

Invitation of Rates for Preparation of Estimates

Name of Work : Improvement of Water Resources Monitoring System for river basins in Maharashtra (India)

Number : HPD /PB-1/ 03 /Year 2015 dated- 2 /01/2015

1. On behalf of Chief Engineer, Planning and Hydrology, Nashik-422004 (India), Water Resources Department, Government of Maharashtra; The Executive Engineer, Hydrology Project Division, Pune invites **rates for estimation purpose** of various equipment / instruments required for Hydro-meteorological data collection & WQ sample testing. Approximately 537 stations & six WQ lab level II equipment set up are being planned. The rates including operation and maintenance of these equipment / instruments for 7 (seven) years needs to be quoted for estimate preparation.

2. Interested suppliers may obtain information about **indicative specifications** of equipment from www.hydrology-project.gov.in on Specifications.html tab

Detailed list of equipment/instruments are quoted on the website www.maharashtra.gov.in at Other Links-Tenders or www.wrd.maharashtra.gov.in at Tender Notice or www.mahahp.org at Public Section - Tender Notice. The suppliers may quote for all items or for any no. of items specified. Quotations must be delivered to the address below on or before 27/01/2015 at 1400 hrs (IST) and same will be opened on the same date @ 1500 hrs (IST).

3. The address referred to above is:

The Executive Engineer
Hydrology Project Division,
“G” Barrack Central Building Pune,
Pune (India)
Pin Code: 411011
Tel: +91-20-26126918
e-mail: eehpd_pune@wrd.maharashtra.gov.in
eehpd.pune@gmail.com

List of Goods:

Line Item No.	Description of Goods	Quantity	Physical unit	Rate in INR	7(seven)Year Operational and Maintenance Cost in INR
A	Meteorological Instruments				
1	Non Recording Rain Raug	1	one set		
2	Self Recording Rain Raug	1	one set		
3	Rain Measuring Cylinders	1	one set		
B	Full Climate Station Instruments which includes following equipments/instruments				
	1. Non Recording Rain Raug	1	one set		
	2. Self Recording Rain Raug	1	one set		
	3. Evaporimeter (also known as evaporation pan)	1	one set		
	4. Sunshine recorder	1	one set		
	5. Stevenson Screen (Double) inclusive of all instruments i.e. Thermometers etc.	1	one set		
	6. Thermograph	1	one set		
	7. Hygrograph	1	one set		
	8. Anemometer	1	one set		
	9. Wind vane	1	one set		
C	Autographic Water Level Recorder	1	one set		
D	Staff Gauge with gauge plate	1	one set		
E	WQ Lab level –II Instruments				
1	Conductivity Meter (Digital)	1	one set		
2	pH Meter (Digital)	1	one set		
3	Nephlo-Turbidity Meter	1	one set		
4	Electronic Monopan Balance	1	one set		
5	Electronic Balance	1	one set		
6	Bacteriological Incubator	1	one set		
7	Constant Voltage Stabilizer (2 KV)	1	one set		
8	Sterilize Autoclave	1	one set		
9	UV-VIS Spectrophotometer	1	one set		
10	Flame Photometer	1	one set		
11	Water bath Bacteriological	1	one set		
12	Water Bath General Purpose	1	one set		
13	Muffle Furnace	1	one set		
14	Hot Air Oven General Purpose (Sediment)	1	one set		
15	Oven General Purpose (Chemical Section)	1	one set		
16	Hot Plates	1	one set		
17	Refrigerator	1	one set		

Line Item No.	Description of Goods	Quantity	Physical unit	Rate in INR	7(seven)Year Operational and Maintenance Cost in INR
18	Deep Freezer (- 20 deg cel.)	1	one set		
19	Ice Box	1	one set		
20	Thermometer Set	1	one set		
21	Magnetic Stirrer	1	one set		
22	Centrifuge	1	one set		
23	Vacuum Pump	1	one set		
24	Shaker Oscillatory	1	one set		
25	Tissue Grinder	1	one set		
26	C.O.D. Digester (Open Reflux)	1	one set		
27	Digestion & distillation Unit (Kjeldahl)	1	one set		
28	Distillation Apparatus (Fluoride)	1	one set		
29	Filtration Assembly for Membrane filter	1	one set		
30	Fume Cap board	1	one set		
31	Soxhlet Extraction Unit	1	one set		
32	Water Purifier distillation Unit	1	one set		
33	Water Purifier double distillation Unit	1	one set		
34	Dissolved Oxygen sampler	1	one set		
35	Microscope	1	one set		
36	Air Conditioner (60 sq.m area)	1	one set		
F	Hand GPS	1	one set		

