



Arrangements for:
HNC Water Operations
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Acknowledgement

SQA acknowledges the valuable contribution that Scotland's colleges have made to the development of Higher National qualifications.

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1 Introduction

This is the Arrangement Document for the revised Group Award in HNC Water Operations, which was validated in November 2008. This document includes: background information on the development of the Group Award, its aims, guidance on access, details of the Group Award structure, and guidance on delivery.

The revised HNC Water Operations (G979 15) replaces the predecessor award HNC Water Operations with Management (G03H 15).

2 Rationale for the revision of the Group Award

This is a revised award of the predecessor award of HNC Water Operations with Management. Management remains an area of study within the award, however, the new title more accurately reflects the balance of the competencies in the award.

These are the main findings of the market research and consultation process carried out with candidates, employers and higher education establishments.

- ◆ *Water Distribution, Supervision and Management, and Waste Water* need some revision. The revision in each case is an updating to reflect technical, legislative and business developments which have taken place since the validation of the existing HNC.
- ◆ They all indicated that professional body recognition of the HNC was important.
- ◆ Core Skills were seen as important but the main emphasis was on development of them rather than assessment.
- ◆ In general the existing course was regarded as valuable and useful.
- ◆ The course matches their needs as employers in general terms.
- ◆ A major revision or significant revision to *Water/Wastewater Quality, Water Industry Organisation, Supervision and Management* and *Water Distribution*. Some of these new areas have been incorporated into the course within the details of the Unit Specifications.
- ◆ Professional body recognition of the HNC was important.
- ◆ A written examination and project as forms of assessments were important and should be continued.

The new award reflects changes in legislation, technical advances and organisational changes within the industry. An emphasis has been placed on membrane filtration within *Water Treatment* for example and the legislation relating to *Water Quality* has been updated. In *Distribution* much more emphasis is placed on identification and control of leakage and the *Water Organisation* Unit has been altered to incorporate recent business and organisational changes.

3 Aims of the Group Award

3.1 General aims of the Group Award

- 1 To enable candidates to develop their knowledge and skills relating to the Water Industry in order to make a more effective contribution to the business needs.
- 2 To enable progression within the SCQF.
- 3 To develop study and research skills.
- 4 To prepare candidates to progress to HE and membership of industry professional bodies, eg Institute of Water Officers.

3.2 Specific aims of the Group Award

- 5 Provide candidates with an understanding of the water industry in relation to water operations in terms of collection, treatment and distribution of water.
- 6 Provide candidates for an understanding of wastewater in terms of collection, treatment and disposal.
- 7 To provide candidates with an understanding of the legislative and regulatory context under which water operations are controlled.
- 8 To provide candidates with an understanding of the organisation and management of the water industry in the UK.

3.3 Target groups

Prospective candidates' industrial involvement ranges over the whole spectrum of the industry:

- ◆ Operative
- ◆ Manager
- ◆ Team Leaders
- ◆ Graduates
- ◆ Customer Services
- ◆ Technicians
- ◆ Lab Assistants

3.4 Employment opportunities

The HNC Water Operations is primarily a course aimed at employees of the water industry and contractors to the water industry. The course provides a broad understanding of the various functions of the water industry. Candidates could come from a wide range of roles within the industry, and on completion of the course can gain promotion within the water industry eg from operative to team leader or team leader to manager.

- ◆ Operative
- ◆ Manager
- ◆ Team Leader
- ◆ Customer Services
- ◆ Technicians
- ◆ Lab Assistants

4 Access to Group Award

This Group Award has to cater for a variety of different learner requirements and aspirations. The qualification has been designed to ensure that there are opportunities to develop the skills to meet the needs of employers in the water industry and also to provide a platform from which learners might progress to further study.

Access to this award is at the discretion of the centre, however, the award is primarily intended for employees of the water industry. The learning activities require significant access to water industry installations and therefore, ideally, course participants should be employed within water industry activities. Prospective participants should be able to provide evidence either by formal qualifications or by other means, such as proven relevant industrial experience, that they can benefit from undertaking this award.

Formal qualifications

For HNC, admission to the 1st year should normally be open to applicants in possession of:

- ◆ An appropriate collection of SQA National Units or SVQ/NVQs (eg SVQ (2 or 3) or SCQF 5)
- ◆ City and Guilds of London Institute Water Industry Certificate
- ◆ Alternative qualification(s) at least equivalent to the above
- ◆ Applications from those without any of the above qualifications but who have significant work experience in an appropriate role within the water industry and for whom the centre identifies as having a realistic expectation of attaining the award
- ◆ Any other qualification which demonstrates that the prospective candidate has attained a Core Skills profile that will allow them to benefit from taking this award

Work experience

It is preferable if candidates are currently employed or have been employed in the water or wastewater or related industries.

In the case of employees, entry to the course should be subject to agreement with the employer.

Core Skills

It is preferable if candidates possessed the following Core Skills:

Core Skill or component	SCQF level
Communication	4
Using Numbers	4
IT	4
Problem Solving	4
Working with Others	4

Candidates who have English as an additional language

In the case of candidates where English is a second language, then an IELTS level of 5.5 should have been attained.

Where appropriate, centres may wish to conduct a Core Skills profile of certain prospective candidates should they not possess formal qualifications to demonstrate attainment in Core Skills.

