E
3	23° 38' 19.976" N	87° 59' 26.659" E	22	23° 38' 11.065" N	87° 58' 56.757" E
4	23° 38' 16.442" N	87° 59' 27.660" E	23	23° 38' 11.094" N	87° 58' 56.725" E
5	23° 38' 13.735" N	87° 59' 27.313" E	24	23° 38' 11.367" N	87° 58' 56.376" E
6	23° 38' 12.750" N	87° 59' 27.305" E	25	23° 38' 12.142" N	87° 58' 55.344" E
7	23° 38' 11.960" N	87° 59' 26.237" E	26	23° 38' 13.159" N	87° 58' 54.065" E
8	23° 38' 6.695" N	87° 59' 26.309" E	27	23° 38' 14.092" N	87° 58' 53.113" E
9	23° 38' 6.645" N	87° 59' 25.158" E	28	23° 38' 14.258" N	87° 58' 52.939" E
10	23° 38' 7.227" N	87° 59' 25.002" E	29	23° 38' 14.698" N	87° 58' 52.437" E
11	23° 38' 8.677" N	87° 59' 24.303" E	30	23° 38' 15.106" N	87° 58' 51.904" E
12	23° 38' 15.707" N	87° 59' 22.675" E	31	23° 38' 15.275" N	87° 58' 51.652" E
13	23° 38' 20.567" N	87° 59' 21.367" E	32	23° 38' 17.911" N	87° 58' 52.841" E
14	23° 38' 23.124" N	87° 59' 19.705" E	33	23° 38' 20.521" N	87° 58' 55.055" E
15	23° 38' 23.927" N	87° 59' 17.918" E	34	23° 38' 23.511" N	87° 58' 58.392" E
16	23° 38' 24.015" N	87° 59' 14.931" E	35	23° 38' 27.220" N	87° 59' 3.556" E
17	23° 38' 22.942" N	87° 59' 10.515" E	36	23° 38' 28.916" N	87° 59' 7.444" E
18	23° 38' 20.795" N	87° 59' 7.212" E	37	23° 38' 30.038" N	87° 59' 13.708" E
19	23° 38' 16.625" N	87° 59' 2.699" E	38	23° 38' 29.571" N	87° 59' 19.401" E
			39	23° 38' 28.175" N	87° 59' 22.426" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG1	KETUGRAM 1
RIVER	AJ	AJAY

0 0.1 0.2 0.4 0.6 0.8

Kilometers

POTENTIAL BLOCK PBBD_KG1_AJ_11 OF AJAY RIVER

87°59'30"E

88°0'0"E

23°38'0"N

AJAY RIVER

PBBD_KG1_AJ_11

N

S

E

W

PBBD_KG1_AJ_11					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 3.821" N	88° 0' 1.220" E	16	23° 38' 2.475" N	87° 59' 32.504" E
2	23° 38' 3.883" N	88° 0' 0.291" E	17	23° 38' 0.842" N	87° 59' 34.778" E
3	23° 38' 4.189" N	87° 59' 55.776" E	18	23° 38' 0.867" N	87° 59' 39.367" E
4	23° 37' 56.651" N	87° 59' 43.441" E	19	23° 38' 4.024" N	87° 59' 46.039" E
5	23° 37' 55.012" N	87° 59' 41.498" E	20	23° 38' 5.715" N	87° 59' 50.683" E
6	23° 37' 54.977" N	87° 59' 41.082" E	21	23° 38' 5.843" N	87° 59' 57.482" E
7	23° 37' 54.515" N	87° 59' 38.016" E	22	23° 38' 6.363" N	88° 0' 1.166" E
8	23° 37' 54.357" N	87° 59' 35.848" E	23	23° 38' 10.717" N	88° 0' 8.516" E
9	23° 37' 54.743" N	87° 59' 34.514" E	24	23° 38' 13.193" N	88° 0' 11.383" E
10	23° 37' 56.134" N	87° 59' 31.160" E	25	23° 38' 15.196" N	88° 0' 14.247" E
11	23° 37' 58.318" N	87° 59' 28.599" E	26	23° 38' 16.603" N	88° 0' 17.463" E
12	23° 38' 1.215" N	87° 59' 27.724" E	27	23° 38' 16.368" N	88° 0' 19.271" E
13	23° 38' 5.549" N	87° 59' 27.981" E	28	23° 38' 14.812" N	88° 0' 20.380" E
14	23° 38' 8.628" N	87° 59' 28.298" E	29	23° 38' 10.621" N	88° 0' 14.073" E
15	23° 38' 5.675" N	87° 59' 29.773" E	30	23° 38' 8.279" N	88° 0' 9.013" E
			31	23° 38' 5.112" N	88° 0' 3.834" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

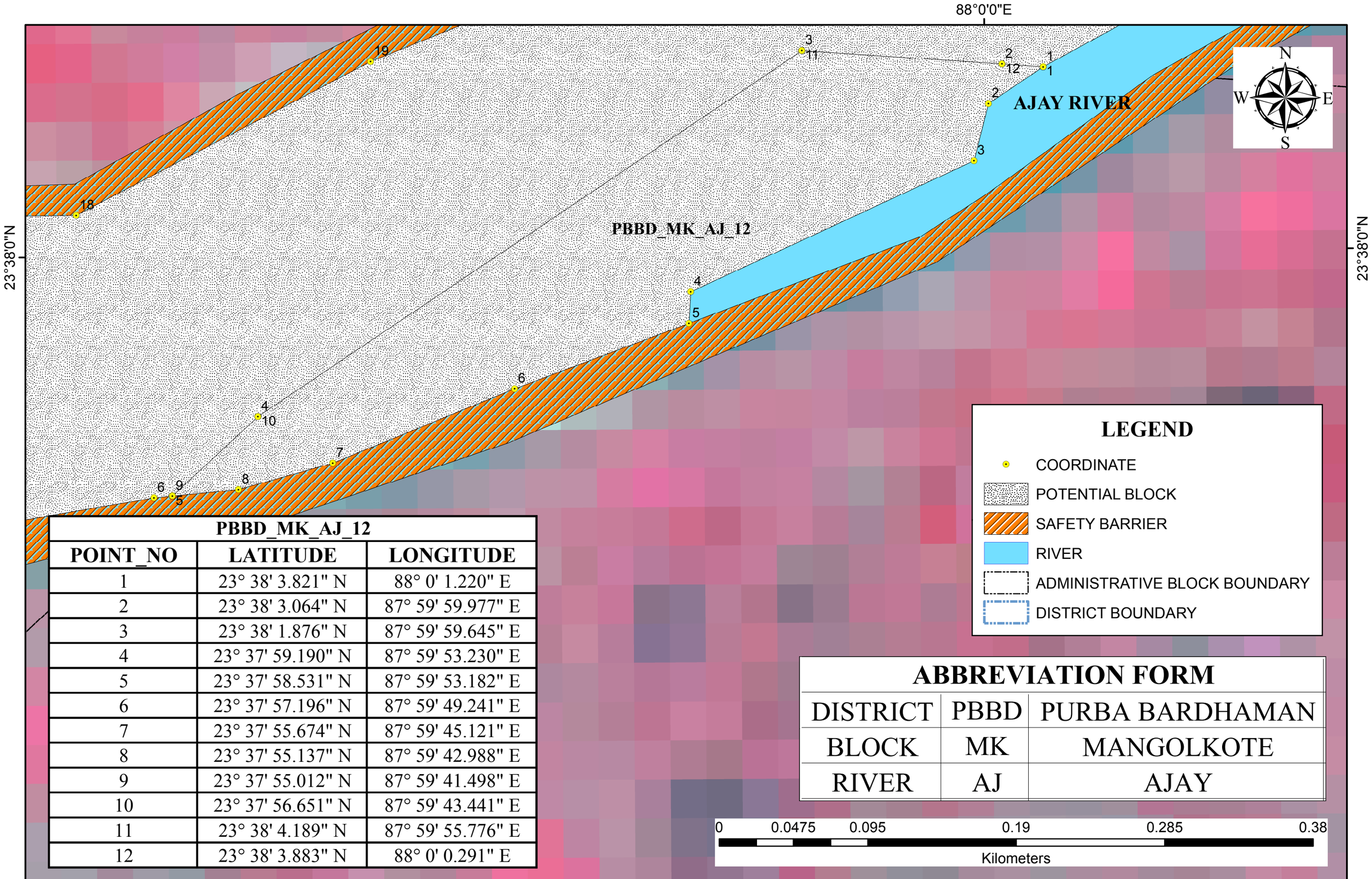
ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG1	KETUGRAM 1
RIVER	AJ	AJAY

0 0.1 0.2 0.4 0.6 0.8

Kilometers

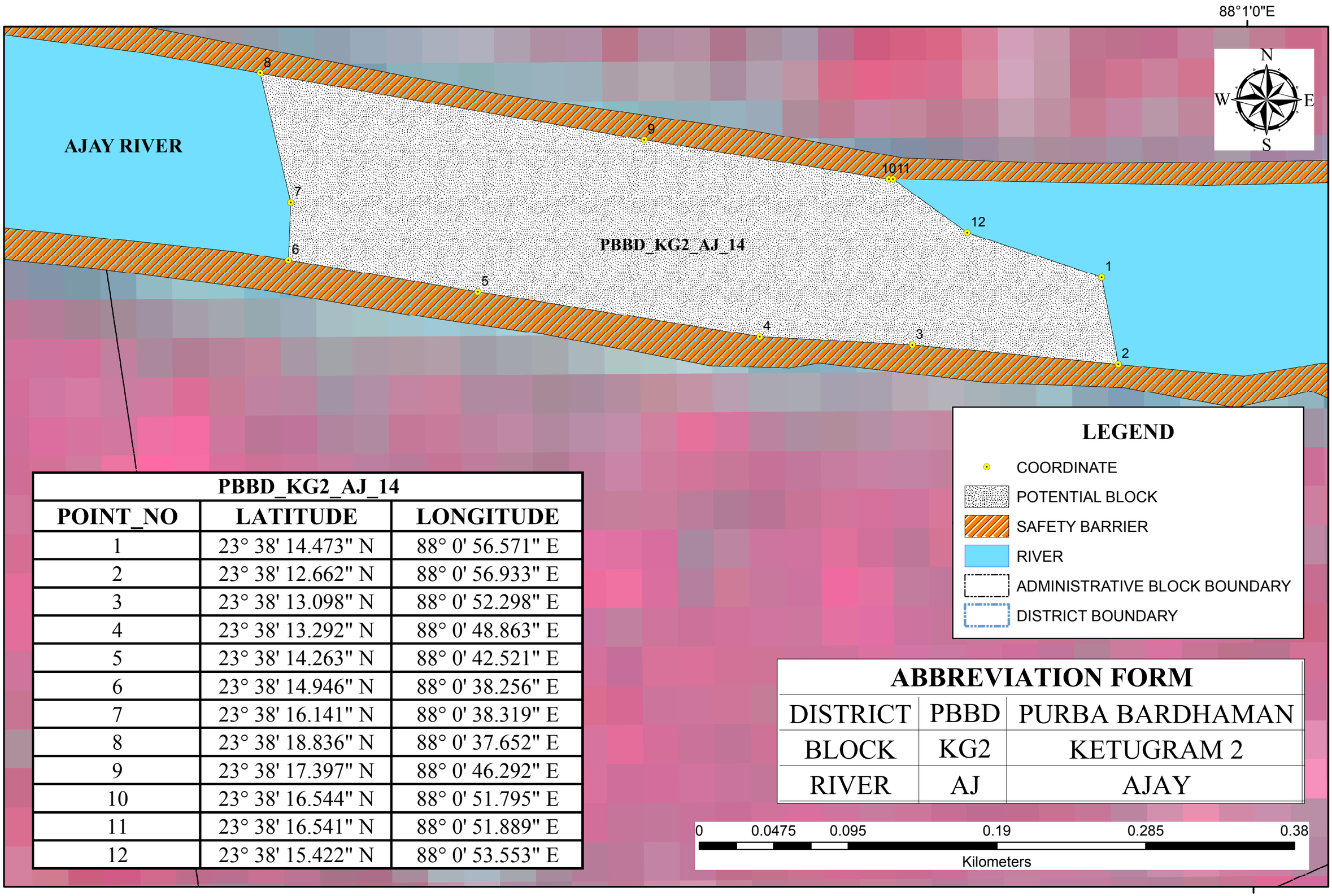
POTENTIAL BLOCK PBBD_MK_AJ_12 OF AJAY RIVER



PBBD_MK_AJ_12		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 3.821" N	88° 0' 1.220" E
2	23° 38' 3.064" N	87° 59' 59.977" E
3	23° 38' 1.876" N	87° 59' 59.645" E
4	23° 37' 59.190" N	87° 59' 53.230" E
5	23° 37' 58.531" N	87° 59' 53.182" E
6	23° 37' 57.196" N	87° 59' 49.241" E
7	23° 37' 55.674" N	87° 59' 45.121" E
8	23° 37' 55.137" N	87° 59' 42.988" E
9	23° 37' 55.012" N	87° 59' 41.498" E
10	23° 37' 56.651" N	87° 59' 43.441" E
11	23° 38' 4.189" N	87° 59' 55.776" E
12	23° 38' 3.883" N	88° 0' 0.291" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	MK	MANGOLKOTE
RIVER	AJ	AJAY

POTENTIAL BLOCK PBBD_KG2_AJ_14 OF AJAY RIVER



PBBD_KG2_AJ_14		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 14.473" N	88° 0' 56.571" E
2	23° 38' 12.662" N	88° 0' 56.933" E
3	23° 38' 13.098" N	88° 0' 52.298" E
4	23° 38' 13.292" N	88° 0' 48.863" E
5	23° 38' 14.263" N	88° 0' 42.521" E
6	23° 38' 14.946" N	88° 0' 38.256" E
7	23° 38' 16.141" N	88° 0' 38.319" E
8	23° 38' 18.836" N	88° 0' 37.652" E
9	23° 38' 17.397" N	88° 0' 46.292" E
10	23° 38' 16.544" N	88° 0' 51.795" E
11	23° 38' 16.541" N	88° 0' 51.889" E
12	23° 38' 15.422" N	88° 0' 53.553" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

POTENTIAL BLOCK PBBD_KG2_AJ_14A OF AJAY RIVER

88°1'0"E

88°1'30"E

23°38'0"N

AJAY RIVER

PBBD_KG2_AJ_14A		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 12.757" N	88° 1' 7.460" E
2	23° 38' 12.502" N	88° 1' 6.159" E
3	23° 38' 13.888" N	88° 1' 7.099" E
4	23° 38' 15.526" N	88° 1' 9.129" E
5	23° 38' 17.116" N	88° 1' 8.131" E
6	23° 38' 17.796" N	88° 1' 10.760" E
7	23° 38' 22.746" N	88° 1' 19.551" E
8	23° 38' 22.447" N	88° 1' 24.198" E
9	23° 38' 21.558" N	88° 1' 24.844" E
10	23° 38' 21.420" N	88° 1' 24.447" E
11	23° 38' 18.108" N	88° 1' 20.537" E
12	23° 38' 15.552" N	88° 1' 16.857" E
13	23° 38' 13.746" N	88° 1' 14.154" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

0 0.075 0.15 0.3 0.45 0.6

Kilometers

POTENTIAL BLOCK PBBD_KG2_AJ_15 OF AJAY RIVER

88°1'30"E 88°2'0"E

23°38'30"N 23°38'0"N

PBBD_KG2_AJ_15

AJAY RIVER

PBBD_KG2_AJ_15		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 25.503" N	88° 1' 53.418" E
2	23° 38' 21.744" N	88° 1' 54.658" E
3	23° 38' 19.989" N	88° 1' 54.719" E
4	23° 38' 18.505" N	88° 1' 54.135" E
5	23° 38' 17.371" N	88° 1' 54.019" E
6	23° 38' 16.146" N	88° 1' 52.790" E
7	23° 38' 12.740" N	88° 1' 52.763" E
8	23° 38' 8.199" N	88° 1' 52.504" E
9	23° 38' 7.862" N	88° 1' 52.350" E
10	23° 38' 11.332" N	88° 1' 51.374" E
11	23° 38' 14.607" N	88° 1' 50.428" E
12	23° 38' 16.775" N	88° 1' 49.414" E
13	23° 38' 20.870" N	88° 1' 46.322" E
14	23° 38' 22.672" N	88° 1' 44.431" E
15	23° 38' 24.014" N	88° 1' 41.974" E
16	23° 38' 24.276" N	88° 1' 40.120" E
17	23° 38' 24.537" N	88° 1' 37.134" E
18	23° 38' 24.392" N	88° 1' 33.024" E
19	23° 38' 23.146" N	88° 1' 29.428" E
20	23° 38' 26.705" N	88° 1' 32.815" E
21	23° 38' 27.604" N	88° 1' 33.962" E
22	23° 38' 30.221" N	88° 1' 35.452" E
23	23° 38' 31.209" N	88° 1' 38.565" E
24	23° 38' 31.794" N	88° 1' 43.724" E
25	23° 38' 30.817" N	88° 1' 49.665" E
26	23° 38' 29.825" N	88° 1' 50.351" E
27	23° 38' 28.406" N	88° 1' 51.498" E

N W E S

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

0 0.125 0.25 0.5 0.75 1

Kilometers

POTENTIAL BLOCK PBBD_KG2_AJ_16 OF AJAY RIVER

88°2'0"E

88°2'30"E

23°38'0"N

AJAY RIVER

PBBD_KG2_AJ_16

PBBD_KG2_AJ_16		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 0.997" N	88° 2' 6.188" E
2	23° 38' 0.290" N	88° 2' 9.031" E
3	23° 38' 0.400" N	88° 2' 11.926" E
4	23° 38' 1.622" N	88° 2' 15.624" E
5	23° 38' 3.710" N	88° 2' 18.629" E
6	23° 38' 5.756" N	88° 2' 20.533" E
7	23° 38' 5.117" N	88° 2' 20.122" E
8	23° 38' 5.115" N	88° 2' 20.121" E
9	23° 38' 4.811" N	88° 2' 19.924" E
10	23° 38' 3.909" N	88° 2' 19.343" E
11	23° 37' 55.735" N	88° 2' 14.073" E
12	23° 37' 54.174" N	88° 2' 10.063" E
13	23° 37' 53.946" N	88° 2' 8.157" E
14	23° 37' 54.237" N	88° 2' 5.731" E
15	23° 37' 55.397" N	88° 2' 2.118" E
16	23° 37' 57.178" N	88° 1' 58.210" E
17	23° 37' 59.400" N	88° 1' 55.165" E
18	23° 38' 2.433" N	88° 1' 54.065" E
19	23° 38' 11.074" N	88° 1' 54.415" E
20	23° 38' 7.382" N	88° 1' 56.948" E
21	23° 38' 2.916" N	88° 2' 2.282" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

0 0.125 0.25 0.5 0.75 1

Kilometers

POTENTIAL BLOCK PBBD_MK_AJ_17 OF AJAY RIVER

PBBD_MK_AJ_17		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 9.692" N	88° 2' 23.769" E
2	23° 38' 3.347" N	88° 2' 24.160" E
3	23° 38' 2.103" N	88° 2' 24.290" E
4	23° 38' 0.933" N	88° 2' 23.338" E
5	23° 37' 58.924" N	88° 2' 20.111" E
6	23° 37' 55.764" N	88° 2' 14.147" E
7	23° 37' 55.735" N	88° 2' 14.073" E
8	23° 38' 4.811" N	88° 2' 19.924" E
9	23° 38' 3.909" N	88° 2' 19.343" E
10	23° 38' 5.115" N	88° 2' 20.121" E
11	23° 38' 5.117" N	88° 2' 20.122" E
12	23° 38' 5.757" N	88° 2' 20.534" E
13	23° 38' 7.301" N	88° 2' 21.972" E
14	23° 38' 9.569" N	88° 2' 23.717" E

88°2'30"E

23°38'0"N

AJAY RIVER

PBBD_MK_AJ_17

N

S

W

E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	MK	MANGOLKOTE
RIVER	AJ	AJAY

0 0.05 0.1 0.2 0.3 0.4

Kilometers

88°2'30"E

POTENTIAL BLOCK PBBD_KT1_AJ_18 OF AJAY RIVER

88°2'30"E

AJAY RIVER

PBBD_KT1_AJ_18

N

W E

S

PBBD_KT1_AJ_18		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 2.103" N	88° 2' 24.290" E
2	23° 38' 3.347" N	88° 2' 24.160" E
3	23° 38' 9.692" N	88° 2' 23.769" E
4	23° 38' 12.824" N	88° 2' 25.091" E
5	23° 38' 15.229" N	88° 2' 26.642" E
6	23° 38' 15.284" N	88° 2' 26.784" E
7	23° 38' 15.560" N	88° 2' 27.489" E
8	23° 38' 15.655" N	88° 2' 27.733" E
9	23° 38' 12.437" N	88° 2' 27.370" E
10	23° 38' 9.408" N	88° 2' 27.421" E
11	23° 38' 8.883" N	88° 2' 27.412" E
12	23° 38' 7.687" N	88° 2' 27.052" E
13	23° 38' 4.872" N	88° 2' 26.021" E
14	23° 38' 3.020" N	88° 2' 25.036" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KT1	KATWA 1
RIVER	AJ	AJAY

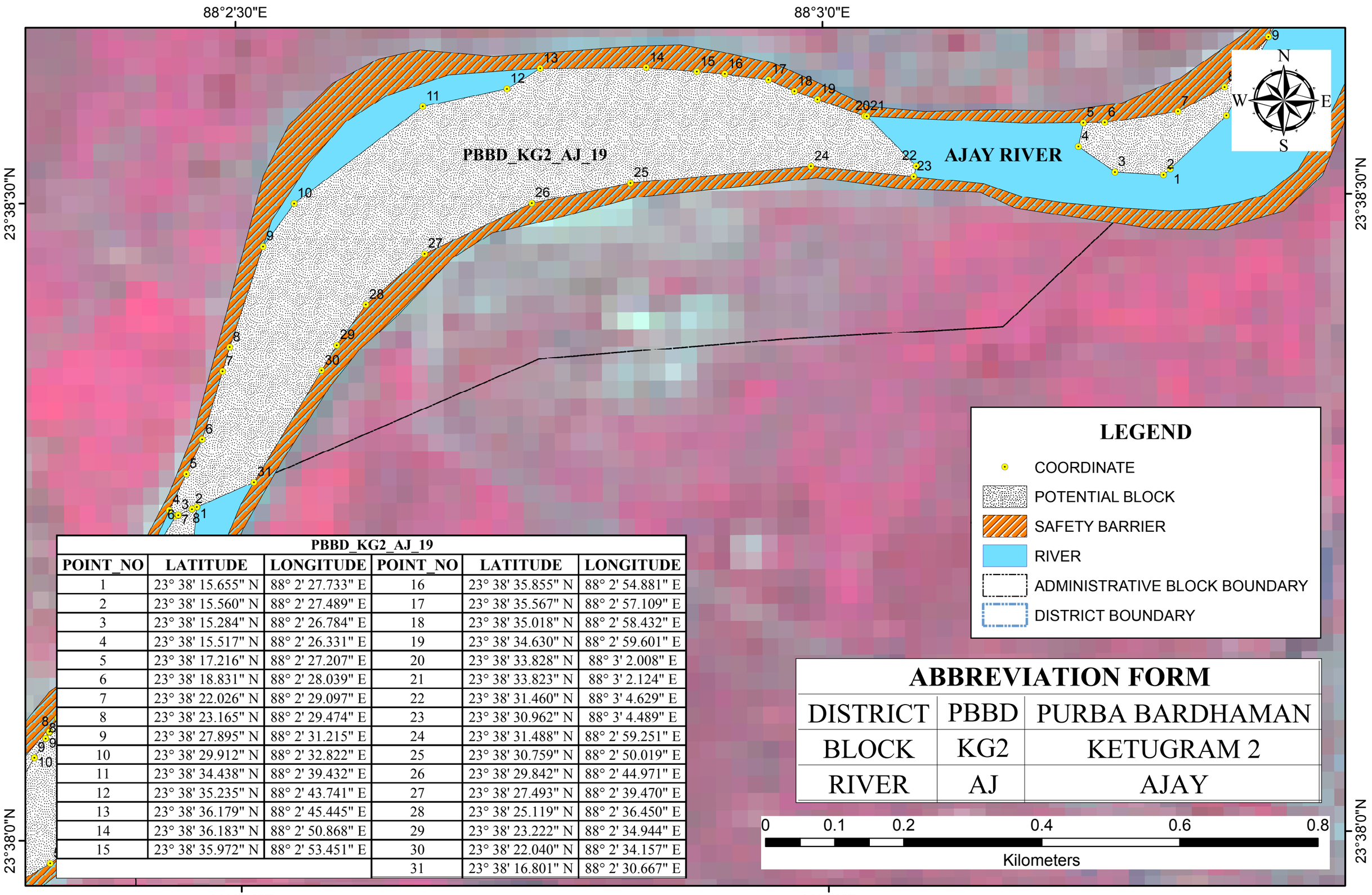
0 0.05 0.1 0.2 0.3 0.4

Kilometers

23°38'0"N

88°2'30"E

POTENTIAL BLOCK PBBD_KG2_AJ_19 OF AJAY RIVER



PBBD_KG2_AJ_19					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 15.655" N	88° 2' 27.733" E	16	23° 38' 35.855" N	88° 2' 54.881" E
2	23° 38' 15.560" N	88° 2' 27.489" E	17	23° 38' 35.567" N	88° 2' 57.109" E
3	23° 38' 15.284" N	88° 2' 26.784" E	18	23° 38' 35.018" N	88° 2' 58.432" E
4	23° 38' 15.517" N	88° 2' 26.331" E	19	23° 38' 34.630" N	88° 2' 59.601" E
5	23° 38' 17.216" N	88° 2' 27.207" E	20	23° 38' 33.828" N	88° 3' 2.008" E
6	23° 38' 18.831" N	88° 2' 28.039" E	21	23° 38' 33.823" N	88° 3' 2.124" E
7	23° 38' 22.026" N	88° 2' 29.097" E	22	23° 38' 31.460" N	88° 3' 4.629" E
8	23° 38' 23.165" N	88° 2' 29.474" E	23	23° 38' 30.962" N	88° 3' 4.489" E
9	23° 38' 27.895" N	88° 2' 31.215" E	24	23° 38' 31.488" N	88° 2' 59.251" E
10	23° 38' 29.912" N	88° 2' 32.822" E	25	23° 38' 30.759" N	88° 2' 50.019" E
11	23° 38' 34.438" N	88° 2' 39.432" E	26	23° 38' 29.842" N	88° 2' 44.971" E
12	23° 38' 35.235" N	88° 2' 43.741" E	27	23° 38' 27.493" N	88° 2' 39.470" E
13	23° 38' 36.179" N	88° 2' 45.445" E	28	23° 38' 25.119" N	88° 2' 36.450" E
14	23° 38' 36.183" N	88° 2' 50.868" E	29	23° 38' 23.222" N	88° 2' 34.944" E
15	23° 38' 35.972" N	88° 2' 53.451" E	30	23° 38' 22.040" N	88° 2' 34.157" E
			31	23° 38' 16.801" N	88° 2' 30.667" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

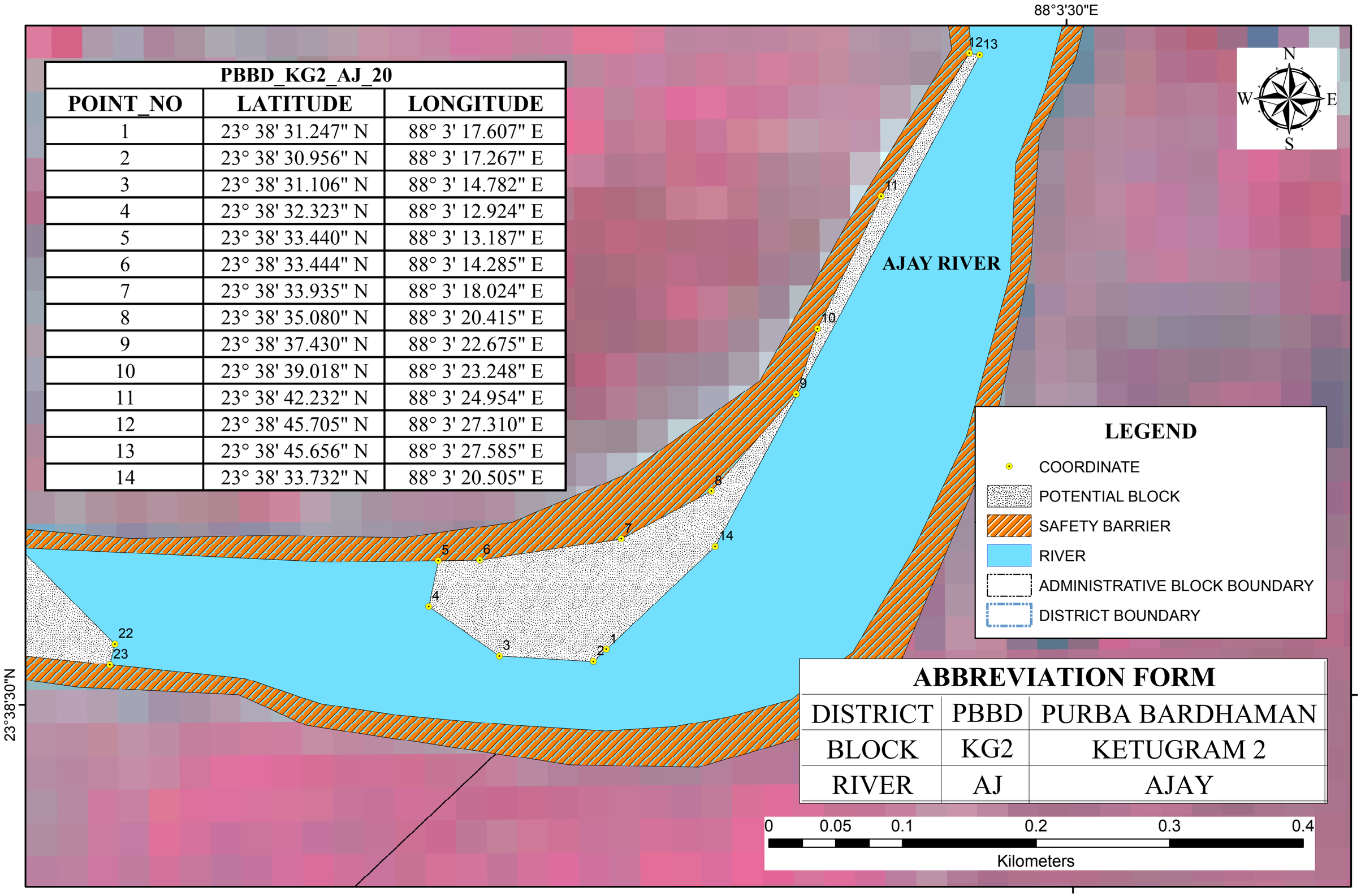
ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

