

Government of India & Government of The Netherlands



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

HIS Water Quality Training Specifications

Introduction

This document provides an overview of training for staff involved in managing and operating a Hydrological Information System for water quality. The training courses presented here, were developed and implemented under the Hydrology Project (1996-2003). Selected courses may be required again in the near future, for refresher purposes and when new staff is posted in the various HIS functions.

The initiative to use training as human resource development or to further develop as specialised training provider may originate from different institutional levels. Some training can very well be managed as in-house affair. Other training is arranged at nearby local training institutes. For specialised training, with low enrolment volume, dedicated central training institutes play an important role in the water sector as a whole.

HIS training beneficiaries, managers and, providers would find this HIS training reference document a valuable tool in their work. It offers a quick start in the often tedious process to spell out personalised staff learning paths, define a particular course in detail, locate available resources, or prepare annual training plans for the department.

Courses are grouped in a logical arrangement, per instrument, software and HIS function. and include information on the following aspects:

- Course title
- Target group
- Provider(s)
- Location (central, local)
- Duration
- Technical advisors involved in design and deliveries
- Objective
- Admission qualifications
- Equipment or software used
- Programme (suggested syllabus)

In addition to the training courses included, there are more training possibilities to improve the staff's job performance, for example:

- Topical workshops and seminars
- Postgraduate training in India and abroad
- Study tours in India and abroad

The contents of these training activities will vary a lot, as they depend on available resources and the interest of third parties to respond to HIS training needs. Examples of what postgraduate training and study tours could look like are available in separate HP catalogues: *Study tours in India*, listing interesting example sites and data management offices
Catalogue on postgraduate training in India

New Delhi, January 2000

Training specifications

SW & GW Water Quality Data Collection

ToT - 1: training skills

Target group:	Candidate WQ trainers (Q-4)
Provider during HP:	CTU (for SW) and RGI (for GW) in co-operation with Consultant
Location:	SW: Pune (CTU) GW: Raipur (RGI) For exercises in skills training, the venue for ToT-1 in WQ would be in or near an operational laboratory
Duration:	3-4 days for training skills + time required for selected laboratory practices, as per training need
Remarks:	Two batches of trainers were trained at CGWB-WQ lab in Hyderabad (total capacity created: 31 trainers). Additional requests are handled by CTU and RGI.
Consultant:	S. Jagota / H. Wittenberg / S.P. Chakrabati / R H Siddiqi

Objective:	After this course, the participants are able to: <ul style="list-style-type: none">• Manage in-house training courses• Effectively present, demonstrate, guide exercises and facilitate discussions
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Admission qualifications:

Training methods: Mainly exercises, no lecturing

Equipment/software used: Basic training equipment and example lab. equipment for exercises

Provider after HP: CTU and RGI

Contact person:

Program

Day 1	09.30	Discussion: Training needs & organisation development	
	10.00	Exercise: Needs analysis of an organisation	
	10.30	Lecture: Matching training demand with supply	
	11.00	Discussion: Training development cycle step by step	
	14.00	Discussion: Training management areas	
	14.30	Exercise: Define Trainers' role in training development & management	
	15.00	Overview – communication skills	
	15.30	Exercise: Self assessment	
	15.45	Exercise: Presentation skills	
	16.15	Summary & tips – Presentation skills	
	16.30	Exercise: Presentation skills	
	17.15	Feedback: video playback of days recording	
	Day 2	09.30	Icebreaker
		09.45	Lecture: Elements of skills training
10.00		Exercise: Skills training	
10.30		Tips – Skills training	
11.00		Exercise: Skills training	
12.30		Summary – Skills training	
14.00		Lecture: Discussion techniques overview	
14.15		Exercise: Open inventory discussion technique	
14.45		Summary & tips – Open inventory discussion technique	
16.00		Exercise: Focused discussion/ questioning technique	
16.45		Summary & tips – Focused discussion/ questioning technique	
17.00	Feedback: video playback of days recording		
Day 3	09.30	Icebreaker	
	10.00	Exercise: Participants prepare for a mini course, using all methods	
	14.00	Exercise: Participants run a mini course	
	16.00	Evaluation & valedictory	
Additional		Sessions on selected laboratory practices. These would be inserted <i>at the beginning</i> of the ToT course, as these sessions can be used by the participants to exercise training skills.	

