SEEPAT ROAD
P.O.: SECL
BILASPUR

साउथईस्टर्नकोलफिल्डस्लिमिटे
South Eastern Coalfields Limited
(कोलइण्डियाकाएकअंश/A subsidiary of Coal India Ltd.)
CIN U10102CT1985GOI003161
Website : www.secl-cil.in
कार्यालय: महाप्रबंधक, गेवरा क्षेत्र
OFFICE OF THE GENERAL MANAGER
GEVRA AREA

जिला: कोरबा(छत्तीसगढ़)
पिन:495452

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पो0आ0:गेवराप्रोजेक्ट
P.O. : GEVRA PROJECT
Distt.: Korba (C.G.)
Pin: 495452

क्रमांक/एस.ई.सी.एल/मप्र/गे.क्षे./ पर्यावरण/2023 / 519

दिनांक 31 /03/2023

To
The Divisional Forest Officer
Katghora Division
Katghora Korba

SUB: Submission of 44 points checklist against diversion of 94.293 Ha. Revenue Forest Land of SECL Gevra OCP, Dist Korba CG
Proposal No. FP/CG/MIN/41389/2019

REF: Online EDS dt:12.01.2023

Dear Madam

Please refer to our prevoius letter vide no. 249 dt: 20.10.2022, wherein the data pertaining SECL Gevra OCP has been submitted as per the 44 points checklist.

Now we are hereby submitting the CA scheme of Gariyaband 132 Ha. & Pali 58 Ha. duly certified by the respective DFOs.

Submitted for further necessary action please.

Thanking You

Yours Sincerely

31/3/23

General Manager
SECL Gevra Area

Copy to
1. Chief Conservator of Forest Bilaspur CG
2. Additional Principal Chief Conservator of Forest (LM), Raipur CG

GEO-REFERENCED BOUNDARY MAP

(IN SHAPE FILE)
COMPENSATORT AFFORESTATION (CA) FOREST LAND
(AREA-38.00 HA)
GEVRA PROJECT
GEVRA AREA, SECL

JANUARY-2023

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GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE)
OF COMPENSATORY AFFORESTATION (CA) FOREST LAND
(AREA-54.00 HA) AT GARIYABAND DIVISION FOR
GEVRA OCP, GEVRA AREA, SECL

1.0 Introduction

A proposal for DGPS survey of 38.000hectarecompensatory afforestation (CA) forest land at Katghora division has been received in CMPDIL through e-office along with details of forest land allotted by forest department duly forwarded through General Manager, Gevra Area, South Eastern Coalfields Limited (SECL) vide letter G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101).As per annual action plan for the year 2022-2023(CMPDI/RI-5/EXPL/2022-23/03 Dated 01-04-2022) DGPS survey of forest land is to be taken up by CMPDIL.

As per work order No.G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101).the CA land (Area-38.00Ha) for 94.293 Ha revenue forest land proposal of Gevra OCP has been identified at Gariyaband Forest Division.

Colliery authorities identified the patch on the ground with the help of forest officials.DGPS survey has been carried out at selected ground locations identified by forestpersonnelas per requirement.

DGPS report containing geo-referenced boundary map and shape files in projected and geographical coordinate system is submitted herewith. A geo-referenced boundary map in 1:10000 scale and corresponding KML files are also enclosed herewith in order to facilitate SECL to apply through online application portal PARIVESH.

Soft copies of the map and shape files are given in CD for further necessary action by SECL.
Relevant documents are given as annexures in this report.
The following table shows the land schedule of the proposed Compensatory Afforestation (CA) Forest Land.

Land Schedule of Compensatory Afforestation(CA) Forest Land					
SL. NO.	**Division**	**Range**	**Comp**	**Area(HA)**	
1	Gariyaband	Chhura	COM-232	38.00	
				Total Area	**38.000**

2.0 Background

Electricity is a very important commodity that cannot be dispensed for the modern lifestyle of people and communities worldwide. India being a growing economy is not an exception. Electricity produced through thermal power stations meets about seventy percentage of total electricity requirement of our country. Coal plays a vital role in these thermal power stations. With growing

concern for increasing power production, the thrust is on increasing production on coal producing companies, such as SECL.

Coal demand for other industrial and domestic consumption has also increased over the years. Coal producing companies, in general, are always required to mine more coal through open cast and underground coal mines in order to meet the coal demand by thermal power stations.

Coal producing companies are left with only two options. Either they should open new coal mines or increase the capacity of existing mines. While it is not very easy to open up new coal mines, the only option left is to expand the existing mines in terms of its capacity or in terms of physical extent of the existing mine.

In most of the mining lease hold areas it is observed that the coal bearing area is falling in forest areas that has been left out for want of forestry clearance. These forest lands are categorized into the following three types:

- Reserved Forest
- Protected Forest
- Revenue Forest

In order to carry out mining activities in these forest lands, forest clearance is required to obtain from the Ministry of Environment, Forest and Climate Change(MOEFCC).

To check irrational exploitation of forest and to maintain the ecological balance, Forest Conservation Act (FRA), 1980 has been enacted. Under this act, no forest land can be used for non-forestry purpose without prior approval from the ministry.

For getting forest clearance from MOEFCC the coal producing companies are required to apply through recently updated web portal called "Pro-Active and Responsive facilitation by Interactive, Virtuous and Environmental Single-Window Hub (PARIVESH)" which is a web based, role-based workflow application that has been developed for online submission and monitoring of proposals submitted by the proponents for seeking environment, forest, wildlife, and CRZ clearances from central state and district level authorities.

It automates the entire tracking of proposals which includes online submission of a new proposal, editing/updating the details of proposals and displays status of the proposals at each stage of the workflow.

The procedure for forest clearance envisaged under the act mandates a two-stage approval process consisting of two stages:

- **Stage I**

Upon prima facie review the proposal is either accepted or rejected. If approved, the project authority is required to deposit an amount for compensation of the opportunity cost of the forest (NPV, compensatory afforestation, additional expenses towards mitigating probable environmental damage etc.)

- **Stage II**

Following the deposit of above-mentioned costs, the land is handed over to the project authorities provided they have obtained all other requisite clearances.

Reserve forest boundaries are generally marked on the ground with large forest pillars while the boundaries of protected forests are marked on the ground with trenches, fencing and other markings.

As per the circular of MOEFCC, one of the pre-requisites for getting forestry clearance is a geo-referenced boundary map in shape file format of the desired forest land.

3.0 Location

The salient points of CA forest land identified for this project are located at chhura, District-Gariyaband, Chhattisgarh.NearestGariyaband.

4.0 Scope of Services

The scope of services of CMPDIL to provide Geo-referenced boundarymap (in shape files and pdf format), converted geographical coordinates of forest boundary after making DGPS observation at salient points and KML files etc.

5.0 Methodology

Static DGPS (Differential Global Positioning System) survey is appropriate for determining geographical co-ordinates of forest boundary.

The Global Positioning System (GPS) is a satellite-based location, timing and navigation system in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Presently, 30 orbiting satellites of GPS constellation of USA and 24 GLONASS (*Globalnayanavigatsionnayasputnikovayasistema* or Global Navigation Satellite System) satellites of Russia are operational for the purpose of GPS survey.

In addition to these primary GPS constellation, European space agency and Chinese have their own constellation such as Galileo and BeiDou respectively.

India's prestigious GAGAN (GPS Aided Geo Augmented Navigation (GAGAN) system) navigation system is also presently operational providing vital positional information to civil aviation and other industries.

The Global Positioning System is a system of communication made up of three independent aspects such as:

- GPS satellites orbiting the Earth;

- Control and monitoring stations on Earth;
- GPS receivers owned by users.

GPS satellites transmit the satellites number, its position in space, and the exact time. These informations are sent through the transmitted signals at regular intervals by all the satellites are all times.

These signals are picked up by various types of GPS receivers on ground. With signals from three or more satellites, a GPS receiver can triangulate its location on the ground (i.e., longitude and latitude) from the known position of the satellites. With four or more satellites, a GPS receiver can determine a 3D position (i.e., latitude, longitude, and ellipsoidal height).Differential Global Positioning System (DGPS) refers to using two or more GPS receivers to achieve greater positional accuracy. There are three basic methods of doing DGPS survey.

- Static
- Rapid-Static
- Real-time Kinematic (RTK).

For doing DGPS survey of forest land, post-processed static survey is found to be most suitable where one GPS receiver is used as base station and other GPS receivers are used as rover stations. Base receiver is stationed at a point of known co-ordinates for longer duration and rover stations are kept at unknown stations for comparatively shorter duration. DGPS observation is done in each rover stations for compensatory afforestation.

Data from base and rovers are downloaded and then post-processed in GPS data processing software, Leicainfinity to achieve sub-centimeter level accuracies.

ArcGIS 10.2 version software is used for preparation of shape files, KML file and geo-referenced map of the forest land in WGS-84 co-ordinates.

6.0 Survey Instrument

For providing geographical (spherical) co-ordinates of the stations along the boundary, Differential Global Positioning System (DGPS) consisting of one base receiver and a rover receiver were used. CMPDIL has the latest hardware and software of Leica make DGPS instrument which has dual-frequency GPS signal receivers that provide accurate results after post processing in relevant software. Brief specifications of DGPS are provided in the table below.

A	***DGPS Instrument:***	
	Make	Leica
	Model	GS25 & GS16
	Signal	GPS: L1, L2&L5 carrier, CA, L1P, L2P, L2C GLONASS: L1, L2&L5 carrier, L1CA, L2CA, L1P, L2P GALILEO: E2-L1-E1, E5, E6
	Channels	72
	Accuracy:	sub-centimeter
	Post Processed Static DGPS	3mm +0.5ppm horizontal, 5mm + 0.5ppm vertical
	Real Time RTK	10mm + 1 ppm horizontal, 15mm + 1 ppm vertical
	Power:	
	Internal Battery	2 Li-Ion, 3900mAh, 7.2V
	Communication:	
	Bluetooth	Bluetooth standard 1.2
	USB	1.1 Version
B	***DGPS Software***	Inbuilt Leica software for data recording
		Leicainfinity for data processing

7.0 Details of Field Activity

DGPS survey has been carried out in ground locations identified by forest authorities in the presence of Gevra colliery authority.The following table Showing Details of DGPS Survey Point (WGS84).

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
COMP-5/0	DGPS	20° 59' 4.590" N	82° 4' 18.600" E
COMP-5/1	DGPS	20° 59' 4.767" N	82° 4' 18.673" E
COMP-161/1	DGPS	20° 54' 11.925" N	82° 9' 34.198" E
COMP-161/2	DGPS	20° 54' 14.178" N	82° 9' 25.998" E
COMP-160/1	DGPS	20° 54' 17.188" N	82° 9' 15.245" E
COMP-160/2	DGPS	20° 54' 22.751" N	82° 8' 55.928" E
COMP-160/3	DGPS	20° 54' 36.413" N	82° 9' 5.846" E
COMP-161/3	DGPS	20° 54' 32.253" N	82° 9' 37.466" E
COMP-160/4	DGPS	20° 54' 11.756" N	82° 9' 34.117" E
COMP160/5	DGPS	20° 54' 18.211" N	82° 9' 11.925" E
COMP161/5	DGPS	20° 54' 19.334" N	82° 9' 7.897" E
COMP161/6	DGPS	20° 54' 20.496" N	82° 9' 7.666" E
COMP161/7	DGPS	20° 54' 20.682" N	82° 9' 5.876" E
COMP161/8	DGPS	20° 54' 20.017" N	82° 9' 5.460" E
COMP161/9	DGPS	20° 54' 21.436" N	82° 9' 0.192" E
COMP161/10	DGPS	20° 54' 24.048" N	82° 8' 56.827" E
COMP161/11	DGPS	20° 54' 25.146" N	82° 8' 57.939" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
COMP161/12A	DGPS	20° 54' 25.238" N	82° 8' 59.211" E
COMP161/13	DGPS	20° 54' 25.238" N	82° 8' 59.211" E
COMP161/14	DGPS	20° 54' 31.236" N	82° 9' 2.013" E
COMP161/15	DGPS	20° 54' 32.886" N	82° 9' 3.310" E
COMP161/16	DGPS	20° 54' 39.708" N	82° 9' 10.530" E
COMP161/17	DGPS	20° 54' 32.359" N	82° 9' 14.908" E
COMP-160/6	DGPS	20° 54' 23.052" N	82° 9' 18.662" E
COMP-160/7	DGPS	20° 54' 22.374" N	82° 9' 18.139" E
COMP-160/8	DGPS	20° 54' 22.614" N	82° 9' 17.407" E
COMP-160/9	DGPS	20° 54' 18.843" N	82° 9' 15.765" E
COMP-160/10	DGPS	20° 54' 18.638" N	82° 9' 15.449" E
COMP-160/11	DGPS	20° 54' 18.614" N	82° 9' 15.217" E
COMP-232/2 (2)	DGPS	20° 47' 8.409" N	82° 11' 40.715" E
COMP-232/2	DGPS	20° 47' 8.291" N	82° 12' 7.217" E
COMP-232/3	DGPS	20° 47' 21.258" N	82° 12' 18.006" E
COMP-232/4	DGPS	20° 47' 22.843" N	82° 12' 20.237" E
COMP-232/5	DGPS	20° 47' 24.003" N	82° 12' 20.031" E
COMP-232/6	DGPS	20° 47' 25.247" N	82° 12' 17.680" E
COMP-232/7	DGPS	20° 47' 15.819" N	82° 12' 10.124" E
COMP-232/8	DGPS	20° 47' 15.029" N	82° 11' 58.708" E
COMP-232/9	DGPS	20° 47' 12.570" N	82° 11' 59.043" E
GPS1	DGPS	20° 54' 25.514" N	82° 9' 34.720" E
GPS2	DGPS	20° 54' 23.099" N	82° 9' 34.149" E
GPS3	DGPS	20° 54' 22.569" N	82° 9' 35.874" E
GPS4	DGPS	20° 54' 32.478" N	82° 9' 46.245" E
GPS5	DGPS	20° 54' 27.306" N	82° 9' 49.140" E
GPS6	DGPS	20° 54' 24.819" N	82° 9' 45.968" E
GPS7	DGPS	20° 54' 23.782" N	82° 9' 44.482" E
GPS8	DGPS	20° 54' 23.764" N	82° 9' 44.440" E
GPS9	DGPS	20° 54' 20.938" N	82° 9' 43.413" E
GPS10	DGPS	20° 54' 19.819" N	82° 9' 40.200" E
GPS11	DGPS	20° 54' 16.423" N	82° 9' 40.497" E
GPS12	DGPS	20° 54' 15.493" N	82° 9' 35.603" E
GPS13	DGPS	20° 54' 13.718" N	82° 9' 40.360" E
GPS14	DGPS	20° 54' 13.509" N	82° 9' 35.836" E
GPS15	DGPS	20° 54' 12.788" N	82° 9' 35.701" E
GPS16	DGPS	20° 54' 12.588" N	82° 9' 34.546" E
Comp_5_1	DGPS	20° 59' 2.251" N	82° 4' 22.559" E
Comp_5_2	DGPS	20° 59' 0.401" N	82° 4' 25.740" E
Comp_5_3	DGPS	20° 58' 56.197" N	82° 4' 34.008" E
Comp_5_4	DGPS	20° 59' 0.150" N	82° 4' 44.734" E
Comp_5_5	DGPS	20° 59' 1.507" N	82° 4' 56.450" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
Comp_5_6	DGPS	20° 58' 58.278" N	82° 4' 58.791" E
Comp_5_7	DGPS	20° 59' 1.681" N	82° 5' 5.499" E
Comp_5_8	DGPS	20° 58' 57.705" N	82° 5' 12.824" E
Comp_5_9	DGPS	20° 58' 59.135" N	82° 5' 11.385" E
Comp_5_10	DGPS	20° 59' 4.588" N	82° 5' 12.861" E
Comp_5_11	DGPS	20° 59' 16.593" N	82° 5' 6.343" E
Comp_5_12	DGPS	20° 59' 18.581" N	82° 5' 5.575" E
Comp_5_13	DGPS	20° 59' 10.103" N	82° 4' 44.914" E
Comp_5_14	DGPS	20° 59' 4.744" N	82° 4' 18.581" E
hgps_1	DGPS	20° 54' 18.715" N	82° 9' 22.345" E
hgps_2	DGPS	20° 54' 20.635" N	82° 9' 23.322" E
hgps_3	DGPS	20° 54' 20.899" N	82° 9' 25.905" E
hgps_4	DGPS	20° 54' 23.274" N	82° 9' 26.204" E
hgps_5	DGPS	20° 54' 11.992" N	82° 9' 34.149" E
hgps_6	DGPS	20° 54' 14.207" N	82° 9' 25.938" E
hgps_7	DGPS	20° 54' 17.201" N	82° 9' 15.286" E
hgps_8	DGPS	20° 54' 36.483" N	82° 9' 5.791" E
hgps_9	DGPS	20° 54' 32.343" N	82° 9' 37.390" E
hgps_10	DGPS	20° 54' 13.127" N	82° 9' 29.957" E
hgps_11	DGPS	20° 54' 14.176" N	82° 9' 26.019" E
hgps_12	DGPS	20° 54' 22.815" N	82° 8' 55.914" E
hgps_13	DGPS	20° 54' 12.540" N	82° 9' 34.612" E
hgps_14	DGPS	20° 54' 12.709" N	82° 9' 35.836" E
hgps_15	DGPS	20° 54' 13.331" N	82° 9' 35.882" E
hgps_16	DGPS	20° 54' 13.569" N	82° 9' 40.489" E
hgps_17	DGPS	20° 54' 25.412" N	82° 9' 34.718" E
hgps_18	DGPS	20° 54' 23.042" N	82° 9' 34.158" E
hgps_19	DGPS	20° 54' 22.487" N	82° 9' 35.855" E
hgps_20	DGPS	20° 54' 32.439" N	82° 9' 46.319" E
hgps_21	DGPS	20° 54' 27.245" N	82° 9' 49.085" E
hgps_22	DGPS	20° 54' 24.661" N	82° 9' 45.944" E
hgps_23	DGPS	20° 54' 23.828" N	82° 9' 44.441" E
hgps_24	DGPS	20° 54' 20.755" N	82° 9' 43.543" E
hgps_25	DGPS	20° 54' 15.465" N	82° 9' 35.535" E
hgps_26	DGPS	20° 54' 16.375" N	82° 9' 40.456" E
hgps_27	DGPS	20° 54' 19.755" N	82° 9' 40.145" E
hgps_28	DGPS	20° 54' 20.809" N	82° 9' 43.498" E
hgps_29	DGPS	20° 54' 23.840" N	82° 9' 44.430" E
hgps_30	DGPS	20° 54' 24.661" N	82° 9' 45.943" E
hgps_31	DGPS	20° 54' 32.440" N	82° 9' 46.318" E
232_F1	DGPS	20° 47' 7.400" N	82° 11' 38.400" E
232_F2	DGPS	20° 47' 5.900" N	82° 11' 39.900" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
232_F3	DGPS	20° 47' 6.900" N	82° 11' 47.000" E
232_F4	DGPS	20° 47' 9.300" N	82° 11' 57.100" E
232_F5	DGPS	20° 48' 6.400" N	82° 11' 55.600" E
232_F6	DGPS	20° 47' 14.800" N	82° 12' 12.400" E

