



DHV CONSULTANTS &  
DELFT HYDRAULICS with  
HALCROW, TAHAL, CES,  
ORG & JPS

**VOLUME 1**  
***HYDROLOGICAL INFORMATION SYSTEM***

***FIELD MANUAL – PART I***

***JOB DESCRIPTION***

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## JOB DESCRIPTION

In this Chapter an overview is given of job descriptions of HIS staff functions. The coding used for the functions is listed in Table 1.

S.No.	Category/HIS Function	Code
	<b>General</b>	
<b>1.</b>	<b>General</b>	
1.1	Data Centre manager/ Head of the Hydrological Info System	S12
<b>2.</b>	<b>Data Storage Centre</b>	
2.1	Database administrator	I2
2.2	Information techn. and database expert	I1
2.3	Secretary	-
	<b>Ground water</b>	
<b>9.</b>	<b>State Data Processing Centre</b>	
9.1	State DPC manager	G12
9.2	Hydrogeologist	G11
9.3	Trainer	G10
9.4	Water quality expert	Q7
9.5	GIS expert	G9
9.6	Information techn. and database expert	I1
9.7	DPC assistant	G8
9.8	Secretary	-
<b>10.</b>	<b>Regional Data Processing Centre</b>	
10.1	Regional DPC manager	G7
10.2	Hydrogeologist	G6
10.3	Assistant hydrogeologist	G5
10.4	Geohydrological equipment manager	G4
<b>11.</b>	<b>District Data Processing Centre</b>	
11.1	District DPC manager	G3
11.2	GW Data Processor	G2
11.3	Field data collector	G1
	<b>Meteorology</b>	
<b>7.</b>	<b>Full Climatic Station</b>	
7.1	Senior observer	M2
<b>8.</b>	<b>Rainfall station (rainfall)</b>	
8.1	Observer	M1
	<b>Water Quality</b>	
<b>12.</b>	<b>Water quality laboratory</b>	
12.1	Laboratory supervisor	Q6
12.2	Head of the laboratory	Q5
12.3	Trainer (Chemist)	Q4
12.4	Chemist	Q3
12.5	Assistant chemist	Q2

*Table 1  
Staffing for HIS functions  
and coding as used in job  
descriptions*

The following coding is used:

1. For Ground Water: G1..G12
2. For Meteorology: M1..M2
3. for Water Quality: Q1..Q8
4. for Information Technology: I1..I2

# 1 GROUNDWATER

## 1.1 FIELD DATA COLLECTOR (G-1)

<b>HIS function</b>	<b>Field Data Collector</b>
<b>Job category / level</b>	<b>Senior Technical Assistant / Technical Assistant / Junior Engineer</b>
<b>Job responsibilities / purpose</b>	Site Selection, supervision of drilling, water level/quality monitoring, entry of geo-hydrological data
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in Ground Water Surveys / investigations or in-service training and basic training in computers
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. To carry out site selections.</li> <li>2. To attend drilling operations.</li> <li>3. To collect lithological and water samples during drilling operations.</li> <li>4. To prepare drilling reports.</li> <li>5. To undertake mechanical analysis of aquifer materials.</li> <li>6. To furnish site specific lithological and hydrogeological data to support well design.</li> <li>7. To facilitate electric logging of drilled boreholes.</li> <li>8. To conduct zone tests.</li> <li>9. To execute preliminary yield tests.</li> <li>10. To participate in conducting pumping tests.</li> <li>11. To collect data from state and other agencies, and prepare maps.</li> <li>12. To prepare and submit draft basic data report (BDR) for each drilled borehole.</li> <li>13. To undertake monitoring of water level measurement of network stations assigned to him/her and collection of water samples for quality analysis.</li> <li>14. To carry out Reduced Level surveys.</li> <li>15. To carry out entry of groundwater data into GW-DES.</li> </ol>
<b>Reporting / Interactions</b>	To In-charge Exploration / Manager District DPC
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 15 - 35 % in site selection.</li> <li>- 15 - 25 % attending drilling operations, collecting lithological samples, zone testing, arranging electrical logging of the bore hole, identifying productive zones and carrying out mechanical analysis of lithological samples; effective deciding slot size and gravel size.</li> <li>- 5 - 15 % in collecting water level data of network stations in the formats, entering data in file folder.</li> <li>- 5 - 25% in Reduced Level survey.</li> <li>- 20 - 40% in data entry.</li> </ul>

