

*International  
Office  
for Water*

***Capacity building for better water management***



# WATER



## Professional training



## All our training programmes



### *Capacity building for better water management*

#### **WATER IN THE CITY**

**Introduction to the profession**  
**Water quality and analyses**  
**Drinking water production**  
**Drinking water supply**  
**Laying out and rehabilitation of water supply systems**  
**Sanitation systems**  
**Urban wastewater treatment**  
**Waste and sludge treatment**  
**On-site sanitation**  
**Boreholes**  
**Pumping**  
**Maintenance, electrical engineering**  
**Automation and remote management**  
**Metrology**

#### **WATER IN NATURAL ENVIRONMENTS**

**Groundwater**  
**Rivers**  
**Water uses**  
**Monitoring**

#### **WATER IN INDUSTRY**

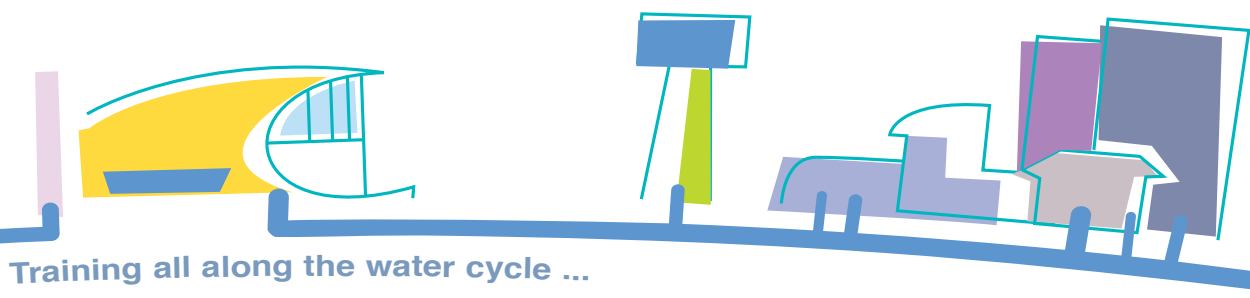
**Management, analyses and controls**  
**Process water**  
**Treatment of industrial wastewater**  
**Decontamination by surface treatment**

#### **MANAGEMENT OF UTILITIES**

**Management of water supply and sanitation utilities**  
**Safety of the personnel**

#### **WEB-TRAINING**

**From your office, have access to training programmes taught by experts**



## WATER IN THE CITY

### INTRODUCTION TO THE PROFESSION

Drinking water supply and sanitation: introduction to the profession  
 Initiation to water supply  
 Initiation to drinking water treatment  
 Initiation to sewerage: sewer system and wastewater treatment plant  
 Initiation to the operation of sewer systems  
 Basics of hydrogeology

### WATER QUALITY AND ANALYSES

#### Initiation

Basics of water chemistry  
 Understanding of chemical reactions in water treatment systems

#### Drinking water

Drinking water analyses for self-monitoring  
 Risk analysis in drinking water production and supply  
 Tastes and odours of drinking water

#### Wastewater

Wastewater analyses for self-monitoring  
 Validity and reliability of industrial wastewater analyses

#### Bacteriology

Elementary analyses related to water bacteriology - Module 1  
 Analyses related to water bacteriology - Module 2  
 New methods for assessing bacterial flora

#### Sampling

Water sampling: Why? How?

#### Toxicity

Toxicity - Ecotoxicity  
 Biomonitoring of discharges

#### Hygiene and safety

Analysis laboratory: hygiene and safety

#### Quality and data management

Format for exchanging data between laboratories and clients  
 Metrology applied in laboratories  
 Uncertainties in quantitative measurements  
 Measurement uncertainties and validation by microbiology



### DRINKING WATER PRODUCTION

#### Initiation

Initiation to drinking water production  
 Operation of drinking water production plants - Level 1

#### Operation

Operation of drinking water production plants - Level 2  
 Water disinfection  
 Ozone in water treatment: principle and application  
 Operation of drinking water production plants - Level 3  
 Operation of a water disinfection centre using chlorine and chlorine dioxide  
 Microscopic observation of freshwater microalgae  
 Means for fighting against algae and their pollution  
 Reagents in drinking water treatment: application and safety  
 Correction of the mineralisation of corrosive waters: neutralisation and remineralisation of water  
 Correction of the mineralisation of scaling waters