8.0 Computation

Data recorded is downloaded from both rover and base receivers of DGPS and processed in Leica infinity software to get post-processed WGS-84 co-ordinates. The geographical co-ordinates of the forest land(CA) are tabulated below.

TABLE-I
GEOGRAPHICAL COORDINATES (WGS-84)
40.000 HA FOREST LAND (CA)
GEVRAOCP, GEVRAAREA, SECL

Point Id	Layer	Division	Range	Latitude (DMS)	Longitude (DMS)
43	COM_232	Gariyaband	Chhura	20° 47' 19.551" N	82° 11' 44.735" E
44	COM_232	Gariyaband	Chhura	20° 47' 21.491" N	82° 11' 46.992" E
45	COM_232	Gariyaband	Chhura	20° 47' 25.703" N	82° 11' 52.189" E
46	COM_232	Gariyaband	Chhura	20° 47' 31.276" N	82° 11' 57.576" E
47	COM_232	Gariyaband	Chhura	20° 47' 36.663" N	82° 12' 2.040" E
48	COM_232	Gariyaband	Chhura	20° 47' 29.908" N	82° 12' 7.443" E
49	COM_232	Gariyaband	Chhura	20° 47' 23.125" N	82° 12' 1.535" E
50	COM_232	Gariyaband	Chhura	20° 47' 17.929" N	82° 11' 58.360" E
51	COM_232	Gariyaband	Chhura	20° 47' 16.740" N	82° 11' 57.105" E
52	COM_232	Gariyaband	Chhura	20° 47' 16.128" N	82° 11' 59.315" E
53	COM_232	Gariyaband	Chhura	20° 47' 16.441" N	82° 12' 1.228" E
54	COM_232	Gariyaband	Chhura	20° 47' 17.901" N	82° 12' 2.510" E
55	COM_232	Gariyaband	Chhura	20° 47' 18.790" N	82° 12' 6.632" E
56	COM_232	Gariyaband	Chhura	20° 47' 16.983" N	82° 12' 10.329" E
57	COM_232	Gariyaband	Chhura	20° 47' 15.625" N	82° 12' 8.761" E
58	COM_232	Gariyaband	Chhura	20° 47' 14.724" N	82° 12' 9.025" E
59	COM_232	Gariyaband	Chhura	20° 47' 13.990" N	82° 12' 12.665" E
60	COM_232	Gariyaband	Chhura	20° 47' 14.612" N	82° 12' 15.950" E
61	COM_232	Gariyaband	Chhura	20° 47' 13.776" N	82° 12' 18.247" E
62	COM_232	Gariyaband	Chhura	20° 47' 12.569" N	82° 12' 17.279" E
63	COM_232	Gariyaband	Chhura	20° 47' 9.829" N	82° 12' 14.368" E
64	COM_232	Gariyaband	Chhura	20° 47' 8.476" N	82° 12' 12.400" E
65	COM_232	Gariyaband	Chhura	20° 47' 9.217" N	82° 12' 11.143" E
66	COM_232	Gariyaband	Chhura	20° 47' 8.286" N	82° 12' 9.515" E
67	COM_232	Gariyaband	Chhura	20° 47' 8.175" N	82° 12' 7.308" E
68	COM_232	Gariyaband	Chhura	20° 47' 7.389" N	82° 12' 6.360" E
69	COM_232	Gariyaband	Chhura	20° 47' 8.046" N	82° 12' 3.974" E

Point Id	Layer	Division	Range	Latitude (DMS)	Longitude (DMS)
70	COM_232	Gariyaband	Chhura	20° 47' 8.524" N	82° 12' 2.095" E
71	COM_232	Gariyaband	Chhura	20° 47' 9.958" N	82° 12' 0.992" E
72	COM_232	Gariyaband	Chhura	20° 47' 11.220" N	82° 11' 59.441" E
73	COM_232	Gariyaband	Chhura	20° 47' 12.453" N	82° 11' 52.252" E
74	COM_232	Gariyaband	Chhura	20° 47' 11.882" N	82° 11' 51.083" E
75	COM_232	Gariyaband	Chhura	20° 47' 12.285" N	82° 11' 49.802" E
76	COM_232	Gariyaband	Chhura	20° 47' 11.988" N	82° 11' 46.380" E
77	COM_232	Gariyaband	Chhura	20° 47' 11.705" N	82° 11' 43.127" E
78	COM_232	Gariyaband	Chhura	20° 47' 10.258" N	82° 11' 39.806" E
79	COM_232	Gariyaband	Chhura	20° 47' 10.935" N	82° 11' 39.415" E
80	COM_232	Gariyaband	Chhura	20° 47' 13.970" N	82° 11' 40.540" E
81	COM_232	Gariyaband	Chhura	20° 47' 16.527" N	82° 11' 41.890" E
82	COM_232	Gariyaband	Chhura	20° 47' 19.551" N	82° 11' 44.735" E

9.0 Documents Submitted

- Drawing Number: CMPDI/RI5/BSP/GEOM/2022/DGPS/90
- Soft copy of shape files & KML files in CD.

DISCLAIMER:

1. DGPS REPORT IS BASED ON SURVEY DATA.
2. DGPS REPORT IS FOR FOREST LAND(CA) APPLICATION ONLY & NOT VALID FOR ANY OTHER PURPOSE
3. CMPDIL IS NOT RESPONSIBLE FOR ANY FUTURE DISPUTE WITH RESPECT TO FOREST LAND DETAILS.

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16/1/23
महाप्रबंधक
General Manager
एस.ई.सी.एल., गेवरा क्षेत्र
SECL, Gevra Area

नोडल ऑफिसर (पर्यावरण/वन)
Nodal Officer (ENV/Forest)
SECL/Gevra Area
एस.ई.सी.एल./गेवरा क्षेत्र

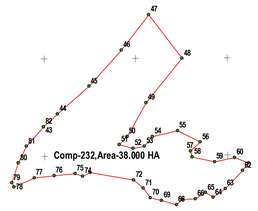
वन परिक्षेत्राधिकारी
छुरा परिक्षेत्र

संयुक्त वनमंडलाधिकारी राजिम
वनमंडल गरियाबंद

Divisional Forest Officer
Gariaband Division Gariaband

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA(COMPENSATORY AFFORESTATION) FOREST LAND AT GARIYABAND DIVISION AGAINST DIVERSION OF 94.293 HA REVENUE FOREST LAND OF SECL GEVRA OCP. (COMPARTMENT NO-232(AREA-38.000 HA)

FID		Division	Range	Compartment	Area(Ha)	Latitude(WGS84)	Longitude(WGS84)
43		Gariyaband	Chhura	Com-232	38.000	20° 47' 19.551" N	82° 11' 44.735" E
44		Gariyaband	Chhura	Com-232	38.000	20° 47' 21.491" N	82° 11' 46.992" E
45		Gariyaband	Chhura	Com-232	38.000	20° 47' 25.703" N	82° 11' 52.189" E
46		Gariyaband	Chhura	Com-232	38.000	20° 47' 31.276" N	82° 11' 57.576" E
47		Gariyaband	Chhura	Com-232	38.000	20° 47' 36.663" N	82° 12' 2.040" E
48		Gariyaband	Chhura	Com-232	38.000	20° 47' 29.908" N	82° 12' 7.443" E
49		Gariyaband	Chhura	Com-232	38.000	20° 47' 23.125" N	82° 12' 1.535" E
50		Gariyaband	Chhura	Com-232	38.000	20° 47' 17.929" N	82° 11' 58.360" E
51		Gariyaband	Chhura	Com-232	38.000	20° 47' 16.740" N	82° 11' 57.105" E
52		Gariyaband	Chhura	Com-232	38.000	20° 47' 16.128" N	82° 11' 59.315" E
53		Gariyaband	Chhura	Com-232	38.000	20° 47' 16.441" N	82° 12' 1.228" E
54		Gariyaband	Chhura	Com-232	38.000	20° 47' 17.901" N	82° 12' 2.510" E
55		Gariyaband	Chhura	Com-232	38.000	20° 47' 18.790" N	82° 12' 6.632" E
56		Gariyaband	Chhura	Com-232	38.000	20° 47' 16.983" N	82° 12' 10.329" E
57		Gariyaband	Chhura	Com-232	38.000	20° 47' 15.625" N	82° 12' 8.761" E
58		Gariyaband	Chhura	Com-232	38.000	20° 47' 14.724" N	82° 12' 9.025" E
59		Gariyaband	Chhura	Com-232	38.000	20° 47' 13.990" N	82° 12' 12.665" E
60		Gariyaband	Chhura	Com-232	38.000	20° 47' 14.612" N	82° 12' 15.950" E
61		Gariyaband	Chhura	Com-232	38.000	20° 47' 13.776" N	82° 12' 18.247" E
62		Gariyaband	Chhura	Com-232	38.000	20° 47' 12.569" N	82° 12' 17.279" E
63		Gariyaband	Chhura	Com-232	38.000	20° 47' 9.829" N	82° 12' 14.368" E
64		Gariyaband	Chhura	Com-232	38.000	20° 47' 8.476" N	82° 12' 12.400" E
65		Gariyaband	Chhura	Com-232	38.000	20° 47' 9.217" N	82° 12' 11.143" E
66		Gariyaband	Chhura	Com-232	38.000	20° 47' 8.286" N	82° 12' 9.515" E
67		Gariyaband	Chhura	Com-232	38.000	20° 47' 8.175" N	82° 12' 7.308" E
68		Gariyaband	Chhura	Com-232	38.000	20° 47' 7.389" N	82° 12' 6.360" E
69		Gariyaband	Chhura	Com-232	38.000	20° 47' 8.046" N	82° 12' 3.974" E
70		Gariyaband	Chhura	Com-232	38.000	20° 47' 8.524" N	82° 12' 2.095" E
71		Gariyaband	Chhura	Com-232	38.000	20° 47' 9.958" N	82° 12' 0.992" E
72		Gariyaband	Chhura	Com-232	38.000	20° 47' 11.220" N	82° 11' 59.441" E
73		Gariyaband	Chhura	Com-232	38.000	20° 47' 12.453" N	82° 11' 52.252" E
74		Gariyaband	Chhura	Com-232	38.000	20° 47' 11.882" N	82° 11' 51.083" E
75		Gariyaband	Chhura	Com-232	38.000	20° 47' 12.285" N	82° 11' 49.802" E
76		Gariyaband	Chhura	Com-232	38.000	20° 47' 11.988" N	82° 11' 46.380" E
77		Gariyaband	Chhura	Com-232	38.000	20° 47' 11.705" N	82° 11' 43.127" E
78		Gariyaband	Chhura	Com-232	38.000	20° 47' 10.258" N	82° 11' 39.806" E
79		Gariyaband	Chhura	Com-232	38.000	20° 47' 10.935" N	82° 11' 39.415" E
80		Gariyaband	Chhura	Com-232	38.000	20° 47' 13.970" N	82° 11' 40.540" E
81		Gariyaband	Chhura	Com-232	38.000	20° 47' 16.527" N	82° 11' 41.890" E
82		Gariyaband	Chhura	Com-232	38.000	20° 47' 19.551" N	82° 11' 44.735" E



