CORRIGENDUM -1
FOR
SUPPLY OF GNSS RECEIVER & ROVERS UNDER
NATIONAL HYDROLOGY PROJECT
TENDER NO. : NHP/SOI/GRB/GNSS DATED 02/07/2018

Sl. No	Clauses	Amendment
1	**GCC Clause 6.1 Delivery and Section 3 – Schedule of Requirements sub section 1 List of goods & related services and delivery period**; Column 6 Desired Delivery Period	**Desired Delivery Period for completion of supply from the date of the Contract may be read as "45 days"**
2	**Section 3 – Schedule of Requirements sub section 2 Technical Specification** **1. GNSS-Base Receiver with separate Antenna** Sl 4 **GNSS tracking**	Sl 4 **GNSS tracking**
3	The offered receiver shall have 400+ physical channels	The offered receiver shall have 400+ physical channels
	Multiple frequency and supporting the following simultaneous signal tracking: - GPS: L1 C/A; L2E/L2P; L2C; L5 - GLONASS: L1 C/A; L1P; L2 C/A; L2P; L3 - GALILEO: L1 CBOC; E5A; E5B; E5 - BEIDOU: B1; B2; B3 - QZSS: L1 C/A; L1C; L1; L2C; L5 - Update for NavIC (IRNSS) signals tracking shall be provided as and when available - SBAS Enabled - Independent carrier phase tracking with full wavelength and Code. - Integrated Bluetooth	Multiple frequency and supporting the following simultaneous signal tracking: - GPS: L1 C/A; L2E/L2P; L2C; L5 - GLONASS: L1 C/A; L1P; L2 C/A; L2P; L3 - GALILEO: L1 CBOC; E5A; E5B; E5 - BEIDOU: B1; B2; B3 - Update for NavIC (IRNSS) signals tracking shall be provided as and when available - SBAS Enabled - Independent carrier phase tracking with full wavelength and Code. - Integrated Bluetooth
	Receiver should have: - Integrated RJ45 connector, two serial ports, USB Port - Ethernet port etc - Should support NTRIP, CLIENT, SERVER & CASTER - Should support FTP Push and E-mail alerts - Data output in all latest open exchange formats like RINEX,	Receiver should have: - Integrated RJ45 connector, two serial ports, USB Port - Ethernet port etc - Should support NTRIP, CLIENT, SERVER & CASTER - Should support FTP Push and E-mail alerts Data output in all latest open exchange formats like RINEX, Compact RINEX etc

Compact RINEX etc	
Receiver should have communication system: a) Primary: ADSL b) Secondary: Wireless cellular i.e. GSM/CDMA (2G/3G/4G) GSM/GPRS/TCIP network.	Receiver should have communication system: a) Primary: ADSL/Broadband b) Secondary: Wireless cellular i.e. GSM/CDMA (2G/3G/4G) GSM/GPRS/TCIP network.
Receiver should have initialization time < 10 sec with the initialization reliability > 99.9%	Receiver should have initialization time < 10 sec with the initialization reliability > 99.9%
Receiver should support scalable accuracy without changing the hardware	Deleted
Real time corrections can be transmitted from a single reference station in a set of reference stations.	Real time corrections can be transmitted from a single reference station in a set of reference stations.
Receiver must be capable of tracking all satellites in view, even if unhealthy, to an elevation angle of 0°.	Receiver must be capable of tracking all satellites in view, even if unhealthy, to an elevation angle of 0°.
The receiver shall support real time kinematic positioning using industry standard formats.	The receiver shall support real time kinematic positioning using industry standard formats.
The receiver shall support onboard worldwide, real-time, absolute precise point positioning (PPP), via Internet Protocol (IP).	The receiver shall support onboard worldwide, real-time, absolute precise point positioning (PPP), via Internet Protocol (IP).
The offered receiver shall have a minimum of two power inputs.	The offered receiver shall have a minimum of two power inputs.
The offered receiver shall contain an internal battery and integrated internal battery charger and capable of operating for up to 12 hours.	The offered receiver shall contain an internal battery and integrated internal battery charger and capable of operating for up to 12 hours.
Receiver should have provision for connecting external power through a 12 Volt battery. Automatic swapping between internal and external power sources should be without affecting data recording.	Receiver should have provision for connecting external power through a 12 Volt battery. Automatic swapping between internal and external power sources should be without affecting data recording.
If a cable is required to connect the external battery to the receiver, a spare power cable is to be provided.	If a cable is required to connect the external battery to the receiver, a spare power cable is to be provided.
The receiver must have a front touch screen panel display to allow the basic receiver configuration on site without the need of any other device (i.e.: IP configuration, data logging, coordinates set-up).	The receiver must have a front panel display with key pad and touch screen (optional) to allow the basic receiver configuration on site without the need of any other device (i.e.: IP configuration, data logging, coordinates set-up).
Support of logging rates from 50Hz to 600 seconds.	Support of logging rates from 50Hz to 600 seconds.