ToT - 2: Training management

Target group:	Active trainers of ToT-1 and their Training Co-ordinators. Combined sessions for SW, GW and WQ trainers preferred
Provider during HP:	Consultant, in co-operation with TCs
Location:	Local
Duration:	3 days
Remarks:	First round completed. TCs will facilitate similar sessions on a regular basis.
Consultant:	S.Jagota / R. L. Qazi / H. Wittenberg

Objective:	After this course, the participants are able to solve ongoing problems in training development, management and communication skills.
Admission qualifications:	Earlier HP training practice
Training methods:	Lectures, exercises, discussions
Equipment/software used:	
Provider after HP:	Training Coordinator.

Program

Day 1	09.30	Overview & objective
	10.00	Personal introductions and open inventory of current issues
	11.00	Discussion of current issues
	14.00	Refresher training: text analysis and skills training
	17.00	Summary & tips.
Day 2	09.30	Icebreaker
	10.00	Lecture: Staffing plan = training volume
	10.30	Demonstration: example staffing plan
	11.00	Exercise: Tabulation & calculation of organisation's training volume
Day 3	09.30	Icebreaker
	10.30	Introduction to training planning principles
	11.00	Example training plan & calendar
	11.30	Exercise: Prepare training plan & calendar of the organisation
	14.00	Discussion: Implementation of training plan
	15.00	Lecture: Training information & administration in the HP
	17.00	Evaluation

Training of trainers : Pollution parameters

Target group:	Candidate WQ trainers (Q-4)
Provider during HP:	Consultant
Location:	For exercises in skills training, the venue for ToT-1 in WQ would be in or near an operational laboratory
Duration:	5 days for training skills + time required for selected laboratory practices, as per training need
Remarks:	Two batches of trainers were trained at CGWB-WQ lab in Hyderabad (total capacity created: 31 trainers). Additional requests are handled by CTU and RGI.
Consultant:	S. Jagota / H. Wittenberg / S.P. Chakrabati
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Objective:	After this course, the participants are able to: <ul style="list-style-type: none">• Manage in-house training courses• Effectively present, demonstrate, guide exercises and facilitate discussions
Admission qualifications:	
Training methods:	Mainly exercises, no lecturing
Equipment/software used:	Basic training equipment and example lab. equipment for exercises
Provider after HP:	CTU and RGI
Contact person:	

Program

- Day 1**
- 1 Basic Concepts – modules 1, 2 & 20
 - 2 Dissolved Oxygen – modules 11 & 12
 - 3 Coliforms – modules 21, 22, 23
- Day 2**
- 1 BOD – modules 15, 16 & 17
 - 2 Coliform & BOD – modules 17 & 23
- Day 3**
- 1 COD – modules 18 & 19
 - 2 Coliform – module 23
 - 3 COD – module 19
- Day 4**
- 1 Exercises
 - 2 Coliform – module 23
 - 3 Exercise
- Day 5**
- 1 BOD – 17
 - 2 Conclusions
 - 3 Evaluation

Refresher course on Pollution parameters

Target group:	Candidate WQ trainers (Q-4)
Provider during HP:	Consultant
Location:	For exercises in skills training, the venue for ToT-1 in WQ would be in or near an operational laboratory
Duration:	5 days for training skills + time required for selected laboratory practices, as per training need
Remarks:	Two batches of trainers were trained at CGWB-WQ lab in Hyderabad (total capacity created: 31 trainers). Additional requests are handled by CTU and RGI.
Consultant:	S. Jagota / H. Wittenberg / S.P. Chakrabati
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Objective:	After this course, the participants are able to: <ul style="list-style-type: none">• Manage in-house training courses• Effectively present, demonstrate, guide exercises and facilitate discussions
Admission qualifications:	
Training methods:	Mainly exercises, no lecturing
Equipment/software used:	Basic training equipment and example lab. equipment for exercises
Provider after HP:	CTU and RGI
Contact person:	