Land Schedule of CA forest Land

Division	Range	Compartment	Area(Ha)
Gariyaband	Chhura	Com-232	38

Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 81.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Customer: **SOUTH EASTERN COALFIELDS LIMITED**

Project: GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA (COMPENSATORY AFFORESTATION)FOREST LAND AT GARIYABAND DIVISION

Job Number: **503308**

Subject: **PLAN SHOWING OF CA (COMPENSATORY AFFORESTATION) FOREST LAND COMPARTMENT NO-232 (AREA-38.000 HA) AGAINST 94.293 HA REVENUE FOREST LAND FOR GEVRA OCP OF GEVRA AREA(SECL)**

Activity	Name	Designation	Signature	Date
Surveyed &Processed By	Madhusudan Banik	Sr.Surveyor (C)		
Checked By	Upendra Pandey	Officer Survey		
Approved	Sudhanshu Mishra	Chief Manager (Mining)		

Scale: 0 255 510 1,020 M — 1:10,000

Sheet: 1

Dwg: CMPDI/RI5/BSP/GEOM/2023/DGPS/90

Rev No.: 0

cmpdi — A Mini Ratna Company

ANNEXURES

DRAWINGS
&
COMPACT DISC

Job No.: 503308

GEO-REFERENCED BOUNDARY MAP

(IN SHAPE FILE)
COMPENSATORT AFFORESTATION (CA) FOREST LAND
(AREA-40.00 HA)
GEVRA PROJECT
GEVRA AREA, SECL

JANUARY-2023

INDEX

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF COMPENSATORY AFFORESTATION (CA) FOREST LAND (AREA-54.00 HA) AT GARIYABAND DIVISION FOR GEVRA OCP, GEVRA AREA, SECL

1.0 Introduction

A proposal for DGPS survey of 40.000hectarecompensatory afforestation (CA) forest land at Gariyaband division has been received in CMPDIL through e-office along with details of forest land allotted by forest department duly forwarded through General Manager, Gevra Area, South Eastern Coalfields Limited (SECL) vide letter G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101).As per annual action plan for the year 2022-2023(CMPDI/RI-5/EXPL/2022-23/03 Dated 01-04-2022) DGPS survey of forest land is to be taken up by CMPDIL.

As per work order No.G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101).the CA land (Area-40.00Ha) for 94.293 Ha revenue forest land proposal of Gevra OCP has been identified at Gariyaband Forest Division.

Colliery authorities identified the patch on the ground with the help of forest officials.DGPS survey has been carried out at selected ground locations identified by forestpersonnelas per requirement.

DGPS report containing geo-referenced boundary map and shape files in projected and geographical coordinate system is submitted herewith. A geo-referenced boundary map in 1:10000 scale and corresponding KML files are also enclosed herewith in order to facilitate SECL to apply through online application portal PARIVESH.

Soft copies of the map and shape files are given in CD for further necessary action by SECL.
Relevant documents are given as annexures in this report.
The following table shows the land schedule of the proposed Compensatory Afforestation (CA) Forest Land.

Land Schedule of Compensatory Afforestation(CA) Forest Land				
SL. NO.	**Division**	**Range**	**Comp**	**Area(HA)**
1	Gariyaband	Chhura	COM-160 COM-161	20.00 20.00
			Total Area	**40.000**

2.0 Background

Electricity is a very important commodity that cannot be dispensed for the modern lifestyle of people and communities worldwide. India being a growing economy is not an exception. Electricity produced through thermal power stations meets about seventy percentage of total electricity requirement of our country. Coal plays a vital role in these thermal power stations. With growing

concern for increasing power production, the thrust is on increasing production on coal producing companies, such as SECL.

Coal demand for other industrial and domestic consumption has also increased over the years. Coal producing companies, in general, are always required to mine more coal through open cast and underground coal mines in order to meet the coal demand by thermal power stations.

Coal producing companies are left with only two options. Either they should open new coal mines or increase the capacity of existing mines. While it is not very easy to open up new coal mines, the only option left is to expand the existing mines in terms of its capacity or in terms of physical extent of the existing mine.

In most of the mining lease hold areas it is observed that the coal bearing area is falling in forest areas that has been left out for want of forestry clearance. These forest lands are categorized into the following three types:

- Reserved Forest
- Protected Forest
- Revenue Forest

In order to carry out mining activities in these forest lands, forest clearance is required to obtain from the Ministry of Environment, Forest and Climate Change(MOEFCC).

To check irrational exploitation of forest and to maintain the ecological balance, Forest Conservation Act (FRA), 1980 has been enacted. Under this act, no forest land can be used for non-forestry purpose without prior approval from the ministry.

For getting forest clearance from MOEFCC the coal producing companies are required to apply through recently updated web portal called "Pro-Active and Responsive facilitation by Interactive, Virtuous and Environmental Single-Window Hub (PARIVESH)" which is a web based, role-based workflow application that has been developed for online submission and monitoring of proposals submitted by the proponents for seeking environment, forest, wildlife, and CRZ clearances from central state and district level authorities.

It automates the entire tracking of proposals which includes online submission of a new proposal, editing/updating the details of proposals and displays status of the proposals at each stage of the workflow.

The procedure for forest clearance envisaged under the act mandates a two-stage approval process consisting of two stages:

- **Stage I**

Upon prima facie review the proposal is either accepted or rejected. If approved, the project authority is required to deposit an amount for compensation of the opportunity cost of the forest (NPV, compensatory afforestation, additional expenses towards mitigating probable environmental damage etc.)

- **Stage II**

Following the deposit of above-mentioned costs, the land is handed over to the project authorities provided they have obtained all other requisite clearances.

Reserve forest boundaries are generally marked on the ground with large forest pillars while the boundaries of protected forests are marked on the ground with trenches, fencing and other markings.

As per the circular of MOEFCC, one of the pre-requisites for getting forestry clearance is a geo-referenced boundary map in shape file format of the desired forest land.

3.0 Location

The salient points of CA forest land identified for this project are located at Chhura,District-Gariyaband, and Chhattisgarh.NearestGariyaband.

4.0 Scope of Services

The scope of services of CMPDIL to provide Geo-referenced boundarymap (in shape files and pdf format), converted geographical coordinates of forest boundary after making DGPS observation at salient points and KML files etc.

5.0 Methodology

Static DGPS (Differential Global Positioning System) survey is appropriate for determining geographical co-ordinates of forest boundary.

The Global Positioning System (GPS) is a satellite-based location, timing and navigation system in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Presently, 30 orbiting satellites of GPS constellation of USA and 24 GLONASS (*Globalnaya navigatsionnaya sputnikovaya sistema* or Global Navigation Satellite System) satellites of Russia are operational for the purpose of GPS survey.

In addition to these primary GPS constellation, European space agency and Chinese have their own constellation such as Galileo and BeiDou respectively.

India's prestigious GAGAN (GPS Aided Geo Augmented Navigation (GAGAN) system) navigation system is also presently operational providing vital positional information to civil aviation and other industries.

The Global Positioning System is a system of communication made up of three independent aspects such as:

- GPS satellites orbiting the Earth;

- Control and monitoring stations on Earth;
- GPS receivers owned by users.

GPS satellites transmit the satellites number, its position in space, and the exact time. These informations are sent through the transmitted signals at regular intervals by all the satellites are all times.

These signals are picked up by various types of GPS receivers on ground. With signals from three or more satellites, a GPS receiver can triangulate its location on the ground (i.e., longitude and latitude) from the known position of the satellites. With four or more satellites, a GPS receiver can determine a 3D position (i.e., latitude, longitude, and ellipsoidal height).Differential Global Positioning System (DGPS) refers to using two or more GPS receivers to achieve greater positional accuracy. There are three basic methods of doing DGPS survey.

- Static
- Rapid-Static
- Real-time Kinematic (RTK).

For doing DGPS survey of forest land, post-processed static survey is found to be most suitable where one GPS receiver is used as base station and other GPS receivers are used as rover stations. Base receiver is stationed at a point of known co-ordinates for longer duration and rover stations are kept at unknown stations for comparatively shorter duration. DGPS observation is done in each rover stations for compensatory afforestation.

Data from base and rovers are downloaded and then post-processed in GPS data processing software, Leicainfinity to achieve sub-centimeter level accuracies.

ArcGIS 10.2 version software is used for preparation of shape files, KML file and geo-referenced map of the forest land in WGS-84 co-ordinates.

6.0 Survey Instrument

For providing geographical (spherical) co-ordinates of the stations along the boundary, Differential Global Positioning System (DGPS) consisting of one base receiver and a rover receiver were used. CMPDIL has the latest hardware and software of Leica make DGPS instrument which has dual-frequency GPS signal receivers that provide accurate results after post processing in relevant software. Brief specifications of DGPS are provided in the table below.

A	***DGPS Instrument:***	
	Make	Leica
	Model	GS25 & GS16
	Signal	GPS: L1, L2&L5 carrier, CA, L1P, L2P, L2C GLONASS: L1, L2&L5 carrier, L1CA, L2CA, L1P, L2P GALILEO: E2-L1-E1, E5, E6
	Channels	72
	Accuracy:	sub-centimeter
	Post Processed Static DGPS	3mm +0.5ppm horizontal, 5mm + 0.5ppm vertical
	Real Time RTK	10mm + 1 ppm horizontal, 15mm + 1 ppm vertical
	Power:	
	Internal Battery	2 Li-Ion, 3900mAh, 7.2V
	Communication:	
	Bluetooth	Bluetooth standard 1.2
	USB	1.1 Version
B	***DGPS Software***	Inbuilt Leica software for data recording
		Leicainfinity for data processing

7.0 Details of Field Activity

DGPS survey has been carried out in ground locations identified by forest authorities in the presence of Gevra colliery authority.The following table Showing Details of DGPS Survey Point (WGS84).

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
COMP-5/0	DGPS	20° 59' 4.590" N	82° 4' 18.600" E
COMP-5/1	DGPS	20° 59' 4.767" N	82° 4' 18.673" E
COMP-161/1	DGPS	20° 54' 11.925" N	82° 9' 34.198" E
COMP-161/2	DGPS	20° 54' 14.178" N	82° 9' 25.998" E
COMP-160/1	DGPS	20° 54' 17.188" N	82° 9' 15.245" E
COMP-160/2	DGPS	20° 54' 22.751" N	82° 8' 55.928" E
COMP-160/3	DGPS	20° 54' 36.413" N	82° 9' 5.846" E
COMP-161/3	DGPS	20° 54' 32.253" N	82° 9' 37.466" E
COMP-160/4	DGPS	20° 54' 11.756" N	82° 9' 34.117" E
COMP160/5	DGPS	20° 54' 18.211" N	82° 9' 11.925" E
COMP161/5	DGPS	20° 54' 19.334" N	82° 9' 7.897" E
COMP161/6	DGPS	20° 54' 20.496" N	82° 9' 7.666" E
COMP161/7	DGPS	20° 54' 20.682" N	82° 9' 5.876" E
COMP161/8	DGPS	20° 54' 20.017" N	82° 9' 5.460" E
COMP161/9	DGPS	20° 54' 21.436" N	82° 9' 0.192" E
COMP161/10	DGPS	20° 54' 24.048" N	82° 8' 56.827" E
COMP161/11	DGPS	20° 54' 25.146" N	82° 8' 57.939" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
COMP161/12A	DGPS	20° 54' 25.238" N	82° 8' 59.211" E
COMP161/13	DGPS	20° 54' 25.238" N	82° 8' 59.211" E
COMP161/14	DGPS	20° 54' 31.236" N	82° 9' 2.013" E
COMP161/15	DGPS	20° 54' 32.886" N	82° 9' 3.310" E
COMP161/16	DGPS	20° 54' 39.708" N	82° 9' 10.530" E
COMP161/17	DGPS	20° 54' 32.359" N	82° 9' 14.908" E
COMP-160/6	DGPS	20° 54' 23.052" N	82° 9' 18.662" E
COMP-160/7	DGPS	20° 54' 22.374" N	82° 9' 18.139" E
COMP-160/8	DGPS	20° 54' 22.614" N	82° 9' 17.407" E
COMP-160/9	DGPS	20° 54' 18.843" N	82° 9' 15.765" E
COMP-160/10	DGPS	20° 54' 18.638" N	82° 9' 15.449" E
COMP-160/11	DGPS	20° 54' 18.614" N	82° 9' 15.217" E
COMP-232/2 (2)	DGPS	20° 47' 8.409" N	82° 11' 40.715" E
COMP-232/2	DGPS	20° 47' 8.291" N	82° 12' 7.217" E
COMP-232/3	DGPS	20° 47' 21.258" N	82° 12' 18.006" E
COMP-232/4	DGPS	20° 47' 22.843" N	82° 12' 20.237" E
COMP-232/5	DGPS	20° 47' 24.003" N	82° 12' 20.031" E
COMP-232/6	DGPS	20° 47' 25.247" N	82° 12' 17.680" E
COMP-232/7	DGPS	20° 47' 15.819" N	82° 12' 10.124" E
COMP-232/8	DGPS	20° 47' 15.029" N	82° 11' 58.708" E
COMP-232/9	DGPS	20° 47' 12.570" N	82° 11' 59.043" E
GPS1	DGPS	20° 54' 25.514" N	82° 9' 34.720" E
GPS2	DGPS	20° 54' 23.099" N	82° 9' 34.149" E
GPS3	DGPS	20° 54' 22.569" N	82° 9' 35.874" E
GPS4	DGPS	20° 54' 32.478" N	82° 9' 46.245" E
GPS5	DGPS	20° 54' 27.306" N	82° 9' 49.140" E
GPS6	DGPS	20° 54' 24.819" N	82° 9' 45.968" E
GPS7	DGPS	20° 54' 23.782" N	82° 9' 44.482" E
GPS8	DGPS	20° 54' 23.764" N	82° 9' 44.440" E
GPS9	DGPS	20° 54' 20.938" N	82° 9' 43.413" E
GPS10	DGPS	20° 54' 19.819" N	82° 9' 40.200" E
GPS11	DGPS	20° 54' 16.423" N	82° 9' 40.497" E
GPS12	DGPS	20° 54' 15.493" N	82° 9' 35.603" E
GPS13	DGPS	20° 54' 13.718" N	82° 9' 40.360" E
GPS14	DGPS	20° 54' 13.509" N	82° 9' 35.836" E
GPS15	DGPS	20° 54' 12.788" N	82° 9' 35.701" E
GPS16	DGPS	20° 54' 12.588" N	82° 9' 34.546" E
Comp_5_1	DGPS	20° 59' 2.251" N	82° 4' 22.559" E
Comp_5_2	DGPS	20° 59' 0.401" N	82° 4' 25.740" E
Comp_5_3	DGPS	20° 58' 56.197" N	82° 4' 34.008" E
Comp_5_4	DGPS	20° 59' 0.150" N	82° 4' 44.734" E
Comp_5_5	DGPS	20° 59' 1.507" N	82° 4' 56.450" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
Comp_5_6	DGPS	20° 58' 58.278" N	82° 4' 58.791" E
Comp_5_7	DGPS	20° 59' 1.681" N	82° 5' 5.499" E
Comp_5_8	DGPS	20° 58' 57.705" N	82° 5' 12.824" E
Comp_5_9	DGPS	20° 58' 59.135" N	82° 5' 11.385" E
Comp_5_10	DGPS	20° 59' 4.588" N	82° 5' 12.861" E
Comp_5_11	DGPS	20° 59' 16.593" N	82° 5' 6.343" E
Comp_5_12	DGPS	20° 59' 18.581" N	82° 5' 5.575" E
Comp_5_13	DGPS	20° 59' 10.103" N	82° 4' 44.914" E
Comp_5_14	DGPS	20° 59' 4.744" N	82° 4' 18.581" E
hgps_1	DGPS	20° 54' 18.715" N	82° 9' 22.345" E
hgps_2	DGPS	20° 54' 20.635" N	82° 9' 23.322" E
hgps_3	DGPS	20° 54' 20.899" N	82° 9' 25.905" E
hgps_4	DGPS	20° 54' 23.274" N	82° 9' 26.204" E
hgps_5	DGPS	20° 54' 11.992" N	82° 9' 34.149" E
hgps_6	DGPS	20° 54' 14.207" N	82° 9' 25.938" E
hgps_7	DGPS	20° 54' 17.201" N	82° 9' 15.286" E
hgps_8	DGPS	20° 54' 36.483" N	82° 9' 5.791" E
hgps_9	DGPS	20° 54' 32.343" N	82° 9' 37.390" E
hgps_10	DGPS	20° 54' 13.127" N	82° 9' 29.957" E
hgps_11	DGPS	20° 54' 14.176" N	82° 9' 26.019" E
hgps_12	DGPS	20° 54' 22.815" N	82° 8' 55.914" E
hgps_13	DGPS	20° 54' 12.540" N	82° 9' 34.612" E
hgps_14	DGPS	20° 54' 12.709" N	82° 9' 35.836" E
hgps_15	DGPS	20° 54' 13.331" N	82° 9' 35.882" E
hgps_16	DGPS	20° 54' 13.569" N	82° 9' 40.489" E
hgps_17	DGPS	20° 54' 25.412" N	82° 9' 34.718" E
hgps_18	DGPS	20° 54' 23.042" N	82° 9' 34.158" E
hgps_19	DGPS	20° 54' 22.487" N	82° 9' 35.855" E
hgps_20	DGPS	20° 54' 32.439" N	82° 9' 46.319" E
hgps_21	DGPS	20° 54' 27.245" N	82° 9' 49.085" E
hgps_22	DGPS	20° 54' 24.661" N	82° 9' 45.944" E
hgps_23	DGPS	20° 54' 23.828" N	82° 9' 44.441" E
hgps_24	DGPS	20° 54' 20.755" N	82° 9' 43.543" E
hgps_25	DGPS	20° 54' 15.465" N	82° 9' 35.535" E
hgps_26	DGPS	20° 54' 16.375" N	82° 9' 40.456" E
hgps_27	DGPS	20° 54' 19.755" N	82° 9' 40.145" E
hgps_28	DGPS	20° 54' 20.809" N	82° 9' 43.498" E
hgps_29	DGPS	20° 54' 23.840" N	82° 9' 44.430" E
hgps_30	DGPS	20° 54' 24.661" N	82° 9' 45.943" E
hgps_31	DGPS	20° 54' 32.440" N	82° 9' 46.318" E
232_F1	DGPS	20° 47' 7.400" N	82° 11' 38.400" E
232_F2	DGPS	20° 47' 5.900" N	82° 11' 39.900" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
232_F3	DGPS	20° 47' 6.900" N	82° 11' 47.000" E
232_F4	DGPS	20° 47' 9.300" N	82° 11' 57.100" E
232_F5	DGPS	20° 48' 6.400" N	82° 11' 55.600" E
232_F6	DGPS	20° 47' 14.800" N	82° 12' 12.400" E

