

चेक लिस्ट क्र.- 44

प्रस्ताव में अन्य (Misc) कमियों का विवरण।

प्रस्ताव में अन्य (Misc) कमियों का विवरण

प्रस्ताव में अन्य कोई कमी नहीं है ।



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राजेश खरे

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रायपुर छत्तीसगढ़



वनमंडलाधिकारी करारी
धरमजयगढ़ वनमण्डल
जिला रायगढ़ (छ.ग.)

CHHATTISGARH EAST RAILWAY LTD

(A JV OF IRCON, SECL AND CHHATTISGARH GOVT.)

DGPS Survey Report of Forest Patches in Dharamjaygarh Forest Division for Forest Diversion Proposal under FCA 1980 for Construction of BG Rail Corridor (Length 62 km) from Urga to Dharamjaygarh



DGPS SURVEY AND GIS MAPPING DONE BY:

Geotrax International Services
Raipur, Chhattisgarh.

वन मण्डलाधिकारी
धरमजयगढ़ वन मण्डल
जिला रायगढ़ (छ.म.)

उप वन मण्डलाधिकारी
धरमजयगढ़ उप वन मण्डल

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धरमजयगढ़

RANGE OFFICER
Range - Chhal

Division - Dharamjaygarh



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1. Introduction and Background

Government of Chhattisgarh (GoCG) is keen to develop Rail infrastructure for facilitating passengers and freight traffic in the Northern part of Chhattisgarh. To this extent the State Government, in consultation with Ministry of Railways (MoR), has appointed a high level Committee, chaired by Mr. A.K. Mishra, Retd. Chief Secretary of C.G comprising representatives of MoR, GoCG, NTPC Ltd, SECL and Confederation of Indian Industry to identify the rail corridors. As per the committee's report and in line with the recommendations of Chhattisgarh Integrated Infrastructure Development Committee (CIIDC), three corridors were identified for the development of rail infrastructure.

- 1) Corridor-I, East corridor: Kharsia - Chhal - Gharghoda - Korichhapar - **Dharamjaygarh up to Korba** with a spur from Gharghoda to Donga Mauha to connect mines of Gare-Pelma block, approximately 180km in length.
- 2) Corridor-II, North Corridor: Surajpur-Parsa-Katghora-Korba, approximately 150 km in length.
- 3) Corridor-III, East-west Corridor: Gevra Road to Pendra Road via Dipka, Katghora, Sindurgarh, Pasan, approximately 122 km in length.

Memorandum of Understanding (MoU) was made on 03.11.12 between Government of Chhattisgarh (GoCG), South East Coalfields Limited (SECL) and IRCON for formation of Specific Joint Venture Companies (JVCs) upon the advise/instructions of Ministry of Railways (MoR) to **develop rail infrastructure for facilitating passengers and freight traffic in northern parts of Chhattisgarh**. In consideration of the above, the implementation of developing Corridor-I and Corridor-III would be taken up by JVCs. The names of the JVCs are proposed as "Chhattisgarh East Rail Ltd" for Corridor- I and "Chhattisgarh East-West Rail Ltd" for Corridor-III.

As part of the Corridor-I, East Corridor phase-II, a new BG line is proposed from Uрга (District Korba) to Dharamaygarh (District Raigarh). The approximate length of the rail corridor is 62 kms.

The feasibility cum detailed project study was conducted by Delhi Integrated Multi Modal Transit System Ltd. (DIMTS). The preliminary alignment was

This Project is a passenger cum freight corridor line and will help in overall economic development of Northern Chhattisgarh region.



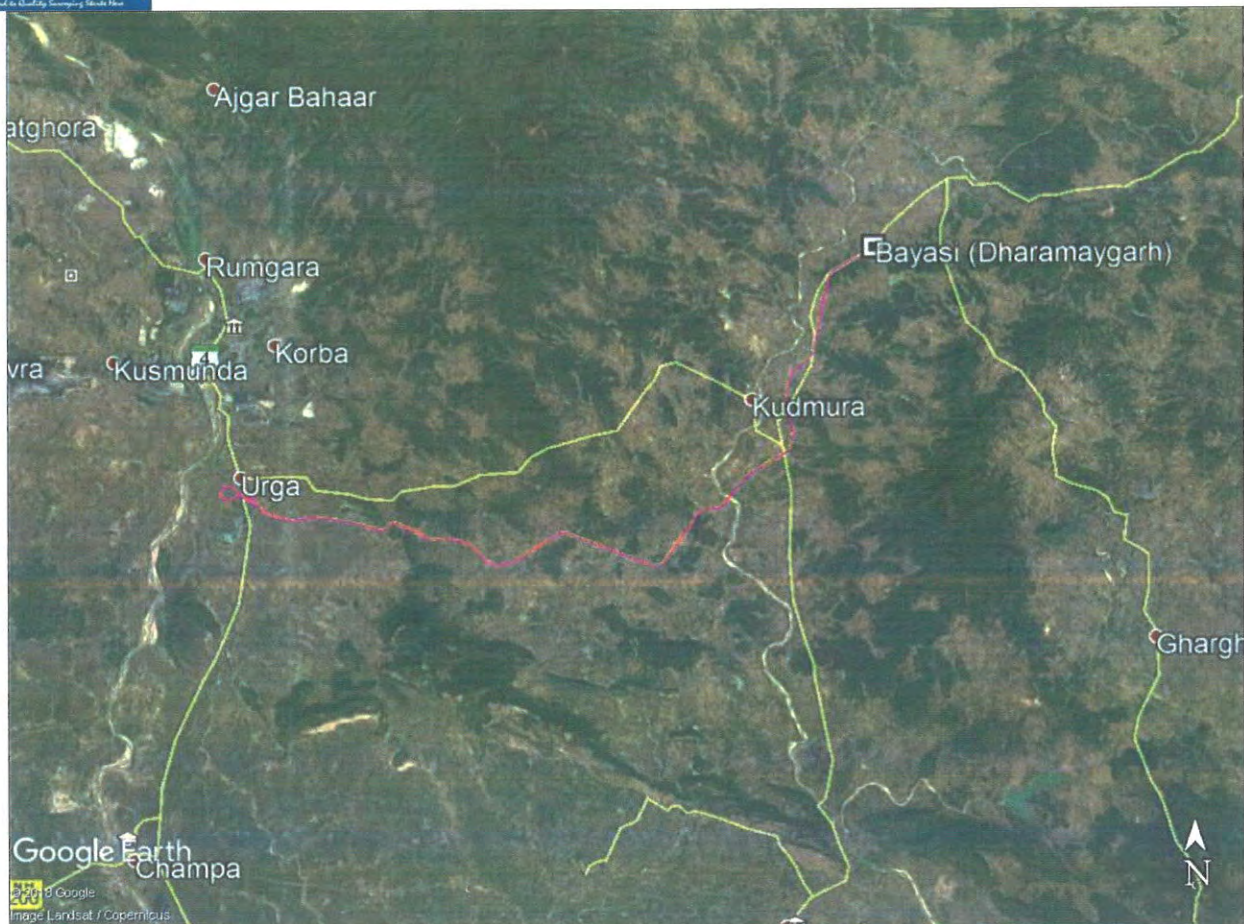


Fig-1: BG Rail Corridor from Uрга to Dharamaygarh on Satellite Imagery

As per directives of Ministry of Environment & Forests dated 8th July 2011; all applications seeking diversion of forest land for non-forest purpose under Forest Conservation Act, 1980 must be accompanied with Geo-referenced shape file (both soft copy and hard copy maps) of the forest land proposed for diversion prepared using Differential GPS (DGPS).



2. Scope of Work

1. Establishment of one base station for DGPS Survey and temporary benchmarks at every 10km.
2. Fixation of corridor boundary point by DGPS (Boundary point fixed at every corner and turning point. It also includes
 - a. DGPS survey to collect the BG Rail Centerline coordinates
 - b. DGPS Survey of revenue forest khasra boundaries
3. Data processing and Interpretation
 - a. Geo-referencing of cadastral map and identification of revenue forest khasras
 - b. Creation of Rail centerline layer using DGPS coordinates and creation of Rail corridor as per the given alignment
 - c. Superimposition of Rail Corridor layer on Georeferenced cadastral maps
 - d. Creation of forest patches (comprise one or more adjoining forest khasras) from the Geo-referenced cadastral maps and computation of forest area of individual forest patches, per village
 - e. Preparation of Geo-referenced forest map and creation of an area statement showing proposed area for forest diversion
 - f. Preparation of DGPS survey report along with soft copy of – maps in shapefile format and kml file
4. Printing of report and Geo-referenced maps (7sets) and Technical compliance.



3. Deliverables

The deliverables envisaged for the assignment are described below

1. Post processed DGPS observations data as well as raw data in RINEX format.
2. DGPS Reports - Base line & network adjustment report for the primary and temporary benchmarks.
3. Geo-referenced cadastral maps & forest block maps (for PF/RF areas, if any) based on DGPS observations.
4. Geo-reference shape file (Soft copy) of Forest Patches, BG Rail ceterline and Railway corridor.
5. Area statement as per DGPS Survey showing proposed area for forest diversion
6. DGPS Survey and mapping report



4. Brief description of the Technical approach

4.1 Input Data

The Rail alignment plan and maps required for geo-referencing were provided by IRCON to M/s Geotrax International Services. The village maps were obtained Chhattisgarh State Govt. revenue department land portal "Bhu Naksha" (<http://cg.nic.in/bhunaksha/>). The revenue forest Khasras are identified by patwari's and revenue department provided the khasra details and assisted our survey team for identification of revenue forest Khasras in the field.

The detailed topographical Survey data along with the location of survey benchmarks (done by DIMTS) was also provided to Geotrax.

4.2 Establishment of Primary Control Point (PCP)

In this process the coordinate of one location (hereafter referred to as PCP) is established with reference to other known locations. For our current study we have established the coordinate of PCP in Raipur, Chhattisgarh with reference to International GNSS ground stations (IGS) that are present in Hyderabad and Bangalore. *The IGS stations are continuously operating stations tracking and receiving satellite signals. The IGS stations records and transmits its precise location for general public use.*

The PCP in Raipur is established with continuous 72 hours observation and processed using the IGS stations in Hyderabad and Bangalore. As per Survey of India (SOI) Guideline, the PCP is to be fixed through continuous observation for 72 hours duration. The observed data is processed with reference to the data of International GNSS Service (IGS) stations- HYDE & IISC as per SOI guideline. The post processing report is herein annexed and marked as **Annexure-1**.

Below table contains the coordinates of the PCP and IGS stations- HYDE and IISC.

Point ID	UTM-Easting(m)	UTM-Northing(m)	EGM-Elevation(m)	Latitude	Longitude	Ellipsoidal Height (m)	City	Location
PCP-Raipur	560764.042	2351378.878	298.819	N21°15'47.16512"	E81°35'08.50131"	234.801	Raipur	Geotrax Office Roof

Point ID	UTM-Easting(m)	UTM-Northing(m)	EGM-Elevation(m)	Latitude	Longitude	Ellipsoidal Height (m)	City	Location
								Top
IGS_HYDE	239826.372	1927383.113	521.783	N17°25'02.21987 "	E78°33'03.17892 "	444.790 m	Hyderabad	NRSC, Hyderabad
IGS_IISC	127917.413	1441987.668	929.917	N13°01'16.19707 "	E77°34'13.35337 "	843.714 m	Bangalore	IISC, Bangalore

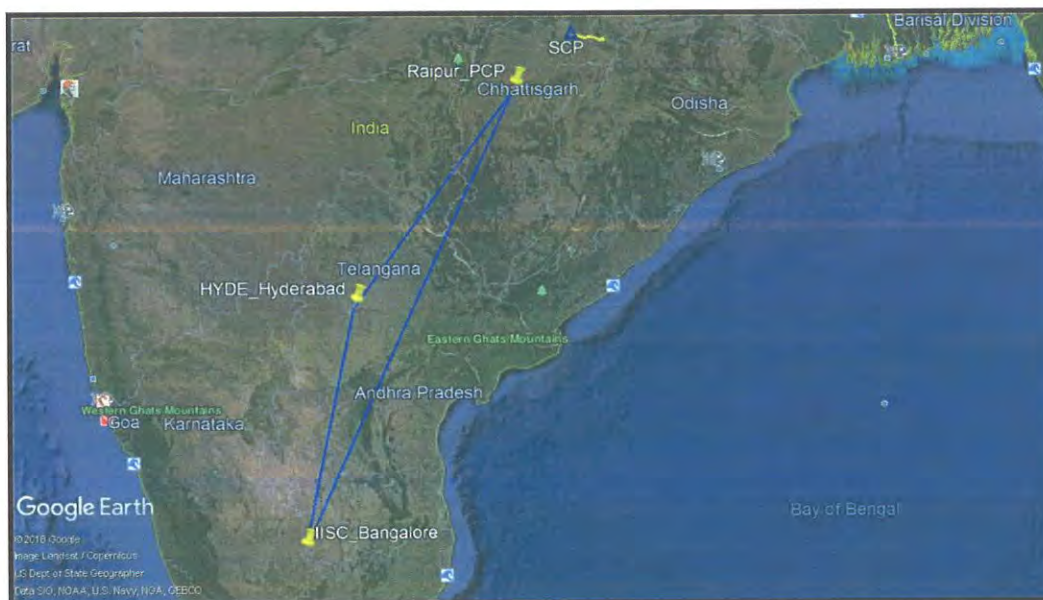


Fig-2: Satellite Image showing the location of the IGS Station-HYDE, IISC, and Raipur Primary Control Point in Raipur

4.3 Establishment of Secondary Control Point (SCP)

The Secondary Control Point (SCP) with static 24 hours of DGPS Observation is established as the DGPS base station near the project location. The SCP is established in the roof top of the primary school in Urga tehsil in Korba district. The Secondary control point (SCP) is established with reference to the Raipur Primary control point (PCP) and the post processing report is herein annexed and marked as **Annexure-2**.

The coordinate of the SCP is as follows:

Latitude: N22°18'39.55260", Longitude: E82°43'07.23316"

Easting: 677032.804m, Northing: 2468257.701m (as per UTM Zone 45N)

Elevation (EGM2008): 285.201m, Ellipsoidal Height: 224.164m.

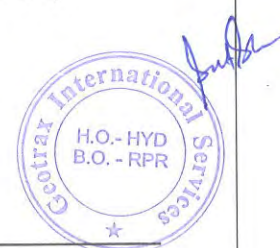




Fig-4: Images showing Secondary Control Point (SCP)

4.4 Establishment of Temporary Benchmarks (TBM)

The Temporary Control Point are established in static & RTK mode along the rail corridor.



Fig-4: Photograph showing Urga Station Temporary Bench Mark (TBM)

All the TBM's are connected to the Primary Control Point (PCP).

Below table lists the coordinates of TBMs:

Sl.No.	Point ID	TBM	Obs. type	Village Name	Location	Easting	Northing
1	Base	Railway TBM-3	Base	Urga Railway Station	Urga Railway Station	678950.865	2463504.69
2	SCP-1	Static	SCP-1	Culvert	IRCON Pillar	682531.463	2461499.022
3	SCP-2	Static	SCP-2	Kortala	P-81 Pillar	693807.999	2459884.503

Sl.No.	Point ID	TBM	Obs. type	Village Name	Location	Easting	Northing
4	SCP-3	Static	SCP-3	Sithra	Forest Pillar	718229.805	2474789.61
5	P-8	TBM	Observed Point	Urga	P-8 Pillar	679260.149	2462273.733
6	P-9	TBM	Observed Point	Urga	P-9 PILLAR	679366.389	2462120.71
7	P-10	TBM	Observed Point	Urga	P-10 PILLAR	679497.513	2461970.678
8	P-11	TBM	Observed Point	Urga	P-11 PILLAR	679669.927	2461897.384
9	TBM-5	TBM	Observed Point	Urga	Culvert	679695.081	2461860.967
10	P-12	TBM	Observed Point	Dilkuja naya bosti	P-12 PILLAR	679858.696	2461804.523
11	P-13	TBM	Observed Point	Dilkuja naya bosti	P-12 PILLAR	680041.598	2461861.392
12	P-14	TBM	Observed Point	Dilkuja naya bosti	P-12 PILLAR	680252.104	2462007.696
13	TBM-1A	TBM	Observed Point	Dilkuja naya bosti	Hard Rock	680505.039	2461498.71
14	TBM-2A	TBM	Observed Point	Dilkuja naya bosti	Hard Rock	681254.502	2460936.274
15	P-30	TBM	Observed Point	Dilkuja naya bosti	P-30 PILLAR	683341.662	2461603.957
16	P-29	TBM	Observed Point	Dilkuja naya bosti	P-29 PILLAR	683156.918	2461625.269
17	P-28	TBM	Observed Point	Dilkuja naya bosti	P-28 PILLAR	682978.411	2461690.747
18	P-27	TBM	Observed Point	Dilkuja naya bosti	P-27 PILLAR	682796.558	2461779.582
19	P-26	TBM	Observed Point	Dilkuja naya bosti	P-26 PILLAR	682604.522	2461841.988
20	P-25	TBM	Observed Point	Dilkuja naya bosti	P-25 PILLAR	682402.578	2461880.669
21	TBM-9	TBM	Observed Point	Dilkuja naya bosti	ON the Rood	682623.852	2461870.714
22	TBM-3A	TBM	Observed Point	Kervaduware	School Roof	693809.454	2459855.017
23	P-75	TBM	Observed Point	Kervaduware	P-75 PILLAR	692653.573	2460219.491
24	P-76	TBM	Observed Point	Kervaduware	P-76 PILLAR	692851.633	2460181.842
25	P-77	TBM	Observed Point	Kervaduware	P-77 PILLAR	693029.754	2460101.594
26	P-78	TBM	Observed Point	Kervaduware	P-78 PILLAR	693229.236	2460050.306
27	P-79	TBM	Observed Point	Kervaduware	P-79 PILLAR	693424.41	2459995.585
28	TBM-15	TBM	Observed Point	Kervaduware	ON the Rood	693741.535	2459867.614

Sl.No.	Point ID	TBM	Obs. type	Village Name	Location	Easting	Northing
29	P-82	TBM	Observed Point	Kervaduvari	P-82 Pillar	694028.313	2459840.564
30	P-83	TBM	Observed Point	Kervaduvari	P-83 Pillar	694191.604	2459755.562
31	P-84	TBM	Observed Point	Kervaduvari	P-84 Pillar	694369.837	2459654.133
32	P-85	TBM	Observed Point	Kervaduvari	P-85 Pillar	694542.581	2459516.849
33	TBM-4A	TBM	Observed Point	Dongaama	Mile Stone	691291.41	2460150.929
34	TBM-5A	TBM	Observed Point	Dongaama	Mile Stone	691340.902	2460217.302
35	TBM-6A	TBM	Observed Point	Dongaama	House Roof	689576.634	2461126.298
36	P-60	TBM	Observed Point	Dongaama	P-60 Pillar	689862.123	2461017.427
37	P-61	TBM	Observed Point	Dongaama	P-61 Pillar	690030.384	2460874.701
38	P-62	TBM	Observed Point	Dongaama	P-62 Pillar	690216.555	2460794.121
39	P-63	TBM	Observed Point	Dongaama	P-63 Pillar	690408.3	2460721.412
40	P-64	TBM	Observed Point	Dongaama	P-64 Pillar	690589.272	2460595.612
41	P-65	TBM	Observed Point	Dongaama	P-65 Pillar	690722.664	2460483.212
42	P-66	TBM	Observed Point	Dongaama	P-66 Pillar	690914.242	2460394.757
43	P-67	TBM	Observed Point	Dongaama	P-67 Pillar	691083.983	2460291.645
44	P-31	TBM	Observed Point		P-31 Pillar	683549.759	2461595.276
45	P-32	TBM	Observed Point		P-32 Pillar	683750.074	2461601.484
46	P-33	TBM	Observed Point		P-33 Pillar	684143.484	2461555.068
47	TBM-7A(P-250)	TBM	Observed Point	Sithra	P-7A(P-250) Pillar	717235.711	2472927.824
48	TBM-8A	TBM	Observed Point	Sithra	P-TREE	716712.564	2472257.026
49	TBM-9A	TBM	Observed Point	Sithra	Culvert	717344.322	2472872.644



4.5 DGPS Survey

DGPS survey was carried out using a pair of DGPS instrument. One DGPS Instrument was used as Base Station. The Base station for the survey was established at the nearest TBM. The distance between the Base Station PCP/TBM and rover was always less than 5km.

The other DGPS instrument was working as Rover. The survey was conducted in Real Time Kinematic (RTK) mode. The survey team collected coordinates of rail centerline pillars and also the left and right corridor pillars by walking along the corridor. Using DGPS receiver the coordinates for prominent locations such as culverts, bridges etc., are also collected.

For Geo-referencing village maps on an average of 10 GCPs were collected for each village.

The DGPS Survey of forest compartments i.e., Protected Forest/Orange area is carried out with the help of Dharamjaygarh Forest department staff after obtaining due permission for the DGPS Survey. The forest guard identified on the ground the boundary of all the effected protected forest compartments and Orange area compartments and DGPS readings are collected on the Forest pillar.

4.6 Creation of GIS Layers of the Rail Line corridor

The rail line centerline points, corridor points captured through DGPS are plotted in the GIS Software and the centerline, and left & right corridor GIS layer is created by joining the points.

4.7 Geo-referencing & digitization

The Ground Control Points (GCP) collected through DGPS survey are used to geo-reference the digitized cadastral maps and revenue forest survey numbers are digitized from the map.

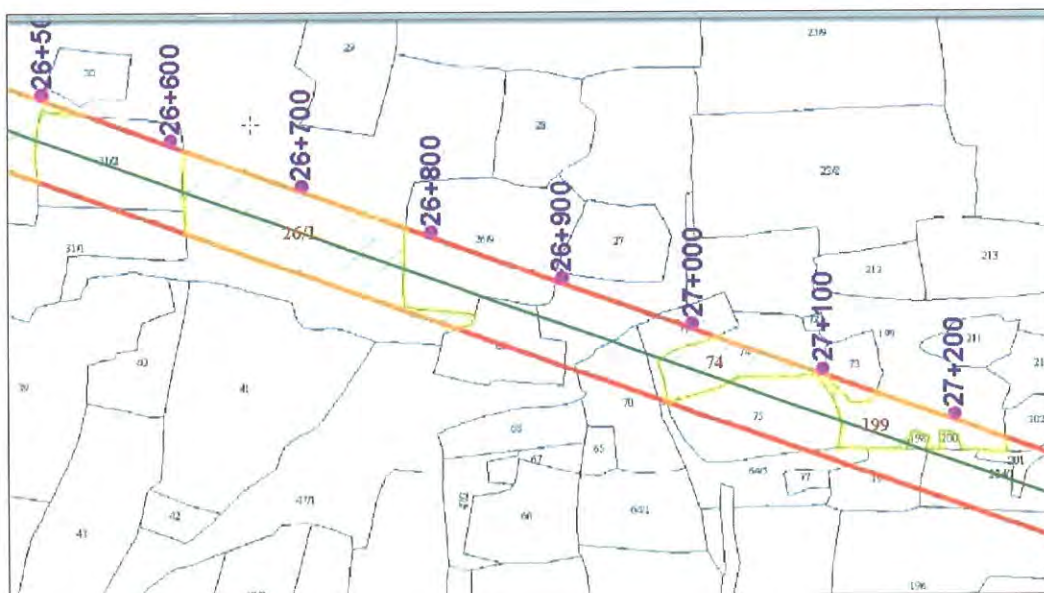
Forest compartment maps are also geo-referenced using the ground control points collected on Forest Boundary pillars. The Orange areas are geo-referenced based on the Khasra boundary and forest boundary pillars.

Digitization of cadastral map is done in ArcGIS software.

4.8 Creation of Forest Patches

Using the revenue forest survey numbers details collected from the revenue department office (Tehsildhar office), the revenue forest Khasra are identified on the map.

The revenue forest Khasra intersecting the railway corridor is digitized and its area computed. In the below picture the hatched lines (on cadastral map) show the revenue forest Khasra area proposed for diversion.



Each revenue forest patch is given a unique number and the total revenue forest effected area is calculated for each village. A single patch number is given if there are two or more revenue forest survey numbers adjacent to each other and are intersecting the railway corridor boundary. Below table shows revenue forest area statement with patch number.

Sr. No.	District	Tehsil	Village	Patch No	Khasra No.	Proposed Diversion Area (Ha)
1	Raigarh	Dharamjaigarh	Maharajganj	Patch No 45	713/1Ka	0.009
2	Raigarh	Dharamjaigarh	Maharajganj	Patch No 46	713/1Ka	0.009
3	Raigarh	Dharamjaigarh	Jogada	Patch No 47	526	0.019
4	Raigarh	Dharamjaigarh	Jogada	Patch No 48	621/1	0.266
5	Raigarh	Dharamjaigarh	Jogada		607	0.022



6	Raigarh	Dharamjaigarh	Jogada	Patch No 49	764/6	0.073
7	Raigarh	Dharamjaigarh	Jogada	Patch No 50	731	0.198
8	Raigarh	Dharamjaigarh	Jogada	Patch No 51	747/1	0.155
9	Raigarh	Dharamjaigarh	Jogada	Patch No 52	813/1 Ka	0.886
10	Raigarh	Dharamjaigarh	Jogada	Patch No 53	933/1	2.532
11	Raigarh	Dharamjaigarh	Jogada	Patch No 54	929/1 Ka	13.166
12	Raigarh	Dharamjaigarh	Hati	Patch No 55	1297/1	0.922

Similar GIS technique (overlay the rail corridor on Geo-referenced forest map) is adopted for computation of the total protected forest, Orange area forest and reserved forest area is using the forest maps

The geo-referenced forest land map (showing forest patches) is prepared by integrating the geo-referenced cadastral map sheets and railway line corridor vector layers.

4.9 Specification of DGPS Equipment

Geotrax deployed the most advance and hi-precision devices to carry out the DGPS survey. The DGPS performance specifications are given below. The corresponding fact sheets are placed below for ready reference.



COMNAV

T300 GNSS Receiver



Features

- **Ultra small**
- **Super light**
- **Many user-friendly conveniences built in**
- **GPS L1/L2/L5, BeiDou B1/B2/B3, GLONASS L1/L2**
- **Low power consumption**
- **Support long baseline E-RTK**

RTK robust enough for challenging environments, in a device that is light and easy to carry

With decades of experience in the surveying GNSS receiver, the T300 is a product which combines lots of market proved advantages together. It can track all the working GNSS constellations. By using ComNav's unique QUAN™ algorithm technology, it can function in RTK mode with all the GNSS constellations or by using any single GNSS constellation such as GLONASS or BeiDou. The strong anti-interference ability of the receiver makes it possible to work in any environment.

Design driven to improve user experience

Our R&D people are always thinking about how to improve the physical experience of users and workflow in the field. With this in mind, the T300 integrates a cutting edge GNSS board, Bluetooth®, UHF (Rx&Tx) into a compact board. Smart design makes the T300 the lightest and smallest (volume) receiver in the world.

Hot swap battery design

Extending the field working time is also a passion for our R&D people. They do lots of tests and analysis to reduce the power consumption, and make the whole system work more efficiently. In parallel, they've designed in the capability to hot swap the battery source. When the warning sounds and LED flashes, put your second battery in place. Then recharge the first while you keep working.

Consumer grade batteries... always available

Losing power in the field is significantly inconvenient for users, as the batteries for GNSS receivers are often unusual types and not readily available. Once again our R&D people developed a solution so that the T300 runs on normal consumer batteries.



Technical Specifications

T300

Signal Tracking

- 256 channels with simultaneously tracked satellite signals
- GPS: L1 C/A, L1 C, L2 P, L5
- BeiDou: B1, B2, B3
- GLONASS: L1, L2
- SBAS: WAAS, EGNOS, MSAS, GAGAN

Performance Specifications

- Cold start: <50 s
- Warm start: <30 s
- Hot start: <15 s
- Initialization time: <10 s
- Singal re-acquisition: <2 s
- Initialization reliability: >99.9%

Positioning Specifications

- Post Processing Static
- Horizontal: 2.5 mm + 0.5 ppm RMS
- Vertical: 5 mm + 0.5 ppm RMS
- Real Time Kinematic
- Horizontal: 8 mm + 1 ppm RMS
- Vertical: 15 mm + 1 ppm RMS
- E-RTK¹ (baseline<100 km)
- Horizontal: 0.2 m + 1 ppm RMS
- Vertical: 0.4 m + 1 ppm RMS
- Code differential GNSS positioning
- Horizontal: 0.25 m + 1 ppm RMS
- Vertical: 0.5 m + 1 ppm RMS
- SBAS: Typically <1 m 3D RMS
- Standalone: <1.5 m 3D RMS

Communications and Memory

- 1 Serial port (7 pin Lemo).
- Baud rates up to 921,600 bps.
- Radio modem: Tx/Rx with full frequency range from 410-470 MHz²
- Transmit power: 0.5-2W adjustable
- Range: 1-4 km
- Position data output rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz
- 5 LEDs (indicating Power, Satellite Tracking, Bluetooth[®] and Differential Data)
- Bluetooth[®]: V 2.2 protocol, work compatible with Windows 7, Windows mobile and Android

Data Format

- Correction data I/O:
- RTCM 2.x, 3.x, CMR (GPS only), CMR+ (GPS only).
- Position data output:
- ASCII: NMEA-0183 GSV, RMC, HDT, VHD, GGA, GSA, ZDA, VTG, GST, PJK, PTNL
- ComNav Binary update to 20 Hz

Physical

- Size(WxH): 15.8 cm x 7.5 cm
- Weight: 0.95 kg (include 2 batteries)

Environmental

- Operating temperature: -40 °C to + 85 °C (40 °F to 140 °F)
- Storage temperature: -40 °C to + 85 °C (40 °F to 185 °F)
- Humidity: 100% condensation
- Waterproof and dust proof: IP67 protected from temporary immersion to depth of 1 meter, floats
- Shock: survives a 2 meter drop on to concrete

Electrical

- Input Voltage: 5-27 VDC
- Power consumption: 2.85 W (3 constellations)³
- Li-ion battery capacity: 2 x 1800 mAh, up to 8 hours typically
- Memory: 256 MB internal with up to 16 GB pluggable memory card

Software

- ComNav field data collection software CGSurvey
- Carlson's SurvCE field data collection software (optional)
- MicroSurvey's FieldGenius field data collection software (optional)

¹ E-RTK, BeiDou B3 signal used in RTK calculate engine; concern the current situation, this mode can be used in APAC.