Program

- Day 1**
- 1 Introduction to Microbiology
 - 2 Microbiological laboratory techniques
 - 3 Culture media preparation
 - 4 Coliform as indicators of pollution
 - 5 Measurement of Coliforms
- Day 2**
- 1 Basic Chemistry Concepts
 - 2 Dissolved Oxygen
 - 3 Measurement of Dissolved Oxygen
 - 4 Biochemical oxygen demand
 - 5 Measurement of Biochemical oxygen demand
 - 6 Measurement of Coliforms
- Day 3**
- 1 Chemical oxygen demand
 - 2 Measurement of Chemical oxygen demand
 - 4 Exercise
 - 5 Measurement of Chemical oxygen demand
 - 6 Measurement of Coliforms
- Day 5**
- 1 Complete BOD and coliform tests
 - 2 Discussion and conclusions
 - 3 Evaluation

Surface water sampling and on-site analyses

Target group:	Selected surface water data collection staff: S-1, S-2, S-3
Provider during HP:	In-house WQ trainers
Location:	Sampling sites
Duration:	1-2 days
Remarks:	Related modules produced by Consultant and distributed in May 1999. Teaming up between SW and GW trainers expected, as SAPs for surface water and groundwater are similar and targets are high.
Consultant:	S.P. Chakrabati / R. C. Trivedi / A. N. Khan
Objective:	After this course, the participants are able to <ul style="list-style-type: none">• Identify representative sampling locations, take samples and analyse field parameters
Admission qualifications:	•
Training methods:	Demonstrations, exercises, discussions
Equipment/software used:	
Provider after HP:	

Program Depending on the allocation of tasks, observers would have a **minimal** or **high** involvement in actual sampling and on-site analysis work.

The minimum involvement would be limited to the following training modules:

- Module 1 Basic water quality concepts
- Module 4 How to prepare standard solutions
- Modules 13 How to sample Surface Water for water quality analysis

With maximum involvement in sampling and on-site analysis, observer training would include:

- Module 1 Basic water quality concepts
- Module 2 Basic chemistry concepts
- Module 3 Good laboratory practices
- Module 4 How to prepare standard solutions
- Module 5 How to measure physical parameters - colour , odour, temperature
- Module 6 Understanding the Hydrogen Ion concentration, pH
- Module 7 How to measure pH
- Module 8 Understanding electrical conductivity
- Module 9 How to measure electrical conductivity
- Module 10 How to measure dissolved, suspended and total solids
- Module 11 Understanding the chemistry of DO measurement
- Module 12 How to measure Dissolved oxygen (DO)
- Module 13 How to sample Surface Water for water quality analysis

Groundwater sampling and on-site analyses

Target group:	Selected Groundwater data collection staff: G1 G2
Provider during HP:	In-house WQ trainers
Location:	Sampling sites
Duration:	1-2 days
Remarks:	Related modules produced by Consultant and distribution in May 1999. Teaming up between SW and GW trainers expected, as SAPs for surface and groundwater are similar and training targets are high.
Consultant:	S.P. Chakrabati / R. C. Trivedi / A. N. Khan
Objective:	After this course, the participants are able to <ul style="list-style-type: none">• Identify representative sampling locations, take samples and analyse field parameters
Admission qualifications:	•
Training methods:	Lectures, exercises, discussions
Equipment/software used:	
Provider after HP:	

Program Depending on the allocation of tasks, observers would have a **minimal** or **high** involvement in actual sampling and on-site analysis work.

The minimum involvement would be limited to the following training modules:

- Module 1 Basic water quality concepts
- Module 4 How to prepare standard solutions
- Modules 14 How to sample Groundwater for water quality analysis

With maximum involvement in sampling and on-site analysis, observer training would include:

- Module 1 Basic water quality concepts
- Module 2 Basic chemistry concepts
- Module 3 Good laboratory practices
- Module 4 How to prepare standard solutions
- Module 5 How to measure physical parameters - colour , odour, temperature
- Module 6 Understanding the Hydrogen Ion concentration, pH
- Module 7 How to measure pH
- Module 8 Understanding electrical conductivity
- Module 9 How to measure electrical conductivity
- Module 10 How to measure dissolved, suspended and total solids
- Module 11 Understanding the chemistry of DO measurement
- Module 12 How to measure Dissolved oxygen (DO)
- Modules 14 How to sample Groundwater for water quality analysis

Chemistry concepts and laboratory practices (*Level I*)