## 1.2 GROUNDWATER DATA PROCESSOR (G-2)

<b>HIS function</b>	<b>Groundwater Data Processor</b>
<b>Job category / level</b>	<b>Assistant Hydro-geologist / Assistant Engineer</b>
<b>Job responsibilities / purpose</b>	Administration, organisation and validation of field data, data interpretation and assessment of groundwater resources.
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Adequate professional knowledge in Ground Water Surveys, investigations, and exploration to be able to take up the job independently, training in computers and GIS applications.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. To administer the regular entry of data from the field and the laboratory to the Centre.</li> <li>2. To convert data from AWLR/DWLR format into HIS format.</li> <li>3. To manage the Centre's database.</li> <li>4. To validate geo-hydrological data according to standardised procedures.</li> <li>5. To organise data for analysis.</li> <li>6. To identify data gaps for field recheck.</li> <li>7. To carry out standard interpretation of data using the dedicated software.</li> <li>8. To prepare contour maps, borehole logs, geological sections, etc.</li> <li>9. To organise data for water resource assessment as per GEC-97 norms.</li> <li>10. To collect and compile relevant statistical data on ground water development from different agencies.</li> <li>11. To run initial groundwater resource assessment programme and identify data gaps.</li> <li>12. To prepare draft interpretation results.</li> <li>13. To transfer at regular intervals the field and processed data to the Regional Centre.</li> </ol>
<b>Reporting / Interactions</b>	To Manager District Data Processing Centre
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 10 - 25 % in collecting existing data on the area, maps, long term data on climate and rainfall, ground water development data, site pinpointing</li> <li>- 10 - 25 % in preparation of maps and draft interpretation</li> <li>- 10 - 50 % groundwater data analysis, GIS studies.</li> </ul>

### 1.3 MANAGER DISTRICT DATA PROCESSING CENTRE (G-3)

<b>HIS function</b>	<b>Manager District Data Processing Centre</b>
<b>Job category / level</b>	<b>Junior Geologist / Geologist / Assistant Director</b>
<b>Job responsibilities / purpose</b>	Day-to-day management of District Data Processing Centre
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Adequate professional knowledge in Ground Water Surveys, investigations, exploration to be able to take up the job independently, knowledge of computers and GIS.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Day to day management of the District Data Processing Centre and to supervise all activities in the Centre.</li> <li>2. To analyse and synthesise all collected survey data and prepare draft report for the district containing recommendations on groundwater development potential.</li> <li>3. To finalise district level maps on water tables, water level fluctuation, water table contours and hydro-chemical maps, on the basis of available data.</li> <li>4. To co-ordinate at field level activities of different site-specific geological staff.</li> <li>5. To supervise field surveys for data collection on groundwater development, extraction and various uses.</li> <li>6. To prepare district and taluka reports for facilitating regional office for preparing development plans.</li> <li>7. To interact with Hydrological Data Users.</li> </ol>
<b>Reporting / Interactions</b>	To Manager Regional Data Processing Centre
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 75 - 80 % preparation of maps and reports.</li> <li>- 20 - 25 % organisation of field data collection and monitoring.</li> </ul>

## 1.4 MANAGER GEO-HYDROLOGICAL EQUIPMENT (G-4)

<b>HIS function</b>	<b>Manager Geo-Hydrological Equipment</b>
<b>Job category / level</b>	<b>Junior Hydro-geologist / Assistant Engineer</b>
<b>Job responsibilities / purpose</b>	Maintenance of all hydro-geological equipment and computers in the Region
<b>Educational entry requirements</b>	BE ( Electronics / Instrumentation)
<b>Induction training / experience</b>	Adequate experience in maintenance of electronic equipment's / computers.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. To maintain an inventory of equipment held at the office, at sites and to maintain adequate stocks of consumable items.</li> <li>2. To prepare working kits of equipment for inspecting teams and to make them available as required.</li> <li>3. To carry out installation of equipment's such as AWLR/DWLR and computers for all district offices in the region.</li> <li>4. To carry out regular maintenance of all equipment's.</li> <li>5. To ensure AMC contracts.</li> <li>6. To repair faulty equipment or to return to manufacturer for repair or replacement.</li> <li>7. To perform random checks and test new and repaired equipment before installation.</li> <li>8. To service and maintain fixed field equipment</li> <li>9. To provide field demonstrations of instruments and equipment.</li> <li>10. To organise preventive maintenance training to district level staff.</li> <li>11. To prepare training notes.</li> <li>12. To identify technological upgrading as and when required.</li> </ol>
<b>Reporting / Interactions</b>	To Manager Regional Data Processing Centre.
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 50 - 60 % preventive maintenance.</li> <li>- 15 - 20 % installation.</li> <li>- 10 % repairs.</li> <li>- 25 - 30 % training of staff and preparation of maintenance notes.</li> </ul>

## 1.5 ASSISTANT HYDRO-GEOLOGIST (G-5)

<b>HIS function</b>	<b>Assistant Hydro-geologist</b>
<b>Job category / level</b>	<b>Senior Technical Assistant / Technical Assistant / Junior Engineer</b>
<b>Job responsibilities / purpose</b>	Collection and management of geo-hydrological data at Regional DPC and data validation and integration.
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in computerised groundwater data analysis and GIS studies.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. To collect and administer at the Regional Data Processing Centre the computerised data from different districts and laboratory under the region.</li> <li>2. To manage the Centre's database.</li> <li>3. To carry out validation of data from the districts according to standardised procedures.</li> <li>4. To integrate data from the different districts.</li> <li>5. To identify regional continuities and discontinuities.</li> <li>6. To digitise maps.</li> <li>7. To prepare reports on data validation and processing.</li> <li>8. To identify Hydrological Data User requirements and organise formats for reporting.</li> <li>9. To transfer the field and processed data to the State Data Processing Centre.</li> </ol>
<b>Reporting / Interactions</b>	To Manager Regional DPC / Hydro-geologist
<b>Work load</b>	100 %