² 410-470 MHz, 3 frequency range, 410-430, 430-460, 460-470, need to clarify when place the order.

³ Power consumption will increase if using internal radio modem transmitter.

Specifications subject to change without notice.

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5. Results

The forest area proposed for diversion is computed from the Geo-referenced revenue and forest maps. The final forest diversion area statement including the revenue forest survey numbers and forest compartments-PF/RF/OA is prepared and is shown below.

Area Statement of Forest Area proposed for diversion				
Sl.No.	District Name	Revenue Forest Area (Ha)	Orange Area, Protected Forest, and Reserved Forest Area (Ha)	Total Forest Area proposed for diversion (Ha)
1	Dharamjaigarh	51.494	46.173	97.667

CERL- Revenue Forest area statement proposed for forest diversion						
Sr. No.	District	Tehsil	Village	Patch No	Khasra No.	Proposed Diversion Area (Ha)
1	Raigarh	Dharamjaigarh	Maharajganj	Patch No 45	713/1Ka	0.009
2	Raigarh	Dharamjaigarh	Maharajganj	Patch No 46	713/1Ka	0.009
3	Raigarh	Dharamjaigarh	Jogada	Patch No 47	526	0.019
4	Raigarh	Dharamjaigarh	Jogada	Patch No 48	621/1	0.266
5	Raigarh	Dharamjaigarh	Jogada		607	0.022
6	Raigarh	Dharamjaigarh	Jogada	Patch No 49	764/6	0.073
7	Raigarh	Dharamjaigarh	Jogada	Patch No 50	731	0.198
8	Raigarh	Dharamjaigarh	Jogada	Patch No 51	747/1	0.155
9	Raigarh	Dharamjaigarh	Jogada	Patch No 52	813/1 Ka	0.886
10	Raigarh	Dharamjaigarh	Jogada	Patch No 53	933/1	2.532
11	Raigarh	Dharamjaigarh	Jogada	Patch No 54	929/1 Ka	13.166
12	Raigarh	Dharamjaigarh	Hati	Patch No 55	1297/1	0.922
13	Raigarh	Dharamjaigarh	Hati	Patch No 56	1297/1	0.002
14	Raigarh	Dharamjaigarh	Hati	Patch No 57	1297/1	0.326
15	Raigarh	Dharamjaigarh	Hati	Patch No 58	1310/1	0.063
16	Raigarh	Dharamjaigarh	Hati	Patch No 59	957/1	0.672
17	Raigarh	Dharamjaigarh	Sithara	Patch No 61	1369/1 Ka	1.611
18	Raigarh	Dharamjaigarh	Sithara	Patch No 62	618/1	1.544

CERL- Revenue Forest area statement proposed for forest diversion

Sr. No.	District	Tehsil	Village	Patch No	Khasra No.	Proposed Diversion Area (Ha)
19	Raigarh	Dharamjaigarh	Sithara	Patch No 63	719/1	0.247
20	Raigarh	Dharamjaigarh	Sithara		501/1/Ka	0.096
21	Raigarh	Dharamjaigarh	Sithara	Patch No 64	501/1/Ka	0.004
22	Raigarh	Dharamjaigarh	Sithara	Patch No 65	501/1/Ka	0.300
23	Raigarh	Dharamjaigarh	Sithara		965/3/Ka	3.702
24	Raigarh	Dharamjaigarh	Sithara		965/3/Ka	0.080
25	Raigarh	Dharamjaigarh	Sithara	Patch No 66	63/1/Ka	1.317
26	Raigarh	Dharamjaigarh	Sithara		25-Jan	0.374
27	Raigarh	Dharamjaigarh	Sithara		28/2 Ka	0.333
28	Raigarh	Dharamjaigarh	Sithara	Patch No 67	25/5 Ka	0.102
29	Raigarh	Dharamjaigarh	Khadgaon	Patch No 68	667/1 Ka	0.035
30	Raigarh	Dharamjaigarh	Khadgaon	Patch No 69	667/1 Ka	1.944
31	Raigarh	Dharamjaigarh	Khadgaon	Patch No 70	667/1 Ka	0.324
32	Raigarh	Dharamjaigarh	Khadgaon	Patch No 71	543/1 Kha	0.029
33	Raigarh	Dharamjaigarh	Khadgaon	Patch No 72	89/1 Ka	0.015
34	Raigarh	Dharamjaigarh	Khadgaon	Patch No 73	71/1 Ka	0.644
35	Raigarh	Dharamjaigarh	Khadgaon		85/1 Kha	0.025
36	Raigarh	Dharamjaigarh	Khadgaon	Patch No 74	85/1 Ka	0.024
37	Raigarh	Dharamjaigarh	Khadgaon	Patch No 75	66/1	0.007
38	Raigarh	Dharamjaigarh	Khadgaon	Patch No 76	66/1	0.024
39	Raigarh	Dharamjaigarh	Khadgaon	Patch No 77	71/1 Ka	1.262
40	Raigarh	Dharamjaigarh	Khadgaon		65/1	0.333
41	Raigarh	Dharamjaigarh	Koilar		385/1	2.000
42	Raigarh	Dharamjaigarh	Koilar		376/1 Kha	6.850
43	Raigarh	Dharamjaigarh	Koilar		376/1 Ka	8.300
44	Raigarh	Dharamjaigarh	Baysi	Patch No 78	1379/1 Ka	0.648
Total Area						51.494

CERL-Forest Department controlled Forest Area statement						
Sr. No.	Division	Range	Compartment Type	Patch No.	Compartment No	Proposed Diversion Area (Ha)
1	Dharamjaigarh	Chhal	Reserved Forest	Patch No 46	1179	1.500
2	Dharamjaigarh	Chhal	Protected Forest	Patch No 54	P552	1.677
3	Dharamjaigarh	Chhal	Protected Forest	Patch No 55	P551	6.973
4	Dharamjaigarh	Chhal	Protected Forest	Patch No 60	P554	2.890
5	Dharamjaigarh	Chhal	Reserved Forest		562	3.596
6	Dharamjaigarh	Chhal	Protected Forest		P554	7.903
7	Dharamjaigarh	Chhal	Protected Forest	Patch No 66	P591	5.948
8	Dharamjaigarh	Chhal	Protected Forest	Patch No 67	P591	1.096
9	Dharamjaigarh	Chhal	Protected Forest	Patch No 70	P592	10.534
10	Dharamjaigarh	Chhal	Protected Forest	Patch No 73	P476	2.017
11	Dharamjaigarh	Chhal	Protected Forest	Patch No 77	P476	2.039
Total Area						46.173

DGPS coordinates of Forest Patches is in annexed herein and marked as Annexure-3. The geo-referenced map of forest land is annexed herein and marked as Annexure -4 and Survey of India Toposheet map showing alternate routes & proposed route is annexed herein and marked as Annexure-5.

In **Dharamjaigarh forest Division**, Transmission line passes through Chhal forest Range. In Raighr district the **total forest** land proposed for diversion is **97.667 Ha**. Out of the total forest land, **46.173 Ha is Protected Forest/Orange area and 97.667 Ha is Revenue forest.**

वन मण्डलाधिकारी
धरमजयगढ़ वन मण्डल
जिला रायगढ़ (छ.ग.)

उप वन मण्डलाधिकारी
धरमजयगढ़ उप वन मण्डल

वन परिक्षेत्राधिकारी
धरमजयगढ़

RANGE OFFICER
Range - Chhal
Division - Dharamjaigarh



6. Background of Organization

6.1 Company Profile: Geotrax

Geotrax International Services (www.geotrax.in) is a Professional Land Mapping and Services provider across India established in the year 1999. During the last 14+ years, we had an opportunity to execute a variety of surveying jobs all over India and in the Middle East to various customer specifications for RIS, LIS, and Municipal GIS oriented jobs. Cadastral Surveys using ETS/DGPS and Provision of Ground control conforming to stringent accuracy standards using high end instruments as RTK/GPRS DGPS is our specialty. We also have a UAV (Drone) and Ground Penetrating Radar (on Roaster).

Geotrax is headed by Mr. V.V.S Bandhakavi (Ex-Survey of India employee) who has more than 40+ years' experience in the field of surveying in India and abroad.

Some of our major clients include:

- Adani Enterprises Limited (AEL)
- Sterlite Power
- National Mineral development Corporation Ltd (NMDC)
- Bharat Aluminium Company Ltd (BALCO)
- Chhattisgarh Rail Corporation Ltd (CRCL)
- Ircon International Limited (IRCON)
- Odisha Space Application Centre (ORSAC)
- Steel Authority of India (SAIL)
- National Thermal Power Corporation (NTPC)
- Survey Settlement and Land Records Department (Govt. Of Gujarat)
- Survey Settlement and Land Records Department (Govt. Of Madhya Pradesh)
- Irrigation Dept. (Govt. of Jammu and Kashmir)
- National Remote Sensing Agency (Hyderabad)
- Meinhardt India Private Limited (Delhi),
- Nagarjuna Construction Company (NCC, Hyderabad)
- Consulting Engineering Services (CES, New Delhi)
- Lee Associates of South Asia (LASA, Delhi)
- Power development Corporation (Govt. of Jammu and Kashmir)

Geotrax expertise covers:

- ❖ DGPS Surveys for Mining lease boundary, and Forest Diversion
- ❖ Consultancy services for Mining Plan & EIA
- ❖ Boundary and cadastral surveys using DGPS and Total station;
- ❖ Topographic surveys.
- ❖ Ground control surveys for photogrammetric projects, including Airborne GPS.
- ❖ Only one of the two companies in India who are empanelled by NRSA for DGPS survey for ground control point collection
- ❖ Route and alignment surveys combining conventional and photogrammetric methods.
- ❖ Construction and cross-section surveys (from road design to precision layout and quality control).



Being a client focused organization, Geotrax's combination of survey equipment, personnel, and computer resources allow for the tailoring of the project approach to match the orders of accuracy and precision requirements for each project. Geotrax's equipment resources include 250 DGPS, 33 hand-held GPS units, theodolites, electronic digital and automatic levels, 19 Electronic Total Stations, and data collectors.

On the mapping side, our CAD and GIS professionals assist the survey projects by creating accurate maps. We have dedicated CAD experts who have extensive experience with different CAD software.



7. Annexures

7.1 Annexure – 1: Primary Control Point (PCP) DGPS Post-Processing Report

Network Adjustment Report

Page 1 of 5

Project Information		Coordinate System	
Name:	D:\Kurud Dron Survey\PCP-Raipur-25-28-jan.vce	Name:	UTM
Size:	631 KB	Datum:	WGS 1984
Modified:	29-01-2018 19:32:41 (UTC:5)	Zone:	44 North (81E)
Time zone:	India Standard Time	Geoid:	EGM96 (Global)
Reference number:		Vertical datum:	
Description:			

Network Adjustment Report

Adjustment Settings

Set-Up Errors

GNSS

Error in Height of Antenna: 0.000 m

Centering Error: 0.000 m

Covariance Display

Horizontal:

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 m

Scale on Linear Error [S]: 1.960

Three-Dimensional

Propagated Linear Error [E]: U.S.

Constant Term [C]: 0.000 m

Scale on Linear Error [S]: 1.960

Adjustment Statistics

Number of Iterations for Successful Adjustment: 2

Network Reference Factor: 1.00

Chi Square Test (95%): Passed

file:///C:/Users/Srinivas/AppData/Local/Temp/TBCTemporal/hyn12dqn.fa2/53eddf8.html 29-01-2018



Precision Confidence Level: 95%
Degrees of Freedom: 4

Post Processed Vector Statistics

Reference Factor: 1.00
Redundancy Number: 4.00
A Priori Scalar: 101.62

Control Point Constraints

Point ID	Type	East σ (Meter)	North σ (Meter)	Height σ (Meter)	Elevation σ (Meter)
HYDE	Global	Fixed	Fixed	Fixed	
IISC	Global	Fixed	Fixed	Fixed	
Fixed = 0.000001(Meter)					

Adjusted Grid Coordinates

Point ID	Easting (Meter)	Easting Error (Meter)	Northing (Meter)	Northing Error (Meter)	Elevation (Meter)	Elevation Error (Meter)	Cor
HYDE	239826.372	?	1927383.113	?	521.783	?	1
IISC	127917.413	?	1441987.668	?	929.917	?	1
RAIPUR-PCP	560766.517	1.972	2351381.191	0.974	298.732	1.799	

Adjusted Geodetic Coordinates

Point ID	Latitude	Longitude	Height (Meter)	Height Error (Meter)	Constraint

file:///C:/Users/Srinivas/AppData/Local/Temp/TBCTemporal/hyn12dqn.faz/53eddf78.html 29-01-2018



HYDE	N17°25'02.21987"	E78°33'03.17892"	444.790	?	LLh
IISC	N13°01'16.19707"	E77°34'13.35337"	843.714	?	LLh
RAIPUR-PCP	N21°15'47.24008"	E81°35'08.58749"	234.714	1.799	

Adjusted ECEF Coordinates

Point ID	X (Meter)	X Error (Meter)	Y (Meter)	Y Error (Meter)	Z (Meter)	Z Error (Meter)	3D Error (Meter)	Constraint
HYDE	1208443.561	?	5966808.390	?	1897080.466	?	?	LLh
IISC	1337936.455	?	6070317.126	?	1427876.785	?	?	LLh
RAIPUR-PCP	870190.163	1.927	5882769.522	1.780	2298653.662	1.091	2.841	

Error Ellipse Components

Point ID	Semi-major axis (Meter)	Semi-minor axis (Meter)	Azimuth
RAIPUR-PCP	2.525	1.079	104°

Adjusted GPS Observations

Transformation Parameters

Azimuth Rotation: -0.230 sec (95%) 0.651 sec

Scale Factor: 1.00000628 (95%) 0.00000163

Observation ID	Observation	A-posteriori Error	Residual	Standardized Residual
HYDE → IISC (PV2)	Az. 192°21'06"	0.650 sec	0.129 sec	0.538

File:///C:/Users/Srinivas/AppData/Local/Temp/TBCTemporal/hyn12dqn.faz2/53eddf8.html 29-01-2018



	ΔHt.	398.799 m	0.031 m	-2.839 m	-1.781 m
	Ellip Dist.	497702.834 m	0.812 m	0.223 m	0.905 m
IISC → RAIPUR-PCP (PV3)	Az.	24°31'59"	0.309 sec	0.046 sec	0.214 sec
	ΔHt.	-609.516 m	1.782 m	2.879 m	0.908 m
	Ellip Dist.	1007051.774 m	1.090 m	-0.326 m	-0.419 m
HYDE → RAIPUR-PCP (PV1)	Az.	36°20'39"	0.254 sec	-0.007 sec	-0.220 sec
	ΔHt.	-210.215 m	1.792 m	-0.237 m	-0.850 m
	Ellip Dist.	531855.361 m	0.619 m	0.001 m	0.008 m

Covariance Terms

From Point	To Point		Components	A-posteriori Error	Horiz. Precision (Ratio)	3D Precision (Ratio)
HYDE	IISC	Az.	192°21'06"	0.000 sec	1 : 0	1 : 0
		ΔHt.	398.924 m	0.000 m		
		ΔElev.	408.134 m	0.000 m		
		Ellip Dist.	497705.955 m	0.000 m		
RAIPUR-PCP	HYDE	Az.	217°21'00"	0.734 sec	1 : 474828	1 : 473051
		ΔHt.	210.077 m	1.799 m		
		ΔElev.	223.051 m	1.799 m		
		Ellip Dist.	531858.695 m	1.120 m		
RAIPUR-PCP	IISC	Az.	205°43'13"	0.408 sec	1 : 1076793	1 : 1073130
		ΔHt.	609.001 m	1.799 m		
		ΔElev.	631.185 m	1.799 m		
		Ellip Dist.	1007058.067 m	0.935 m		

file:///C:/Users/Srinivas/AppData/Local/Temp/TBCTemporal/hyn12dqn_fa2/53eddf8.html 29-01-2018

Date: 29-01-2018 19:56:03	Project: D:\Kurud Dron Survey\PCP-Raipur-25-28-jan.vce	Trimble Business Center
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7.2 Annexure -2: Secondary Control Point (SCP) DGPS Post-Processing Report

Primary Control Point (PCP Raipur) to Secondary Control Point (SCP-1) Baseline Processing Report

Project Information		Coordinate System	
Name:	D:\IRCON\IRCON-URGA TO KUSUMUNDA\SCP-4Hr.vce	Name:	UTM
Size:	97 KB	Datum:	WGS 1984
Modified:	1/31/2018 10:43:08 PM (UTC:5)	Zone:	44 North (81E)
Time zone:	India Standard Time	Geoid:	EGM96 (Global)
Reference number:		Vertical datum:	
Description:			

Baseline Processing Report

Processing Summary

Observation	From	To	Solution Type	H. Prec. (Meter)	V. Prec. (Meter)	Geodetic Az.	Ellipsoid Dist. (Meter)	ΔHeight (Meter)
SCP-01 --- PCP- Raipur (B1)	PCP-Raipur	SCP-01	Fixed	0.007	0.019	45°04'15"	164895.663	-10.637

Acceptance Summary

Processed	Passed	Flag 	Fall 
1	1	0	0

SCP-01 - PCP-Raipur (13:52:00-17:22:55) (S1)

Baseline observation: SCP-01 → PCP-Raipur (B1)
 Processed: 31-01-2018 22:53:28
 Solution type: Fixed
 Frequency used: Dual Frequency (L1, L2)
 Horizontal precision: 0.007 m
 Vertical precision: 0.019 m
 RMS: 0.002 m
 Maximum PDOP: 2.939
 Ephemeris used: Broadcast
 Antenna model: US National Geodetic Survey Calibration
 Processing start time: 31-01-2018 13:52:00 (Local: UTC+5hr)
 Processing stop time: 31-01-2018 17:22:55 (Local: UTC+5hr)
 Processing duration: 03:30:55
 Processing interval: 5 seconds

Vector Components (Mark to Mark)

From:	PCP-Raipur				
	Grid		Local		Global
Easting	560764.042 m	Latitude	N21°15'47.16512"	Latitude	N21°15'47.16512"
Northing	2351378.878 m	Longitude	E81°35'08.50131"	Longitude	E81°35'08.50131"
Elevation	298.819 m	Height	234.801 m	Height	234.801 m

To:	SCP-01				
	Grid		Local		Global
Easting	677032.804 m	Latitude	N22°18'39.55260"	Latitude	N22°18'39.55260"
Northing	2468257.701 m	Longitude	E82°43'07.23316"	Longitude	E82°43'07.23316"
Elevation	285.201 m	Height	224.164 m	Height	224.164 m

Vector					
ΔEasting	116268.761 m	NS Fwd Azimuth	45°04'15"	ΔX	-121949.442 m
ΔNorthing	116878.823 m	Ellipsoid Dist.	164895.663 m	ΔY	-26672.621 m
ΔElevation	-13.618 m	ΔHeight	-10.637 m	ΔZ	107740.077 m



Standard Errors

Vector errors:					
$\sigma \Delta \text{Easting}$	0.002 m	$\sigma \text{ NS fwd Azimuth}$	0°00'00"	$\sigma \Delta X$	0.003 m
$\sigma \Delta \text{Northing}$	0.002 m	$\sigma \text{ Ellipsoid Dist.}$	0.003 m	$\sigma \Delta Y$	0.009 m
$\sigma \Delta \text{Elevation}$	0.010 m	$\sigma \Delta \text{Height}$	0.010 m	$\sigma \Delta Z$	0.004 m

Aposteriori Covariance Matrix (Meter²)

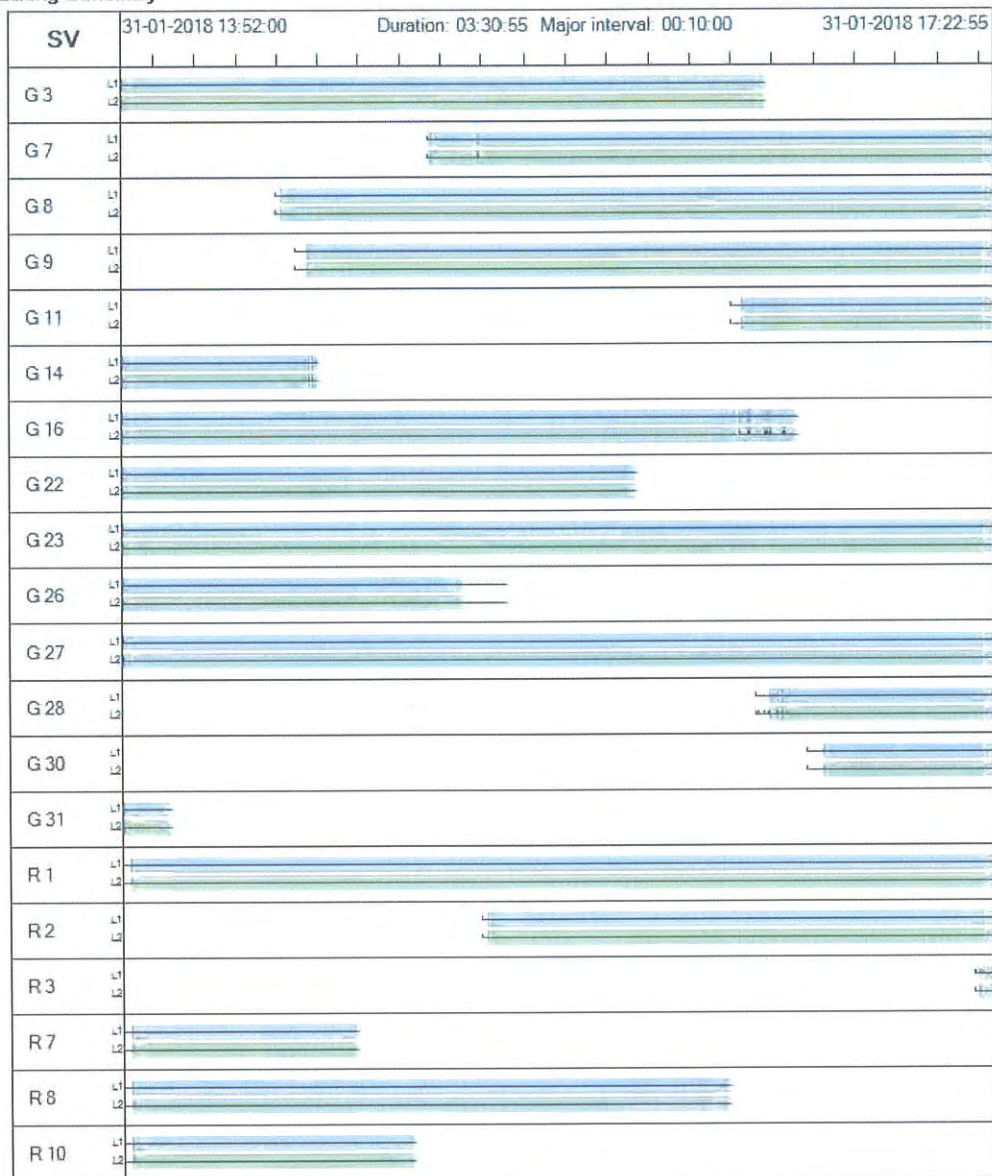
	X	Y	Z
X	0.0000094767		
Y	0.0000173797	0.0000858756	
Z	0.0000039199	0.0000272577	0.0000131925

Occupations

	From	To
Point ID:	PCP-Raipur	SCP-01
Data file:	D:\IRCON\IRCON-URGA TO KUSUMUNDA\SCP-4Hr\03101049031p_20180131131419.180	D:\IRCON\IRCON-URGA TO KUSUMUNDA\SCP-4Hr\03102966031q_20180131135158.180
Receiver type:	Unknown	Unknown
Receiver serial number:		
Antenna type:	NGS D/M+gp60	NGS D/M+gp60
Antenna serial number:	-----	-----
Antenna height (measured):	1.427 m	1.523 m
Antenna method:	Antenna Phase Center	Antenna Phase Center



Tracking Summary



7.3 Annexure-3: DGPS Surveyed co-ordinates of Forest Patches

Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
1	Patch No-45	P-295	709510.7945	2461213.603	22°14'37.47167"	83°01'58.51124"
2		P-296	709512.6219	2461228.54	22°14'37.95636"	83°01'58.58205"
3		P-297	709524.2815	2461229.709	22°14'37.98928"	83°01'58.98969"
4	Patch No-46	P-298	709633.4591	2461376.132	22°14'42.70073"	83°02'02.87033"
5		P-299	709624.144	2461404.091	22°14'43.61357"	83°02'02.55821"
6		P-300	709616.8679	2461410.309	22°14'43.81884"	83°02'02.30709"
7		P-301	709619.7503	2461429.952	22°14'44.45604"	83°02'02.41695"
8		P-302	709614.948	2461458.218	22°14'45.37685"	83°02'02.26254"
9		P-303	709701.4378	2461613.832	22°14'50.39695"	83°02'05.35543"
10		P-304	709788.976	2461652.553	22°14'51.61720"	83°02'08.43006"
11	Patch No-47	P-305	712503.5414	2463714.497	22°15'57.43999"	83°03'44.19148"
12		P-306	712502.6668	2463716.428	22°15'57.50316"	83°03'44.16186"
13		P-307	712528.27	2463750.194	22°15'58.58927"	83°03'45.07200"
14		P-308	712530.6464	2463742.913	22°15'58.35156"	83°03'45.15152"
15	Patch No-48	P-309	713025.955	2464274.161	22°16'15.39831"	83°04'02.70120"
16		P-310	713034.3944	2464304.157	22°16'16.36948"	83°04'03.01024"
17		P-311	713036.543	2464378.594	22°16'18.78789"	83°04'03.12083"
18		P-312	713084.1	2464371.77	22°16'18.54494"	83°04'04.77830"
19		P-313	713083.9718	2464350.677	22°16'17.85943"	83°04'04.76374"
20		P-314	713046.1771	2464300.832	22°16'16.25617"	83°04'03.42011"
21	Patch No-49	P-315	713217.3402	2464526.571	22°16'23.51699"	83°04'09.50518"
22		P-316	713208.8122	2464551.507	22°16'24.33127"	83°04'09.21930"
23		P-317	713234.7442	2464557.426	22°16'24.51210"	83°04'10.12770"
24		P-318	713229.2409	2464574.676	22°16'25.07523"	83°04'09.94377"
25		P-319	713256.0429	2464577.613	22°16'25.15875"	83°04'10.88114"
26	Patch No-50	P-320	713284.2743	2464618.359	22°16'26.47051"	83°04'11.88650"
27		P-321	713222.3279	2464632.359	22°16'26.95311"	83°04'09.72995"
28		P-322	713263.5366	2464683.817	22°16'28.60726"	83°04'11.19363"
29	Patch No-51	P-323	713395.1901	2464743.642	22°16'30.49305"	83°04'15.81979"
30		P-324	713374.4818	2464739.017	22°16'30.35194"	83°04'15.09442"