	The receiver must have memory with minimum of 1GB of space or more.	The receiver must have memory with minimum of 1GB of space or more.
	In addition to the internal embedded memory, the receiver must have a source of removable media of 32 GB memory or more.	In addition to the internal memory, the receiver must have a source of removable media of 32 GB memory or more.
4	**Section 3 – Schedule of Requirements sub section 2 Technical Specification** **1. GNSS-Base Receiver with separate Antenna** **Sl_no 5 GNSS Antenna**	
	The antenna must meet the following environmental specification: Operating temperature: -40° C to +65° C, Humidity: 100%, Shock: 1m drop to hard surface.	The antenna must meet the following environmental specification: Operating temperature: -40° C to +65° C, Humidity: 100%, Shock: 1m drop to hard surface.
	GNSS Antenna should be of Geodetic application specification comprises Chock Ring configuration with tracking capabilities for GPS, Glonass, Galileo, Beidou, IRNSS SBAS.	GNSS Antenna should be Chock Ring Antenna with tracking capabilities for GPS, Glonass, Galileo, Beidou, IRNSS, SBAS, L-Band"
	Technology that minimizes multi-path interference.	Technology that minimizes multi-path interference.
	Phase center stability better than 2 mm and repeatability less than 1 mm	Phase center stability better than 2 mm and repeatability less than 1 mm
	Antenna gain 50dB +2Db	Antenna gain 29dB or more
	Minimum tracking elevation = 0 degrees	Minimum tracking elevation = 0 degrees
	Temperature range is –40°C to +65°C	Temperature range is –40°C to +65°C
	Humidity up to 100, fully sealed	Humidity up to 100, fully sealed
	Shock rating 1m drop	Shock rating 1m drop
	Heavy duty light weight wooden tripod (or other suitable non-metallic) with appropriate centering device	Heavy duty light weight wooden tripod (or other suitable non-metallic) with appropriate centering device
	Tribrach with optical plummet and appropriate adaptor/carrier, with level/ centering bubble, to attach antenna to tribrach	Tribrach with optical plummet and appropriate adaptor/carrier, with level/ centering bubble, to attach antenna to tribrach and any other standard OEM accessories
	Two (2) antenna cables to be provided with each receiver, one each of the following lengths: 10-15 m (approximate) 3 - 5 m (approximate)	Two (2) antenna cables to be provided with each receiver, one each of the following lengths: 10-15 m (approximate) 3 - 5 m (approximate)
	Vendor should provide data conversion tools from native format to RINEX and vice-versa.	Vendor should provide data conversion tools from native format to RINEX and vice-versa.

