कार्यालय वनमण्डलाधिकारी
दन्तेवाड़ा वनमण्डल, दन्तेवाड़ा (छ.ग.)

कार्यालय –07964/ 252221, फैक्स–252305 निवास –07964/ 252439 E-mail:-dfodnt@rediffmail.com

क्रमांक / क.त.अ. / 5301 दन्तेवाड़ा, दिनांक 27 / 07 / 2018

प्रति,

अधीसाशी निदेशक
एन.एम.डी.सी. बी.आई.ओ.एम.
किरंदुल कॉम्पलेक्स

विषयः– माईनिंग लीज – 14 एम.एल. क्षेत्र का डी.जी.पी.एस. सर्वे रिपोर्ट सत्यापन बाबत्।

संदर्भः– आपका पत्र क्रमांक / B.I.O.M/KDL/14 ML/ /2018 Date 24.05.2018

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उपरोक्त विषयान्तर्गत लेख है कि, बैलाडिला निक्षेप क्रमांक – 14 एम.एल. रकबा 322.368 हें. वन संरक्षण अधिनियम 1980 अन्तर्गत नवीनीकरण हेतु प्रकरण पर ऑनलाईन पंजीयन क्रमांक/FP/CG/MIN/31401/2018 आबंटित किया गया है।

आपके द्वारा प्रस्तुत डी.जी.पी.एस. सर्वे रिपोर्ट सत्यापन उपरांन्त आपके ओर भेजी जा रही है।

संलग्नः– उपरोक्तानुसार।

वनमण्डलाधिकारी
दन्तेवाड़ा वनमण्डल, दन्तेवाड़ा

D.G.P.S. SURVEY REPORT OF

DEPOSIT -14 MINING LEASE (322.368 Ha)

KIRANDUL

VILLAGE-KIRANDUL
TAHSIL-BACHELI, CHHATTISGARH (CG),
PIN: 494556

Divisional Forest Officer
Dantewada Division
DANTEWADA

19/1/18

Manager (Survey)
B I O P Dep No 14 & 110
Kira

1.0 INTRODUCTION TO DGPS

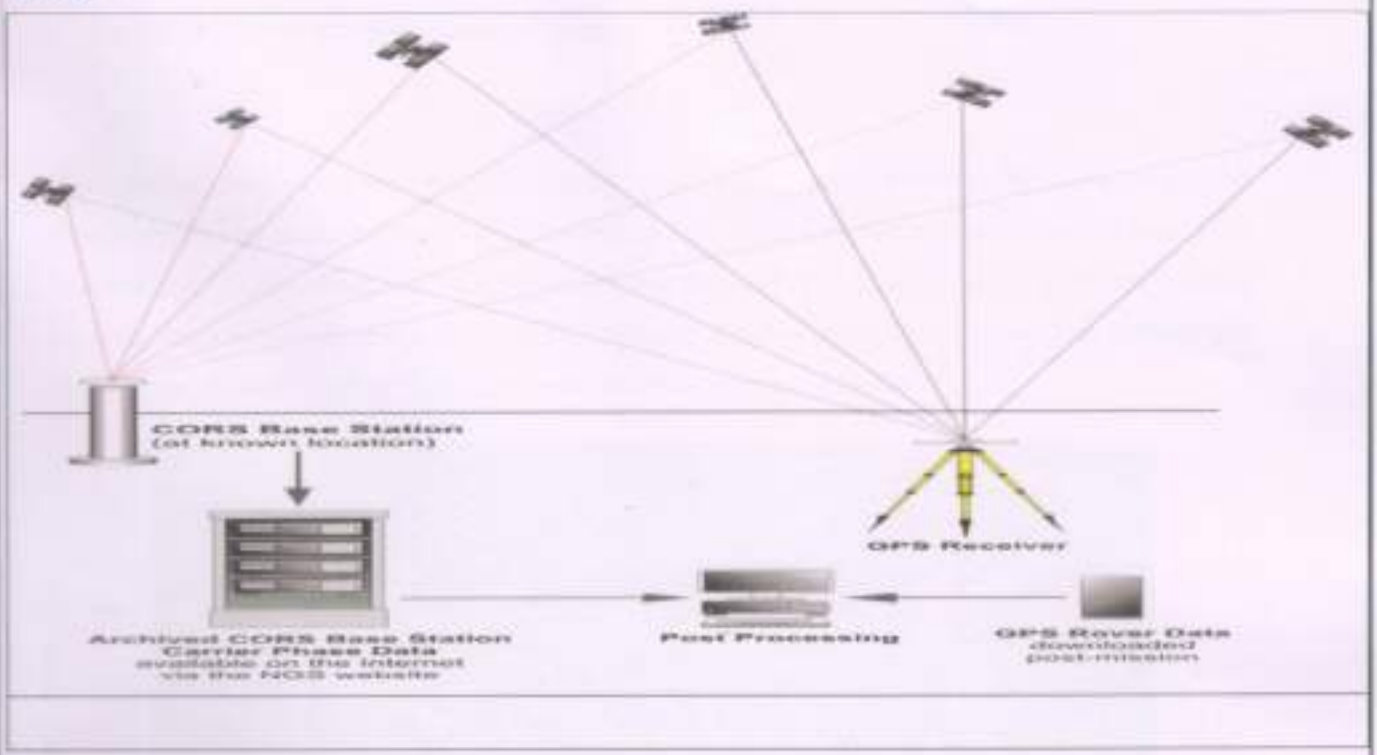
DGPS system consist a reference receiver located on a known position that has been previously surveyed, and one or more receivers, the antenna, differential correction processing system and data link equipment. Both the reference receiver and user receiver collect and store data for later processing.