#### Swimming pools

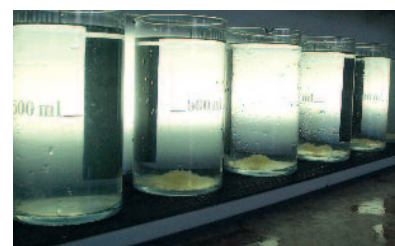
Water treatment and control in swimming pools

#### Treatment techniques

Drinking water treatment processes  
 Water refining: membrane process, activated carbon  
 Membrane filtration in drinking water treatment: microfiltration (MF)  
 ultrafiltration (UF) - nanofiltration (NF) - reverse osmosis (RO)  
 Sea water desalination

#### Individual treatment

Water treatment at the place of use





## DRINKING WATER SUPPLY

### Design, sizing

Hydraulic study: basics of applied hydraulics - Level 1  
Hydraulic study: pumping and supply - Level 2  
Hydraulic study: pumping and supply - Level 3  
Diagnostics and modelling of drinking water supply systems

### Operation

Regulatory evolutions and techniques in water supply  
Operation of drinking water supply systems - Module 1  
Operation of drinking water supply systems - Module 2  
Reading and exploitation of system plans  
Water meters  
Management of meters  
Instrumentation of a drinking water supply system  
Hydraulic regulation valves  
Hydraulic control valves - Level 1  
Hydraulic control valves - Level 2  
Installation and maintenance of fire hydrants and post hydrants  
Cleaning and disinfection of drinking water works  
Maintenance of water quality in supply systems

### Leak detection

Improvement of the system yield: strategy and organisation  
Detection of leaks and buried pipes

### Patrimonial management

Diagnostics of drinking water supply: small and average communities  
Management of assets: renewal and rehabilitation of the water supply system  
Rehabilitation of drinking water tanks  
Building of concrete units

### Domestic system and health protection

Preparation of the qualification to the maintenance of backflow preventers  
Qualification to the maintenance of backflow preventers  
Qualification to the maintenance of backflow preventers – compensatory training course  
Renewal of the qualification to the maintenance of backflow preventers  
Technical and health rules in domestic systems  
Domestic hot waters: control and risk management  
Control of domestic water systems supplied by another water resource  
Use of rain water at the plot



## LAYING OUT AND REHABILITATION OF WATER SUPPLY SYSTEMS

### Drinking water

Construction of DWS systems  
Construction of the systems without trenching  
Laying out of drinking water pipelines  
Qualification to the electrical welding of the polyethylene pipe  
Qualification to the butt welding of polyethylene pipes

### Sanitation

Definition of the construction project - Module 1  
Drafting of special technical specifications - Module 2  
Soil study for the laying out of systems  
Implementation and follow-up of sanitation working sites - Module 3  
Rehabilitation of non-inspectable sanitation systems  
Construction of systems without trenching  
Patrimonial management of inspectable sanitation systems and appurtenances

### Working sites

Inspection and testing of sewerage systems  
Implementation and control of trench filling-up  
Risk prevention on main laying sites  
Marking of working sites  
Temporary signalling of working sites



## SANITATION SYSTEMS

### Design, sizing

Management of urban discharges in rainy weather  
 Water law section for storm drainage developments  
 Sizing of sanitation systems - Level 1  
 Sizing of sanitation systems - Level 2  
 Urban hydrology and calculation of a storm drainage system - Level 1  
 Urban hydrology: modelling of systems - Level 2  
 Alternative techniques: design and sizing  
 Alternative techniques: how to build them?  
 Storm water retention reservoir: design, sizing and maintenance  
 Storm water overflows: design, sizing and operation  
 Rain water treatment  
 Integration of installations into the landscape with a sustainable development approach



### Operation

Regulatory evolutions and sanitation techniques  
 Safety of the personnel working in sewerage systems  
 Work in confined space in sewerage systems  
 Initiation to the operation of sanitation systems  
 Operation of sanitation systems - Module 1  
 Operation of sanitation systems - Module 2  
 Flushing of sewers and sanitation works  
 Knowledge and operation of oil/water separators  
 Levelling in sanitation systems

### Control

Development and control of branching-offs from the sewerage system  
 Leak rate testing in sewerage systems  
 Self-monitoring of sewerage systems: validation and use of measurements  
 Self-monitoring of sewerage systems: implementation  
 Visual inspection of sewerage systems:  
 acceptance of new work and control of existing works - Level 1  
 Visual inspection of sewerage systems:  
 acceptance of new work and control of existing works - Level 2  
 Visual inspection of sewerage systems: specifications and application  
 in patrimonial management



