Water Process Technician (WPT)

Level 3

Apprenticeship Standard

End-point Assessment (EPA)

Energy & Utilities Independent Assessment Service (EUIAS)

Resource Pack for Employers and Providers

Version 1.0

ENERGY & UTILITIES INDEPENDENT ASSESSMENT SERVICE

Contents

About the Apprenticeship

There are 3 key documents applicable to all apprenticeship standards:

1. Apprenticeship Standard - detailing the knowledge, skills and behaviours of the apprenticeship standard. Available here.

2. Apprenticeship Assessment Plan - detailing the requirements of the end-point assessment. Available here.

3. Education & Skills Funding Agency funding rules - detailing the rules for the public funding of apprenticeships in England. Available here.

Within the WPT Standard, there are five pathways / specialisms to choose from:

1. Water Treatment : Process Technician
2. Water Distribution : Network Technician
3. Water Distribution : Leakage Technician
4. Wastewater : Sewerage Network Technician
5. Wastewater : Treatment Technician

About End-point Assessment

End-point assessment allows an apprentice to demonstrate the required knowledge, skills and behaviours, to complete and achieve their apprenticeship.

It is taken by apprentices at the very end of the on-programme phase of training when their employer (and in some cases their training provider/employer) is satisfied that they have met the “gateway” criteria to undertake the assessment.

To ensure apprentices are assessed consistently and comparably, an independent organisation must be selected by an employer to carry out the end-point assessment of each apprentice. These are end-point assessment organisations.

End-point assessment is graded as defined in the published end-point assessment plan. An apprenticeship certificate is only awarded after end-point assessment is successfully completed.

End-point Assessment Gateway

Each apprenticeship standard and assessment plan details the pre-requisites that every apprentice must have completed before entering the end-point assessment phase of their apprenticeship. This is known as the gateway to end-point assessment.

The employer must conduct a gateway review with the apprentice, supported where appropriate by the provider, who in turn will have a continuing duty of care for the apprentice as they undertake end-point assessment.

To support the Gateway, process the EUIAS have designed a gateway review document to summarise the high level end-point assessment entry requirements and to provide a template to record the results of the gateway and the employer and provider declaration. This is attached as appendix xx. This must be submitted to the EUIAS before apprentices can enter end-point assessment.

Any qualifications that are mandatory for the achievement of the apprenticeship or at gateway must be evidenced as part of this gateway review process. The evidence must be submitted to the EUIAS. A certified copy of required certificate(s) must be attached from the awarding body, a print out of the personal learner record from the Learning Records Service, or a formal transcript of results from the awarding organisation. The responsibility for ensuring acceptable English and mathematics achievement rests with the employer/training provider. More details can be found in the apprenticeship funding and performance management rules available here.

Employers must satisfy themselves that apprentices are ready for their end-point assessment. Apprentices must demonstrate that they meet the following criteria:

- Achieved a minimum level 2 English and mathematics
- Satisfactory completion of the formal training plan agreed with the apprentice by the employer
- Sufficient evidence in the form of a portfolio to allow the apprentice to consistently demonstrate knowledge, skills and behaviours as described in the standard

Although the apprentice should only be recommended for end-point assessment when they are ready, employers should have a remediation process in place to support any apprentice who fails to meet the conditions of the end point assessment.

It is recommended that apprentices are not entered into end-point assessment if they are subject to a live disciplinary or written warning.

End-point Assessment Process

The end-point assessment may be completed over a three month period to accommodate work scheduling and cost effective planning of resources.
Successful achievement of the end-point assessment will lead to final certification of the apprenticeship and demonstrate that the apprentice is a fully competent technician. It uses the following assessment tools:

- Knowledge assessment; independently marked by an assessment organisation (weighting 30%)
- Portfolio assessment, incorporating work log summative assessment and trade test documentation; marked by technical experts usually sourced from the apprentice's employer (weighting 70%)

End-point Assessment Activities

Stage 1- Knowledge Assessment

Apprentices will be required to complete a standardised knowledge assessment that will be administered and marked by an independent assessment organisation. The assessment will enable apprentices to demonstrate knowledge across the Water Process Technician standard - core requirements, as appropriate i.e. Water Treatment, Water Networks, Water Leakage, Wastewater Networks or Wastewater Treatment.