## 1.6 HYDRO-GEOLOGIST (G-6)

<b>HIS function</b>	<b>Hydro-geologist</b>
<b>Job category / level</b>	<b>Hydro-geologist</b>
<b>Job responsibilities / purpose</b>	Analysis of groundwater time series and execution of GIS oriented studies
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in computerised groundwater data analysis and GIS studies.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. To analyse the integrated geo-hydrological data.</li> <li>2. To execute integrity and consistency checks.</li> <li>3. To identify suspect data and missing data and have feed back with district offices.</li> <li>4. To collect maps from different districts.</li> <li>5. To digitise thematic maps.</li> <li>6. To manipulate the mapped data.</li> <li>7. To produce integrated maps.</li> <li>8. To finalise regional maps and correlate with district maps.</li> <li>9. To carry out calculations for areas.</li> <li>10. To prepare integrated well logs.</li> <li>11. To carry out basic statistical analysis.</li> <li>12. To carry out time series / regression analysis.</li> <li>13. To prepare analysis reports.</li> <li>14. To carry out water resource assessment for regions and basins as per GEC-97 norms.</li> <li>15. To prepare regional reports.</li> </ol>
<b>Reporting / Interactions</b>	To Manager Regional DPC
<b>Work load</b>	100 % on GIS work

## 1.7 MANAGER REGIONAL DATA PROCESSING CENTRE (G-7)

<b>HIS function</b>	<b>Manager Regional Data Processing Centre</b>
<b>Job category / level</b>	<b>Hydro-geologist/ Deputy Director/ Regional Director</b>
<b>Job responsibilities / purpose</b>	Day-to-day management of Regional DPC
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in Hydro-geological investigations, computerised ground-water data analysis and GIS studies.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Day-to-day management of the Regional Data Processing Centre and to supervise all activities in the Centre.</li> <li>2. To analyse the integrated data.</li> <li>3. To ensure execution of integrity and consistency checks.</li> <li>4. To identify suspect data and missing data and have feed back with district offices.</li> <li>5. To organise thematic maps, imageries and data from other agencies.</li> <li>6. To finalise regional maps and correlate with district maps.</li> <li>7. To carry out water resource assessment for regions and basins as per GEC-97 norms.</li> <li>8. To finalise regional reports.</li> </ol>
<b>Reporting / Interactions</b>	To Manager State DPC
<b>Work load</b>	100 % on HIS work

## 1.8 DPC ASSISTANT (G-8)

<b>HIS function</b>	<b>DPC Assistant</b>
<b>Job category / level</b>	<b>Technician</b>
<b>Job responsibilities / purpose</b>	Assisting in Data Processing Centre
<b>Educational entry requirements</b>	10 <sup>th</sup> class
<b>Induction training / experience</b>	Experience of working in groundwater department as assistant.
<b>Tasks</b>	<p>General assistance in Data Processing Centre including:</p> <ol style="list-style-type: none"> <li>1. organisation of data,</li> <li>2. data entry,</li> <li>3. digitisation of maps,</li> <li>4. spreadsheet operations,</li> <li>5. word processing,</li> <li>6. execution of computations, and</li> <li>7. preparation of graphics.</li> </ol>
<b>Reporting / Interactions</b>	To DPC Manager / Hydro-geologist / Water Quality Expert / GIS Expert.
<b>Work load</b>	100 %

## 1.9 GIS EXPERT (G-9)

<b>HIS function</b>	<b>GIS Expert</b>
<b>Job category / level</b>	<b>Hydro-geologist/ Deputy Director</b>
<b>Job responsibilities / purpose</b>	GIS studies
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in computerised groundwater data analysis and GIS studies
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Execution of all GIS related data validation and processing activities according to standardised procedures in collaboration with the hydro-geologists and water quality expert.</li> <li>2. Raster to vector conversion.</li> <li>3. Digital image processing.</li> <li>4. Map editing.</li> <li>5. Digitisation of maps.</li> <li>6. 2D and 3D data processing.</li> <li>7. Layer wise data manipulation.</li> <li>8. Production of State level/basin level composite maps.</li> <li>9. Production of specialised outputs.</li> <li>10. Analysis of maps and generation of reports.</li> <li>11. Preparation of draft reports.</li> </ol>
<b>Reporting / Interactions</b>	To Manager State Data Processing Centre
<b>Work load</b>	100 % on GIS work