0 0.1 0.2 0.4 0.6 0.8

Kilometers

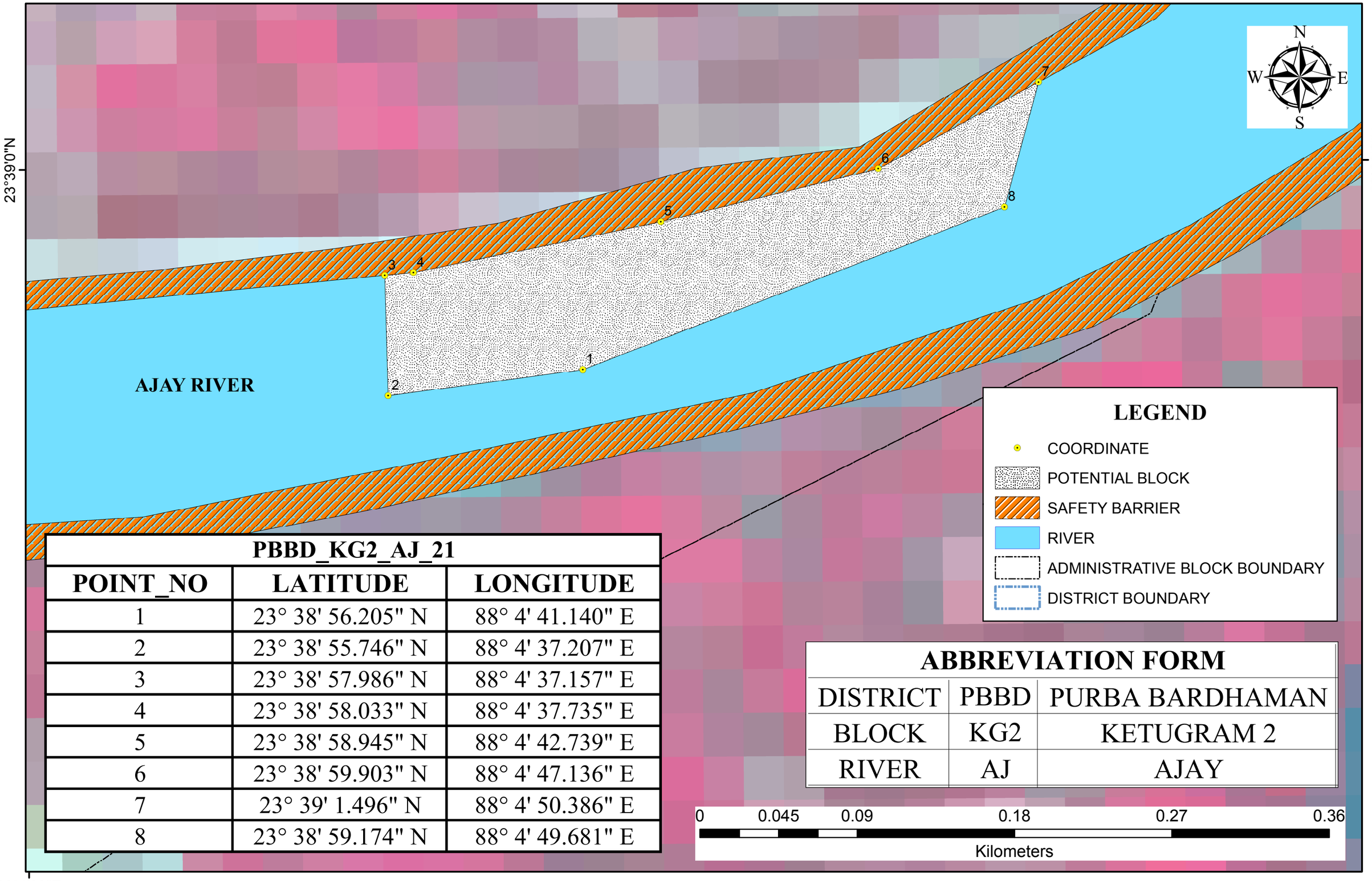
POTENTIAL BLOCK PBBD_KG2_AJ_20 OF AJAY RIVER

PBBD_KG2_AJ_20		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 31.247" N	88° 3' 17.607" E
2	23° 38' 30.956" N	88° 3' 17.267" E
3	23° 38' 31.106" N	88° 3' 14.782" E
4	23° 38' 32.323" N	88° 3' 12.924" E
5	23° 38' 33.440" N	88° 3' 13.187" E
6	23° 38' 33.444" N	88° 3' 14.285" E
7	23° 38' 33.935" N	88° 3' 18.024" E
8	23° 38' 35.080" N	88° 3' 20.415" E
9	23° 38' 37.430" N	88° 3' 22.675" E
10	23° 38' 39.018" N	88° 3' 23.248" E
11	23° 38' 42.232" N	88° 3' 24.954" E
12	23° 38' 45.705" N	88° 3' 27.310" E
13	23° 38' 45.656" N	88° 3' 27.585" E
14	23° 38' 33.732" N	88° 3' 20.505" E



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

POTENTIAL BLOCK PBBD_KG2_AJ_21 OF AJAY RIVER



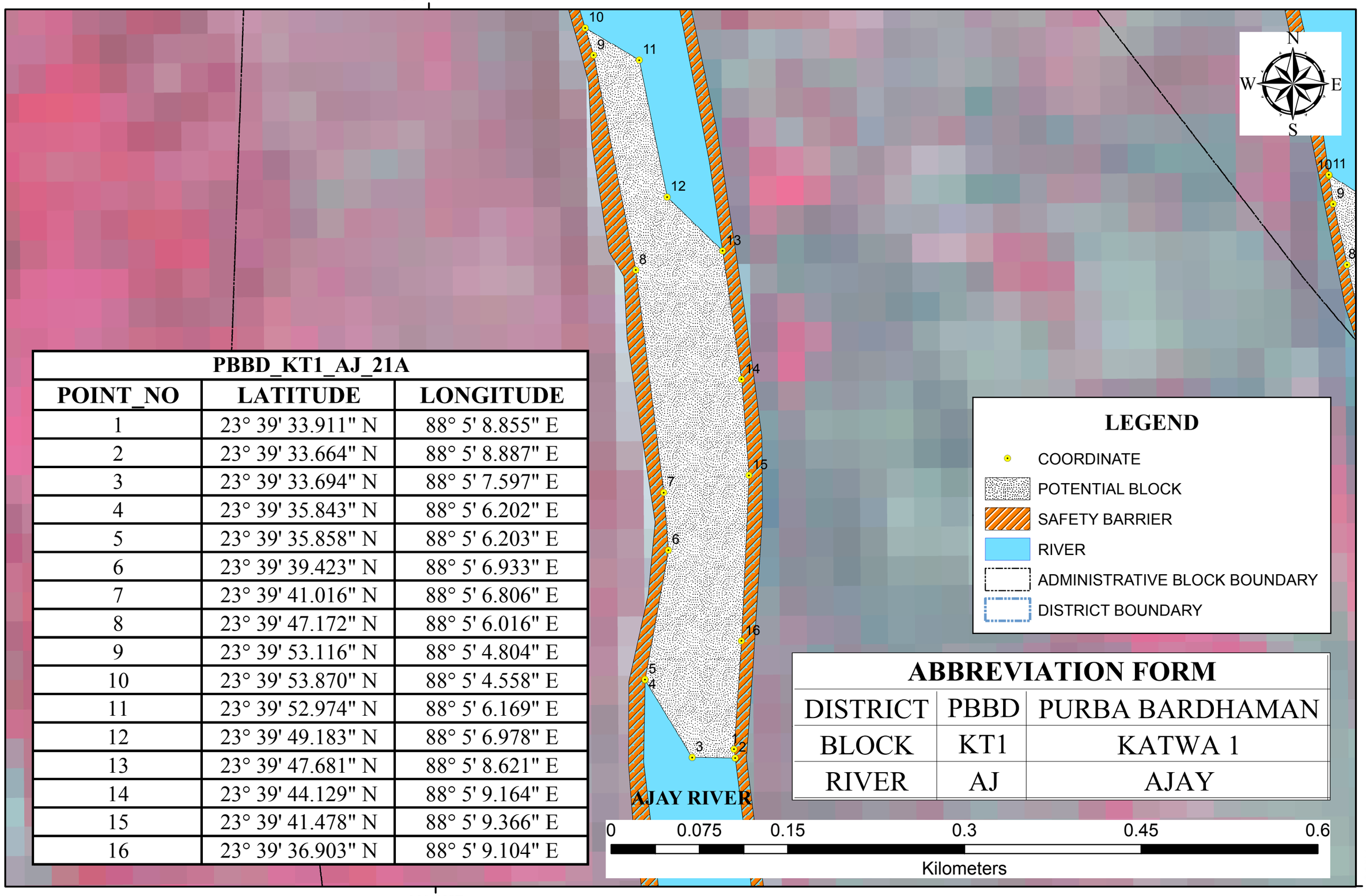
PBBD_KG2_AJ_21		
POINT_NO	LATITUDE	LONGITUDE
1	23° 38' 56.205" N	88° 4' 41.140" E
2	23° 38' 55.746" N	88° 4' 37.207" E
3	23° 38' 57.986" N	88° 4' 37.157" E
4	23° 38' 58.033" N	88° 4' 37.735" E
5	23° 38' 58.945" N	88° 4' 42.739" E
6	23° 38' 59.903" N	88° 4' 47.136" E
7	23° 39' 1.496" N	88° 4' 50.386" E
8	23° 38' 59.174" N	88° 4' 49.681" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KG2	KETUGRAM 2
RIVER	AJ	AJAY

POTENTIAL BLOCK PBBD_KT1_AJ_21A OF AJAY RIVER

88°5'0"E

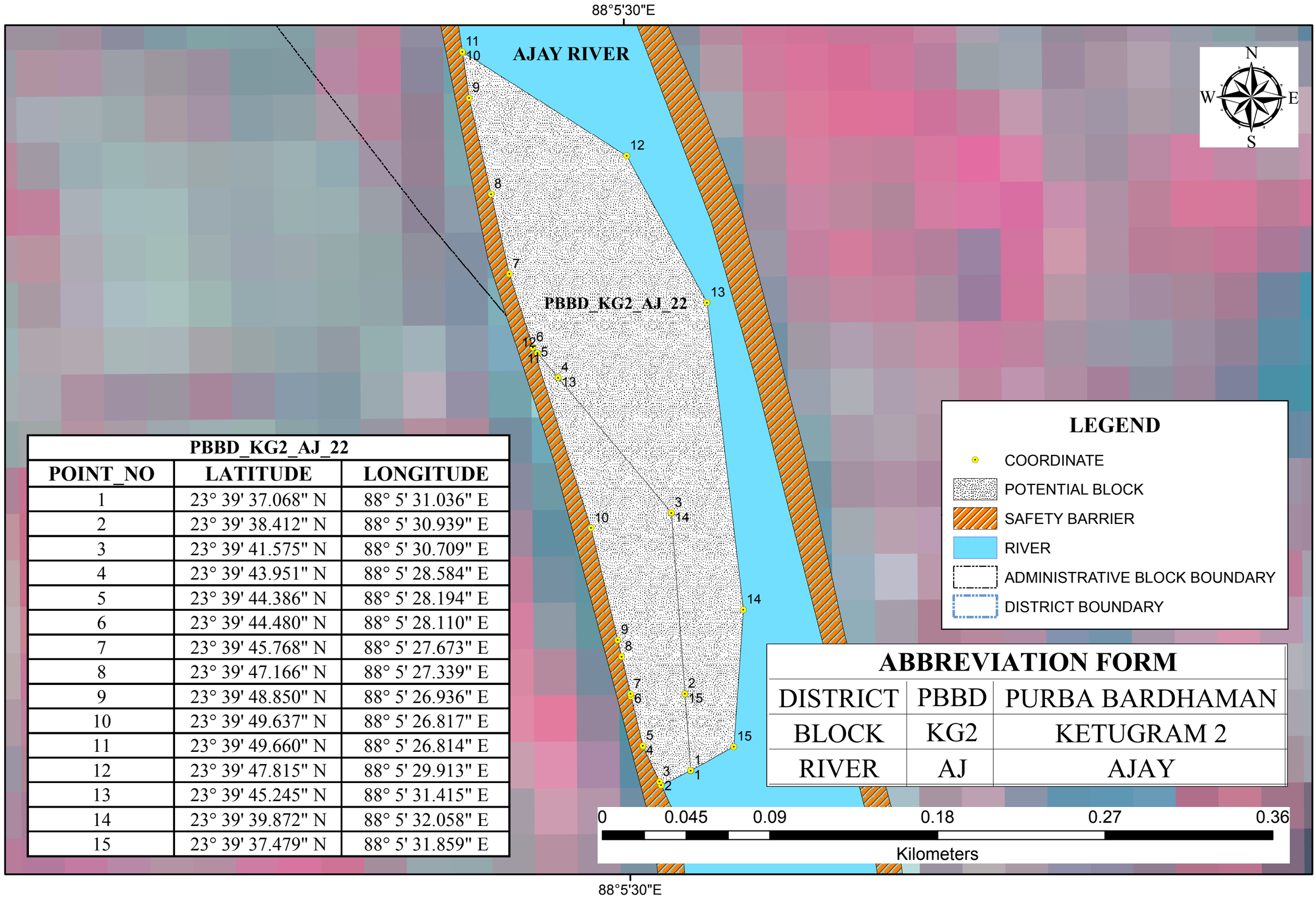
PBBD_KT1_AJ_21A		
POINT_NO	LATITUDE	LONGITUDE
1	23° 39' 33.911" N	88° 5' 8.855" E
2	23° 39' 33.664" N	88° 5' 8.887" E
3	23° 39' 33.694" N	88° 5' 7.597" E
4	23° 39' 35.843" N	88° 5' 6.202" E
5	23° 39' 35.858" N	88° 5' 6.203" E
6	23° 39' 39.423" N	88° 5' 6.933" E
7	23° 39' 41.016" N	88° 5' 6.806" E
8	23° 39' 47.172" N	88° 5' 6.016" E
9	23° 39' 53.116" N	88° 5' 4.804" E
10	23° 39' 53.870" N	88° 5' 4.558" E
11	23° 39' 52.974" N	88° 5' 6.169" E
12	23° 39' 49.183" N	88° 5' 6.978" E
13	23° 39' 47.681" N	88° 5' 8.621" E
14	23° 39' 44.129" N	88° 5' 9.164" E
15	23° 39' 41.478" N	88° 5' 9.366" E
16	23° 39' 36.903" N	88° 5' 9.104" E



88°5'0"E

23°39'30"N

POTENTIAL BLOCK PBBD_KG2_AJ_22 OF AJAY RIVER



PBBD_KG2_AJ_22		
POINT_NO	LATITUDE	LONGITUDE
1	23° 39' 37.068" N	88° 5' 31.036" E
2	23° 39' 38.412" N	88° 5' 30.939" E
3	23° 39' 41.575" N	88° 5' 30.709" E
4	23° 39' 43.951" N	88° 5' 28.584" E
5	23° 39' 44.386" N	88° 5' 28.194" E
6	23° 39' 44.480" N	88° 5' 28.110" E
7	23° 39' 45.768" N	88° 5' 27.673" E
8	23° 39' 47.166" N	88° 5' 27.339" E
9	23° 39' 48.850" N	88° 5' 26.936" E
10	23° 39' 49.637" N	88° 5' 26.817" E
11	23° 39' 49.660" N	88° 5' 26.814" E
12	23° 39' 47.815" N	88° 5' 29.913" E
13	23° 39' 45.245" N	88° 5' 31.415" E
14	23° 39' 39.872" N	88° 5' 32.058" E
15	23° 39' 37.479" N	88° 5' 31.859" E

POTENTIAL BLOCK PBBD_KT1_AJ_23 OF AJAY RIVER

88°5'30"E

AJAY RIVER

PBBD_KT1_AJ_23

16
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PBBD_KT1_AJ_23		
POINT_NO	LATITUDE	LONGITUDE
1	23° 39' 37.068" N	88° 5' 31.036" E
2	23° 39' 36.815" N	88° 5' 30.476" E
3	23° 39' 36.876" N	88° 5' 30.445" E
4	23° 39' 37.492" N	88° 5' 30.137" E
5	23° 39' 37.505" N	88° 5' 30.134" E
6	23° 39' 38.373" N	88° 5' 29.917" E
7	23° 39' 38.412" N	88° 5' 29.908" E
8	23° 39' 39.070" N	88° 5' 29.744" E
9	23° 39' 39.357" N	88° 5' 29.672" E
10	23° 39' 41.319" N	88° 5' 29.183" E
11	23° 39' 44.480" N	88° 5' 28.110" E
12	23° 39' 44.386" N	88° 5' 28.194" E
13	23° 39' 43.951" N	88° 5' 28.584" E
14	23° 39' 41.575" N	88° 5' 30.709" E
15	23° 39' 38.412" N	88° 5' 30.939" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KT1	KATWA 1
RIVER	AJ	AJAY

0 0.0275 0.055 0.11 0.165 0.22

Kilometers

88°5'30"E

POTENTIAL BLOCK PBBD_KH_DW_01 OF DWARAKESWAR RIVER

87°42'30"E 87°43'0"E 87°43'30"E

23°0'30"N

DWARAKESWAR RIVER

PBBD_KH_DW_01

PBBD_KH_DW_01		
POINT_NO	LATITUDE	LONGITUDE
1	23° 0' 28.323" N	87° 43' 13.904" E
2	23° 0' 27.278" N	87° 43' 11.566" E
3	23° 0' 30.063" N	87° 43' 4.740" E
4	23° 0' 31.612" N	87° 42' 57.015" E
5	23° 0' 36.181" N	87° 42' 51.240" E
6	23° 0' 41.076" N	87° 42' 48.110" E
7	23° 0' 41.860" N	87° 42' 48.850" E
8	23° 0' 50.288" N	87° 42' 56.805" E
9	23° 0' 45.137" N	87° 42' 57.922" E
10	23° 0' 38.888" N	87° 43' 2.034" E
11	23° 0' 36.462" N	87° 43' 4.418" E
12	23° 0' 30.747" N	87° 43' 11.532" E

N W E S

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KH	KHANDAGHOSH
RIVER	DW	DWARAKESWAR

0 0.1 0.2 0.4 0.6 0.8

Kilometers

87°42'30"E 87°43'0"E 87°43'30"E

POTENTIAL BLOCK PBBD_KH_DW_02(IIA) OF DWARAKESWAR RIVER

87°43'0"E

87°43'30"E

23°0'0"N

DWARAKESWAR RIVER

PBBD_KH_DW_02(IIA)

PBBD_KH_DW_02(IIA)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 0' 19.677" N	87° 43' 18.218" E
2	23° 0' 15.539" N	87° 43' 19.980" E
3	23° 0' 14.146" N	87° 43' 23.542" E
4	23° 0' 5.741" N	87° 43' 25.133" E
5	23° 0' 0.777" N	87° 43' 26.891" E
6	22° 59' 59.280" N	87° 43' 26.789" E
7	23° 0' 1.613" N	87° 43' 25.139" E
8	23° 0' 6.835" N	87° 43' 21.439" E
9	23° 0' 8.398" N	87° 43' 19.095" E
10	23° 0' 16.933" N	87° 43' 10.995" E
11	23° 0' 16.076" N	87° 43' 9.796" E
12	23° 0' 24.128" N	87° 43' 1.487" E
13	23° 0' 25.101" N	87° 43' 0.221" E
14	23° 0' 25.251" N	87° 43' 3.376" E

N

W

E

S

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

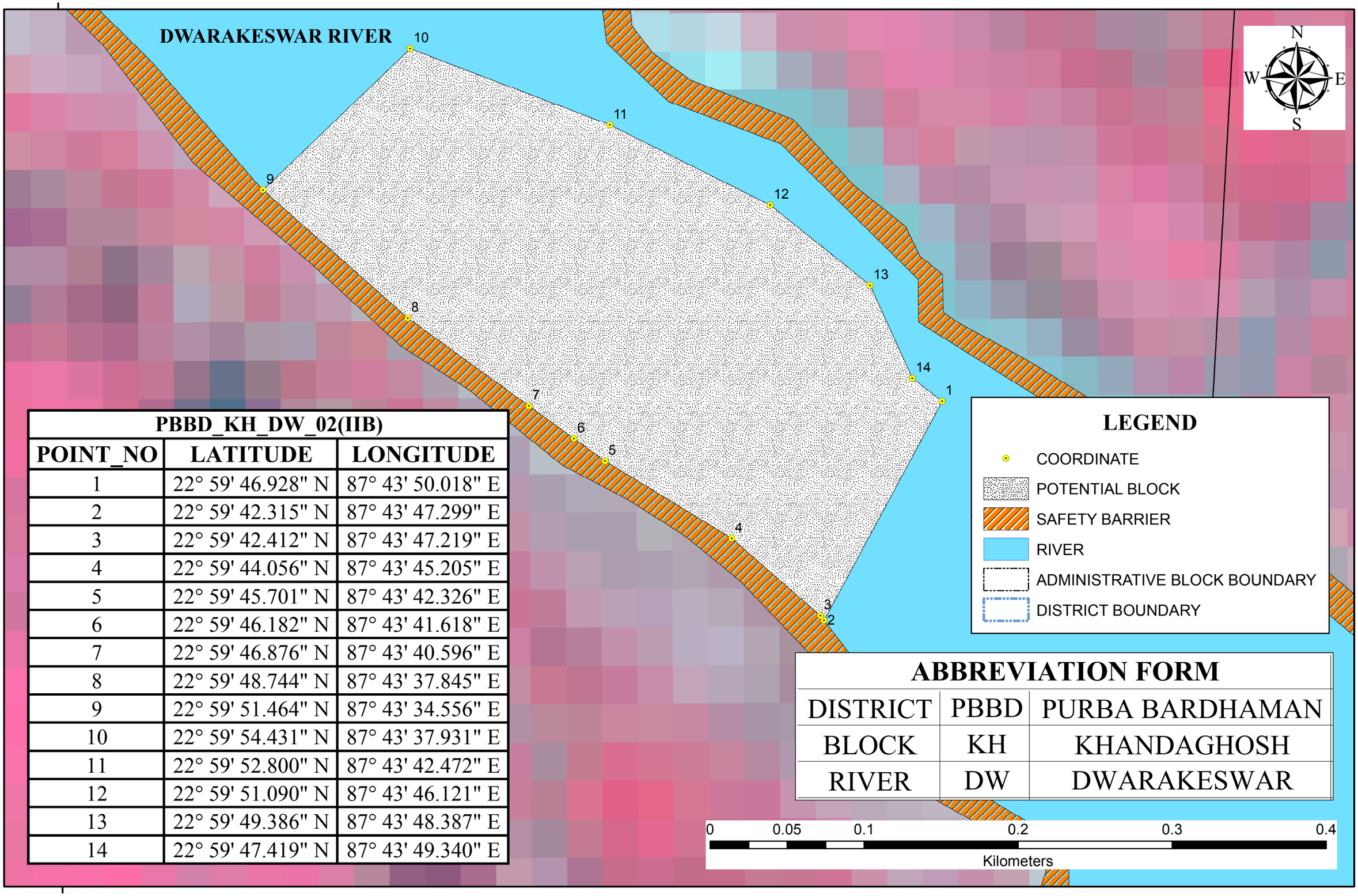
ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KH	KHANDAGHOSH
RIVER	DW	DWARAKESWAR

0 0.1 0.2 0.4 0.6 0.8

Kilometers

POTENTIAL BLOCK PBBD_KH_DW_02(IIB) OF DWARAKESWAR RIVER

87°43'30"E

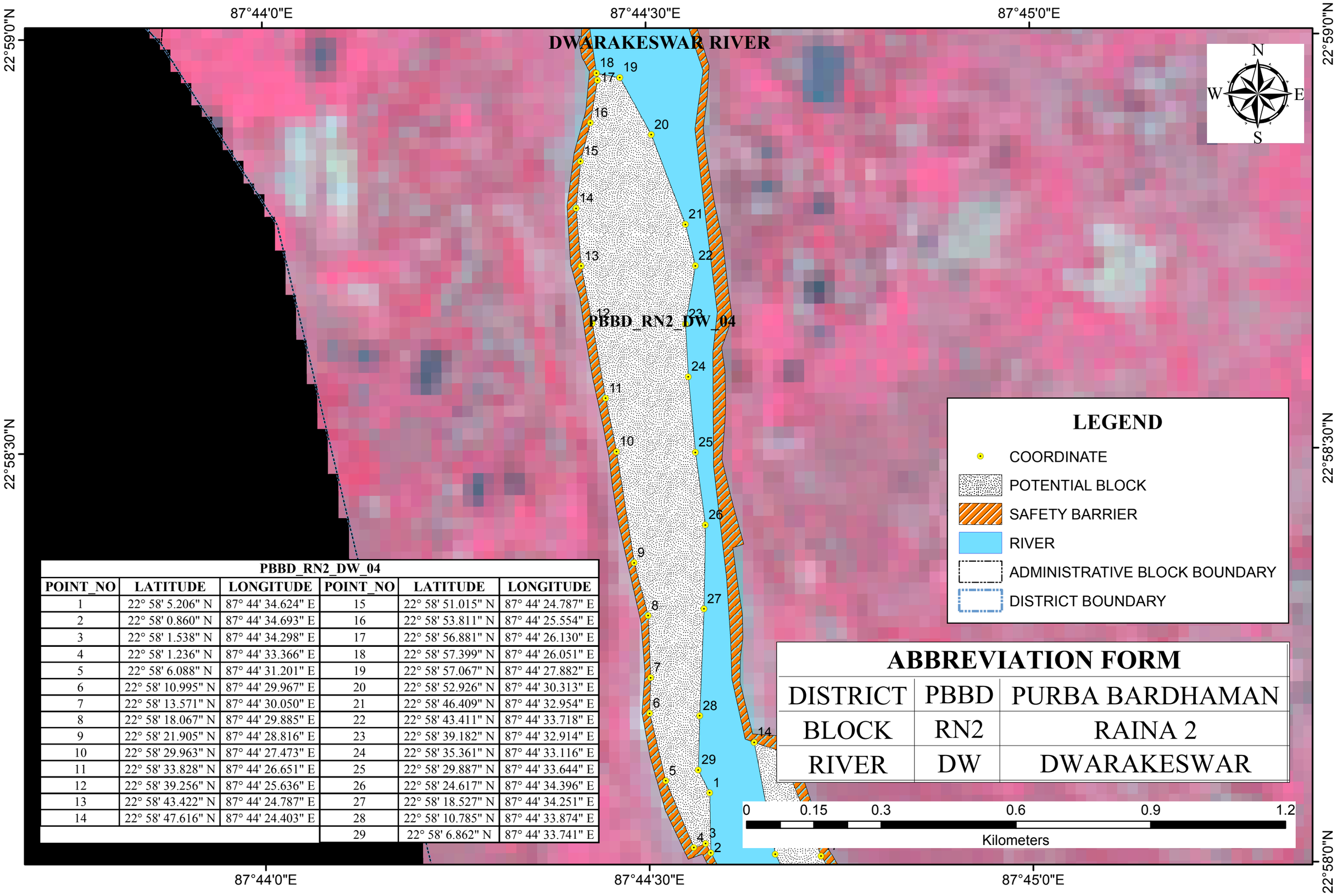


PBBD_KH_DW_02(IIB)		
POINT_NO	LATITUDE	LONGITUDE
1	22° 59' 46.928" N	87° 43' 50.018" E
2	22° 59' 42.315" N	87° 43' 47.299" E
3	22° 59' 42.412" N	87° 43' 47.219" E
4	22° 59' 44.056" N	87° 43' 45.205" E
5	22° 59' 45.701" N	87° 43' 42.326" E
6	22° 59' 46.182" N	87° 43' 41.618" E
7	22° 59' 46.876" N	87° 43' 40.596" E
8	22° 59' 48.744" N	87° 43' 37.845" E
9	22° 59' 51.464" N	87° 43' 34.556" E
10	22° 59' 54.431" N	87° 43' 37.931" E
11	22° 59' 52.800" N	87° 43' 42.472" E
12	22° 59' 51.090" N	87° 43' 46.121" E
13	22° 59' 49.386" N	87° 43' 48.387" E
14	22° 59' 47.419" N	87° 43' 49.340" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KH	KHANDAGHOSH
RIVER	DW	DWARAKESWAR