Sr. No.	Patch No.	Point Id	Easting''m''	Northing''m''	Latitude''N''	Longitude''E''
31		P-325	713348.9482	2464771.696	22°16'31.42547"	83°04'14.21838"
32		P-326	713377.7278	2464796.486	22°16'32.21838"	83°04'15.23528"
33		P-327	713400.2412	2464774.911	22°16'31.50710"	83°04'16.01116"
34	Patch No-52	P-328	713484.8276	2464808.507	22°16'32.56136"	83°04'18.98114"
35		P-329	713473.0397	2464865.4	22°16'34.41575"	83°04'18.59673"
36		P-330	713641.312	2464969.683	22°16'37.73010"	83°04'24.52308"
37		P-331	713582.7236	2464867.245	22°16'34.42680"	83°04'22.42797"
38	Patch No-53	P-332	714048.1234	2465150.417	22°16'43.42264"	83°04'38.81652"
39		P-333	714039.4683	2465215.592	22°16'45.54482"	83°04'38.54556"
40		P-334	714303.2481	2465378.508	22°16'50.72190"	83°04'47.83573"
41		P-335	714305.0549	2465426.637	22°16'52.28539"	83°04'47.92197"
42		P-336	714427.6704	2465337.818	22°16'49.34372"	83°04'52.16132"
43		P-337	714334.7766	2465327.459	22°16'49.04863"	83°04'48.91224"
44	Patch No-54	P-338	714538.7261	2465406.408	22°16'51.52327"	83°04'56.07269"
45		P-339	714487.6943	2465539.439	22°16'55.86988"	83°04'54.35455"
46		P-340	714761.1773	2465778.876	22°17'03.52939"	83°05'04.02081"
47		P-341	715083.7966	2465978.132	22°17'09.86070"	83°05'15.38399"
48		P-342	715115.0093	2465967.206	22°17'09.49156"	83°05'16.46878"
49		P-343	715157.0743	2465952.861	22°17'09.00643"	83°05'17.93093"
50		P-344	715195.9301	2465940.57	22°17'08.58949"	83°05'19.28198"
51		P-345	715143.2865	2465779.796	22°17'03.38773"	83°05'17.36583"
52	Patch No-55	P-346	715324.9916	2465892.021	22°17'06.95353"	83°05'23.76583"
53		P-347	715267.1154	2465898.489	22°17'07.18979"	83°05'21.74771"
54		P-348	715371.3814	2465971.334	22°17'09.51047"	83°05'25.42427"
55		P-349	715379.1602	2465944.505	22°17'08.63499"	83°05'25.68297"
56		P-350	715407.894	2465951.649	22°17'08.85425"	83°05'26.68991"
57		P-351	715401.8836	2465983.24	22°17'09.88372"	83°05'26.49528"
58		P-352	715582.3144	2466050.948	22°17'12.00310"	83°05'32.82938"
59	Patch No-56	P-353	715642.2337	2466246.587	22°17'18.33468"	83°05'35.01670"
60		P-354	715642.4983	2466250.821	22°17'18.47215"	83°05'35.02799"
61		P-355	715644.3601	2466251.945	22°17'18.50787"	83°05'35.09355"

Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
62	Patch No-57	P-356	715647.7104	2466246.521	22°17'18.33005"	83°05'35.20794"
63		P-357	715624.5662	2466077.044	22°17'12.83222"	83°05'34.31761"
64		P-358	715627.309	2466096.085	22°17'13.44986"	83°05'34.42261"
65		P-359	715682.8187	2466115.585	22°17'14.05863"	83°05'36.37067"
66		P-360	715689.0156	2466234.384	22°17'17.91697"	83°05'36.64462"
67		P-361	715714.341	2466250.025	22°17'18.41393"	83°05'37.53666"
68		P-362	715927.043	2466381.395	22°17'22.58773"	83°05'45.02882"
69		P-363	715980.8087	2466344.08	22°17'21.35069"	83°05'46.88847"
70		P-364	715720.6884	2466183.425	22°17'16.24645"	83°05'37.72609"
71		P-365	715717.0894	2466134.188	22°17'14.64780"	83°05'37.57655"
72	Patch No-58	P-366	716270.0446	2466560.846	22°17'28.26526"	83°05'57.09512"
73		P-367	716199.6051	2466560.974	22°17'28.30127"	83°05'54.63509"
74		P-368	716220.66	2466579.246	22°17'28.88560"	83°05'55.37931"
75		P-369	716325.4428	2466692.506	22°17'32.51935"	83°05'59.09385"
76		P-370	716428.0872	2466904.469	22°17'39.36202"	83°06'02.78174"
77		P-371	716341.3726	2466929.968	22°17'40.23000"	83°05'59.76556"
78		P-372	716348.6377	2466948.679	22°17'40.83482"	83°06'00.02839"
79		P-373	716435.1753	2466923.231	22°17'39.96862"	83°06'03.03841"
80		P-374	716497.2676	2467162.162	22°17'47.70608"	83°06'05.32320"
81		P-375	716551.5433	2467329.642	22°17'53.12482"	83°06'07.30030"
82		P-376	716611.026	2467320.541	22°17'52.80211"	83°06'09.37340"
83		P-377	716584.9367	2467141.811	22°17'47.00498"	83°06'08.37524"
84		P-378	716521.675	2466897.795	22°17'39.10278"	83°06'06.04710"
85		P-379	716608.1469	2466872.367	22°17'38.23721"	83°06'09.05482"
86		P-380	716601.3175	2466853.529	22°17'37.62801"	83°06'08.80713"
87		P-381	716514.729	2466878.991	22°17'38.49476"	83°06'05.79537"
88		P-382	716373.0305	2466655.964	22°17'31.31017"	83°06'00.73811"
89		P-383	716283.4785	2466555.841	22°17'28.09651"	83°05'57.56187"
90	Patch No-59	P-384	716695.6415	2467707.71	22°18'05.34726"	83°06'12.51719"
91		P-385	716620.4519	2467810.372	22°18'08.71795"	83°06'09.94097"
92		P-386	716618.3881	2467874.666	22°18'10.80852"	83°06'09.90018"

Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
93	Patch No-60	P-387	716693.8002	2467825.722	22°18'09.18362"	83°06'12.51032"
94		P-388	716564.003	2468353.933	22°18'26.40992"	83°06'08.23385"
95		P-389	716460.008	2468428.667	22°18'28.88595"	83°06'04.63778"
96		P-390	716373.748	2468736.821	22°18'38.94039"	83°06'01.77466"
97		P-391	716372.595	2468778.036	22°18'40.28044"	83°06'01.75443"
98		P-392	716231.0122	2469283.827	22°18'56.78335"	83°05'57.05483"
99		P-393	716170.2148	2469501.021	22°19'03.86990"	83°05'55.03669"
100		P-394	716087.92	2469823.478	22°19'14.38739"	83°05'52.31870"
101		P-395	716078.242	2469947.113	22°19'18.41006"	83°05'52.04071"
102		P-396	716103.3642	2470180.705	22°19'25.99074"	83°05'53.03184"
103		P-397	716140.9743	2470397.313	22°19'33.01376"	83°05'54.45099"
104		P-398	716177.2258	2470606.095	22°19'39.78301"	83°05'55.81893"
105		P-399	716236.069	2470591.81	22°19'39.29212"	83°05'57.86760"
106		P-400	716181.312	2470278.904	22°19'29.14706"	83°05'55.80254"
107		P-401	716144.1666	2470055.168	22°19'21.89217"	83°05'54.39615"
108		P-402	716138.4411	2469938.1	22°19'18.08989"	83°05'54.13924"
109		P-403	716166.715	2469737.46	22°19'11.55606"	83°05'55.02937"
110		P-404	716276.724	2469343.11	22°18'58.68943"	83°05'58.68042"
111		P-405	716450.7867	2468758.386	22°18'39.60641"	83°06'04.47609"
112		P-406	716466.96	2468700.607	22°18'37.72119"	83°06'05.01291"
113	Patch No-61	P-407	716298.819	2470951.235	22°19'50.94542"	83°06'00.23464"
114		P-408	716245.6129	2470933.243	22°19'50.38476"	83°05'58.36714"
115		P-409	716239.8979	2470905.091	22°19'49.47238"	83°05'58.15379"
116		P-410	716228.5028	2470901.413	22°19'49.35799"	83°05'57.75392"
117		P-411	716243.816	2470989.606	22°19'52.21744"	83°05'58.33179"
118		P-412	716269.4784	2470992.033	22°19'52.28472"	83°05'59.22949"
119		P-413	716284.0305	2471031.192	22°19'53.55082"	83°05'59.75692"
120		P-414	716250.253	2471026.678	22°19'53.41942"	83°05'58.57471"
121		P-415	716281.9301	2471209.116	22°19'59.33451"	83°05'59.77015"
122		P-416	716342.3722	2471200.702	22°19'59.03368"	83°06'01.87761"
123	Patch No-62	P-417	716348.0894	2471233.45	22°20'00.09543"	83°06'02.09329"



Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
124		P-418	716287.8235	2471243.058	22°20'00.43499"	83°05'59.99256"
125		P-419	716342.8815	2471560.152	22°20'10.71598"	83°06'02.07044"
126		P-420	716350.3969	2471554.627	22°20'10.53301"	83°06'02.33031"
127		P-421	716387.3039	2471458.066	22°20'07.37793"	83°06'03.57266"
128		P-422	716364.3426	2471326.546	22°20'03.11381"	83°06'02.70644"
129		P-423	716355.4315	2471329.161	22°20'03.20283"	83°06'02.39640"
130		P-424	716343.2628	2471300.232	22°20'02.26810"	83°06'01.95719"
131		P-425	716358.8112	2471294.863	22°20'02.08657"	83°06'02.49777"
132	Patch No-63	P-426	716732.0152	2472277.44	22°20'33.85213"	83°06'16.01524"
133		P-427	716711.3549	2472282.223	22°20'34.01696"	83°06'15.29575"
134		P-428	716806.2933	2472369.909	22°20'36.82374"	83°06'18.65548"
135		P-429	716838.0183	2472399.211	22°20'37.76166"	83°06'19.77819"
136		P-430	716849.7241	2472354.223	22°20'36.29421"	83°06'20.16520"
137		P-431	716820.0448	2472363.04	22°20'36.59425"	83°06'19.13257"
138	Patch No-64	P-432	717041.3897	2472579.244	22°20'43.52049"	83°06'26.97155"
139		P-433	717034.0336	2472580.252	22°20'43.55662"	83°06'26.71503"
140		P-434	717042.4802	2472588.054	22°20'43.80633"	83°06'27.01395"
141		P-435	717044.35	2472587.292	22°20'43.78072"	83°06'27.07891"
142	Patch No-65	P-436	717195.1682	2472647.452	22°20'45.66736"	83°06'32.37765"
143		P-437	717181.2509	2472663.911	22°20'46.20862"	83°06'31.89946"
144		P-438	717156.0641	2472692.961	22°20'47.16426"	83°06'31.03368"
145		P-439	717168.8099	2472704.734	22°20'47.54107"	83°06'31.48476"
146		P-440	717196.2285	2472704.669	22°20'47.52648"	83°06'32.44269"
147		P-441	717212.5873	2472745.167	22°20'48.83527"	83°06'33.03405"
148		P-442	717281.0922	2472808.439	22°20'50.86048"	83°06'35.45848"
149		P-443	717699.4602	2473195.824	22°21'03.26016"	83°06'50.26565"
150		P-444	717733.5699	2473182.336	22°21'02.80623"	83°06'51.45081"
151		P-445	717658.7201	2473075.549	22°20'59.36971"	83°06'48.78324"
152		P-446	717266.3394	2472713.18	22°20'47.77121"	83°06'34.89642"
153		P-447	717208.4957	2472694.33	22°20'47.18488"	83°06'32.86623"
154		P-448	717216.2509	2472666.923	22°20'46.29060"	83°06'33.12377"

Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
155	Patch No-66	P-449	717838.0129	2473257.077	22°21'05.18770"	83°06'55.13666"
156		P-450	717746.7719	2473242.512	22°21'04.75599"	83°06'51.94160"
157		P-451	717882.7256	2473439.119	22°21'11.08380"	83°06'56.78827"
158		P-452	717945.262	2473606.322	22°21'16.48946"	83°06'59.05540"
159		P-453	718034.2576	2474044.659	22°21'30.69507"	83°07'02.38031"
160		P-454	718107.5008	2474405.914	22°21'42.40259"	83°07'05.11712"
161		P-455	718118.9628	2474462.447	22°21'44.23473"	83°07'05.54542"
162		P-456	718141.3189	2474572.713	22°21'47.80820"	83°07'06.38081"
163		P-457	718179.8911	2474461.333	22°21'44.17064"	83°07'07.67384"
164		P-458	718176.558	2474444.894	22°21'43.63790"	83°07'07.54929"
165		P-459	718165.9636	2474392.644	22°21'41.94457"	83°07'07.15340"
166		P-460	718084.2433	2473989.61	22°21'28.88308"	83°07'04.09981"
167		P-461	718003.6062	2473591.919	22°21'15.99468"	83°07'01.08688"
168		P-462	717944.1467	2473428.627	22°21'10.71474"	83°06'58.92916"
169	Patch No-67	P-463	718199.7494	2474559.271	22°21'47.34461"	83°07'08.41591"
170		P-464	718190.8978	2474515.616	22°21'45.92985"	83°07'08.08514"
171		P-465	718161.8534	2474617.554	22°21'49.25617"	83°07'07.12040"
172		P-466	718153.1303	2474630.969	22°21'49.69618"	83°07'06.82219"
173		P-467	718175.0546	2474739.105	22°21'53.20064"	83°07'07.64147"
174		P-468	718229	2474794	22°21'54.96007"	83°07'09.55348"
175		P-469	718246.6957	2474790.804	22°21'54.84810"	83°07'10.17025"
176	Patch No-68	P-470	718280.3235	2474956.652	22°22'00.22286"	83°07'11.42692"
177		P-471	718262.954	2474972.486	22°22'00.74545"	83°07'10.82777"
178		P-472	718286.1224	2474985.251	22°22'01.14970"	83°07'11.64363"
179	Patch No-69	P-473	718313.4309	2475119.933	22°22'05.51444"	83°07'12.66419"
180		P-474	718294.8806	2475117.927	22°22'05.45773"	83°07'12.01498"
181		P-475	718285.6819	2475284.746	22°22'10.88368"	83°07'11.77567"
182		P-476	718331.6824	2475511.632	22°22'18.23654"	83°07'13.49484"
183		P-477	718346.7655	2475529.019	22°22'18.79473"	83°07'14.03047"
184		P-478	718396.9236	2475531.708	22°22'18.85913"	83°07'15.78454"
185	Patch No-70	P-479	718424.0994	2475665.736	22°22'23.20265"	83°07'16.80022"



Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
186		P-480	718372.8501	2475714.681	22°22'24.81689"	83°07'15.03343"
187		P-481	718380.4852	2475752.34	22°22'26.03731"	83°07'15.31879"
188		P-482	718399.2748	2476042.32	22°22'35.45323"	83°07'16.11827"
189		P-483	718518.3291	2476630.39	22°22'54.51122"	83°07'20.56866"
190		P-484	718480.2191	2476638.105	22°22'54.77945"	83°07'19.24064"
191		P-485	718491	2476672	22°22'55.87611"	83°07'19.63411"
192		P-486	718657.4125	2476611.832	22°22'53.84429"	83°07'25.42005"
193		P-487	718536.438	2476014.279	22°22'34.47899"	83°07'20.89770"
194		P-488	718435.8897	2475723.884	22°22'25.08709"	83°07'17.24088"
195		P-489	718520.879	2476970.565	22°23'05.56591"	83°07'20.82555"
196	Patch No-71	P-490	718533.9912	2477035.334	22°23'07.66492"	83°07'21.31574"
197		P-491	718541.9617	2477033.72	22°23'07.60882"	83°07'21.59350"
198	Patch No-72	P-492	718704.4592	2477549.779	22°23'24.30638"	83°07'27.52723"
199		P-493	718716.7534	2477610.506	22°23'26.27439"	83°07'27.98689"
200		P-494	718721.4927	2477609.547	22°23'26.24103"	83°07'28.15205"
201	Patch No-73	P-495	718847.7452	2477753.571	22°23'30.86387"	83°07'32.63563"
202		P-496	718798.404	2477812.233	22°23'32.79309"	83°07'30.94017"
203		P-497	718856.8867	2478101.106	22°23'42.15468"	83°07'33.12689"
204		P-498	718864.6306	2478139.356	22°23'43.39429"	83°07'33.41645"
205		P-499	718870.3891	2478167.802	22°23'44.31613"	83°07'33.63177"
206		P-500	718877.0621	2478144.008	22°23'43.53974"	83°07'33.85323"
207		P-501	718905.4255	2478152.757	22°23'43.81104"	83°07'34.84886"
208		P-502	718913.1724	2478248.734	22°23'46.92679"	83°07'35.16707"
209		P-503	718949.0499	2478321.442	22°23'49.27331"	83°07'36.45697"
210		P-504	718962.0454	2478318.156	22°23'49.16055"	83°07'36.90955"
211		P-505	718922.6915	2478123.766	22°23'42.86090"	83°07'35.43798"
212	Patch No-74	P-506	718909.1452	2478280.019	22°23'47.94540"	83°07'35.04179"
213		P-507	718891.664	2478272.888	22°23'47.72169"	83°07'34.42729"
214		P-508	718897.617	2478302.291	22°23'48.67456"	83°07'34.64989"
215	Patch No-75	P-509	718936.8736	2478474.541	22°23'54.25469"	83°07'36.10711"
216		P-510	718932.6962	2478475.567	22°23'54.28995"	83°07'35.96162"



Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
217		P-511	718936.1927	2478492.84	22°23'54.84972"	83°07'36.09236"
218		P-512	718939.7311	2478486.765	22°23'54.65065"	83°07'36.21303"
219		P-513	718938.6713	2478505.083	22°23'55.24648"	83°07'36.18505"
220	Patch No-76	P-514	718952.7228	2478574.49	22°23'57.49578"	83°07'36.71049"
221		P-515	718956.2279	2478563.162	22°23'57.12600"	83°07'36.82740"
222		P-516	718981.5822	2478414.658	22°23'52.28793"	83°07'37.64010"
223	Patch No-77	P-517	718949.3531	2478432.084	22°23'52.86909"	83°07'36.52229"
224		P-518	718979.3834	2478693.096	22°24'01.33825"	83°07'37.70099"
225		P-519	719019.8647	2478736.752	22°24'02.73847"	83°07'39.13747"
226		P-520	718980.4927	2478711.657	22°24'01.94097"	83°07'37.74894"
227		P-521	718987.6488	2478796.745	22°24'04.70306"	83°07'38.04116"
228		P-522	718999.9671	2478849.431	22°24'06.40971"	83°07'38.49777"
229		P-523	719077.477	2479049.328	22°24'12.87076"	83°07'41.30583"
230		P-524	719195.594	2479221.358	22°24'18.40740"	83°07'45.51950"
231		P-525	719383.955	2479385.854	22°24'23.66676"	83°07'52.18476"
232		P-526	719570.9452	2479501.945	22°24'27.35350"	83°07'58.77822"
233		P-527	719819.1977	2479643.167	22°24'31.82861"	83°08'07.52558"
234		P-528	720122.023	2479829.761	22°24'37.75293"	83°08'18.20319"
235		P-529	720292.294	2479934.679	22°24'41.08396"	83°08'24.20704"
236		P-530	720536.387	2480076.933	22°24'45.59413"	83°08'32.80997"
237		P-531	720817.971	2480190.585	22°24'49.15719"	83°08'42.70924"
238		P-532	721054.4238	2480272.349	22°24'51.70470"	83°08'51.01517"
239		P-533	721359.4814	2480390.455	22°24'55.40126"	83°09'01.73741"
240		P-534	721385.4289	2480336.358	22°24'53.63103"	83°09'02.61731"
241		P-535	721069.2333	2480213.984	22°24'49.80095"	83°08'51.50365"
242		P-536	720829.9328	2480131.235	22°24'47.22278"	83°08'43.09773"
243		P-537	720616.413	2480048.804	22°24'44.64283"	83°08'35.59319"
244		P-538	720323.77	2479883.597	22°24'39.40922"	83°08'25.28181"
245		P-539	719850.635	2479592.062	22°24'30.15316"	83°08'08.59903"
246		P-540	719614.9276	2479435.079	22°24'25.16003"	83°08'00.28235"
247		P-541	719343.0325	2479255.172	22°24'19.43843"	83°07'50.68962"

वन वन अधिकारी
धरमजागर वन मण्डल
जिला रायगढ़ (छ.)

वन वन अधिकारी
धरमजागर वन मण्डल

वन अधिकारी
धरमजागर

RANGE OFFICER
Range - Chhal
Division - Dharamjaigarh





Sr. No.	Patch No.	Point Id	Easting"m"	Northing"m"	Latitude"N"	Longitude"E"
248		P-542	719164.6735	2479041.472	22°24'12.57528"	83°07'44.34966"
249		P-543	719064.9836	2478775.814	22°24'03.98722"	83°07'40.73378"
250		P-544	719054.5044	2478774.524	22°24'03.95012"	83°07'40.36688"
251	Patch No-78	P-545	721374.4138	2480397.784	22°24'55.63251"	83°09'02.26303"
252		P-546	721509.1999	2480472.303	22°24'57.99161"	83°09'07.01176"
253		P-547	721656.3506	2480573.289	22°25'01.20505"	83°09'12.20601"
254		P-548	721547.493	2480456.699	22°24'57.46664"	83°09'08.34248"
255		P-549	721452.2232	2480423.39	22°24'56.42847"	83°09'04.99566"
256		P-550	721414.8838	2480398.675	22°24'55.64261"	83°09'03.67810"

वन मण्डलाधिकारी
धरमजयगढ़ वन मण्डल
जिला चम्पा (छ.प्र.)

उप वन मण्डलाधिकारी
धरमजयगढ़ उप वन मण्डल

वन परिमन्त्राधिकारी
धरमजयगढ़

RANGE OFFICER
Range - Chhal
Division - Dharamjaigarh



7.4 Annexure – 4: DGPS Surveyed Map of BG Rail Line corridor showing proposed forest diversion area

Map Showing The Forest Patches In Dharamjaigarh Forest Division Proposed For Diversion For New BG Railway Corridor Form Urga To Dharamjaigarh.



उपमंडलाधिकारी
धरमजयगढ़ वन मण्डल
जिला रायगढ़ (छ.ग.)

एन वन मण्डलाधिकारी
धरमजयगढ़ वन मण्डल
जिला रायगढ़ (छ.ग.)

न परिक्षेत्राधिकारी
धरमजयगढ़ वन मण्डल
जिला रायगढ़ (छ.ग.)

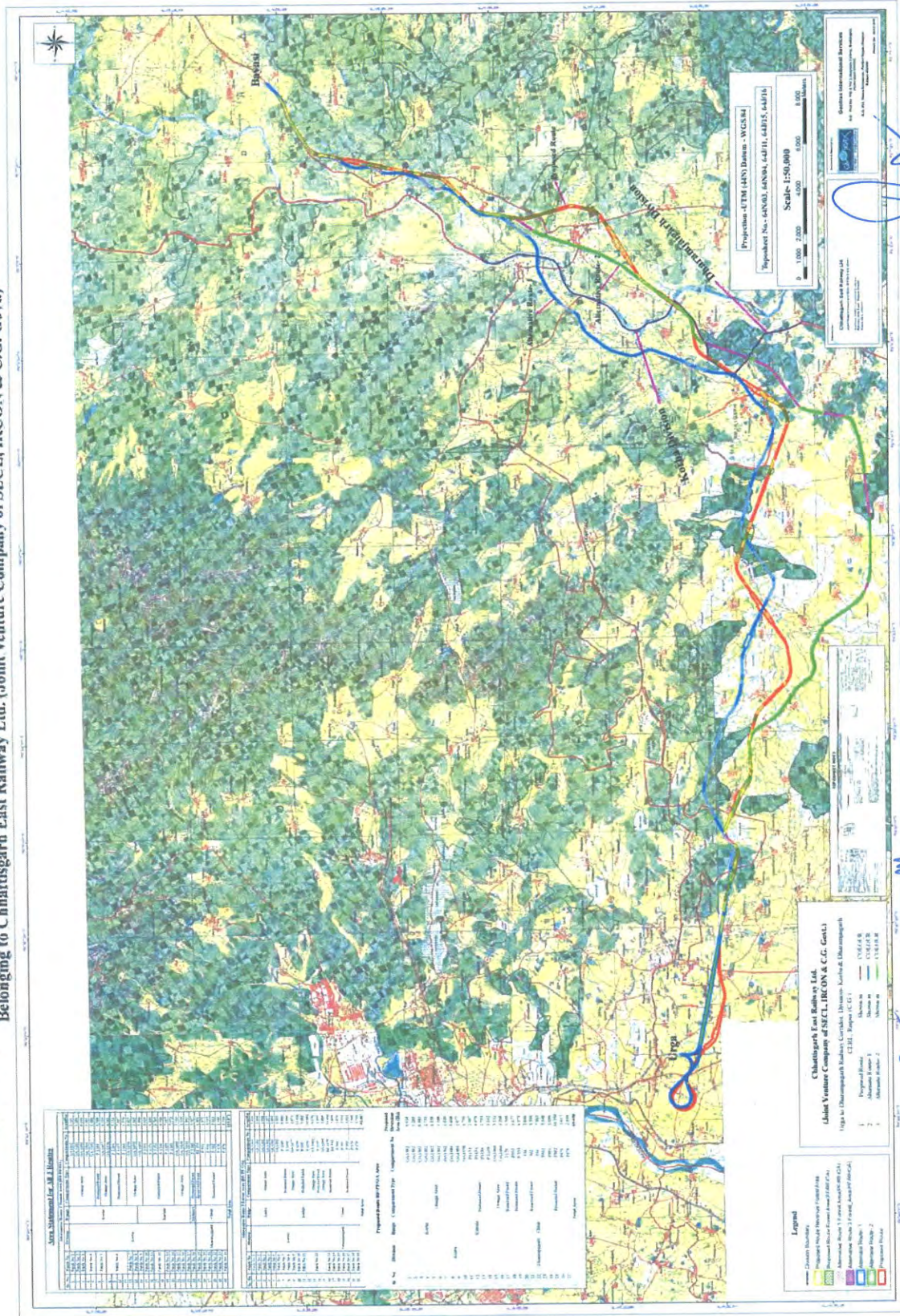
Page 4U of 41

RANGE OFFICER
Range - Chhal
Division - Dharamjaigarh



7.5 Annexure – 5: DGPS Surveyed Map of BG Rail Line corridor showing proposed & alternate routes

Map Showing the Forest Division Area for Proposed Railway Track Corridor from Urga to Dharamjaigarh with Alternative Route- 1 & 2, Belonging to Chhattisgarh East Railway Ltd. (Joint Venture Company of SECL, IRCON & C.G. Govt.)



**DGPS Survey report of 315.00 Hectares of land
proposed for Compensatory Afforestation in
Katghora forest division, Chhattisgarh for
compliance with Forest Diversion Proposal of
Urga to Dharamjaygarh BG Railway corridor
Of
Chhattisgarh East Railway Ltd
(A JV of IRCON, SECL AND CHHATTISGARH GOVT.)**



March 2021

**DGPS SURVEY AND GIS MAPPING DONE BY:
Geotrax International Services
Raipur, Chhattisgarh.**

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1. Introduction and Background

1.1 Background

Government of Chhattisgarh (GoCG) is keen to develop Rail infrastructure for facilitating passengers and freight traffic in the Northern part of Chhattisgarh. To this extent the State Government, in consultation with Ministry of Railways (MoR), has appointed a high level Committee, chaired by Mr. A.K. Mishra, Retd. Chief Secretary of C.G comprising representatives of MoR, GoCG, NTPC Ltd, SECL and Confederation of Indian Industry to identify the rail corridors. As per the committee's report and in line with the recommendations of Chhattisgarh Integrated Infrastructure Development Committee (CIIDC), three corridors were identified for the development of rail infrastructure.

- 1) Corridor-I, East corridor: Kharsia - Chhal - Gharghoda - Korichhapar - **Dharamjaygarh up to Korba** with a spur from Gharghoda to Donga Mauha to connect mines of Gare-Pelma block, approximately 180km in length.
- 2) Corridor-II, North Corridor: Surajpur-Parsa-Katghora-Korba, approximately 150 km in length.
- 3) Corridor-III, East-west Corridor: Gevra Road to Pendra Road via Dipka, Katghora, Sindurgarh, Pasan, approximately 122 km in length.

Memorandum of Understanding (MoU) was made on 03.11.12 between Government of Chhattisgarh (GoCG), South East Coalfields Limited (SECL) and IRCON for formation of Specific Joint Venture Companies (JVCs) upon the advise/instructions of Ministry of Railways (MoR) to **develop rail infrastructure for facilitating passengers and freight traffic in northern parts of Chhattisgarh**. In consideration of the above, the implementation of developing Corridor-I and Corridor-III would be taken up by JVCs. The names of the JVCs are proposed as "Chhattisgarh East Rail Ltd" for Corridor- I and "Chhattisgarh East-West Rail Ltd" for Corridor-III.

As part of the Corridor-I, East Corridor phase-II, a new BG line is proposed from Urga (District Korba) to Dharamaygarh (District Raigarh).