8.0 Computation

Data recorded is downloaded from both rover and base receivers of DGPS and processed in Leica infinity software to get post-processed WGS-84 co-ordinates. The geographical co-ordinates of the forest land(CA) are tabulated below.

TABLE-I
GEOGRAPHICAL COORDINATES (WGS-84)
40.000 HA FOREST LAND (CA)
GEVRAOCP, GEVRAAREA, SECL

Point Id	Layer	Division	Range	Latitude (DMS)	Longitude (DMS)
83	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
84	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
85	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
86	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
87	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
88	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
89	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
90	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
91	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
92	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
93	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
94	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
95	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
96	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
97	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
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101	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
102	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
103	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
104	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
105	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
106	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
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108	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
109	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E

Point Id	Layer	Division	Range	Latitude (DMS)	Longitude (DMS)
110	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
111	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
112	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
113	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
114	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
115	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
116	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
117	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
118	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
119	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
120	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
121	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
122	COM_160	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
123	COM_161	Gariyaband	Chhura	20° 54' 22.940" N	82° 9' 26.394" E
124	COM_161	Gariyaband	Chhura	20° 54' 17.188" N	82° 9' 15.245" E
125	COM_161	Gariyaband	Chhura	20° 54' 18.211" N	82° 9' 11.925" E
126	COM_161	Gariyaband	Chhura	20° 54' 19.334" N	82° 9' 7.897" E
127	COM_161	Gariyaband	Chhura	20° 54' 20.496" N	82° 9' 7.666" E
128	COM_161	Gariyaband	Chhura	20° 54' 20.682" N	82° 9' 5.876" E
129	COM_161	Gariyaband	Chhura	20° 54' 20.017" N	82° 9' 5.460" E
130	COM_161	Gariyaband	Chhura	20° 54' 21.436" N	82° 9' 0.192" E
131	COM_161	Gariyaband	Chhura	20° 54' 22.751" N	82° 8' 55.928" E
132	COM_161	Gariyaband	Chhura	20° 54' 24.589" N	82° 8' 58.044" E
133	COM_161	Gariyaband	Chhura	20° 54' 23.854" N	82° 8' 59.618" E
134	COM_161	Gariyaband	Chhura	20° 54' 24.880" N	82° 8' 59.924" E
135	COM_161	Gariyaband	Chhura	20° 54' 26.210" N	82° 9' 2.103" E
136	COM_161	Gariyaband	Chhura	20° 54' 27.449" N	82° 9' 1.483" E
137	COM_161	Gariyaband	Chhura	20° 54' 28.704" N	82° 9' 2.604" E
138	COM_161	Gariyaband	Chhura	20° 54' 29.881" N	82° 9' 2.366" E
139	COM_161	Gariyaband	Chhura	20° 54' 32.537" N	82° 9' 3.675" E
140	COM_161	Gariyaband	Chhura	20° 54' 33.060" N	82° 9' 4.974" E
141	COM_161	Gariyaband	Chhura	20° 54' 35.173" N	82° 9' 7.447" E
142	COM_161	Gariyaband	Chhura	20° 54' 37.505" N	82° 9' 5.637" E
143	COM_161	Gariyaband	Chhura	20° 54' 37.970" N	82° 9' 6.220" E
144	COM_161	Gariyaband	Chhura	20° 54' 38.328" N	82° 9' 6.882" E
145	COM_161	Gariyaband	Chhura	20° 54' 38.271" N	82° 9' 8.063" E
146	COM_161	Gariyaband	Chhura	20° 54' 38.488" N	82° 9' 9.070" E
147	COM_161	Gariyaband	Chhura	20° 54' 38.889" N	82° 9' 10.270" E
148	COM_161	Gariyaband	Chhura	20° 54' 34.556" N	82° 9' 12.980" E
149	COM_161	Gariyaband	Chhura	20° 54' 31.807" N	82° 9' 13.840" E
150	COM_161	Gariyaband	Chhura	20° 54' 30.009" N	82° 9' 14.272" E
151	COM_161	Gariyaband	Chhura	20° 54' 25.067" N	82° 9' 15.660" E
152	COM_161	Gariyaband	Chhura	20° 54' 23.072" N	82° 9' 16.793" E
153	COM_161	Gariyaband	Chhura	20° 54' 21.396" N	82° 9' 15.955" E
154	COM_161	Gariyaband	Chhura	20° 54' 18.614" N	82° 9' 15.217" E

9.0 Documents Submitted

- Drawing Number: CMPDI/RI5/BSP/GEOM/2022/DGPS/90
- Soft copy of shape files & KML files in CD.

DISCLAIMER:

1. DGPS REPORT IS BASED ON SURVEY DATA.
2. DGPS REPORT IS FOR FOREST LAND(CA) APPLICATION ONLY & NOT VALID FOR ANY OTHER PURPOSE
3. CMPDIL IS NOT RESPONSIBLE FOR ANY FUTURE DISPUTE WITH RESPECT TO FOREST LAND DETAILS.

****

महाप्रबंधक
General Manager
एस.ई.सी.एल., गेवरा क्षेत्र
SECL, Gevra Area

नोडल ऑफीसर (पर्यावरण/वन)
Nodal Officer (ENV/Forest)
SECL/Gevra Area
एस.ई.सी.एल./गेवरा क्षेत्र

वन परिक्षेत्राधिकारी
छुरा परिक्षेत्र

संयुक्त वनमंडलाधिकारी राजिम
वनमंडल गरियाबंद

Divisional Forest Officer
Gariaband Division Gariaband

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA(COMPENSATORY AFFORESTATION) FOREST LAND AT GARIYABAND DIVISION AGAINST DIVERSION OF 94.293 HA REVENUE FOREST LAND OF SECL GEVRA OCP. (COMPARTMENT NO-161&160(AREA-20.000 HA) EACH

N

FID		Division	Range	Compartment	Area(Ha)	Latitude(WGS84)	Longitude(WGS84)
83		Gariyaband	Chhura	Com-161	20.000	20° 54' 22.940" N	82° 9' 26.394" E
84		Gariyaband	Chhura	Com-161	20.000	20° 54' 23.175" N	82° 9' 28.441" E
85		Gariyaband	Chhura	Com-161	20.000	20° 54' 25.008" N	82° 9' 28.541" E
86		Gariyaband	Chhura	Com-161	20.000	20° 54' 25.479" N	82° 9' 29.268" E
87		Gariyaband	Chhura	Com-161	20.000	20° 54' 25.567" N	82° 9' 31.459" E
88		Gariyaband	Chhura	Com-161	20.000	20° 54' 25.462" N	82° 9' 33.604" E
89		Gariyaband	Chhura	Com-161	20.000	20° 54' 25.053" N	82° 9' 34.466" E
90		Gariyaband	Chhura	Com-161	20.000	20° 54' 23.099" N	82° 9' 34.093" E
91		Gariyaband	Chhura	Com-161	20.000	20° 54' 22.635" N	82° 9' 34.184" E
92		Gariyaband	Chhura	Com-161	20.000	20° 54' 22.358" N	82° 9' 34.885" E
93		Gariyaband	Chhura	Com-161	20.000	20° 54' 22.294" N	82° 9' 35.929" E
94		Gariyaband	Chhura	Com-161	20.000	20° 54' 23.103" N	82° 9' 37.176" E
95		Gariyaband	Chhura	Com-161	20.000	20° 54' 25.112" N	82° 9' 38.401" E
96		Gariyaband	Chhura	Com-161	20.000	20° 54' 26.767" N	82° 9' 38.375" E
97		Gariyaband	Chhura	Com-161	20.000	20° 54' 28.731" N	82° 9' 38.235" E
98		Gariyaband	Chhura	Com-161	20.000	20° 54' 30.505" N	82° 9' 38.076" E
99		Gariyaband	Chhura	Com-161	20.000	20° 54' 31.708" N	82° 9' 37.988" E
100		Gariyaband	Chhura	Com-161	20.000	20° 54' 31.688" N	82° 9' 39.382" E
101		Gariyaband	Chhura	Com-161	20.000	20° 54' 31.612" N	82° 9' 41.503" E
102		Gariyaband	Chhura	Com-161	20.000	20° 54' 31.510" N	82° 9' 44.032" E
103		Gariyaband	Chhura	Com-161	20.000	20° 54' 31.784" N	82° 9' 45.337" E
104		Gariyaband	Chhura	Com-161	20.000	20° 54' 32.073" N	82° 9' 46.384" E
105		Gariyaband	Chhura	Com-161	20.000	20° 54' 30.968" N	82° 9' 46.907" E
106		Gariyaband	Chhura	Com-161	20.000	20° 54' 28.839" N	82° 9' 47.834" E
107		Gariyaband	Chhura	Com-161	20.000	20° 54' 27.184" N	82° 9' 48.541" E
108		Gariyaband	Chhura	Com-161	20.000	20° 54' 26.078" N	82° 9' 47.346" E
109		Gariyaband	Chhura	Com-161	20.000	20° 54' 24.860" N	82° 9' 45.934" E
110		Gariyaband	Chhura	Com-161	20.000	20° 54' 23.873" N	82° 9' 44.383" E
111		Gariyaband	Chhura	Com-161	20.000	20° 54' 20.978" N	82° 9' 43.369" E
112		Gariyaband	Chhura	Com-161	20.000	20° 54' 19.850" N	82° 9' 40.005" E
113		Gariyaband	Chhura	Com-161	20.000	20° 54' 16.489" N	82° 9' 40.409" E
114		Gariyaband	Chhura	Com-161	20.000	20° 54' 14.891" N	82° 9' 33.347" E
115		Gariyaband	Chhura	Com-161	20.000	20° 54' 12.001" N	82° 9' 34.121" E
116		Gariyaband	Chhura	Com-161	20.000	20° 54' 13.176" N	82° 9' 29.973" E
117		Gariyaband	Chhura	Com-161	20.000	20° 54' 14.218" N	82° 9' 26.054" E
118		Gariyaband	Chhura	Com-161	20.000	20° 54' 18.131" N	82° 9' 26.099" E
119		Gariyaband	Chhura	Com-161	20.000	20° 54' 18.754" N	82° 9' 22.454" E
120		Gariyaband	Chhura	Com-161	20.000	20° 54' 20.075" N	82° 9' 23.817" E
121		Gariyaband	Chhura	Com-161	20.000	20° 54' 20.537" N	82° 9' 26.034" E
122		Gariyaband	Chhura	Com-161	20.000	20° 54' 22.940" N	82° 9' 26.394" E
123		Gariyaband	Chhura	Com-160	20.000	20° 54' 18.614" N	82° 9' 15.217" E
124		Gariyaband	Chhura	Com-160	20.000	20° 54' 17.188" N	82° 9' 15.245" E
125		Gariyaband	Chhura	Com-160	20.000	20° 54' 18.211" N	82° 9' 11.925" E
126		Gariyaband	Chhura	Com-160	20.000	20° 54' 19.334" N	82° 9' 7.897" E
127		Gariyaband	Chhura	Com-160	20.000	20° 54' 20.496" N	82° 9' 7.666" E
128		Gariyaband	Chhura	Com-160	20.000	20° 54' 20.682" N	82° 9' 5.876" E
129		Gariyaband	Chhura	Com-160	20.000	20° 54' 20.017" N	82° 9' 5.460" E
130		Gariyaband	Chhura	Com-160	20.000	20° 54' 21.436" N	82° 9' 0.192" E
131		Gariyaband	Chhura	Com-160	20.000	20° 54' 22.751" N	82° 8' 55.928" E
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141		Gariyaband	Chhura	Com-160	20.000	20° 54' 35.173" N	82° 9' 7.447" E
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144		Gariyaband	Chhura	Com-160	20.000	20° 54' 38.328" N	82° 9' 6.882" E
145		Gariyaband	Chhura	Com-160	20.000	20° 54' 38.271" N	82° 9' 8.063" E
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147		Gariyaband	Chhura	Com-160	20.000	20° 54' 38.889" N	82° 9' 10.270" E
148		Gariyaband	Chhura	Com-160	20.000	20° 54' 34.556" N	82° 9' 12.980" E
149		Gariyaband	Chhura	Com-160	20.000	20° 54' 31.807" N	82° 9' 13.840" E
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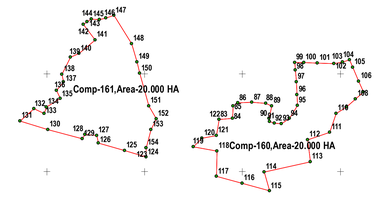
152		Gariyaband	Chhura	Com-160	20.000	20° 54' 23.072" N	82° 9' 16.793" E
153		Gariyaband	Chhura	Com-160	20.000	20° 54' 21.396" N	82° 9' 15.955" E
154		Gariyaband	Chhura	Com-160	20.000	20° 54' 18.614" N	82° 9' 15.217" E