Target group:	Assistant chemists in SW and GW laboratories (Q-2)
Provider during HP:	In-house WQ trainers
Location:	Laboratory
Duration:	2-3 days
Remarks:	Modules produced by the Consultant. First batch of 14 modules (out of 50) distributed in May 1999, to get started. Courses need not to include all modules at a time, but can be grouped in conveniently short courses as per training need and time available.
Consultant:	S.P. Chakrabati / R. C. Trivedi / A. N. Khan
Objective:	After this course, the participants are able to <ul style="list-style-type: none">• Analysis of physio-chemical parameters
Admission qualifications:	<ul style="list-style-type: none">• B. Sc.
Training methods:	Demonstrations, exercises, discussions
Equipment/software used:	
Provider after HP:	

Program

With maximum involvement the training would include:

Module 1	Basic water quality concepts
Module 2	Basic chemistry concepts
Module 3	Good laboratory practices
Module 4	How to prepare standard solutions
Module 5	How to measure physical parameters - colour , odour, temperature
Module 6	Understanding the Hydrogen Ion concentration, pH
Module 7	How to measure pH
Module 8	Understanding electrical conductivity
Module 9	How to measure electrical conductivity
Module 10	How to measure dissolved, suspended and total solids
Module 11	Understanding the chemistry of DO measurement
Module 12	How to measure Dissolved oxygen (DO)

Optional

Module 13	How to sample Surface water for water quality analysis
Module 14	How to sample Groundwater for water quality analysis
Module 24	Basic aquatic chemistry concepts

Transfer the above in the day-to-day schedule

Chemistry concepts and laboratory practices (*Level II & II +*)

Target group:	Chemists in GW and SW laboratories (Q-3)
Provider during HP:	In-house WQ trainers
Location:	Laboratory
Duration:	A few weeks in total
Remarks:	Modules produced by the Consultant. First batch of 14 modules (out of 50) distributed in May 1999, to get started. Courses need not to include all modules at a time, but can be grouped in conveniently short courses as per training need and time available.
Consultant:	S.P. Chakrabati / R. C. Trivedi / A. N. Khan / R H Siddiqi
Objective:	After this course, the participants are able to <ul style="list-style-type: none">• Analysis of physiochemical, bacteriological and trace pollutants
Admission qualifications:	<ul style="list-style-type: none">• M. Sc.
Training methods:	Lectures, exercises, discussions
Equipment/software used:	
Provider after HP:	
Contact person:	

Program

With maximum involvement the training would include:

Module 15	Understanding Biochemical Oxygen Demand test
Module 16	Understanding dilution and seeding procedures in BOD test
Module 17	How to measure Biochemical Oxygen Demand
Module 18	Understanding Chemical Oxygen Demand test
Module 19	How to measure Chemical Oxygen Demand (COD)
Module 20	Introduction to microbiology
Module 21	Microbiological laboratory techniques
Module 22	Coliforms as indicator of faecal pollution
Module 23	How to measure coliforms
Module 27	Surface water quality planning concepts
Module 29	Advanced aquatic chemistry: solubility equilibria
Module 43	How to measure iron
Module 44	How to measure sodium
Module 45	How to measure sulphate
Module 46	How to measure silicate
Module 31	Behaviour of trace compounds in aquatic environment
Module 32	Potentiometric analysis
Module 33	Use of ion selective probes
Module 34	Absorption spectroscopy
Module 35	Emission spectroscopy and nephelometry
Module 36	How to measure fluoride
Module 37	How to measure nitrogen - nitrate by UVS and CD reduction method
Module 38	How to measure nitrogen, ammonia and organic
Module 39	How to measure nitrogen, ammonia by direct phenate method
Module 40	How to measure chlorophyll
Module 41	How to measure phosphorus
Module 42	How to measure boron

Transfer the above in the day-to-day schedule

AAS introduction

Target group:	Selected Chemists (Q-3)
Providers:	CPCB (New Delhi), NEERI (Nagpur), ITRC (Lucknow)
Location:	At provider's laboratory
Duration:	3 days
Remarks:	Consultant co-ordinates central nominations
Consultant:	S. P. Chakrabarti / R. L. Qazi
Objective:	After this course, the participants will understand equipment features, specifications and operations, as required to advise in procurement procedures and to absorb the subsequent suppliers briefing on equipment specifics during installation
Admission qualifications:	<ul style="list-style-type: none">• Involvement as technical advisor in WQ equipment procurement• Designated as future operator
Training methods:	Lectures, practice, discussions
Equipment used:	Operational AAS meter, peripherals and samples
Provider after HP:	
Contact person:	