### 1.10 TRAINER (G-10)

<b>HIS function</b>	<b>Trainer</b>
<b>Job category / level</b>	<b>Hydro-geologist</b>
<b>Job responsibilities / purpose</b>	Training groundwater professionals on a regular basis
<b>Entry experience</b>	10 years of field experience in various aspects of ground water
<b>Induction training / experience</b>	Training of trainers, as provided by HP CTI
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Prepare detailed (re-) design of curricula and training materials, as required for local circumstances</li> <li>2. Promote training in beneficiary organisations</li> <li>3. Secure proper trainee nominations and selection</li> <li>4. Organise training resources (venue, materials, guest trainers, etc)</li> <li>5. Implement (the major part of) the training</li> <li>6. Evaluate training</li> <li>7. Report on training deliveries and development.</li> <li>8. See tasks hydro-geologist (G11)</li> </ol>
<b>Reporting / Interactions</b>	<ul style="list-style-type: none"> <li>- To Manager DPC</li> <li>- Close co-operation with the State Training Co-ordinator</li> <li>- Guidance from CTI where ToT was received</li> </ul>
<b>Work load</b>	Initially, full time

### 1.11 HYDRO-GEOLOGIST (G-11)

<b>HIS function</b>	<b>Hydro-geologist</b>
<b>Job category / level</b>	<b>Deputy director</b>
<b>Job responsibilities / purpose</b>	State level groundwater data interpretation and reporting
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in Groundwater exploration, management with computer skills.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. To carry out final validation and authentication of geo-hydrological data according to standardised procedures, in close collaboration with Water Quality expert and staff of the Processing Centres of the Central Agencies.</li> <li>2. To give feed back to the Regional and District Offices on the quality of the data.</li> <li>3. To integrate the data from different districts</li> <li>4. Regional analysis and identifying different hydro-geological situations.</li> <li>5. To assess the groundwater resource for the state as per GEC-97 norms.</li> <li>6. Identifying areas for groundwater development and restoration.</li> <li>7. Computing district / geology influenced recharge.</li> <li>8. Preparation of reports and required documents.</li> <li>9. Provision of assistance to visiting Hydrological Data Users.</li> </ol>
<b>Reporting / Interactions</b>	To Manager DPC
<b>Work load</b>	100 %

## 1.12 MANAGER STATE DATA PROCESSING CENTRE (G-12)

<b>HIS function</b>	<b>Manager State Data Processing Centre</b>
<b>Job category / level</b>	<b>Regional Director</b>
<b>Job responsibilities / purpose</b>	Day-to-day operation of the State Data Processing Centre
<b>Educational entry requirements</b>	M.Sc. (Geology or equivalent)
<b>Induction training / experience</b>	Experience in hydro-geological investigations, computer analysis and GIS studies.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Overall management of the State Hydrological Information System as far as groundwater quantity and quality data is concerned</li> <li>2. Day-to-day management of the Data Processing Centre</li> <li>3. Monitoring the observing of standardised procedures during data processing.</li> <li>4. To maintain proper communication links with the Regional Data Processing Centres</li> <li>5. To maintain proper communication links with the Data Storage Centre.</li> <li>6. Establishment and maintenance of optimal professional relationship with the processing centres of the Central Agencies.</li> <li>7. Final responsibility for the quality of the data and of the reporting.</li> <li>8. To participate in HDUG meetings and activities.</li> <li>9. Preparation of Hydrological Information Need document.</li> </ol>
<b>Reporting / Interactions</b>	To Director and Data Centre manager
<b>Work load</b>	100 % on HIS work

## 2 HYDRO-METEOROLOGY

### 2.1 HYDROMETEOROLOGICAL OBSERVER (M-1)

<b>HIS function</b>	<b>Hydrometeorological Observer</b>
<b>Job category / level</b>	<b>State Field Observer / Khalasi / Work Sarkar</b>
<b>Job responsibilities / purpose</b>	<ul style="list-style-type: none"> <li>- to take field observations at fixed time.</li> <li>- to make entry of data in the prescribed form.</li> <li>- to despatch the data to the controlling office daily.</li> </ul>
<b>Educational entry requirements</b>	High School (Matric)
<b>Induction training/experience</b>	Basic Observers Course
<b>Tasks</b>	<p><b>At stations with SRG only:</b></p> <ol style="list-style-type: none"> <li>1. Measure rainfall at 0830 hrs IST daily.</li> <li>2. Enter the rainfall data in the prescribed form and also in the register.</li> <li>3. Despatch the rainfall data to controlling office as per prescribed procedure.</li> </ol> <p><b>At stations with both SRG &amp; ARG, besides above tasks in respect of SRG:</b></p> <ol style="list-style-type: none"> <li>4. Remove the previous day chart and put the fresh chart on the clockdrum of the ARG at 0830 hrs IST.</li> <li>5. To give time marks on the chart.</li> <li>6. Tabulate hourly rainfall values from the autographic chart as per proforma supplied.</li> <li>7. Compare daily rainfall values of SRG &amp; ARG.</li> <li>8. Calculate monthly total of rainfall.</li> <li>9. Despatch periodic returns to controlling office (sub-division) as prescribed.</li> <li>10. Keep the instruments clean and in working condition.</li> <li>11. Keep the observatory enclosure locked, clean and fencing intact.</li> <li>12. Keep the exposure conditions good by clearing wild growths.</li> </ol>
<b>Reporting / Interactions</b>	To report to controlling office (Sub-division) immediately if instrument becomes out of order or measure glass is broken.
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 10% for SRG</li> <li>- 25% for SRG and ARG</li> </ul>

