



# TPS Water Quality Fundamentals Training Course Outline & Details

## Summary

The TPS water quality fundamentals course is designed for people who need to test water quality as part of their role, or at least have exposure to water quality equipment and monitoring. This one day course will result in users with a rich, outcomes-based understanding of water science, sensor technology, accuracy and equipment maintenance. The benefits of this course are:



The course is prepared in accordance with the National Micro-Credentials Framework.

- Reduced confusion around equipment, measurements and maintenance
- Increase in time available for monitoring, less time wasted troubleshooting
- Supporting greater accuracy in results, reduction in rework due to incorrect readings
- Avoid unnecessary costs from mismanaged or damaged equipment
- Staff retention through professional development



## Scope

The training will cover 5 water parameters. pH, Oxidation-Reduction Potential (ORP), Electrical Conductivity (EC), Dissolved Oxygen (DO) and Turbidity. The context for the training will be environmental water with reference to other applications and industries where appropriate. Each parameter will be covered comprehensively from the science right through to the practical hands-on calibration and testing.



## Learning Outcomes

Attendees who complete the training will have a foundational understanding of the science behind each parameter and the technologies of the types of sensors commonly utilised in industry. Building on this base, attendees will be better able to identify erroneous readings and rectify them. Finally, attendees will be able to demonstrate practical competency during equipment setup, cleaning, calibration, testing, troubleshooting and proper storage.



## Assessment Methods

Attendees will be assessed at 10 stages during the course. Attainment of learning will be assessed under two forms, a written questionnaire for the fundamentals and an observation for the practical components for each of the 5 water quality parameters.



## Volume of Learning

Course duration ~6 hours completed in a single day with appropriate breaks.



## Who Is Our Training For?

Our training is ideal for Monitoring Teams, Environmental Scientists, Research Students, Ecologists, Water Consultants, Water Watch coordinators, Treatment Plant Operators and Conservationists.

The industries we support include water treatment, construction, environmental monitoring, water ecology, water watch groups, Local, State, and Federal Government - (both regulation and monitoring), research groups, universities, aquaculture, food and beverage, industrial manufacturing, mining, and mineral processing.



## Pre-requisites

There are no pre-requisites for the course however, the material is intended for individuals who work with water quality testing equipment of all brands or types.

## On the day

- The training will be held indoors at an appropriate venue
- The group size for the training is 10-15 to allow for quality instruction and interaction
- TPS will supply all the equipment and accessories necessary to complete the training
- Attendees are not required to bring anything on the day
- There are no PPE requirements
- Lunch and refreshments will be provided

# Course outline

The course structure will follow this outline.

## pH Fundamentals

### Principles of pH

- Defining pH
- Nernst equation
- Affects of pH
- Various applications for pH

### Sensor Technology

- Different types of sensors (Glass membrane, ISFET)
- Understanding the components of sensors
- How the sensor measures pH

### Accuracy

- Setting expectations and understanding baseline limitations
- The calibration process

### Maintenance

- Proper care and use
- Maintenance requirements
- Proper storage guidelines
- Identifying erroneous readings and their causes



Assessment questionnaire on pH fundamentals

## pH Practical

- Instruction on the use of the equipment



Assessment of practical competency in care, calibration, sampling and good storage practices

# ORP

## Fundamentals

### Principles of ORP

- Defining Oxidation-Reduction Potential
- Nernst equation
- Affects of ORP
- Various applications for ORP

### Sensor Technology

- Different types of sensors
- Understanding the components of sensors
- How the sensor measures ORP

### Accuracy

- Setting expectations and understanding baseline limitations
- The calibration process

### Maintenance

- Proper care and use
- Maintenance requirements
- Proper storage guidelines
- Identifying erroneous readings and their causes



Assessment questionnaire on ORP fundamentals

# OPR

## Practical

- Instruction on the use of the equipment



Assessment of practical competency in care, calibration, sampling and good storage practices

# EC

## Fundamentals

### Principles of EC

- Defining Electrical Conductivity
- Total Dissolved Solids
- Salinity
- Affects of EC
- Various applications for EC

### Sensor Technology

- Different types of sensors (Contact, Torodial)
- Understanding the components of sensors
- How the sensor measures EC

### Accuracy

- Setting expectations and understanding baseline limitations
- The calibration process

### Maintenance

- Proper care and use
- Maintenance requirements
- Proper storage guidelines
- Identifying erroneous readings and their causes



Assessment questionnaire on EC fundamentals

# EC

## Practical

- Instruction on the use of the equipment



Assessment of practical competency in care, calibration, sampling and good storage practices

# DO

## Fundamentals

### Principles of DO

- Defining Dissolved Oxygen
- Quantity vs Percentage
- Affects of Temperature, Salinity, Pressure on DO
- Affects of DO
- Various applications for DO

### Sensor Technology

- Different types of sensors (Polarographic, Optical)
- Understanding the components of sensors
- How the sensor measures DO

### Accuracy

- Setting expectations and understanding baseline limitations
- The calibration process

### Maintenance

- Proper care and use
- Maintenance requirements
- Proper storage guidelines
- Identifying erroneous readings and their causes



Assessment questionnaire on DO fundamentals

# DO

## Practical

- Instruction on the use of the equipment



Assessment of practical competency in care, calibration, sampling and good storage practices



# Turbidity Fundamentals

## Principles of Turbidity

- Defining Turbidity
- Turbidity vs Total Suspended Solids (TSS)
- NTU vs. FNU units
- Effects of Turbidity
- Various applications for Turbidity

## Sensor Technology

- Different types of sensors (Tungsten, LED)
- Understanding the components of sensors
- How the sensor measures Turbidity
- Comparing results from different sensors

## Accuracy

- Setting expectations and understanding baseline limitations
- The calibration process

## Maintenance

- Proper care and use
- Maintenance requirements
- Proper storage guidelines
- Identifying erroneous readings and their causes



Assessment questionnaire  
on Turbidity fundamentals

# Turbidity Practical

- Instruction on the use of the equipment



Assessment of practical competency in care, calibration, sampling and good storage practices



# Course Conclusions



## Micro-Credential Certificate

At the completion of the training, attendees who have passed all the assessments will be issued a micro-credential certificate from TPS stating their attainment of competency.



## Fees

The cost for this comprehensive, one-day intensive course is \$875 ex GST per person.

**Spaces are limited, please register your expression of interest now.**



### Contact

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