DGPS system is based on the principal that receiver in the same vicinity will simultaneously experience common error on a particular satellite ranging signal .in the receiver , measurement are taken from the reference receiver to remove common errors. Based on this principals, the user receiver must use the same set of satellite as the reference station then the DGPS equation is formulated to remove the common error get cancel. The common errors are single path delay through atmosphere and satellite clock.

Advantages :

- Coordinates are available in real time in the field in global WGS-84 or local system
- Quality control - one knows in the field that the ambiguities are resolved and that the results are correct
- It is a truly one-person system
- Several rovers can use one reference station
- The approach has given rise to many applications

Static Survey
• Most widely used differential technique for control and geodetic surveying. • Involves long observation times (1-2 hour, depending on number of visible satellites) in order to resolve the integer ambiguities between the satellite and the receiver. • Accuracies in the sub-centimeter range can be obtained.



2.0 PROCEDURE

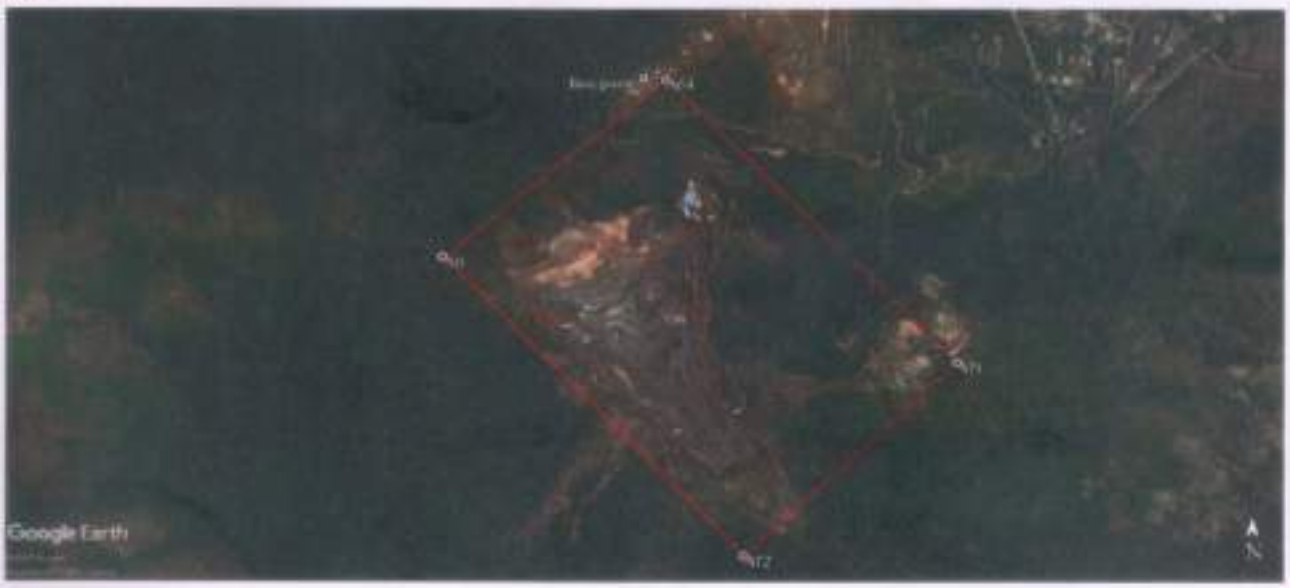
Establishment of Primary Control Points (Base Stations)

- The Base stations at Kirandul complex are established with cement pillars. The pillars are of permanent nature. The pillars are inserted with an Iron rod in their centres.