### Diagnostics and strategy

Diagnostics of sewerage systems and master plan

## URBAN WASTEWATER TREATMENT

### Operation

Operation of a wastewater treatment plant - Level 1  
 Safety and hygiene in a wastewater treatment plant  
 Operation of wastewater treatment plants for small communities  
 Activated sludge - Level 2: measurements and diagnostics  
 Activated sludge - Level 2: adjustments  
 Microscopic observation of the separator biomass  
 Activated sludge - Level 3: malfunction  
 Technical management of a wastewater treatment plant  
 Nitrification, denitrification and phosphate removal  
 ISO-14001 certification of sanitation systems  
 Operation of a physico-chemical wastewater treatment plant  
 Operation of membrane bioreactors  
 Operation of biofilters and desodorisation

### Design

Hydraulics applied to the design and sizing of wastewater treatment plants  
 Civil engineering in wastewater treatment plants  
 Design and sizing - Module 1: wastewater treatment plant using activated sludge on a separate system  
 Design and sizing - Module 2: wastewater treatment plant using activated sludge on a combined system  
 Design and sizing - Module 3: treatment for small communities  
 Design and sizing - Module 4: compact treatment processes  
 Participation in the technical acceptance of a wastewater treatment plant using activated sludge

### Quality control

Implementation of self-monitoring of wastewater treatment plants in small communities  
 Operation and maintenance of a self-monitoring system in a wastewater treatment plant



## WASTE AND SLUDGE TREATMENT

Treatment processes and re-use of sludge from wastewater treatment plants  
 Treatment processes and re-use of sludge from wastewater treatment plants in small communities  
 Operation of sludge dewatering systems  
 Digestion of sludge from wastewater treatment plants  
 Sludge re-use in agriculture: regulation, responsibilities and implementation  
 Treatment of sanitation by-products (sludge from wastewater treatment plants not included)



## ON-SITE SANITATION

Microscopic observation of sludge and biomass from septic tanks  
 Maintenance of on-site sanitation systems?: role of the community?  
 Design, sizing and installation of on-site sanitation systems  
 Management of on-site sanitation utilities  
 Diagnostics of sanitation during real estate transactions  
 Management of on-site sanitation: rehabilitation without litigation  
 On-site sanitation for the contractor: technical and regulatory bases  
 Technical control of new on-site sanitation systems  
 Technical control of existing on-site sanitation systems: design and diagnostics of good working order

## BOREHOLES

Protection of drinking water abstraction areas  
 Boreholes  
 Controls by the prime contractor - boreholes  
 Diagnostics, ageing and rehabilitation of a borehole



## PUMPING

Choice and installation of a pump  
 Pumping stations in sewerage systems  
 Water booster pumps: operation and sizing  
 Operation and maintenance of a submerged pump  
 Pumping tests on boreholes  
 Design of pumping stations: Module 1 - civil engineering  
 Design of pumping stations: Module 2 - hydraulic operation



## MAINTENANCE, ELECTRICAL ENGINEERING, AUTOMATION AND REMOTE MANAGEMENT

### Maintenance

Maintenance of current mechanical equipment in wastewater treatment plants  
 Maintenance of pumping stations  
 Maintenance of electric installations  
 Operation and maintenance of industrial programmable logic controllers  
 Use and adjustment of control loops

### Electro-technical engineering

Awareness to the electrical environment  
 Understanding and operating electric installations in water production plants  
 Operation and maintenance of electronic starters and speed variators  
 Programming of industrial automata: initiation  
 Programming of industrial automata: improvement  
 Optimisation of energy consumption in plants  
 Quality of electric power: stakes, diagnostics and solutions  
 Acceptance of electric installations and automated systems  
 Industrial networks and programmable logic controllers

### Remote management

How to use remote management equipment - Initiation  
 Development and maintenance of the new remote management tools

### Renewable energies

Strategy for the use of renewable energies in water production plants  
 Operation and maintenance of production systems using renewable energies



## METROLOGY

Flow metering, water level metering - Level 1  
 Flow metering, pluviometry and sampling - Level 2  
 Operation and maintenance of measurement chains  
 Metrology in plants and systems  
 Operation and maintenance of water quality sensors  
 River hydrometry: the gauger's job





## MANAGEMENT OF UTILITIES

### MANAGEMENT OF WATER SUPPLY AND SANITATION UTILITIES

#### Regulations

Management of utilities: regulatory and legislative background  
Water and urban planning procedures