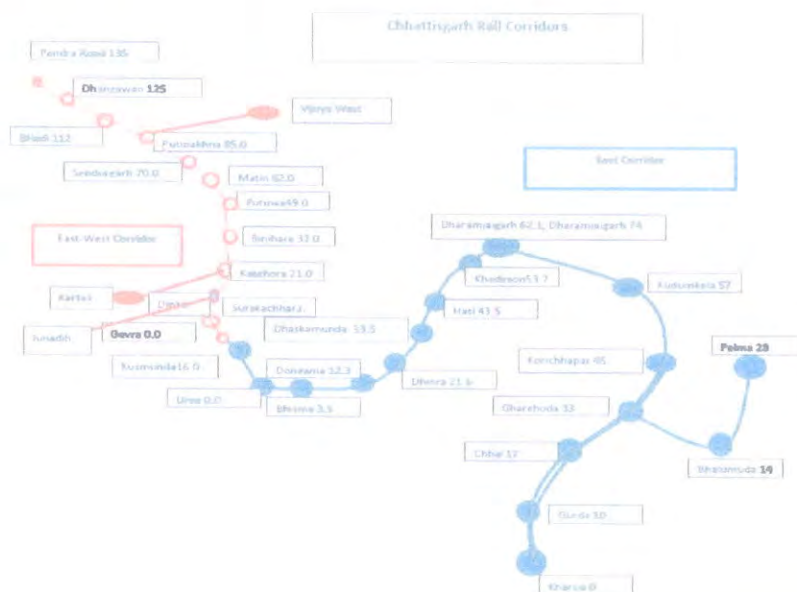
The approximate length of the rail corridor is 62 kms. The total forest area proposed for diversion is given below

Sl.No	Name of the Forest Division	Protected/Reserved/Orange Area (Ha)	Revenue Forest Area (Ha)	Total Forest Area (Ha)
1	Dharamjaygarh	46.173	51.494	97.667
2	Korba	23.483	35.885	59.368
	Total Forest Area (Ha)	69.656	87.379	157.035

The feasibility cum detailed project study was conducted by Delhi Integrated Multi Modal Transit System Ltd. (DIMTS). The preliminary alignment was accepted by IRCON and detailed topographical survey (including DGPS Survey) is conducted on the alignment by DIMTS. The Rail corridor line passes through two Districts, i.e. Korba & Raigarh, and three tehsils of these districts. It passes through two forests Division; Korba Forest Division, & Dharamjaygarh forest Division.

This Project is a passenger cum freight corridor line and will help in overall economic development of Northern Chhattisgarh region.

Coal Corridors - Overview



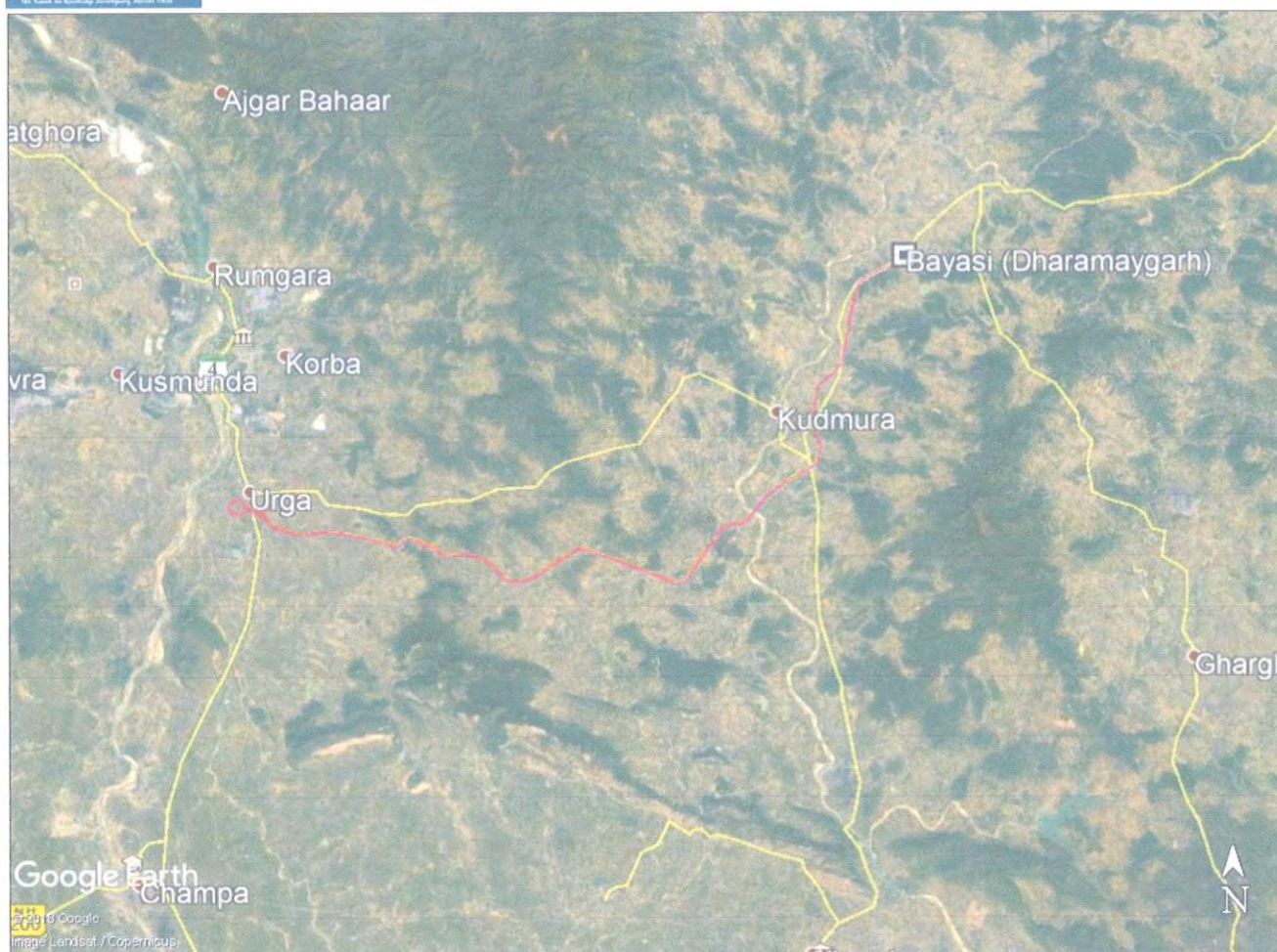


Fig-1: BG Rail Corridor from Uрга to Dharamjaygarh on Satellite Imagery

As per directives of Ministry of Environment & Forests dated 8th July 2011; all applications seeking diversion of forest land for non-forest purpose under Forest Conservation Act, 1980 must be accompanied with Geo-referenced shape file (both soft copy and hard copy maps) of the forest land proposed for diversion prepared using Differential GPS (DGPS).

1.2 Compensatory Afforestation (CA) Land Details and Site Inspection Report:

The total forest area for diversion in the proposed Railway Corridor is approximately 157.035 Hectares. The degraded forest land (DFL) proposed for CA is approximately 315 Hectares out of which in this report 315 **Hectares of Degraded forest land is surveyed and submitted in this report by Geotrax.**

The proposed CA land is Degraded Forest land which is identified in Kendai forest range of Katghora forest division. The land is identified and proposed by the Katghora Forest department staff. The site was jointly inspected by Geotrax staff along with Kendai Range forest department staff.

The Divisional Forest Officer, Katghora division allotted 150 Hectares of Degraded Forest area to CERL vide letter no. /2019/4131 dated 29.06.2019 And allotted 165 Hectares of Degraded Forest area to CERL vide letter no. /2019/8655 dated 03.10.2019. The said letter is herewith enclosed

 कार्यालय वन मण्डलाधिकारी कटघोरा वनमण्डल कटघोरा, जिला - कोरबा (छ.ग.) Phone/Fax No.: 07815-250157, mail : dfo-katghora.cg@gov.in	
क्रमांक / तक.अधि. / 2019 / 4131 प्रति,	कटघोरा, दिनांक 29.06.2019
Rajesh Khare Chief Operation Officer Chhattisgarh East Rail Corridor	
विषय :	Rail Corridor Project implemented by CERL and land for Compensatory Afforestation.
संदर्भ :	परिक्षेत्र अधिकारी कैंदई का पत्र क्र. 396 दि. 26.06.19 --- :000: ---
उपरोक्त संदर्भित विषयांतर्गत लेख है कि छ.ग. ईस्ट वेस्ट रेल कॉरीडोर लिमि. द्वारा क्षतिपूर्ति वृक्षारोपण हेतु 316.00 हे. क्षेत्र का मांग किया गया है। परिक्षेत्र अधिकारी कैंदई द्वारा सिरमिना सर्किल अंतर्गत कक्ष क्रमांक P312 में 100.00 हे. एवं P313 में 50.00 हे. कुल 150.00 हे. वनभूमि क्षतिपूर्ति वृक्षारोपण हेतु उपलब्ध होना पाया गया है। अतः क्षतिपूर्ति वृक्षारोपण हेतु 150.00 हे. का DGPS सर्वे कार्य पूर्ण कर प्रतिवेदन शीघ्र इस कार्यालय में प्रस्तुत करें।	
संलग्न:-	संदर्भित पत्र की छायाप्रति।
क्रमांक / तक.अधि. / 2019 / 4131 प्रतिलिपि	 वनमण्डलाधिकारी कटघोरा वनमण्डल कटघोरा कटघोरा, दिनांक
1. उप वनमण्डलाधिकारी कटघोरा की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु अग्रहित। 2. परिक्षेत्र अधिकारी कैंदई की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।	
 वनमण्डलाधिकारी कटघोरा वनमण्डल कटघोरा	
T.O. 2019-20	260

कार्यालय वन मण्डलाधिकारी कटघोरा वनमण्डल कटघोरा, जिला - कोरबा (छ.ग.)

Phone/Fax No.: 07815-250157, mail : dfo-katghora.cg@gov.in

क्रमांक / तक्र.अधि / 2019 / 5655
प्रति,

कटघोरा, दिनांक 03/10/19

✓ Rajesh Khare
Chief Operation Officer
Chhattisgarh East Rail Corridor

विषय: Rail Corridor Project implemented by CERL and land for Compensatory Afforestation.

संदर्भ: 1. उपवनमंडलाधिकारी कटघोरा का पत्र क्र. 2136 दि. 26.09.19
2. कार्य पत्र क्र. 6099 दि. 17.09.19

— :000: —

उपरोक्त संदर्भित विषयान्तर्गत लेख है कि छ.ग. ईस्ट रेल कॉरीडोर प्रोजेक्ट द्वारा क्षतिपूर्ति वृक्षारोपण हेतु 316.00 हे. क्षेत्र का मांग किया गया था। जिसमें 150.00 हे. क्षेत्र उपलब्ध कराया जा चुका है। शेष 165.00 हे. क्षेत्र हेतु DGPS की अनुमति मांगी गई है।

अतः आवेदक विभाग को 165.00 हे. क्षेत्र का DGPS सर्वे हेतु अनुमति प्रदान की जाती है।

संलग्न:- संदर्भित पत्र की छायाप्रति।

वनमण्डलाधिकारी
कटघोरा वनमण्डल कटघोरा
कटघोरा, दिनांक 03/10/19

क्रमांक / तक्र.अधि / 2019 / 5656
प्रतिलिपि

1. वनमण्डलाधिकारी कोरबा वनमण्डल कोरबा की ओर सूचनार्थ प्रेषित।
2. उप वनमण्डलाधिकारी कटघोरा की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु अर्पित।
3. परिक्षेत्र अधिकारी कोरबा की ओर सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित। DGPS सर्वे कार्य के दौरान आवश्यक सहयोग प्रदान करें।

वनमण्डलाधिकारी
कटघोरा वनमण्डल कटघोरा

1.3 Geotrax Empanelment Certificate in Chhattisgarh- from CGCOST



छत्तीसगढ़ विज्ञान एवं प्रौद्योगिकी परिषद

एम.आई.जी. 25, इन्द्रावती कॉलोनी, रायपुर, (छ.ग.) 492 001

Chhattisgarh Council of Science & Technology

MIG – 25, Indravati Colony, Raipur, (C.G.) 492 001

Tel : 0771-2434569 Fax : 2434093

E-mail : dgccost@gmail.com Web : www.cgcost.nic.in

Prof. M.M. Hambarde
Director General

No. 2470 /CCOST/2026

Date: 23/01/2016

प्रति

Geotrax International Services

(Survey and Mapping Consultancy),

H/o. 23-88A,

Krishnavan Nagar, Kothipat,

Hyderabad (A.P.) 500 058,

Email: info@geotrax.in, Web: www.geotrax.in

विषय :- DGPS / GIS Services प्रदान करने हेतु Empanelment के संबंध में।

परिषद द्वारा पूर्व में DGPS / GIS Services प्रदान करने हेतु firms के empanelment हेतु EOI (Expression of Interest) बुलाये गये थे। जिसके संदर्भ में आपके द्वारा आवेदन प्रस्तुत किया गया था।

दिनांक 28.12.2015 को आपके द्वारा विषय विशेषज्ञ समिति के समक्ष दिये गये प्रस्तुतिकरण के आधार पर समिति द्वारा डीजीपीएस सर्वे कार्य हेतु आपकी संस्था का empanelment किया जाता है।

कृपया अपनी सहमति परिषद को प्रदान करने का कष्ट करें।


(महानिदेशक)

खनिज साधन विभाग
मंत्रालय, महानदी भवन, नया रायपुर

नया रायपुर, दिनांक 5 जून 2014

क्रमांक एफ 7-14/2013/12.—राज्य शासन एतद्वारा चीफ कंट्रोलर आफ माईन्स, भारतीय खान ब्यूरो, नयापुर के परिषद क्रमांक N-1101373/MP/90/CCOM Vol. VII, Circular No. 2/2010, दिनांक 06-04-2010 के पैरा-02 के बिन्दु क्रमांक-02 के अन्तर्गत में Differential Global Positioning System (डीजीपीएस) का उपयोग करते हुए सर्वेक्षण करने के लिए नीचे तालिका के क्रम नंबर-02 में दर्शित संस्थान को क्रम नंबर-03 में दर्शित खनिज से संबंधित खनिज रियायतों के लिए अधिमान्यता प्रदान करता है।

तालिका

क्र.	एजेंसी का नाम एवं पता	अधिमान्यता का विवरण
1.	छत्तीसगढ़ विज्ञान एवं प्रौद्योगिकी परिषद्, एम.आई.जी.-25 इन्द्रावती कालोनी, रायपुर-492001 (छत्तीसगढ़)	राज्य में समस्त खनिजों की खनिज रियायतों से संबंधित डीजीपीएस सर्वे कार्य हेतु।
2.	स्टील अथॉरिटी आफ इंडिया लिमिटेड, भिलाई इस्पात संयंत्र, भिलाई-490001, जिला-दुर्ग (छत्तीसगढ़)	राज्य में विगत राज्य की खनिज रियायतों से संबंधित डीजीपीएस सर्वे कार्य हेतु।
3.	भारतीय सर्वेक्षण विभाग, छत्तीसगढ़ जियो-स्पेशल डाटा सेंटर, सर्वे आफ इंडिया, रीना जवाहर्मेड उरा फ्लोर, पश्चिमो नक्का, धमतरी रोड, रायपुर-492001 (छत्तीसगढ़)	राज्य में समस्त खनिजों की खनिज रियायतों से संबंधित डीजीपीएस सर्वे कार्य हेतु।

अधिमान्यता प्राप्त संस्थान के लिये शर्तें :-

1. Coordinates of boundry pillars shall be established in the World Geodetic System 1984 (WGS-84) Datum.
 2. Each boundry pillar shall be surveyed using DGPS, at least 2 Hours observation, for its ground position.
 3. The maximum distance between any two successive pillars should not be more than 100 meter.
 4. All corner pillar should be of pyramid shaped with base of 1 meter and height of 2 meter and should be placed 1 meter above the ground and 1 meter below the ground.
 5. Distance and bearing to the forward and backward pillars and latitudes and longitudes should be marked on all the corner pillars.
3. उपरोक्त शर्तों के अतिरिक्त निम्नलिखित शर्तों को भी शामिल किया जाना होगा :-
1. उपरोक्त बिन्दु से संबंधित कार्य के लिए खनिज रियायतधारी द्वारा अधिमान्यता प्राप्त संस्थान को भुगतान करना होगा। डीजीपीएस सर्वे कार्य हेतु पारस्परिक या विपरीत अधिमान्यता प्राप्त संस्थान एवं खनिज रियायतधारी के मध्य अपनी समझौते से किया जाएगा।
 2. डीजीपीएस सर्वे के संबंध में भारतीय खान ब्यूरो/राज्य शासन द्वारा समय-समय पर जारी निर्देशों का पालन अधिमान्यता प्राप्त संस्थान को करना होगा।
 3. यह अधिमान्यता इस आदेश के जारी होने से आठवें अर्द्ध शताब्दी तक प्रभावशील होगी।

छत्तीसगढ़ के राज्यपाल के नाम से तथा आदेशानुसार
के.डी. खन्ना, ज.आ.सी.डी.

2. Scope of Work

1. Establishment of one base station for DGPS Survey with 72 Hours observation and one or more secondary control points near the CA land boundary.
2. Fixation of corridor boundary point by DGPS (Boundary point fixed at every corner and turning point.
3. Data processing and interpretation :-
 - a. Geo referencing of SOI Toposheet map (1:50000)& and Forest Map (1:15000)
 - b. Creation of proposed CA land boundary vector map using the DGPS survey data.
 - c. Superimposition of CA land polygon layer on Georeferenced forest map.
 - d. Computation of area proposed for CA.
 - e. Preparation of DGPS report along with soft copies of maps in shape file format and kml file.
4. Printing of report and Georeferenced map.

3. Deliverables

The deliverables envisaged for the assignment are described below

1. Georeferenced SOI map & Forest map showing CA land patches.
2. Georeferenced shape files & kml file (Soft copy) showing CA land Patches.
3. Area statement as per DGPS Survey, showing proposed area for compensatory afforestation.
4. CA land boundary coordinates as per DGPS Survey.
5. DGPS Survey and mapping report.

4. Brief description of the Technical approach

4.1 Input Data

Forest Department staff of Kendai range accompanied the Geotrax survey team for identification of the forest compartment boundary of 315 Hectares degraded forest land for the purpose of CA and assisted the survey team in carrying out DGPS Survey.



4.2 Planning DGPS survey

Using Survey of India Toposheet, forest maps and revenue maps the DGPS base station Primary and Secondary control points (PCP & SCP) in & around the CA land area are established by Geotrax. One PCP is established in Korba and 2 Secondary Controls are established in Kendai Range, Katghora forest division. The Korba Primary Control point (on roof top of Niharika Guest House) is established with reference to Urga primary control point which was observed for 24 hours duration and processed with reference to

Raipur PCP which is observed for 72 Hours duration and processed with reference to IGS Stations in Hyderabad and Bangalore.

a. Korba PCP (Niharika Guest House) est. w.r.t to Urga PCP

b. Urga PCP (on primary school roof top) est. w.r.t Raipur PCP



Fig-1: Google Image showing locations of Korba (Niharika Guest house) Primary Control Point & Urga Primary Control Points (PCP)

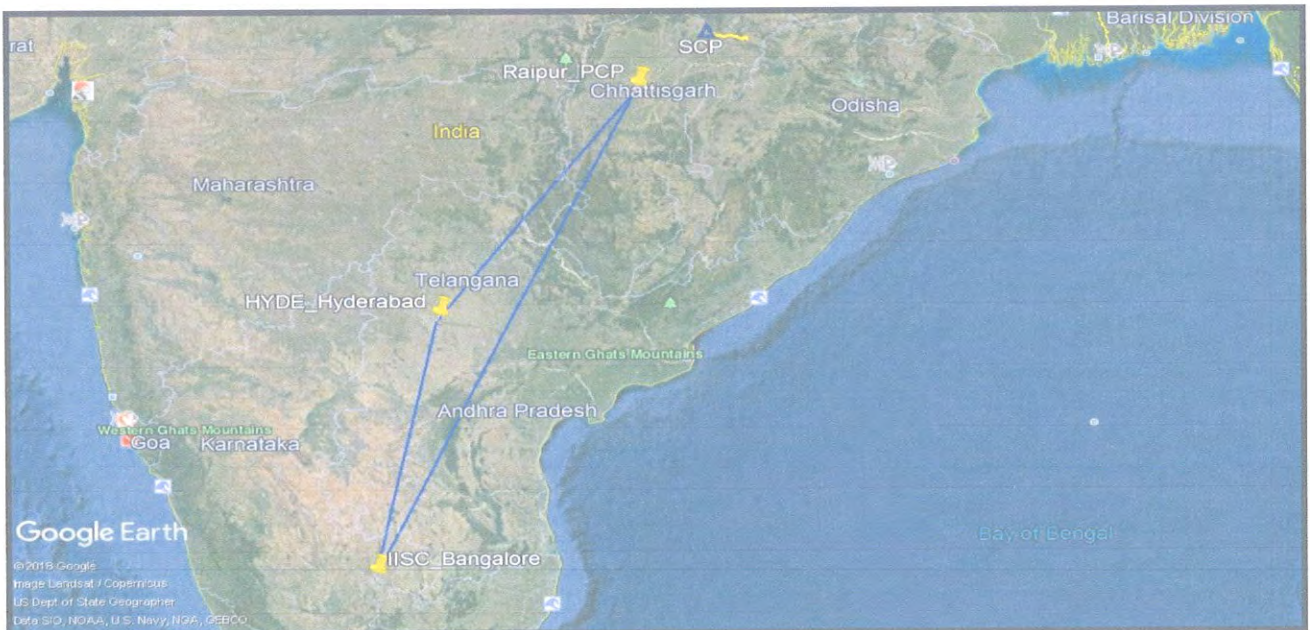


Fig-2: Google Image showing locations of Raipur PCP & IGS-Bangalore and Hyderabad

4.3 Establishment of Primary Control Point

Based on the input data (maps of the proposed line corridor, tower location details), the DGPS base station – Primary, Secondary and Temporary Benchmarks Control Points (PCP and TBM) in the project area are planned. One PCP with 72 hours observation was planned and established in Raipur. The PCP was connected to main control in Raipur which is established with continuous 72 hours observation and processed using the IGS stations in Hyderabad and Bangalore. As per Survey of India (SOI) Guideline, the PCP is to be fixed through continuous observation for 72 hours duration. The 72 hours of observation was carried out using DGPS. The observed data was processed with reference to the data of International GNSS Service (IGS) stations- HYDE & IISC as per SOI guideline (Post processed report is enclosed as Annexure-1).

Point ID	UTM-Easting(m)	UTM-Northing(m)	EGM-Elevation(m)	Latitude	Longitude	Ellipsoidal Height (m)	City	Location
PCP-Raipur	560764.042	2351378.878	298.819	N21°15'47.16512"	E81°35'08.50131"	234.801	Raipur	Geotrax Office Roof Top
IGS_HYDE	239826.372	1927383.113	521.783	N17°25'02.21987 "	E78°33'03.17892 "	444.790 m	Hyderabad	NRSC, Hyderabad
IGS_IISC	127917.413	1441987.668	929.917	N13°01'16.19707 "	E77°34'13.35337 "	843.714 m	Bangalore	IISC, Bangalore

Table 1: UTM and Geographical coordinates of IGS stations and Raipur-PCP

The Urga Primary Control Point (PCP) with static 24 hours of DGPS Observation was established as the DGPS base station near the project location. The PCP was established in the roof top of the primary school in Urga tehsil in Korba district. The Secondary control point (PCP) was established with reference to the Raipur Primary control point (PCP).

The coordinate of the Urga PCP is as follows:

Latitude: N22°18'39.55260", Longitude: E82°43'07.23316"

Easting: 677032.804m, Northing: 2468257.701m (as per UTM Zone 45N)

Elevation (EGM2008): 285.201m, Ellipsoidal Height: 224.164m.



Fig-3: Images showing Urga Primary Control Point (PCP)

4.4 Establishment of Secondary control point

The Kendai Secondary Control is established with reference to the Korba Primary Control Point (Niharika Guest House) in Static mode. The CA land boundary survey has been carried with reference to this secondary control points in Real-Time-Kinematic mode (RTK) using DGPS instruments.



Fig-4: Google satellite image showing Secondary Control Point (SCP) in kendai Range

The coordinate of the SCP is given below:

Point ID	Easting	Northing	Latitude (Local)	Longitude (Local)	Elevation
KorbaPCP	677921.651	2473378.503	22°21'25.69098"	82°43'40.33817"	314.45
MDSCP-01	643775.865	2532951.033	22°53'54.03989"	82°24'06.47437"	435.994
MDSCP-02	638287.387	2535670.607	22°55'24.12451"	82°20'54.74759"	396.255
MDSCP-03	648317.424	2540434.364	22°57'55.89234"N	82°26'48.43147"E	408.545

Table 2: UTM and Geographical coordinates of Korba PCP and Kendai Range-SCP

4.5 DGPS Survey Procedure

DGPS survey was carried out using a pair of DGPS instrument. One DGPS Instrument was used as Base Station and other is used as Rover. The survey was conducted in Real Time Kinematic (RTK) survey method. The Survey team carried out DGPS Survey of CA land boundary points by walking along the CA boundary. DGPS readings were collected at every 50m distance along CA land boundary and at every turn or bend.

During the survey the start and end of the CA patch was identified in the field with the help of staff from the revenue department. The revenue department staff also provided information regarding the Khasra number, ownership etc.

4.6 Creation of CA land patch boundary

The surveyed points captured through DGPS were plotted in the GIS Software and the boundary line was created by joining the points. The vector layer prepared and then superimposed on Georeferenced forest map.



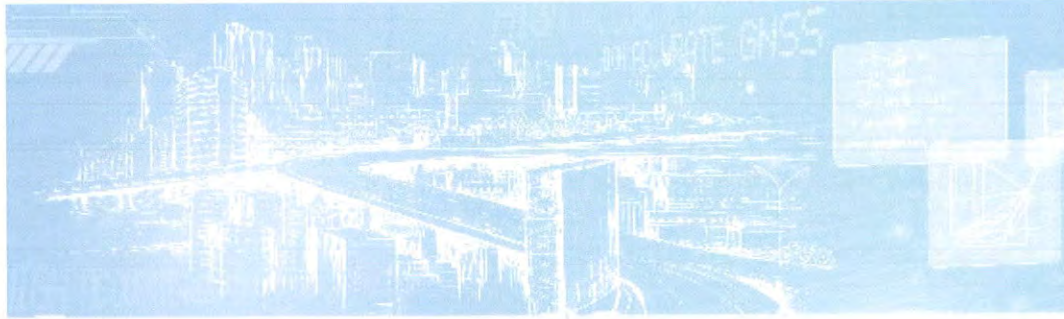
Fig-5: Google satellite image showing Secondary Control Point (SCP) in kendai Range and nearby proposed CA land boundary

4.7 Specification of DGPS Equipment

Geotrax deployed the most advance and hi-precision devices to carry out the DGPS survey. The DGPS performance specifications are given below. The corresponding fact sheets are placed below for ready reference.

COMNAV

T300 GNSS Receiver



Features

- *Ultra small*
- *Super light*
- *Many user-friendly conveniences built in*
- *GPS L1/L2/L5, BeiDou B1/B2/B3, GLONASS L1/L2*
- *Low power consumption*
- *Support long baseline E-RTK⁺*

RTK robust enough for challenging environments, in a device that is light and easy to carry

With decades of experience in the surveying GNSS receiver, the T300 is a product which combines lots of market proved advantages together. It can track all the working GNSS constellations. By using ComNav's unique QUANTM algorithm technology, it can function in RTK mode with all the GNSS constellations or by using any single GNSS constellation such as GLONASS or BeiDou. The strong anti-interference ability of the receiver makes it possible to work in any environment.

Design driven to improve user experience

Our R&D people are always thinking about how to improve the physical experience of users and workflow in the field. With this in mind, the T300 integrates a cutting edge GNSS board, Bluetooth®, UHF (Rx&Tx) into a compact board. Smart design makes the T300 the lightest and smallest (volume) receiver in the world.

Hot swap battery design

Extending the field working time is also a passion for our R&D people. They do lots of tests and analysis to reduce the power consumption, and make the whole system work more efficiently. In parallel, they've designed in the capability to hot swap the battery source. When the warning sounds and LED flashes, put your second battery in place. Then recharge the first while you keep working.

Consumer grade batteries... always available

Losing power in the field is significantly inconvenient for users, as the batteries for GNSS receivers are often unusual types and not readily available. Once again our R&D people developed a solution so that the T300 runs on normal consumer batteries.