Location of Base stations/Control points

Base stations are erected at Deposit 5, Deposit 10&11A and Kirandul Mines office area. One of the Base stations had been observed for 12 hours and processed with respect to IGS station located at IISC Bangalore. Other Base stations/Control points were observed for 5-6 hours duration forming an acute angled triangle and processed with respected to the initial Base station. The stations are in the open sky and are free from any Tower and HT transmission line.

The distance between D5 Off to M1, D5 off to KDL Off and M1 to KDL Off is 2.75km, 6.87km and 6.81 km respectively. All the corner pillars have been observed for 2 hours duration.



Equipment's used

Two nos. Leica GS 10 and four nos. GS 15 GNSS receivers were used for Static survey. Accuracy of the equipment is 2mm after Post processing in horizontal and 4mm in vertical planes.

Leica GS10 Leica GS15

3. Processing of raw data

Leica Geo office 8.2 software is used for post processing of raw data. One of the Base stations has been processed with respect to IGS station, Bangalore and the others are processed with respect to this Control point.

IGS International GNSS service has around 380 GPS stations (337 active as of 01 Feb 2007) continuously running all over the world. The data of these IGS stations is processed on a daily basis to give precise orbits of the GPS satellites, precise coordinates and velocities of the IGS station and earth rotation parameters. CMMACS has contributed IGS station located at Bangalore for the GPS users worldwide. CMMACS (Centre for Mathematical Modelling and Computer Simulation) IGS station was established in year 1995 on an unfractured gneissic rock exposure in the Indian Institute of Science Campus in Bangalore.

This station also serves as a reference for GPS measurements made elsewhere in the country. Since this station forms a part of the global network of GPS stations worldwide, the co-ordinate of this station is known to millimeter accuracy.

IGS station at IISC Bangalore

Base station at Kirandul Hilltop Mine office area

4. Objective

As per directives of INDIAN BUREAU OF MINES (IBM) dated 06.04.2010 the boundary pillars of each mine lease / prospecting license are to be fixed precisely. Each boundary pillars shall be surveyed using DGPS (at least 2 Hours observation) for its ground position by an agency recognized by the State Government).

Superimposition of output files on Geo-referenced Vectorised Forest Compartment maps, SOI Topo sheets and Satellite Imageries (LISS IV) purchased from NRSC, Hyderabad.

NMDC as empaneled agency of Directorate of Geology and Mines, Chhattisgarh (Ref. Circular No. F-7- 14/2013/12, dated. 26.12.2013).

खनिज साधन विभाग

मंत्रालय, महानदी भवन, नया रायपुर

रायपुर, दिनांक 26 दिसम्बर 2013

क्रमांक एफ 7-14/2013/12.—राज्य शासन एतद्द्वारा चीफ कंट्रोलर ऑफ माइन्स भारतीय खान ब्यूरो, नागपुर के परिपत्र क्रमांक 2/2010, दिनांक 06-04-2010 के पैरा-2 के बिन्दु-2 के तारतम्य में Differential Global Positioning System (डिजीपीएस) का उपयोग करते हुए सर्वेक्षण करने के लिए तालिका के कालम 2 में दर्शित संस्थान को कालम 3 में दर्शित खनिज से संबंधित खनिज रियायतों के लिए अधिमान्यता प्रदान करता है :—

क्रमांक (1)	संस्थान का नाम एवं पता (2)	अधिमान्यता का विवरण (3)
1.	सेन्ट्रल माईन प्लानिंग एण्ड डिजाईनिंग इंस्टीट्यूट गोन्डवाना प्लेस, कांके रोड, रांची-834031 (झारखण्ड)	खनिज कोयला की खनिज रियायतों से संबंधित डीजीपीएस सर्वे कार्य.
2.	नेशनल मिनरल डेव्हलपमेंट कार्पोरेशन लिमिटेड, खनिज भवन 10-3-311/ए, मसाब टैंक, कैसल हिल्स, हैदराबाद (आंध्रप्रदेश)	खनिज कोयला को छोड़कर अन्य खनिजों की खनिज रियायतों से संबंधित डीजीपीएस सर्वे कार्य.
3.	मौलाना आजाद राष्ट्रीय प्रौद्योगिकी संस्थान, भोपाल-462051 (मध्यप्रदेश)	खनिज कोयला को छोड़कर अन्य खनिजों की खनिज रियायतों से संबंधित डीजीपीएस सर्वे कार्य.