The knowledge assessment will be a multiple-choice paper, containing 50 questions and taken by the apprentice under examination conditions. It will be a maximum of 90 minutes and will be either electronic or paper based question paper. It has a 30% weighting of the final grading.

The questions will be determined and standardised by the Energy & Utilities Independent Assessment Service (EUIAS) in consultation with representative employers.
Apprentices will be questioned against the core technical knowledge elements:

- Relevant industry health and safety standards, regulations, environmental and regulatory requirements
- Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment
- Company policies and procedures including HR, Operations and Health & Safety
- Water industry operations in water and waste water treatment, water and sewerage network operations
- Relevant level of theory and principles that underpin the use of specific equipment, instruments and IT systems
- Testing procedures of equipment and instruments as well as a range of fault finding procedures these are further expanded as detailed on the following page:

Relevant industry health and safety standards and regulations, and environmental and regulatory requirements

- COSHH
- Asbestos awareness
- Working at height
- First aid
- Risk assessment
- PPE
- H&S signage
- Isolation procedures
- Working time directive
- Reporting accidents/incidents
- Manual handling
- RIDDOR
- Confined space

Maintenance practices, processes and procedures covering a range of waste and water systems, plant and equipment

- Types of maintenance
- Isolation procedures
- Specifications
- Signs and symbols
- Process control
- Alarms and trips
- Relevant mathematical calculations
- Calibration/certification
- Testing
- Legislation

Company policies and procedures including HR, Operations and Health & Safety

- COSHH
- Asbestos awareness
- Working at height
- First aid
- Risk assessment
- PPE
- H&S signage
- Isolation procedures
- Working time directive
- Reporting accidents/incidents
- Manual handling
- RIDDOR
- Confined space
- Asset security

Water Industry operations in water and waste water treatment, water and sewerage network operations (based on their specific pathway within WPT)

Water Treatment

- Raw Water Operations
- Water Quality requirements
- Works design, flows, hydraulic theories, principles and calculations
- Disinfection
- Treated water Storage
- Screening
- Coagulation
- Clarification
- Filtration
- Taste and odour removal
- Reporting accidents/incidents
- Waste streams and treatment
- Distribution system protection

Water Distribution Network Technician

- Regulatory performance measures
- Water Quality requirements
- Valve and hydrant operations
- Network assets and design
- Network performance monitoring
- Water Quality sampling
- Location and avoidance of underground apparatus
- Pressure management
- NRSWA
- Leakage detection operations
- Water fittings regulations
- Data logging operations
- Materials used in clean water networks
- Customer side leakage
- Access to private land
- Rehabilitation and renewal
- Flow and hydraulics theories, principles and calculations

Water Distribution Leakage Technician

- Regulatory performance measures
- Water Quality requirements
- Network assets and design
- Valve and hydrant operations
- Location and avoidance of underground apparatus
- NRSWA
- Leakage detection operations
- Water fittings regulations
- Data logging operations
- Materials used in clean water networks
- Customer side leakage
- Access to private land
- Rehabilitation and renewal
- Flow and hydraulics theories, principles and calculations

Wastewater (sewerage) Network Technician

- Regulatory reporting and performance measures
- Sewerage networks assets and design
- Pollution reporting
- Incident response including flooding and blockages
- Regulations relating to network installation and alteration
- Access to private land
- Jetting operations and best practice
- CCTV operations including industry standard coding
- Location and avoidance of underground apparatus
- NRSWA
- Flow and hydraulics theories, data and calculations

Wastewater Treatment Technician

- Wastewater compliance and performance monitoring
- Sewage pumping station operations
- Works design, flow separation, hydraulic theories, principles and calculations
- Screenings and grit removal
- Primary settlement operations
- Biological treatment (all including fixed film and ASP)
- Sludge storage, treatment and transportation
- Odour management
- Incident support and pollution reporting
- Phosphate removal

Relevant level of theory and principles that underpin the use of specific equipment, instruments and IT systems

- Sampling and testing methods, procedures and equipment
- Theories and principals of fault finding and problem solving
- Relevant calculations
- Process measurement equipment
- Legislation and reporting requirements
- Process control equipment

Testing procedures of equipment and instruments as well as a range of fault finding procedures

- Sampling and testing methods, procedures, and equipment
- Theories and principles of fault finding and problem solving
- Types of maintenance
- Maintenance procedures
- Inspection
- Signs and symbols
- Tools and equipment

Apprentices will be advised to carry out revision across all subject areas in advance of the knowledge assessment.