Technical Specifications

T300

Signal Tracking

- 256 channels with simultaneously tracked satellite signals
 - GPS: L1 C/A, L1 C, L2 P, L5
 - BeiDou: B1, B2, B3
 - GLONASS: L1, L2
 - SBAS: WAAS, EGNOS, MSAS, GAGAN

Performance Specifications

- Cold start: <50 s
- Warm start: <30 s
- Hot start: <15 s
- Initialization time: <10 s
- Singal re-acquisition: <2 s
- Initialization reliability: >99.9%

Positioning Specifications

- Post Processing Static
 - Horizontal: 2.5 mm + 0.5 ppm RMS
 - Vertical: 5 mm + 0.5 ppm RMS
- Real Time Kinematic
 - Horizontal: 8 mm + 1 ppm RMS
 - Vertical: 15 mm + 1 ppm RMS
- E-RTK¹ (baseline<100 km)
 - Horizontal: 0.2 m + 1 ppm RMS
 - Vertical: 0.4 m + 1 ppm RMS
- Code differential GNSS positioning
 - Horizontal: 0.25 m + 1 ppm RMS
 - Vertical: 0.5 m + 1 ppm RMS
- SBAS: Typically <1 m 3D RMS
- Standalone: <1.5 m 3D RMS

Communications and Memory

- 1 Serial port (7 pin Lemo),
Baud rates up to 921,600 bps.
- Radio modem: Tx/Rx with full frequency range from 410-470 MHz²
 - Transmit power: 0.5-2W adjustable
 - Range: 1-4 km
- Position data output rates: 1 Hz, 2 Hz, 5 Hz, 10 Hz
- 5 LEDs (indicating Power, Satellite Tracking, Bluetooth[®] and Differential Data)
- Bluetooth[®]: V 2.X protocol, work compatible with Windows 7, Windows mobile and Android

Data Format

- Correction data I/O:
 - RTCM 2.x, 3.x, CMR (GPS only), CMR+ (GPS only).
- Position data output:
 - ASCII: NMEA-0183 GSV, RMC, HDT, VHD, GGA, GSA, ZDA, VTG, GST, PJK, PTNL
 - ComNav Binary update to 20 Hz

Physical

- Size(W×H): 15.8 cm × 7.5 cm
- Weight: 0.95 kg (include 2 batteries)

Environmental

- Operating temperature: -40 °C to +65 °C (40 °F to 149 °F)
- Storage temperature: -40 °C to +85 °C (40 °F to 185 °F)
- Humidity: 100% condensation
- Waterproof and dust proof: IP67 protected from temporary immersion to depth of 1 meter, floats
- Shock: survives a 2 meter drop on to concrete

Electrical

- Input Voltage: 5-27 VDC
- Power consumption: 2.85 W (3 constellations)³
- Li-ion battery capacity: 2 × 1800 mAh, up to 8 hours typically
- Memory: 256 MB internal with up to 16 GB pluggable memory card

Software

- ComNav field data collection software CGSurvey
- Carlson's SurvCE field data collection software (optional)
- MicroSurvey's FieldGenius field data collection software (optional)

¹ E-RTK, BeiDou B3 signal used in RTK calculate engine; concern the current situation, this mode can be used in APAC.

² 410-470 MHz, 3 frequency range, 410-430, 430-460, 460-470, need to clarify when place the order.

³ Power consumption will increase if using internal radio modem transmitter.

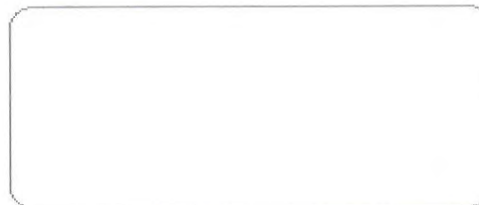
Specifications subject to change without notice.

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5. Results

The area proposed for Compensatory Afforestation in degraded forest land is 315.00 Ha. The forest area wise area statement of the proposed land for CA is given below. The final patch wise CA land boundary coordinates are annexed herewith and marked as **Annexure -1**. The forest compartment wise geo-referenced maps showing the CA land patch are annexed herewith and marked as **Annexure-2**. The Survey of India Toposheet is geo-referenced and the CA land patches are superimposed on it. The Geo-referenced SOI map is annexed herewith and marked as **Annexure-3**. The Patch wise CA land treatment maps are annexed herewith and marked as **Annexure-4**. The Patch wise Google map is annexed herewith and marked as **Annexure-5**.

The consolidated area statement of the proposed CA land patches is given in the below table

Statement Showing The Area Of Proposed CA Land						
Sl. No.	Division	Range	Patch No	Compartment No	Type of Forest	Area (Ha.)
1	Katghora	Kendai	Patch 1	P 314	Protected Forest	25
2	Katghora	Kendai	Patch 2	P 314	Protected Forest	60
3	Katghora	Kendai	Patch 3	P 316	Protected Forest	20
4	Katghora	Kendai	Patch 4	P 317	Protected Forest	40
5	Katghora	Kendai	Patch 5	P 318	Protected Forest	20
6	Katghora	Kendai	Patch 6	P 312	Protected Forest	100
7	Katghora	Kendai	Patch 7	P 313	Protected Forest	50
Total Area						315

वनमण्डलाधिकारी
कटघोरा वनमण्डल, कटघोरा

उप वन मण्डलाधिकारी
कटघोरा

वन परिक्षेत्र अधिकारी
कंदई

परिक्षेत्र सहायक
सिरमिना

Background of Organization

Geotrax International Services (www.geotrax.in) is a Professional Land Mapping and Services provider across India established in the year 1999. During the last 15+ years, we had an opportunity to execute a variety of surveying jobs all over India and in the Middle East to various customer specifications for RIS, LIS, and Municipal GIS oriented jobs. Cadastral Surveys using ETS/DGPS and Provision of Ground control conforming to stringent accuracy standards using high end instruments as RTK/GPRS DGPS is our speciality. We also have a UAV (Drone) and Ground Penetrating Radar (on Roaster).

Geotrax is headed by Mr. V.V.S Bandhakavi (Ex-Survey of India employee) who has more than 40+ years' experience in the field of surveying in India and abroad.

Some of our major clients include:

- Odisha Space Application Centre (ORSAC)
- Steel Authority of India (SAIL)
- National Thermal Power Corporation (NTPC)
- Survey Settlement and Land Records Department (Govt. Of Gujarat)
- Survey Settlement and Land Records Department (Govt. Of Madhya Pradesh)
- Irrigation Dept. (Govt. of Jammu and Kashmir)
- National Remote Sensing Agency (Hyderabad)
- Meinhardt India Private Limited (Delhi),
- Nagarjuna Construction Company (NCC, Hyderabad)
- Consulting Engineering Services (CES, New Delhi)
- Lee Associates of South Asia (LASA, Delhi)
- Power development Corporation (Govt. of Jammu and Kashmir)

Geotrax expertise covers:

- ❖ DGPS Surveys for Mining lease boundary, and Forest Diversion
- ❖ Consultancy services for Mining Plan & EIA
- ❖ Boundary and cadastral surveys using DGPS and Total station;
- ❖ Topographic surveys.
- ❖ Ground control surveys for photogrammetric projects, including Airborne GPS.
- ❖ Only one of the two companies in India who are empanelled by NRSA for DGPS survey for ground control point collection
- ❖ Route and alignment surveys combining conventional and photogrammetric methods.
- ❖ Construction and cross-section surveys (from road design to precision layout and quality control).

Being a client focused organization, Geotrax's combination of survey equipment, personnel, and computer resources allow for the tailoring of the project approach to match the orders of accuracy and precision requirements for each project. Geotrax's equipment resources include 250 DGPS, 33 hand-held GPS units, theodolites, electronic digital and automatic levels, 19 Electronic Total Stations, and data collectors.

On the mapping side, our CAD and GIS professionals assist the survey projects by creating accurate maps. We have dedicated CAD experts who have extensive experience with different CAD software.

6. Annexure

6.1 Annexure – 1: CA Land Patch Boundary DGPS Coordinates

Sl. No.	Patch No & Compartment Name	Pillar Id	Easting(m)	Northing(m)	Latitude(°N)	Longitude (°E)
1	Patch 1 & P 314	P -1	646769.7991	2539283.243	22°57'18.96687"	82°25'53.69845"
2		P -2	646836.7946	2539315.038	22°57'19.97928"	82°25'56.06126"
3		P -3	646904.4748	2539347.919	22°57'21.02681"	82°25'58.44849"
4		P -4	646975.2631	2539383.092	22°57'22.14783"	82°26'00.94562"
5		P -5	647017.252	2539415.868	22°57'23.20007"	82°26'02.43092"
6		P -6	647037.1469	2539458.439	22°57'24.57776"	82°26'03.14394"
7		P -7	647057.0419	2539501.011	22°57'25.95546"	82°26'03.85697"
8		P -8	647076.9368	2539543.582	22°57'27.33315"	82°26'04.57000"
9		P -9	647093.1584	2539574.34	22°57'28.32796"	82°26'05.15003"
10		P -10	647110.2143	2539601.377	22°57'29.20151"	82°26'05.75808"
11		P -11	647126.5072	2539620.404	22°57'29.81492"	82°26'06.33659"
12		P -12	647146.177	2539637.541	22°57'30.36580"	82°26'07.03300"
13		P -13	647176.8613	2539661.282	22°57'31.12786"	82°26'08.11837"
14		P -14	647197.3761	2539674.873	22°57'31.56319"	82°26'08.84324"
15		P -15	647227.9208	2539690.429	22°57'32.05920"	82°26'09.92090"
16		P -16	647275.5044	2539675.665	22°57'31.56410"	82°26'11.58632"
17		P -17	647332.5913	2539650.815	22°57'30.73808"	82°26'13.58191"
18		P -18	647370.6282	2539631.573	22°57'30.10039"	82°26'14.91064"
19		P -19	647400.8415	2539614.86	22°57'29.54742"	82°26'15.96557"
20		P -20	647383.705	2539526.797	22°57'26.68992"	82°26'15.33371"
21		P -21	647366.5685	2539438.734	22°57'23.83242"	82°26'14.70186"
22		P -22	647349.432	2539350.67	22°57'20.97491"	82°26'14.07001"
23		P -23	647380.575	2539340.851	22°57'20.64576"	82°26'15.15993"
24		P -24	647407.1869	2539332.523	22°57'20.36657"	82°26'16.09130"
25		P -25	647416.92	2539393.303	22°57'22.33942"	82°26'16.45388"
26		P -26	647430.7753	2539480.824	22°57'25.18037"	82°26'16.97037"
27		P -27	647439.7167	2539537.305	22°57'27.01374"	82°26'17.30368"
28		P -28	647447.0589	2539583.685	22°57'28.51921"	82°26'17.57738"
29		P -29	647452.6712	2539579.897	22°57'28.39428"	82°26'17.77311"
30		P -30	647459.7361	2539565.694	22°57'27.93027"	82°26'18.01624"
31		P -31	647467.6736	2539555.441	22°57'27.59443"	82°26'18.29138"
32		P -32	647487.5174	2539545.188	22°57'27.25479"	82°26'18.98449"
33		P -33	647513.1531	2539538.586	22°57'27.03197"	82°26'19.88219"
34		P -34	647506.8811	2539451.133	22°57'24.19086"	82°26'19.63193"
35		P -35	647500.6091	2539363.681	22°57'21.34976"	82°26'19.38167"
36		P -36	647494.337	2539276.228	22°57'18.50865"	82°26'19.13141"
37		P -37	647491.201	2539232.502	22°57'17.08810"	82°26'19.00628"
38		P -38	647408.9202	2539241.389	22°57'17.40321"	82°26'16.12083"



39		P -39	647326.6394	2539250.276	22°57'17.71832"	82°26'13.23538"
40		P -40	647262.8312	2539199.51	22°57'16.08817"	82°26'10.97793"
41		P -41	647199.023	2539148.743	22°57'14.45801"	82°26'08.72049"
42		P -42	647115.3126	2539081.35	22°57'12.29362"	82°26'05.75870"
43		P -43	647038.832	2539019.777	22°57'10.31616"	82°26'03.05273"
44		P -44	646983.983	2539078.286	22°57'12.23570"	82°26'01.14730"
45		P -45	646929.134	2539136.794	22°57'14.15523"	82°25'59.24185"
46	Patch 2 & P 314	P -46	646847.1581	2539173.571	22°57'15.37685"	82°25'56.37665"
47		P -47	646765.1823	2539210.348	22°57'16.59847"	82°25'53.51144"
48		P -48	648309.968	2539342.792	22°57'20.41221"	82°26'47.78756"
49		P -49	648377.2628	2539470.638	22°57'24.54694"	82°26'50.19420"
50		P -50	648422.126	2539555.868	22°57'27.30342"	82°26'51.79866"
51		P -51	648528.1506	2539655.394	22°57'30.50504"	82°26'55.55523"
52		P -52	648617.4058	2539742.087	22°57'33.29480"	82°26'58.71869"
53		P -53	648685.3374	2539811.671	22°57'35.53517"	82°27'01.12766"
54		P -54	648753.3758	2539881.369	22°57'37.77921"	82°27'03.54043"
55		P -55	648821.9658	2539911.565	22°57'38.73886"	82°27'05.95888"
56		P -56	648885.9424	2539939.731	22°57'39.63395"	82°27'08.21468"
57		P -57	648993.4887	2539945.538	22°57'39.78814"	82°27'11.99231"
58		P -58	649078.33	2539962.233	22°57'40.30361"	82°27'14.97662"
59		P -59	649163.1713	2539978.929	22°57'40.81907"	82°27'17.96094"
60		P -60	649205.381	2539961.012	22°57'40.22299"	82°27'19.43656"
61		P -61	649233.8679	2539888.84	22°57'37.86750"	82°27'20.41153"
62		P -62	649262.3548	2539816.668	22°57'35.51201"	82°27'21.38649"
63		P -63	649314.566	2539741.879	22°57'33.06378"	82°27'23.19340"
64		P -64	649366.7772	2539667.09	22°57'30.61555"	82°27'25.00030"
65		P -65	649418.9885	2539592.301	22°57'28.16731"	82°27'26.80718"
66		P -66	649487.5141	2539540.168	22°57'26.45036"	82°27'29.19466"
67		P -67	649548.0767	2539494.093	22°57'24.93292"	82°27'31.30470"
68		P -68	649601.0222	2539454.717	22°57'23.63571"	82°27'33.14965"
69		P -69	649634.879	2539404.179	22°57'21.98177"	82°27'34.32058"
70		P -70	649614.898	2539368.268	22°57'20.82074"	82°27'33.60662"
71		P -71	649581.6787	2539335.584	22°57'19.76894"	82°27'32.42904"
72		P -72	649543.2332	2539297.759	22°57'18.55166"	82°27'31.06621"
73		P -73	649505.2056	2539234.116	22°57'16.49488"	82°27'29.70906"
74		P -74	649456.6358	2539179.948	22°57'14.74955"	82°27'27.98514"
75		P -75	649397.0401	2539128.003	22°57'13.08007"	82°27'25.87494"
76		P -76	649355.6585	2539202.268	22°57'15.50776"	82°27'24.44810"
77		P -77	649314.277	2539276.533	22°57'17.93546"	82°27'23.02125"
78		P -78	649307.8498	2539364.398	22°57'20.79402"	82°27'22.82621"
79		P -79	649301.4226	2539452.263	22°57'23.65258"	82°27'22.63116"
80		P -80	649298.209	2539496.195	22°57'25.08186"	82°27'22.53364"
81		P -81	649244.6983	2539538.826	22°57'26.48505"	82°27'20.66994"
82		P -82	649213.2701	2539558.54	22°57'27.13607"	82°27'19.57348"
83		P -83	649172.8185	2539602.406	22°57'28.57517"	82°27'18.16865"
84		P -84	649144.0469	2539649.549	22°57'30.11706"	82°27'17.17499"



85	Patch 2 & P 314	P -85	649119.8976	2539745.43	22°57'33.24193"	82°27'16.36054"
86		P -86	649107.823	2539793.37	22°57'34.80436"	82°27'15.95331"
87		P -87	649021.2088	2539793.936	22°57'34.85063"	82°27'12.91279"
88		P - 88	648957.8978	2539794.349	22°57'34.88444"	82°27'10.69030"
89		P -89	648891.2876	2539794.784	22°57'34.92000"	82°27'08.35200"
90		P -90	648837.794	2539810.872	22°57'35.46022"	82°27'06.47961"
91		P -91	648750.109	2539727.788	22°57'32.78733"	82°27'03.37247"
92		P -92	648778.3543	2539641.896	22°57'29.98590"	82°27'04.33426"
93		P -93	648806.5995	2539556.004	22°57'27.18447"	82°27'05.29604"
94		P -94	648834.8448	2539470.112	22°57'24.38303"	82°27'06.25782"
95		P -95	648863.09	2539384.22	22°57'21.58160"	82°27'07.21957"
96		P -96	648880.0311	2539335.522	22°57'19.99299"	82°27'07.79740"
97		P -97	648890.6145	2539233.922	22°57'16.68655"	82°27'08.13367"
98		P -98	648875.7978	2539210.639	22°57'15.93437"	82°27'07.60544"
99		P -99	648794.712	2539220.317	22°57'16.27506"	82°27'04.76227"
100		P -100	648772.5375	2539131.736	22°57'13.40241"	82°27'03.95311"
101		P -101	648750.363	2539043.155	22°57'10.52975"	82°27'03.14396"
102		P -102	648846.005	2539039.863	22°57'10.39200"	82°27'06.50031"
103		P -103	648881.6186	2539018.022	22°57'09.67050"	82°27'07.74293"
104		P -104	648907.1092	2538971.517	22°57'08.15043"	82°27'08.62163"
105		P -105	648932.7064	2538924.818	22°57'06.62400"	82°27'09.50400"
106		P -106	648977.266	2538878.788	22°57'05.11325"	82°27'11.05226"
107		P -107	649033.8082	2538826.142	22°57'03.38352"	82°27'13.01885"
108		P -108	649087.0761	2538772.092	22°57'01.60922"	82°27'14.87000"
109		P -109	649135.7662	2538722.687	22°56'59.98740"	82°27'16.56205"
110		P -110	649178.4993	2538713.12	22°56'59.66260"	82°27'18.05883"
111		P -111	649161.8394	2538648.653	22°56'57.57215"	82°27'17.45159"
112		P -112	649137.6696	2538555.127	22°56'54.53938"	82°27'16.57063"
113		P -113	649118.4781	2538480.864	22°56'52.13126"	82°27'15.87113"
114		P -114	649074.5351	2538515.129	22°56'53.25937"	82°27'14.34048"
115		P -115	649042.1222	2538545.571	22°56'54.25946"	82°27'13.21325"
116	Patch 3 & P 316	P -116	648995.9403	2538601.227	22°56'56.08369"	82°27'11.61142"
117		P -117	648957.6301	2538661.324	22°56'58.04980"	82°27'10.28746"
118		P -118	648904.109	2538720.402	22°56'59.98761"	82°27'08.42916"
119		P -119	648850.588	2538779.479	22°57'01.92542"	82°27'06.57085"
120		P -120	648795.9733	2538848.484	22°57'04.18632"	82°27'04.67758"
121		P -121	648741.3585	2538917.489	22°57'06.44722"	82°27'02.78429"
122		P -122	648686.7438	2538986.494	22°57'08.70812"	82°27'00.89098"
123		P -123	648632.129	2539055.499	22°57'10.96901"	82°26'58.99765"
124		P -124	648541.062	2539092.886	22°57'12.21366"	82°26'55.81370"
125		P -125	648449.995	2539130.272	22°57'13.45829"	82°26'52.62974"
126		P -126	648403.3193	2539201.112	22°57'15.77627"	82°26'51.01569"
127		P -127	648356.6437	2539271.952	22°57'18.09424"	82°26'49.40163"
128	Patch 3 & P 316	P -128	649452.2838	2537963.837	22°56'35.21516"	82°27'27.40880"
129		P -129	649527.0746	2537938.468	22°56'34.36626"	82°27'30.02528"
130		P -130	649611.656	2537910.775	22°56'33.43868"	82°27'32.98461"

131		P -131	649699.4965	2537882.569	22°56'32.49332"	82°27'36.05815"
132		P -132	649764.6512	2537861.51	22°56'31.78766"	82°27'38.33786"
133		P -133	649727.0607	2537805.496	22°56'29.97880"	82°27'36.99883"
134		P -134	649688.69	2537748.32	22°56'28.13238"	82°27'35.63201"
135		P -135	649686.702	2537673.843	22°56'25.71177"	82°27'35.53626"
136		P -136	649647.1499	2537729.35	22°56'27.52908"	82°27'34.16727"
137		P -137	649612.525	2537791.444	22°56'29.55894"	82°27'32.97353"
138		P -138	649548.241	2537778.549	22°56'29.16047"	82°27'30.71255"
139		P -139	649506.2823	2537700.836	22°56'26.64756"	82°27'29.21267"
140		P -140	649464.3237	2537623.124	22°56'24.13465"	82°27'27.71280"
141		P -141	649422.365	2537545.411	22°56'21.62173"	82°27'26.21294"
142		P -142	649419.209	2537458.079	22°56'18.78359"	82°27'26.07177"
143		P -143	649466.1745	2537388.301	22°56'16.49995"	82°27'27.69601"
144		P -144	649433.2597	2537337.404	22°56'14.85587"	82°27'26.52296"
145		P -145	649356.6234	2537385.934	22°56'16.45830"	82°27'23.84985"
146		P -146	649279.9871	2537434.464	22°56'18.06071"	82°27'21.17673"
147		P -147	649244.858	2537488.588	22°56'19.83160"	82°27'19.96248"
148		P -148	649198.451	2537506.995	22°56'20.44493"	82°27'18.33994"
149		P -149	649103.443	2537508.545	22°56'20.52590"	82°27'15.00558"
150		P -150	649036.5159	2537518.76	22°56'20.87953"	82°27'12.65991"
151		P -151	648974.7081	2537528.194	22°56'21.20609"	82°27'10.49365"
152		P -152	648926.0001	2537568.449	22°56'22.53043"	82°27'08.79791"
153		P -153	648942.7365	2537619.696	22°56'24.19110"	82°27'09.40316"
154		P -154	648972.2413	2537679.577	22°56'26.12837"	82°27'10.45960"
155		P -155	649052.0011	2537699.342	22°56'26.74527"	82°27'13.26616"
156		P -156	649168.3092	2537727.715	22°56'27.63026"	82°27'17.35862"
157		P -157	649215.3185	2537736.546	22°56'27.90224"	82°27'19.01179"
158		P -158	649238.6103	2537766.061	22°56'28.85428"	82°27'19.83963"
159		P -159	649296.1573	2537796.224	22°56'29.81633"	82°27'21.87012"
160		P -160	649333.1192	2537824.734	22°56'30.73130"	82°27'23.17747"
161		P -161	649364.8168	2537848.214	22°56'31.48443"	82°27'24.29829"
162		P -162	649392.179	2537872.685	22°56'32.27115"	82°27'25.26727"
163		P -163	649424.3136	2537921.724	22°56'33.85508"	82°27'26.41232"
164	Patch 4 & P 317	P -164	650460.24	2538032.652	22°56'37.12618"	82°28'02.81428"
165		P -165	650541.186	2538037.438	22°56'37.25547"	82°28'05.65734"
166		P -166	650622.132	2538042.223	22°56'37.38474"	82°28'08.50040"
167		P -167	650718.1121	2538020.548	22°56'36.64888"	82°28'11.86189"
168		P -168	650814.0922	2537998.872	22°56'35.91299"	82°28'15.22337"
169		P -169	650910.0723	2537977.197	22°56'35.17708"	82°28'18.58485"
170		P -170	651006.0525	2537955.521	22°56'34.44115"	82°28'21.94631"
171		P -171	651102.0326	2537933.846	22°56'33.70520"	82°28'25.30776"
172		P -172	651120.4166	2537925.948	22°56'33.44243"	82°28'25.95029"
173		P -173	651154.6186	2537886.882	22°56'32.16128"	82°28'27.13709"
174		P -174	651202.7398	2537828.178	22°56'30.23711"	82°28'28.80555"
175		P -175	651250.861	2537769.473	22°56'28.31293"	82°28'30.47399"
176		P -176	651286.349	2537712.69	22°56'26.45534"	82°28'31.69966"



177		P -177	651266.1328	2537673.419	22°56'25.18525"	82°28'30.97620"
178		P -178	651239.2987	2537621.293	22°56'23.49939"	82°28'30.01593"
179		P -179	651184.9197	2537562.295	22°56'21.59912"	82°28'28.08640"
180		P -180	651130.5407	2537503.297	22°56'19.69884"	82°28'26.15688"
181		P -181	651120.6488	2537474.047	22°56'18.75113"	82°28'25.79937"
182		P -182	651114.6797	2537412.139	22°56'16.74048"	82°28'25.56806"
183		P -183	651107.9328	2537387.93	22°56'15.95564"	82°28'25.32272"
184		P -184	651075.59	2537340.806	22°56'14.43419"	82°28'24.17089"
185		P -185	651110.267	2537327.529	22°56'13.99125"	82°28'25.38339"
186		P -186	651104.4138	2537303.078	22°56'13.19826"	82°28'25.16934"
187		P -187	651073.8544	2537264.581	22°56'11.95669"	82°28'24.08315"
188		P -188	651013.9262	2537206.637	22°56'10.09246"	82°28'21.95927"
189		P -189	650945.875	2537158.351	22°56'08.54485"	82°28'19.55369"
190		P -190	650871.4093	2537130.721	22°56'07.67085"	82°28'16.93024"
191		P -191	650855.3317	2537178.061	22°56'09.21510"	82°28'16.38254"
192		P -192	650823.1765	2537272.741	22°56'12.30359"	82°28'15.28715"
193		P -193	650800.8944	2537357.473	22°56'15.06546"	82°28'14.53480"
194		P -194	650778.6124	2537442.205	22°56'17.82733"	82°28'13.78245"
195		P -195	650756.3303	2537526.936	22°56'20.58920"	82°28'13.03008"
196		P -196	650734.0482	2537611.668	22°56'23.35106"	82°28'12.27771"
197		P -197	650689.644	2537662.492	22°56'25.01778"	82°28'10.73691"
198		P -198	650634.8339	2537719.534	22°56'26.89003"	82°28'08.83302"
199		P -199	650579.8981	2537756.269	22°56'28.10214"	82°28'06.91758"
200		P -200	650532.5677	2537785.568	22°56'29.07001"	82°28'05.26649"
201		P -201	650474.499	2537821.514	22°56'30.25747"	82°28'03.24079"
202		P -202	650422.396	2537845.103	22°56'31.04127"	82°28'01.42015"
203		P -203	650414.696	2537857.681	22°56'31.45267"	82°28'01.15428"
204		P -204	650430.0094	2537927.748	22°56'33.72558"	82°28'01.71636"
205		P -205	650444.9033	2537986.276	22°56'35.62349"	82°28'02.25968"
206	Patch 5 & P 318	P -206	650919.88	2536796.833	22°55'56.80038"	82°28'18.51422"
207		P -207	651013.093	2536792.39	22°55'56.62561"	82°28'21.78436"
208		P -208	651106.306	2536787.948	22°55'56.45082"	82°28'25.05450"
209		P -209	651199.519	2536783.505	22°55'56.27601"	82°28'28.32463"
210		P -210	651292.7321	2536779.063	22°55'56.10119"	82°28'31.59476"
211		P -211	651339.3386	2536776.842	22°55'56.01377"	82°28'33.22982"
212		P -212	651373.2996	2536739.465	22°55'54.78757"	82°28'34.40865"
213		P -213	651411.0607	2536697.906	22°55'53.42416"	82°28'35.71937"
214		P -214	651395.4318	2536606.655	22°55'50.46271"	82°28'35.13865"
215		P -215	651379.803	2536515.404	22°55'47.50126"	82°28'34.55794"
216		P -216	651364.1741	2536424.153	22°55'44.53980"	82°28'33.97724"
217		P -217	651348.5452	2536332.902	22°55'41.57835"	82°28'33.39654"
218		P -218	651332.9164	2536241.651	22°55'38.61690"	82°28'32.81586"
219		P -219	651317.2875	2536150.4	22°55'35.65544"	82°28'32.23518"
220		P -220	651265.8223	2536146.208	22°55'35.53595"	82°28'30.42740"
221		P -221	651216.6785	2536142.611	22°55'35.43503"	82°28'28.70130"
222		P -222	651174.1676	2536221.405	22°55'38.01047"	82°28'27.23699"

223		P -223	651131.6567	2536300.199	22°55'40.58591"	82°28'25.77267"
224		P -224	651089.1458	2536378.993	22°55'43.16135"	82°28'24.30834"
225		P -225	651058.9831	2536434.9	22°55'44.98869"	82°28'23.26934"
226		P -226	651029.9178	2536496.684	22°55'47.00674"	82°28'22.27092"
227		P -227	651000.2787	2536559.687	22°55'49.06463"	82°28'21.25278"
228		P -228	650969.7737	2536633.891	22°55'51.48694"	82°28'20.20818"
229		P -229	650942.0334	2536720.18	22°55'54.30120"	82°28'19.26485"

Sl. No.	Patch No & Compartment Name	Pillar ID	Easting (m)	Northing (m)	Longitude (°E)	Latitude (°N)
1	Patch No- 6 & P 312	P 1	646192.284	2541118.289	42°40'08.70666"	22°58'18.80765"
2		P 2	646221.107	2541108.829	42°41'06.50393"	22°58'18.49098"
3		P 3	646247.711	2541100.097	42°41'59.85062"	22°58'18.19870"
4		P 4	646274.314	2541091.365	42°42'53.19724"	22°58'17.90641"
5		P 5	646300.918	2541082.633	42°43'46.54379"	22°58'17.61413"
6		P 6	646327.522	2541073.901	42°44'39.89027"	22°58'17.32184"
7		P 7	646354.125	2541065.169	42°45'33.23668"	22°58'17.02955"
8		P 8	646380.729	2541056.437	42°46'26.58303"	22°58'16.73726"
9		P 9	646413.386	2541045.298	42°47'32.06039"	22°58'16.36479"
10		P 10	646415.936	2541024.198	42°47'36.77561"	22°58'15.67800"
11		P 11	646418.732	2540996.338	42°47'41.85552"	22°58'14.77138"
12		P 12	646421.528	2540968.478	42°47'46.93543"	22°58'13.86475"
13		P 13	646424.325	2540940.618	42°47'52.01532"	22°58'12.95813"
14		P 14	646427.121	2540912.758	42°47'57.09519"	22°58'12.05150"
15		P 15	646429.917	2540884.898	42°48'02.17506"	22°58'11.14488"
16		P 16	646433.163	2540852.567	42°48'08.07004"	22°58'10.09278"
17		P 17	646446.962	2540833.537	42°48'35.45722"	22°58'09.46973"
18		P 18	646463.4	2540810.869	42°49'08.07892"	22°58'08.72760"
19		P 19	646479.837	2540788.202	42°49'40.70052"	22°58'07.98547"
20		P 20	646496.274	2540765.534	42°50'13.32203"	22°58'07.24334"
21		P 21	646512.711	2540742.867	42°50'45.94344"	22°58'06.50121"
22		P 22	646531.588	2540716.836	42°51'23.40555"	22°58'05.64895"
23		P 23	646553.405	2540707.214	42°52'07.10551"	22°58'05.32924"
24		P 24	646579.025	2540695.916	42°52'58.42021"	22°58'04.95383"
25		P 25	646604.644	2540684.618	42°53'49.73482"	22°58'04.57841"
26		P 26	646630.264	2540673.32	42°54'41.04935"	22°58'04.20299"