87°43'30"E

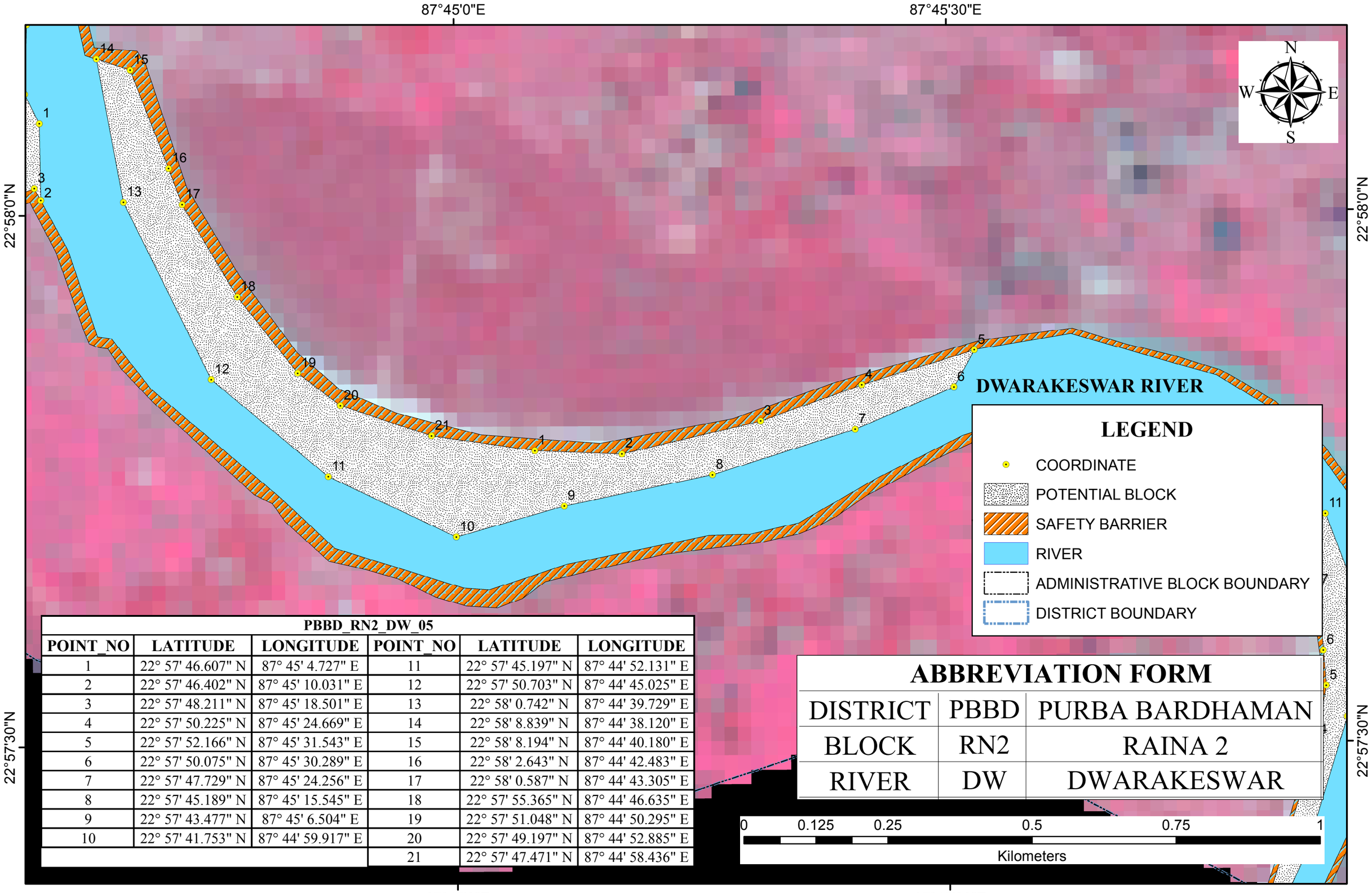
POTENTIAL BLOCK PBBD_RN2_DW_04 OF DWARAKESWAR RIVER



PBBD_RN2_DW_04					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	22° 58' 5.206" N	87° 44' 34.624" E	15	22° 58' 51.015" N	87° 44' 24.787" E
2	22° 58' 0.860" N	87° 44' 34.693" E	16	22° 58' 53.811" N	87° 44' 25.554" E
3	22° 58' 1.538" N	87° 44' 34.298" E	17	22° 58' 56.881" N	87° 44' 26.130" E
4	22° 58' 1.236" N	87° 44' 33.366" E	18	22° 58' 57.399" N	87° 44' 26.051" E
5	22° 58' 6.088" N	87° 44' 31.201" E	19	22° 58' 57.067" N	87° 44' 27.882" E
6	22° 58' 10.995" N	87° 44' 29.967" E	20	22° 58' 52.926" N	87° 44' 30.313" E
7	22° 58' 13.571" N	87° 44' 30.050" E	21	22° 58' 46.409" N	87° 44' 32.954" E
8	22° 58' 18.067" N	87° 44' 29.885" E	22	22° 58' 43.411" N	87° 44' 33.718" E
9	22° 58' 21.905" N	87° 44' 28.816" E	23	22° 58' 39.182" N	87° 44' 32.914" E
10	22° 58' 29.963" N	87° 44' 27.473" E	24	22° 58' 35.361" N	87° 44' 33.116" E
11	22° 58' 33.828" N	87° 44' 26.651" E	25	22° 58' 29.887" N	87° 44' 33.644" E
12	22° 58' 39.256" N	87° 44' 25.636" E	26	22° 58' 24.617" N	87° 44' 34.396" E
13	22° 58' 43.422" N	87° 44' 24.787" E	27	22° 58' 18.527" N	87° 44' 34.251" E
14	22° 58' 47.616" N	87° 44' 24.403" E	28	22° 58' 10.785" N	87° 44' 33.874" E
			29	22° 58' 6.862" N	87° 44' 33.741" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	RN2	RAINA 2
RIVER	DW	DWARAKESWAR

POTENTIAL BLOCK PBBD_RN2_DW_05 OF DWARAKESWAR RIVER



PBBD_RN2_DW_05					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	22° 57' 46.607" N	87° 45' 4.727" E	11	22° 57' 45.197" N	87° 44' 52.131" E
2	22° 57' 46.402" N	87° 45' 10.031" E	12	22° 57' 50.703" N	87° 44' 45.025" E
3	22° 57' 48.211" N	87° 45' 18.501" E	13	22° 58' 0.742" N	87° 44' 39.729" E
4	22° 57' 50.225" N	87° 45' 24.669" E	14	22° 58' 8.839" N	87° 44' 38.120" E
5	22° 57' 52.166" N	87° 45' 31.543" E	15	22° 58' 8.194" N	87° 44' 40.180" E
6	22° 57' 50.075" N	87° 45' 30.289" E	16	22° 58' 2.643" N	87° 44' 42.483" E
7	22° 57' 47.729" N	87° 45' 24.256" E	17	22° 58' 0.587" N	87° 44' 43.305" E
8	22° 57' 45.189" N	87° 45' 15.545" E	18	22° 57' 55.365" N	87° 44' 46.635" E
9	22° 57' 43.477" N	87° 45' 6.504" E	19	22° 57' 51.048" N	87° 44' 50.295" E
10	22° 57' 41.753" N	87° 44' 59.917" E	20	22° 57' 49.197" N	87° 44' 52.885" E
			21	22° 57' 47.471" N	87° 44' 58.436" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	RN2	RAINA 2
RIVER	DW	DWARAKESWAR

POTENTIAL BLOCK PBBD_RN2_DW_06 OF DWARAKESWAR RIVER

87°45'30"E

87°46'0"E

22°57'30"N

DWARAKESWAR RIVER

N

W

E

S

PBBD_RN2_DW_06		
POINT_NO	LATITUDE	LONGITUDE
1	22° 57' 23.542" N	87° 45' 51.548" E
2	22° 57' 20.847" N	87° 45' 50.185" E
3	22° 57' 21.260" N	87° 45' 49.347" E
4	22° 57' 30.070" N	87° 45' 52.284" E
5	22° 57' 33.140" N	87° 45' 52.887" E
6	22° 57' 35.113" N	87° 45' 52.722" E
7	22° 57' 38.540" N	87° 45' 52.393" E
8	22° 57' 41.610" N	87° 45' 51.516" E
9	22° 57' 43.529" N	87° 45' 49.817" E
10	22° 57' 44.084" N	87° 45' 49.163" E
11	22° 57' 42.842" N	87° 45' 52.882" E
12	22° 57' 38.808" N	87° 45' 54.532" E
13	22° 57' 31.376" N	87° 45' 54.156" E

LEGEND

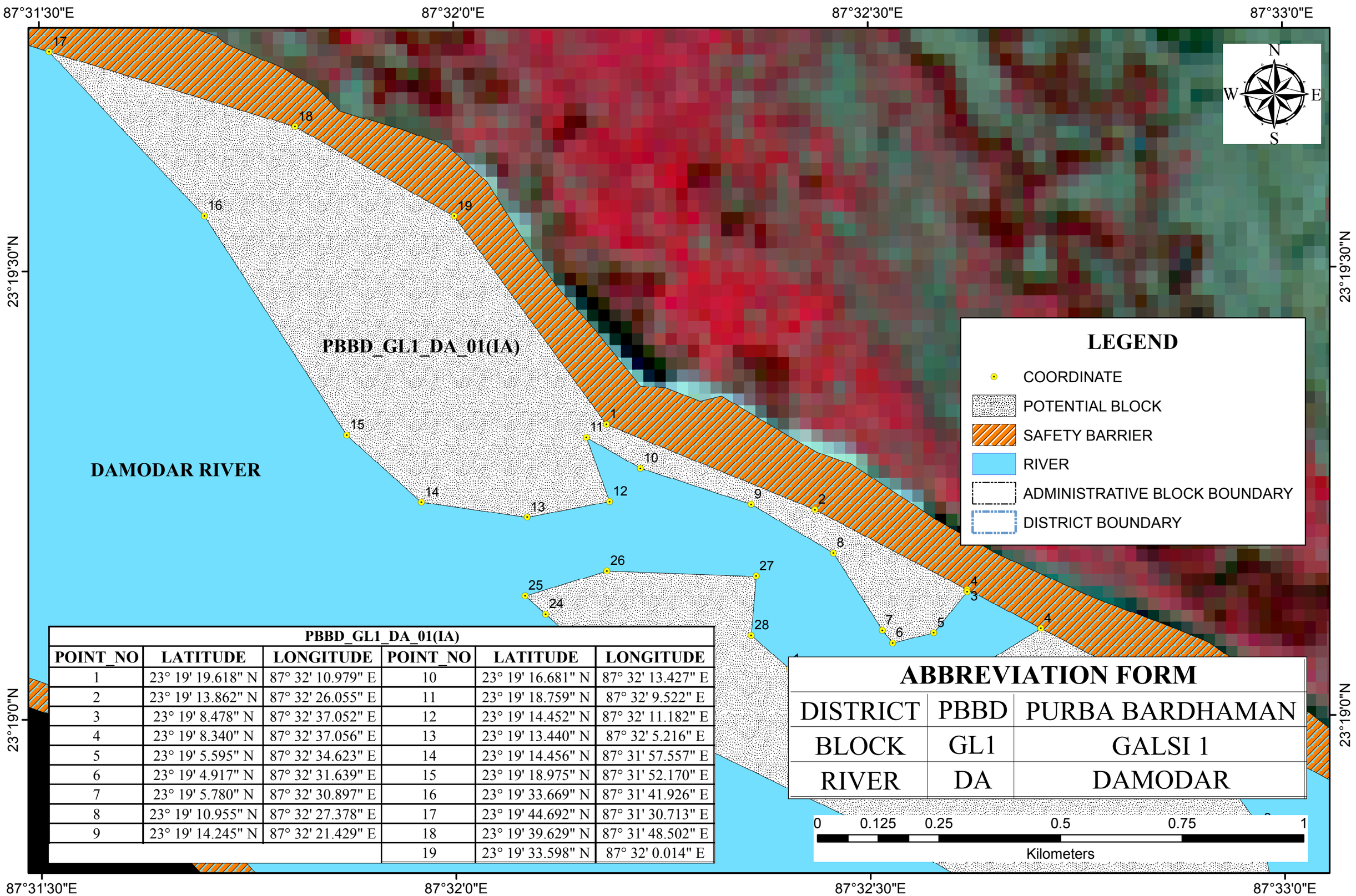
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	RN2	RAINA 2
RIVER	DW	DWARAKESWAR

0 0.075 0.15 0.3 0.45 0.6

Kilometers

POTENTIAL BLOCK PBBD_GL1_DA_01(IA) OF DAMODAR RIVER

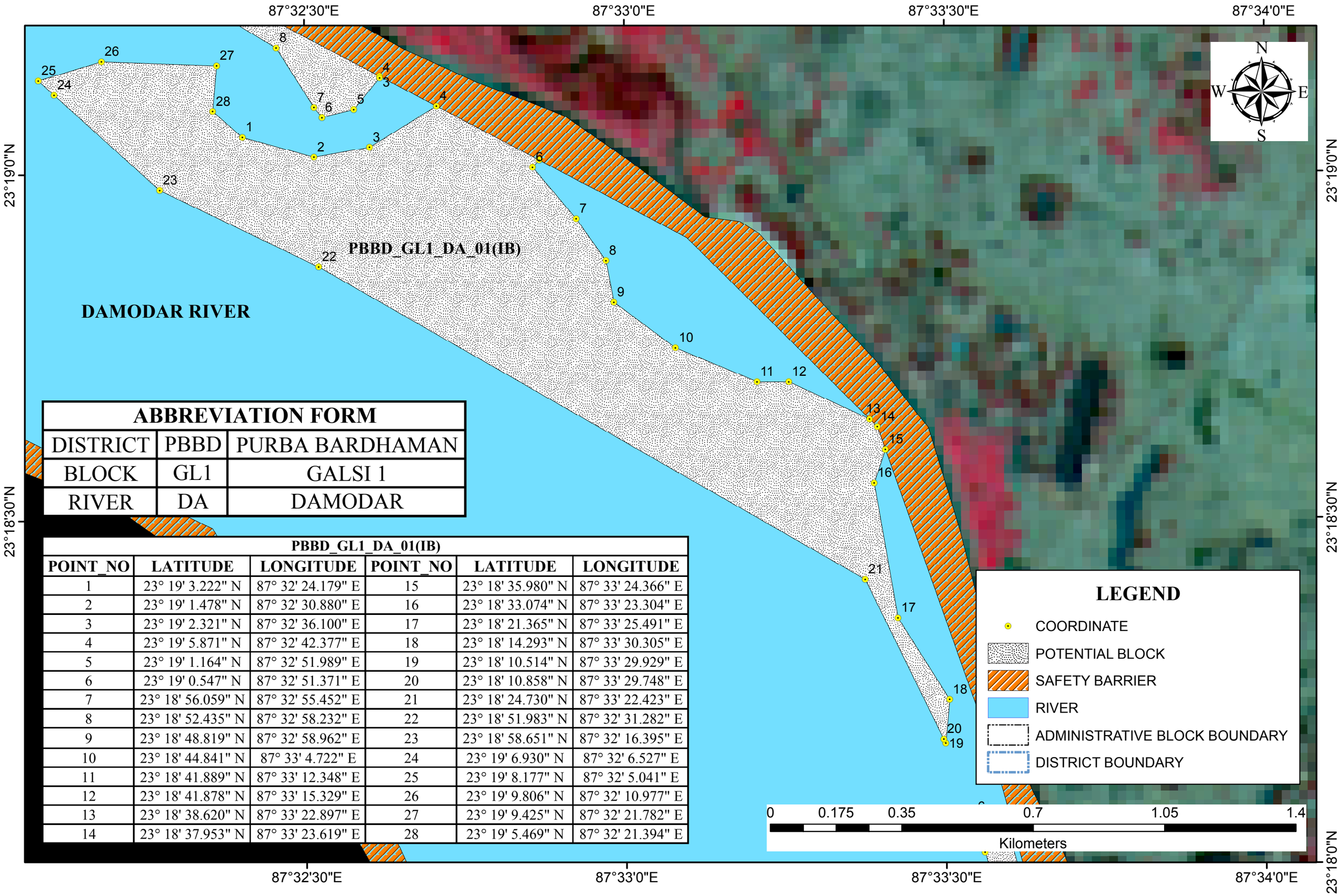


PBBD_GL1_DA_01(IA)					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 19' 19.618" N	87° 32' 10.979" E	10	23° 19' 16.681" N	87° 32' 13.427" E
2	23° 19' 13.862" N	87° 32' 26.055" E	11	23° 19' 18.759" N	87° 32' 9.522" E
3	23° 19' 8.478" N	87° 32' 37.052" E	12	23° 19' 14.452" N	87° 32' 11.182" E
4	23° 19' 8.340" N	87° 32' 37.056" E	13	23° 19' 13.440" N	87° 32' 5.216" E
5	23° 19' 5.595" N	87° 32' 34.623" E	14	23° 19' 14.456" N	87° 31' 57.557" E
6	23° 19' 4.917" N	87° 32' 31.639" E	15	23° 19' 18.975" N	87° 31' 52.170" E
7	23° 19' 5.780" N	87° 32' 30.897" E	16	23° 19' 33.669" N	87° 31' 41.926" E
8	23° 19' 10.955" N	87° 32' 27.378" E	17	23° 19' 44.692" N	87° 31' 30.713" E
9	23° 19' 14.245" N	87° 32' 21.429" E	18	23° 19' 39.629" N	87° 31' 48.502" E
			19	23° 19' 33.598" N	87° 32' 0.014" E

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL1	GALSI 1
RIVER	DA	DAMODAR

POTENTIAL BLOCK PBBD_GL1_DA_01(IB) OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL1	GALSI 1
RIVER	DA	DAMODAR

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

PBBD_GL1_DA_01(IB)

POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 19' 3.222" N	87° 32' 24.179" E	15	23° 18' 35.980" N	87° 33' 24.366" E
2	23° 19' 1.478" N	87° 32' 30.880" E	16	23° 18' 33.074" N	87° 33' 23.304" E
3	23° 19' 2.321" N	87° 32' 36.100" E	17	23° 18' 21.365" N	87° 33' 25.491" E
4	23° 19' 5.871" N	87° 32' 42.377" E	18	23° 18' 14.293" N	87° 33' 30.305" E
5	23° 19' 1.164" N	87° 32' 51.989" E	19	23° 18' 10.514" N	87° 33' 29.929" E
6	23° 19' 0.547" N	87° 32' 51.371" E	20	23° 18' 10.858" N	87° 33' 29.748" E
7	23° 18' 56.059" N	87° 32' 55.452" E	21	23° 18' 24.730" N	87° 33' 22.423" E
8	23° 18' 52.435" N	87° 32' 58.232" E	22	23° 18' 51.983" N	87° 32' 31.282" E
9	23° 18' 48.819" N	87° 32' 58.962" E	23	23° 18' 58.651" N	87° 32' 16.395" E
10	23° 18' 44.841" N	87° 33' 4.722" E	24	23° 19' 6.930" N	87° 32' 6.527" E
11	23° 18' 41.889" N	87° 33' 12.348" E	25	23° 19' 8.177" N	87° 32' 5.041" E
12	23° 18' 41.878" N	87° 33' 15.329" E	26	23° 19' 9.806" N	87° 32' 10.977" E
13	23° 18' 38.620" N	87° 33' 22.897" E	27	23° 19' 9.425" N	87° 32' 21.782" E
14	23° 18' 37.953" N	87° 33' 23.619" E	28	23° 19' 5.469" N	87° 32' 21.394" E

POTENTIAL BLOCK PBBD_GL1_DA_01A OF DAMODAR RIVER

87°33'30"E

87°34'0"E

23°18'0"N

DAMODAR RIVER

N

W

E

S

6

7

5

8

9

4

1

3

2

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

PBBD_GL1_DA_01A		
POINT_NO	LATITUDE	LONGITUDE
1	23° 17' 46.200" N	87° 33' 41.130" E
2	23° 17' 42.524" N	87° 33' 40.821" E
3	23° 17' 42.934" N	87° 33' 40.572" E
4	23° 17' 46.930" N	87° 33' 38.134" E
5	23° 18' 1.059" N	87° 33' 33.582" E
6	23° 18' 4.122" N	87° 33' 32.596" E
7	23° 18' 3.537" N	87° 33' 35.529" E
8	23° 17' 55.599" N	87° 33' 37.999" E
9	23° 17' 54.843" N	87° 33' 38.624" E

ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL1	GALSI 1
RIVER	DA	DAMODAR

0 0.075 0.15 0.3 0.45 0.6

Kilometers

87°33'30"E

87°34'0"E

POTENTIAL BLOCK PBBD_GL1_DA_02(IIA) OF DAMODAR RIVER

87°33'30"E 87°34'0"E 87°34'30"E 87°35'0"E 87°35'30"E

23°17'30"N 23°17'0"N 23°16'30"N

DAMODAR RIVER

PBBD_GL1_DA_02(IIA)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 16' 22.427" N	87° 35' 9.516" E
2	23° 16' 19.576" N	87° 35' 7.618" E
3	23° 16' 20.408" N	87° 35' 6.772" E
4	23° 16' 31.730" N	87° 34' 55.271" E
5	23° 16' 46.128" N	87° 34' 40.646" E
6	23° 16' 58.636" N	87° 34' 22.757" E
7	23° 17' 17.123" N	87° 33' 56.316" E
8	23° 17' 27.242" N	87° 33' 50.144" E
9	23° 17' 28.314" N	87° 33' 49.490" E
10	23° 17' 27.154" N	87° 33' 55.968" E
11	23° 17' 7.448" N	87° 34' 25.637" E
12	23° 17' 6.528" N	87° 34' 26.076" E
13	23° 17' 2.832" N	87° 34' 31.481" E
14	23° 16' 56.531" N	87° 34' 39.275" E
15	23° 16' 43.137" N	87° 34' 53.971" E
16	23° 16' 38.663" N	87° 34' 56.713" E
17	23° 16' 33.297" N	87° 35' 4.099" E
18	23° 16' 31.835" N	87° 35' 5.422" E
19	23° 16' 29.056" N	87° 35' 3.823" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL1	GALSI 1
RIVER	DA	DAMODAR

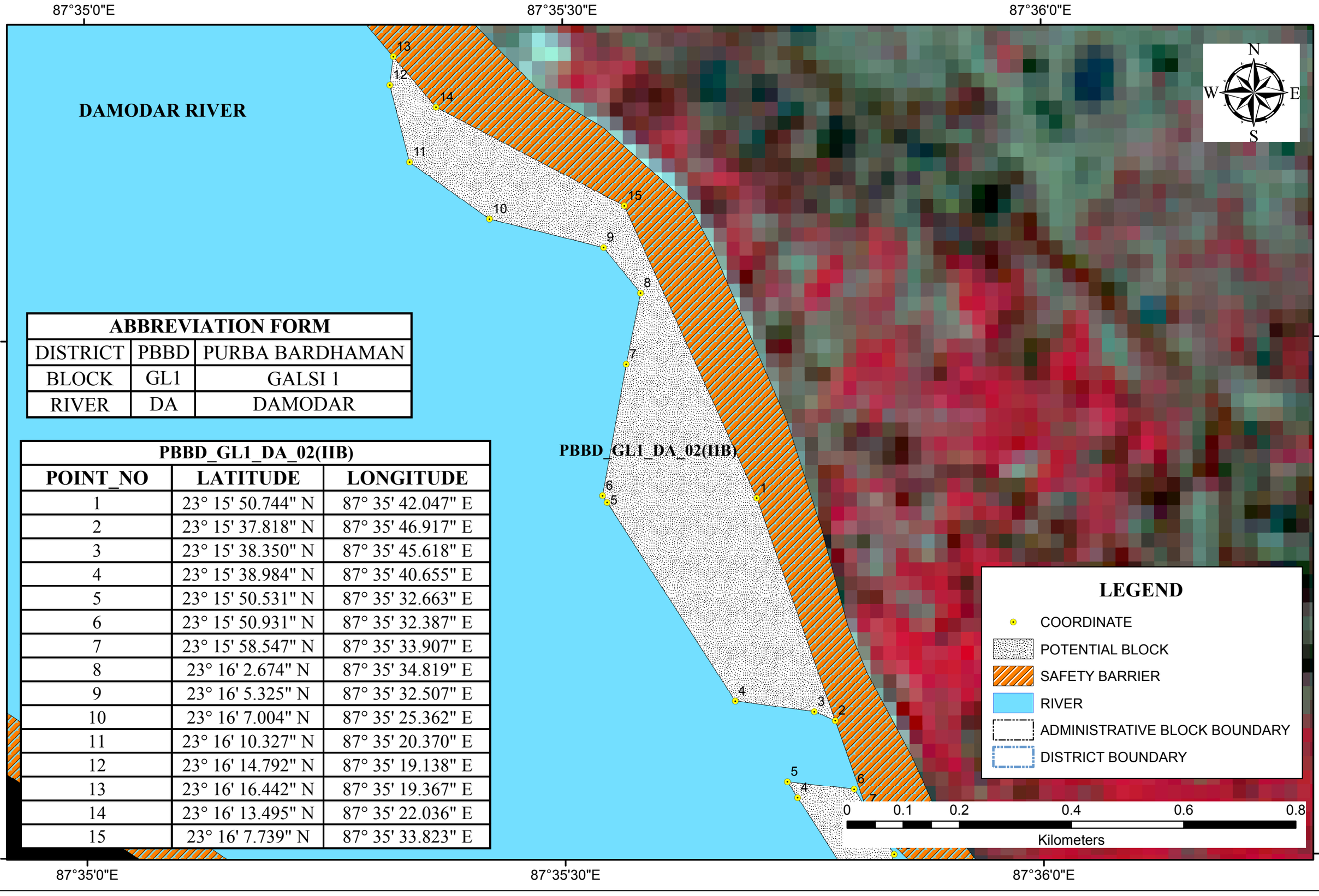
LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

0 0.15 0.3 0.6 0.9 1.2

Kilometers

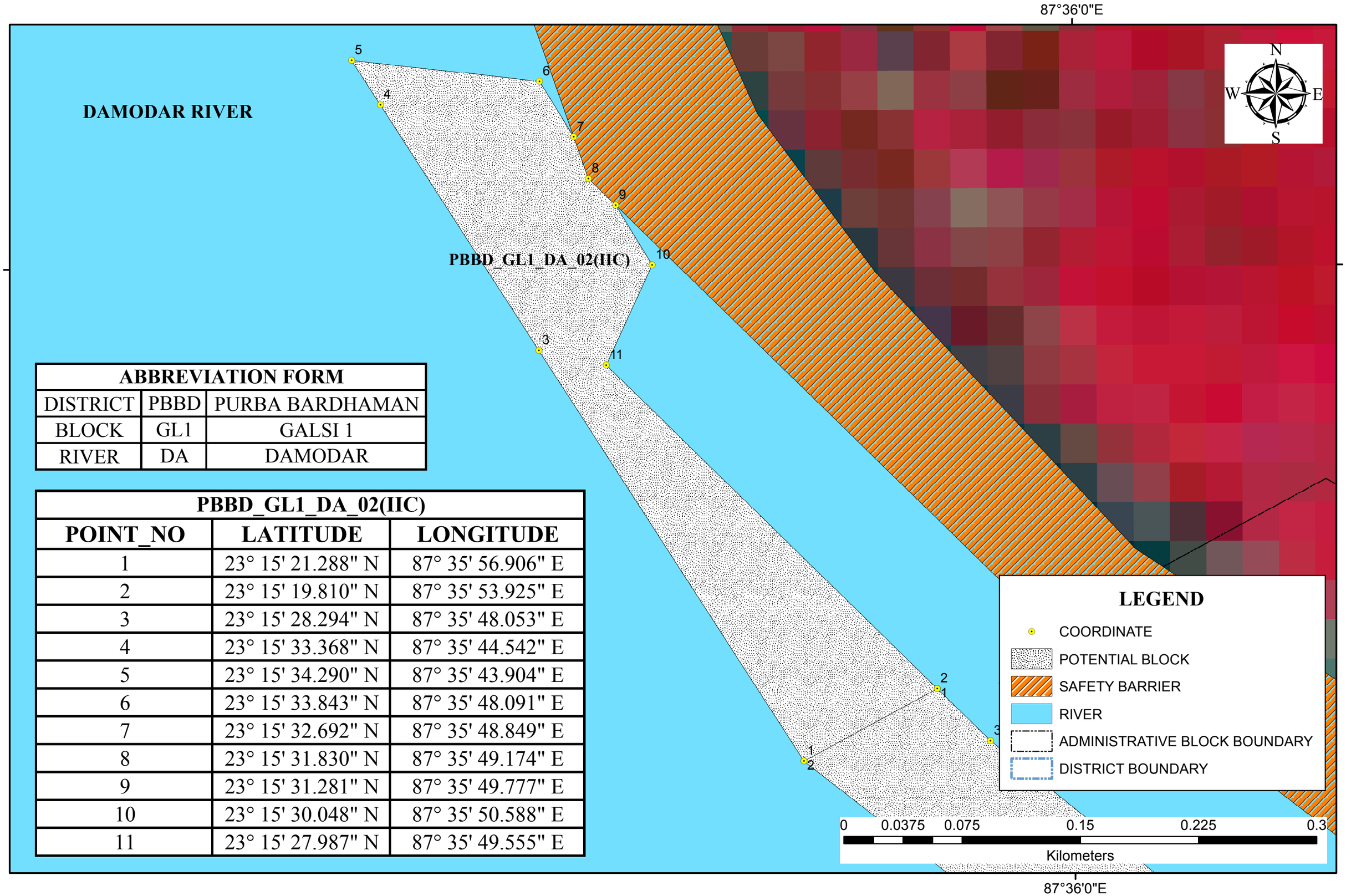
POTENTIAL BLOCK PBBD_GL1_DA_02(IIB) OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL1	GALSI 1
RIVER	DA	DAMODAR

PBBD_GL1_DA_02(IIB)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 15' 50.744" N	87° 35' 42.047" E
2	23° 15' 37.818" N	87° 35' 46.917" E
3	23° 15' 38.350" N	87° 35' 45.618" E
4	23° 15' 38.984" N	87° 35' 40.655" E
5	23° 15' 50.531" N	87° 35' 32.663" E
6	23° 15' 50.931" N	87° 35' 32.387" E
7	23° 15' 58.547" N	87° 35' 33.907" E
8	23° 16' 2.674" N	87° 35' 34.819" E
9	23° 16' 5.325" N	87° 35' 32.507" E
10	23° 16' 7.004" N	87° 35' 25.362" E
11	23° 16' 10.327" N	87° 35' 20.370" E
12	23° 16' 14.792" N	87° 35' 19.138" E
13	23° 16' 16.442" N	87° 35' 19.367" E
14	23° 16' 13.495" N	87° 35' 22.036" E
15	23° 16' 7.739" N	87° 35' 33.823" E