## 2.2 SENIOR HYDROMETEOROLOGICAL OBSERVER (M-2)

<b>HIS function</b>	<b>Senior Hydrometeorological Observer</b>
<b>Job category / level</b>	<b>Senior Observer</b>
<b>Job responsibilities / purpose</b>	<ol style="list-style-type: none"> <li>1. Take field observations at Full Climate Station (FCS) at fixed times.</li> <li>2. Make entries of data in the prescribed form.</li> <li>3. Remove the previous day charts and put charts on autographic instruments.</li> <li>4. Process the data and despatch to controlling office.</li> </ol>
<b>Educational entry requirements</b>	B.Sc. / Diploma in Engineering / Senior Secondary School with Science.
<b>Induction training/experience</b>	Senior Observer Course
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Record wind direction and wind speed.</li> <li>2. Record rainfall (SRG).</li> <li>3. Read dry and wet bulbs, read max. and min. temperatures and set max. and min. thermometers and compare daily temperatures with dry bulb temperature.</li> <li>4. Measure pan evaporation.</li> <li>5. Read barometer exact at 0830 hrs IST if installed at FCS.</li> <li>6. Make all observations in the above order 10 minutes before the commencement of fixed hours of observations which are 0830 and 1730 hrs IST. (Start at 0820 and 1720 hrs IST).</li> <li>7. Make entries of data in the prescribed forms in proper columns.</li> <li>8. Remove the autographic charts of previous day of ARG, thermograph and hygrograph and fix fresh charts with time mark.</li> <li>9. Remove the previous autographic chart of sun-shine recorder (after sun set only) and fix the fresh charts with time mark. (During rainy season, the fresh chart is put next day before sunrise).</li> <li>13. Tabulate / process the data from the autographic charts.</li> <li>14. Compare eye - reading and autographic data.</li> <li>15. Despatch returns to controlling office as per prescribed time schedules.</li> <li>16. Maintain eye - reading and autographic instruments in working conditions.</li> <li>17. Keep the observatory enclosure locked, clean and fencing intact.</li> <li>18. Keep exposure conditions good by clearing wild growths.</li> </ol>
<b>Reporting/Interactions</b>	To report to Controlling Office about functioning of the observatory.
<b>Work load</b>	50%

### 3 WATER QUALITY

#### 3.1 FIELD OBSERVER FOR WATER QUALITY (Q-1)

<b>HIS function</b>	<b>Field observer for Water Quality</b>
<b>Job category / level</b>	<b>Similar to S1/S2/S3/G1</b>
<b>Job responsibilities / purpose</b>	Simple field analysis, sample collection and transportation to the field laboratory.
<b>Educational entry requirements</b>	<ul style="list-style-type: none"> <li>- High school with science subjects (inter science preferred)</li> <li>- Diploma in Engineering</li> <li>- Desirable: experience in chemical analyses, B.Sc.</li> </ul>
<b>Induction training/experience</b>	On-the-job training and some experience preferred.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Prepare sample containers (clean, dry, coded).</li> <li>2. Prepare glassware (clean, dry).</li> <li>3. Prepare solutions for preservation.</li> <li>4. Prepare standard solutions for DO titration.</li> <li>5. Observe the field situation.</li> <li>6. Perform site analyses for temperature, colour, pH, DO and EC.</li> <li>7. Collect water samples according to set procedures for all level laboratories for DO, BOD, bacteriological analysis and other determinations.</li> <li>8. Preserve samples.</li> <li>9. Register samples.</li> <li>10. Transport or arrange transport to all level laboratories.</li> </ol>
<b>Reporting / Interactions</b>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>- with assistant chemist: registration (transfer of samples), preparation of</li> <li>- preservation solutions, and</li> <li>- with chemist and senior chemist: report data, field observations.</li> </ul> <p><b>Reporting:</b></p> <p>To the Head of the laboratory about the field observations and field analyses conducted and the functioning of field equipment.</p>
<b>Work load (per site!)</b>	<ul style="list-style-type: none"> <li>- 10% sampling surface water</li> <li>- 10% analysis and despatch of samples reporting</li> </ul>