27	P 27	646659.382	2540660.479	42°55'39.37141"	22°58'03.77631"
28	P 28	646680.807	2540671.679	42°56'22.69063"	22°58'04.13363"
29	P 29	646705.622	2540684.65	42°57'12.86134"	22°58'04.54746"
30	P 30	646730.436	2540697.621	42°58'03.03214"	22°58'04.96129"
31	P 31	646755.25	2540710.592	42°58'53.20301"	22°58'05.37512"
32	P 32	646780.065	2540723.563	42°59'43.37397"	22°58'05.78895"
33	P 33	646808.286	2540738.316	43°00'40.43449"	22°58'06.25960"
34	P 34	646835.039	2540752.3	43°01'34.52542"	22°58'06.70576"
35	P 35	646863.429	2540767.14	43°02'31.92513"	22°58'07.17920"
36	P 36	646888.817	2540780.411	43°03'23.25701"	22°58'07.60259"
37	P 37	646911.513	2540778.64	43°04'08.87803"	22°58'07.53781"
38	P 38	646933.966	2540776.888	43°04'54.00853"	22°58'07.47372"
39	P 39	646961.881	2540774.709	43°05'50.11997"	22°58'07.39403"
40	P 40	646989.796	2540772.531	43°06'46.23140"	22°58'07.31435"
41	P 41	647017.711	2540770.352	43°07'42.34280"	22°58'07.23466"
42	P 42	647045.626	2540768.174	43°08'38.45417"	22°58'07.15497"
43	P 43	647076.49	2540765.765	43°09'40.49303"	22°58'07.06685"
44	P 44	647076.323	2540740.724	43°09'39.66417"	22°58'06.25280"
45	P 45	647076.136	2540712.724	43°09'38.73743"	22°58'05.34259"
46	P 46	647075.949	2540684.725	43°09'37.81069"	22°58'04.43238"
47	P 47	647075.762	2540656.726	43°09'36.88397"	22°58'03.52217"
48	P 48	647075.575	2540628.726	43°09'35.95725"	22°58'02.61196"
49	P 49	647075.388	2540600.727	43°09'35.03054"	22°58'01.70176"
50	P 50	647075.2	2540572.728	43°09'34.10384"	22°58'00.79155"
51	P 51	647075.013	2540544.728	43°09'33.17715"	22°57'59.88134"
52	P 52	647074.826	2540516.729	43°09'32.25047"	22°57'58.97113"
53	P 53	647074.639	2540488.729	43°09'31.32380"	22°57'58.06092"
54	P 54	647074.445	2540459.644	43°09'30.36120"	22°57'57.11542"
55	P 55	647053.226	2540476.202	43°08'48.00397"	22°57'57.66045"
56	P 56	647031.152	2540493.427	43°08'03.93806"	22°57'58.22746"
57	P 57	647009.077	2540510.653	43°07'19.87205"	22°57'58.79448"
58	P 58	646983.68	2540530.471	43°06'29.17386"	22°57'59.44683"
59	P 59	646960.76	2540536.781	43°05'43.19209"	22°57'59.65927"
60	P 60	646942.924	2540541.475	43°05'07.40521"	22°57'59.81753"
61	P 61	646933.846	2540525.365	43°04'48.82800"	22°57'59.29666"
62	P 62	646950.966	2540504.686	43°05'22.86008"	22°57'58.61894"
63	P 63	646997.957	2540477.975	43°06'56.86148"	22°57'57.73565"
64	P 64	647015.478	2540456.561	43°07'31.68434"	22°57'57.03391"
65	P 65	647036.057	2540431.408	43°08'12.58716"	22°57'56.20965"
66	P 66	647041.386	2540410.166	43°08'22.88773"	22°57'55.51735"
67	P 67	647046.619	2540389.301	43°08'33.00509"	22°57'54.83737"
68	P 68	647023.588	2540387.458	43°07'46.63997"	22°57'54.78479"
69	P 69	647002.505	2540385.772	43°07'04.19809"	22°57'54.73665"
70	P 70	646970.879	2540402.098	43°06'00.90194"	22°57'55.27748"
71	P 71	646946.333	2540414.77	43°05'11.77527"	22°57'55.69723"
72	P 72	646915.129	2540430.879	43°04'09.32202"	22°57'56.23085"



73	P 73	646882.34	2540447.807	43°03'03.69640"	22°57'56.79157"
74	P 74	646850.645	2540464.169	43°02'00.26194"	22°57'57.33356"
75	P 75	646834.513	2540489.094	43°01'28.30140"	22°57'58.14900"
76	P 76	646817.784	2540514.944	43°00'55.15549"	22°57'58.99469"
77	P 77	646800.649	2540541.418	43°00'21.20766"	22°57'59.86083"
78	P 78	646784.174	2540566.875	42°59'48.56523"	22°58'00.69366"
79	P 79	646765.595	2540581.167	42°59'11.47274"	22°58'01.16417"
80	P 80	646746.393	2540595.937	42°58'33.13724"	22°58'01.65044"
81	P 81	646729.14	2540609.209	42°57'58.69130"	22°58'02.08738"
82	P 82	646698.368	2540624.232	42°56'57.08512"	22°58'02.58555"
83	P 83	646699.507	2540590.159	42°56'58.70762"	22°58'01.47745"
84	P 84	646710.893	2540568.454	42°57'21.18550"	22°58'00.76823"
85	P 85	646725.709	2540540.211	42°57'50.43517"	22°57'59.84534"
86	P 86	646738.903	2540515.06	42°58'16.48337"	22°57'59.02347"
87	P 87	646753.271	2540487.671	42°58'44.84796"	22°57'58.12850"
88	P 88	646767.24	2540461.042	42°59'12.42630"	22°57'57.25834"
89	P 89	646789.893	2540440.987	42°59'57.60098"	22°57'56.59916"
90	P 90	646807.646	2540432.865	43°00'33.15216"	22°57'56.32949"
91	P 91	646830.215	2540422.54	43°01'18.34847"	22°57'55.98666"
92	P 92	646852.163	2540412.489	43°02'02.30178"	22°57'55.65294"
93	P 93	646874.132	2540402.418	43°02'46.29520"	22°57'55.31856"
94	P 94	646894.865	2540383.968	43°03'27.63911"	22°57'54.71216"
95	P 95	646913.321	2540367.544	43°04'04.44152"	22°57'54.17238"
96	P 96	646934.878	2540348.362	43°04'47.42709"	22°57'53.54190"
97	P 97	646955.234	2540330.247	43°05'28.01921"	22°57'52.94653"
98	P 98	646982.411	2540332.785	43°06'22.73669"	22°57'53.02042"
99	P 99	647011.461	2540335.499	43°07'21.22612"	22°57'53.09940"
100	P 100	647035.307	2540337.726	43°08'09.23771"	22°57'53.16424"
101	P 101	647063.566	2540340.365	43°09'06.13290"	22°57'53.24107"
102	P 102	647074.344	2540325.731	43°09'27.52544"	22°57'52.76187"
103	P 103	647090.18	2540304.228	43°09'58.95827"	22°57'52.05777"
104	P 104	647103.986	2540285.482	43°10'26.36024"	22°57'51.44396"
105	P 105	647113.851	2540257.123	43°10'45.64642"	22°57'50.51887"
106	P 106	647123.4	2540223.397	43°11'04.19114"	22°57'49.41940"
107	P 107	647133.424	2540187.991	43°11'23.65989"	22°57'48.26515"
108	P 108	647146.065	2540164.816	43°11'48.63156"	22°57'47.50771"
109	P 109	647158.824	2540141.424	43°12'13.83699"	22°57'46.74317"
110	P 110	647171.221	2540133.403	43°12'38.61635"	22°57'46.47845"
111	P 111	647178.384	2540106.848	43°12'52.50109"	22°57'45.61288"
112	P 112	647187.73	2540072.198	43°13'10.61908"	22°57'44.48341"
113	P 113	647195.021	2540045.164	43°13'24.75444"	22°57'43.60221"
114	P 114	647201.619	2540017.964	43°13'37.49118"	22°57'42.71585"
115	P 115	647207.319	2539990.551	43°13'48.41726"	22°57'41.82281"
116	P 116	647213.019	2539963.137	43°13'59.34331"	22°57'40.92977"
117	P 117	647218.719	2539935.723	43°14'10.26933"	22°57'40.03673"
118	P 118	647222.954	2539915.353	43°14'18.38792"	22°57'39.37315"

119		P 119	647216.149	2539889.266	43°14'04.18572"	22°57'38.52720"
120		P 120	647201.042	2539864.843	43°13'33.31749"	22°57'37.73800"
121		P 121	647182.358	2539834.638	43°12'55.14240"	22°57'36.76198"
122		P 122	647167.629	2539810.825	43°12'25.04614"	22°57'35.99250"
123		P 123	647152.899	2539787.013	43°11'54.94998"	22°57'35.22302"
124		P 124	647136.887	2539764.068	43°11'22.29083"	22°57'34.48218"
125		P 125	647120.254	2539741.544	43°10'48.39090"	22°57'33.75520"
126		P 126	647103.621	2539719.02	43°10'14.49108"	22°57'33.02821"
127		P 127	647086.691	2539696.722	43°09'39.99989"	22°57'32.30869"
128		P 128	647069.301	2539674.778	43°09'04.58866"	22°57'31.60078"
129		P 129	647049.418	2539655.152	43°08'24.20949"	22°57'30.96907"
130		P 130	647028.778	2539636.232	43°07'42.32182"	22°57'30.36050"
131		P 131	647008.138	2539617.311	43°07'00.43425"	22°57'29.75193"
132		P 132	646984.092	2539595.267	43°06'11.63301"	22°57'29.04291"
133		P 133	646964.181	2539583.015	43°05'31.34285"	22°57'28.65091"
134		P 134	646940.334	2539568.341	43°04'43.08798"	22°57'28.18143"
135		P 135	646916.487	2539553.667	43°03'54.83320"	22°57'27.71194"
136		P 136	646889.252	2539536.908	43°02'59.72290"	22°57'27.17574"
137		P 137	646864.83	2539521.88	43°02'10.30328"	22°57'26.69492"
138		P 138	646837.595	2539505.121	43°01'15.19319"	22°57'26.15872"
139		P 139	646809.784	2539488.008	43°00'18.91819"	22°57'25.61119"
140		P 140	646782.856	2539471.439	42°59'24.42969"	22°57'25.08103"
141		P 141	646757.132	2539455.609	42°58'32.37576"	22°57'24.57457"
142		P 142	646733.502	2539441.069	42°57'44.56149"	22°57'24.10934"
143		P 143	646722.573	2539459.957	42°57'22.94862"	22°57'24.72686"
144		P 144	646712.254	2539481.113	42°57'02.60741"	22°57'25.41793"
145		P 145	646700.875	2539504.442	42°56'40.17694"	22°57'26.17997"
146		P 146	646691.43	2539523.807	42°56'21.55789"	22°57'26.81253"
147		P 147	646688.459	2539551.523	42°56'16.12496"	22°57'27.71453"
148		P 148	646686.187	2539579.431	42°56'12.10241"	22°57'28.62254"
149		P 149	646683.916	2539607.339	42°56'08.07984"	22°57'29.53055"
150		P 150	646681.644	2539635.247	42°56'04.05727"	22°57'30.43856"
151	Patch No- 6 & P 312	P 151	646682.049	2539663.177	42°56'05.41958"	22°57'31.34645"
152		P 152	646684.017	2539693.689	42°56'09.97703"	22°57'32.33779"
153		P 153	646685.924	2539723.249	42°56'14.39231"	22°57'33.29820"
154		P 154	646687.84	2539752.945	42°56'18.82792"	22°57'34.26303"
155		P 155	646689.758	2539782.671	42°56'23.26796"	22°57'35.22882"
156		P 156	646673.704	2539795.026	42°55'51.21838"	22°57'35.63555"
157		P 157	646651.514	2539812.102	42°55'06.91872"	22°57'36.19775"
158		P 158	646629.325	2539829.179	42°54'22.61896"	22°57'36.75995"
159		P 159	646607.135	2539846.256	42°53'38.31909"	22°57'37.32214"
160		P 160	646584.945	2539863.332	42°52'54.01911"	22°57'37.88434"
161		P 161	646562.755	2539880.409	42°52'09.71904"	22°57'38.44653"
162		P 162	646541.944	2539899.056	42°51'28.22289"	22°57'39.05933"
163		P 163	646522.143	2539918.853	42°50'48.78058"	22°57'39.70920"
164		P 164	646502.342	2539938.649	42°50'09.33817"	22°57'40.35907"



165	P 165	646482.541	2539958.446	42°49'29.89565"	22°57'41.00894"
166	P 166	646462.74	2539978.243	42°48'50.45303"	22°57'41.65880"
167	P 167	646444.32	2539999.233	42°48'13.81157"	22°57'42.34702"
168	P 168	646426.614	2540020.891	42°47'38.62047"	22°57'43.05674"
169	P 169	646408.039	2540041.843	42°47'01.66605"	22°57'43.74375"
170	P 170	646389.463	2540062.794	42°46'24.71154"	22°57'44.43076"
171	P 171	646370.888	2540083.745	42°45'47.75692"	22°57'45.11777"
172	P 172	646352.313	2540104.697	42°45'10.80220"	22°57'45.80478"
173	P 173	646333.738	2540125.648	42°44'33.84737"	22°57'46.49179"
174	P 174	646315.163	2540146.6	42°43'56.89245"	22°57'47.17880"
175	P 175	646296.587	2540167.551	42°43'19.93742"	22°57'47.86581"
176	P 176	646278.012	2540188.502	42°42'42.98228"	22°57'48.55282"
177	P 177	646259.437	2540209.454	42°42'06.02705"	22°57'49.23982"
178	P 178	646240.862	2540230.405	42°41'29.07171"	22°57'49.92683"
179	P 179	646222.286	2540251.357	42°40'52.11627"	22°57'50.61384"
180	P 180	646203.711	2540272.308	42°40'15.16072"	22°57'51.30084"
181	P 181	646185.136	2540293.259	42°39'38.20507"	22°57'51.98784"
182	P 182	646166.561	2540314.211	42°39'01.24932"	22°57'52.67485"
183	P 183	646147.985	2540335.162	42°38'24.29347"	22°57'53.36185"
184	P 184	646129.41	2540356.113	42°37'47.33751"	22°57'54.04885"
185	P 185	646110.835	2540377.065	42°37'10.38145"	22°57'54.73585"
186	P 186	646092.26	2540398.016	42°36'33.42529"	22°57'55.42285"
187	P 187	646074.07	2540419.287	42°35'57.25117"	22°57'56.12012"
188	P 188	646057.471	2540441.805	42°35'24.30044"	22°57'56.85741"
189	P 189	646045.295	2540466.887	42°35'00.29636"	22°57'57.67669"
190	P 190	646038.49	2540487.376	42°34'47.00785"	22°57'58.34496"
191	P 191	646035.176	2540505.821	42°34'40.70142"	22°57'58.94566"
192	P 192	646035.893	2540528.037	42°34'42.57806"	22°57'59.66768"
193	P 193	646037.881	2540546.271	42°34'46.93385"	22°58'00.25983"
194	P 194	646042.282	2540573.922	42°34'56.32598"	22°58'01.15741"
195	P 195	646049.25	2540601.025	42°35'10.87216"	22°58'02.03633"
196	P 196	646057.292	2540627.845	42°35'27.57236"	22°58'02.90574"
197	P 197	646066.676	2540654.208	42°35'46.96336"	22°58'03.75985"
198	P 198	646076.689	2540680.357	42°36'07.61573"	22°58'04.60679"
199	P 199	646086.701	2540706.505	42°36'28.26817"	22°58'05.45372"
200	P 200	646096.714	2540732.654	42°36'48.92068"	22°58'06.30066"
201	P 201	646107.881	2540761.816	42°37'11.95357"	22°58'07.24521"
202	P 202	646105.327	2540792.591	42°37'07.41772"	22°58'08.24654"
203	P 203	646103.002	2540820.611	42°37'03.28803"	22°58'09.15821"
204	P 204	646095.6	2540848.742	42°36'48.94583"	22°58'10.07508"
205	P 205	646086.696	2540882.575	42°36'31.69620"	22°58'11.17782"
206	P 206	646090.873	2540902.548	42°36'40.48873"	22°58'11.82583"
207	P 207	646096.388	2540926.445	42°36'52.04898"	22°58'12.60099"
208	P 208	646109.48	2540941.163	42°37'18.67245"	22°58'13.07536"
209	P 209	646122.854	2540956.199	42°37'45.87055"	22°58'13.55996"
210	P 210	646142.968	2540987.817	42°38'26.95088"	22°58'14.58154"



211		P 211	646156.324	2541008.812	42°38'54.22862"	22°58'15.25987"
212		P 212	646169.37	2541029.826	42°39'20.88225"	22°58'15.93891"
213		P 213	646177.284	2541060.38	42°39'37.40009"	22°58'16.92973"
214		P 214	646185.163	2541090.796	42°39'53.84332"	22°58'17.91608"
215	Patch No- 7 & P 313	P 215	647468.876	2540149.465	43°22'37.67012"	22°57'46.90593"
216		P 216	647496.819	2540145.122	43°23'33.79287"	22°57'46.75585"
217		P 217	647525.44	2540140.674	43°24'31.27668"	22°57'46.60212"
218		P 218	647557.678	2540135.664	43°25'36.02465"	22°57'46.42897"
219		P 219	647586.339	2540131.21	43°26'33.58900"	22°57'46.27503"
220		P 220	647617.526	2540126.363	43°27'36.22635"	22°57'46.10751"
221		P 221	647642.639	2540122.46	43°28'26.66457"	22°57'45.97262"
222		P 222	647671.165	2540118.027	43°29'23.95675"	22°57'45.81940"
223		P 223	647697.512	2540113.932	43°30'16.87425"	22°57'45.67788"
224		P 224	647725.419	2540109.595	43°31'12.92317"	22°57'45.52798"
225		P 225	647752.037	2540105.458	43°32'06.38471"	22°57'45.38499"
226		P 226	647778.966	2540101.273	43°33'00.46886"	22°57'45.24034"
227		P 227	647806.96	2540096.923	43°33'56.69296"	22°57'45.08997"
228		P 228	647834.444	2540092.651	43°34'51.89329"	22°57'44.94233"
229		P 229	647861.866	2540088.39	43°35'46.96879"	22°57'44.79503"
230		P 230	647890.305	2540083.97	43°36'44.08747"	22°57'44.64225"
231		P 231	647918.813	2540079.54	43°37'41.34213"	22°57'44.48912"
232		P 232	647947.086	2540075.145	43°38'38.12766"	22°57'44.33723"
233		P 233	647971.932	2540071.284	43°39'28.02941"	22°57'44.20376"
234		P 234	647998.424	2540067.167	43°40'21.23650"	22°57'44.06144"
235		P 235	648035.35	2540054.323	43°41'35.25895"	22°57'43.63208"
236		P 236	648071.362	2540041.797	43°42'47.44942"	22°57'43.21335"
237		P 237	648087.524	2540026.507	43°43'19.65549"	22°57'42.71111"
238		P 238	648104.685	2540010.272	43°43'53.85331"	22°57'42.17780"
239		P 239	648125.929	2539992.04	43°44'36.22511"	22°57'41.57827"
240		P 240	648149.513	2539976.993	43°45'23.36655"	22°57'41.08155"
241		P 241	648177.97	2539960.448	43°46'20.28063"	22°57'40.53456"
242		P 242	648205.554	2539949.964	43°47'15.55791"	22°57'40.18491"
243		P 243	648225.943	2539944.867	43°47'56.46813"	22°57'40.01267"
244		P 244	648247.259	2539963.871	43°48'39.72208"	22°57'40.62366"
245		P 245	648268.16	2539982.504	43°49'22.13179"	22°57'41.22273"
246		P 246	648289.06	2540001.136	43°50'04.54160"	22°57'41.82179"
247		P 247	648309.96	2540019.769	43°50'46.95151"	22°57'42.42085"
248		P 248	648330.287	2540039.644	43°51'28.23336"	22°57'43.06046"
249		P 249	648353.866	2540053.864	43°52'15.94462"	22°57'43.51523"
250		P 250	648379.579	2540069.372	43°53'07.97327"	22°57'44.01114"
251		P 251	648403.999	2540084.1	43°53'57.38671"	22°57'44.48213"
252		P 252	648428.967	2540099.158	43°54'47.90696"	22°57'44.96366"
253		P 253	648452.513	2540113.359	43°55'35.55201"	22°57'45.41779"
254		P 254	648430.048	2540123.866	43°54'50.57102"	22°57'45.76658"
255		P 255	648404.685	2540135.729	43°53'59.78851"	22°57'46.16037"
256		P 256	648377.128	2540148.617	43°53'04.61367"	22°57'46.58820"



257		P 257	648349.543	2540161.519	43°52'09.38259"	22°57'47.01648"
258		P 258	648322.37	2540174.228	43°51'14.97525"	22°57'47.43836"
259		P 259	648294.627	2540187.204	43°50'19.42770"	22°57'47.86908"
260		P 260	648289.966	2540211.398	43°50'10.53022"	22°57'48.65714"
261		P 261	648285.83	2540232.864	43°50'02.63624"	22°57'49.35632"
262		P 262	648280.532	2540260.358	43°49'52.52521"	22°57'50.25186"
263		P 263	648274.358	2540292.404	43°49'40.74039"	22°57'51.29565"
264		P 264	648268.953	2540320.457	43°49'30.42376"	22°57'52.20939"
265		P 265	648263.315	2540349.718	43°49'19.66295"	22°57'53.16247"
266		P 266	648257.464	2540380.085	43°49'08.49515"	22°57'54.15160"
267		P 267	648252.572	2540405.478	43°48'59.15707"	22°57'54.97867"
268		P 268	648247.117	2540433.791	43°48'48.74475"	22°57'55.90087"
269		P 269	648242.125	2540459.698	43°48'39.21703"	22°57'56.74473"
270		P 270	648263.667	2540469.578	43°49'22.74574"	22°57'57.05902"
271		P 271	648286.658	2540480.122	43°50'09.20332"	22°57'57.39446"
272		P 272	648312.109	2540491.795	43°51'00.63078"	22°57'57.76578"
273		P 273	648337.561	2540503.467	43°51'52.05832"	22°57'58.13710"
274		P 274	648363.012	2540515.14	43°52'43.48593"	22°57'58.50841"
275		P 275	648388.463	2540526.812	43°53'34.91361"	22°57'58.87973"
276		P 276	648413.914	2540538.484	43°54'26.34137"	22°57'59.25104"
277		P 277	648439.381	2540550.119	43°55'17.80244"	22°57'59.62111"
278		P 278	648465.089	2540561.216	43°56'09.73424"	22°57'59.97363"
279		P 279	648490.796	2540572.313	43°57'01.66611"	22°58'00.32614"
280		P 280	648516.503	2540583.409	43°57'53.59805"	22°58'00.67866"
281		P 281	648542.21	2540594.506	43°58'45.53006"	22°58'01.03117"
282		P 282	648567.917	2540605.603	43°59'37.46215"	22°58'01.38368"
283		P 283	648599.539	2540619.253	44°00'41.34213"	22°58'01.81729"
284		P 284	648592.507	2540591.683	44°00'26.65012"	22°58'00.92325"
285		P 285	648585.605	2540564.618	44°00'12.22686"	22°58'00.04557"
286		P 286	648578.963	2540538.579	43°59'58.35041"	22°57'59.20116"
287		P 287	648571.753	2540510.307	43°59'43.28469"	22°57'58.28437"
288		P 288	648564.065	2540480.165	43°59'27.22214"	22°57'57.30693"
289		P 289	648556.682	2540451.216	43°59'11.79510"	22°57'56.36814"
290		P 290	648549.877	2540424.536	43°58'57.57751"	22°57'55.50296"
291		P 291	648564.567	2540408.607	43°59'26.81179"	22°57'54.98040"
292		P 292	648582.726	2540388.918	44°00'02.94771"	22°57'54.33447"
293		P 293	648601.134	2540368.959	44°00'39.57950"	22°57'53.67968"
294		P 294	648620.108	2540348.386	44°01'17.33665"	22°57'53.00477"
295		P 295	648640.753	2540326	44°01'58.42154"	22°57'52.27038"
296		P 296	648661.009	2540304.038	44°02'38.72931"	22°57'51.54987"
297		P 297	648680.63	2540282.762	44°03'17.77597"	22°57'50.85190"
298		P 298	648698.858	2540262.998	44°03'54.04832"	22°57'50.20352"
299		P 299	648720.437	2540239.6	44°04'36.99049"	22°57'49.43591"
300		P 300	648742.97	2540247.643	44°05'22.47607"	22°57'49.69015"
301	Patch No-7 & P 313	P 301	648768.435	2540256.732	44°06'13.88073"	22°57'49.97747"
302		P 302	648792.359	2540265.272	44°07'02.17247"	22°57'50.24739"

303	P 303	648811.859	2540272.232	44°07'41.53632"	22°57'50.46741"
304	P 304	648824.036	2540251.245	44°08'05.61316"	22°57'49.78121"
305	P 305	648837.155	2540228.636	44°08'31.55164"	22°57'49.04195"
306	P 306	648850.258	2540206.051	44°08'57.46088"	22°57'48.30353"
307	P 307	648864.729	2540181.112	44°09'26.07217"	22°57'47.48809"
308	P 308	648867.116	2540150.374	44°09'30.26248"	22°57'46.48805"
309	P 309	648869.496	2540119.728	44°09'34.44036"	22°57'45.49096"
310	P 310	648839.633	2540119.289	44°08'34.36134"	22°57'45.48628"
311	P 311	648810.767	2540118.864	44°07'36.29045"	22°57'45.48175"
312	P 312	648773.901	2540118.322	44°06'22.12293"	22°57'45.47597"
313	P 313	648740.838	2540117.835	44°05'15.60616"	22°57'45.47077"
314	P 314	648707.739	2540117.348	44°04'09.01854"	22°57'45.46557"
315	P 315	648691.392	2540096.637	44°03'35.72582"	22°57'44.79749"
316	P 316	648673.6	2540074.093	44°02'59.48805"	22°57'44.07031"
317	P 317	648654.458	2540049.84	44°02'20.50309"	22°57'43.28800"
318	P 318	648639.034	2540030.298	44°01'49.08982"	22°57'42.65763"
319	P 319	648621.761	2540008.413	44°01'13.91144"	22°57'41.95170"
320	P 320	648602.602	2539984.138	44°00'34.89041"	22°57'41.16865"
321	P 321	648587.697	2539963.845	44°00'04.50598"	22°57'40.51370"
322	P 322	648573.03	2539945.314	43°59'34.63516"	22°57'39.91596"
323	P 323	648558.3	2539926.704	43°59'04.63766"	22°57'39.31568"
324	P 324	648545.317	2539910.301	43°58'38.19749"	22°57'38.78659"
325	P 325	648527.94	2539888.346	43°58'02.80758"	22°57'38.07840"
326	P 326	648510.562	2539866.391	43°57'27.41778"	22°57'37.37021"
327	P 327	648493.185	2539844.436	43°56'52.02809"	22°57'36.66202"
328	P 328	648475.808	2539822.481	43°56'16.63849"	22°57'35.95383"
329	P 329	648458.43	2539800.526	43°55'41.24900"	22°57'35.24564"
330	P 330	648441.053	2539778.571	43°55'05.85962"	22°57'34.53745"
331	P 331	648423.676	2539756.616	43°54'30.47034"	22°57'33.82925"
332	P 332	648406.734	2539735.211	43°53'55.96859"	22°57'33.13882"
333	P 333	648378.946	2539728.025	43°52'59.93188"	22°57'32.91410"
334	P 334	648351.838	2539721.015	43°52'05.26605"	22°57'32.69488"
335	P 335	648324.729	2539714.004	43°51'10.60025"	22°57'32.47566"
336	P 336	648297.621	2539706.994	43°50'15.93450"	22°57'32.25643"
337	P 337	648270.513	2539699.984	43°49'21.26880"	22°57'32.03721"
338	P 338	648243.405	2539692.973	43°48'26.60314"	22°57'31.81798"
339	P 339	648216.297	2539685.963	43°47'31.93752"	22°57'31.59875"
340	P 340	648189.188	2539678.953	43°46'37.27194"	22°57'31.37952"
341	P 341	648162.08	2539671.942	43°45'42.60641"	22°57'31.16028"
342	P 342	648134.972	2539664.932	43°44'47.94093"	22°57'30.94105"
343	P 343	648110.367	2539658.569	43°43'58.32456"	22°57'30.74206"
344	P 344	648081.605	2539679.101	43°43'00.87656"	22°57'31.41875"
345	P 345	648054.293	2539666.441	43°42'05.68871"	22°57'31.01591"
346	P 346	648026.238	2539653.438	43°41'09.00120"	22°57'30.60213"
347	P 347	647999.83	2539641.197	43°40'15.64168"	22°57'30.21263"
348	P 348	647971.76	2539628.186	43°39'18.92224"	22°57'29.79861"