Program

- Day 1**
1. Introduction, advanced instrumental analysis in environmental monitoring, heavy metals and micro pollutants in the environment (Lecture)
 2. Introduction to atomic absorption spectro-photometry, principles, instruments and their components, use of vapor generation assembly and graphite furnace (Lecture)
 3. Pre-treatment of samples, water and biological material. (Laboratory session)
- Day 2**
1. Pre-treatment of samples, water and biological material (Laboratory session)
 2. Use of atomic absorption spectrophotometer (AAS), instrument calibration for Cd, Cu, Hg, Se. (Laboratory session)
 3. Maintenance and trouble shooting of the AAS (Lecture and demonstration)
- Day 3**
1. AAS analyses of environmental samples. (Laboratory session)
 2. Environmental data processing, quality control and interpretation. (Lecture)
 3. Wrap-up discussion and conclusions

Refer to modules

Module 47 Introduction to advanced instrumental analysis – AAS

Module 48 Performing analysis by AAS – getting started

UV-VIS introduction

Target group:	Selected Chemists (Q-3)
Providers:	CPCB (New Delhi), NEERI (Nagpur), ITRC (Lucknow)
Location:	At provider's laboratory
Duration:	3 days days
Remarks:	Consultant co-ordinates central nominations
Consultant:	S. P. Chakrabarti / R. L. Qazi
Objective:	After this course, the participants will understand equipment features, specifications and operations, as required to advise in procurement procedures and to absorb the subsequent suppliers briefing on equipment specifics during installation
Admission qualifications:	<ul style="list-style-type: none">• Involvement as technical advisor in WQ equipment procurement• Designated as future operator
Training methods:	Lectures, practice, discussions
Equipment used:	Operational UV-VIS meter, peripherals and samples
Provider after HP:	
Contact person:	

Program

Day 1

1. Introduction, advanced instrumental analysis in environmental monitoring, heavy metals and micro pollutants in the environment (Lecture)
2. Ultraviolet Visible Spectrophotometer (UV-VIS): principles, instruments and their components (Lecture)
3. Pre-treatment of samples, water and biological material. (Laboratory session)

Day 2

1. Use of UV-VIS, instrument calibration for organic and inorganic compounds (Laboratory session)
2. Maintenance and trouble shooting of UV-VIS. (Lecture and demonstration)
3. UV-VIS analysis of environmental samples (Laboratory session)

Day 3

1. UV-VIS analyses of environmental samples. (Laboratory session)
2. Environmental data processing, quality control and interpretation. (Lecture)
3. Wrap-up discussion and conclusions

GC introduction

Target group:	Selected Chemists (Q-3)
Provider during HP:	CPCB (New Delhi), NEERI (Nagpur), ITRC (Lucknow), or local laboratory
Location:	At provider's laboratory
Duration:	5 working days
Remarks:	Consultant co-ordinates central nominations
Consultant:	S. P. Chakrabarti / R.L. Qazi
Objective:	After this course, the participants will understand equipment features, specifications and operations, as required to advise in procurement procedures and to absorb the subsequent suppliers briefing on equipment specifics during installation
Admission qualifications:	<ul style="list-style-type: none">• Involvement as technical advisor in WQ equipment procurement• Designated as future operator
Training methods:	Lectures, practice, discussions
Equipment used:	Operational GC meter, peripherals and samples
Provider after HP:	
Contact person:	