A pass will be a minimum of 70% with a distinction for this element awarded to those with 90% or above.

The outcome of the knowledge assessment will be submitted to the final decision panel.

Stage 2 - Trade Test & Portfolio Assessment

Trade Test

Apprentices will complete a practical assessment known as 'trade test' in the last three months, providing the opportunity to synoptically demonstrate core and specific knowledge, skills and behaviours. The WPT trade tests comprise of 3 parts, 2 of which are mandatory and a third part which will be randomly allocated.

The apprentice will need to apply the appropriate principles, procedures and knowledge and explain what and why they are undertaking a particular approach.

They will be expected to select and use the appropriate equipment and tools, protect themselves and others from potential harm that can arise from their work, while ensuring other processes on site continue to function; effectively and efficiently maintaining production.

Water Treatment Technicians can expect to be assessed on the following:
Two mandatory parts which are:

1) Correct monitoring and operation of the disinfection process
2) On site testing to ensure water quality compliance
3) A random element from the tests listed a – g below (dependent on the specific site processes operated
    a. Raw water services operations
    b. Correct monitoring and operation of chemical dosing
    c. Correct monitoring and operation of clarification and settlement
    d. Correct monitoring and operation of filtration
    e. Correct monitoring and operation of treated water storage
    f. Correct monitoring and operation of waste streams
    g. Correct monitoring and operation of advanced water treatment

Water Distribution Network Technicians can expect to be assessed on the following:
Two mandatory parts which are:

1) Setting out and removing signing, lighting and guarding
2) Customer visit
3) A random element from the tests listed a – f below (dependent on the role of the individual)
    a. Location and avoidance of underground apparatus
    b. Operating a valve or hydrant safely and with due diligence
    c. Sampling and testing for chlorine and turbidity
    d. Sampling and testing for bacteriological analysis
    e. Identify and prove customer side leakage
    f. Set up temporary loggers (flow and/or pressure)

Water Distribution Leakage Technicians can expect to be assessed on the following:
Two mandatory parts which are:

1) Setting out and removing signing, lighting and guarding
2) Customer visit
3) A random element from the tests listed a – i below (dependent on the role of the individual)
    a. Location and avoidance of underground apparatus
    b. Operating a valve or hydrant safely and with due diligence
    c. Sampling and testing for chlorine and turbidity
    d. Sampling and testing for bacteriological analysis
    e. Identify and prove customer side leakage
    f. Set up temporary loggers (flow and / or pressure)
    g. Leakage detection operations
    h. Step test
    i. Access, download and interpret data from permanent loggers

Wastewater (Sewerage) Network Technicians can expect to be assessed on the following:
Two mandatory parts which are:

1) Setting out and removing signing, lighting and guarding
2) Customer visit
3) A random element from the tests listed a – g below (dependent on the role of the individual)
    a. Carry out CCTV inspection
    b. Carry out jetting of a sewer
    c. Inspection and maintenance of CSO's
    d. Trace and locate drain / sewer
    e. Trace and locate sewer defect / blockage
    f. FOG survey
    g. Misconnection / pollution tracing

Wastewater Treatment Technicians can expect to be assessed on the following:
Two mandatory parts which are:

1) Effluent compliance
2) Biological treatment – based on the treatment processes most commonly operated by the by the apprentice either:
    a) Check and ensure the correct operation of ASP or
    b) Check and ensure the correct operation of fixed film biological treatment
3) A random element from the tests listed a – i below (dependent on the specific site processes operated)
    a. Check and ensure correct operation of screens
    b. Check, inspect and confirm flow separation
    c. Correct monitoring and operation of settlement processes
    d. Process performance monitoring
    e. Lift, inspect and unblock submersible pump
    f. Check and ensure correct operation of chemical dosing

g. Check and ensure correct operation of sludge settlement and storage
h. Check and ensure the correct operation of mechanical sludge thickening or dewatering
i. Check and ensure correct operation of sludge digestion

The assessment organisation will develop and hold a bank of trade tests covering core and specific requirements. Standardised documentation will be used to outline the test requirements, assessment criteria and to record decisions. An approved test will be released to the apprentice's employer on application, to be completed in the specified end-point period. Trade tests will be administered and marked by a technical expert, which may or may not be the same person as the technical expert who undertakes the portfolio review.