5	**Section 3 – Schedule of Requirements sub section 2 Technical Specification** **2. GNSS-Rover Receiver/smart Device with integrated/ detachable Antenna Sl 4 GNSS receiver**	
	The offered receiver shall have 70 or Calibration Certificate to be submitted more physical channels	The offered receiver shall have 240 or more physical channels. Calibration Certificate to be submitted.
	Multiple frequency and supporting the following simultaneous signal tracking: - GPS: L1 C/A; L2E/L2P; L2C; L5 - GLONASS: L1 C/A; L1P; L2 C/A; L2P; L3 - GALILEO: L1 CBOC; E5A; E5B; E5 - BEIDOU: B1; B2; B3 - IRNSS: L5 - QZSS: L1 C/A; L1C; L1; L2C; L5	Multiple frequency and supporting the following simultaneous signal tracking: - GPS: L1 C/A; L2E/L2P; L2C; L5 - GLONASS: L1 C/A; L1P; L2 C/A; L2P; L3 - GALILEO: L1 CBOC; E5A; E5B; E5 - BEIDOU: B1; B2; B3 - IRNSS: L5
	Device must be capable of receiving/transmitting the messages from base receiver through GSM/GPRS/TCIP network.	Receiver/smart Device must be capable of receiving/transmitting the messages from base receiver through GSM/GPRS/TCIP network.
	Device Should support scalable accuracy without changing the hardware	Receiver/smart Device Should support scalable accuracy without changing the hardware
	Device must be capable of tracking all satellites in view, even if unhealthy, to an elevation angle of 0°.	Receiver/smart Device must be capable of tracking all satellites in view, even if unhealthy, to an elevation angle of 0°.
	Device shall support real time kinematic positioning using industry standard formats.	Receiver/smart Device shall support real time kinematic positioning using industry standard formats.
	Device shall have a minimum of one power inputs.	Receiver/smart Device shall have a minimum of one power inputs.
	Device shall contain an internal battery and integrated internal battery charger and capable of operating for up to 8 hours.	Receiver/smart Device should contain an internal battery, capable of operating for up to 8 hours with internal/external battery charger. Provision for connection to external battery should also be provided
	Device must have 8" or better size screen/display with Window OS to allow the basic receiver configuration on site without the need of any other device (i.e.: IP configuration, data logging, coordinates set-up)	Receiver/smart Device must have 7" or better size screen/display with Window OS to allow the basic receiver configuration on site without the need of any other device
	Device must support of logging rates from 50Hz to 600 seconds.	Receiver/smart Device must support of logging rates from 20Hz to 600 seconds

	Device must contain embedded memory with minimum of 1GB of space or more.	Receiver/smart Device must contain internal memory with minimum of 1GB of space or more.
	In addition to the internal embedded memory, the receiver must have a source of removable media of sufficient memory.	In addition to the internal memory, the Receiver/smart Device must have a source of removable media of at least 8 GB memory.
	Device must have integrated at least one serial and one USB port.	Receiver/smart Device must have integrated at least one serial and one USB port.
	Device must support Bluetooth connections.	Receiver/smart must support Bluetooth connections.
	Device must meet the following environmental specification: Operating temperature: -40° C - + 65° C, Humidity: 100%, Shock: 1m drop to hard surface.	Receiver/smart Device must meet the following environmental specification: Operating temperature: -40° C - + 65° C, Humidity: 100%, Shock: 1m drop to hard surface.
	The antenna must support tracking of GPS, Glonass, Galileo, Beidou, IRNSS, SBAS signals.	The antenna must support tracking of GPS, Glonass, Galileo, Beidou, IRNSS, SBAS signals.
	Technology that minimizes multi-path interference.	Technology that minimizes multi-path interference.
	Antenna gain 50dB ±2Db	Antenna gain 29 dB or more
	Minimum tracking elevation = 0 degrees	Minimum tracking elevation = 0 degrees
	The device must be supplied with mounting kit having optical/laser plummet	The Receiver/smart Device must be supplied with mounting kit having optical/laser plummet
	The device must have a robust adjustable (telescopic) range pole (minimum of 3.0m long) with quick release operation and robust bipod, heavy duty bag with reinforced solid base and reinforced opening is to be provided along with the range pole.	The Receiver/smart Device must have a robust adjustable (telescopic) range pole (minimum of 3.0m long) with quick release operation and robust bipod, heavy duty bag with reinforced solid base and reinforced opening is to be provided along with the range pole. Along with Receiver/smart Device, standard OEM accessories to be provided
	The device must be provided with a heavy duty protective case or container for the main unit and the ancillary items.	The Receiver/smart Device must be provided with a heavy duty protective case or container for the main unit and the ancillary items.
6	**Section 3 – Schedule of Requirements sub section 2 Technical Specification** **3. Software** **Sl 1 Software**	
	The software at the server of control centre should have following capabilities: 1. Should be capable of Raw Data import and quality check. 2. Should have antenna phase centre	The software at the server end should have following capabilities: 1. It must run automatically and continuously as a windows service. 2. The software should be capable of handling and configuring GNSS reference stations for GPS, GLONASS, GALILEO, Beidou and IRNSS.