Program

- Day 1** **General introductions**
- Environmental chemistry
 - Fate of different pollutants in the environment particularly organic micro-pollutants (pesticides)
 - Principle of chromatographic techniques in analytical chemistry with reference to measurement of organic pollutants in the environment
- Day 2**
- Morning**
Structural and functional aspects of the GC, including sample injection system, chromatographic columns, inert earth supports, derivative formation, oven, detectors, retention time of analysis, temperature programming for separation of narrow boiling point chemicals and problems encountered.
- Afternoon**
Practical sessions with exposure to the instrument, including proper housing and peripheral arrangements in the GC room.
- Day 3**
- Morning**
- Importance of sample preparation, extraction techniques for organic micro-pollutants from water, sediment and biological materials.
 - Extraction procedures, including different solvents used for extraction of various organic micro-pollutants.
- Afternoon**
Practical exercises on extraction of organic micro-pollutants from water, sediment and biological materials
- Day 4**
- Morning**
- Measurement techniques, including standards and precautionary measures to be taken on operating GC
 - Standards and reference materials
- Afternoon**
Practice session on operation of GC, using extracted samples for analysing different organics using their references
- Day 5**
- Morning**
- Data reporting and evaluation
 - Major problems and precautions in operation and data reporting
 - Trouble shooting
- Afternoon**
Practical session: analyses of samples

Refer to modules -

- 49 Introduction to advanced instrumental analysis – GC
- 50 Performing analysis by GC - getting started

SW water quality data entry & initial validations (SWDES)

Target group:	Selected Chemists (Q-2, Q-3)
Provider during HP:	SW in-house data entry trainer & Consultant
Location:	In laboratory, using computers at own lab
Duration:	2 days
Remarks:	Starts when primary software module is completed with WQ parameters and trainers are trained: July 1999 onwards
Consultant:	S.P. Chakrabati / R. C. Trivedi / A. N. Khan

Objective: After this course, the participants are able to

- operate SWDES software, enter WQ data, validate data and prepare reports

Admission qualifications:

- Basic computer skills

Training methods: Lectures, exercises, discussions

Equipment/software used:

Provider after HP:

Contact person:

Program

Day 1

Session 1	Registration & inauguration
Session 2	HIS Concepts & Data Processing Plan
Session 3	Introduction to SWDES.
Session 4	Overview of software functions
Session 5	Introduction to WQ module in SWDES Exercise : Creating station
Session 6	Laboratory information form Exercise : Entering Laboratory information
Session 7	Parameter information form Exercise : Entering Parameter Information
Session 8	Sample collection information form Exercise : Entering Sample Collection Information

Day 2

Session 9	Analysis data entry & validation Exercise : Entering laboratory analysis data & perform data validation
Session 10	Enter & export AQC data
Session 11	Generating reports Exercise : Reporting Laboratory information, parameter information, sample collection register, sample analysis and validation data, sample data summary , standards report
Session 12	Discussion and Evaluation

GW water quality data entry & initial validations (WQDES_GW)

Target group:	Selected Chemists (Q-2, Q-3)
Provider during HP:	SW in-house data entry trainer & Consultant
Location:	In laboratory, using computers at own lab
Duration:	2 days
Remarks:	Starts when primary software module is completed with WQ parameters and trainers are trained: July 1999 onwards
Consultant:	S.P. Chakrabati / R. C. Trivedi / A. N. Khan

Objective: After this course, the participants are able to

- operate SWDES software, enter WQ data, validate data and prepare reports

Admission qualifications:

- Basic computer skills

Training methods: Lectures, exercises, discussions

Equipment/software used:

Provider after HP:

Contact person:

Program

Day 1

Session 1	Registration Inauguration
Session 3	HIS Concepts & Data Processing Plan
Session 4	Overview of software functions
Session 5	Introduction to WQ module in WQDES_GW Exercise : Creating Wells
Session 6	Laboratory information form Exercise : Entering Laboratory information
Session 7	Parameter information form Exercise : Entering Parameter Information
Session 8	Sample collection information form Exercise : Entering Sample Collection Information
Session 9	Analysis data entry & validation Exercise : Entering laboratory analysis data & perform data validation

Day 2

Session 10	Enter & export AQC data
Session 11	Generating reports Exercise : Reporting Laboratory information, parameter information, sample collection register, sample analysis and validation data, sample data summary , standards report
Session 12	Generating Graphs & diagrams Exercise: Plot different graphs, Time series, Yearly average, parameter correlation, summary statistics and exploring graph server options, zooming, axis scaling, exporting, printing. Working with piper, stiff and Wilcox diagram
Session 13	Import / export historical and GWDES 2.04 data
Session 14	Discussion and Evaluation

WQ data processing and reporting (SW)

Target group: Surface water quality expert (Q-8)

Provider during HP: NIH and CTU

Location: Local

Duration: 4 days

Remarks: Part of HYMOS 4 training program ?? Separate??