Land Schedule of CA forest Land

Division	Range	Compartment	Area(Ha)
Gariyaband	Chhura	Com-161	20
Gariyaband	Chhura	Com-160	20

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Customer	SOUTH EASTERN COALFIELDS LIMITED			
Project	GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA (COMPENSATORY AFFORESTATION)FOREST LAND AT GARIYABAND DIVISION			Job Number 503308
Subject	Activity	Name	Designation	Signature / Date
PLAN SHOWING OF CA (COMPENSATORY AFFORESTATION) FOREST LAND COMPARTMENT NO-161&160 (AREA-20.000 HA) EACH AGAINST 94.293 HA REVENUE FOREST LAND FOR GEVRA OCP OF GEVRA AREA(SECL)	Surveyed &Processed By	Madhusudan Banik	Sr.Surveyor (C)	
	Checked By	Upendra Pandey	Officer Survey	
	Approved	Sudhanshu Mishra	Chief Manager (Mining)	
	Scale 0 255 510 1,020 M — 1:10,000			Sheet 1
	Dwg CMPDI/RI5/BSP/GEOM/2023/DGPS/90			Rev No. 0

cmpdi — A Mini Ratna Company

ANNEXURES

DRAWINGS
&
COMPACT DISC

Job No.: 503308

GEO-REFERENCED BOUNDARY MAP

(IN SHAPE FILE)
COMPENSATORT AFFORESTATION (CA) FOREST LAND
(AREA-54.00 HA)
GEVRA PROJECT
GEVRA AREA, SECL

JANUARY-2023

INDEX

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE)
OF COMPENSATORY AFFORESTATION (CA) FOREST LAND
(AREA-54.00 HA) AT GARIYABAND DIVISION FOR
GEVRA OCP, GEVRA AREA, SECL

1.0 Introduction

A proposal for DGPS survey of 54.000hectarecompensatory afforestation (CA) forest land at Gariyaband division has been received in CMPDIL through e-office along with details of forest land allotted by forest department duly forwarded through General Manager, Gevra Area, South Eastern Coalfields Limited (SECL) vide letter G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101).As per annual action plan for the year 2022-2023(CMPDI/RI-5/EXPL/2022-23/03 Dated 01-04-2022) DGPS survey of forest land is to be taken up by CMPDIL.

As per work order No.G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101). the CA land (Area-54.00Ha) for 94.293 Ha revenue forest land proposal of Gevra OCP has been identified at Gariyaband Forest Division.

Colliery authorities identified the patch on the ground with the help of forest officials.DGPS survey has been carried out at selected ground locations identified by forestpersonnelas per requirement.

DGPS report containing geo-referenced boundary map and shape files in projected and geographical coordinate system is submitted herewith. A geo-referenced boundary map in 1:10000 scale and corresponding KML files are also enclosed herewith in order to facilitate SECL to apply through online application portal PARIVESH.

Soft copies of the map and shape files are given in CD for further necessary action by SECL.
Relevant documents are given as annexures in this report.
The following table shows the land schedule of the proposed Compensatory Afforestation (CA) Forest Land.

Land Schedule of Compensatory Afforestation(CA) Forest Land					
SL. NO.	**Division**	**Range**	**Comp**	**Area(HA)**	
1	Gariyaband	Fingeshwar	COM-5	54.00	
				Total Area	**54.000**

2.0 Background

Electricity is a very important commodity that cannot be dispensed for the modern lifestyle of people and communities worldwide. India being a growing economy is not an exception. Electricity produced through thermal power stations meets about seventy percentage of total electricity requirement of our country. Coal plays a vital role in these thermal power stations. With growing

concern for increasing power production, the thrust is on increasing production on coal producing companies, such as SECL.

Coal demand for other industrial and domestic consumption has also increased over the years. Coal producing companies, in general, are always required to mine more coal through open cast and underground coal mines in order to meet the coal demand by thermal power stations.

Coal producing companies are left with only two options. Either they should open new coal mines or increase the capacity of existing mines. While it is not very easy to open up new coal mines, the only option left is to expand the existing mines in terms of its capacity or in terms of physical extent of the existing mine.

In most of the mining lease hold areas it is observed that the coal bearing area is falling in forest areas that has been left out for want of forestry clearance. These forest lands are categorized into the following three types:

- Reserved Forest
- Protected Forest
- Revenue Forest

In order to carry out mining activities in these forest lands, forest clearance is required to obtain from the Ministry of Environment, Forest and Climate Change(MOEFCC).

To check irrational exploitation of forest and to maintain the ecological balance, Forest Conservation Act (FRA), 1980 has been enacted. Under this act, no forest land can be used for non-forestry purpose without prior approval from the ministry.

For getting forest clearance from MOEFCC the coal producing companies are required to apply through recently updated web portal called "Pro-Active and Responsive facilitation by Interactive, Virtuous and Environmental Single-Window Hub (PARIVESH)" which is a web based, role-based workflow application that has been developed for online submission and monitoring of proposals submitted by the proponents for seeking environment, forest, wildlife, and CRZ clearances from central state and district level authorities.

It automates the entire tracking of proposals which includes online submission of a new proposal, editing/updating the details of proposals and displays status of the proposals at each stage of the workflow.

The procedure for forest clearance envisaged under the act mandates a two-stage approval process consisting of two stages:

- **Stage I**

Upon prima facie review the proposal is either accepted or rejected. If approved, the project authority is required to deposit an amount for compensation of the opportunity cost of the forest (NPV, compensatory afforestation, additional expenses towards mitigating probable environmental damage etc.)

- **Stage II**

Following the deposit of above-mentioned costs, the land is handed over to the project authorities provided they have obtained all other requisite clearances.

Reserve forest boundaries are generally marked on the ground with large forest pillars while the boundaries of protected forests are marked on the ground with trenches, fencing and other markings.

As per the circular of MOEFCC, one of the pre-requisites for getting forestry clearance is a geo-referenced boundary map in shape file format of the desired forest land.

3.0 Location

The salient points of CA forest land identified for this project are located at fingeshwar,District-Gariyaband, Chhattisgarh.Nearest Gariyaband.

4.0 Scope of Services

The scope of services of CMPDIL to provide Geo-referenced boundarymap (in shape files and pdf format), converted geographical coordinates of forest boundary after making DGPS observation at salient points and KML files etc.

5.0 Methodology

Static DGPS (Differential Global Positioning System) survey is appropriate for determining geographical co-ordinates of forest boundary.

The Global Positioning System (GPS) is a satellite-based location, timing and navigation system in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Presently, 30 orbiting satellites of GPS constellation of USA and 24 GLONASS (*Globalnaya navigatsionnaya sputnikovaya sistema* or Global Navigation Satellite System) satellites of Russia are operational for the purpose of GPS survey.

In addition to these primary GPS constellation, European space agency and Chinese have their own constellation such as Galileo and BeiDou respectively.

India's prestigious GAGAN (GPS Aided Geo Augmented Navigation (GAGAN) system) navigation system is also presently operational providing vital positional information to civil aviation and other industries.

The Global Positioning System is a system of communication made up of three independent aspects such as:

- GPS satellites orbiting the Earth;

- Control and monitoring stations on Earth;
- GPS receivers owned by users.

GPS satellites transmit the satellites number, its position in space, and the exact time. These informations are sent through the transmitted signals at regular intervals by all the satellites are all times.

These signals are picked up by various types of GPS receivers on ground. With signals from three or more satellites, a GPS receiver can triangulate its location on the ground (i.e., longitude and latitude) from the known position of the satellites. With four or more satellites, a GPS receiver can determine a 3D position (i.e., latitude, longitude, and ellipsoidal height).Differential Global Positioning System (DGPS) refers to using two or more GPS receivers to achieve greater positional accuracy. There are three basic methods of doing DGPS survey.

- Static
- Rapid-Static
- Real-time Kinematic (RTK).

For doing DGPS survey of forest land, post-processed static survey is found to be most suitable where one GPS receiver is used as base station and other GPS receivers are used as rover stations. Base receiver is stationed at a point of known co-ordinates for longer duration and rover stations are kept at unknown stations for comparatively shorter duration. DGPS observation is done in each rover stations for compensatory afforestation.

Data from base and rovers are downloaded and then post-processed in GPS data processing software, Leicainfinity to achieve sub-centimeter level accuracies.

ArcGIS 10.2 version software is used for preparation of shape files, KML file and geo-referenced map of the forest land in WGS-84 co-ordinates.

6.0 Survey Instrument

For providing geographical (spherical) co-ordinates of the stations along the boundary, Differential Global Positioning System (DGPS) consisting of one base receiver and a rover receiver were used. CMPDIL has the latest hardware and software of Leica make DGPS instrument which has dual-frequency GPS signal receivers that provide accurate results after post processing in relevant software. Brief specifications of DGPS are provided in the table below.

A	***DGPS Instrument:***	
	Make	Leica
	Model	GS25 & GS16
	Signal	GPS: L1, L2&L5 carrier, CA, L1P, L2P, L2C GLONASS: L1, L2&L5 carrier, L1CA, L2CA, L1P, L2P GALILEO: E2-L1-E1, E5, E6
	Channels	72
	Accuracy:	sub-centimeter
	Post Processed Static DGPS	3mm +0.5ppm horizontal, 5mm + 0.5ppm vertical
	Real Time RTK	10mm + 1 ppm horizontal, 15mm + 1 ppm vertical
	Power:	
	Internal Battery	2 Li-Ion, 3900mAh, 7.2V
	Communication:	
	Bluetooth	Bluetooth standard 1.2
	USB	1.1 Version
B	***DGPS Software***	Inbuilt Leica software for data recording
		Leicainfinity for data processing

7.0 Details of Field Activity

DGPS survey has been carried out in ground locations identified by forest authorities in the presence of Gevra colliery authority.The following table Showing Details of DGPS Survey Point (WGS84).