The test will be awarded a pass or fail.

The assessment report on the trade test must be included in the apprentice's portfolio

Portfolio Assessment

The apprentice will submit a portfolio consisting of a work log typically developed during the last two years of the apprenticeship, together with documentation from a trade test completed in the final three months.

The portfolio provides the opportunity to demonstrate knowledge, skills and behaviours across the standard - core and specific requirements. The portfolio will be marked by a technical expert, using standardised criteria and documentation; recording coverage against the standard, highlighting any performance above or below and awarding a preliminary mark out of 100.

Work Log

As the apprentice progresses through their training, they should build up evidence on the full range of knowledge, skills and behaviours required by the standard and be assessed on particular tasks or procedures or items of equipment

The work log must be sufficient to evidence the apprentice can apply knowledge, skills and behaviours required in a variety of tasks. Progress review documentation should also be included. The apprentice's supervisor will typically support the development of the work log in accordance with company policy and procedures, although the assessment organisation will provide guidance on the content of the work log.

As part of the end-point assessment, a technical expert will review the apprentice's work log and undertake a summative assessment of competence against the standard's knowledge, skills and behaviours:

Water Treatment Technicians will need to demonstrate they can:

- Monitor and Maintain water treatment processes e.g. chemical dosing, filtration and disinfection
- Operate, control and maintain process control equipment and instrumentation
- Find the root cause of faults and ensure they are communicated and resolved
- Carry out risk assessments and check method statements applicable to site operations
- Control Operations on their treatment works including work in confined spaces
- Use water treatment theories and principles to ensure processes are maintained at optimum performance.
- Use treatment works design specifications to control treatment works and monitor the performance of their works
- Ensure vital safety equipment is maintained and available for use
- Carry out process stream and full treatment works shutdown as required by routine planned maintenance and emergencies
- Implement emergency procedures on your treatment works.

Water Distribution Network Technicians will need to demonstrate they can:

- Analyse and Assess network performance measures e.g. water pressure, flows and leakage.
- Investigate and identify resolutions to network performance issues
- Apply procedures and their control measures to the network to minimise the risk of supply interruptions to customers
- Maintain network, equipment and systems including pumps and control valves
- Where required act as Supervisor of Street Works, ensuring the safety of pedestrians, vehicles and site staff.
- Use technical knowledge to operate electronic location equipment to identify and locate underground cables
- Use hydraulic theories and principles to carry out fault diagnosis on water networks
- Plan network operations ensuring water mains and water service pipe couplings and method are suitable for use
- Authorise valve operations on water networks in accordance with operations and maintenance strategies and procedures.
- Carry out valve operations giving due consideration to impact on customers, ensuring continuity of supply and minimising water quality problems.
- Implement emergency procedures on your treatment works.

Water Distribution Leakage Technicians will need to demonstrate they can:

- Work safely in a variety of work locations that may include urban and rural areas on and off the public highway and may include remote locations
- Using technical knowledge identify areas that require further investigation due to leakage deciding on the most appropriate methods to identify and locate sources of leakage.
- Using technical knowledge operate electronic location equipment, identify and locate underground water mains and services.
- Use hydraulic theories, principles and carry out valve operations to set-up, test, maintain or alter district meter areas
- Use industry principles and measurement to estimate volumes of water lost through leakage
- Programme, deploy, retrieve and interpret data from data logging equipment
- Apply procedures and their control measures to the network to minimise the risk of interruption of supplies to

Wastewater (Sewerage) Network Technicians will need to demonstrate they can:

