

# Wastewater Treatment Technician

## Unit WWTTO03 – Phosphate Removal

This training specification has been developed from the water process trailblazer standard. The specification details the **minimum** training specification, as agreed by industry employers, to deliver the skills and knowledge required to operate and maintain the process of phosphate removal.

The specification details the critical requirement of the activity to carry out the work outlined and does not preclude employers from adding to the skills and knowledge detailed by the specification in their own training programmes.

All work must be carried out to approved procedures and practices and in accordance with statutory health, safety and environmental requirements.

### What does this specification look like?

Wastewater treatment technicians need to be able to:

- PR1 Control the phosphate removal process on wastewater treatment works
- PR2 Optimise the phosphate removal process on the basis of process performance, test results, analysis of trends and legislative requirements
- PR3 Restore the phosphate removal process to normal operation through identification of root cause of faults arising with the processes

### What do I need to take this module?

Candidates to be **assessed** as competent in this area should have successfully completed the modules shown below or have evidence demonstrating an equivalent level of competence.

1. SHEA or equivalent
2. COSHH
3. Wastewater compliance and performance monitoring
4. Primary Settlement Operations
5. Fixed Film Biological Treatment
6. Activated Sludge Process

## Performance Criteria

To achieve this unit, you will need to be able to:

### General Requirements

- P1. Identify the work area to be accessed using company documentation, systems and work instructions
- P2. Select, inspect and wear required PPE in line with company procedures
- P3. Carry out a site specific risk assessment of the work area, identifying the hazards and implementing the control measures required
- P4. Maintain accurate and up to date records
- P5. Report information and data to the designated person

### Task Specific - Phosphate Removal Requirements

- P6. Safely carry out operational and first line maintenance tasks relating to the process and ancillary equipment including removing blockages and fault finding
- P7. Identify and retrieve current data and documentation governing wastewater quality standards applicable to the process
- P8. Identify and locate the phosphate removal processes and associated equipment on the works **and** on the information system e.g. SCADA / HMI
- P9. Identify all mechanical, electrical and instrumentation assets which monitor and control the phosphate removal process on the works **and** on the information system e.g. SCADA / HMI
- P10. Identify and maintain control parameters associated with the phosphate removal process and associated equipment
- P11. Confirm the correct configuration, operation and performance of the phosphate removal process and that they correspond to the information system e.g. SCADA / HMI
- P12. Respond to alarms correctly
- P13. Instigate corrective actions to restore the phosphate removal process to compliant conditions, taking account of process lag time
- P14. Evaluate trend data from the information / SCADA system, tests and / or process performance to identify:
  - a) Normal trends or cycles for the works, and
  - b) Atypical trends or changes and the underlying or root causes for the change
- P15. Optimise the phosphate removal process to efficiently achieve the required parameters
- P16. Complete, record and report associated monitoring to specification, appropriate to the works
- P17. Manage associated chemical dosing systems regarding deliveries, safe storage and quantity to ensure optimum effectiveness of phosphate removal process and downstream wastewater treatment processes

## Knowledge and Understanding

To achieve this unit, you will need to know and understand:

### General Requirements

- K1. The principles of Health, Safety and Environmental legislation in relation to working with wastewater
- K2. The organisation's safety rules, policies and procedures relating to working with wastewater
- K3. The hazards associated with working with wastewater and the correct way to respond to them
- K4. How to select, inspect and use PPE when working with wastewater and chemical dosing for phosphate removal
- K5. How to carry out a site specific risk assessment and identify workplace hazards
- K6. How to respond in the event of an emergency situation in the workplace environment
- K7. How to leave the work area in a safe and secure condition
- K8. The company recording and reporting process

### Task Specific – Phosphate Removal

- K9. How to safely carry out operational and first line maintenance tasks taking into account any systems of work and operating procedures
- K10. The sources of phosphate in sewage
- K11. The impact of phosphate in the aquatic environment
- K12. The legislative requirements for removing phosphate from wastewater
- K13. The chemical differences of phosphates
- K14. The main types of phosphate removal processes available (chemical and biological), their ranges and requirements and the design considerations associated with these
- K15. The chemical reactions involved with the removal of phosphates from wastewater
- K16. The conditions which allow biological removal of phosphate
- K17. How to calculate and select the effective and efficient chemical dosing rates varying conditions
- K18. How to confirm the configuration, operation and performance of the phosphate removal processes and how it corresponds to the information system e.g. SCADA / HMI
- K19. How to interrogate the information system e.g. SCADA / HMI to:
  - a) Identify and control Items of mechanical, electrical and instrumentation equipment
  - b) Evaluate trend data differentiating normal operational cycles from fault conditions
- K20. How to carry out sampling and analysis and control the process based on the results to ensure effective operation of phosphate removal

- K21. How to manage the associated chemical storage facilities to ensure availability of chemical at all times
- K22. The typical problems associated with phosphate removal
- K23. The range of instrumentation used to monitor and control the process and their calibration requirements
- K24. Alarms, action levels, authorisation levels and consequences associated with the process
- K25. Factors which can affect phosphate removal including operational, mechanical, chemical and weather related factors
- K26. How to identify the root cause of phosphate removal problems
- K27. Understand the sequence of actions required to restore the processes to compliant conditions, taking account of all process variables and process lag times
- K28. The consequences of sub-optimal phosphate removal operations on the effluent / subsequent process streams including the consequences of:
  - a) Maintenance
  - b) Deliberate adjustments
  - c) Desludging operations
  - d) Taking a process unit out of service
- K29. The tools used in first line maintenance tasks, their uses and limitations
- K30. Data collection, recording, reporting and maintenance requirements

### How will it be assessed?

To achieve this unit, you will need to be able to provide evidence of the performance criteria and the knowledge and understanding requirements listed above.

Assessment types:

1. External assessment – an external accrediting body will assess against a national minimum standard
2. Internal assessment process – a company led on-going assessment against requirements
3. End-point assessment – see assessment plan for further details here (will be Energy & Utility Skills defined)

### What type of evidence will be expected?

To achieve this unit, you will need to be able to provide evidence of the performance criteria and the knowledge and understanding requirements listed above.

Evidence types:

1. On-going local assessments
  - a) Assessment plan, review, feedback, standard assessment sheets
2. Knowledge based learning
  - a) Classroom, exams, assignments, Q&A sessions, e-learning modules
3. Evidence portfolios
  - a) Learning logs, photos, observation sheets

### Assessment types and process