### 3.2 ASSISTANT CHEMIST (Q-2)

<b>HIS function</b>	<b>Assistant Chemist</b>
<b>Job category / level</b>	<b>Assistant Chemist</b>
<b>Job responsibilities / purpose</b>	All physical and chemical analyses.
<b>Educational entry requirements</b>	BSc. Chemistry
<b>Professional Induction training / experience</b>	<ul style="list-style-type: none"> <li>- At least three years of experience in a chemical laboratory.</li> <li>- Knowledge of water quality parameters and their determination.</li> <li>- Familiar with computers.</li> </ul>
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Replace or assist Field Observer for Water Quality if necessary.</li> <li>2. Analysis for level II parameters, including: <ul style="list-style-type: none"> <li>- Titration's,</li> <li>- Distillation,</li> <li>- Digestion,</li> <li>- Bacteriological analyses,</li> <li>- Operation of UV-VIS-spectrophotometer, and</li> <li>- Operation of flame photometer,</li> </ul> </li> <li>3. Pre-treatment of samples for analyses on GC and AAS.</li> <li>4. Assist in analysis on GC and AAS.</li> <li>5. Enter field data and observations into a computer.</li> <li>6. Enter analyses results into a computer.</li> </ol>
<b>Reporting / Interactions</b>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>- with field observer for WQ: advise on sampling and sample preservation, perform registration of samples when they enter the laboratory</li> <li>- with chemist: assist with GC and AAS analysis</li> <li>- with head of the laboratory: report problems in the overall functioning of the laboratory</li> </ul> <p><b>Reporting:</b></p> <p>To the Chemist and the Head of the laboratory, according to set procedures in a laboratory logbook/working file/folders and functioning of laboratory equipment.</p>
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 70% (wet) chemical analysis, instrumental analysis and assistance for GC and AAS analysis if used in the laboratory.</li> <li>- 20% data entry</li> <li>- 10% reporting</li> </ul>

### 3.3 CHEMIST (Q-3)

<b>HIS function</b>	<b>Chemist</b>
<b>Job category / level</b>	<b>Chemist / Research Officer</b>
<b>Job responsibilities / purpose</b>	Analysis of required parameters / validation and entry of results into the computer.
<b>Educational entry requirements</b>	MSc. Chemistry
<b>Induction training/experience</b>	At least five years of experience of working in a chemical laboratory, at least two years of experience of working in a water quality laboratory.  Desirable: experience in computerised data processing, knowledge of advanced instrumental analyses techniques.
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Analyses listed in the job description of the assistant chemist.</li> <li>2. Analyses on AAS and GC if used.</li> <li>3. Delegate workload for assistant chemist and Field Observer for Water Quality.</li> <li>4. Trouble shooting with regard to equipment or analysis.</li> <li>5. Method development in consultation with the senior chemist.</li> <li>6. Setting up newly received instruments.</li> <li>7. Practice Quality Control.</li> </ol>
<b>Reporting / Interactions</b>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>- with assistant chemist: supervise in GC and AAS analysis, solve problems</li> <li>- for the assistant chemist with regard to analysis and equipment</li> <li>- with head of the laboratory: report problems in the overall functioning of the laboratory</li> </ul> <p><b>Reporting:</b></p> <p>To the Head of the laboratory according to the set procedures in a laboratory logbook/working file/folders and functioning of laboratory equipment and Good Laboratory Practice.</p>
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 60% performing analyses</li> <li>- 20% quality control</li> <li>- 10% trouble shooting and method checking</li> <li>- 10% management of consumables.</li> </ul>

### 3.4 WQ TRAINER (Q-4)

<b>HIS function</b>	<b>WQ trainer</b>
<b>Job category / level</b>	<b>Q-3, Q-5, Q-6 or Q-7</b>
<b>Job responsibilities / purpose</b>	Train field assistants and assistant chemists / researchers on a regular basis
<b>Educational entry requirements</b>	= Q-3
<b>Induction training/experience</b>	Affinity with training, transfer of knowledge and human resource development
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Prepare detailed (re-) design of curricula and training materials, as required for local circumstances</li> <li>2. Promote training in beneficiary organisations</li> <li>3. Monitor proper trainee nominations</li> <li>4. Organise training resources (venue, materials, guest trainers, etc)</li> <li>5. Implement (the major part of) the training</li> <li>6. Evaluate training</li> <li>7. Report on training deliveries and development</li> </ol>
<b>Reporting / Interactions</b>	<ul style="list-style-type: none"> <li>- Close co-operation with the State Training Co-ordinator,</li> <li>- Guidance from CTI where ToT was received.</li> </ul>
<b>Work load</b>	Initially, full time

### 3.5 HEAD OF THE LABORATORY (Q-5)

<b>HIS function</b>	<b>Head of the Laboratory</b>
<b>Job category / level</b>	<b>Senior Chemist /Chief Chemist / Senior Research Officer</b>
<b>Job responsibilities / purpose</b>	Quality control and assurance, laboratory management, maintenance of records, functioning and maintenance of instruments.
<b>Educational entry requirements</b>	MSc Chemistry
<b>Induction training/experience</b>	<ul style="list-style-type: none"> <li>- Several years experience in a water chemistry laboratory, knowledge of environmental topics in both surface water and ground water</li> <li>- Desirable: a research degree, knowledge of advanced instrumental analyses of water quality parameters</li> </ul>
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Organise work programs for staff</li> <li>2. Supervise activities of laboratory (quality control)</li> <li>3. Data analysis</li> <li>4. Method development</li> <li>5. Organise training, training need assessment?</li> <li>6. Substitute assistant chemist and chemist if necessary</li> </ol>
<b>Reporting / Interactions</b>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>- with the members of the staff: laboratory techniques, supervision of</li> <li>- special studies</li> <li>- with the director: apply for new projects, write periodical report on</li> <li>- water quality in dialogue with the director.</li> </ul> <p><b>Reporting:</b></p> <p>To the Director regarding functioning of laboratories and progress of work</p>
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 30% supervision of laboratory, workplans, quality control</li> <li>- 20% reporting, trouble shooting and method development</li> </ul>