correction capabilities inclusive for both Relative absolute models.

3. Should be capable of Modelling & Estimation of systematic errors.

4. Should be capable to generate data to create a virtual position for the rover receiver.

5. Should be capable to generate RCTM data stream for the virtual position.

6. Should be capable to transmit RCTM data to the Rover in the field.

7. Should be capable to generate broadcast network correction stream.

8. Software should be capable to post process the data.

9. Should be capable to process data in Network Mode or in PPP mode in real time or post processing.

10. It should have capability of RTK ambiguity resolution, estimating DGPS corrections and generating corrections for network RTK.

11. Should be able to processes zero-differenced observations and the satellite and receiver clock correction are estimated at every epoch independently.

12. Should be designed for processing GNSS network with the highest possible accuracy with the full variance-covariance and not only their baseline-related parts.

13. Should have scalable platform to run one system over multiple servers.

14. Advanced Web Application including accounting and billing modules to help automate operation tasks.

15. Should be capable od real-time network processing to provide comprehensive GNSS support including GPS, GLONASS,

3. Software should be able to handle receivers of different make and models of GNSS receivers.

4. The software should generate Real Time data stream from the connected stations to be distributed using a Radio or an IP communication. The support for all common Real time Formats should be there.

5. The GNSS Software shall generate different type of corrections to allow different kind of services:
   a. Single RTK corrections from specific stations
   b. Single RTK corrections from nearest station. (Requires user's position via NMEA string).

6. With the "multi-station" approach, the user should be automatically routed to the "best fit" reference station in the network/cluster that is closest to the field user's location without re-initialization of rover.

7. All Real-time corrections should be provided in the International Recognized Standard called RTCM. RTCM messages in version 2.x and 3.x or higher are allowed.

8. Should include key quality and quantity information, which should include data completeness, satellite tracking, cycle slip, multipath and receiver clock.

9. The GNSS Software shall provide access to the following communication channels: Internet, intranet, local or wide area networks (TCP/IP) or with Mobile Cellular GPRS or Wireless technology using RTCM standard NTRIP Protocol.

		Galileo, Beidou and QZSS.	
		16. It should provide Network-RTK solution with support for RTCM Multi-Signal Massage (MSM)	
		17. Full and comprehensive software package allowing for scalable use from local single-station operation to a full network modelled country-wide solution.	
		18. Scalable in functionality and geographic coverage area.	
		19. Automatic raw and RINEX data push to FTP.	
		20. Monitoring of satellite and site parameters.	
		21. Automated alert massage sending if the any of the base receiver of network starts malfunctioning or the data quality degrades because of any reason.	
		22. The Network Server Software should be capable to perform continuous computations of the following parameters by analysing code and carries phase observations: 20.1 Multipath Errors 20.2 Ionospheric Errors 20.3 Troposphric Errors 20.4 Ephemoris Errors 20.5 Carries phase ambiguities.	
		23. Should have the capability to graphically view the station health status on the web server.	
		24. Should have the capability to log all download transactions, so that it can be used for final billing to clients.	
		25. Should have capability to manage all the accounting services.	