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
COMP-5/0	DGPS	20° 59' 4.590" N	82° 4' 18.600" E
COMP-5/1	DGPS	20° 59' 4.767" N	82° 4' 18.673" E
COMP-161/1	DGPS	20° 54' 11.925" N	82° 9' 34.198" E
COMP-161/2	DGPS	20° 54' 14.178" N	82° 9' 25.998" E
COMP-160/1	DGPS	20° 54' 17.188" N	82° 9' 15.245" E
COMP-160/2	DGPS	20° 54' 22.751" N	82° 8' 55.928" E
COMP-160/3	DGPS	20° 54' 36.413" N	82° 9' 5.846" E
COMP-161/3	DGPS	20° 54' 32.253" N	82° 9' 37.466" E
COMP-160/4	DGPS	20° 54' 11.756" N	82° 9' 34.117" E
COMP160/5	DGPS	20° 54' 18.211" N	82° 9' 11.925" E
COMP161/5	DGPS	20° 54' 19.334" N	82° 9' 7.897" E
COMP161/6	DGPS	20° 54' 20.496" N	82° 9' 7.666" E
COMP161/7	DGPS	20° 54' 20.682" N	82° 9' 5.876" E
COMP161/8	DGPS	20° 54' 20.017" N	82° 9' 5.460" E
COMP161/9	DGPS	20° 54' 21.436" N	82° 9' 0.192" E
COMP161/10	DGPS	20° 54' 24.048" N	82° 8' 56.827" E
COMP161/11	DGPS	20° 54' 25.146" N	82° 8' 57.939" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
COMP161/12A	DGPS	20° 54' 25.238" N	82° 8' 59.211" E
COMP161/13	DGPS	20° 54' 25.238" N	82° 8' 59.211" E
COMP161/14	DGPS	20° 54' 31.236" N	82° 9' 2.013" E
COMP161/15	DGPS	20° 54' 32.886" N	82° 9' 3.310" E
COMP161/16	DGPS	20° 54' 39.708" N	82° 9' 10.530" E
COMP161/17	DGPS	20° 54' 32.359" N	82° 9' 14.908" E
COMP-160/6	DGPS	20° 54' 23.052" N	82° 9' 18.662" E
COMP-160/7	DGPS	20° 54' 22.374" N	82° 9' 18.139" E
COMP-160/8	DGPS	20° 54' 22.614" N	82° 9' 17.407" E
COMP-160/9	DGPS	20° 54' 18.843" N	82° 9' 15.765" E
COMP-160/10	DGPS	20° 54' 18.638" N	82° 9' 15.449" E
COMP-160/11	DGPS	20° 54' 18.614" N	82° 9' 15.217" E
COMP-232/2 (2)	DGPS	20° 47' 8.409" N	82° 11' 40.715" E
COMP-232/2	DGPS	20° 47' 8.291" N	82° 12' 7.217" E
COMP-232/3	DGPS	20° 47' 21.258" N	82° 12' 18.006" E
COMP-232/4	DGPS	20° 47' 22.843" N	82° 12' 20.237" E
COMP-232/5	DGPS	20° 47' 24.003" N	82° 12' 20.031" E
COMP-232/6	DGPS	20° 47' 25.247" N	82° 12' 17.680" E
COMP-232/7	DGPS	20° 47' 15.819" N	82° 12' 10.124" E
COMP-232/8	DGPS	20° 47' 15.029" N	82° 11' 58.708" E
COMP-232/9	DGPS	20° 47' 12.570" N	82° 11' 59.043" E
GPS1	DGPS	20° 54' 25.514" N	82° 9' 34.720" E
GPS2	DGPS	20° 54' 23.099" N	82° 9' 34.149" E
GPS3	DGPS	20° 54' 22.569" N	82° 9' 35.874" E
GPS4	DGPS	20° 54' 32.478" N	82° 9' 46.245" E
GPS5	DGPS	20° 54' 27.306" N	82° 9' 49.140" E
GPS6	DGPS	20° 54' 24.819" N	82° 9' 45.968" E
GPS7	DGPS	20° 54' 23.782" N	82° 9' 44.482" E
GPS8	DGPS	20° 54' 23.764" N	82° 9' 44.440" E
GPS9	DGPS	20° 54' 20.938" N	82° 9' 43.413" E
GPS10	DGPS	20° 54' 19.819" N	82° 9' 40.200" E
GPS11	DGPS	20° 54' 16.423" N	82° 9' 40.497" E
GPS12	DGPS	20° 54' 15.493" N	82° 9' 35.603" E
GPS13	DGPS	20° 54' 13.718" N	82° 9' 40.360" E
GPS14	DGPS	20° 54' 13.509" N	82° 9' 35.836" E
GPS15	DGPS	20° 54' 12.788" N	82° 9' 35.701" E
GPS16	DGPS	20° 54' 12.588" N	82° 9' 34.546" E
Comp_5_1	DGPS	20° 59' 2.251" N	82° 4' 22.559" E
Comp_5_2	DGPS	20° 59' 0.401" N	82° 4' 25.740" E
Comp_5_3	DGPS	20° 58' 56.197" N	82° 4' 34.008" E
Comp_5_4	DGPS	20° 59' 0.150" N	82° 4' 44.734" E
Comp_5_5	DGPS	20° 59' 1.507" N	82° 4' 56.450" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
Comp_5_6	DGPS	20° 58' 58.278" N	82° 4' 58.791" E
Comp_5_7	DGPS	20° 59' 1.681" N	82° 5' 5.499" E
Comp_5_8	DGPS	20° 58' 57.705" N	82° 5' 12.824" E
Comp_5_9	DGPS	20° 58' 59.135" N	82° 5' 11.385" E
Comp_5_10	DGPS	20° 59' 4.588" N	82° 5' 12.861" E
Comp_5_11	DGPS	20° 59' 16.593" N	82° 5' 6.343" E
Comp_5_12	DGPS	20° 59' 18.581" N	82° 5' 5.575" E
Comp_5_13	DGPS	20° 59' 10.103" N	82° 4' 44.914" E
Comp_5_14	DGPS	20° 59' 4.744" N	82° 4' 18.581" E
hgps_1	DGPS	20° 54' 18.715" N	82° 9' 22.345" E
hgps_2	DGPS	20° 54' 20.635" N	82° 9' 23.322" E
hgps_3	DGPS	20° 54' 20.899" N	82° 9' 25.905" E
hgps_4	DGPS	20° 54' 23.274" N	82° 9' 26.204" E
hgps_5	DGPS	20° 54' 11.992" N	82° 9' 34.149" E
hgps_6	DGPS	20° 54' 14.207" N	82° 9' 25.938" E
hgps_7	DGPS	20° 54' 17.201" N	82° 9' 15.286" E
hgps_8	DGPS	20° 54' 36.483" N	82° 9' 5.791" E
hgps_9	DGPS	20° 54' 32.343" N	82° 9' 37.390" E
hgps_10	DGPS	20° 54' 13.127" N	82° 9' 29.957" E
hgps_11	DGPS	20° 54' 14.176" N	82° 9' 26.019" E
hgps_12	DGPS	20° 54' 22.815" N	82° 8' 55.914" E
hgps_13	DGPS	20° 54' 12.540" N	82° 9' 34.612" E
hgps_14	DGPS	20° 54' 12.709" N	82° 9' 35.836" E
hgps_15	DGPS	20° 54' 13.331" N	82° 9' 35.882" E
hgps_16	DGPS	20° 54' 13.569" N	82° 9' 40.489" E
hgps_17	DGPS	20° 54' 25.412" N	82° 9' 34.718" E
hgps_18	DGPS	20° 54' 23.042" N	82° 9' 34.158" E
hgps_19	DGPS	20° 54' 22.487" N	82° 9' 35.855" E
hgps_20	DGPS	20° 54' 32.439" N	82° 9' 46.319" E
hgps_21	DGPS	20° 54' 27.245" N	82° 9' 49.085" E
hgps_22	DGPS	20° 54' 24.661" N	82° 9' 45.944" E
hgps_23	DGPS	20° 54' 23.828" N	82° 9' 44.441" E
hgps_24	DGPS	20° 54' 20.755" N	82° 9' 43.543" E
hgps_25	DGPS	20° 54' 15.465" N	82° 9' 35.535" E
hgps_26	DGPS	20° 54' 16.375" N	82° 9' 40.456" E
hgps_27	DGPS	20° 54' 19.755" N	82° 9' 40.145" E
hgps_28	DGPS	20° 54' 20.809" N	82° 9' 43.498" E
hgps_29	DGPS	20° 54' 23.840" N	82° 9' 44.430" E
hgps_30	DGPS	20° 54' 24.661" N	82° 9' 45.943" E
hgps_31	DGPS	20° 54' 32.440" N	82° 9' 46.318" E
232_F1	DGPS	20° 47' 7.400" N	82° 11' 38.400" E
232_F2	DGPS	20° 47' 5.900" N	82° 11' 39.900" E

POINT_ID	INSTRUMENT	LATITUDE(WGS84)	LONGITUDE(WGS84)
232_F3	DGPS	20° 47' 6.900" N	82° 11' 47.000" E
232_F4	DGPS	20° 47' 9.300" N	82° 11' 57.100" E
232_F5	DGPS	20° 48' 6.400" N	82° 11' 55.600" E
232_F6	DGPS	20° 47' 14.800" N	82° 12' 12.400" E

8.0 Computation

Data recorded is downloaded from both rover and base receivers of DGPS and processed in Leica infinity software to get post-processed WGS-84 co-ordinates. The geographical co-ordinates of the forest land(CA) are tabulated below.

TABLE-I
GEOGRAPHICAL COORDINATES (WGS-84)
54.000 HA FOREST LAND (CA)
GEVRAOCP, GEVRAAREA, SECL

Point Id	Layer	Division	Range	Latitude (DMS)	Longitude (DMS)
0	COM_5	Gariyaband	Fingeshwar	20° 59' 6.405" N	82° 4' 25.201" E
1	COM_5	Gariyaband	Fingeshwar	20° 59' 7.692" N	82° 4' 30.514" E
2	COM_5	Gariyaband	Fingeshwar	20° 59' 8.401" N	82° 4' 35.275" E
3	COM_5	Gariyaband	Fingeshwar	20° 59' 9.238" N	82° 4' 40.100" E
4	COM_5	Gariyaband	Fingeshwar	20° 59' 10.103" N	82° 4' 44.914" E
5	COM_5	Gariyaband	Fingeshwar	20° 59' 12.642" N	82° 4' 51.183" E
6	COM_5	Gariyaband	Fingeshwar	20° 59' 16.304" N	82° 5' 0.040" E
7	COM_5	Gariyaband	Fingeshwar	20° 59' 18.581" N	82° 5' 5.575" E
8	COM_5	Gariyaband	Fingeshwar	20° 59' 16.593" N	82° 5' 6.343" E
9	COM_5	Gariyaband	Fingeshwar	20° 59' 15.063" N	82° 5' 7.667" E
10	COM_5	Gariyaband	Fingeshwar	20° 59' 14.608" N	82° 5' 8.019" E
11	COM_5	Gariyaband	Fingeshwar	20° 59' 14.066" N	82° 5' 8.192" E
12	COM_5	Gariyaband	Fingeshwar	20° 59' 12.342" N	82° 5' 8.123" E
13	COM_5	Gariyaband	Fingeshwar	20° 59' 11.821" N	82° 5' 8.168" E
14	COM_5	Gariyaband	Fingeshwar	20° 59' 11.096" N	82° 5' 8.456" E
15	COM_5	Gariyaband	Fingeshwar	20° 59' 6.806" N	82° 5' 11.811" E
16	COM_5	Gariyaband	Fingeshwar	20° 59' 5.985" N	82° 5' 12.355" E
17	COM_5	Gariyaband	Fingeshwar	20° 59' 5.381" N	82° 5' 12.602" E
18	COM_5	Gariyaband	Fingeshwar	20° 59' 4.588" N	82° 5' 12.861" E
19	COM_5	Gariyaband	Fingeshwar	20° 59' 3.296" N	82° 5' 11.857" E
20	COM_5	Gariyaband	Fingeshwar	20° 59' 0.481" N	82° 5' 11.382" E
21	COM_5	Gariyaband	Fingeshwar	20° 58' 59.135" N	82° 5' 11.385" E
22	COM_5	Gariyaband	Fingeshwar	20° 58' 59.957" N	82° 5' 10.526" E
23	COM_5	Gariyaband	Fingeshwar	20° 59' 0.569" N	82° 5' 9.803" E
24	COM_5	Gariyaband	Fingeshwar	20° 59' 0.897" N	82° 5' 9.101" E
25	COM_5	Gariyaband	Fingeshwar	20° 59' 0.960" N	82° 5' 8.643" E
26	COM_5	Gariyaband	Fingeshwar	20° 59' 0.987" N	82° 5' 7.911" E

Point Id	Layer	Division	Range	Latitude (DMS)	Longitude (DMS)
27	COM_5	Gariyaband	Fingeshwar	20° 59' 1.183" N	82° 5' 7.035" E
28	COM_5	Gariyaband	Fingeshwar	20° 59' 1.887" N	82° 5' 5.417" E
29	COM_5	Gariyaband	Fingeshwar	20° 59' 1.333" N	82° 5' 4.634" E
30	COM_5	Gariyaband	Fingeshwar	20° 58' 59.684" N	82° 5' 2.872" E
31	COM_5	Gariyaband	Fingeshwar	20° 58' 58.605" N	82° 5' 1.332" E
32	COM_5	Gariyaband	Fingeshwar	20° 58' 58.278" N	82° 4' 58.791" E
33	COM_5	Gariyaband	Fingeshwar	20° 59' 1.507" N	82° 4' 56.450" E
34	COM_5	Gariyaband	Fingeshwar	20° 59' 0.150" N	82° 4' 44.734" E
35	COM_5	Gariyaband	Fingeshwar	20° 58' 56.197" N	82° 4' 34.008" E
36	COM_5	Gariyaband	Fingeshwar	20° 58' 58.390" N	82° 4' 30.191" E
37	COM_5	Gariyaband	Fingeshwar	20° 59' 0.401" N	82° 4' 25.740" E
38	COM_5	Gariyaband	Fingeshwar	20° 59' 1.574" N	82° 4' 23.719" E
39	COM_5	Gariyaband	Fingeshwar	20° 58' 58.694" N	82° 4' 17.926" E
40	COM_5	Gariyaband	Fingeshwar	20° 59' 3.051" N	82° 4' 13.698" E
41	COM_5	Gariyaband	Fingeshwar	20° 59' 4.744" N	82° 4' 18.581" E
42	COM_5	Gariyaband	Fingeshwar	20° 59' 6.405" N	82° 4' 25.201" E

9.0 Documents Submitted

- Drawing Number: CMPDI/RI5/BSP/GEOM/2022/DGPS/90
- Soft copy of shape files & KML files in CD.

DISCLAIMER:

1. DGPS REPORT IS BASED ON SURVEY DATA.
2. DGPS REPORT IS FOR FOREST LAND(CA) APPLICATION ONLY & NOT VALID FOR ANY OTHER PURPOSE
3. CMPDIL IS NOT RESPONSIBLE FOR ANY FUTURE DISPUTE WITH RESPECT TO FOREST LAND DETAILS.

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16/1/23
महाप्रबंधक
General Manager
एस.ई.सी.एल., गेवरा क्षेत्र
SECL, Gevra Area

नोडल ऑफीसर (पर्यावरण/वन)
Nodal Officer (ENV/Forest)
SECL/Gevra Area
एस.ई.सी.एल./गेवरा क्षेत्र

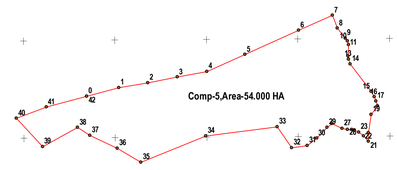
वन परिक्षेत्र अधिकारी
फिंगेश्वर

संयुक्त वनमंडलाधिकारी राजिम
वनमंडल गरियाबंद

Divisional Forest Officer
Gariaband Division Gariaband

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA(COMPENSATORY AFFORESTATION) FOREST LAND AT GARIYABAND DIVISION AGAINST DIVERSION OF 94.293 HA REVENUE FOREST LAND OF SECL GEVRA OCP. (COMPARTMENT NO-5(AREA-54.000 HA)

FID		Division	Range	Compartment	Area(Ha)	Latitude(WGS84)	Longitude(WGS84)
0		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 6.405" N	82° 4' 25.201" E
1		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 7.692" N	82° 4' 30.514" E
2		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 8.401" N	82° 4' 35.275" E
3		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 9.238" N	82° 4' 40.100" E
4		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 10.103" N	82° 4' 44.914" E
5		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 12.642" N	82° 4' 51.183" E
6		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 16.304" N	82° 5' 0.040" E
7		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 18.581" N	82° 5' 5.575" E
8		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 16.593" N	82° 5' 6.343" E
9		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 15.063" N	82° 5' 7.667" E
10		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 14.608" N	82° 5' 8.019" E
11		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 14.066" N	82° 5' 8.192" E
12		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 12.342" N	82° 5' 8.123" E
13		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 11.821" N	82° 5' 8.168" E
14		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 11.096" N	82° 5' 8.456" E
15		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 6.806" N	82° 5' 11.811" E
16		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 5.985" N	82° 5' 12.355" E
17		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 5.381" N	82° 5' 12.602" E
18		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 4.588" N	82° 5' 12.861" E
19		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 3.296" N	82° 5' 11.857" E
20		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.481" N	82° 5' 11.382" E
21		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 59.135" N	82° 5' 11.385" E
22		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 59.957" N	82° 5' 10.526" E
23		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.569" N	82° 5' 9.803" E
24		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.897" N	82° 5' 9.101" E
25		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.960" N	82° 5' 8.643" E
26		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.987" N	82° 5' 7.911" E
27		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 1.183" N	82° 5' 7.035" E
28		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 1.887" N	82° 5' 5.417" E
29		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 1.333" N	82° 5' 4.634" E
30		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 59.684" N	82° 5' 2.872" E
31		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 58.605" N	82° 5' 1.332" E
32		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 58.278" N	82° 4' 58.791" E
33		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 1.507" N	82° 4' 56.450" E
34		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.150" N	82° 4' 44.734" E
35		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 56.197" N	82° 4' 34.008" E
36		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 58.390" N	82° 4' 30.191" E
37		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 0.401" N	82° 4' 25.740" E
38		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 1.574" N	82° 4' 23.719" E
39		Gariyaband	Fingeshwar	Com-5	54.000	20° 58' 58.694" N	82° 4' 17.926" E
40		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 3.051" N	82° 4' 13.698" E
41		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 4.744" N	82° 4' 18.581" E
42		Gariyaband	Fingeshwar	Com-5	54.000	20° 59' 6.405" N	82° 4' 25.201" E