349	P 349	647942.085	2539615.046	43°38'18.97389"	22°57'29.38091"
350	P 350	647922.72	2539627.335	43°37'40.26509"	22°57'29.78660"
351	P 351	647902.355	2539640.258	43°36'59.55654"	22°57'30.21324"
352	P 352	647880.907	2539653.868	43°36'16.68430"	22°57'30.66256"
353	P 353	647856.946	2539669.073	43°35'28.78856"	22°57'31.16453"
354	P 354	647830.555	2539685.82	43°34'36.03472"	22°57'31.71741"
355	P 355	647807.367	2539700.535	43°33'49.68320"	22°57'32.20319"
356	P 356	647785.575	2539714.364	43°33'06.12316"	22°57'32.65971"
357	P 357	647765.318	2539727.218	43°32'25.63020"	22°57'33.08408"
358	P 358	647749.681	2539737.141	43°31'54.37303"	22°57'33.41167"
359	P 359	647772.925	2539742.933	43°32'41.24257"	22°57'33.59255"
360	P 360	647799.56	2539749.57	43°33'34.94924"	22°57'33.79982"
361	P 361	647831.259	2539756.373	43°34'38.84469"	22°57'34.01086"
362	P 362	647858.688	2539762.124	43°35'34.12979"	22°57'34.18908"
363	P 363	647887.195	2539768.102	43°36'31.59012"	22°57'34.37431"
364	P 364	647913.28	2539773.571	43°37'24.16620"	22°57'34.54380"
365	P 365	647934.493	2539778.019	43°38'06.92236"	22°57'34.68162"
366	P 366	647966.121	2539772.673	43°39'10.43565"	22°57'34.49771"
367	P 367	647995.993	2539767.623	43°40'10.42220"	22°57'34.32400"
368	P 368	648026.413	2539762.481	43°41'11.50873"	22°57'34.14711"
369	P 369	648059.821	2539756.834	43°42'18.59607"	22°57'33.95284"
370	P 370	648089.11	2539751.883	43°43'17.41259"	22°57'33.78251"
371	P 371	648116.376	2539747.274	43°44'12.16649"	22°57'33.62395"
372	P 372	648146.926	2539742.11	43°45'13.51330"	22°57'33.44630"
373	P 373	648170.896	2539738.058	43°46'01.64840"	22°57'33.30690"
374	P 374	648181.786	2539767.213	43°46'24.12943"	22°57'34.25126"
375	P 375	648192.081	2539794.778	43°46'45.38404"	22°57'35.14409"
376	P 376	648201.933	2539821.154	43°47'05.72196"	22°57'35.99841"
377	P 377	648211.903	2539847.848	43°47'26.30586"	22°57'36.86306"
378	P 378	648222.51	2539876.247	43°47'48.20441"	22°57'37.78293"
379	P 379	648233.611	2539905.968	43°48'11.12167"	22°57'38.74559"
380	P 380	648213.038	2539911.881	43°47'29.85623"	22°57'38.94442"
381	P 381	648185.624	2539919.76	43°46'34.87039"	22°57'39.20935"
382	P 382	648158.127	2539927.664	43°45'39.71718"	22°57'39.47509"
383	P 383	648131.049	2539935.447	43°44'45.40399"	22°57'39.73678"
384	P 384	648103.783	2539943.284	43°43'50.71385"	22°57'40.00029"
385	P 385	648080.94	2539949.867	43°43'04.89547"	22°57'40.22160"
386	P 386	648053.812	2539944.07	43°42'10.21381"	22°57'40.04183"
387	P 387	648025.572	2539938.036	43°41'13.28922"	22°57'39.85468"
388	P 388	647994.196	2539931.331	43°40'10.04588"	22°57'39.64675"
389	P 389	647967.029	2539925.527	43°39'15.28547"	22°57'39.46672"
390	P 390	647951.452	2539916.123	43°38'43.76623"	22°57'39.16600"
391	P 391	647927.481	2539901.654	43°37'55.26251"	22°57'38.70324"
392	P 392	647900.557	2539885.401	43°37'00.78465"	22°57'38.18347"
393	P 393	647876.624	2539870.955	43°36'12.35889"	22°57'37.72145"
394	P 394	647853.544	2539859.042	43°35'25.69738"	22°57'37.34154"



395	P 395	647839.053	2539835.4	43°34'56.08330"	22°57'36.57756"
396	P 396	647825.046	2539812.547	43°34'27.45751"	22°57'35.83906"
397	P 397	647785.498	2539823.978	43°33'08.13289"	22°57'36.22331"
398	P 398	647785.498	2539823.978	43°33'08.13289"	22°57'36.22331"
399	P 399	647740.549	2539836.97	43°31'37.97501"	22°57'36.66004"
400	P 400	647729.559	2539837.119	43°31'15.87284"	22°57'36.66839"
401	P 401	647713.22	2539823.779	43°30'42.74370"	22°57'36.23992"
402	P 402	647677.843	2539823.432	43°29'31.57783"	22°57'36.23992"
403	P 403	647673.219	2539825.824	43°29'22.32339"	22°57'36.31915"
404	P 404	647683.586	2539849.677	43°29'43.64712"	22°57'37.09131"
405	P 405	647695.089	2539876.143	43°30'07.30669"	22°57'37.94805"
406	P 406	647704.981	2539898.904	43°30'27.65448"	22°57'38.68487"
407	P 407	647687.91	2539923.239	43°29'53.79687"	22°57'39.48146"
408	P 408	647672.242	2539945.575	43°29'22.72068"	22°57'40.21260"
409	P 409	647658.002	2539965.874	43°28'54.47844"	22°57'40.87706"
410	P 410	647634.594	2539971.726	43°28'07.50909"	22°57'41.07478"
411	P 411	647608.974	2539978.131	43°27'16.10085"	22°57'41.29117"
412	P 412	647583.628	2539984.467	43°26'25.24221"	22°57'41.50526"
413	P 413	647557.61	2539990.972	43°25'33.03440"	22°57'41.72501"
414	P 414	647530.77	2539997.682	43°24'39.17760"	22°57'41.95171"
415	P 415	647503.456	2540004.51	43°23'44.37137"	22°57'42.18241"
416	P 416	647475.564	2540011.483	43°22'48.40393"	22°57'42.41799"
417	P 417	647483.456	2539991.126	43°23'03.87822"	22°57'41.75366"
418	P 418	647493.578	2539965.02	43°23'23.72294"	22°57'40.90170"
419	P 419	647503.699	2539938.913	43°23'43.56759"	22°57'40.04974"
420	P 420	647515.152	2539909.373	43°24'06.02187"	22°57'39.08575"
421	P 421	647526.191	2539880.898	43°24'27.66684"	22°57'38.15649"
422	P 422	647537.52	2539851.679	43°24'49.87693"	22°57'37.20297"
423	P 423	647546.85	2539827.612	43°25'08.17132"	22°57'36.41756"
424	P 424	647558.502	2539797.558	43°25'31.01582"	22°57'35.43679"
425	P 425	647563.569	2539776.727	43°25'40.79702"	22°57'34.75795"
426	P 426	647540.96	2539772.808	43°24'55.24334"	22°57'34.63774"
427	P 427	647513.416	2539767.78	43°23'59.73868"	22°57'34.48305"
428	P 428	647485.871	2539762.752	43°23'04.23405"	22°57'34.32836"
429	P 429	647457.881	2539762.215	43°22'07.92368"	22°57'34.31983"
430	P 430	647429.885	2539761.745	43°21'11.60131"	22°57'34.31347"
431	P 431	647401.889	2539761.276	43°20'15.27892"	22°57'34.30712"
432	P 432	647373.893	2539760.806	43°19'18.95654"	22°57'34.30076"
433	P 433	647339.36	2539764.554	43°18'09.56737"	22°57'34.43359"
434	P 434	647308.578	2539768.227	43°17'07.72409"	22°57'34.56279"
435	P 435	647279.964	2539771.641	43°16'10.23460"	22°57'34.68289"
436	P 436	647290.38	2539792.472	43°16'31.59522"	22°57'35.35681"
437	P 437	647301.801	2539815.315	43°16'55.01843"	22°57'36.09579"
438	P 438	647312.799	2539837.311	43°17'17.57352"	22°57'36.80739"
439	P 439	647325.321	2539862.355	43°17'43.25419"	22°57'37.61759"
440	P 440	647337.843	2539887.399	43°18'08.93494"	22°57'38.42780"



441		P 441	647350.365	2539912.443	43°18'34.61578"	22°57'39.23800"
442		P 442	647362.887	2539937.487	43°19'00.29670"	22°57'40.04820"
443		P 443	647375.409	2539962.531	43°19'25.97772"	22°57'40.85840"
444		P 444	647387.931	2539987.574	43°19'51.65882"	22°57'41.66860"
445		P 445	647399.564	2540010.84	43°20'15.51677"	22°57'42.42128"
446		P 446	647411.641	2540034.995	43°20'40.28642"	22°57'43.20272"
447		P 447	647423.56	2540058.833	43°21'04.73056"	22°57'43.97389"
448		P 448	647435.733	2540083.178	43°21'29.69573"	22°57'44.76149"
449		P 449	647447.95	2540107.614	43°21'54.75322"	22°57'45.55200"
450		P 450	647459.028	2540129.768	43°22'17.47201"	22°57'46.26873"

वनमण्डलाधिकारी
कटघोरा वनमण्डल, कटघोरा

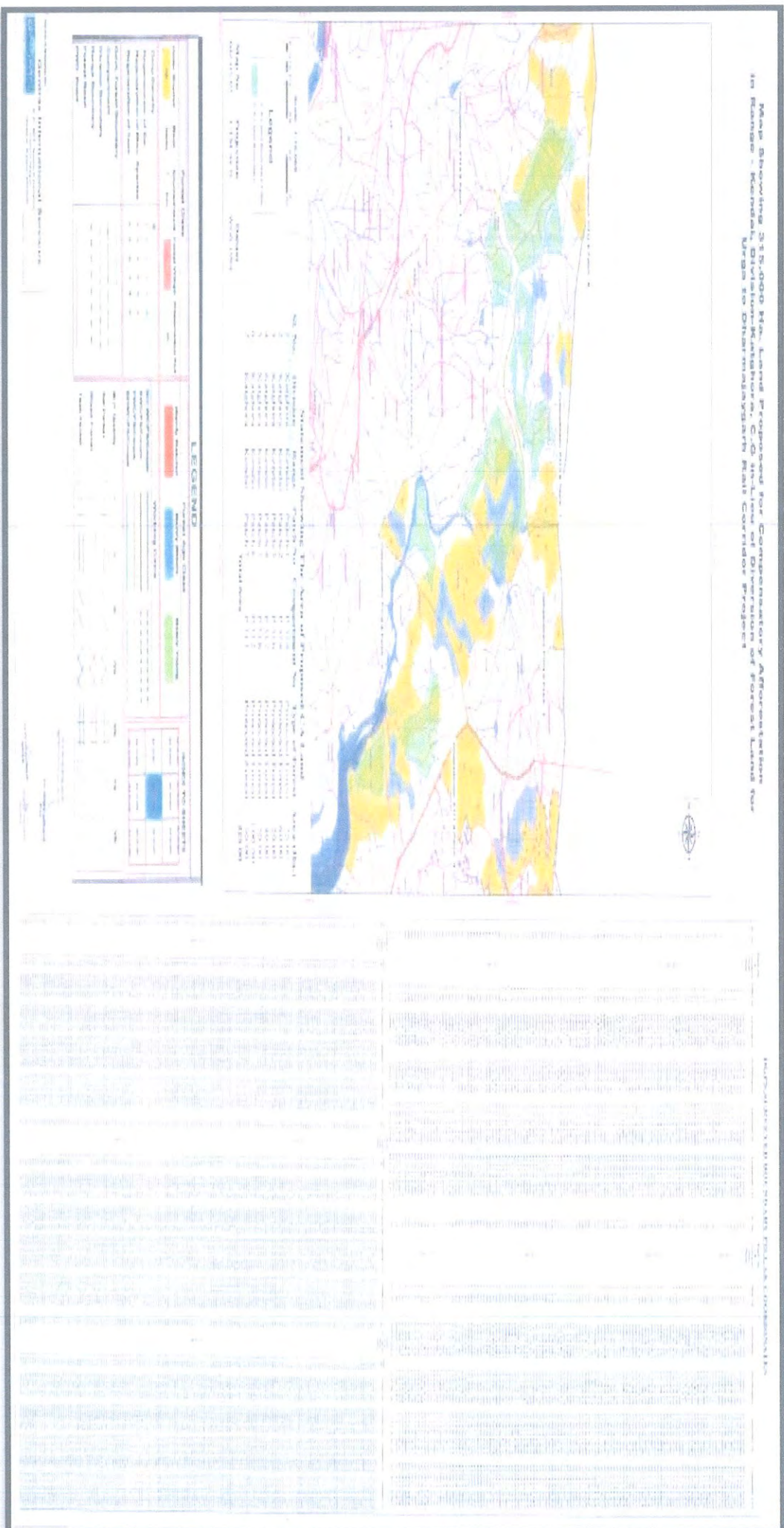
उप वन मण्डलाधिकारी
कटघोरा

वन परिक्षेत्र अधिकारी
केंदई

परिक्षेत्र सहायक
सिरमिना

6.2 Annexure-2: Forest Map Showing CA Land Patches

6.2.1 Patch 1,2,3,4,5,6 and 7 on Forest Stock map – PF 314, PF 316, PF 317, PF 318, PF 312 & PF 313 with proposed area of 315.00 Ha

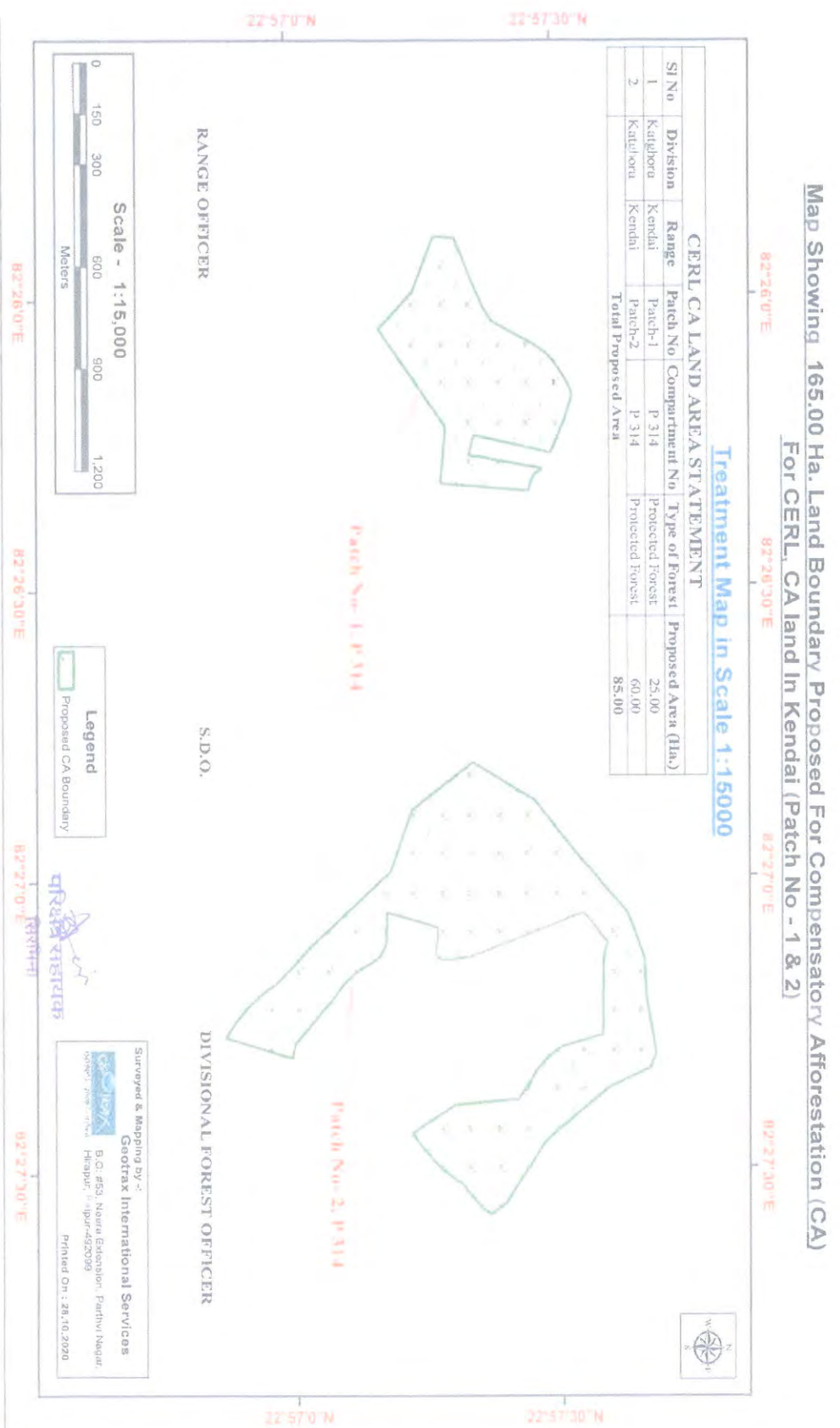


6.4

Annexure-4: Geo-referenced Treatment maps showing proposed CA land patches

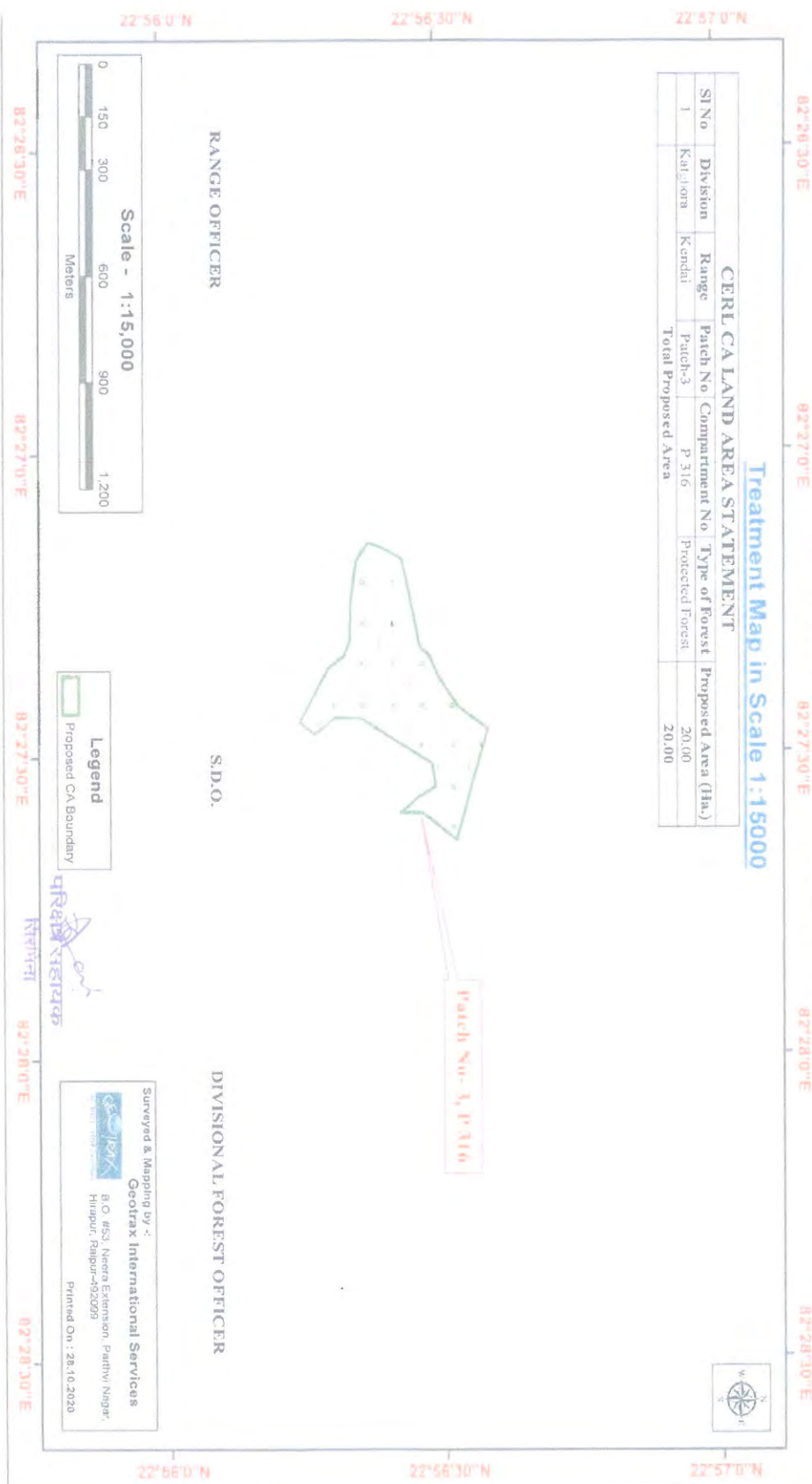
6.4.1 Patch 1&2 Treatment Map – PF 314 with proposed area of 85.00 Ha

Map Showing 165.00 Ha. Land Boundary Proposed For Compensatory Afforestation (CA)
For CERL, CA land in Kendai (Patch No - 1 & 2)

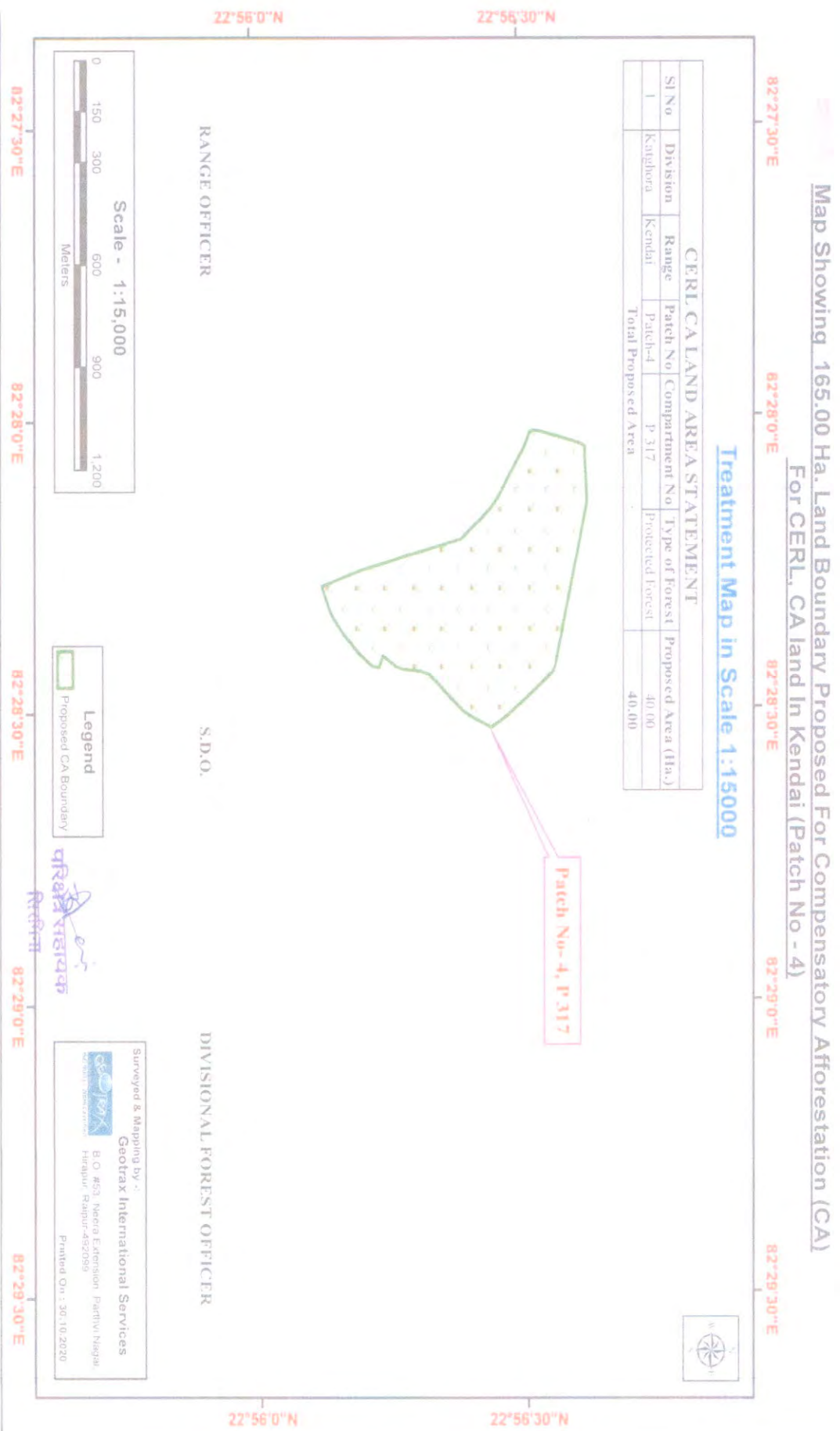


6.4.2 Patch 3 Treatment Map – PF 316 with proposed area of 20.00 Ha

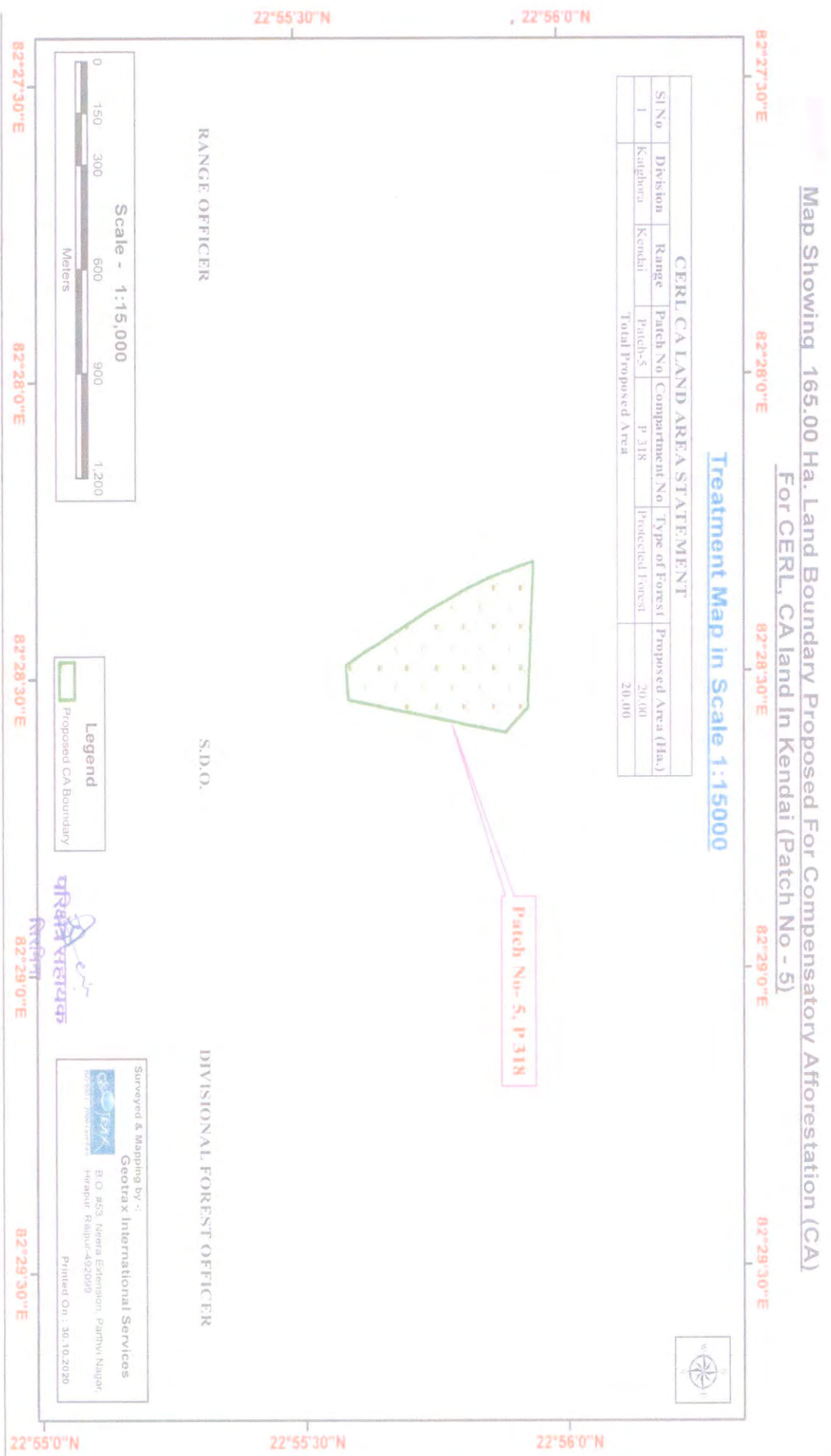
Map Showing 165.00 Ha. Land Boundary Proposed For Compensatory Afforestation (CA)
For CERL, CA land in Kendai (Patch No - 3)