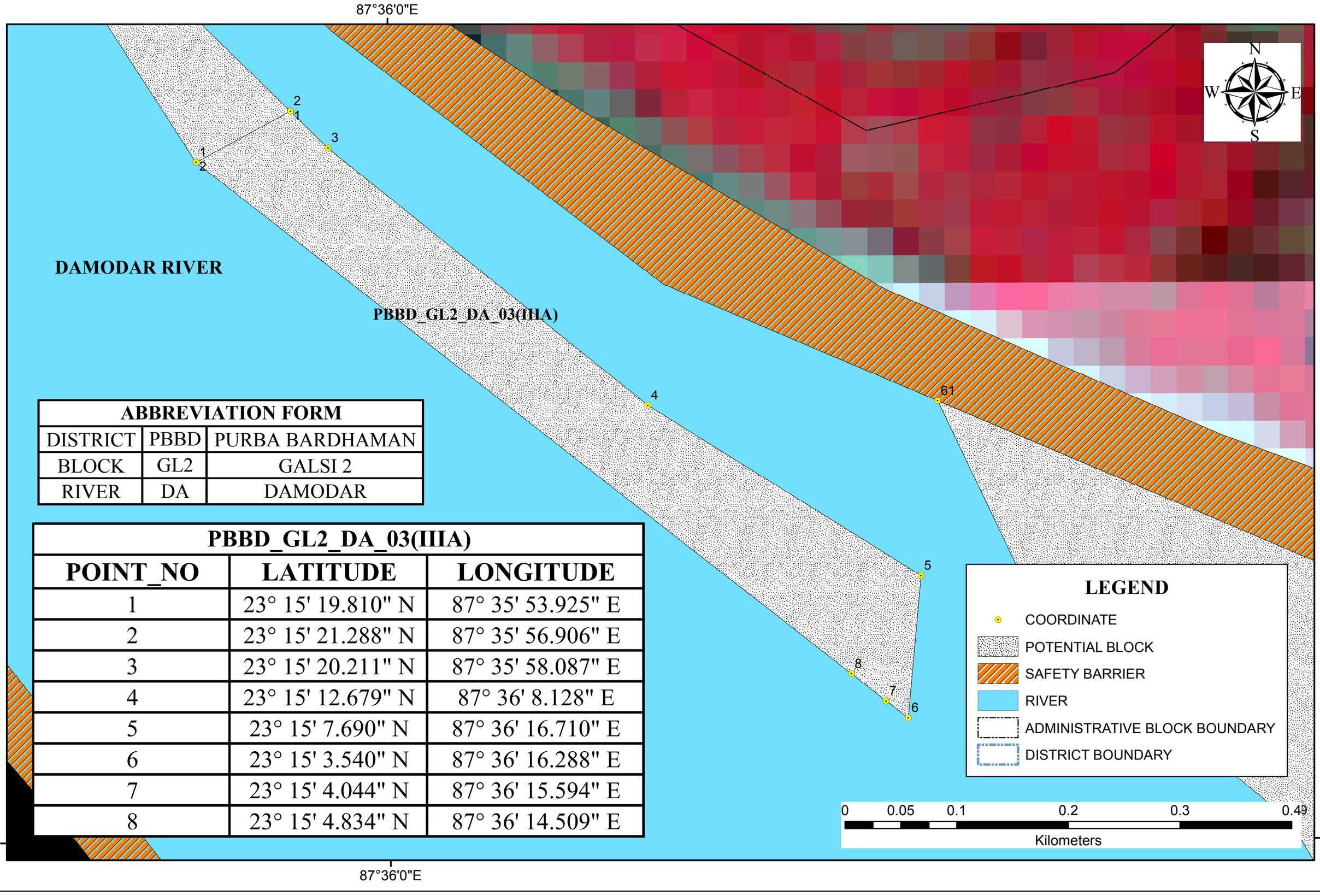
POTENTIAL BLOCK PBBD_GL1_DA_02(IIC) OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL1	GALSI 1
RIVER	DA	DAMODAR

PBBD_GL1_DA_02(IIC)		
POINT_NO	**LATITUDE**	**LONGITUDE**
1	23° 15' 21.288" N	87° 35' 56.906" E
2	23° 15' 19.810" N	87° 35' 53.925" E
3	23° 15' 28.294" N	87° 35' 48.053" E
4	23° 15' 33.368" N	87° 35' 44.542" E
5	23° 15' 34.290" N	87° 35' 43.904" E
6	23° 15' 33.843" N	87° 35' 48.091" E
7	23° 15' 32.692" N	87° 35' 48.849" E
8	23° 15' 31.830" N	87° 35' 49.174" E
9	23° 15' 31.281" N	87° 35' 49.777" E
10	23° 15' 30.048" N	87° 35' 50.588" E
11	23° 15' 27.987" N	87° 35' 49.555" E

POTENTIAL BLOCK PBBD_GL2_DA_03(IIIA) OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

PBBD_GL2_DA_03(IIIA)		
POINT_NO	**LATITUDE**	**LONGITUDE**
1	23° 15' 19.810" N	87° 35' 53.925" E
2	23° 15' 21.288" N	87° 35' 56.906" E
3	23° 15' 20.211" N	87° 35' 58.087" E
4	23° 15' 12.679" N	87° 36' 8.128" E
5	23° 15' 7.690" N	87° 36' 16.710" E
6	23° 15' 3.540" N	87° 36' 16.288" E
7	23° 15' 4.044" N	87° 36' 15.594" E
8	23° 15' 4.834" N	87° 36' 14.509" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

POTENTIAL BLOCK PBBD_GL2_DA_03(IIIB) OF DAMODAR RIVER

87°42'0"E

87°42'30"E

23°15'0"N

PBBD_GL2_DA_03(IIIB)

DAMODAR RIVER

PBBD_GL2_DA_03(IIIB)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 15' 13.407" N	87° 42' 30.801" E
2	23° 15' 11.362" N	87° 42' 26.320" E
3	23° 15' 13.446" N	87° 42' 22.085" E
4	23° 15' 14.719" N	87° 42' 14.494" E
5	23° 15' 15.789" N	87° 42' 13.069" E
6	23° 15' 17.576" N	87° 42' 34.040" E
7	23° 15' 17.751" N	87° 42' 34.543" E
8	23° 15' 16.694" N	87° 42' 34.393" E

LEGEND

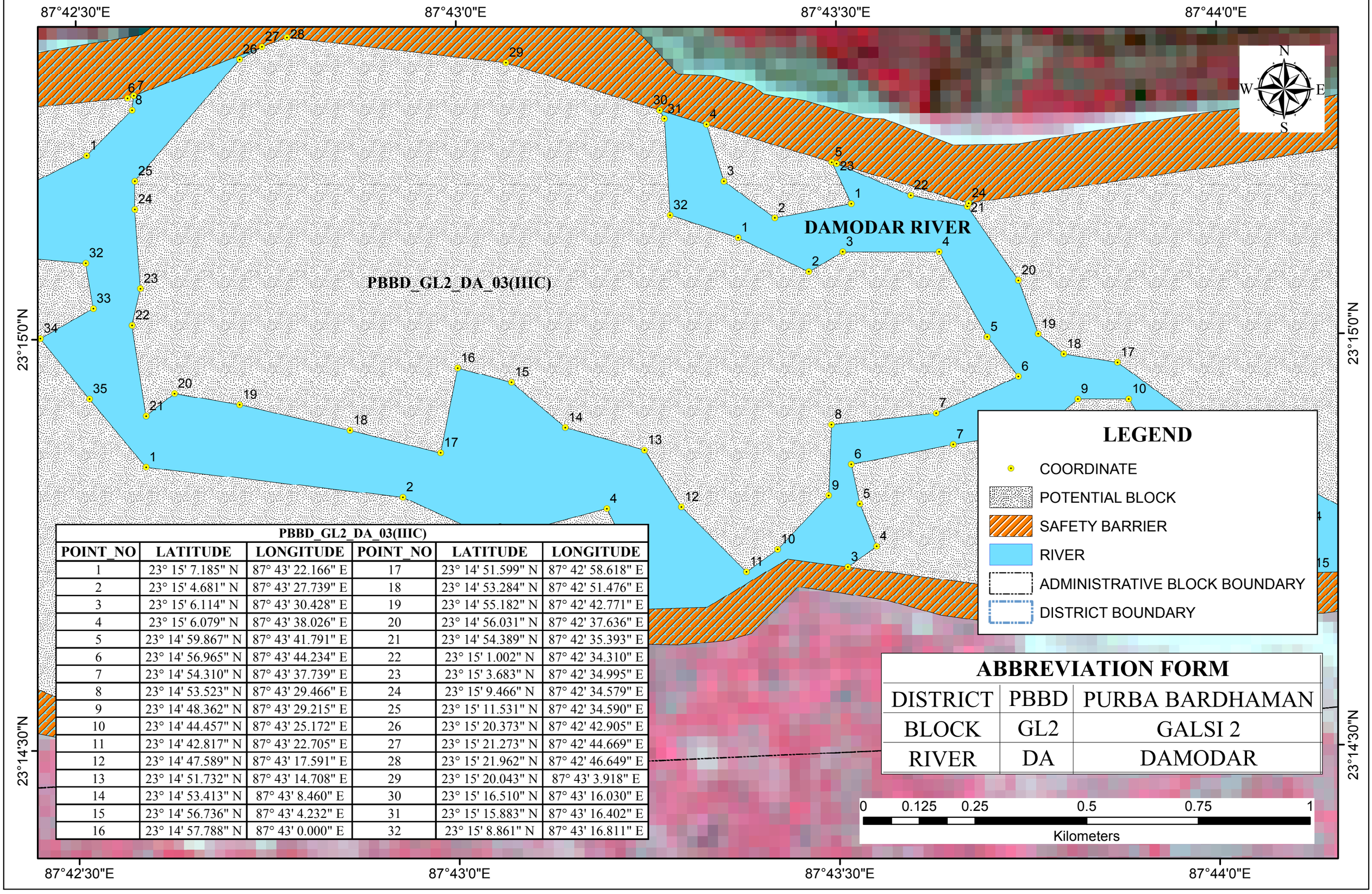
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

0 0.05 0.1 0.2 0.3 0.4

Kilometers

POTENTIAL BLOCK PBBD_GL2_DA_03(IIIC) OF DAMODAR RIVER



PBBD_GL2_DA_03(IIIC)					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 15' 7.185" N	87° 43' 22.166" E	17	23° 14' 51.599" N	87° 42' 58.618" E
2	23° 15' 4.681" N	87° 43' 27.739" E	18	23° 14' 53.284" N	87° 42' 51.476" E
3	23° 15' 6.114" N	87° 43' 30.428" E	19	23° 14' 55.182" N	87° 42' 42.771" E
4	23° 15' 6.079" N	87° 43' 38.026" E	20	23° 14' 56.031" N	87° 42' 37.636" E
5	23° 14' 59.867" N	87° 43' 41.791" E	21	23° 14' 54.389" N	87° 42' 35.393" E
6	23° 14' 56.965" N	87° 43' 44.234" E	22	23° 15' 1.002" N	87° 42' 34.310" E
7	23° 14' 54.310" N	87° 43' 37.739" E	23	23° 15' 3.683" N	87° 42' 34.995" E
8	23° 14' 53.523" N	87° 43' 29.466" E	24	23° 15' 9.466" N	87° 42' 34.579" E
9	23° 14' 48.362" N	87° 43' 29.215" E	25	23° 15' 11.531" N	87° 42' 34.590" E
10	23° 14' 44.457" N	87° 43' 25.172" E	26	23° 15' 20.373" N	87° 42' 42.905" E
11	23° 14' 42.817" N	87° 43' 22.705" E	27	23° 15' 21.273" N	87° 42' 44.669" E
12	23° 14' 47.589" N	87° 43' 17.591" E	28	23° 15' 21.962" N	87° 42' 46.649" E
13	23° 14' 51.732" N	87° 43' 14.708" E	29	23° 15' 20.043" N	87° 43' 3.918" E
14	23° 14' 53.413" N	87° 43' 8.460" E	30	23° 15' 16.510" N	87° 43' 16.030" E
15	23° 14' 56.736" N	87° 43' 4.232" E	31	23° 15' 15.883" N	87° 43' 16.402" E
16	23° 14' 57.788" N	87° 43' 0.000" E	32	23° 15' 8.861" N	87° 43' 16.811" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

POTENTIAL BLOCK PBBD_GL2_DA_03(IIID) OF DAMODAR RIVER

87°43'30"E

87°44'0"E

23°14'30"N

PBBD_GL2_DA_03(IIID)

DAMODAR RIVER

N

W

E

S

PBBD_GL2_DA_03(IIID)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 42.402" N	87° 44' 0.192" E
2	23° 14' 40.860" N	87° 43' 48.679" E
3	23° 14' 43.138" N	87° 43' 30.701" E
4	23° 14' 44.627" N	87° 43' 32.994" E
5	23° 14' 47.731" N	87° 43' 31.670" E
6	23° 14' 50.625" N	87° 43' 31.015" E
7	23° 14' 52.033" N	87° 43' 39.067" E
8	23° 14' 53.033" N	87° 43' 46.000" E
9	23° 14' 55.291" N	87° 43' 48.917" E
10	23° 14' 55.272" N	87° 43' 52.940" E
11	23° 14' 52.787" N	87° 43' 54.490" E
12	23° 14' 50.100" N	87° 43' 55.146" E
13	23° 14' 48.412" N	87° 44' 2.958" E
14	23° 14' 45.916" N	87° 44' 6.743" E
15	23° 14' 42.528" N	87° 44' 7.321" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

0 0.075 0.15 0.3 0.45 0.6

Kilometers

POTENTIAL BLOCK PBBD_GL2_DA_03(IIIE) OF DAMODAR RIVER

87°44'0"E 87°44'30"E 87°45'0"E

23°15'0"N 23°14'30"N

PBBD_GL2_DA_03(IIIE)

DAMODAR RIVER

PBBD_GL2_DA_03(IIIE)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 15' 9.621" N	87° 43' 31.118" E
2	23° 15' 8.617" N	87° 43' 25.079" E
3	23° 15' 11.319" N	87° 43' 21.071" E
4	23° 15' 15.455" N	87° 43' 19.733" E
5	23° 15' 12.670" N	87° 43' 29.598" E
6	23° 15' 10.449" N	87° 45' 0.691" E
7	23° 15' 8.389" N	87° 45' 1.225" E
8	23° 15' 8.827" N	87° 44' 52.456" E
9	23° 15' 8.670" N	87° 44' 41.953" E
10	23° 15' 6.229" N	87° 44' 34.118" E
11	23° 15' 2.122" N	87° 44' 29.402" E
12	23° 14' 58.206" N	87° 44' 27.816" E
13	23° 14' 51.405" N	87° 44' 25.097" E
14	23° 14' 48.732" N	87° 44' 22.624" E
15	23° 14' 47.139" N	87° 44' 10.102" E
16	23° 14' 51.100" N	87° 44' 2.079" E
17	23° 14' 57.961" N	87° 43' 52.060" E
18	23° 14' 58.600" N	87° 43' 47.818" E
19	23° 15' 0.055" N	87° 43' 45.815" E
20	23° 15' 3.985" N	87° 43' 44.272" E
21	23° 15' 9.372" N	87° 43' 40.279" E
22	23° 15' 10.219" N	87° 43' 35.814" E
23	23° 15' 12.564" N	87° 43' 29.973" E
24	23° 15' 9.626" N	87° 43' 40.375" E
25	23° 15' 15.931" N	87° 44' 27.523" E
26	23° 15' 18.672" N	87° 44' 44.518" E
27	23° 15' 17.850" N	87° 44' 54.386" E

LEGEND

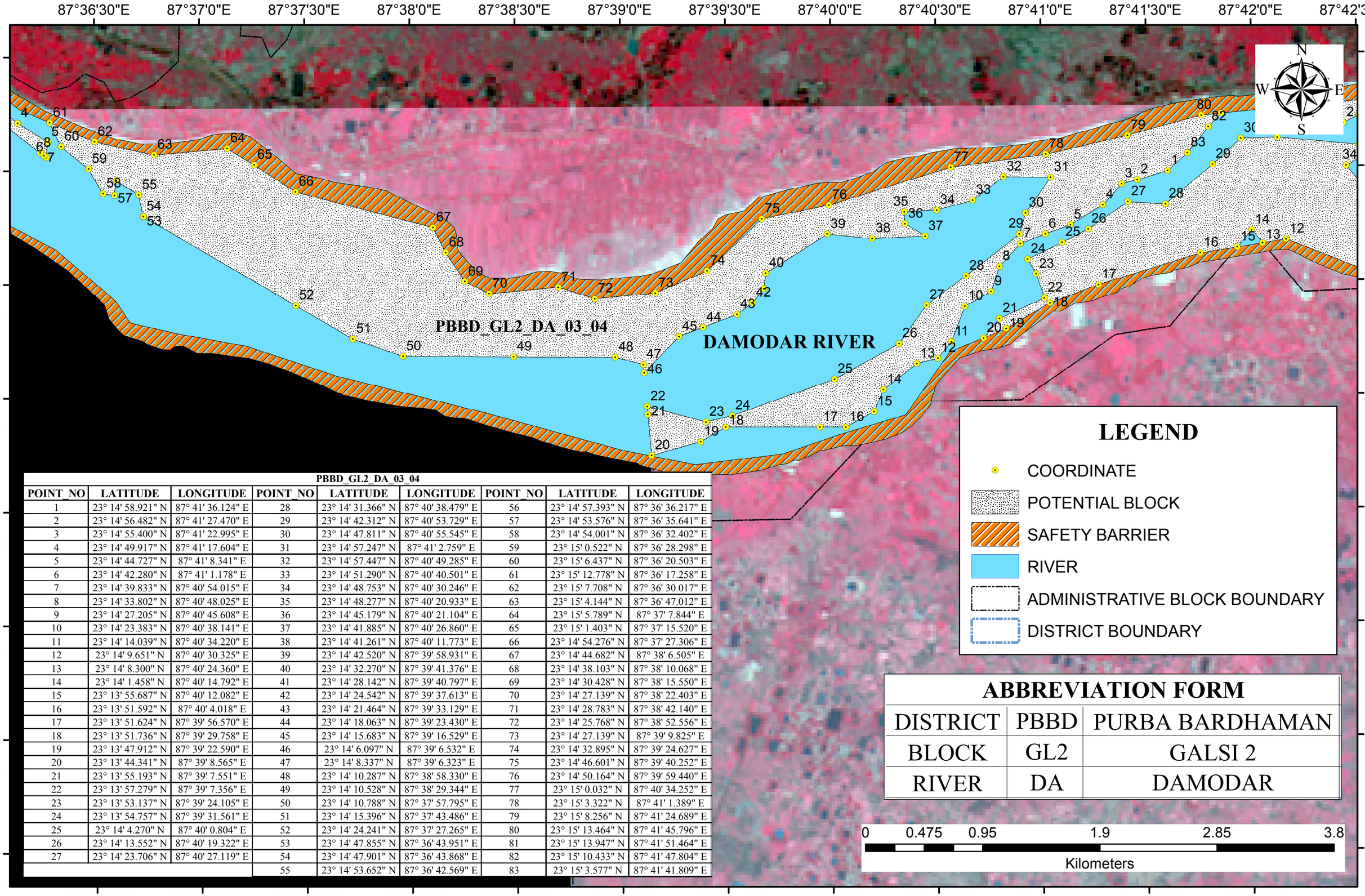
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

0 0.15 0.3 0.6 0.9 1.2

Kilometers

POTENTIAL BLOCK PBBD_GL2_DA_03_04 OF DAMODAR RIVER



PBBD_GL2_DA_03_04

POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 58.921" N	87° 41' 36.124" E	28	23° 14' 31.366" N	87° 40' 38.479" E	56	23° 14' 57.393" N	87° 36' 36.217" E
2	23° 14' 56.482" N	87° 41' 27.470" E	29	23° 14' 42.312" N	87° 40' 53.729" E	57	23° 14' 53.576" N	87° 36' 35.641" E
3	23° 14' 55.400" N	87° 41' 22.995" E	30	23° 14' 47.811" N	87° 40' 55.545" E	58	23° 14' 54.001" N	87° 36' 32.402" E
4	23° 14' 49.917" N	87° 41' 17.604" E	31	23° 14' 57.247" N	87° 41' 2.759" E	59	23° 15' 0.522" N	87° 36' 28.298" E
5	23° 14' 44.727" N	87° 41' 8.341" E	32	23° 14' 57.447" N	87° 40' 49.285" E	60	23° 15' 6.437" N	87° 36' 20.503" E
6	23° 14' 42.280" N	87° 41' 1.178" E	33	23° 14' 51.290" N	87° 40' 40.501" E	61	23° 15' 12.778" N	87° 36' 17.258" E
7	23° 14' 39.833" N	87° 40' 54.015" E	34	23° 14' 48.753" N	87° 40' 30.246" E	62	23° 15' 7.708" N	87° 36' 30.017" E
8	23° 14' 33.802" N	87° 40' 48.025" E	35	23° 14' 48.277" N	87° 40' 20.933" E	63	23° 15' 4.144" N	87° 36' 47.012" E
9	23° 14' 27.205" N	87° 40' 45.608" E	36	23° 14' 45.179" N	87° 40' 21.104" E	64	23° 15' 5.789" N	87° 37' 7.844" E
10	23° 14' 23.383" N	87° 40' 38.141" E	37	23° 14' 41.885" N	87° 40' 26.860" E	65	23° 15' 1.403" N	87° 37' 15.520" E
11	23° 14' 14.039" N	87° 40' 34.220" E	38	23° 14' 41.261" N	87° 40' 11.773" E	66	23° 14' 54.276" N	87° 37' 27.306" E
12	23° 14' 9.651" N	87° 40' 30.325" E	39	23° 14' 42.520" N	87° 39' 58.931" E	67	23° 14' 44.682" N	87° 38' 6.505" E
13	23° 14' 8.300" N	87° 40' 24.360" E	40	23° 14' 32.270" N	87° 39' 41.376" E	68	23° 14' 38.103" N	87° 38' 10.068" E
14	23° 14' 1.458" N	87° 40' 14.792" E	41	23° 14' 28.142" N	87° 39' 40.797" E	69	23° 14' 30.428" N	87° 38' 15.550" E
15	23° 13' 55.687" N	87° 40' 12.082" E	42	23° 14' 24.542" N	87° 39' 37.613" E	70	23° 14' 27.139" N	87° 38' 22.403" E
16	23° 13' 51.592" N	87° 40' 4.018" E	43	23° 14' 21.464" N	87° 39' 33.129" E	71	23° 14' 28.783" N	87° 38' 42.140" E
17	23° 13' 51.624" N	87° 39' 56.570" E	44	23° 14' 18.063" N	87° 39' 23.430" E	72	23° 14' 25.768" N	87° 38' 52.556" E
18	23° 13' 51.736" N	87° 39' 29.758" E	45	23° 14' 15.683" N	87° 39' 16.529" E	73	23° 14' 27.139" N	87° 39' 9.825" E
19	23° 13' 47.912" N	87° 39' 22.590" E	46	23° 14' 6.097" N	87° 39' 6.532" E	74	23° 14' 32.895" N	87° 39' 24.627" E
20	23° 13' 44.341" N	87° 39' 8.565" E	47	23° 14' 8.337" N	87° 39' 6.323" E	75	23° 14' 46.601" N	87° 39' 40.252" E
21	23° 13' 55.193" N	87° 39' 7.551" E	48	23° 14' 10.287" N	87° 38' 58.330" E	76	23° 14' 50.164" N	87° 39' 59.440" E
22	23° 13' 57.279" N	87° 39' 7.356" E	49	23° 14' 10.528" N	87° 38' 29.344" E	77	23° 15' 0.032" N	87° 40' 34.252" E
23	23° 13' 53.137" N	87° 39' 24.105" E	50	23° 14' 10.788" N	87° 37' 57.795" E	78	23° 15' 3.322" N	87° 41' 1.389" E
24	23° 13' 54.757" N	87° 39' 31.561" E	51	23° 14' 15.396" N	87° 37' 43.486" E	79	23° 15' 8.256" N	87° 41' 24.689" E
25	23° 14' 4.270" N	87° 40' 0.804" E	52	23° 14' 24.241" N	87° 37' 27.265" E	80	23° 15' 13.464" N	87° 41' 45.796" E
26	23° 14' 13.552" N	87° 40' 19.322" E	53	23° 14' 47.855" N	87° 36' 43.951" E	81	23° 15' 13.947" N	87° 41' 51.464" E
27	23° 14' 23.706" N	87° 40' 27.119" E	54	23° 14' 47.901" N	87° 36' 43.868" E	82	23° 15' 10.433" N	87° 41' 47.804" E
			55	23° 14' 53.652" N	87° 36' 42.569" E	83	23° 15' 3.577" N	87° 41' 41.809" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

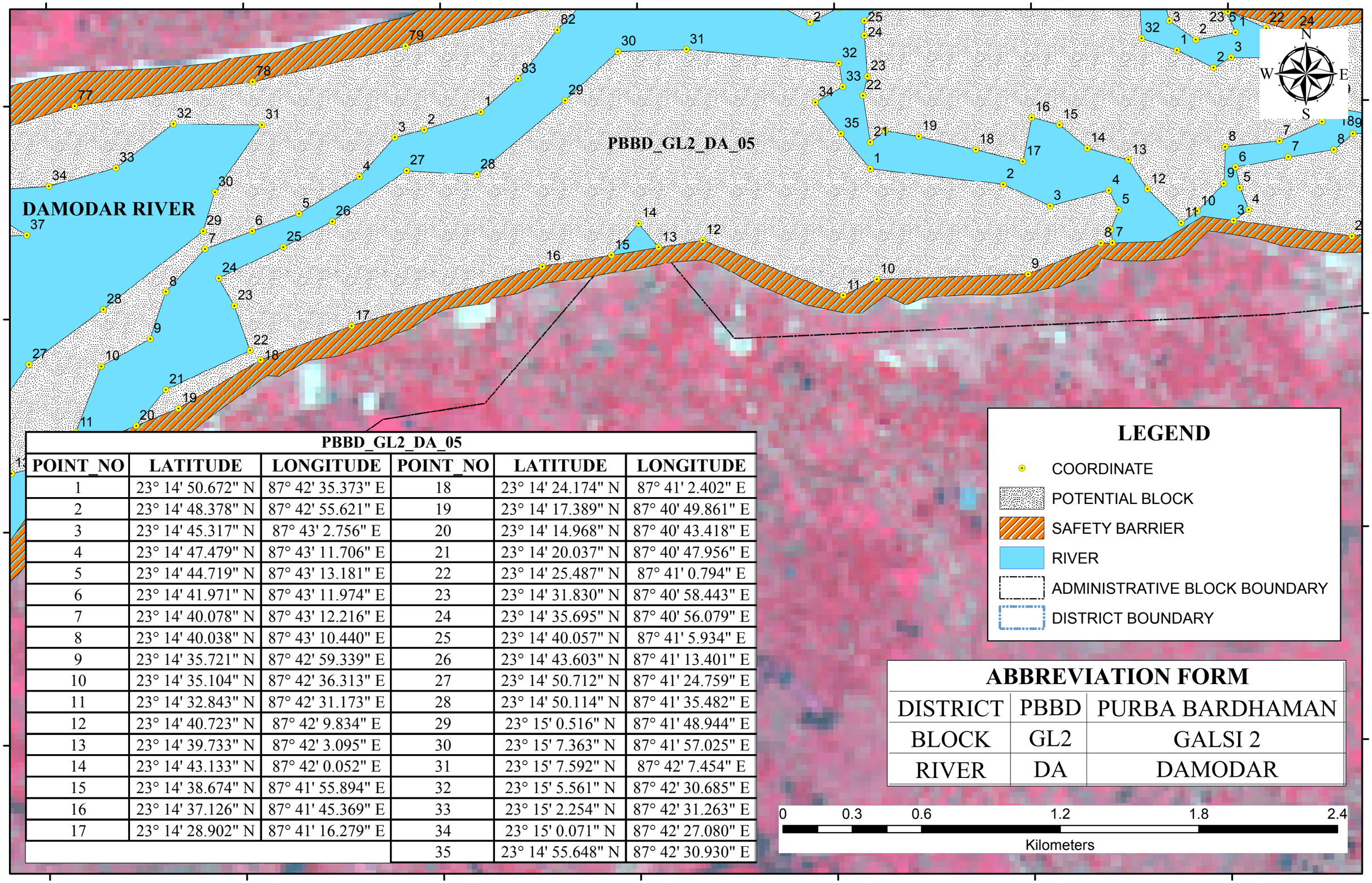
ABBREVIATION FORM

DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

0 0.475 0.95 1.9 2.85 3.8

Kilometers

POTENTIAL BLOCK PBBD_GL2_DA_05 OF DAMODAR RIVER



PBBD_GL2_DA_05					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 50.672" N	87° 42' 35.373" E	18	23° 14' 24.174" N	87° 41' 2.402" E
2	23° 14' 48.378" N	87° 42' 55.621" E	19	23° 14' 17.389" N	87° 40' 49.861" E
3	23° 14' 45.317" N	87° 43' 2.756" E	20	23° 14' 14.968" N	87° 40' 43.418" E
4	23° 14' 47.479" N	87° 43' 11.706" E	21	23° 14' 20.037" N	87° 40' 47.956" E
5	23° 14' 44.719" N	87° 43' 13.181" E	22	23° 14' 25.487" N	87° 41' 0.794" E
6	23° 14' 41.971" N	87° 43' 11.974" E	23	23° 14' 31.830" N	87° 40' 58.443" E
7	23° 14' 40.078" N	87° 43' 12.216" E	24	23° 14' 35.695" N	87° 40' 56.079" E
8	23° 14' 40.038" N	87° 43' 10.440" E	25	23° 14' 40.057" N	87° 41' 5.934" E
9	23° 14' 35.721" N	87° 42' 59.339" E	26	23° 14' 43.603" N	87° 41' 13.401" E
10	23° 14' 35.104" N	87° 42' 36.313" E	27	23° 14' 50.712" N	87° 41' 24.759" E
11	23° 14' 32.843" N	87° 42' 31.173" E	28	23° 14' 50.114" N	87° 41' 35.482" E
12	23° 14' 40.723" N	87° 42' 9.834" E	29	23° 15' 0.516" N	87° 41' 48.944" E
13	23° 14' 39.733" N	87° 42' 3.095" E	30	23° 15' 7.363" N	87° 41' 57.025" E
14	23° 14' 43.133" N	87° 42' 0.052" E	31	23° 15' 7.592" N	87° 42' 7.454" E
15	23° 14' 38.674" N	87° 41' 55.894" E	32	23° 15' 5.561" N	87° 42' 30.685" E
16	23° 14' 37.126" N	87° 41' 45.369" E	33	23° 15' 2.254" N	87° 42' 31.263" E
17	23° 14' 28.902" N	87° 41' 16.279" E	34	23° 15' 0.071" N	87° 42' 27.080" E
			35	23° 14' 55.648" N	87° 42' 30.930" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