Consultant: S.P. Chakrabati / R. C. Trivedi / A. N. Khan

Objective: After this course, the participants are able to

- report on environmental impact assessment based on processed data

Admission qualifications: •

Training methods: Lectures, exercises, discussions

Equipment/software used:

Provider after HP:

Contact person:

Program

Program: HYMOS Water Quality data processing and training planning

Day 1	1	Registration & inauguration
	2	HIS Concepts & SW Data Processing Plan
	3	Overview of HYMOS & SWDES
	4	Working with HYMOS
	5	Defining Stations
	6	Defining Data Series
Day 2	1	Working with SWDES
	2	Entry of WQ Data (I)
	3	Entry of WQ Data (II)
	4	Primary Validation of WQ Data (I)
	5	Primary Validation of WQ Data (II)
	6	Discussions
Day 3	1	Validation of Hydrological Data (I)
	2	Validation of Hydrological Data (II)
	3	Discussions
	4	Secondary Validation of WQ Data (I)
	5	Secondary Validation of WQ Data (II)
	6	Discussions
Day 4	1	Analysis of WQ Data (I)
	2	Analysis of WQ Data (II)
	3	Report on WQ Data (I)
	4	Report on WQ Data (II)
	5	Local Visit
Day 5	1	Organisation of Temporary Databases
	2	Installation of HYMOS
	3	Organisation of HYMOS Program Files
	4	Database Concepts
	5	Organisation of HYMOS Database Files
	6	Evaluation & Valedictory

WQ data processing and reporting (GW)

Target group: Groundwater quality expert (Q-7)

Provider during HP: Software supplier

Location: As per contract

Duration: As per contract

Remarks:

Consultant: S.P. Chakrabati / R. C. Trivedi / A. N. Khan

Objective: After this course, the participants are able to

- report on environmental impact assessment based on processed data

Admission qualifications: •

Training methods: Lectures, exercises, discussions

Equipment/software used:

Provider after HP:

Contact person:

Program

Understanding HIS concept and its set up
Understanding data processing activities under HIS
How to enter water quality data (SW)
How to enter water quality data (GW)
How to carry out primary validation of water quality data
How to plan and organize data entry in laboratories
Understanding data processing planning
Different types and forms of data in HIS
How to receive data from different laboratories
How to organise data into temporary databases
How to carry out secondary validation of water quality data
How to analyse water quality data
How to report water quality data

Day 1	1 2 3 4
Day 2	1 2 3 4
Day 3	1 2 3 4
Day 4	1 2 3 4
Day 5	1 2 3 4
etc	etc

Water quality monitoring systems and operationalisation (SW & GW)

Target group: All SW & GW lab chemists

Provider during HP: Consultant and subcontracted institutes

Location:

Duration:

Remarks:

Consultant: S.P. Chakrabati / R. C. Trivedi / A. N. Khan

Objective: After this course, the participants are able to

- share the location specific experiences

Admission qualifications: •

Training methods: Lectures, exercises, discussions

Equipment/software used:

Provider after HP:

Contact person:

Program

- Day 1**
- 1 Registration
 - 2 Introduction to HIS and WQMS objectives
 - 3 WQ monitoring objectives under HP
 - 4 Review of water quality monitoring network
 - 5 Review of surface water and groundwater sampling procedure
 - 6 Sampling - Sample containers, sample preservation and labelling,
 - 7 Analysis of field parameters
 - 8 Field information reporting,
 - 9 Transport of samples
- Day 2**
- 1 Laboratory infrastructure requirements
 - 2 Preservation of chemicals, reagents, standard solutions & upkeep of laboratory
 - 3 Within-laboratory AQC exercise
 - 4 Analysis of major ions and ionic balance
 - 5 Analysis of organic matter and microbiological parameters
- Day 3**
- Field Visit – demonstration at WQ site
- Day 4**
- 1 Refresher programme on SWDES for surface water quality analysis
 - 2 Refresher programme on WQDES_GW for groundwater quality analysis
- Day 5**
- 1 Refresher programme on SWDES for surface water quality analysis
 - 2 Refresher programme on WQDES_GW for groundwater quality analysis
 - 3 Discussions and Evaluation