6.4.3 Patch 4 Treatment Map – PF 317 with proposed area of 40.00 Ha

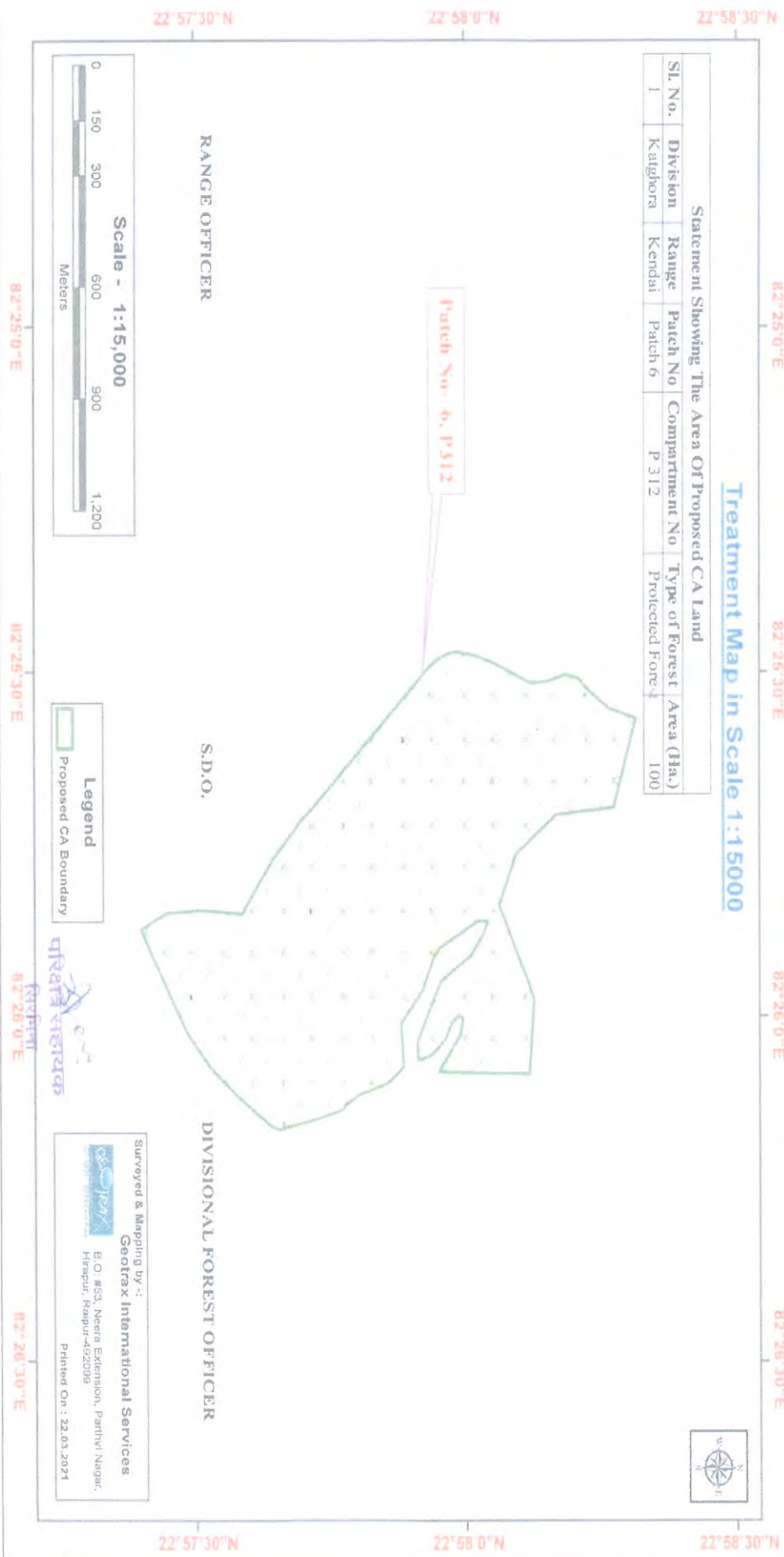


6.4.4 Patch 5 Treatment Map – PF 318 with proposed area of 20.00 Ha



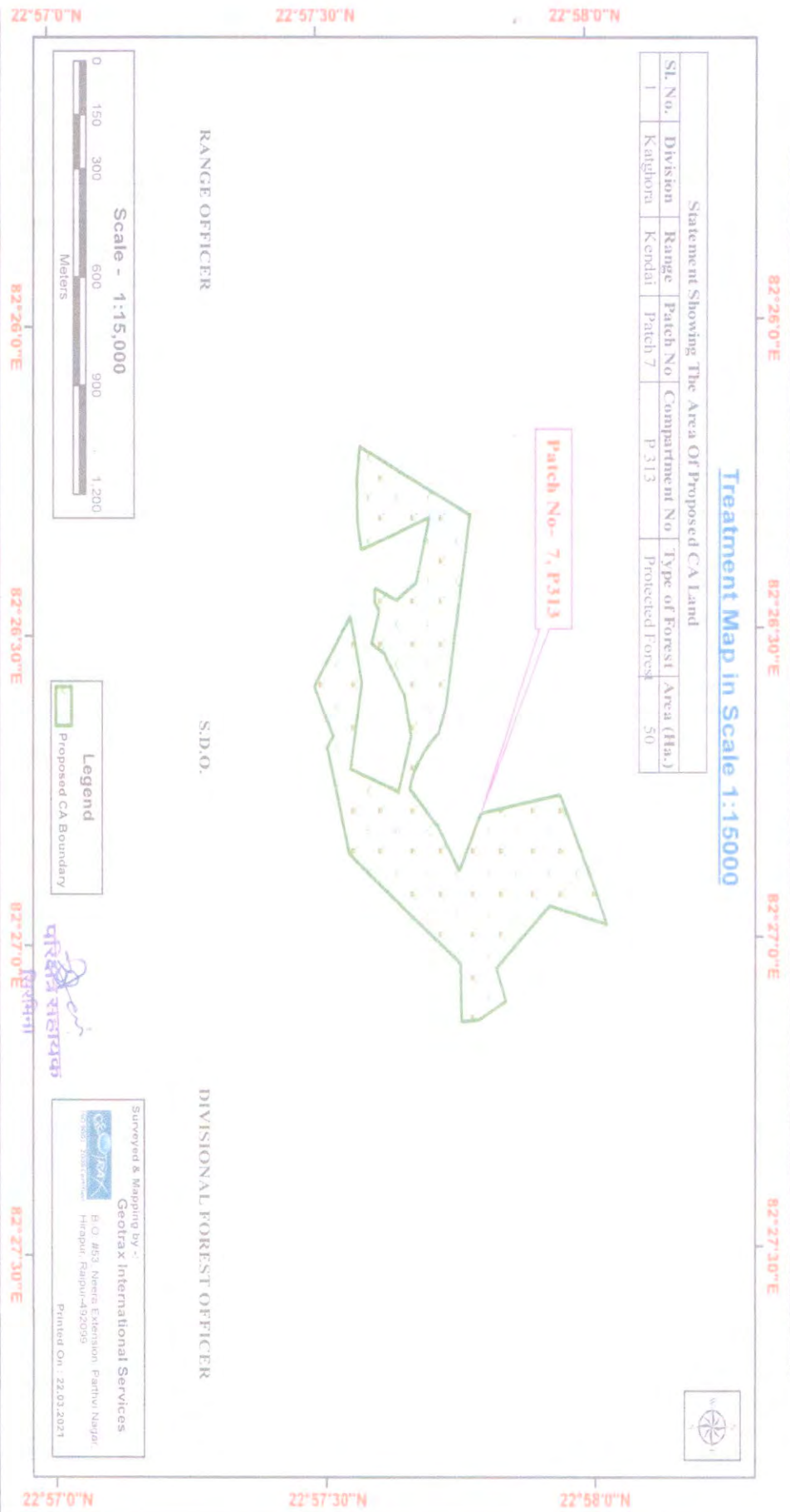
6.4.5 Patch 6 Treatment Map – PF 312 with proposed area of 100.00 Ha

Map Showing 315.000 Ha. Land Proposed for Compensatory Afforestation in Range - Kendai, Division-Katghora, C.G in-Lieu of Diversion of Forest Land for Uрга to Dharmalaygarh Rail Corridor Project (Patch No-6)



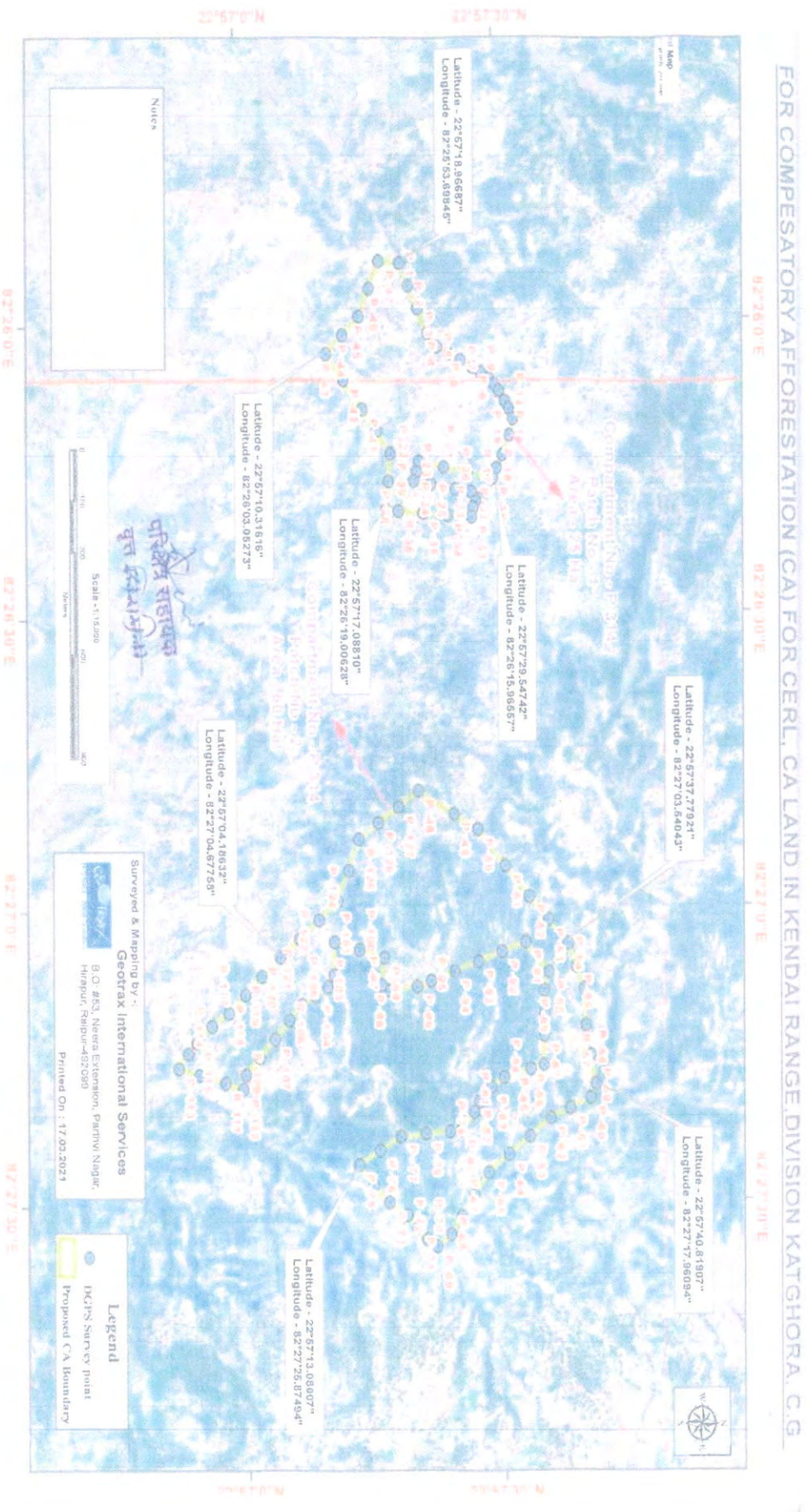
6.4.6 Patch 7 Treatment Map – PF 313 with proposed area of 50.00 Ha

Map Showing 315.000 Ha. Land Proposed for Compensatory Afforestation in Range - Kendai. Division-Katghora. C.G in-Lieu of Diversion of Forest Land for Uрга to Dharmajaygarh Rail Corridor Project (Patch No-7)

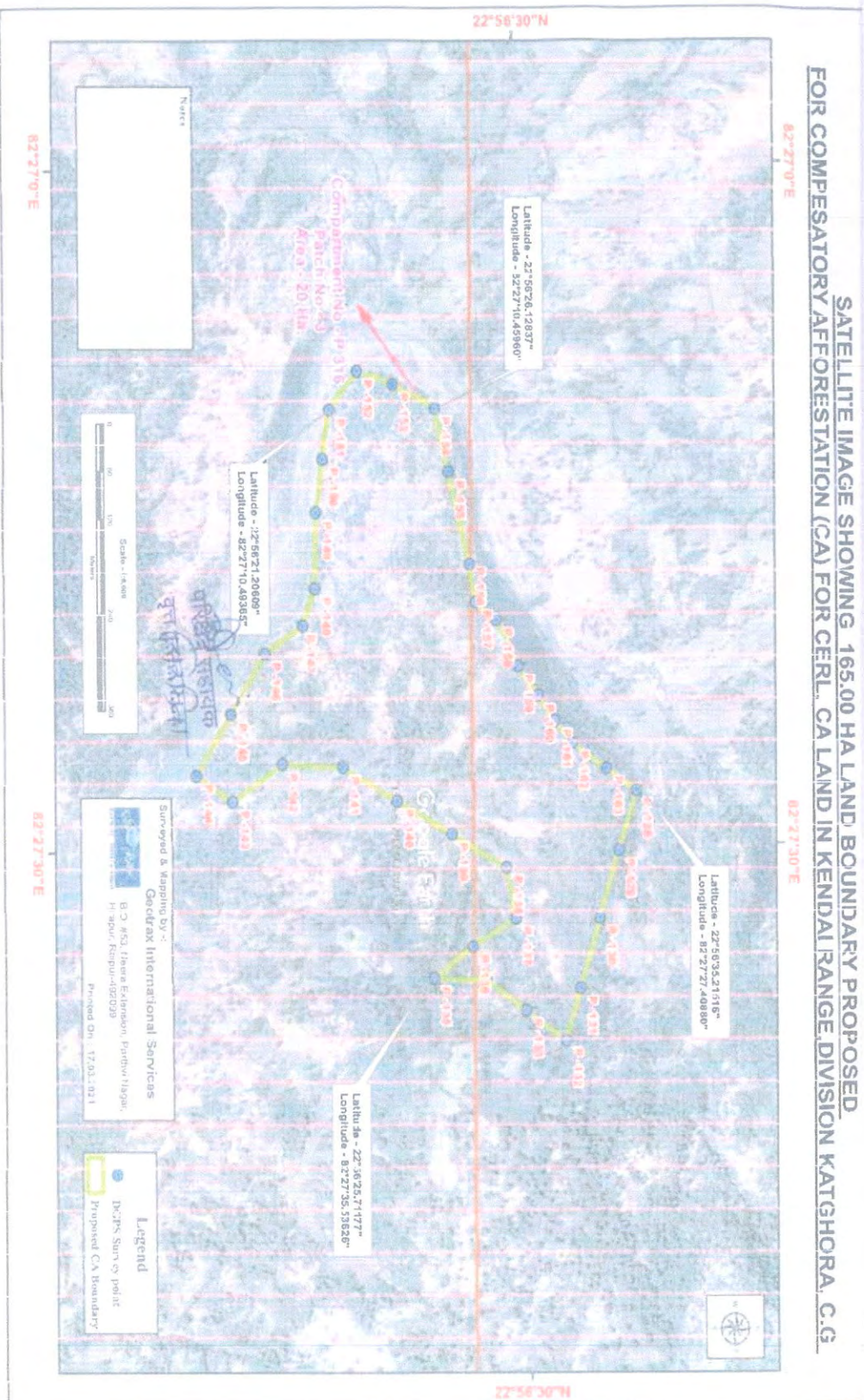


6.5 Annexure-5: Geo-referenced Google maps showing proposed CA land patches

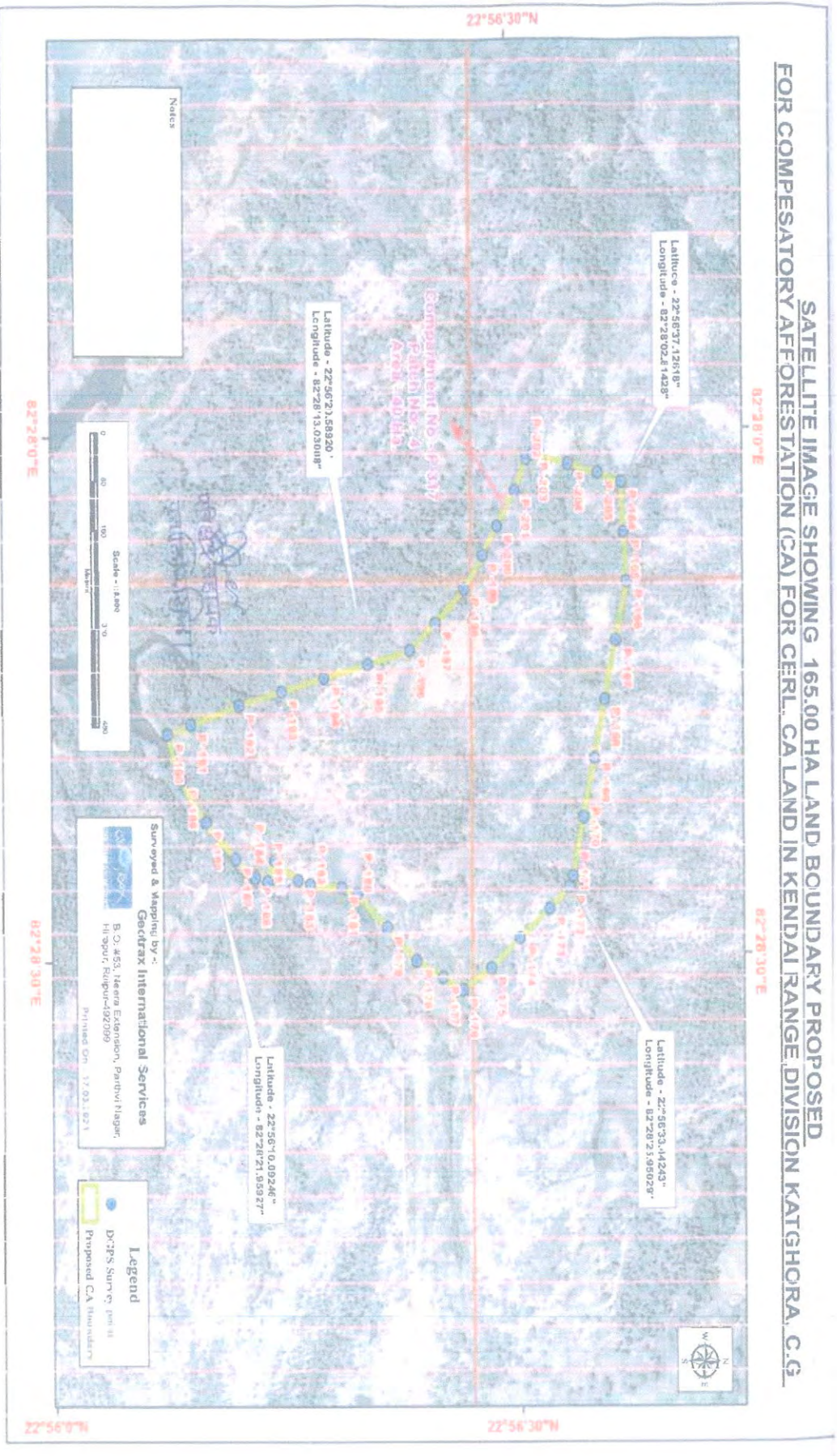
6.5.1 Patch 1&2 Google Map – PF 314 with proposed area of 85.00



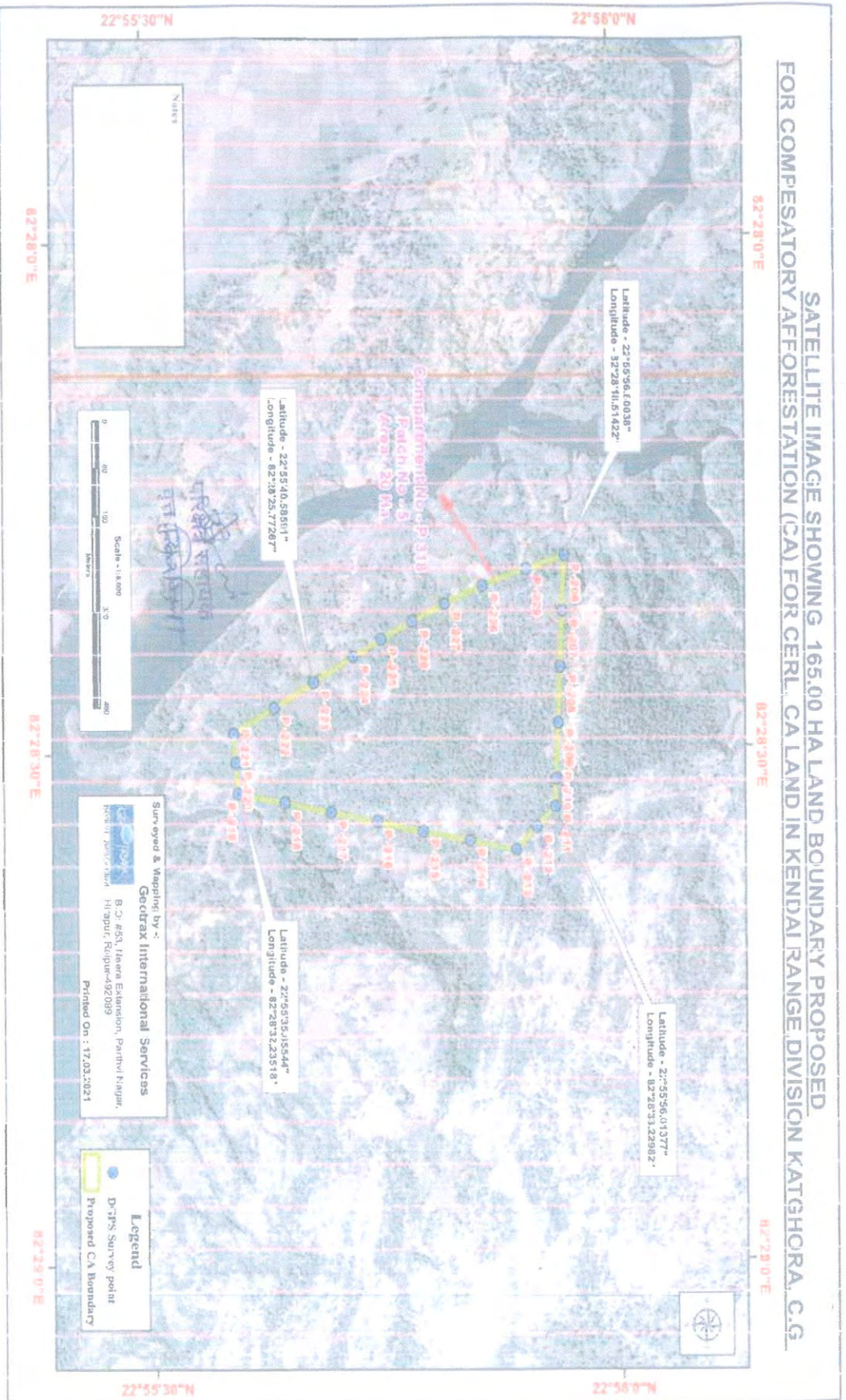
6.5.2 Patch 3 Google Map – PF 316 with proposed area of 20.00 Ha



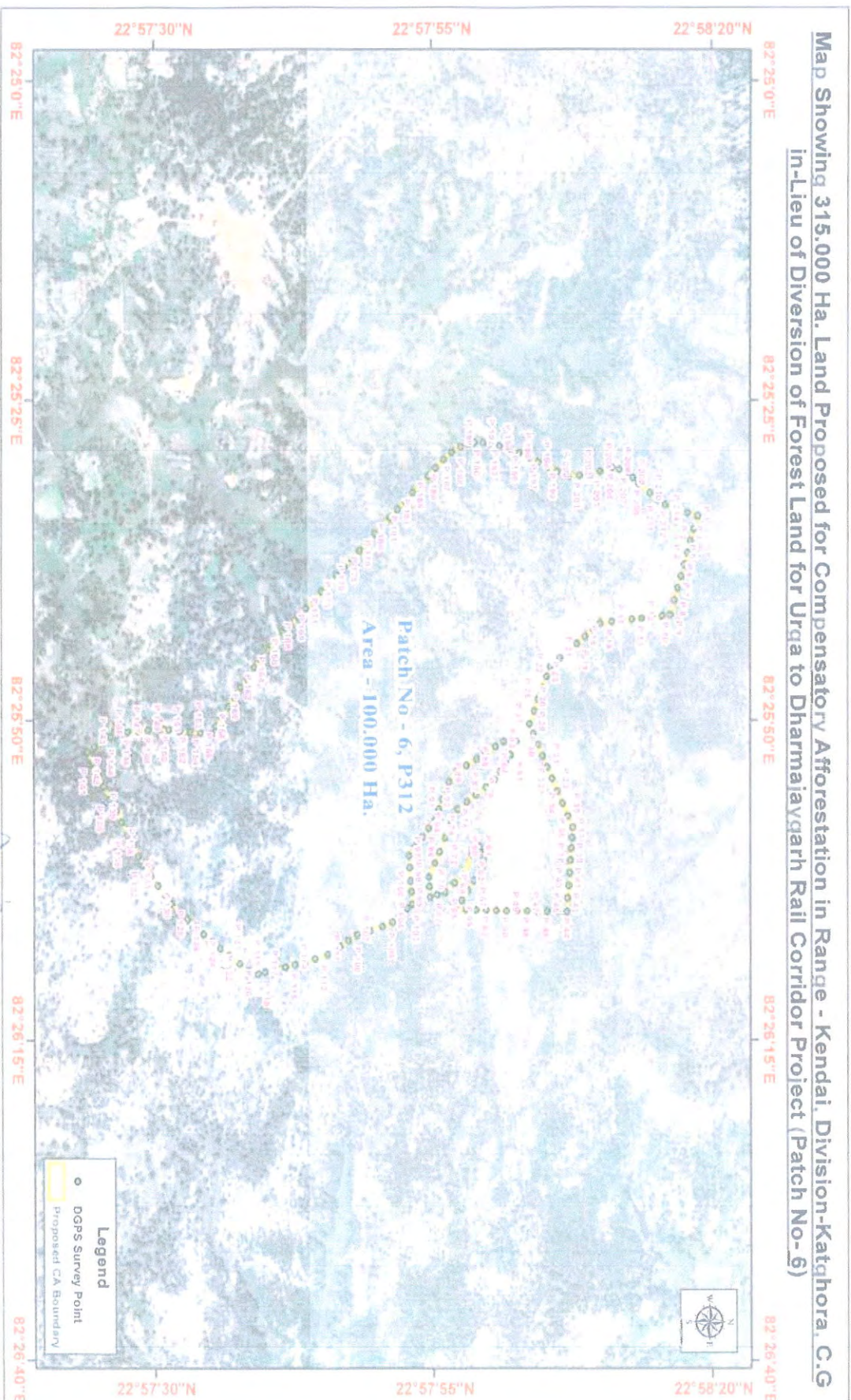
6.5.3 Patch 4 Google Map – PF 317 with proposed area of 40.00 Ha



6.5.4 Patch 5 Google Map – PF 318 with proposed area of 20.00 Ha



6.5.5 Patch 6 Google Map – PF 312 with proposed area of 100.00 Ha



6.5.6 Patch 7 Google Map – PF 313 with proposed area of 50.00 Ha

Map Showing 315.000 Ha. Land Proposed for Compensatory Afforestation in Range - Kendai, Division-Katphora. C.G
in-Lieu of Diversion of Forest Land for Uрга to Dharmajaygarh Rail Corridor Project (Patch No-7)