0 0.3 0.6 1.2 1.8 2.4

Kilometers

POTENTIAL BLOCK PBBD_GL2_DA_06 OF DAMODAR RIVER

87°44'30"E 87°45'0"E 87°45'30"E 87°46'0"E

23°15'0"N 23°14'30"N 23°14'0"N

DAMODAR RIVER

PBBD_GL2_DA_06

N W E S

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

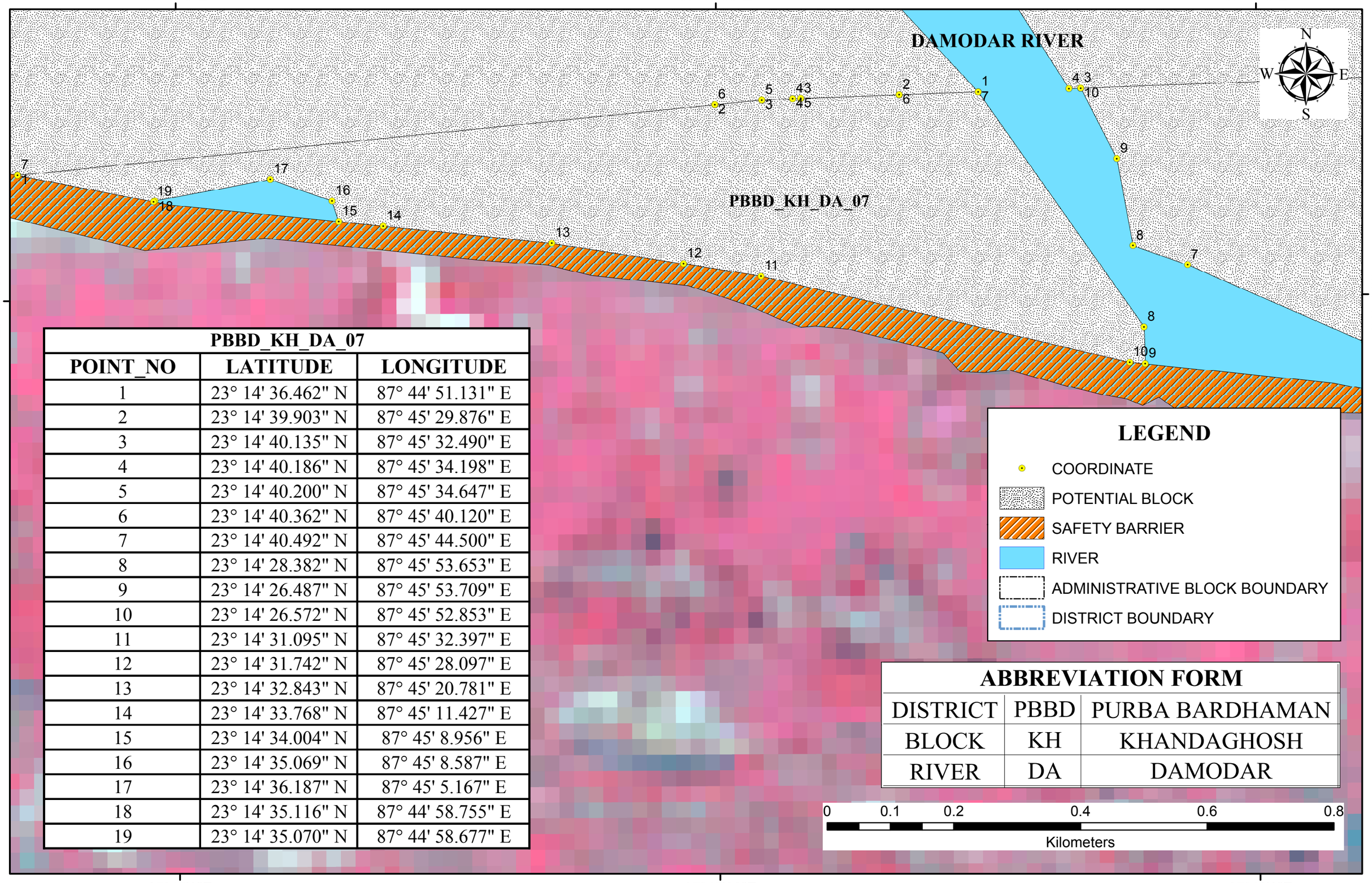
PBBD_GL2_DA_06					
POINT_NO	LATITUDE	LONGITUDE	POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 40.492" N	87° 45' 44.500" E	14	23° 15' 1.998" N	87° 44' 37.428" E
2	23° 14' 40.362" N	87° 45' 40.120" E	15	23° 15' 6.897" N	87° 44' 48.534" E
3	23° 14' 40.200" N	87° 45' 34.647" E	16	23° 15' 7.046" N	87° 44' 52.110" E
4	23° 14' 40.186" N	87° 45' 34.198" E	17	23° 15' 4.700" N	87° 44' 59.069" E
5	23° 14' 40.135" N	87° 45' 32.490" E	18	23° 15' 0.553" N	87° 45' 2.621" E
6	23° 14' 39.903" N	87° 45' 29.876" E	19	23° 14' 55.039" N	87° 45' 7.780" E
7	23° 14' 36.462" N	87° 44' 51.131" E	20	23° 14' 51.728" N	87° 45' 9.326" E
8	23° 14' 36.852" N	87° 44' 49.018" E	21	23° 14' 49.644" N	87° 45' 13.336" E
9	23° 14' 35.515" N	87° 44' 37.814" E	22	23° 14' 48.565" N	87° 45' 22.939" E
10	23° 14' 43.328" N	87° 44' 28.974" E	23	23° 14' 50.398" N	87° 45' 28.312" E
11	23° 14' 42.931" N	87° 44' 21.767" E	24	23° 14' 50.946" N	87° 45' 30.614" E
12	23° 14' 48.836" N	87° 44' 26.181" E	25	23° 14' 49.053" N	87° 45' 35.925" E
13	23° 14' 57.263" N	87° 44' 34.496" E	26	23° 14' 49.122" N	87° 45' 35.903" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

0 0.175 0.35 0.7 1.05 1.4

Kilometers

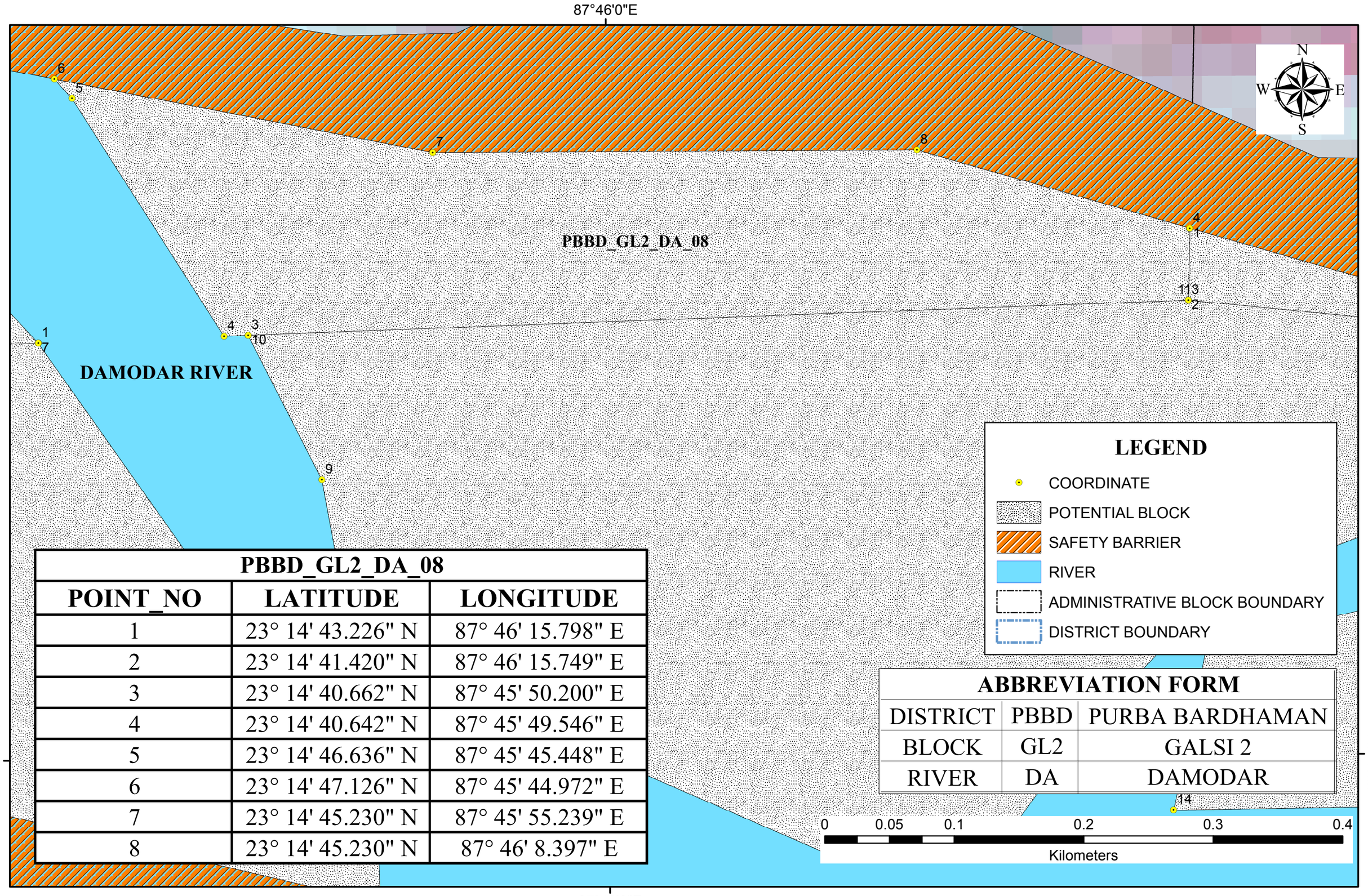
POTENTIAL BLOCK PBBD_KH_DA_07 OF DAMODAR RIVER



PBBD_KH_DA_07		
POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 36.462" N	87° 44' 51.131" E
2	23° 14' 39.903" N	87° 45' 29.876" E
3	23° 14' 40.135" N	87° 45' 32.490" E
4	23° 14' 40.186" N	87° 45' 34.198" E
5	23° 14' 40.200" N	87° 45' 34.647" E
6	23° 14' 40.362" N	87° 45' 40.120" E
7	23° 14' 40.492" N	87° 45' 44.500" E
8	23° 14' 28.382" N	87° 45' 53.653" E
9	23° 14' 26.487" N	87° 45' 53.709" E
10	23° 14' 26.572" N	87° 45' 52.853" E
11	23° 14' 31.095" N	87° 45' 32.397" E
12	23° 14' 31.742" N	87° 45' 28.097" E
13	23° 14' 32.843" N	87° 45' 20.781" E
14	23° 14' 33.768" N	87° 45' 11.427" E
15	23° 14' 34.004" N	87° 45' 8.956" E
16	23° 14' 35.069" N	87° 45' 8.587" E
17	23° 14' 36.187" N	87° 45' 5.167" E
18	23° 14' 35.116" N	87° 44' 58.755" E
19	23° 14' 35.070" N	87° 44' 58.677" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KH	KHANDAGHOSH
RIVER	DA	DAMODAR

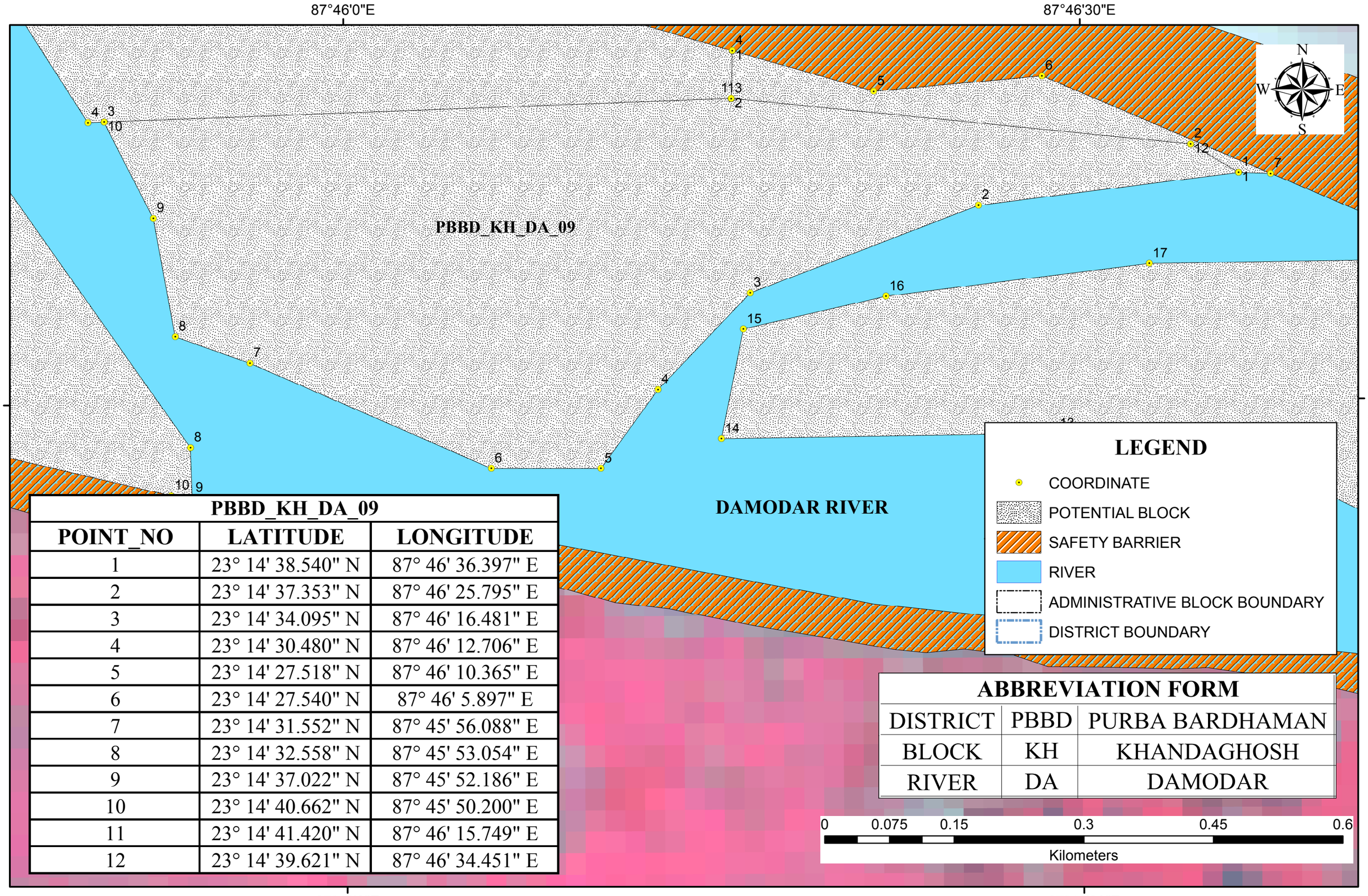
POTENTIAL BLOCK PBBD_GL2_DA_08 OF DAMODAR RIVER



PBBD_GL2_DA_08		
POINT_NO	**LATITUDE**	**LONGITUDE**
1	23° 14' 43.226" N	87° 46' 15.798" E
2	23° 14' 41.420" N	87° 46' 15.749" E
3	23° 14' 40.662" N	87° 45' 50.200" E
4	23° 14' 40.642" N	87° 45' 49.546" E
5	23° 14' 46.636" N	87° 45' 45.448" E
6	23° 14' 47.126" N	87° 45' 44.972" E
7	23° 14' 45.230" N	87° 45' 55.239" E
8	23° 14' 45.230" N	87° 46' 8.397" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	GL2	GALSI 2
RIVER	DA	DAMODAR

POTENTIAL BLOCK PBBD_KH_DA_09 OF DAMODAR RIVER



PBBD_KH_DA_09		
POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 38.540" N	87° 46' 36.397" E
2	23° 14' 37.353" N	87° 46' 25.795" E
3	23° 14' 34.095" N	87° 46' 16.481" E
4	23° 14' 30.480" N	87° 46' 12.706" E
5	23° 14' 27.518" N	87° 46' 10.365" E
6	23° 14' 27.540" N	87° 46' 5.897" E
7	23° 14' 31.552" N	87° 45' 56.088" E
8	23° 14' 32.558" N	87° 45' 53.054" E
9	23° 14' 37.022" N	87° 45' 52.186" E
10	23° 14' 40.662" N	87° 45' 50.200" E
11	23° 14' 41.420" N	87° 46' 15.749" E
12	23° 14' 39.621" N	87° 46' 34.451" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KH	KHANDAGHOSH
RIVER	DA	DAMODAR

POTENTIAL BLOCK PBBD_KH_DA_09_11 OF DAMODAR RIVER

87°46'30"E 87°47'0"E 87°47'30"E 87°48'0"E

23°14'30"N 23°14'0"N 23°13'30"N

DAMODAR RIVER

PBBD_KH_DA_09_11

PBBD_KH_DA_09_11		
POINT_NO	LATITUDE	LONGITUDE
1	23° 13' 55.935" N	87° 47' 38.697" E
2	23° 13' 54.047" N	87° 47' 40.585" E
3	23° 13' 55.221" N	87° 47' 37.599" E
4	23° 14' 3.238" N	87° 47' 20.124" E
5	23° 14' 13.849" N	87° 46' 59.973" E
6	23° 14' 15.380" N	87° 46' 59.889" E
7	23° 14' 19.910" N	87° 47' 2.374" E
8	23° 14' 20.138" N	87° 46' 58.129" E
9	23° 14' 18.531" N	87° 46' 53.979" E
10	23° 14' 19.262" N	87° 46' 51.004" E
11	23° 14' 23.579" N	87° 46' 46.441" E
12	23° 14' 27.310" N	87° 46' 37.783" E
13	23° 14' 28.748" N	87° 46' 28.908" E
14	23° 14' 28.609" N	87° 46' 15.276" E
15	23° 14' 32.734" N	87° 46' 16.194" E
16	23° 14' 33.944" N	87° 46' 22.011" E
17	23° 14' 35.130" N	87° 46' 32.743" E
18	23° 14' 35.230" N	87° 46' 42.356" E
19	23° 14' 34.879" N	87° 46' 42.989" E
20	23° 14' 34.621" N	87° 46' 43.452" E
21	23° 14' 22.489" N	87° 47' 5.289" E

N W E S

LEGEND

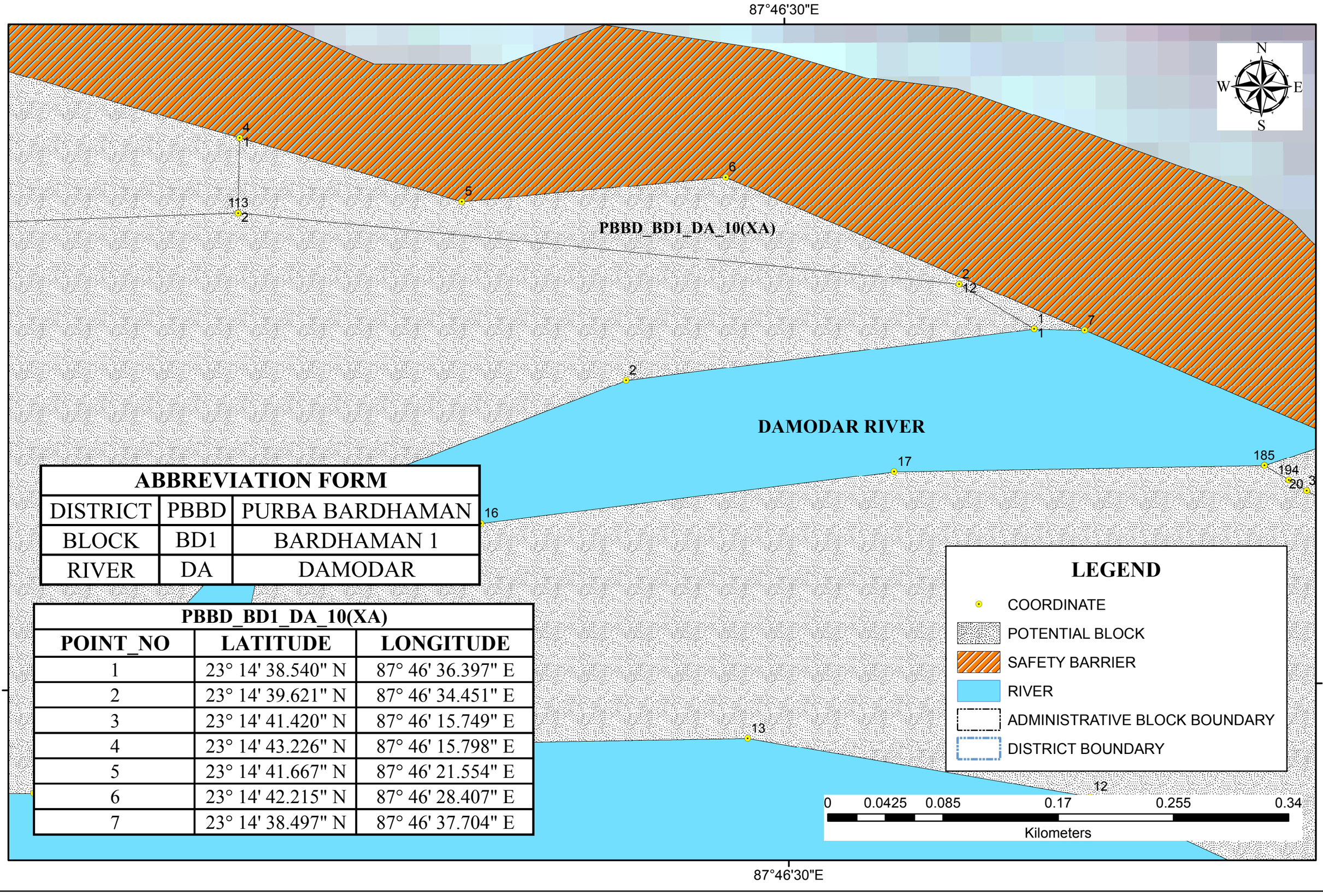
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	KH	KHANDAGHOSH
RIVER	DA	DAMODAR

0 0.2 0.4 0.8 1.2 1.6

Kilometers

POTENTIAL BLOCK PBBD_BD1_DA_10(XA) OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD1	BARDHAMAN 1
RIVER	DA	DAMODAR

PBBD_BD1_DA_10(XA)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 14' 38.540" N	87° 46' 36.397" E
2	23° 14' 39.621" N	87° 46' 34.451" E
3	23° 14' 41.420" N	87° 46' 15.749" E
4	23° 14' 43.226" N	87° 46' 15.798" E
5	23° 14' 41.667" N	87° 46' 21.554" E
6	23° 14' 42.215" N	87° 46' 28.407" E
7	23° 14' 38.497" N	87° 46' 37.704" E

POTENTIAL BLOCK PBBD_BD1_DA_10(XB) OF DAMODAR RIVER

87°47'30"E 87°48'0"E 87°48'30"E

23°14'30"N 23°14'0"N

DAMODAR RIVER

PBBD_BD1_DA_10(XB)

PBBD_BD1_DA_10(XB)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 13' 58.842" N	87° 48' 32.880" E
2	23° 13' 56.882" N	87° 48' 32.429" E
3	23° 13' 55.633" N	87° 48' 32.142" E
4	23° 13' 54.935" N	87° 48' 21.993" E
5	23° 13' 56.221" N	87° 48' 12.840" E
6	23° 13' 57.919" N	87° 48' 3.913" E
7	23° 13' 57.933" N	87° 48' 1.009" E
8	23° 13' 55.459" N	87° 48' 0.324" E
9	23° 13' 53.815" N	87° 47' 58.750" E
10	23° 13' 56.123" N	87° 47' 51.614" E
11	23° 14' 1.733" N	87° 47' 44.720" E
12	23° 14' 8.973" N	87° 47' 42.082" E
13	23° 14' 11.881" N	87° 47' 38.748" E
14	23° 14' 15.407" N	87° 47' 35.640" E
15	23° 14' 21.629" N	87° 47' 30.091" E
16	23° 14' 23.470" N	87° 47' 25.984" E
17	23° 14' 12.063" N	87° 47' 59.687" E
18	23° 14' 0.002" N	87° 48' 30.936" E
20	23° 14' 24.124" N	87° 47' 24.052" E
21	23° 14' 23.939" N	87° 47' 24.599" E
22	23° 14' 24.170" N	87° 47' 17.593" E
23	23° 14' 26.083" N	87° 47' 15.431" E
24	23° 14' 24.124" N	87° 47' 24.052" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD1	BARDHAMAN 1
RIVER	DA	DAMODAR

LEGEND

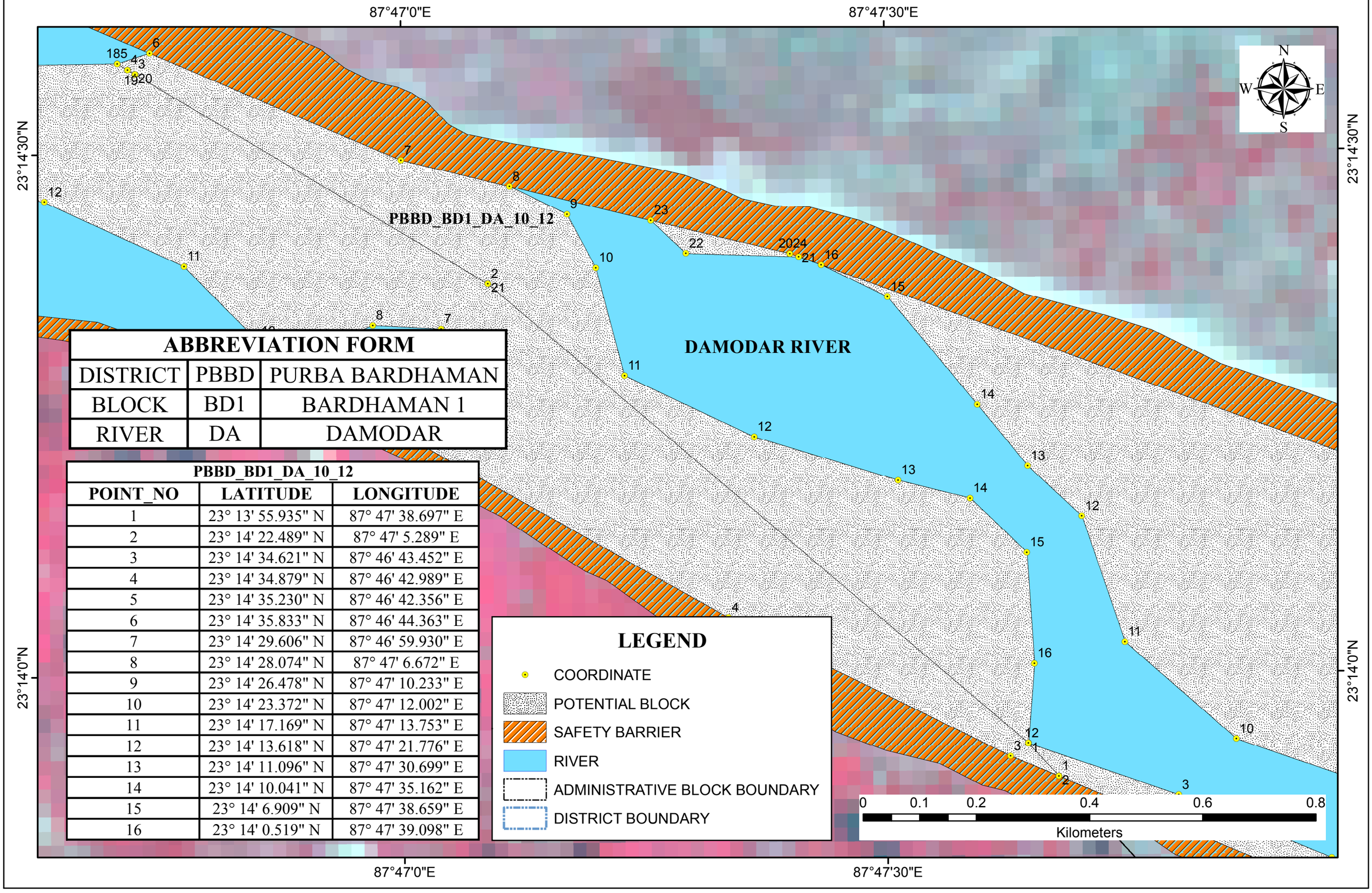
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