#### Governance of utilities

Administrative and financial management of utilities  
Sizing and organisation of a water supply utility  
Sizing and organisation of a sanitation utility  
Financial management of public water authorities  
Method for delegating public services  
Control of the delegating of public services  
Performance indicators for water supply utilities  
Performance indicators for sanitation utilities  
ISO-9001 certification of water supply and sanitation utilities  
Managing skills and training plans

#### Customer management

Reception and communication with the users: how to improve practices?  
Customer service: organisation and means  
Customer service: regulations and relations with the users  
Drafting specifications for the purchase of a software for customer management

#### Public contracts

Initiation to public works contracts: water and sanitation  
Management of public works contracts: water and sanitation  
Public works contracts: water production and wastewater treatment plants



### SAFETY OF THE PERSONNEL

Safety of the personnel working in sewerage systems  
Work in confined space in sewerage systems  
Safety when working with chlorine: working with and exchanging chlorine bottles  
Risk prevention on main laying sites  
Safety and hygiene in wastewater treatment plants  
Analysis laboratory: hygiene and safety  
Marking of working sites  
Temporary signalling of working sites

## WATER IN NATURAL ENVIRONMENTS

### GROUNDWATER

Basics of hydrogeology  
Protection of drinking water abstraction areas  
Treatment of polluted groundwater  
Groundwater monitoring: development, follow-up and interpretation of a piezometer network

### RIVERS

#### Management

Plans for water development and management (SAGE): directions for use  
Management plan and river maintenance  
Overall and quantitative hydrology  
Coypu: biology and trapping  
River hydrometry: the gauger's job  
Ecological status of aquatic environments: chemical and physico-chemical aspects  
Freshwater hydrobiology

#### Restoration

Rockfills in rivers  
Follow-up of working sites in rivers  
River restoration, maintenance and development

#### Diagnostics

River diagnostics  
Assessment of the quality of aquatic environments and good ecological status





## WATER USES

### Agriculture

Water and agriculture

### Water body

Design, construction, maintenance and monitoring of water bodies for recreational use

## MONITORING

### Mapping

Introduction to cartographic reference frames on water in France

River mapping

River modelling and GIS

## WATER IN INDUSTRY

### MANAGEMENT, ANALYSES AND CONTROLS

Environmental management in SMEs - SMLs - ISO 14001

Wastewater analyses for self-monitoring

Validity and reliability of analyses of industrial wastewater

Water abstraction and wastewater discharges by industries: legislative and regulatory framework

### PROCESS WATER

Initiation to the techniques used for producing industrial water

Water treatment?: processes and controls

Production of industrial water for agri-food industry

Ion-exchange resins

Boiler water - Cooling water

### TREATMENT OF INDUSTRIAL WASTEWATER

#### Operation

Operation of a biological wastewater treatment plant - Level 1

Operation of a wastewater treatment plant using activated sludge - Level 2

Operation of a physico-chemical wastewater treatment plant (surface treatment not included)

Operation of a sludge and liquid waste methanisation unit

Treatment by membrane bioreactors

#### Sizing

Sizing of wastewater treatment plants using activated sludge in agri-food industry

Zero discharge: evapo-concentration of industrial wastewater

Pollution removal: clean technologies

#### Sludge treatment

Sludge re-use in agriculture: regulations, responsibilities and implementation



### DECONTAMINATION BY SURFACE TREATMENT

Basics in detoxification

Detoxification of wastewater

Operation of a detoxification plant

Design and sizing of detoxification plants

## WEB-TRAINING

Rain water: resources, risks, management and treatment

Water saving and the Water Framework Directive





ENVIRONMENTS  
TECHNIQUES  
USES  
MANAGEMENT



**Communities**

**Suppliers**

**Industrialists**

**Engineering**



**International  
Office  
for Water**

**French National Water Training Centre**  
**Centre National de Formation aux Métiers de l'Eau - CNFME**  
22, rue Edouard Chamberland  
87065 Limoges Cedex  
France  
Tel.: +33 5 55 11 47 00  
Fax: +33 5 55 11 47 01  
Mail: [stages@oieau.fr](mailto:stages@oieau.fr)  
[www.oieau.org/cnfme](http://www.oieau.org/cnfme)

> Commercial Manager

**Pascal BOYER**

Tel. +33 5 55 11 47 70

> Development and International  
Relations Department

**Joseph PRONOST**

Tel. +33 5 55 11 47 04