- Use hydraulic theories, data and calculations from flow surveys to assess sewer capacity and performance.
- Operate electronic location equipment to locate drains and sewers
- Where required act as Supervisor of Street Works, ensuring the safety of pedestrians, vehicles and site staff
- Carry out sewer network inspections, including new sewer connections
- Respond to customer reported incidents, clear blockages
- Work safely in a variety of work locations that may include urban and rural areas on and off the public highway and may include remote locations
- Conduct Confined Spaces Operations and ensure equipment is maintained to the required standard
- Where required, supervise and inspect excavations and backfilling including trench support systems
- Organise and carry out maintenance operations including High Pressure Water Jetting, flushing and de- silting
- Organise and carry-out investigations utilising CCTV equipment and report using industry standard coding system
- Plan work to take account of risks to the environment

Wastewater Treatment Technicians will need to demonstrate they can:

- Use waste water treatment theories and principles to ensure processes are maintained at optimum performance
- Operate & maintain process control equipment and instrumentation
- Maintain Sewerage systems, including associated control systems
- Maintain Sewer Pumping Stations and associated equipment

- Control the operations on your sites to ensure Environmental Quality Standards for effluent discharge and air quality are met
- Control Operations on your treatment works including work in confined spaces
- Monitor and maintain waste water treatment processes including screening, grit removal, settlement, biological treatment and sludge treatment
- Identify the root cause of faults and ensure they are communicated and resolved
- Use treatment works design specifications to control treatment works and monitor the performance of your works
- Ensure safety equipment is maintained and available for use
- Carry out process stream and full treatment works shutdown as required by routine planned maintenance and emergencies
- Implement emergency procedures on treatment works
- Organise and control maintenance operations on treatment works equipment

The evidence in the work log should be based around quality rather than quantity and therefore apprentices and mentors alike should ensure that the evidence added to the portfolio is accurate and of good quality for tasks of a complex nature and not those that would be considered simple and/or routine.

The selected tasks should also cover a wide range of work-based activities identified in the core skills and specific requirements of the apprentice's pathway. These may include, but are not limited to:

- Follow and apply current Health, Safety & Environmental legislation, regulations, practices and procedures
- Personal responsibility to comply with current and relevant industry standards and regulations
- Follow Company policies and procedures including HR, Operations & Health & Safety.
- Conduct day to day operations to maintain clean tap water and/or effective removal and treatment of waste water
- Work on customer/company premises demonstrating care and respect to customers and colleagues
- Undertake testing procedures of equipment, instruments and IT systems
- Analyse and interpret faults on systems, equipment, instruments and IT systems and implement effective solutions
- Carry out risk assessments, including lone worker procedures
- Drive vehicles equipped with tools and materials to other sites as required
- Use a variety of appropriate communication methods to interact with others to give/receive information accurately, in a timely, positive and professional manner
- Complete reports and ensure records are maintained for audit and reporting purposes
- Work with focus and clear purpose in all weather conditions, covering 24/7 operations, sometimes working alone and safely adapt working methods to reflect changes in working environments

Review the individual pathway standard and/or the WPT Portfolio Guidance document or more detail.

Grading Criteria

The apprenticeship will be graded fail, pass and distinction. The final grade will be determined by collective performance in the end-point assessment's two assessment tools.

A points system will determine if the apprentice has achieved a pass or distinction and is described below:

- Pass - minimum 2 points (1 point portfolio + 1 point knowledge assessment)
- Distinction - minimum 8 points and maximum 10 points

Minimum combinations:

- Portfolio 5 points + 3 points knowledge assessment = 8 points
- Portfolio 6 points + 2 points knowledge assessment = 8 points
- Portfolio 7 points + 1 point knowledge assessment = 8 points

Portfolio %	Points	Grade	Knowledge Assessment %	Points	Grade
<69	0	Fail	<69	0	Fail
70	1	Pass	70 - 79	1	Pass
71 - 74	2	Pass	80 - 89	2	Pass
75 - 79	3	Pass	90 - 100	3	Distinction
80 - 84	4	Pass	-	-	-
85 - 89	5	Distinction	-	-	-
90 - 94	6	Distinction	-	-	-
95 - 100	7	Distinction	-	-	-