Land Schedule of CA forest Land

Division	Range	Compartment	Area(Ha)
Gariyaband	Fingeshwar	Com-5	54

Coordinate System: WGS 1984 UTM Zone 44N
Projection: Transverse Mercator
Datum: WGS 1984
False Easting: 500,000.0000
False Northing: 0.0000
Central Meridian: 81.0000
Scale Factor: 0.9996
Latitude Of Origin: 0.0000
Units: Meter

Customer: **SOUTH EASTERN COALFIELDS LIMITED**

Project: GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA (COMPENSATORY AFFORESTATION)FOREST LAND AT GARIYABAND DIVISION

Job Number: **503308**

Subject: PLAN SHOWING OF CA (COMPENSATORY AFFORESTATION) FOREST LAND COMPARTMENT NO-5 (AREA-54.000 HA) AGAINST 94.293 HA REVENUE FOREST LAND FOR GEVRA OCP OF GEVRA AREA(SECL)

Activity	Name	Designation	Signature	Date
Surveyed &Processed By	Madhusudan Banik	Sr.Surveyor (C)		
Checked By	Upendra Pandey	Officer Survey		
Approved	Sudhanshu Mishra	Chief Manager (Mining)		

Scale: 0 255 510 1,020 M — 1:10,000

Sheet: 1

Dwg: CMPDI/RI5/BSP/GEOM/2023/DGPS/90

Rev No.: 0

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ANNEXURES

DRAWINGS
&
COMPACT DISC

Job No.: 503308

GEO-REFERENCED BOUNDARY MAP

(IN SHAPE FILE)
COMPENSATORT AFFORESTATION (CA) FOREST LAND
(AREA-58.00 HA)
GEVRA PROJECT
GEVRA AREA, SECL

DECEMBER-2022

cmpdi
A Mini Ratna Company

INDEX

Job No.: 505381

cmpdi
A Mini Ratna Company

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF COMPENSATORY AFFORESTATION (CA) FOREST LAND (AREA-59.577 HA) AT KATHGHORA DIVISION FOR GEVRA OCP, GEVRA AREA, SECL

1.0 Introduction

A proposal for DGPS survey of 58.000 hectare compensatory afforestation (CA) forest land at Katghora division has been received in CMPDIL through e-office along with details of forest land allotted by forest department duly forwarded through General Manager, Gevra Area, South Eastern Coalfields Limited (SECL) vide letter G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101).As per annual action plan for the year 2022-2023(CMPDI/RI-5/EXPL/2022-23/03 Dated 01-04-2022) DGPS survey of forest land is to be taken up by CMPDIL.

As per work order No. G-FORS/16/0003/2022-Forest,SECL HQ- SOUTH EASTERN COALFILDS LIMITED (Computer No 753101). The CA land (Area-58.00 Ha) for 94.293 Ha revenue forest land proposal of Gevra OCP has been identified at Kathghora Forest Division.

Colliery authorities identified the patch on the ground with the help of forest officials.DGPS survey has been carried out at selected ground locations identified by forest personnel as per requirement.

DGPS report containing geo-referenced boundary map and shape files in projected and geographical coordinate system is submitted herewith. A geo-referenced boundary map in 1:10000 scale and corresponding KML files are also enclosed herewith in order to facilitate SECL to apply through online application portal PARIVESH.

Soft copies of the map and shape files are given in CD for further necessary action by SECL.
Relevant documents are given as annexures in this report.
The following table shows the land schedule of the proposed Compensatory Afforestation (CA) Forest Land.

Land Schedule of Compensatory Afforestation(CA) Forest Land					
SL. NO.	**Division**	**Range**	**Comp**	**Area(HA)**	
1	Kathghora	Pali	OA599	58.00	
				Total Area	**58.000**

2.0 Background

Electricity is a very important commodity that cannot be dispensed for the modern lifestyle of people and communities worldwide. India being a growing economy is not an exception. Electricity produced through thermal power stations meets about seventy percentage of total electricity requirement of our country. Coal plays a vital role in these thermal power stations. With growing

concern for increasing power production, the thrust is on increasing production on coal producing companies, such as SECL.

Coal demand for other industrial and domestic consumption has also increased over the years. Coal producing companies, in general, are always required to mine more coal through open cast and underground coal mines in order to meet the coal demand by thermal power stations.

Coal producing companies are left with only two options. Either they should open new coal mines or increase the capacity of existing mines. While it is not very easy to open up new coal mines, the only option left is to expand the existing mines in terms of its capacity or in terms of physical extent of the existing mine.

In most of the mining lease hold areas it is observed that the coal bearing area is falling in forest areas that has been left out for want of forestry clearance. These forest lands are categorized into the following three types:

- Reserved Forest
- Protected Forest
- Revenue Forest

In order to carry out mining activities in these forest lands, forest clearance is required to obtain from the Ministry of Environment, Forest and Climate Change (MOEFCC).

To check irrational exploitation of forest and to maintain the ecological balance, Forest Conservation Act (FRA), 1980 has been enacted. Under this act, no forest land can be used for non-forestry purpose without prior approval from the ministry.

For getting forest clearance from MOEFCC the coal producing companies are required to apply through recently updated web portal called "Pro-Active and Responsive facilitation by Interactive, Virtuous and Environmental Single-Window Hub (PARIVESH)" which is a web based, role-based workflow application that has been developed for online submission and monitoring of proposals submitted by the proponents for seeking environment, forest, wildlife, and CRZ clearances from central state and district level authorities.

It automates the entire tracking of proposals which includes online submission of a new proposal, editing/updating the details of proposals and displays status of the proposals at each stage of the workflow.

The procedure for forest clearance envisaged under the act mandates a two-stage approval process consisting of two stages:

- **Stage I**

Upon prima facie review the proposal is either accepted or rejected. If approved, the project authority is required to deposit an amount for compensation of the opportunity cost of the forest (NPV, compensatory afforestation, additional expenses towards mitigating probable environmental damage etc.)

- **Stage II**

Following the deposit of above-mentioned costs, the land is handed over to the project authorities provided they have obtained all other requisite clearances.

Reserve forest boundaries are generally marked on the ground with large forest pillars while the boundaries of protected forests are marked on the ground with trenches, fencing and other markings.

As per the circular of MOEFCC, one of the pre-requisites for getting forestry clearance is a geo-referenced boundary map in shape file format of the desired forest land.

3.0 Location

The salient points of CA forest land identified for this project are located at Ratija (OA599) , District-Korba, Chhattisgarh.Nearest Township is Pali.

4.0 Scope of Services

The scope of services of CMPDIL to provide Geo-referenced boundary map (in shape files and pdf format), converted geographical coordinates of forest boundary after making DGPS observation at salient points and KML files etc.

5.0 Methodology

Static DGPS (Differential Global Positioning System) survey is appropriate for determining geographical co-ordinates of forest boundary.

The Global Positioning System (GPS) is a satellite-based location, timing and navigation system in all weather conditions, anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. Presently, 30 orbiting satellites of GPS constellation of USA and 24 GLONASS (*Globalnaya navigatsionnaya sputnikovaya sistema* or Global Navigation Satellite System) satellites of Russia are operational for the purpose of GPS survey.

In addition to these primary GPS constellation, European space agency and Chinese have their own constellation such as Galileo and BeiDou respectively.

India's prestigious GAGAN (GPS Aided Geo Augmented Navigation (GAGAN) system) navigation system is also presently operational providing vital positional information to civil aviation and other industries.

The Global Positioning System is a system of communication made up of three independent aspects such as:

- GPS satellites orbiting the Earth;

- Control and monitoring stations on Earth;
- GPS receivers owned by users.

GPS satellites transmit the satellites number, its position in space, and the exact time. These informations are sent through the transmitted signals at regular intervals by all the satellites are all times.

These signals are picked up by various types of GPS receivers on ground. With signals from three or more satellites, a GPS receiver can triangulate its location on the ground (i.e., longitude and latitude) from the known position of the satellites. With four or more satellites, a GPS receiver can determine a 3D position (i.e., latitude, longitude, and ellipsoidal height).Differential Global Positioning System (DGPS) refers to using two or more GPS receivers to achieve greater positional accuracy. There are three basic methods of doing DGPS survey.

- Static
- Rapid-Static
- Real-time Kinematic (RTK).

For doing DGPS survey of forest land, post-processed static survey is found to be most suitable where one GPS receiver is used as base station and other GPS receivers are used as rover stations. Base receiver is stationed at a point of known co-ordinates for longer duration and rover stations are kept at unknown stations for comparatively shorter duration. DGPS observation is done in each rover stations for compensatory afforestation.

Data from base and rovers are downloaded and then post-processed in GPS data processing software, Leica infinity to achieve sub-centimeter level accuracies.

ArcGIS 10.2 version software is used for preparation of shape files, KML file and geo-referenced map of the forest land in WGS-84 co-ordinates.

6.0 Survey Instrument

For providing geographical (spherical) co-ordinates of the stations along the boundary, Differential Global Positioning System (DGPS) consisting of one base receiver and a rover receiver were used. CMPDIL has the latest hardware and software of Leica make DGPS instrument which has dual-frequency GPS signal receivers that provide accurate results after post processing in relevant software. Brief specifications of DGPS are provided in the table below.

A	***DGPS Instrument:***	
	Make	Leica
	Model	GS25 & GS16
	Signal	GPS: L1, L2&L5 carrier, CA, L1P, L2P, L2C GLONASS: L1, L2&L5 carrier, L1CA, L2CA, L1P, L2P GALILEO: E2-L1-E1, E5, E6
	Channels	72
	Accuracy:	sub-centimeter
	Post Processed Static DGPS	3mm +0.5ppm horizontal, 5mm + 0.5ppm vertical
	Real Time RTK	10mm + 1 ppm horizontal, 15mm + 1 ppm vertical
	Power:	
	Internal Battery	2 Li-Ion, 3900mAh, 7.2V
	Communication:	
	Bluetooth	Bluetooth standard 1.2
	USB	1.1 Version
B	***DGPS Software***	Inbuilt Leica software for data recording
		Leica infinity for data processing

7.0 Details of Field Activity

DGPS survey has been carried out in ground locations identified by forest authorities in the presence of Gevra colliery authority. The following table Showing Details of DGPS Survey Point (WGS84).

Point_Id	Instrument	Latitude(wgs84)	Longitude(wgs84)
B1	DGPS	22° 18' 36.332" N	82° 29' 5.994" E
B2	DGPS	22° 18' 34.671" N	82° 29' 5.375" E
B4	DGPS	22° 18' 30.540" N	82° 28' 57.513" E
B5	DGPS	22° 18' 34.407" N	82° 28' 56.637" E
B6	DGPS	22° 18' 36.506" N	82° 28' 57.005" E
B7	DGPS	22° 18' 43.449" N	82° 28' 56.091" E
B8	DGPS	22° 18' 43.385" N	82° 28' 55.080" E
B9	DGPS	22° 18' 32.072" N	82° 29' 3.697" E
B10	DGPS	22° 18' 35.055" N	82° 29' 2.895" E
B11	DGPS	22° 18' 33.472" N	82° 29' 8.280" E
B12	DGPS	22° 18' 36.833" N	82° 29' 10.234" E
B13	DGPS	22° 18' 30.837" N	82° 29' 2.173" E
B14	DGPS	22° 18' 36.392" N	82° 28' 55.701" E
B15	DGPS	22° 18' 34.942" N	82° 28' 55.344" E
B16	DGPS	22° 18' 32.966" N	82° 28' 52.705" E
B17	DGPS	22° 18' 31.998" N	82° 28' 49.026" E
B18	DGPS	22° 18' 31.763" N	82° 28' 48.195" E
B19	DGPS	22° 18' 34.010" N	82° 28' 47.147" E
B20	DGPS	22° 18' 31.645" N	82° 28' 47.530" E

B21	DGPS	22° 18' 36.297" N	82° 28' 47.266" E
B22	DGPS	22° 18' 38.508" N	82° 28' 48.088" E
B23	DGPS	22° 18' 40.348" N	82° 28' 46.387" E
B24	DGPS	22° 18' 44.612" N	82° 28' 46.171" E
B25	DGPS	22° 18' 44.799" N	82° 28' 45.357" E
B26	DGPS	22° 18' 42.531" N	82° 28' 43.577" E
B27	DGPS	22° 18' 42.825" N	82° 28' 42.035" E
B28	DGPS	22° 18' 38.441" N	82° 28' 39.548" E
B29	DGPS	22° 18' 38.531" N	82° 28' 37.622" E
B30	DGPS	22° 18' 35.365" N	82° 28' 36.470" E
B31	DGPS	22° 18' 33.610" N	82° 28' 32.021" E
B32	DGPS	22° 18' 36.696" N	82° 28' 28.531" E
B33	DGPS	22° 18' 47.373" N	82° 28' 30.251" E
B34	DGPS	22° 18' 49.011" N	82° 28' 28.780" E
B35	DGPS	22° 18' 41.508" N	82° 28' 25.660" E
B36	DGPS	22° 18' 42.257" N	82° 28' 22.538" E
B37	DGPS	22° 18' 47.418" N	82° 28' 15.544" E
B38	DGPS	22° 18' 48.854" N	82° 28' 16.181" E
B39	DGPS	22° 18' 52.812" N	82° 28' 21.166" E
B40	DGPS	22° 18' 53.246" N	82° 28' 19.600" E
B41	DGPS	22° 18' 54.860" N	82° 28' 19.185" E
B42	DGPS	22° 18' 57.349" N	82° 28' 29.301" E
B43	DGPS	22° 18' 59.077" N	82° 28' 30.188" E
B44	DGPS	22° 18' 59.438" N	82° 28' 33.124" E
B45	DGPS	22° 18' 56.323" N	82° 28' 37.046" E
B46	DGPS	22° 18' 54.586" N	82° 28' 50.750" E
B47	DGPS	22° 18' 47.778" N	82° 28' 58.590" E
P1	DGPS	22° 18' 32.889" N	82° 29' 7.241" E
P2	DGPS	22° 18' 34.080" N	82° 29' 5.785" E
P3	DGPS	22° 18' 36.317" N	82° 29' 8.049" E

8.0 Computation

Data recorded is downloaded from both rover and base receivers of DGPS and processed in Leica infinity software to get post-processed WGS-84 co-ordinates. The geographical co-ordinates of the forest land (CA) are tabulated below.