### 3.6 LABORATORY SUPERVISOR (Q-6)

<b>HIS function</b>	<b>Laboratory Supervisor</b>
<b>Job category / level</b>	<b>Senior Chemist/ Chief Chemist / Senior Research Officer</b>
<b>Job responsibilities / purpose</b>	Functioning of several regional / divisional / sub –divisional chemistry laboratories / Inter laboratory Quality Control
<b>Educational entry requirements</b>	MSc Chemistry
<b>Induction training/experience</b>	<ul style="list-style-type: none"> <li>- Several years experience in a water chemistry laboratory, knowledge of environmental topics in both surface water and ground water.</li> <li>- Desirable: a research degree, knowledge of advanced instrumental analyses of water quality parameters.</li> </ul>
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Supervise activities of laboratories</li> <li>2. Plan sample distribution over laboratories</li> <li>3. Identify need for method checking/development</li> <li>4. Identify training needs and organise training</li> <li>5. Inter laboratory Quality Control</li> <li>6. Substitute chemist and head of the laboratory if necessary</li> </ol>
<b>Reporting / Interactions</b>	<p><b>Interactions:</b></p> <ul style="list-style-type: none"> <li>- with the members of the staff: laboratory techniques, supervision of special studies</li> <li>- with the director: apply for new projects, write periodical report on water quality</li> </ul> <p><b>Reporting:</b></p> <ul style="list-style-type: none"> <li>- to the Director regarding functioning of laboratories and progress of work</li> <li>- to water quality expert/data processing expert on the AQC performance of all laboratories</li> </ul>
<b>Work load</b>	30%-50% supervision of labs, including quality control

### 3.7 WATER QUALITY EXPERT GROUND WATER (Q-7)

<b>HIS function</b>	<b>Water Quality Expert Ground Water</b>
<b>Job category / level</b>	
<b>Job responsibilities / purpose</b>	Analysis and reporting of all water quality data collected in a state or region / initiate and check with laboratory supervisor or heads of laboratories in case doubt of correctness of data arises from analysis
<b>Educational entry requirements</b>	MSc in relevant field
<b>Induction training/experience</b>	<ul style="list-style-type: none"> <li>- Experienced in computerised analysis and interpretation of water quality both for surface and groundwater. Must have background in (applied) chemistry, environmental engineering or equivalent to ensure a sound knowledge of the fate and origin and of environmentally relevant substances (including trace metals, pesticides).</li> <li>- Desired: experienced in proposing, defining, guiding and reporting research in above-mentioned area. Affiliation with numerical modelling.</li> </ul>
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Monitoring the observing of standardised procedures during data collection and chemical analysis</li> <li>2. Final validation of ground water quality data in close collaboration with the Centre's hydro-geologists and the staff of the processing centres of the Central agencies</li> <li>3. Feed back to the Water Quality Laboratories on the quality of the data.</li> <li>4. Final processing of water quality data; guarantee integrated analysis and reporting of water quality.</li> <li>5. Contribution to reporting and preparation of yearbooks.</li> <li>6. Provision of assistance to visiting Hydrological data Users in water quality analysis.</li> <li>7. Initiate special studies and investigations (write project proposals, guide research and write report on findings)</li> </ol>
<b>Reporting / Interactions</b>	<ul style="list-style-type: none"> <li>- with the Senior Chemist responsible for the laboratories in the region</li> <li>- with Surface Water Quality Expert for data validation and analysis</li> <li>- with hydro-geologists in the same data centre for integration of quantity and quality</li> <li>- to manager DPC</li> <li>- will report in standardised form on the status and development of water quality in the state/region</li> <li>- investigation/research proposals</li> </ul>
<b>Work load</b>	<ul style="list-style-type: none"> <li>- 50% actual validation, analysis and interpretation of water quality data</li> <li>- 20% interaction with colleagues in other data centres</li> <li>- 15% work together with Senior Chemist on improving quality of the data and defining special studies</li> <li>- 15% research and investigations</li> </ul>