2. अधिमान्यता प्राप्त संस्थान के लिए शर्तें—

2.1 खनिपट्टा/पूर्वेक्षण अनुज्ञप्ति क्षेत्रों के प्रत्येक सीमा स्तम्भों का डीजीपीएस सर्वे के माध्यम से कम से कम 2 घंटे के आब्जर्वेशन पर स्थल पर सीमा स्तम्भों की स्थिति निर्धारण हेतु को-आर्डिनेट्स ज्ञात करना.

2.2 उपरोक्त बिन्दु 2.1 में दर्शित कार्य के लिए खनिज रियायतधारी द्वारा अधिमान्यता प्राप्त संस्थान को भुगतान करना होगा. डीजीपीएस सर्वे कार्य हेतु पारिश्रमिक का निर्धारण अधिमान्यता प्राप्त संस्थान एवं खनिज रियायतधारी के मध्य आपसी समन्वय से किया जाएगा.

2.3 डीजीपीएस सर्वे के संबंध में इण्डियन ब्यूरो ऑफ माइन्स/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 आगामी आदेश पर्यंत प्रभावशील होगी.

5.0. INTRODUCTION TO SURVEY SITE:

The surveyed Mining lease area is located in Kirandul Village , Bailadila Forest Range which comes, Dantewada District, Chhattisgarh..

DGPS coordinates of the Mining Lease area, 14 ML

Sl.no	Point Code	Longitude	Latitude	Easting	Northing
1	Base Point D14-Off	81° 13' 50.71266" E	18° 37' 34.82244" N	524340.532	2059499.234
2	A11	81° 13' 15.94600" E	18° 37' 02.54535" N	523323.06	2058505.933
3	A64	81° 13' 54.63350" E	18° 37' 34.60060" N	524455.425	2059492.564
4	A71	81° 14' 44.67880" E	18° 36' 44.04923" N	525923.927	2057940.846
5	A72	81° 14' 07.67830" E	18° 36' 11.20223" N	524841.011	2056929.86

Divisional Forest Officer
Dantewada Division
DANTEWADA

19/1/18

Manager (Survey)
B.I.O.P. Dep-No. 14 & 11 C
KIRANDUL (C.G.)

6. DGPS SURVEY Photographs: -

Boundary Pillar photographs: CORNER POINT-A64

CORNER POINT-A11

CORNER POINT-A71

CORNER POINT-A72

DATA POST PROCESSING REPORT

- when it has to be right

Leica Geosystems

Results - Baseline
IISC - D14-off

Project Information

Project name:	DEP-14
Date created:	11/04/2014 10:42:44
Time zone:	5h 30'
Coordinate system name:	UTM44 (2)
Application software:	LEICA Geo Office 8.2
Processing kernel:	PSI-Pro 3.0
Processed:	11/04/2014 10:45:30

Point Information

	Reference: IISC	Rover: D14-off
Receiver type / S/N:	ASHTECH / 520013802	GS10 / 1532592
Antenna type / S/N:	ASH701945E_M NONE / CR62005480	AS10 Pole / -
Antenna height:	0.0780 m	0.4550 m
Initial coordinates:		
Latitude:	13° 01' 16.19707" N	18° 37' 34.82374" N
Longitude:	77° 34' 13.35337" E	81° 13' 50.71236" E
Ellip. Hgt:	843.7145 m	995.75294 m
Time span:	07/04/2014 06:17:25 - 07/04/2014 18:45:11	
Duration:	12h 27' 46"	

Processing Parameters

Parameters	Selected	Used	Comment
Cut-off angle:	15°	15°	

Ephemeris type (GPS):	Broadcast	Broadcast
Ephemeris type (GLONASS):	Broadcast	Broadcast
Solution type:	Automatic	Phase: all fix
GNSS type:	Automatic	GPS / GLONASS
Frequency:	Automatic	L1/E1 and L2
Fix ambiguities up to:	80 km	80 km
Min. duration for float solution (static):	5' 00"	5' 00"
Sampling rate:	Use all	30
Tropospheric model:	Hopfield	Hopfield
Ionospheric model:	Automatic	None
Use stochastic modelling:	Yes	Yes
Min. distance:	8 km	8 km
Ionospheric activity:	Automatic	Automatic

Satellite Selection

Manually disabled GPS satellites (PRNs):	None
Manually disabled GLONASS satellites (Slot Id):	None
Manually disabled Galileo satellites:	None