0 0.225 0.45 0.9 1.35 1.8

Kilometers

N W E S

POTENTIAL BLOCK PBBD_BD1_DA_10_12 OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD1	BARDHAMAN 1
RIVER	DA	DAMODAR

PBBD_BD1_DA_10_12		
POINT_NO	LATITUDE	LONGITUDE
1	23° 13' 55.935" N	87° 47' 38.697" E
2	23° 14' 22.489" N	87° 47' 5.289" E
3	23° 14' 34.621" N	87° 46' 43.452" E
4	23° 14' 34.879" N	87° 46' 42.989" E
5	23° 14' 35.230" N	87° 46' 42.356" E
6	23° 14' 35.833" N	87° 46' 44.363" E
7	23° 14' 29.606" N	87° 46' 59.930" E
8	23° 14' 28.074" N	87° 47' 6.672" E
9	23° 14' 26.478" N	87° 47' 10.233" E
10	23° 14' 23.372" N	87° 47' 12.002" E
11	23° 14' 17.169" N	87° 47' 13.753" E
12	23° 14' 13.618" N	87° 47' 21.776" E
13	23° 14' 11.096" N	87° 47' 30.699" E
14	23° 14' 10.041" N	87° 47' 35.162" E
15	23° 14' 6.909" N	87° 47' 38.659" E
16	23° 14' 0.519" N	87° 47' 39.098" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

POTENTIAL BLOCK PBBD_BD1_DA_12(XIIA) OF DAMODAR RIVER

87°48'0"E 87°48'30"E 87°49'0"E

23°13'30"N

DAMODAR RIVER

PBBD_BD1_DA_12(XIIA)

N W E S

PBBD_BD1_DA_12(XIIA)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 13' 54.047" N	87° 47' 40.585" E
2	23° 13' 55.935" N	87° 47' 38.697" E
3	23° 13' 52.935" N	87° 47' 48.026" E
4	23° 13' 49.273" N	87° 47' 57.500" E
5	23° 13' 47.981" N	87° 48' 14.622" E
6	23° 13' 45.993" N	87° 48' 33.229" E
7	23° 13' 44.055" N	87° 48' 41.968" E
8	23° 13' 40.402" N	87° 48' 49.580" E
9	23° 13' 36.415" N	87° 48' 55.328" E
10	23° 13' 33.804" N	87° 49' 1.084" E
11	23° 13' 31.567" N	87° 49' 1.070" E
12	23° 13' 31.069" N	87° 48' 57.529" E
13	23° 13' 29.547" N	87° 48' 52.493" E
14	23° 13' 25.922" N	87° 48' 54.705" E
15	23° 13' 21.436" N	87° 48' 57.098" E
16	23° 13' 14.695" N	87° 49' 2.829" E
17	23° 13' 10.076" N	87° 49' 8.925" E
18	23° 13' 10.197" N	87° 49' 8.673" E
19	23° 13' 21.505" N	87° 48' 38.041" E
20	23° 13' 31.064" N	87° 48' 19.641" E
21	23° 13' 37.026" N	87° 48' 13.782" E
22	23° 13' 47.100" N	87° 47' 58.260" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

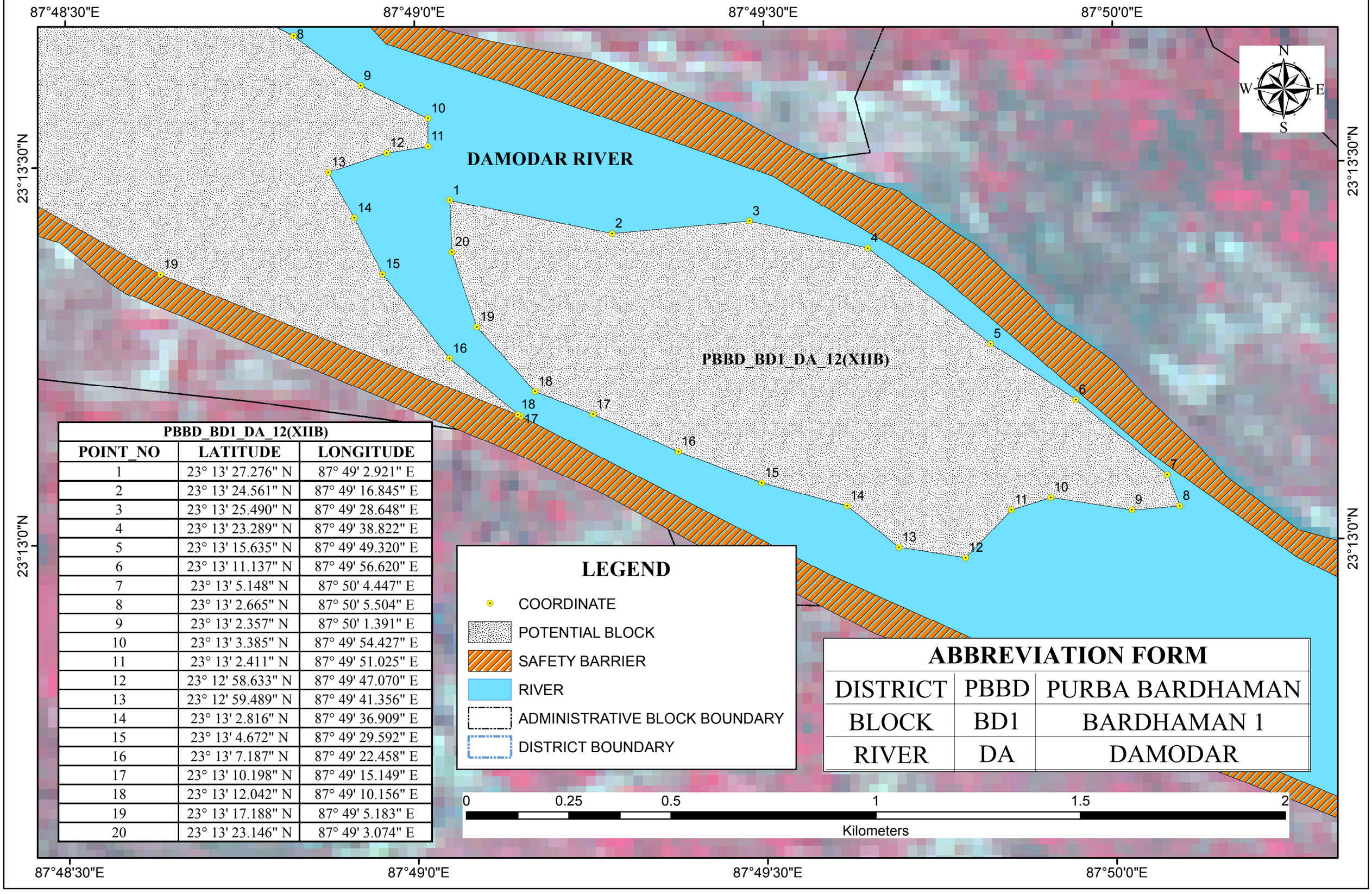
ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD1	BARDHAMAN 1
RIVER	DA	DAMODAR

0 0.25 0.5 1 1.5 2

Kilometers

87°47'30"E 87°48'0"E 87°48'30"E 87°49'0"E

POTENTIAL BLOCK PBBD_BD1_DA_12(XIIB) OF DAMODAR RIVER



PBBD_BD1_DA_12(XIIB)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 13' 27.276" N	87° 49' 2.921" E
2	23° 13' 24.561" N	87° 49' 16.845" E
3	23° 13' 25.490" N	87° 49' 28.648" E
4	23° 13' 23.289" N	87° 49' 38.822" E
5	23° 13' 15.635" N	87° 49' 49.320" E
6	23° 13' 11.137" N	87° 49' 56.620" E
7	23° 13' 5.148" N	87° 50' 4.447" E
8	23° 13' 2.665" N	87° 50' 5.504" E
9	23° 13' 2.357" N	87° 50' 1.391" E
10	23° 13' 3.385" N	87° 49' 54.427" E
11	23° 13' 2.411" N	87° 49' 51.025" E
12	23° 12' 58.633" N	87° 49' 47.070" E
13	23° 12' 59.489" N	87° 49' 41.356" E
14	23° 13' 2.816" N	87° 49' 36.909" E
15	23° 13' 4.672" N	87° 49' 29.592" E
16	23° 13' 7.187" N	87° 49' 22.458" E
17	23° 13' 10.198" N	87° 49' 15.149" E
18	23° 13' 12.042" N	87° 49' 10.156" E
19	23° 13' 17.188" N	87° 49' 5.183" E
20	23° 13' 23.146" N	87° 49' 3.074" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD1	BARDHAMAN 1
RIVER	DA	DAMODAR

0 0.25 0.5 1 1.5 2

Kilometers

POTENTIAL BLOCK PBBD_BD2_DA_13(XIIIB) OF DAMODAR RIVER

87°51'30"E

23°12'30"N

23°12'30"N

N

W

E

S

DAMODAR RIVER

PBBD_BD2_DA_13(XIIIB)

5

6

1

13

4

3

2

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD2	BARDHAMAN 2
RIVER	DA	DAMODAR

PBBD_BD2_DA_13(XIIIB)		
POINT_NO	**LATITUDE**	**LONGITUDE**
1	23° 12' 23.798" N	87° 51' 39.046" E
2	23° 12' 16.538" N	87° 51' 45.049" E
3	23° 12' 17.367" N	87° 51' 35.095" E
4	23° 12' 23.301" N	87° 51' 19.682" E
5	23° 12' 26.924" N	87° 51' 18.030" E
6	23° 12' 26.944" N	87° 51' 30.130" E

LEGEND

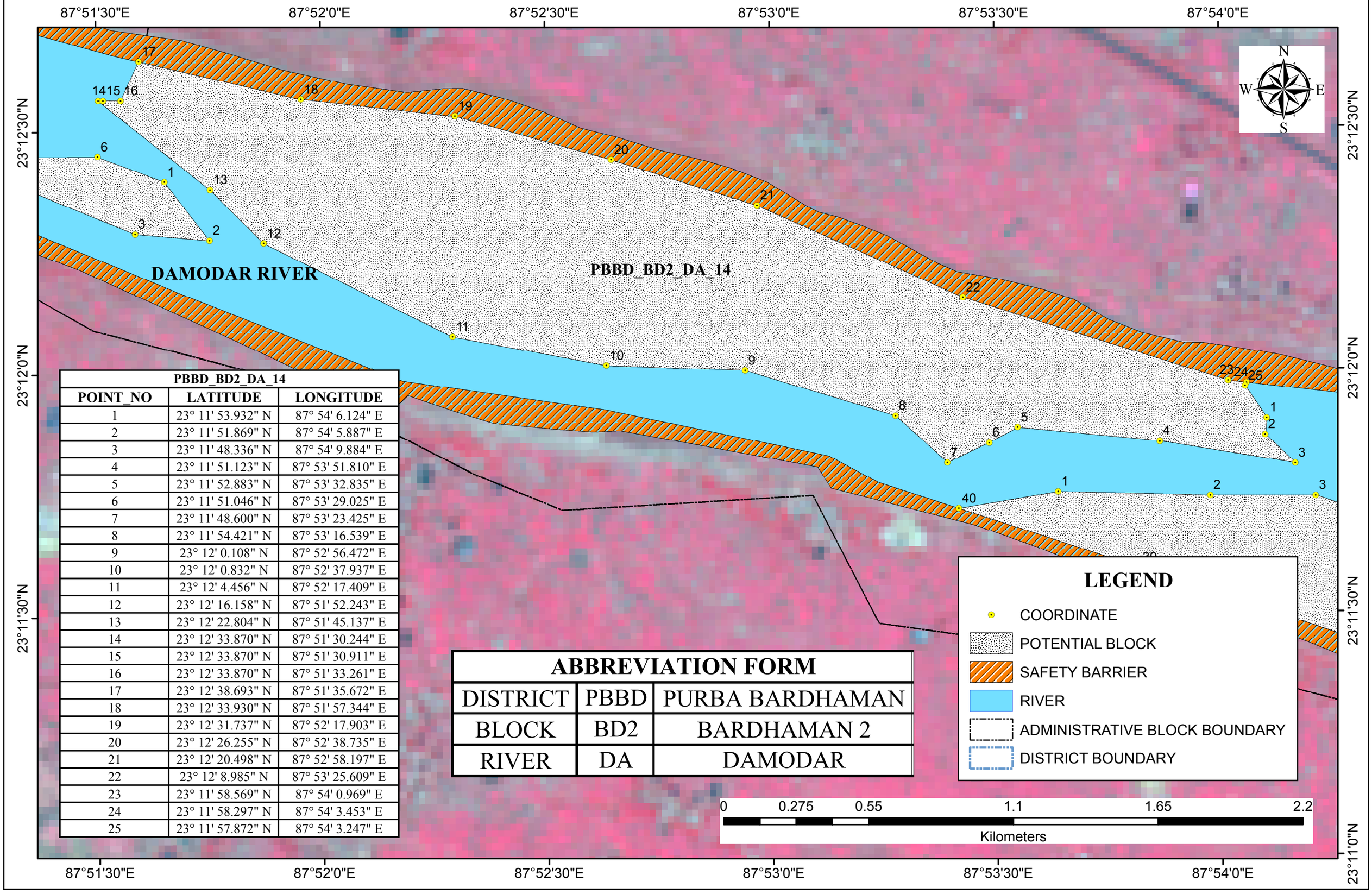
- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

0 0.075 0.15 0.3 0.45 0.6

Kilometers

87°51'30"E

POTENTIAL BLOCK PBBD_BD2_DA_14 OF DAMODAR RIVER



PBBD_BD2_DA_14		
POINT_NO	LATITUDE	LONGITUDE
1	23° 11' 53.932" N	87° 54' 6.124" E
2	23° 11' 51.869" N	87° 54' 5.887" E
3	23° 11' 48.336" N	87° 54' 9.884" E
4	23° 11' 51.123" N	87° 53' 51.810" E
5	23° 11' 52.883" N	87° 53' 32.835" E
6	23° 11' 51.046" N	87° 53' 29.025" E
7	23° 11' 48.600" N	87° 53' 23.425" E
8	23° 11' 54.421" N	87° 53' 16.539" E
9	23° 12' 0.108" N	87° 52' 56.472" E
10	23° 12' 0.832" N	87° 52' 37.937" E
11	23° 12' 4.456" N	87° 52' 17.409" E
12	23° 12' 16.158" N	87° 51' 52.243" E
13	23° 12' 22.804" N	87° 51' 45.137" E
14	23° 12' 33.870" N	87° 51' 30.244" E
15	23° 12' 33.870" N	87° 51' 30.911" E
16	23° 12' 33.870" N	87° 51' 33.261" E
17	23° 12' 38.693" N	87° 51' 35.672" E
18	23° 12' 33.930" N	87° 51' 57.344" E
19	23° 12' 31.737" N	87° 52' 17.903" E
20	23° 12' 26.255" N	87° 52' 38.735" E
21	23° 12' 20.498" N	87° 52' 58.197" E
22	23° 12' 8.985" N	87° 53' 25.609" E
23	23° 11' 58.569" N	87° 54' 0.969" E
24	23° 11' 58.297" N	87° 54' 3.453" E
25	23° 11' 57.872" N	87° 54' 3.247" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD2	BARDHAMAN 2
RIVER	DA	DAMODAR

POTENTIAL BLOCK PBBD_BD2_DA_15(XVA) OF DAMODAR RIVER

87°53'30"E 87°54'0"E 87°54'30"E 87°55'0"E 87°55'30"E 87°56'0"E 87°56'30"E

23°11'30"N 23°11'0"N 23°10'30"N 23°10'0"N

PBBD_BD2_DA_15(XVA)

DAMODAR RIVER

N W E S

PBBD_BD2_DA_15(XVA)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 11' 44.937" N	87° 53' 38.217" E
2	23° 11' 44.408" N	87° 53' 58.540" E
3	23° 11' 44.328" N	87° 54' 12.612" E
4	23° 11' 42.016" N	87° 54' 19.744" E
5	23° 11' 41.345" N	87° 54' 28.675" E
6	23° 11' 39.870" N	87° 54' 33.802" E
7	23° 11' 32.993" N	87° 54' 44.700" E
8	23° 11' 31.706" N	87° 54' 52.956" E
9	23° 11' 26.487" N	87° 55' 2.748" E
10	23° 11' 17.530" N	87° 55' 16.089" E
11	23° 11' 13.780" N	87° 55' 21.870" E
12	23° 11' 7.772" N	87° 55' 25.179" E
13	23° 11' 7.951" N	87° 55' 29.871" E
14	23° 11' 12.292" N	87° 55' 29.007" E
15	23° 11' 6.018" N	87° 55' 42.589" E
16	23° 10' 56.456" N	87° 55' 53.466" E
17	23° 10' 50.211" N	87° 56' 1.910" E
18	23° 10' 44.162" N	87° 56' 12.142" E
19	23° 10' 34.414" N	87° 56' 19.444" E
20	23° 10' 30.458" N	87° 56' 25.000" E
21	23° 10' 23.401" N	87° 56' 31.204" E
22	23° 10' 19.041" N	87° 56' 35.193" E
23	23° 10' 17.082" N	87° 56' 29.414" E
24	23° 10' 22.440" N	87° 56' 15.160" E
25	23° 10' 27.374" N	87° 56' 7.039" E
26	23° 10' 29.327" N	87° 55' 57.377" E
27	23° 10' 44.807" N	87° 55' 45.378" E
28	23° 10' 45.146" N	87° 55' 45.571" E
29	23° 10' 47.197" N	87° 55' 47.819" E
30	23° 11' 10.917" N	87° 55' 17.160" E
31	23° 11' 11.833" N	87° 55' 11.738" E
32	23° 11' 16.854" N	87° 55' 0.275" E
33	23° 11' 18.124" N	87° 54' 54.924" E
34	23° 11' 26.226" N	87° 54' 46.491" E
35	23° 11' 23.775" N	87° 54' 41.784" E
36	23° 11' 27.328" N	87° 54' 34.437" E
37	23° 11' 26.125" N	87° 54' 28.175" E
38	23° 11' 24.837" N	87° 54' 23.277" E
39	23° 11' 35.525" N	87° 53' 48.989" E
40	23° 11' 42.916" N	87° 53' 24.900" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD2	BARDHAMAN 2
RIVER	DA	DAMODAR

0 0.5 1 2 3 4

Kilometers

POTENTIAL BLOCK PBBD_BD2_DA_15(XVB) OF DAMODAR RIVER

87°57'0"E 87°57'30"E 87°58'0"E 87°58'30"E

23°10'0"N

23°9'30"N

DAMODAR RIVER

PBBD_BD2_DA_15(XVB)

PBBD_BD2_DA_15(XVB)		
POINT_NO	LATITUDE	LONGITUDE
1	23° 9' 55.778" N	87° 58' 16.191" E
2	23° 9' 51.444" N	87° 58' 13.850" E
3	23° 9' 51.376" N	87° 58' 13.813" E
4	23° 9' 56.393" N	87° 58' 6.446" E
5	23° 10' 0.600" N	87° 57' 53.821" E
6	23° 10' 4.501" N	87° 57' 45.523" E
7	23° 10' 4.862" N	87° 57' 44.898" E
8	23° 10' 4.969" N	87° 57' 44.526" E
9	23° 10' 5.831" N	87° 57' 42.693" E
10	23° 10' 9.512" N	87° 57' 31.553" E
11	23° 10' 9.502" N	87° 57' 28.750" E
12	23° 10' 10.002" N	87° 57' 27.012" E
13	23° 10' 9.591" N	87° 57' 13.135" E
14	23° 10' 8.974" N	87° 57' 0.697" E
15	23° 10' 13.531" N	87° 56' 42.834" E
16	23° 10' 12.281" N	87° 57' 0.493" E
17	23° 10' 14.931" N	87° 57' 17.634" E
18	23° 10' 12.797" N	87° 57' 28.971" E
19	23° 10' 15.005" N	87° 57' 33.639" E
20	23° 10' 4.928" N	87° 57' 49.572" E
21	23° 10' 6.789" N	87° 57' 54.796" E

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

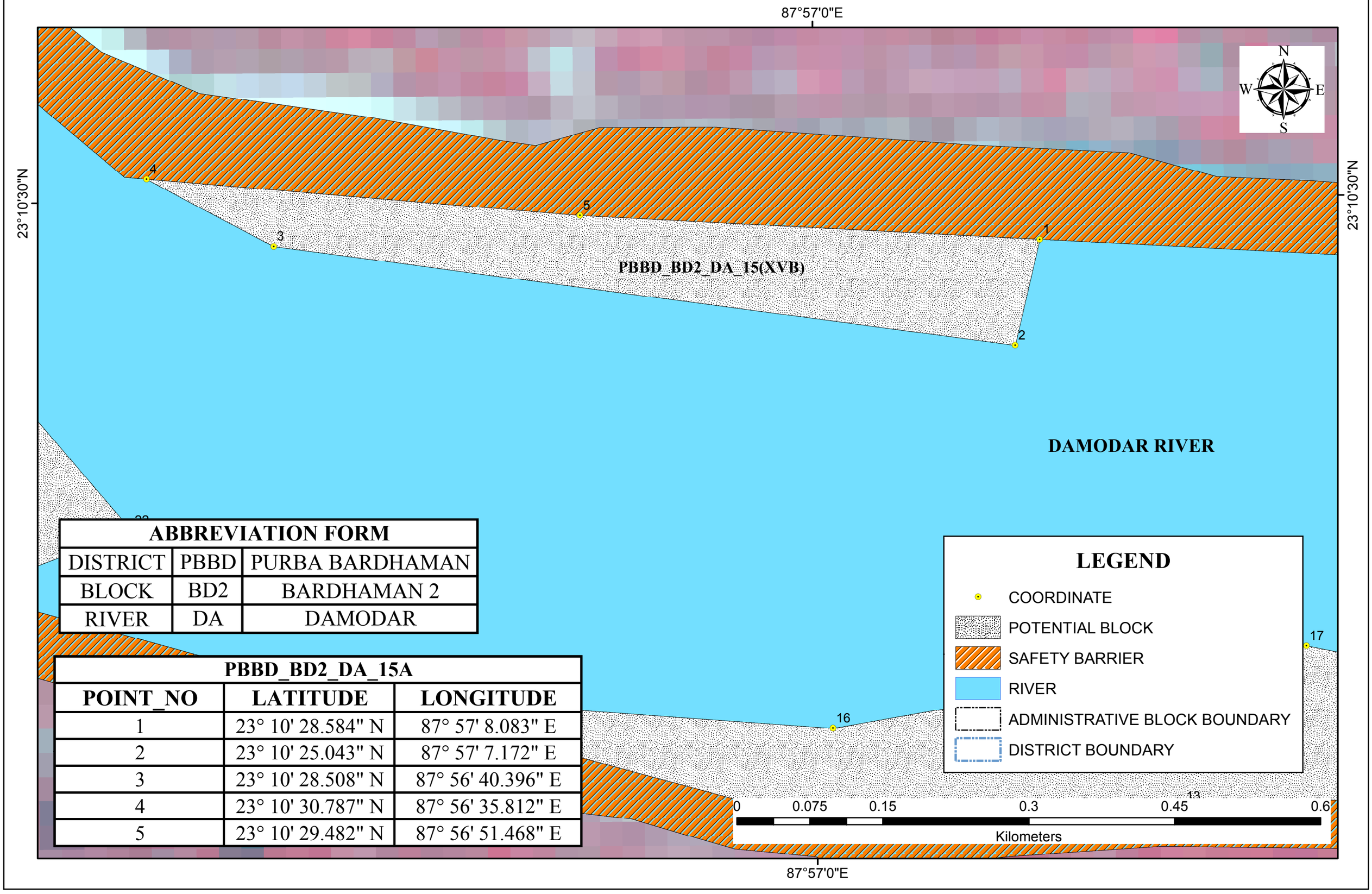
ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD2	BARDHAMAN 2
RIVER	DA	DAMODAR

0 0.25 0.5 1 1.5 2

Kilometers

N W E S

POTENTIAL BLOCK PBBD_BD2_DA_15(XVB) OF DAMODAR RIVER



ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	BD2	BARDHAMAN 2
RIVER	DA	DAMODAR

PBBD_BD2_DA_15A		
POINT_NO	**LATITUDE**	**LONGITUDE**
1	23° 10' 28.584" N	87° 57' 8.083" E
2	23° 10' 25.043" N	87° 57' 7.172" E
3	23° 10' 28.508" N	87° 56' 40.396" E
4	23° 10' 30.787" N	87° 56' 35.812" E
5	23° 10' 29.482" N	87° 56' 51.468" E

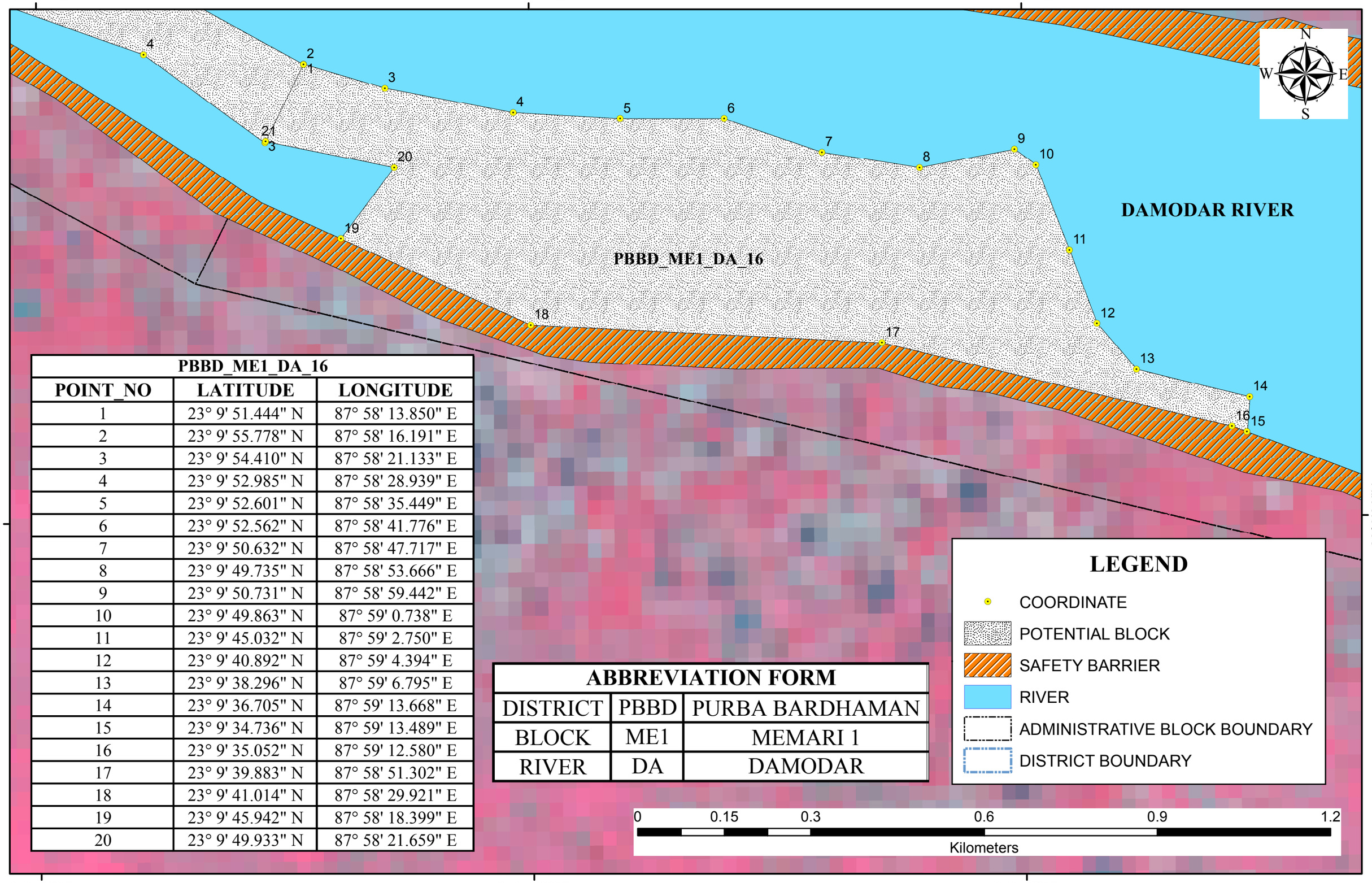
LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

POTENTIAL BLOCK PBBD_ME1_DA_16 OF DAMODAR RIVER

87°58'0"E 87°58'30"E 87°59'0"E

23°9'30"N



PBBD_ME1_DA_16		
POINT_NO	LATITUDE	LONGITUDE
1	23° 9' 51.444" N	87° 58' 13.850" E
2	23° 9' 55.778" N	87° 58' 16.191" E
3	23° 9' 54.410" N	87° 58' 21.133" E
4	23° 9' 52.985" N	87° 58' 28.939" E
5	23° 9' 52.601" N	87° 58' 35.449" E
6	23° 9' 52.562" N	87° 58' 41.776" E
7	23° 9' 50.632" N	87° 58' 47.717" E
8	23° 9' 49.735" N	87° 58' 53.666" E
9	23° 9' 50.731" N	87° 58' 59.442" E
10	23° 9' 49.863" N	87° 59' 0.738" E
11	23° 9' 45.032" N	87° 59' 2.750" E
12	23° 9' 40.892" N	87° 59' 4.394" E
13	23° 9' 38.296" N	87° 59' 6.795" E
14	23° 9' 36.705" N	87° 59' 13.668" E
15	23° 9' 34.736" N	87° 59' 13.489" E
16	23° 9' 35.052" N	87° 59' 12.580" E
17	23° 9' 39.883" N	87° 58' 51.302" E
18	23° 9' 41.014" N	87° 58' 29.921" E
19	23° 9' 45.942" N	87° 58' 18.399" E
20	23° 9' 49.933" N	87° 58' 21.659" E

ABBREVIATION FORM		
DISTRICT	PBBD	PURBA BARDHAMAN
BLOCK	ME1	MEMARI 1
RIVER	DA	DAMODAR

LEGEND

- COORDINATE
- POTENTIAL BLOCK
- SAFETY BARRIER
- RIVER
- ADMINISTRATIVE BLOCK BOUNDARY
- DISTRICT BOUNDARY

0 0.15 0.3 0.6 0.9 1.2

Kilometers

87°58'0"E 87°58'30"E 87°59'0"E

Annexure 5
Map showing of Potential In-situ mineral Blocks of Purba Bardhaman District

POTENTIAL BLOCK - PUB_MOR_ZONE_01

87°34'0"E 87°34'30"E 87°35'0"E

23°27'0"N 23°26'30"N

Panchanan Tola

PUB_MOR_ZONE_01

1 2 3 4

N W E S

0 0.05 0.1 0.2 0.3 0.4
Kilometers

NAME	AREA(HA)	ID	LATITUDE	LONGITUDE
PUB_MOR_ZONE_01	72.79	1	23° 26' 48.776" N	87° 34' 0.309" E
		2	23° 26' 49.707" N	87° 34' 39.433" E
		3	23° 26' 29.518" N	87° 34' 41.428" E
		4	23° 26' 28.374" N	87° 33' 58.351" E

Annexure 6
SEIAA 73rd Meeting (8th September, 2022) Minutes of Meeting

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State Environment Impact Assessment Authority
Pranisampad Bhawan, 5th Floor, Sector-III, Salt Lake, Kolkata - 700106
(West Bengal)
Minutes of SEIAA Meeting

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Subject:- 73rd meeting of SEIAA

Venue:- **Conference Room of Environment Department, Prani Sampad Bhavan, 5th Floor, LB Block, Sector III, Salt Lake, Kolkata 700106.**

From :- **08 September 2022**

To :- **08 September 2022**

1. Proposal No. :- **SIA/WB/IND2/152174/2020** File No- **EN/T-II-1/013/2020** Proposed Exploratory Drilling (10 wells) in NELP VII Block WB-ONN-2005/4, situated in North 24 Parganas and Nadia Districts, West Bengal by **M/s. Oil & Natural Gas Corporation Limited, HSE MBA Basin**	Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/IND2/152174/2020** dated **17 Jul 2020** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **1(b) Offshore and onshore oil and gas exploration, development & production**, under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

SEAC recommended the proposed project for Environmental Clearance with the following additional condition:

1. Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

PROJECT DETAILS

The project of M/s **HSE MBA BASIN** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
1.	West Bengal	Nadia	Ranaghat - I	Noapara
2.	West Bengal	Nadia	Ranaghat - II	Matikumra
3.	West Bengal	Nadia	Haringhata	Haringhata
4.	West Bengal	North 24 Parganas	Habra - I	Asokenagar
5.	West Bengal	North 24 Parganas	Habra - II	Beraberi

The production details / project configuration is as follows :

Project configuration/product details						
S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**

1.	Crude Oil & Natural Gas	0	9	MMT (oil) and BCM (Gas)	Road	

Raw Material Requirement is as follows :

Raw Material Requirement details								
S. No.	Item	Quantity per annum	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
1.	High speed diesel	600	9	Kilo Liters	IOC Depot	Road		45

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved.