Note: If Technical Specifications do not cover any equipment specified above in list of goods, appropriate specifications may be assumed which shall satisfy functional requirement of the equipment under consideration. For Specifications web site:- www.hydrology-project.gov.in. on tab [Specifications.html](#)

General description

Background:

The geographical location of Maharashtra is bounded between latitude 16.4° to 22.1° N and longitude 72.6° to 80.9° E. The geographical area of Maharashtra state is 307.71 Thousands Km² which is @ 9.4% of the total geographical area of India. Major river basins in the state are the Krishna river with its major tributary as Bhima, Godavari, Tapi, West flowing rivers of Konkan strip and small portion of Narmada river on north. The Krishna, Godavari, Tapi and Narmada basins do not wholly lie in Maharashtra but territory of Maharashtra is formed of the regions of their sub-basins. Maharashtra State Water Policy (July, 2003) envisages that the water resources of the state shall be planned, developed and managed via a multi-sector approach at the river basin and sub basin scale. The policy states that the distress in water availability during deficit period shall be shared equitably amongst the different sectors of water use and also amongst upstream and downstream users. The rainfall in each basin varies with respect to space and time to great extent.

West flowing rivers south of Tapi (Rivers of Konkan strip):

Number of rivers originates from Sahyadri and flow westward to Arabian sea through Konkan Strip. Damanganga, Surya, Vaitarana, Ulhas, Karla, Kundalika, Kal, Savitri, Vashishthi, Shastri, Gad, Karli, Tillari and Terekhol are prominent rivers. These rivers are of shorter length holding fair amount of water during monsoon but run totally dry during summer months. The incidences of natural calamities such as land erosion, salt water intrusion, land subsidence etc. are often in Konkan. The total length of rivers in Konkan is @ 1609 Km. The annual rainfall in Konkan is between 2000 to 3500 mm. The rainfall is very intense during June to September. Surya, Vaitarna, Modak sagar, Tansa, Bhatsa, Tillari are Major dams in Konkan area. Panvel, Nagothane, Pen, Chiplun, Mahad are flood prone towns. The Mahad experienced heavy floods in 1923, 1976, 1989 and 1994. Mithi river flooded in July 2005. Mumbai city, Thane, Raigad and Ratnagiri districts were affected by flooding in 2005. On July 26, 2005, 944 mm rainfall was recorded in 24 hours at Santacruz in Mumbai.

Tapi and Narmada Rivers:

Tapi and Narmada are the two west flowing rivers coming from Madhya Pradesh state and flowing down to Gujrat state through Maharashtra. Narmada River forms 54 km long common boundary along northern border. Purna, Bori, Aner, Panjra are the tributaries of Tapi and Pedhi, Katepurna, Mum and Nalganga are the tributaries of Purna. Tapi River in Maharashtra is 208 Km. The Katepurna, Wan, Chandrabhaga, Purna, Chankapur, Girna, Hatnoor are major dams in Tapi basin. Akola, Jalgaon are flood prone cities in Tapi basin. Annual average rainfall varies from 700 - 1000 mm in most part of the basin. Devganga, Devnad, Udai are tributaries of Narmada in state. Jalgaon and Dhule are drought prone area.