Final Coordinates

	Reference:IISC	Rover: D14-off
Coordinates:		
Latitude:	13° 01' 16.19707" N	18° 37' 34.82244" N
Longitude:	77° 34' 13.35337" E	81° 13' 50.71266" E
Ellip. Hgt:	843.7145 m	995.75294 m
Solution type:	Float	
GNSS type:	GPS	
Frequency:	IonoFree (L3)	
Ambiguity:	No	

Quality: Sd. Lat: 0.0006 m Sd. Lon: 0.0017 m Sd. Hgt: 0.0018 m
Posn. Qlty: 0.0018 m Sd. Slope: 0.0010 m

- when it has to be right

Results - Baseline
D14-OFF - A64

Project Information

Project name:	DEP-14
Date created:	11/04/2014 10:42:44
Time zone:	5h 30'
Coordinate system name:	UTM44 (2)
Application software:	LEICA Geo Office 8.2
Processing kernel:	PSI-Pro 3.0
Processed:	11/04/2014 10:58:44

Point Information

	Reference: D14-off	Rover: A64
Receiver type / S/N:	GS10 / 1532592	GS15 / 1509706
Antenna type / S/N:	AS10 Pole / -	GS15 Tripod / -
Antenna height:	0.4550 m	1.5000 m
Initial coordinates:		
Latitude:	18° 37' 34.82374" N	18° 37' 34.60003" N
Longitude:	81° 13' 50.71236" E	81° 13' 54.63273" E
Ellip. Hgt:	995.75294 m	992.0947 m

Time span:	10/04/2014 06:25:02 - 10/04/2014 08:30:23
Duration:	2h 05' 21"

Processing Parameters

Parameters	Selected	Used	Comment
Cut-off angle:	15°	15°	
Ephemeris type (GPS):	Broadcast	Broadcast	

Ephemeris type (GLONASS):	Broadcast	Broadcast
Solution type:	Automatic	Phase: all fix
GNSS type:	Automatic	GPS / GLONASS
Frequency:	Automatic	L1/E1 and L2
Fix ambiguities up to:	80 km	80 km
Min. duration for float solution (static):	5' 00"	5' 00"
Sampling rate:	Use all	1
Tropospheric model:	Hopfield	Hopfield
Ionospheric model:	Automatic	Computed
Use stochastic modelling:	Yes	Yes
Min. distance:	8 km	8 km
Ionospheric activity:	Automatic	Automatic

Satellite Selection

Manually disabled GPS satellites (PRNs):	one
Manually disabled GLONASS satellites (Slot Id):	one
Manually disabled Galileo satellites:	one

Final Coordinates

	Reference:D14-off	Rover:[illegible]
Coordinates:		
Latitude:	18° 37' 34.82244" N	18° 37' 34.[illegible]" N
Longitude:	81° 13' 50.71288" E	81° 13' 54.[illegible]" E
Ellip. Hgt:	995.75294 m	1057.5182 m

Solution type:	Phase: all fix
GNSS type:	GPS / GLONASS
Frequency:	L1/E1 and L2
Ambiguity:	Yes

Quality:	Sd. Lat: 0.0000 m	Sd. Lon: 0.0000 m	Sd. Hgt: [illegible] m
	Posn. Qlty: 0.0000 m	Sd. Slope: 0.0000 m	

when it has to be right

Results - Baseline
D14-Off - A11

Project Information

Project name:	DEP-14
Date created:	11/04/2014 10:42:44
Time zone:	5h 30'
Coordinate system name:	UTM44 (2)
Application software:	LEICA Geo Office 8.2
Processing kernel:	PSI-Pro 3.0
Processed:	11/04/2014 10:58:44

Point Information

	Reference: D14-off	Rover: A11
Receiver type / S/N:	GS10 / 1532592	GS15 / 1509693
Antenna type / S/N:	AS10 Pole / -	GS15 Tripod / -
Antenna height:	0.4550 m	1.5000 m
Initial coordinates:		
Latitude:	18° 37' 34.82374" N	18° 37' 02.54438" N
Longitude:	81° 13' 50.71236" E	81° 13' 15.94513" E
Ellip. Hgt:	995.75294 m	972.5012 m
Time span:	10/04/2014 09:17:07 - 10/04/2014 11:30:31	
Duration:	2h 13' 24"	

Processing Parameters

Parameters	Selected	Used	Comment
Cut-off angle:	15°	15°	
Ephemeris type (GPS):	Broadcast	Broadcast	