Conclusion

Recommended

S.No	Conditions
(1)	**A. Specific conditions:-** i) No drilling shall be carried out in Protected Areas/forest area. ii) Approach road shall be made pucca to minimize generation of suspended dust. iii) Total water requirement shall not exceed 22 KLD/well proposed to be met through tankers. Mobile ETP shall be installed coupled with RO to reuse the treated water in drilling system. Size of the waste shall not exceed from the hole volume of the well + volume of drill cutting expected to be generated and volume of discarded mud if any. Two feet free board may be left to accommodate rain water. There shall be separate storm water channel and rain water shall not be allowed to mix with waste water. Alternatively, if possible, pit less drilling be practiced instead of above. iv) No lead acid batteries shall be utilized in the project/site. **B. General Conditions** I. **Statutory compliance** (i) The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, if drilling is carried in Forest areas. (ii) The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the State pollution Control Board. (iii) Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016

shall be obtained and the provisions contained in the Rules shall be strictly adhered to.

(iv) The project proponent shall obtain and adhere to statutory clearance under the Coastal Regulation Zone Notification, 2011, if applicable.

II. Air quality monitoring and preservation

i) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.

ii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

iii) Ambient air quality shall be monitored at the nearest human settlements as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOX, CO, CH4, HC, Nonmethane HC etc.

iv) During exploration, production, storage and handling, the fugitive emission of methane, if any, shall be monitored.

v) The project proponent also to ensure trapping/storing of the CO_2 generated, if any, during the process and handling.

vi) Approach road shall be made pucca to minimize generation of suspended dust.

III. Water quality monitoring and preservation

i) As proposed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged to any surface water body, sea and/or on land. Domestic sewage shall be disposed off through septic tank/soak pit.

ii) The effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986, or as specified by the State Pollution Control Board while granting Consent under the Air/Water Act, whichever is more stringent.

iii) The project proponent shall construct the garland drain all around the drilling site to prevent runoff of any oil containing waste into the nearby water bodies. Separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated wastewater shall conform to CPCB standards.

iv) Drill cuttings separated from drilling fluid shall be adequately washed and disposed in HDPE lined pit. Waste mud shall be tested for hazardous contaminants and disposed according to HWMH Rules, 2016. No effluent/drilling mud/drill cutting shall be discharged/disposed off into nearby surface water bodies. The project proponent shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546(E) dated 30th August, 2005.

IV. Noise monitoring and prevention

i) Acoustic enclosure shall be provided to DG set for controlling the noise pollution.

ii) The overall noise levels in and around the drilling location areas shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.

iii) The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

V. Energy Conservation measures

i) The energy sources for lighting purposes shall preferably be LED based.

VI. Waste management

i) Oil spillage prevention and mitigation scheme shall be prepared. In case of oil spillage/ contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.

ii) Oil content in the drill cuttings shall be monitored by Authorized agency and report shall be sent to the State Environment Impact Assessment Authority.

VII. Safety and Human health issues

i) Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

ii) Blow Out Preventer system shall be installed to prevent well blowouts during drilling operations. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling fluid logging etc.

iii) The project proponent shall prepare operating manual in respect of all activities, which would cover all safety & environment related issues and measures to be taken for protection. One set of environmental manual shall be made available at the drilling site/ project site. Awareness shall be created at each level of the management. All the schedules and results of environmental monitoring shall be available at the project site office. Remote monitoring of site should be done.

iv) On completion of drilling, the project proponent should plug the drilled wells safely and obtain certificate from environment safety angle from the concerned authority.

v) The project proponent shall take measures after completion of drilling process by well plugging and secured enclosures, decommissioning of rig upon abandonment of the well and drilling site shall be restored the area in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.

vi) The project proponent shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. Possibility of using ground flare shall be explored. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation.

vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

viii) The project proponent shall develop a contingency plan for H_2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H_2S detectors in locations of high risk of exposure along with self-containing breathing apparatus

ix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

x) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

xi) The project proponent shall carry out long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry of Environment, Forests & Climate

Change / State Environment Impact Assessment Authority / State Pollution Control Board.

VIII. Environment Management Plan (EMP)

i) The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii) Need based activities for local people is part of the EMP.

iii) The company shall have a well laid down environmental policy duly approve by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest /wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board as a part of six-monthly report.

iv) A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly report to the head of the organization.

v) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi) Year wise progress of implementation of action plan shall be reported to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board along with the Six-Monthly Compliance Report.

vii) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

IX. Additional conditions

(1) Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

X. Miscellaneous

i) The environmental clearance accorded shall be valid for a period of 10 years for the proposed project or till the exploration period whichever is earlier.

ii) This is EC issued for exploratory wells only and those wells shall not be converted to production wells without prior permission from State Environment Impact Assessment Authority.

iii) The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

iv) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

v) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

vi) The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions to Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.

vii) The project proponent shall submit the environmental statement for each financial year in Form-V to the State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

viii) The project proponent shall inform the State Environment Impact Assessment Authority, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

ix) Restoration of the project site shall be carried out satisfactorily and report shall be sent to the State Environment Impact Assessment Authority.

x) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

xi) The project proponent shall abide by all the commitments and recommendations made in the EMP report and also that during their presentation to the State Expert Appraisal Committee.

xii) No further expansion or modifications in the project shall be carried out without prior approval of the State Environment Impact Assessment Authority.

xiii) The State Environment Impact Assessment Authority / State Pollution Control Board shall monitor compliance of the stipulated conditions.

xiv) The project authorities should extend full cooperation to the officer(s) of the State Environment Impact Assessment Authority / State Pollution Control Board by furnishing the requisite data / information/monitoring reports.

xv) The State Environment Impact Assessment Authority reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The State Environment Impact Assessment Authority may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

xvi) Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xvii) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

xviii) The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.

2. Proposal No. :- **SIA/WB/IND2/277881/2022** File No- **EN/T-II-1/042/2022** Proposed Onshore Exploratory drilling of 7 wells in Bengal Onshore OALP-III Block BPONHP-2018/1 situated in North 24 Parganas district (villages Phulsara, Uttar Shibpur, Aziznagar, Patharghata) and South 24 Parganas district (villages Begampur, Andulgari, Netra), West Bengal by **M/s. Oil & Natural Gas Corporation Limited**	Type-**EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/IND2/277881/2022** dated **13 Jun 2022** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **1(b) Offshore and onshore oil and gas exploration, development & production**, under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

SEAC recommended the proposed project for Environmental Clearance with the following additional condition:

1. Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

PROJECT DETAILS

The project of M/s **OIL AND NATURAL GAS CORPORATION LIMITED** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
1.	West Bengal	North 24 Parganas	Gaighata	Phulsara, Mondalpara
2.	West Bengal	North 24 Parganas	Deganga	Aziznagar
3.	West Bengal	North 24 Parganas	Baduria	Uttar Shibpur, Chandipur
4.	West Bengal	North 24 Parganas	Rajarhat	Chatkabaria, Patharghata
5.	West Bengal	South 24 Parganas	Bhangar - I	Andulgari, Hadiya
6.	West Bengal	South 24 Parganas	Canning - II	Netra
7.	West Bengal	South 24 Parganas	Baruipur	Begampur

The production details / project configuration is as follows :

Project configuration/product details						
S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**
1.	Drilling of 7 no.s of exploratory wells within OALP-III Block BP-ONHP-2018/1 to a maximum depth of 2500-6000 m	7	9	No.s	Others	Not Applicable

Raw Material Requirement is as follows :

Raw Material Requirement details								
S. No.	Item	Quantity per annum	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
(1.)	HSD for DGs	6	4		IOC Depot	Road		45

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved.

Conclusion

Recommended

S.No	Conditions
(1)	**A. Specific conditions:-** i) No drilling shall be carried out in Protected Areas/forest area. ii) Approach road shall be made pucca to minimize generation of suspended dust. iii) Total water requirement shall not exceed 22 KLD/well proposed to be met through tankers. Mobile ETP shall be installed coupled with RO to reuse the treated water in drilling system. Size of the waste shall not exceed from the hole volume of the well + volume of drill cutting expected to be generated and volume of discarded mud if any. Two feet free board may be left to accommodate rain water. There shall be separate storm water channel and rain water shall not be allowed to mix with waste water. Alternatively, if possible, pit less drilling be practiced instead of above. iv) No lead acid batteries shall be utilized in the project/site. **B. General Conditions** **I. Statutory compliance** i) The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, if drilling is carried in Forest areas. ii) The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the State pollution Control Board. iii) Necessary authorization required under the Hazardous and Other Wastes (Management and Trans-Boundary Movement) Rules, 2016, Solid Waste Management Rules, 2016 shall be obtained and the provisions contained in the Rules shall be strictly adhered to. iv) The project proponent shall obtain and adhere to statutory clearance under the Coastal Regulation Zone Notification, 2011, if applicable. **II. Air quality monitoring and preservation** i) The National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 shall be complied with.

ii) The locations of ambient air quality monitoring stations shall be decided in consultation with the State Pollution Control Board (SPCB) and it shall be ensured that at least one stations each is installed in the upwind and downwind direction as well as where maximum ground level concentrations are anticipated.

iii) Ambient air quality shall be monitored at the nearest human settlements as per the National Ambient Air Quality Emission Standards issued by the Ministry vide G.S.R. No. 826(E) dated 16th November, 2009 for PM10, PM2.5, SO2, NOX, CO, CH4, HC, Nonmethane HC etc.

iv) During exploration, production, storage and handling, the fugitive emission of methane, if any, shall be monitored.

v) The project proponent also to ensure trapping/storing of the CO_2 generated, if any, during the process and handling.

vi) Approach road shall be made pucca to minimize generation of suspended dust.

III. Water quality monitoring and preservation

i) As proposed by the project proponent, Zero Liquid Discharge shall be ensured and no waste/treated water shall be discharged to any surface water body, sea and/or on land. Domestic sewage shall be disposed off through septic tank/soak pit.

ii) The effluent discharge shall conform to the standards prescribed under the Environment (Protection) Rules, 1986, or as specified by the State Pollution Control Board while granting Consent under the Air/Water Act, whichever is more stringent.

iii) The project proponent shall construct the garland drain all around the drilling site to prevent runoff of any oil containing waste into the nearby water bodies. Separate drainage system shall be created for oil contaminated and non-oil contaminated. Effluent shall be properly treated and treated wastewater shall conform to CPCB standards.

iv) Drill cuttings separated from drilling fluid shall be adequately washed and disposed in HDPE lined pit. Waste mud shall be tested for hazardous contaminants and disposed according to HWMH Rules, 2016. No effluent/drilling mud/drill cutting shall be discharged/disposed off into nearby surface water bodies. The project proponent shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546(E) dated 30th August, 2005.

IV. Noise monitoring and prevention

i) Acoustic enclosure shall be provided to DG set for controlling the noise pollution.

ii) The overall noise levels in and around the drilling location areas shall be kept well within the standards by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation.

iii) The ambient noise levels should conform to the standards prescribed under E(P)A Rules, 1986 viz. 75 dB(A) during day time and 70 dB(A) during night time.

V. Energy Conservation measures

i) The energy sources for lighting purposes shall preferably be LED based.

VI. Waste management

i) Oil spillage prevention and mitigation scheme shall be prepared. In case of oil spillage/ contamination, action plan shall be prepared to clean the site by adopting proven technology. The recyclable waste (oily sludge) and spent oil shall be disposed of to the authorized recyclers.

ii) Oil content in the drill cuttings shall be monitored by Authorized agency and report shall be sent to the State Environment Impact Assessment Authority.

VII. Safety and Human health issues

i) Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

ii) Blow Out Preventer system shall be installed to prevent well blowouts during drilling operations. BOP measures during drilling shall focus on maintaining well bore hydrostatic pressure by proper pre-well planning and drilling fluid logging etc.

iii) The project proponent shall prepare operating manual in respect of all activities, which would cover all safety & environment related issues and measures to be taken for protection. One set of environmental manual shall be made available at the drilling site/ project site. Awareness shall be created at each level of the management. All the schedules and results of environmental monitoring shall be available at the project site office. Remote monitoring of site should be done.

iv) On completion of drilling, the project proponent should plug the drilled wells safely and obtain certificate from environment safety angle from the concerned authority.

v) The project proponent shall take measures after completion of drilling process by well plugging and secured enclosures, decommissioning of rig upon abandonment of the well and drilling site shall be restored the area in original condition. In the event that no economic quantity of hydrocarbon is found a full abandonment plan shall be implemented for the drilling site in accordance with the applicable Indian Petroleum Regulations.

vi) The project proponent shall take necessary measures to prevent fire hazards, containing oil spill and soil remediation as needed. Possibility of using ground flare shall be explored. At the place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during operation.

vii) Training shall be imparted to all employees on safety and health aspects of chemicals handling. Pre-employment and routine periodical medical examinations for all employees shall be undertaken on regular basis. Training to all employees on handling of chemicals shall be imparted.

viii) The project proponent shall develop a contingency plan for H_2S release including all necessary aspects from evacuation to resumption of normal operations. The workers shall be provided with personal H_2S detectors in locations of high risk of exposure along with self-containing breathing apparatus

ix) Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, creche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

x) Occupational health surveillance of the workers shall be done on a regular basis and records maintained as per the Factories Act.

xi) The project proponent shall carry out long term subsidence study by collecting base line data before initiating drilling operation till the project lasts. The data so collected shall be submitted six monthly to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.

VIII. Environment Management Plan (EMP)

i) The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii) Need based activities for local people is part of the EMP.

iii) The company shall have a well laid down environmental policy duly approve by the Board of

Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest /wildlife norms/ conditions. The company shall have defined system of reporting infringements / deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board as a part of six-monthly report.

iv) A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly report to the head of the organization.

v) Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi) Year wise progress of implementation of action plan shall be reported to the Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board along with the Six-Monthly Compliance Report.

vii) Self environmental audit shall be conducted annually. Every three years third party environmental audit shall be carried out.

IX. Additional conditions

i) Short term need-based activities to be identified and implemented. Name of the beneficiary should be displayed at site.

X. Miscellaneous

i) The environmental clearance accorded shall be valid for a period of 10 years for the proposed project or till the exploration period whichever is earlier.

ii) This is EC issued for exploratory wells only and those wells shall not be converted to production wells without prior permission from State Environment Impact Assessment Authority.

iii) The project proponent shall make public the environmental clearance granted for their project along with the environmental conditions and safeguards at their cost by prominently advertising it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days and in addition this shall also be displayed in the project proponent's website permanently.

iv) The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

v) The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

vi) The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions to Ministry of Environment, Forests & Climate Change / State Environment Impact Assessment Authority / State Pollution Control Board.

vii) The project proponent shall submit the environmental statement for each financial year in Form-V to the State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

viii) The project proponent shall inform the State Environment Impact Assessment Authority, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

ix) Restoration of the project site shall be carried out satisfactorily and report shall be sent to the State Environment Impact Assessment Authority.

x) The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

xi) The project proponent shall abide by all the commitments and recommendations made in the EMP report and also that during their presentation to the State Expert Appraisal Committee.

xii) No further expansion or modifications in the project shall be carried out without prior approval of the State Environment Impact Assessment Authority.

xiii) The State Environment Impact Assessment Authority / State Pollution Control Board shall monitor compliance of the stipulated conditions.

xiv) The project authorities should extend full cooperation to the officer(s) of the State Environment Impact Assessment Authority / State Pollution Control Board by furnishing the requisite data / information/monitoring reports.

xv) The State Environment Impact Assessment Authority reserves the right to stipulate additional conditions, if found necessary at subsequent stages and the project proponent shall implement all the said conditions in a time bound manner. The State Environment Impact Assessment Authority may revoke or suspend the environmental clearance, if implementation of any of the above conditions is not found satisfactory.

xvi) Concealing factual data or submission of false/fabricated data and failure to comply with any of the conditions mentioned above may result in withdrawal of this clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xvii) Any appeal against this environmental clearance shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

xviii) The above conditions will be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, the Hazardous Waste (Management, Handling and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 read with subsequent amendments therein.

3. Proposal No. :- **SIA/WB/MIS/267917/2022** File No- **EN/T-II-1/026/2022** Proposed construction of Business Building at Premises No.-22-0706, Plot No- SV-7, Diplomatic Enclave in AA-II E, New Town, Rajarhat, West Bengal by **M/s. Nxtra Data Limited**	Type-**EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/MIS/267917/2022** dated **14 Apr 2022** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(a) Building and Construction projects**, under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

SEAC recommended the project for Environmental Clearance.

PROJECT DETAILS

The project of M/s **NXTRA DATA LIMITED** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
(1.)	Maharashtra	Thane	Ambarnath	Badlapur MIDC
(2.)	West Bengal	North 24 Parganas	Rajarhat	-

14. **Project configuration/product details**

S. No.	Project configuration/product details	Quantity	Unit	Other Unit	Mode of Transport/Transmission of Product	Other Mode of Transport
Development of an B+G+6 storied Business Building. Total built up area is 29857.970 sqm and land area is 11,528.67 sq.m						

Raw Material Requirement details

S. No.	Item	Quantity per annum	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
NIL								

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and observed that in the sanction plan, in the title of the project the predominant use is mentioned as 'Business' Building. The project application, the project is mentioned as Data Centre which falls under 'IT & ITES' use category. Further in the Building Permit as well as the population calculation sheet, the use is mentioned as 'Residential'. A clarification regarding the building use category is required to be submitted by the PP.

RECOMMENDATIONS OF SEIAA

Therefore, the application for EC is deferred (Additional Information).

Conclusion

Deferred

4. Proposal No. :- **SIA/WB/MIS/55503/2019** File No- **SIA/WB/NCP/82292/2018**
Proposed expansion of Residential Complex at Rajarhat Road, R.S. Dag No. 470(P), 473, 474, 475, 476, 477, 478, 479, 480, 481(P), 483, 489, 490, 491, 492, 493, 494, 495, 496, 497, 499, 500, 501(P), 502(P), 503(P), 504(P), 506(P), 507(P), 509(P), 526(P), 531, 532, 533 & 501/716(P) recorded in L.R. Khatian Nos. 2821, 3233, 3281, 3283, 3248, 3285, 3286, 3282, 2849, 2848, 2887, 2846, 3234, 3315, 2855, 2856, 2857, 2858, 2859, 3318, 3317, 3412, 3341, 3340, 2803, 2806, 2805, 2802, 2801, 2800, 2804, 2807, 3302, 3304, 3306, 3301, 3303, 3305, 3312, 2853, 3136, 3307, 3309, 3311, 3310, 3308, 3313, 3411, 3314, 3288, 3287, 2830, 2829, 2828, 2827, 2826, 2825, 2845, 2844, 2843, 2842, 2841, 2840, 2839, 2838, 2837, 2836, 2835, 2834, 2833, 2832, 3240, 2815, 3316, 2854, 2809, 2808, 2814, 2819, 2850, 2851, 2852, 2822, 2823, 2824, 2796,

Type- **EC**

2797, 2798, 2799, 2816, 2817, 2818, 2810, 2811, 2812, 2813, 2792, 2793, 2794, 2795, 2820, 3073, 3072, 3238, 3236, 3237, 3235, 3239, 3296, 2860, 2861, 2862, 2863, 2864, 3071, 3265, 4092, 3279, 3070, 2866, 2831 & 2865, J.L. No. 28, Mouza: Bhatenda, Under Rajarhat Bishnupur Gram Panchayat 1, P.O. & P.S. – Rajarhat, Dist. – North 24 Parganas, West Bengal by **M/s. Ganesh Tracom Pvt. Ltd. & Others (VIOLATION CASE)**	

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/MIS/55503/2019** dated **30 Sep 2020** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(b) Townships and Area Development projects**, under Category **"B1"** of EIA Notification 2006 and the proposal is appraised at State level.

Earlier the project proponent (PP) had obtained EC vide No. 2704/EN/T-II-1/082/2014 dated 07.12.2016 for residential complex at Rajarhat Road, Mouza: Bhatenda, J.L. No. 28, PS – Rajarhat, Under Rajarhat Bishnupur GP 1, Dist. – North 24 Parganas.

The project proponent obtained ToR vide Memo No. 976-2N-49/2014(E) dated 02.09.2019.

SEAC recommended the proposed project for Environmental Clearance under violation category with the condition that the project proponent shall develop tree plantation as approved by DFO.

PROJECT DETAILS

The project of M/s **GANESH TRACOM PVT LTD AND OTHERS** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
(1.)	West Bengal	North 24 Parganas	Rajarhat	Bhatenda

14. **Project configuration/product details**

S. No.	Project configuration/product details	Quantity	Unit	Other Unit	Mode of Transport/Transmission of Product	Other Mode of Transport
The ongoing phase obtained Environmental Clearance from SEIAA, West Bengal (EC No. 2704/EN/T-II-I/082/2014 dated 07.12.2016). Total numbers of flats in existing phase is 1215. In the proposed expansion phase, another 144 residential flats will be constructed. Thus, total number of flats (including the ongoing & proposed phases) in this project will be 1215 + 144 = 1359 nos. Built up area of the existing phase is 1,44,246.78 sq. m. and in the proposed expansion phase additional built up area will be 18,410.65 sq.m. Thus, total built up area including the existing & expansion phases will be (1,44,246.78 + 18,410.65) sq.m = 1,62,657.43 sq.m.						

Raw Material Requirement is as follows :

Raw Material Requirement details								
S. No.	**Item**	**Quantity per annum**	**Unit**	**Other Unit**	**Source**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**	**Distance of Source from Project Site(Kilometers)**
(1.)	Building & construction raw materials	1000	1		Local	Road		10

	(sand, Cement & steel)							

Details of previous ToR is as follows :

Details of previous ToR

ToR issued vide Memo No. 976-2N-49/2014(E) dated 02.09.2019

Expansion Details :

S. No.	Product/Activity (Capacity / Area)	Quantity		Unit	Other Unit
		From	To		
(1.)	Built Up Area	144246.78	18410.65	Others	sq. metre

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved based on the Building Plan approved by the Executive Officer, Rajarhat Panchayat Samity vide No. 926/RPS dated 28.08.2018.

Conclusion

Recommended

S.No	Conditions
(1)	**I. Statutory compliance:** i. The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws. ii. The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc. as per National Building Code including protection measures from lightening etc. iii. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project. iv. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable. v. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee. vi. The project proponent shall obtain the necessary permission for drawl of ground water /surface water required for the project from the competent authority. vii. A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained. viii. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as applicable, by project

proponents from the respective competent authorities.

ix. The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, and the Plastics Waste (Management) Rules, 2016 shall be followed.

x. The project proponent shall follow the ECBC/ECBC-R prescribed by Bureau of Energy Efficiency, Ministry of Power strictly.

xi. The project proponent should strictly comply with the guidelines for High Rise Buildings, issued by MoEF, GoI vide No. 21-270/2008-IA.III dated 07.02.2012.

xii. The project proponent shall comply with the EMP as proposed in terms of Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020.

II. Air quality monitoring and preservation

i. Notification GSR 94(E) dated 25.01.2018 of MoEF&CC regarding Mandatory Implementation of Dust Mitigation Measures for Construction and Demolition Activities for projects requiring Environmental Clearance shall be complied with.

ii. A management plan shall be drawn up and implemented to contain the current exceedance in ambient air quality at the site.

iii. The project proponent shall install system to carryout Ambient Air Quality monitoring for common/criterion parameters relevant to the main pollutants released (e.g. PM10 and PM25) covering upwind and downwind directions during the construction period.

iv. Diesel power generating sets proposed as source of backup power should be of enclosed type and conform to rules made under the Environment (Protection) Act, 1986. The height of stack of DG sets should be equal to the height needed for the combined capacity of all proposed DG sets. Use of low sulphur diesel. The location of the DG sets may be decided with in consultation with State Pollution Control Board.

v. Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3 meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murram and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site.

vi. Sand, murram, loose soil, cement, stored on site shall be covered adequately so as to prevent dust pollution.

vii. Wet jet shall be provided for grinding and stone cutting.

viii. Unpaved surfaces and loose soil shall be adequately sprinkled with water to suppress dust.

ix. All construction and demolition debris shall be stored at the site (and not dumped on the roads or open spaces outside) before they are properly disposed. All demolition and construction waste shall be managed as per the provisions of the Construction and Demolition Waste Rules 2016.

x. The diesel generator sets to be used during construction phase shall be low sulphur diesel type and shall conform to Environmental (Protection) prescribed for air and noise emission standards.

xi. The gaseous emissions from DG set shall be dispersed through adequate stack height as per CPCB standards. Acoustic enclosure shall be provided to the DG sets to mitigate the noise pollution. Low sulphur diesel shall be used. The location of the DG set and exhaust pipe height shall be as per the provisions of the Central Pollution Control Board (CPCB) norms.

xii. For indoor air quality the ventilation provisions as per National Building Code of India.

III. Water quality monitoring and preservation

i. The natural drain system should be maintained for ensuring unrestricted flow of water. No construction shall be allowed to obstruct the natural drainage through the site, on wetland and water bodies. Check dams, bio-swales, landscape, and other sustainable urban drainage systems (SUDS) are allowed for maintaining the drainage pattern and to harvest rain water.

ii. Buildings shall be designed to follow the natural topography as much as possible. Minimum cutting and filling should be done.

iii. Total fresh water use shall not exceed the proposed requirement as provided in the project details.

iv. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office of Ministry of Environment, Forest and Climate Change (MoEF&CC) along with State Level Environment Impact Assessment Authority (SEIAA) and West Bengal Pollution

Control Board (WBPCB) along with six monthly Monitoring reports.

v. A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

vi. At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.

vii. Installation of dual pipe plumbing for supplying fresh water for drinking, cooking and bathing etc. and other for supply of recycled water for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. shall be done.

viii. Use of water saving devices/ fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc.) for water conservation shall be incorporated in the building plan.

ix. Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.

x. Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.

xi. The local bye-law provisions on rain water harvesting should be followed. If local byelaw provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain water harvesting recharge pits/storage tanks shall be provided for ground water recharging as per the CGWB norms.

xii. A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.

xiii. All recharge should be limited to shallow aquifer.

xiv. No ground water shall be used during construction phase of the project.

xv. Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the State Water Investigation Directorate (SWID) in the matter. Formal approval shall be taken from the SWID for any ground water abstraction or dewatering.

xvi. Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening.

xvii. No sewage or untreated effluent water would be discharged through storm water drains.

xviii. Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB before the project is commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by MoEF&CC. Natural treatment systems shall be promoted.

xix. Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.

xx. Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

IV. Noise monitoring and prevention

i. Ambient noise levels shall conform to residential area/commercial area/industrial area/silence zone both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.

ii. Noise level survey shall be carried as per the prescribed guidelines and report in this regard shall be submitted to Regional Office of the MoEF&CC along with SEIAA and WBPCB as a part of six-monthly compliance report.

iii. Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel

shall be implemented as mitigation measures for noise impact due to ground sources.