TABLE-I
GEOGRAPHICAL COORDINATES (WGS-84)
58.000 HA FOREST LAND (CA)
GEVRA OCP, GEVRA AREA, SECL

FID	area	Comp	Division	Range	Latitude	Longitude
0	58.00042319	OA599	Khatghora	Pali	22° 18' 36.522" N	82° 29' 6.020" E

1	58.00042319	OA599	Khatghora	Pali	22° 18' 34.857" N	82° 29' 2.775" E
2	58.00042319	OA599	Khatghora	Pali	22° 18' 30.601" N	82° 29' 2.171" E
3	58.00042319	OA599	Khatghora	Pali	22° 18' 30.429" N	82° 28' 57.606" E
4	58.00042319	OA599	Khatghora	Pali	22° 18' 36.382" N	82° 28' 57.664" E
5	58.00042319	OA599	Khatghora	Pali	22° 18' 44.015" N	82° 28' 56.739" E
6	58.00042319	OA599	Khatghora	Pali	22° 18' 43.764" N	82° 28' 54.500" E
7	58.00042319	OA599	Khatghora	Pali	22° 18' 36.233" N	82° 28' 55.096" E
8	58.00042319	OA599	Khatghora	Pali	22° 18' 34.842" N	82° 28' 54.587" E
9	58.00042319	OA599	Khatghora	Pali	22° 18' 32.966" N	82° 28' 52.705" E
10	58.00042319	OA599	Khatghora	Pali	22° 18' 32.063" N	82° 28' 47.266" E
11	58.00042319	OA599	Khatghora	Pali	22° 18' 40.360" N	82° 28' 48.183" E
12	58.00042319	OA599	Khatghora	Pali	22° 18' 44.846" N	82° 28' 46.615" E
13	58.00042319	OA599	Khatghora	Pali	22° 18' 44.892" N	82° 28' 45.414" E
14	58.00042319	OA599	Khatghora	Pali	22° 18' 42.980" N	82° 28' 41.934" E
15	58.00042319	OA599	Khatghora	Pali	22° 18' 42.431" N	82° 28' 40.996" E
16	58.00042319	OA599	Khatghora	Pali	22° 18' 37.403" N	82° 28' 35.095" E
17	58.00042319	OA599	Khatghora	Pali	22° 18' 35.147" N	82° 28' 33.035" E
18	58.00042319	OA599	Khatghora	Pali	22° 18' 35.301" N	82° 28' 30.781" E
19	58.00042319	OA599	Khatghora	Pali	22° 18' 36.696" N	82° 28' 28.899" E
20	58.00042319	OA599	Khatghora	Pali	22° 18' 47.875" N	82° 28' 31.419" E
21	58.00042319	OA599	Khatghora	Pali	22° 18' 48.822" N	82° 28' 28.553" E
22	58.00042319	OA599	Khatghora	Pali	22° 18' 42.848" N	82° 28' 25.671" E
23	58.00042319	OA599	Khatghora	Pali	22° 18' 42.144" N	82° 28' 23.382" E
24	58.00042319	OA599	Khatghora	Pali	22° 18' 43.062" N	82° 28' 22.697" E
25	58.00042319	OA599	Khatghora	Pali	22° 18' 43.702" N	82° 28' 22.319" E
26	58.00042319	OA599	Khatghora	Pali	22° 18' 47.482"	82° 28' 23.516"

					N	E
27	58.00042319	OA599	Khatghora	Pali	22° 18' 48.270" N	82° 28' 21.203" E
28	58.00042319	OA599	Khatghora	Pali	22° 18' 44.194" N	82° 28' 20.156" E
29	58.00042319	OA599	Khatghora	Pali	22° 18' 45.054" N	82° 28' 18.003" E
30	58.00042319	OA599	Khatghora	Pali	22° 18' 45.442" N	82° 28' 16.920" E
31	58.00042319	OA599	Khatghora	Pali	22° 18' 46.028" N	82° 28' 16.239" E
32	58.00042319	OA599	Khatghora	Pali	22° 18' 46.562" N	82° 28' 16.059" E
33	58.00042319	OA599	Khatghora	Pali	22° 18' 47.892" N	82° 28' 15.915" E
34	58.00042319	OA599	Khatghora	Pali	22° 18' 48.568" N	82° 28' 18.100" E
35	58.00042319	OA599	Khatghora	Pali	22° 18' 49.748" N	82° 28' 18.750" E
36	58.00042319	OA599	Khatghora	Pali	22° 18' 50.771" N	82° 28' 20.051" E
37	58.00042319	OA599	Khatghora	Pali	22° 18' 52.909" N	82° 28' 22.467" E
38	58.00042319	OA599	Khatghora	Pali	22° 18' 55.242" N	82° 28' 25.474" E
39	58.00042319	OA599	Khatghora	Pali	22° 18' 56.446" N	82° 28' 28.011" E
40	58.00042319	OA599	Khatghora	Pali	22° 18' 57.030" N	82° 28' 29.451" E
41	58.00042319	OA599	Khatghora	Pali	22° 18' 58.573" N	82° 28' 30.345" E
42	58.00042319	OA599	Khatghora	Pali	22° 18' 58.984" N	82° 28' 33.223" E
43	58.00042319	OA599	Khatghora	Pali	22° 18' 56.025" N	82° 28' 37.048" E
44	58.00042319	OA599	Khatghora	Pali	22° 18' 55.565" N	82° 28' 38.589" E
45	58.00042319	OA599	Khatghora	Pali	22° 18' 54.350" N	82° 28' 50.747" E
46	58.00042319	OA599	Khatghora	Pali	22° 18' 49.612" N	82° 28' 55.847" E
47	58.00042319	OA599	Khatghora	Pali	22° 18' 47.541" N	82° 28' 58.588" E
48	58.00042319	OA599	Khatghora	Pali	22° 18' 36.597" N	82° 29' 10.232" E
49	58.00042319	OA599	Khatghora	Pali	22° 18' 36.522" N	82° 29' 6.020" E

9.0 Documents Submitted

- Drawing Number: CMPDI/RI5/BSP/GEOM/2022/DGPS/89
- Soft copy of shape files & KML files in CD.

DISCLAIMER:

1. DGPS REPORT IS BASED ON SURVEY DATA.
2. DGPS REPORT IS FOR FOREST LAND (CA) APPLICATION ONLY & NOT VALID FOR ANY OTHER PURPOSE
3. CMPDIL IS NOT RESPONSIBLE FOR ANY FUTURE DISPUTE WITH RESPECT TO FOREST LAND DETAILS.

****

महाप्रबंधक
General Manager
एस.ई.सी.एल., गेवरा क्षेत्र
SECL, Gevra Area

नोडल ऑफिसर (पर्यावरण/वन)
Nodal Officer (ENV/Forest)
SECL/Gevra Area
एस.ई.सी.एल./गेवरा क्षेत्र

...EST OFFICER
PALL KATGHORA-DN

उप वनमण्डलाधिकारी
पाली, जिला-कोरबा (छ.ग.)

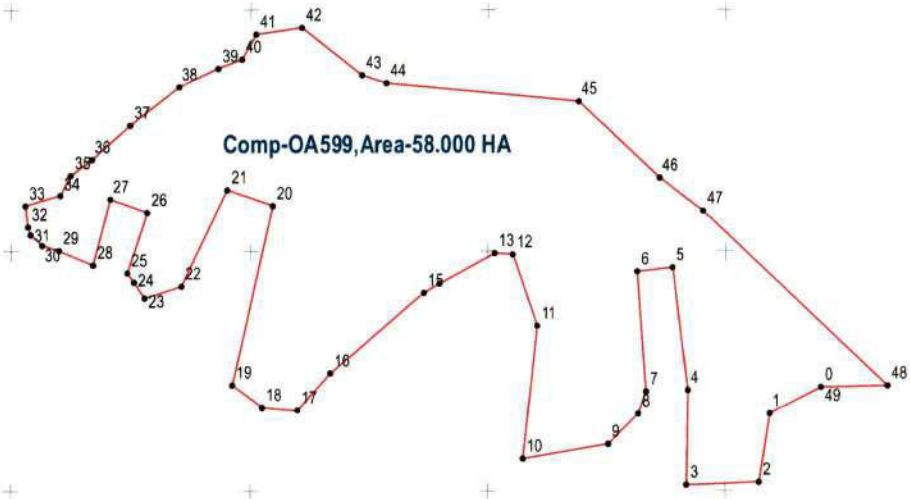
वनमण्डलाधिकारी
कटघोरा वनमण्डल, कटघोरा

GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA(COMPENSATORY AFFORESTATION) FOREST LAND AT KATGHORA DIVISION AGAINST DIVERSION OF 94.293 HA REVENUE FOREST LAND OF SECL GEVRA OCP. (COMPARTMENT NO-OA599(AREA-58.000 HA)

82°27'30"E 82°27'45"E 82°28'0"E 82°28'15"E 82°28'30"E 82°28'45"E 82°29'0"E 82°29'15"E

22°19'15"N 22°19'0"N 22°18'45"N 22°18'30"N 22°18'15"N 22°18'0"N

FID	Division	Range	Compartment	Area(Ha)	Latitude(WGS84)	Longitude(WGS84)
0	Khatghora	Pali	OA599	58.000	22° 18' 36.522" N	82° 29' 6.020" E
1	Khatghora	Pali	OA599	58.000	22° 18' 34.857" N	82° 29' 2.775" E
2	Khatghora	Pali	OA599	58.000	22° 18' 30.601" N	82° 29' 2.171" E
3	Khatghora	Pali	OA599	58.000	22° 18' 30.429" N	82° 28' 57.606" E
4	Khatghora	Pali	OA599	58.000	22° 18' 36.382" N	82° 28' 57.664" E
5	Khatghora	Pali	OA599	58.000	22° 18' 44.015" N	82° 28' 56.739" E
6	Khatghora	Pali	OA599	58.000	22° 18' 43.764" N	82° 28' 54.500" E
7	Khatghora	Pali	OA599	58.000	22° 18' 36.233" N	82° 28' 55.096" E
8	Khatghora	Pali	OA599	58.000	22° 18' 34.842" N	82° 28' 54.587" E
9	Khatghora	Pali	OA599	58.000	22° 18' 32.966" N	82° 28' 52.705" E
10	Khatghora	Pali	OA599	58.000	22° 18' 32.063" N	82° 28' 47.266" E
11	Khatghora	Pali	OA599	58.000	22° 18' 40.360" N	82° 28' 48.183" E
12	Khatghora	Pali	OA599	58.000	22° 18' 44.846" N	82° 28' 46.615" E
13	Khatghora	Pali	OA599	58.000	22° 18' 44.892" N	82° 28' 45.414" E
14	Khatghora	Pali	OA599	58.000	22° 18' 42.980" N	82° 28' 41.934" E
15	Khatghora	Pali	OA599	58.000	22° 18' 42.431" N	82° 28' 40.996" E
16	Khatghora	Pali	OA599	58.000	22° 18' 37.403" N	82° 28' 35.095" E
17	Khatghora	Pali	OA599	58.000	22° 18' 35.147" N	82° 28' 33.035" E
18	Khatghora	Pali	OA599	58.000	22° 18' 35.301" N	82° 28' 30.781" E
19	Khatghora	Pali	OA599	58.000	22° 18' 36.696" N	82° 28' 28.899" E
20	Khatghora	Pali	OA599	58.000	22° 18' 47.875" N	82° 28' 31.419" E
21	Khatghora	Pali	OA599	58.000	22° 18' 48.822" N	82° 28' 28.553" E
22	Khatghora	Pali	OA599	58.000	22° 18' 42.848" N	82° 28' 25.671" E
23	Khatghora	Pali	OA599	58.000	22° 18' 42.144" N	82° 28' 23.382" E
24	Khatghora	Pali	OA599	58.000	22° 18' 43.062" N	82° 28' 22.697" E
25	Khatghora	Pali	OA599	58.000	22° 18' 43.702" N	82° 28' 22.319" E
26	Khatghora	Pali	OA599	58.000	22° 18' 47.482" N	82° 28' 23.516" E
27	Khatghora	Pali	OA599	58.000	22° 18' 48.270" N	82° 28' 21.203" E
28	Khatghora	Pali	OA599	58.000	22° 18' 44.194" N	82° 28' 20.156" E
29	Khatghora	Pali	OA599	58.000	22° 18' 45.054" N	82° 28' 18.003" E
30	Khatghora	Pali	OA599	58.000	22° 18' 45.442" N	82° 28' 16.920" E
31	Khatghora	Pali	OA599	58.000	22° 18' 46.028" N	82° 28' 16.239" E
32	Khatghora	Pali	OA599	58.000	22° 18' 46.562" N	82° 28' 16.059" E
33	Khatghora	Pali	OA599	58.000	22° 18' 47.892" N	82° 28' 15.915" E
34	Khatghora	Pali	OA599	58.000	22° 18' 48.568" N	82° 28' 18.100" E
35	Khatghora	Pali	OA599	58.000	22° 18' 49.748" N	82° 28' 18.750" E
36	Khatghora	Pali	OA599	58.000	22° 18' 50.771" N	82° 28' 20.051" E
37	Khatghora	Pali	OA599	58.000	22° 18' 52.909" N	82° 28' 22.467" E
38	Khatghora	Pali	OA599	58.000	22° 18' 55.242" N	82° 28' 25.474" E
39	Khatghora	Pali	OA599	58.000	22° 18' 56.446" N	82° 28' 28.011" E
40	Khatghora	Pali	OA599	58.000	22° 18' 57.030" N	82° 28' 29.451" E
41	Khatghora	Pali	OA599	58.000	22° 18' 58.573" N	82° 28' 30.345" E
42	Khatghora	Pali	OA599	58.000	22° 18' 58.984" N	82° 28' 33.223" E
43	Khatghora	Pali	OA599	58.000	22° 18' 56.025" N	82° 28' 37.048" E
44	Khatghora	Pali	OA599	58.000	22° 18' 55.565" N	82° 28' 38.589" E
45	Khatghora	Pali	OA599	58.000	22° 18' 54.350" N	82° 28' 50.747" E
46	Khatghora	Pali	OA599	58.000	22° 18' 49.612" N	82° 28' 55.847" E
47	Khatghora	Pali	OA599	58.000	22° 18' 47.541" N	82° 28' 58.588" E
48	Khatghora	Pali	OA599	58.000	22° 18' 36.597" N	82° 29' 10.232" E
49	Khatghora	Pali	OA599	58.000	22° 18' 36.522" N	82° 29' 6.020" E



N

Land Schedule CA Forest Land			
Division	**Range**	**Compartment**	**Area(Ha)**
Khatghora	Pali	OA599	58.000

Coordinate System: GCS WGS 1984
Datum: WGS 1984
Units: Degree

Customer: SOUTH EASTERN COALFIELDS LIMITED

Project: GEO-REFERENCED BOUNDARY MAP (IN SHAPE FILE) OF CA (COMPENSATORY AFFORESTATION)FOREST LAND AT KATGHORA DIVISION

Job Number: 503308

Subject: PLAN SHOWING OF CA (COMPENSATORY AFFORESTATION) FOREST LAND COMPARTMENT NO-OA599 (AREA-58.000 HA) AGAINST 94.293 HA REVENUE FOREST LAND FOR GEVRA OCP OF GEVRA AREA(SECL)

Activity	Name	Designation	Signature	Date
Surveyed	Striker Paul	Surveyor (M)		
Surveyed	Pradip Das	Surveyor (M)		
Approved	Sudhanshu Mishra	Chief Manager (Mining)		

cmpdi

Scale 0 55 110 220 M 1:10,000

Sheet 1

Dwg CMPDI/RI5/BSP/GEOM/2023/DGPS/90

Rev No. 0

ANNEXURES

Job No.: 503308

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&
COMPACT DISC

Job No.: 503308