Ephemeris type (GLONASS):	Broadcast	Broadcast
Solution type:	Automatic	Phase: all fix
GNSS type:	Automatic	GPS / GLONASS
Frequency:	Automatic	L1/E1 and L2
Fix ambiguities up to:	80 km	80 km
Min. duration for float solution (static):	5' 00"	5' 00"
Sampling rate:	Use all	1
Tropospheric model:	Hopfield	Hopfield
Ionospheric model:	Automatic	Computed
Use stochastic modelling:	Yes	Yes
Min. distance:	8 km	8 km
Ionospheric activity:	Automatic	Automatic

Satellite Selection

Manually disabled GPS satellites (PRNs):	None
Manually disabled GLONASS satellites (Slot Id):	None
Manually disabled Galileo satellites:	None

Final Coordinates

	Reference:D14-off	Rover:A11
Coordinates:		
Latitude:	18° 37' 34.82244" N	18° 37' 02.54535" N
Longitude:	81° 13' 50.71266" E	81° 13' 15.94600" E
Ellip. Hgt:	995.75294 m	1041.5318 m
Solution type:	Phase: all fix	
GNSS type:	GPS / GLONASS	
Frequency:	L1/E1 and L2	
Ambiguity:	Yes	

Quality: Sd. Lat: 0.0000 m Sd. Lon: 0.0000 m Sd. Hgt: 0.0001 m
Posn. Qlty: 0.0000 m Sd. Slope: 0.0000 m

- when it has to be right

Leica Geosystems

Results - Baseline
D14-OFF - A71

Project Information

Project name:	DEP-14
Date created:	11/04/2014 10:42:44
Time zone:	Std 30'
Coordinate system name:	UTM44 (2)
Application software:	LEICA Geo Office 8.2
Processing kernel:	PSI-Pro 3.0
Processed:	11/04/2014 10:58:44

Point Information

	Reference: D14-off	Rover: A71
Receiver type / S/N:	GS10 / 1532582	GS15 / 1509706
Antenna type / S/N:	AS10 Pole / -	GS15 Tripod / -
Antenna height:	0.4550 m	1.3000 m
Initial coordinates:		
Latitude:	18° 37' 34.82374" N	18° 36' 44.04711" N
Longitude:	81° 13' 50.71236" E	81° 14' 44.67785" E
Ellip. Hgt:	995.75294 m	901.1067m
Time span:	10/04/2014 10:30:12 - 10/04/2014 12:40:05	
Duration:	2h 09' 53"	

Processing Parameters

Parameters	Selected	Used	Comment
Cut-off angle:	15°	15°	
Ephemeris type (GPS):	Broadcast	Broadcast	

Ephemeris type (GLONASS):	Broadcast	Broadcast
Solution type:	Automatic	Phase: all fix
GNSS type:	Automatic	GPS / GLONASS
Frequency:	Automatic	L1/E1 and L2
Fix ambiguities up to:	80 km	80 km
Min. duration for float solution (static):	5' 00"	5' 00"
Sampling rate:	Use all	1
Tropospheric model:	Hopfield	Hopfield
Ionospheric model:	Automatic	Computed
Use stochastic modelling:	Yes	Yes
Min. distance:	8 km	8 km
Ionospheric activity:	Automatic	Automatic

Satellite Selection

Manually disabled GPS satellites (PRNs):	None
Manually disabled GLONASS satellites (Slot Id):	None
Manually disabled Galileo satellites:	None

Final Coordinates

	Reference:D14-off	Rover:A71
Coordinates:		
Latitude:	18° 37' 34.82244" N	18° 36' 44.04923" N
Longitude:	81° 13' 50.71266" E	81° 14' 44.67880" E
Ellip. Hgt:	995.75294 m	970.5891 m
Solution type:	Phase: all fix	
GNSS type:	GPS / GLONASS	
Frequency:	L1/E1 and L2	
Ambiguity:	Yes	

Quality: Sd. Lat: 0.0000 m Sd. Lon: 0.0000 m Sd. Hgt: 0.0001 m
Posn. Qlty: 0.0000 m Sd. Slope: 0.0000 m

NMDC

· when it has to be right

Leica Geosystems

Results - Baseline
D14-off - A72

Project Information

Project name:	DEP-14
Date created:	11/04/2014 10:42:44
Time zone:	5h 30'
Coordinate system name:	UTM44 (2)
Application software:	LEICA Geo Office 8.2
Processing kernel:	PSI-Pro 3.0
Processed:	11/04/2014 10:58:44