Godavari River:

Godavari the longest river in Maharashtra (968 Km) originates at Tryambakeshwar in Nashik District and enters Andhra Pradesh near Dharmabad in Nanded District. It again flows for about 48 Km along southern boundary of Gadchiroli district and enters Andhra Pradesh. On south Darna, Pravara, Sindhphana, joins Godavari. Purna joins from north. The Nanded is the flood prone city in Godavari. Also Nashik, Kopargaon, Newasa, Sangamner, Paithan are flood prone cities/towns. Gangapur, Mula, Bhandardara, Jayakwadi, Yeldari, Siddheshwar, Lower Dudhna, Lower Terna, Manjra are major dams in Godavari. Manjra river originates in Beed District and flows through Latur and enters into Karnataka and Andhra Pradesh. It joins Godavari in Nanded District. This river portion of Godavari covers mostly Marathwada region. The districts namely Aurangabad, Jalna, Beed, Latur, Osmanabad, Nanded, Nashik, Parbhani etc. normally suffers drought.

In Vidarbha region, confluence of Pranhita (Wardha and Wainganga are major tributaries) with Godavari is near Sironcha. Length of Wainganga in Maharashtra is 476 Km. The Chulband, Human, Dina, Khobragadi join Wainganga from eastern side however Kanhan and Wardha joins it from western side. In Vidarbha region, Wainganga (Bhandara district and Bramhapuri taluka (Chandrapur)), confluence of Wardha and Penganga (Chandrapur proper) are flood prone. Khadakpurna Upper Peinganga, Upper Wardha, Pench, Bawanthadi, Itidoh, Gosikhurd are major dams in Vidarbha region. The districts namely Buldhana, Akola etc. normally suffers drought in Vidarbha.

Krishna and Bhima River basin:

North-south flowing Krishna and South-east flowing Bhima are major rivers of south Maharashtra. Krishna rises near Mahabaleshwar. The Krishna is 282 km long in the state. On west it is joined by Koyana, Venna, Panchaganga while Yerala joins it from east. Bhima river rises near Bhimashankar in Pune district and flows through Pune and

Solapur district. Ghod, Man, Pawana, Neera and Sina are the main tributaries that join Bhima. The length of Bhima in Maharashtra is 451 Km. It joins Krishna on the Karnataka-Andhra Pradesh boundary near Raichur. Krishna, Panchganga, Warna, Mula Mutha, Bhima are flood prone rivers. The Sangli, Kolhapur, Patan, Karad, Kurundwad in Krishna and Pune, Shirur, Daund, Pandharpur are flood prone cities/towns in Bhima river basin. Dhoni, Dhoni Balkawadi, Kanher, Urmodi, Tarli, Koyna, Warna, Dudhganga in Krishna and Panshet, Warasgaon, Temghar, Mulshi, Pawana, Chaskaman, Dimbhe, Manikdoh, Pimpalgaon Joge, Ghod, Ujjani, Nira Deoghar, Bhatghar, Veer,

Gunjawani are major dams in Bhima basin. The Krishna and Bhima basin experienced heavy floods in 2005 and 2006 year which caused heavy loss to lives and property.

The Water Resources Department (WRD) of Government of Maharashtra (GoM) is entrusted with the surface water resources planning, development and management. A large number of major, medium and minor water resources development projects (reservoirs and weirs) have been constructed in Maharashtra. In Maharashtra around 1650 large multipurpose dams exists in above mentioned five river basins. More than 100 dams are gated. Though, the reservoirs in Maharashtra are not specifically provided with flood cushion, they have moderated flood peaks to considerable extent by proper reservoir operations. The reservoirs are multipurpose including hydropower, irrigation, domestic and industrial uses and are operated with rigid schedules as single entities based on the historical hydro-meteorological data and experience gained. These methods are often not adequate for establishing optimal operational decisions, especially where integrated operation of multiple reservoirs for flood management is contemplated. In addition, manual data observation and transmission results in a considerable time lag, between data observed in field and its communication to decision making level which sometime leaves little time, for flood forecasts.

The Ministry of Water Resources (MoWR), Government of India (GoI) has implemented Hydrology Project Phase II (HP-II), which was a follow-on to the Hydrology Project-I (HP-I). During HP-I, the Hydrological Information System (HIS) was developed for the entire state of Maharashtra and the data is monitored manually 1-2 times a day. The proposed work of Procurement of Hydrometeorological equipment for HIS network of Non Telemetry sites are spread in the above mentioned river basins of the state of Maharashtra which comprises the entire state. For details regarding Hydrology Project visit: www.mahahp.org