### 3.8 WATER QUALITY EXPERT SURFACE WATER (Q-8)

HIS function	Water Quality Expert Surface Water
Job category / level	
Job responsibilities / purpose	Analysis and reporting of all water quality data collected in a state or region. Initiate and check with laboratory supervisor or heads of laboratories in case doubt of correctness of data arises from analysis
Educational entry requirements	M.Sc. in relevant field
Induction training / experience	<p>Experienced in computerised analysis and interpretation of water quality both for surface and groundwater. Must have background in (applied) chemistry, environmental engineering or equivalent to ensure a sound knowledge of the fate and origin and of environmentally relevant substances (including trace metals, pesticides).</p> <p>Desired: experienced in proposing, defining, guiding and reporting research in above-mentioned area. Affiliation with numerical modelling.</p>
Tasks	<ol style="list-style-type: none"> <li>1. Monitoring the observing of standardised procedures during data collection and chemical analysis</li> <li>2. Final validation of surface water quality data in close collaboration with the Centre's hydrologists and the staff of the processing centres of the Central agencies</li> <li>3. Feed back to the Water Quality Laboratories on the quality of the data.</li> <li>4. Final processing of water quality data; guarantee integrated analysis and reporting of water quality.</li> <li>5. Contribution to reporting and preparation of yearbooks.</li> <li>6. Provision of assistance to visiting Hydrological data Users in water quality analysis.</li> <li>7. Initiate special studies and investigations (write project proposals, guide research and write report on findings)</li> </ol>
Reporting / Interactions	<ul style="list-style-type: none"> <li>- with the Senior Chemist responsible for the laboratories in the region</li> <li>- with Ground Water Quality Expert for validation and analysis</li> <li>- with hydrologists in the same data centre for integration of quantity and quality</li> <li>- to manager DPC</li> <li>- will report in standardised form on the status and development of water quality in the state/region</li> <li>- Investigation/research proposals.</li> </ul>
Work load	<ul style="list-style-type: none"> <li>- 50% actual validation, analysis and interpretation of water quality data</li> <li>- 20% interaction with colleagues in other data centres</li> <li>- 15% work together with Sr. Chemist on improving quality of the data and defining special studies</li> <li>- 15% research and investigations.</li> </ul>

## 4 INFORMATION TECHNOLOGY

### 4.1 INFORMATION TECHNOLOGY AND DATA BASE EXPERT (I-1)

<b>HIS function</b>	<b>Information Technology and Data Base Expert</b>
<b>Job category / level</b>	<b>Informatics engineer</b>
<b>Job responsibilities / purpose</b>	Smooth functioning of software, hardware and communication infrastructure in Data Centres
<b>Educational entry requirements</b>	M.Sc. Informatics and database management
<b>Induction training / experience</b>	Experience in Data Base Management
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Control and maintenance of the Centre's computer infrastructure (hardware and software, peripherals, etc.).</li> <li>2. Overall responsibility for and maintenance of the Centres' databases and dedicated software's.</li> <li>3. Periodic updating of the database with data transferred from Data Processing/Storage Centres,</li> <li>4. Support to all computer users in the Centres on information technology matters,</li> <li>5. Control of activities by service and system maintenance providers,</li> <li>6. Control of data storage, file back up and archiving, and</li> <li>7. Control of the Centre's communication systems.</li> </ol>
<b>Reporting / Interactions</b>	To Manager State Data Processing/Storage Centre
<b>Work load</b>	100 %

## 4.2 DATABASE ADMINISTRATOR (I-2)

<b>HIS function</b>	<b>Database Administrator</b>
<b>Job category / level</b>	<b>Informatics engineer</b>
<b>Job responsibilities / purpose</b>	State database management
<b>Educational entry requirements</b>	M.Sc. Informatics
<b>Induction training / experience</b>	Experience in Data Base Management
<b>Tasks</b>	<ol style="list-style-type: none"> <li>1. Overall responsibility for the operation of the HIS-database.</li> <li>2. Provision of adequate formatting procedures on the data for easy import and export of data</li> <li>3. Storage of data received from owner DPC and local DPC and administration of data input streams – ‘field data’, ‘processing’ &amp; ‘temporary data’ as also ‘object data’.</li> <li>4. Monitor the timely delivery of data.</li> <li>5. Transfer of data from owner DPC to local DPC &amp; vice versa &amp; keep adequate administration of the data flows – ‘temporary data’.</li> <li>6. Administration of data retrieval and security checks.</li> <li>7. Update of data access rights of users.</li> <li>8. Preparation and maintenance of the Catalogue of the HIS-database.</li> <li>9. Create access to Catalogue via Internet and Intranet.</li> <li>10. Create and distribute Catalogue updates on CD.</li> <li>11. Advise users on data retrieval options and database content.</li> <li>12. Maintain the integrity of the HIS-database.</li> <li>13. Monitor the synchronisation with related databases, e.g. between state and region.</li> <li>14. Adjustment of data to allow entry &amp; retrieval of new types of data</li> <li>15. Make back-ups and archive data.</li> <li>16. Control the data communication processes and the applied protocols.</li> <li>17. Communicate with external service organisations (outsource highly specialised tasks).</li> <li>18. Keep MIS database up to date.</li> <li>19. Preparation of reports on data availability, data supply, data access and data retrieval according to the standards (time-wise and content- wise) adopted in the HIS.</li> </ol>
<b>Reporting / Interactions</b>	To Manager State Data Storage Centre
<b>Work load</b>	100 %