Point Information

	Reference: D14-off	Rover: A72
Receiver type / S/N:	GS10 / 1532592	GS15 / 1509693
Antenna type / S/N:	AS10 Pole / -	GS15 Tripod / -
Antenna height:	0.4550 m	1.6000 m
Initial coordinates:		
Latitude:	18° 37' 34.82374" N	18° 36' 11.20201" N
Longitude:	81° 13' 50.71236" E	81° 14' 07.67739" E
Ellip. Hgt:	995.75294 m	832.1208 m
Time span:	10/04/2014 06:50:27 -	10/04/2014 09:00:25
Duration:	2h 09' 58"	

Processing Parameters

Parameters	Selected	Used	Comment
Cut-off angle:	15°	15°	
Ephemeris type (GPS):	Broadcast	Broadcast	

Ephemeris type (GLONASS):	Broadcast	Broadcast
Solution type:	Automatic	Phase: all fix
GNSS type:	Automatic	GPS / GLONASS
Frequency:	Automatic	L1/E1 and L2
Fix ambiguities up to:	80 km	80 km
Min. duration for float solution (static):	5' 00"	5' 00"
Sampling rate:	Use all	1
Tropospheric model:	Hopfield	Hopfield
Ionospheric model:	Automatic	Computed
Use stochastic modelling:	Yes	Yes
Min. distance:	8 km	8 km
Ionospheric activity:	Automatic	Automatic

Satellite Selection

Manually disabled GPS satellites (PRNs):	None
Manually disabled GLONASS satellites (Slot Id):	None
Manually disabled Galileo satellites:	None

Final Coordinates

	Reference:D14-off	Rover:A72
Coordinates:		
Latitude:	18° 37' 34.82244" N	18° 36' 11.20223" N
Longitude:	81° 13' 50.71266" E	81° 14' 07.67830" E
Ellip. Hgt:	995.75294 m	901.3080 m
Solution type:	Phase: all fix	
GNSS type:	GPS / GLONASS	
Frequency:	L1/E1 and L2	
Ambiguity:	Yes	

Quality: Sd. Lat: 0.0000 m Sd. Lon: 0.0000 m Sd. Hgt: 0.0001 m
Posn. Qlty: 0.0000 m Sd. Slope: 0.0000 m