V. Energy Conservation measures

i. Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC.

ii. Outdoor and common area lighting shall be LED.

iii. Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof u-values shall be as per ECBC specifications.

iv. Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.

v. Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.

vi. Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.

VI. Waste Management

i. A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.

ii. Disposal of muck during construction phase shall not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.

iii. Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.

iv. Organic waste compost/ Vermiculture pit/ Organic Waste Converter within the premises with a minimum capacity of 0.3 kg /person/day must be installed.

v. All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.

vi. Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the State Pollution Control Board.

vii. Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.

viii. Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.

ix. Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Rules, 2016.

x. Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.

VII. Water Body Conservation:-

i. Existing water body (if any) should not be lined and their embankments should not be cemented. The water body is to be kept in natural conditions without disturbing the ecological habitat.

VIII. Green Cover

i. The unit should strictly abide by The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and subsequent rules. The proponent should undertake plantation of trees over at least 20% of the total area.

ii. No tree can be felled/transplant unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority. Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured

species (cut) to species (planted).

iii. The proponent should plant at least 710 nos. trees. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping. The project proponent should follow plantation plan approved by DFO, 24 Parganas (North) Division vide Memo no. 1829/17-T-9 dated 07.10.2021.

iv. Where the trees need to be cut with prior permission from the concerned local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.

v. Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.

vi. Compensatory tree plantation of area approx. 2000 sqm. to be undertaken in WBHIDCO area as proposed.

IX. Transport

i. A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.
   a. Hierarchy of roads with proper segregation of vehicular and pedestrian traffic.
   b. Traffic calming measures.
   c. Proper design of entry and exit points.
   d. Parking norms as per local regulation.

ii. Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise emission standards be operated only during non-peak hours.

iii. A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

X. Human health issues

i. All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.

ii. For indoor air quality the ventilation provisions as per National Building Code of India.

iii. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

iv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

v. Occupational health surveillance of the workers shall be done on a regular basis.

vi. A First Aid Room shall be provided in the project both during construction and operations of the project.

XI. Environment Management Plan (EMP)

i. The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii. Need based activities for local people is part of the EMP. Details of such activities for expansion project (in addition to the activities for the existing project) is uploaded in the PARIVESH portal by the project proponent.

iii. The company shall have a well laid down environmental policy duly approved by the Board of Directors.

The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms /conditions. The company shall have defined system of reporting infringements /deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB as a part of six-monthly report.

iv. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of senior Executive, who will directly to the head of the organization.

v. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi. Year wise progress of implementation of action plan shall be reported to the Regional Office of MoEF&CC along with SEIAA and WBPCB along with the Six Monthly Compliance Report.

XII. Additional condition

1. The project proponent shall develop tree plantation as approved by the DFO.

XIII. Miscellaneous

i. The environmental clearance accorded shall be valid for a period of 10 years for the proposed project.

ii. The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.

iii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

iv. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the Ministry of Environment, Forest and Climate Change at environment clearance portal with a copy to SEIAA and WBPCB.

vi. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

vii. The project proponent shall inform the Regional Office of the MoEF&CC along with SEIAA and WBPCB, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

viii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

ix. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the State Expert Appraisal Committee (SEAC).

x. No further expansion or modifications in the plant shall be carried out without prior approval of the SEIAA.

xi. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xii. The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xiii. The SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xiv. The Regional Office of the MoEF&CC/SEIAA/WBPCB shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office of MoEF&CC / SEIAA/WBPCB by furnishing the requisite data / information/monitoring reports.

xv. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other

	orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter. xvi. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

5. Proposal No. :- **SIA/WB/NCP/72819/2018** File No- **EN/T-II-1/012/2018** Proposed expansion of Residential Complex by at 33A, Canal South Road, Kolkata – 700 015, KMC Ward No. 57, PO – Beliaghata, PS – Tangra, West Bengal by **M/s. Springcity Buildcon LLP & Others.**	Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/NCP/72819/2018** dated **07 Mar 2018** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(a) Building and Construction projects** under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

Earlier the project had obtained EC vide no. 2705/EN/T-II-I/007/2015 dated 07.12.2016 in the name of M/s. Nishant Fiscal Services Pvt. Ltd. & Ors. for a built up area of 1,03,624.34 sq.m. from SEIAA, WB.

The project had received stipulated conditions for environmental clearance for expansion project vide Memo No. 1954/EN/T-II-1/012/2018 dated 10.08.2018 for a built-up area of 113283.96 sq.m. and land area of 38,709.81 sq.m (as per U.L.C.) and 29,481.034 sq.m (as per Survey).

The project was placed in the 67th meeting of SEIAA held on 12.07.2022 and it was observed that some documents required to be uploaded in the PARIVESH Portal. The project proponent uploaded documents on 03.08.2022.

PROJECT DETAILS

The project of M/s **SPRINGCITY BUILDCON LLP AND OTHERS** located in as follows :

State of the project

S. No.	State	District	Tehsil	Village
(1.)	West Bengal	Kolkata	Kolkata	

14. **Project configuration/product details**

S. No.	Project configuration/product details	Quantity	Unit	Other Unit	Mode of Transport/Transmission of Product	Other Mode of Transport
G + 34 Storied = 3 No. G + 19 Storied = 1 No. B + G + 7 Storied = 1 No. (MLCP) G + 2 Storied = 1 No. (Assembly)						

Raw Material Requirement details

S. No.	Item	Quantity per annum	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
NIL								

Details of Previous ToR								
S. No.	Item	Quantity	Unit	Other Unit	Source	Mode of Transport/Transmission of Product	Other Mode of Transport	Distance of Source from Project Site(Kilometers)
NIL								

1.2. **Expansion Details :**

S. No.	Product/Activity (Capacity / Area)	Quantity		Unit	Other Unit
		From	To		
Vertical expansion of (G + 31) to (G + 34) & (G + 29) to (G + 32) storey					

DELIBERATION IN SEIAA

SEIAA considered the submission made by the project proponent vide their letter No. NIL dated 03.08.2022 uploaded on 03.08.2022 and accepted the same.

RECOMMENDATIONS OF SEIAA

The application for EC is approved based on the KMC Building Permit No. 2016070060 dated 05.04.2021.

Conclusion

Recommended

S.No	Conditions
(1)	**I. Statutory compliance:** i. The project proponent shall obtain all necessary clearance/ permission from all relevant agencies including town planning authority before commencement of work. All the construction shall be done in accordance with the local building byelaws. ii. The approval of the Competent Authority shall be obtained for structural safety of buildings due to earthquakes, adequacy of firefighting equipment etc. as per National Building Code including protection measures from lightening etc. iii. The project proponent shall obtain forest clearance under the provisions of Forest (Conservation) Act, 1986, in case of the diversion of forest land for non-forest purpose involved in the project. iv. The project proponent shall obtain clearance from the National Board for Wildlife, if applicable. v. The project proponent shall obtain Consent to Establish / Operate under the provisions of Air (Prevention & Control of Pollution) Act, 1981 and the Water (Prevention & Control of Pollution) Act, 1974 from the concerned State Pollution Control Board/ Committee. vi. The project proponent shall obtain the necessary permission for drawl of ground water /surface water required for the project from the competent authority. vii. A certificate of adequacy of available power from the agency supplying power to the project along with the load allowed for the project should be obtained. viii. All other statutory clearances such as the approvals for storage of diesel from Chief Controller of Explosives, Fire Department, Civil Aviation Department shall be obtained, as

applicable, by project proponents from the respective competent authorities.

ix. The provisions of the Solid Waste (Management) Rules, 2016, e-Waste (Management) Rules, 2016, and the Plastics Waste (Management) Rules, 2016 shall be followed.

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v. Construction site shall be adequately barricaded before the construction begins. Dust, smoke & other air pollution prevention measures shall be provided for the building as well as the site. These measures shall include screens for the building under construction, continuous dust/ wind breaking walls all around the site (at least 3 meter height). Plastic/tarpaulin sheet covers shall be provided for vehicles bringing in sand, cement, murram and other construction materials prone to causing dust pollution at the site as well as taking out debris from the site.

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iii. Total fresh water use shall not exceed the proposed requirement as provided in the project details.

iv. The quantity of fresh water usage, water recycling and rainwater harvesting shall be measured and recorded to monitor the water balance as projected by the project proponent. The record shall be submitted to the Regional Office of Ministry of Environment, Forest and Climate Change (MoEF&CC) along with State Level Environment Impact Assessment Authority (SEIAA) and West Bengal Pollution Control Board (WBPCB) along with six monthly Monitoring reports.

v. A certificate shall be obtained from the local body supplying water, specifying the total annual water availability with the local authority, the quantity of water already committed, the quantity of water allotted to the project under consideration and the balance water available. This should be specified separately for ground water and surface water sources, ensuring that there is no impact on other users.

vi. At least 20% of the open spaces as required by the local building bye-laws shall be pervious. Use of Grass pavers, paver blocks with at least 50% opening, landscape etc. would be considered as pervious surface.

vii. Installation of dual pipe plumbing for supply of recycled water and other for flushing, landscape irrigation, car washing, thermal cooling, conditioning etc. and for supplying fresh water for drinking, cooking and bathing etc. shall to be done.

viii. Use of water saving devices/ fixtures (viz. low flow flushing systems; use of low flow faucets tap aerators etc.) for water conservation shall be incorporated in the building plan.

ix. Separation of grey and black water should be done by the use of dual plumbing system. In case of single stack system separate recirculation lines for flushing by giving dual plumbing system be done.

x. Water demand during construction should be reduced by use of pre-mixed concrete, curing agents and other best practices referred.

xi. The local bye-law provisions on rain water harvesting should be followed. If local byelaw provision is not available, adequate provision for storage and recharge should be followed as per the Ministry of Urban Development Model Building Byelaws, 2016. Rain water harvesting recharge pits/storage tanks shall be provided for ground water recharging as per the CGWB norms.

xii. A rain water harvesting plan needs to be designed where the recharge bores of minimum one recharge bore per 5,000 square meters of built up area and storage capacity of minimum one day of total fresh water requirement shall be provided. In areas where ground water recharge is not feasible, the rain water should be harvested and stored for reuse. The ground water shall not be withdrawn without approval from the Competent Authority.

xiii. All recharge should be limited to shallow aquifer.

xiv. No ground water shall be used during construction phase of the project.

xv. Any ground water dewatering should be properly managed and shall conform to the approvals and the guidelines of the State Water Investigation Directorate (SWID) in the matter. Formal approval shall be taken from the SWID for any ground water abstraction or dewatering.

xvi. Sewage shall be treated in the STP with tertiary treatment. The treated effluent from STP shall be recycled/re-used for flushing, AC make up water and gardening.

xvii. No sewage or untreated effluent water would be discharged through storm water drains.

xviii. Onsite sewage treatment of capacity of treating 100% waste water to be installed. The installation of the Sewage Treatment Plant (STP) shall be certified by an independent expert and a report in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB before the project is commissioned for operation. Treated waste water shall be reused on site for landscape, flushing, cooling tower, and other end-uses. Excess treated water shall be discharged as per statutory norms notified by

MoEF&CC. Natural treatment systems shall be promoted.

xix. Periodical monitoring of water quality of treated sewage shall be conducted. Necessary measures should be made to mitigate the odour problem from STP.

xx. Sludge from the onsite sewage treatment, including septic tanks, shall be collected, conveyed and disposed as per the Ministry of Urban Development, Central Public Health and Environmental Engineering Organization (CPHEEO) Manual on Sewerage and Sewage Treatment Systems, 2013.

IV. Noise monitoring and prevention

i. Ambient noise levels shall conform to residential area/commercial area/industrial area/silence zone both during day and night as per Noise Pollution (Control and Regulation) Rules, 2000. Incremental pollution loads on the ambient air and noise quality shall be closely monitored during construction phase. Adequate measures shall be made to reduce ambient air and noise level during construction phase, so as to conform to the stipulated standards by CPCB / SPCB.

ii. Noise level survey shall be carried out as per the prescribed guidelines and report in this regard shall be submitted to Regional Office of the MoEF&CC along with SEIAA and WBPCB as a part of six-monthly compliance report.

iii. Acoustic enclosures for DG sets, noise barriers for ground-run bays, ear plugs for operating personnel shall be implemented as mitigation measures for noise impact due to ground sources.

V. Energy Conservation measures

i. Compliance with the Energy Conservation Building Code (ECBC) of Bureau of Energy Efficiency shall be ensured. Buildings in the States which have notified their own ECBC, shall comply with the State ECBC.

ii. Outdoor and common area lighting shall be LED.

iii. Concept of passive solar design that minimize energy consumption in buildings by using design elements, such as building orientation, landscaping, efficient building envelope, appropriate fenestration, increased day lighting design and thermal mass etc. shall be incorporated in the building design. Wall, window, and roof u-values shall be as per ECBC specifications.

iv. Energy conservation measures like installation of CFLs/ LED for the lighting the area outside the building should be integral part of the project design and should be in place before project commissioning.

v. Solar, wind or other Renewable Energy shall be installed to meet electricity generation equivalent to 1% of the demand load or as per the state level/ local building bye-laws requirement, whichever is higher.

vi. Solar power shall be used for lighting in the apartment to reduce the power load on grid. Separate electric meter shall be installed for solar power. Solar water heating shall be provided to meet 20% of the hot water demand of the commercial and institutional building or as per the requirement of the local building bye-laws, whichever is higher. Residential buildings are also recommended to meet its hot water demand from solar water heaters, as far as possible.

VI. Waste Management

i. A certificate from the competent authority handling municipal solid wastes, indicating the existing civic capacities of handling and their adequacy to cater to the M.S.W. generated from project shall be obtained.

ii. Disposal of muck during construction phase shall not create any adverse effect on the neighboring communities and be disposed taking the necessary precautions for general safety and health aspects of people, only in approved sites with the approval of competent authority.

iii. Separate wet and dry bins must be provided in each unit and at the ground level for facilitating segregation of waste. Solid waste shall be segregated into wet garbage and inert materials.

iv. Organic waste compost/ Vermiculture pit/ Organic Waste Converter within the premises

with a minimum capacity of 0.3 kg /person/day must be installed.

v. All non-biodegradable waste shall be handed over to authorized recyclers for which a written tie up must be done with the authorized recyclers.

vi. Any hazardous waste generated during construction phase, shall be disposed off as per applicable rules and norms with necessary approvals of the State Pollution Control Board.

vii. Use of environment friendly materials in bricks, blocks and other construction materials, shall be required for at least 20% of the construction material quantity. These include Fly Ash bricks, hollow bricks, AACs, Fly Ash Lime Gypsum blocks, Compressed earth blocks, and other environment friendly materials.

viii. Fly ash should be used as building material in the construction as per the provision of Fly Ash Notification of September, 1999 and amended as on 27th August, 2003 and 25th January, 2016. Ready mixed concrete must be used in building construction.

ix. Any wastes from construction and demolition activities related thereto shall be managed so as to strictly conform to the Construction and Demolition Waste Management Rules, 2016.

x. Used CFLs and TFLs should be properly collected and disposed off/sent for recycling as per the prevailing guidelines/ rules of the regulatory authority to avoid mercury contamination.

VII. Water Body Conservation:-

i. Existing water body (if any) should not be lined and their embankments should not be cemented. The water body is to be kept in natural conditions without disturbing the ecological habitat.

VIII. Green Cover

i. The unit should strictly abide by The West Bengal Trees (Protection and Conservation in Non-Forest Areas) Act, 2006 and subsequent rules. The proponent should undertake plantation of trees over at least 20% of the total area.

ii. No tree can be felled/transplanted unless exigencies demand. Where absolutely necessary, tree felling shall be with prior permission from the concerned regulatory authority. Old trees should be retained based on girth and age regulations as may be prescribed by the Forest Department. Plantations to be ensured species (cut) to species (planted).

iii. The proponent should plant at least 410 nos. trees. The landscape planning should include plantation of native species. The species with heavy foliage, broad leaves and wide canopy cover are desirable. Water intensive and/or invasive species should not be used for landscaping. The project proponent should follow plantation plan approved by DFO, Forest Utilisation Division vide Memo no. 967/13-1 dated 17.08.2021.

iv. Where the trees need to be cut with prior permission from the concerned Local Authority, compensatory plantation in the ratio of 1:10 (i.e. planting of 10 trees for every 1 tree that is cut) shall be done and maintained. Plantations to be ensured species (cut) to species (planted). Area for green belt development shall be provided as per the details provided in the project document.

v. Topsoil should be stripped to a depth of 20 cm from the areas proposed for buildings, roads, paved areas, and external services. It should be stockpiled appropriately in designated areas and reapplied during plantation of the proposed vegetation on site.

IX. Transport

i. A comprehensive mobility plan, as per MoUD best practices guidelines (URDPFI), shall be prepared to include motorized, non-motorized, public, and private networks. Road should be designed with due consideration for environment, and safety of users. The road system can be designed with these basic criteria.

   e. Hierarchy of roads with proper segregation of vehicular and pedestrian traffic.
   f. Traffic calming measures.
   g. Proper design of entry and exit points.
   h. Parking norms as per local regulation.

ii. Vehicles hired for bringing construction material to the site should be in good condition and should have a pollution check certificate and should conform to applicable air and noise

emission standards and to be operated only during non-peak hours.

iii. A detailed traffic management and traffic decongestion plan shall be drawn up to ensure that the current level of service of the roads within a 05 kms radius of the project is maintained and improved upon after the implementation of the project. This plan should be based on cumulative impact of all development and increased habitation being carried out or proposed to be carried out by the project or other agencies in this 05 Kms radius of the site in different scenarios of space and time and the traffic management plan shall be duly validated and certified by the State Urban Development department and the P.W.D./competent authority for road augmentation and shall also have their consent to the implementation of components of the plan which involve the participation of these departments.

X. Human health issues

i. All workers working at the construction site and involved in loading, unloading, carriage of construction material and construction debris or working in any area with dust pollution shall be provided with dust mask.

ii. For indoor air quality the ventilation provisions as per National Building Code of India.

iii. Emergency preparedness plan based on the Hazard identification and Risk Assessment (HIRA) and Disaster Management Plan shall be implemented.

iv. Provision shall be made for the housing of construction labour within the site with all necessary infrastructure and facilities such as fuel for cooking, mobile toilets, mobile STP, safe drinking water, medical health care, crèche etc. The housing may be in the form of temporary structures to be removed after the completion of the project.

v. Occupational health surveillance of the workers shall be done on a regular basis.

vi. A First Aid Room shall be provided in the project both during construction and operations of the project.

XI. Environment Management Plan (EMP)

i. The project proponent should submit the proposed EMP on a six monthly basis. The Office Memorandum issued by the MoEF & CC vide F. No. 22-65/2017-IA.III dated 30.09.2020 should be strictly followed.

ii. Need based activities for local people is part of the EMP. Details of such activities for expansion project (in addition to the activities for the existing project) is uploaded in the PARIVESH portal by the project proponent.

iii. The company shall have a well laid down environmental policy duly approved by the Board of Directors. The environmental policy should prescribe for standard operating procedures to have proper checks and balances and to bring into focus any infringements/deviation/violation of the environmental / forest / wildlife norms /conditions. The company shall have defined system of reporting infringements /deviation / violation of the environmental / forest / wildlife norms / conditions and / or shareholders / stake holders. The copy of the board resolution in this regard shall be submitted to the Regional Office of MoEF&CC along with SEIAA and WBPCB as a part of six-monthly report.

iv. A separate Environmental Cell both at the project and company head quarter level, with qualified personnel shall be set up under the control of Senior Executive, who will directly report to the head of the organization.

v. Action plan for implementing EMP and environmental conditions along with responsibility matrix of the company shall be prepared and shall be duly approved by competent authority. The year wise funds earmarked for environmental protection measures shall be kept in separate account and not to be diverted for any other purpose.

vi. Year wise progress of implementation of action plan shall be reported to the Regional Office of MoEF&CC along with SEIAA and WBPCB along with the Six-Monthly Compliance Report.

XII. Miscellaneous

i. The environmental clearance accorded shall be valid for a period of 10 years for the proposed project.

ii. The project proponent shall prominently advertise it at least in two local newspapers of the District or State, of which one shall be in the vernacular language within seven days indicating that the project has been accorded environment clearance and the details of MoEFCC/SEIAA website where it is displayed.

iii. The copies of the environmental clearance shall be submitted by the project proponents to the Heads of local bodies, Panchayats and Municipal Bodies in addition to the relevant offices of the Government who in turn has to display the same for 30 days from the date of receipt.

iv. The project proponent shall upload the status of compliance of the stipulated environment clearance conditions, including results of monitored data on their website and update the same on half-yearly basis.

v. The project proponent shall submit six-monthly reports on the status of the compliance of the stipulated environmental conditions on the website of the Ministry of Environment, Forest and Climate Change at environment clearance portal with a copy to SEIAA and WBPCB.

vi. The project proponent shall submit the environmental statement for each financial year in Form-V to the concerned State Pollution Control Board as prescribed under the Environment (Protection) Rules, 1986, as amended subsequently and put on the website of the company.

vii. The project proponent shall inform the Regional Office of the MoEF&CC along with SEIAA and WBPCB, the date of financial closure and final approval of the project by the concerned authorities, commencing the land development work and start of production operation by the project.

viii. The project authorities must strictly adhere to the stipulations made by the State Pollution Control Board and the State Government.

ix. The project proponent shall abide by all the commitments and recommendations made in the EIA/EMP report and also that during their presentation to the State Expert Appraisal Committee (SEAC).

x. No further expansion or modifications in the plant shall be carried out without prior approval of the SEIAA.

xi. Concealing factual data or submission of false/fabricated data may result in revocation of this environmental clearance and attract action under the provisions of Environment (Protection) Act, 1986.

xii. The SEIAA may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory.

xiii. The SEIAA reserves the right to stipulate additional conditions if found necessary. The Company in a time bound manner shall implement these conditions.

xiv. The Regional Office of the MoEF&CC/SEIAA/WBPCB shall monitor compliance of the stipulated conditions. The project authorities should extend full cooperation to the officer(s) of the Regional Office of MoEF&CC / SEIAA/WBPCB by furnishing the requisite data / information/monitoring reports.

xv. The above conditions shall be enforced, inter-alia under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, the Air (Prevention & Control of Pollution) Act, 1981, the Environment (Protection) Act, 1986, Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 and the Public Liability Insurance Act, 1991 along with their amendments and Rules and any other orders passed by the Hon'ble Supreme Court of India / High Courts and any other Court of Law relating to the subject matter.

xvi. Any appeal against this EC shall lie with the National Green Tribunal, if preferred, within a period of 30 days as prescribed under Section 16 of the National Green Tribunal Act, 2010.

6. Proposal No. :- **SIA/WB/NCP/75645/2018** File No- **EN/T-II-1/061/2018** Proposed Residential Building at Premises No.46A/1, Biplabi Barin Ghosh Sarani (Formerly an apportioned portion of premises No. 46A, Biplabi Barin Ghosh Sarani), Kolkata-700067, Ward No-14, Borough No –III, P.S.- Maniktala Under KMC, West Bengal by **M/s. Swastik Projects Pvt. Ltd.**	Type- **EC**

INTRODUCTION

The proponent made online application vide proposal no. **SIA/WB/NCP/75645/2018** dated **16 Jul 2018** along with copies of EIA/EMP seeking environment clearance under the provisions of the EIA Notification, 2006 for the above mentioned project. The proposed project activity is listed at SL.No. **8(a) Building and Construction projects** under Category **"B2"** of EIA Notification 2006 and the proposal is appraised at State level.

Earlier the project had received Environmental Clearance vide No. Memo No. 2176/EN/T-II-1/081/2012 dated 25.09.2017 for a built up area of 27947.489 sq.m. on a land parcel of 9474.00 sq.m. Initially the proposal was for the construction of 01 Residential Block of B+G+12 storied having 188 nos. flats. Thereafter, the project proposal was revised / modified and the proponent applied in prescribed format for environmental clearance and uploaded the application in the PARIVESH portal on 16.07.2018. The project had received stipulated conditions for environmental clearance for the project vide Memo No. 29/EN/T-II-1/061/2018 dated 04.01.2019 for a built-up area of 31636.43 sq.m. and land area of 9474.00 sq.m.

A field inspection of the project site to ascertain the present status of the project was conducted by WBPCB on 11.06.2022. It was reported that no construction work was started.

SEAC recommended Environmental Clearance for the proposed project in cancellation of the earlier EC issued vide No. 2176/EN/T-II-1/081/2012 dated 25.09.2017.

The project was placed in the 70th meeting of SEIAA held on 22.08.2022 and it was observed that some documents required to be uploaded in the PARIVESH Portal. The project proponent uploaded documents on 30.08.2022.

PROJECT DETAILS

The project of M/s **SWASTIK PROJECTS PVT. LTD.** located in as follows :

State of the project				
S. No.	**State**	**District**	**Tehsil**	**Village**
(1.)	West Bengal	Kolkata	Kolkata	

14. **Project configuration/product details**

S. No.	**Project configuration/product details**	**Quantity**	**Unit**	**Other Unit**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**
Building and Construction project of Total built-up area of 31636.43 sqm on a Land Area of 9474.00 sqm.						

Raw Material Requirement details

S. No.	**Item**	**Quantity per annum**	**Unit**	**Other Unit**	**Source**	**Mode of Transport/Transmission of Product**	**Other Mode of Transport**	**Distance of Source from Project Site(Kilometers)**
NIL								

DELIBERATION IN SEIAA

SEIAA considered the submission made by the PP vide their letter no. NIL dated 30.08.2022 uploaded on 30.08.2022 and observed that there are 5 title deed uploaded by the PP wherein the total land area adds upto 34682 sqm. All the title deed are bearing the Premises No. as 46A, Biplabi Barin Ghosh Sarani. In all other documents eg. Sanction plan and ULC document, the Premises No. is mentioned as 46A/1, Biplabi Barin Ghosh Sarani and the land area as 9474 sqm. PP needs to submit a clarification (boundary declaration/ any other document) in this regard.

RECOMMENDATIONS OF SEIAA

Therefore, the application for EC is deferred (Additional Information).

Conclusion

Deferred

CONSIDERATION/RECONSIDERATION OF EC PROPOSAL (Extension/Amendment/Corrigendum)

1. Proposal No. :- **SIA/WB/IND/278173/2022** File No- **EN/ T- II-1/051/ 2014**
Extension of validity of Environmental Clearance for the proposed expansion of existing standalone cement grinding unit from 0.6 MTPA to 1.8 MTPA at Village – Madhukunda, P.O-Sunuri, P.S – Santuri, PIN – 723 121, Dist. – Purulia, West Bengal by **M/s. Damodhar Cement Works, ACC Limited**

Type Of Project : **Extension**

INTRODUCTION

The proponent made online application vide proposal no. SIA/WB/IND/278173/2022 dated 18.07.2022 seeking extension of validity of Environmental Clearance under the provisions of the EIA Notification, 2006 for the above mentioned proposed project.
The PP had obtained Environmental Clearance for the proposed expansion of existing standalone cement grinding unit from 0.6 MTPA to 1.8 MTPA vide no. 287/EN/T-II1/051/2014 dated 05.02.2016 issued by SEIAA, WB. The validity period of existing EC is upto 04.02.2023.

SEAC recommended that the validity extension of EC may be granted for a period of further 3 (three) years i.e. upto 04.02.2026 as per the EIA Notification, 2006 and its subsequent amendments.

PROJECT DETAILS

The project of M/s **DAMODHAR CEMENT WORKS, ACC LIMITED** located in

State of the project			
S. No.	**State**	**District**	**Tehsil**
(1.)	West Bengal	Purulia	Raghunathpur

The salient features of the project submitted by the project proponent is available at Report under online proposal no. **SIA/WB/IND/278173/2022**

DELIBERATION IN SEIAA

SEIAA considered the recommendation of SEAC and accepted the same.

RECOMMENDATIONS OF SEIAA

Approved extension of validity of Environmental Clearance.

Conclusion

Recommended

MISCELLANEOUS

1. Discussion on draft DSRs of **Purba Medinipur, Paschim Medinipur and Purba Bardhaman**.

   DSRs of Purba Medinipur, Paschim Medinipur and Purba Bardhaman are approved.

2. ToR application for the proposed Modification of "Aerotropolis Township" at Andal, Vill. – Tamla, Dhokinkhanda, Mahira, Khandra, Amloka, Banguli, Durgapur Taluk, District: Paschim Bardhhaman, West Bengal by **M/s. Bengal Aerotroplis project Limited**. Proposal No. **SIA/WB/MIS/80933/2022**.

   Background

   Earlier M/s. Bengal Aerotroplis project Limited had obtained EC from SEIAA, WB vide No. EN/2041/T-II-1/025/2009 dated 11.08.2011 for Greenfield Aerotropolis Township (Phase I) at Andal, Vill. – Tamla, Dhokinkhanda, Mahira, Khandra, Amloka, Banguli, Durgapur Taluk, District: Burdwan, West Bengal.

   Now the PP has applied for modification of "Aerotropolis Township" at Andal, Vill. – Tamla, Dhokinkhanda, Mahira, Khandra, Amloka, Banguli, Durgapur Taluk, District: Paschim Bardhhaman, West Bengal.

   The matter was placed in the 69th meeting of SEIAA held on 10.08.2022 and it was decided to request the project proponent to mention the exact distance of the project area from the municipal limits of Durgapur and also submit Google earth image showing the Lat-Long of the proposed project area along with the municipal limits of Durgapur since the location of the proposed project area appears to be close to Durgapur Municipal Corporation area, which is declared as a 'Severely Polluted Area'.

   The project proponent submitted reply vide their letter Ref No. BAPL/DGP/INFRA(PI)/L/MS-SEIAA/22-23/269 dated 29.08.2022 uploaded on 30.08.2022.

   SEIAA considered the reply submitted by the PP and in view of the O.M. No. 22-23/2018-IA.III[E115231] dated 05.07.2022 of MoEF&CC, the above project which is categorised as a 'B1' project is transferred to MoEF&CC for further necessary action.