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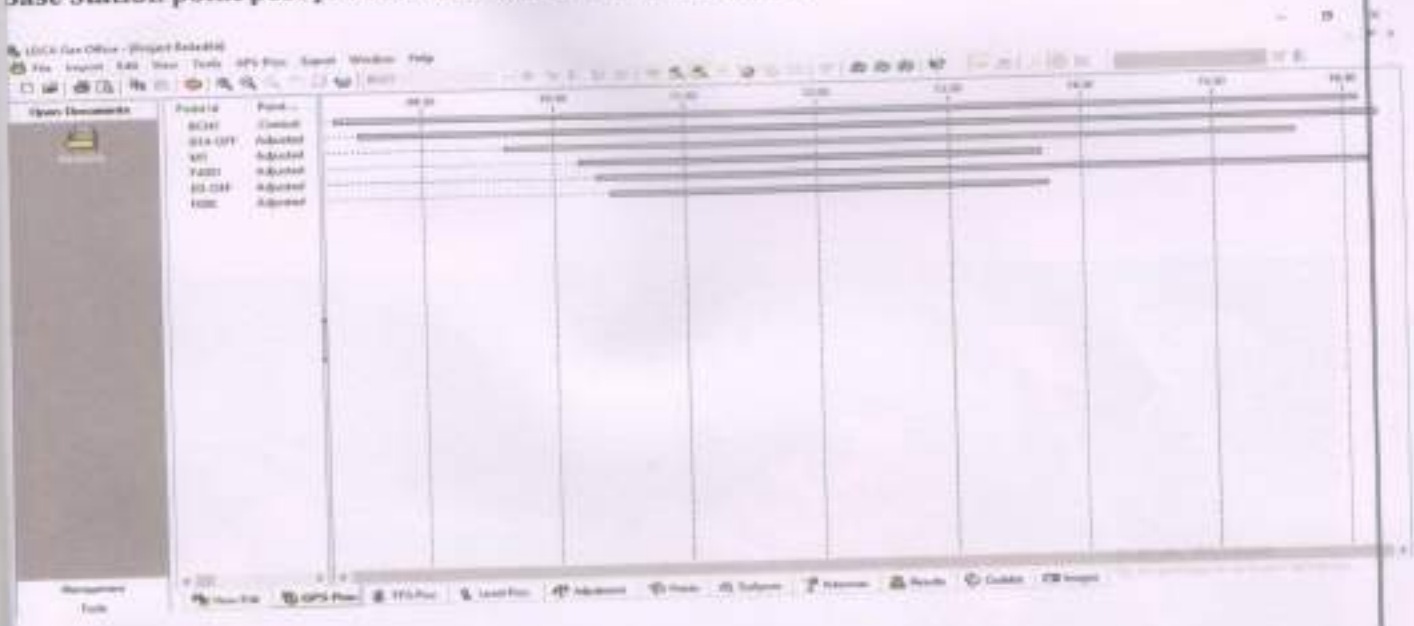
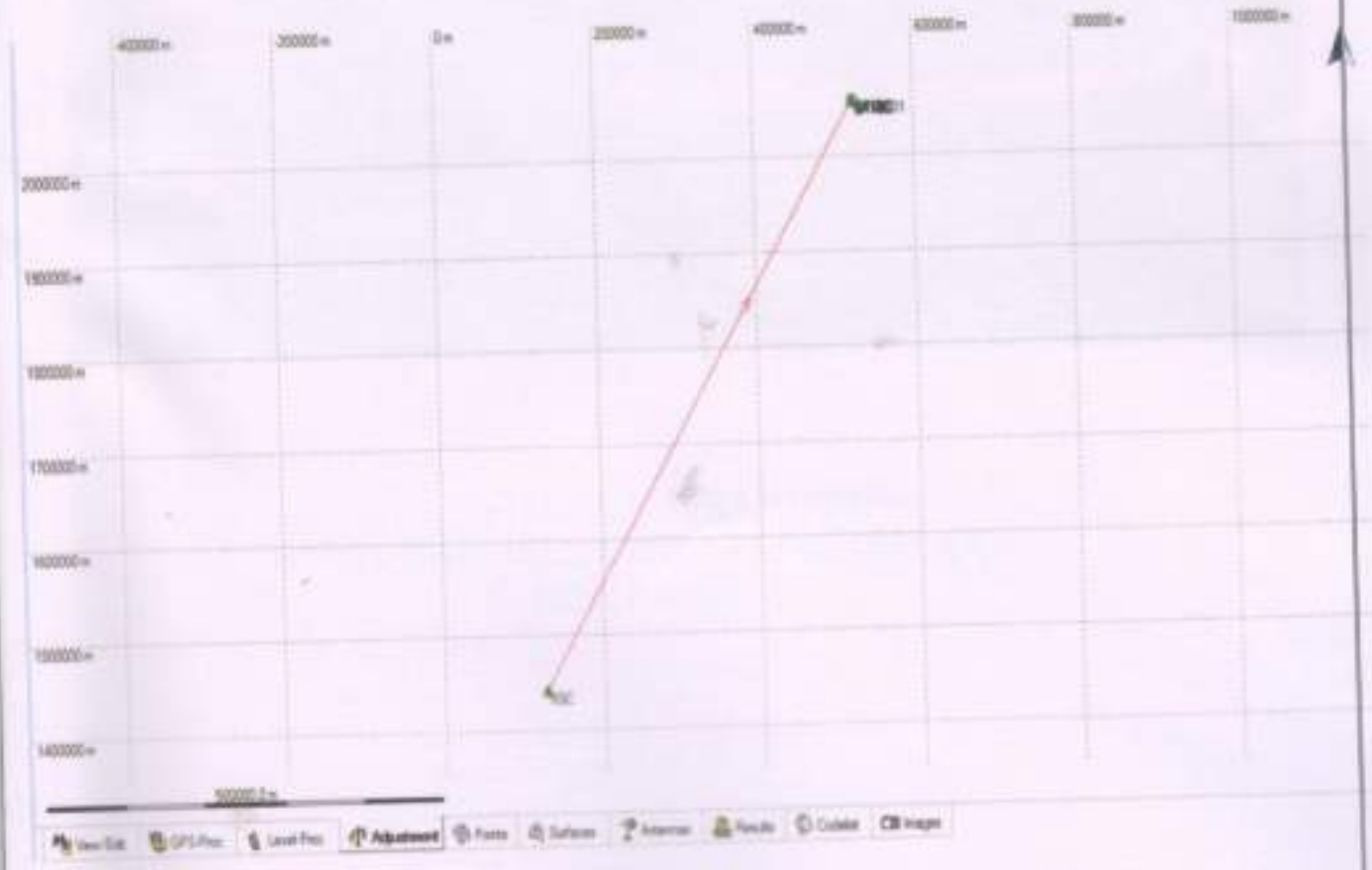
Base Station point post process with IISC station (Bangalore)





Divisional Forest Officer
Bastar Division
DANTEWADA

Manager (Survey)
B.I.O.P. Dep. No. 14 & 110
KIRANDUL (CG.)

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