Guidance on Open Learning

Research has indicated that it is important to retain face to face contact with the candidates and opportunities for networking with other water industry personnel. In the event of any centre wishing to deliver this course on a fully open learning basis, then it would be highly desirable that prospective candidates have access to water industry installations and work experience to enable them to undertake this course.

5 Group Award structure

5.1 Framework

For a candidates to achieve the HNC Water Operations the must attain **all** of the mandatory Units (88 SCQF credit points/11 SQA credits), including one Graded Unit at SCQF level 7 (8 SCQF credit points/1 SQA credit).

Unit title	Code	SCQF credit points	SCQF level	SQA credit value
Water Operations: Water Resources	F53S 34	12	7	1.5
Water Operations: Water Quality Management	F53R 34	12	7	1.5
Water Operations: Water Treatment Processes	F53T 34	12	7	1.5
Water Operations: Water Distribution	F53N 34	12	7	1.5
Water Operations: Waste Water Treatment Processes	F53M 34	12	7	1.5
Water Operations: Materials & Components	F53L 34	12	7	1.5
Water Operations: Water Industry Structure & Organisation	F53P 34	8	7	1
Supervision & Management	D5MT 34	8	7	1
Water Operations: Graded Unit	F5GJ 34	8	7	1

The Graded Unit for this award is a Project. The choice of project reflects the core areas of the water industry and the value meets the requirements of the industry consultation. The Graded Unit covers the main operational areas of the course and encompasses the Units of *Water Resources*, *Water Treatment*, *Water Distribution* and *Waste Water Treatment*. This will benefit both students and employers in terms of the multifunctional aspects of the business.

In addition to the recognised five Core Skills, this award requires candidates to be able to manage their time and organise their activities

All Core Skills are signposted in the individual Units. Core Skills mapping to individual mandatory Units is shown in Appendix 4. The following table shows the potential Core Skills achievement for candidates taking the mandatory Unit.

Core Skills	Desired entry level	Anticipated exit level
Communication	4	Signposted at SCQF level 6
Numeracy	4	Signposted at SCQF level 5
IT	4	Signposted at SCQF level 5
Problem Solving	4	Signposted at SCQF level 6
Working with Others	4	Signposted at SCQF level 6

5.2 Mapping information

Water industry employers have identified a need to ensure that the water industry is able to access and develop a sustainable competent workforce to facilitate cross functional working. The industry is developing, with Energy and Utility Skills and industry regulators, a framework based on National Occupational Standards for 'competent operators' which all UK water undertakers have agreed to adopt. The flexibility of the framework allows for 'off site' academic training to develop workplace learning.

Most of the subject areas in this award will have been introduced to students who have studied S/NVQ levels 2/3. It is important to show the links with existing National Occupational Standards and hence the new framework, to demonstrate how the HNC assists in developing and progressing current and future industry training needs.

Mapping of aims to Units see Appendix 1.

Mapping of Core Skills to Group Award see Appendix 2.

National Occupational Standards relevant to this award see Appendix 3.

Mapping of National Occupational Standards to Units See Appendix 4.

5.3 Articulation, professional recognition and credit transfer

Possession of the HNC Water Operations will provide access to the part-time, supported distance learning programme leading to the BSc degree in Environmental Protection at De Montfort University. The HNC generally in Scotland is recognised by many HE institutions as providing a qualification to access degree level study in 1st year or 2nd year in appropriate courses of higher education.

It is recommended that candidates who are in the process of completing the predecessor award complete it rather than switching to the revised award. However there may be occasions when it is not possible for candidates to complete the existing award eg where they were unable to complete their studies due to ill health or difficulties with their employer and where the centre has gone on to offer the new award and only one or two Units need to be completed. In these cases it is recommended that the suggested credit transfer arrangements given in Appendix 4 be considered.

Completion of this qualification would allow candidates to join the Institute of Water Officers, however, they must also be working in the water industry.

6 Approaches to delivery and assessment

Content and context

The program could be delivered on a part time basis over a two year period, ie 1st year and 2nd year. This might consist of 10 x 2 day tutorial visits per year including an Induction Day and Examination Day. The tutorials could be delivered at approximate six week intervals.

Mode of delivery

It is intended that this qualification should be delivered as much as possible with reference to actual industry practices and processes. With this in mind, it is highly desirable in some Units and essential in others for candidates to have access to water industry installations and systems.

Sequence of delivery

The programme may be delivered on a part-time basis and a logical sequence of delivery is detailed below. Although the Graded Unit is assessed at the end, it is delivered throughout the duration of the programme, concurrently with other Units.

Unit title

- 1 Water Resources
- 2 Water Treatment
- 3 Water Quality Management
- 4 Engineering Materials and Components
- 5 Water Distribution
- 6 Wastewater Treatment
- 7 Water Industry Structure and Organisation
- 8 Supervision and Management
- 9 Graded Unit

Delivery methods

Tutorial delivery methods include a variety of teaching methods which will enhance the learning experience, including face to face tutorials, field trips, group discussion and work, networking candidates industrial experience and expertise, visiting industry specialists, work related project activities etc.

Assessment strategy

Assessment will in the main be conducted on a continuous basis through coursework, normally over a 2 year period. There will be two examinations in the form of one multiple choice and one extended response paper. The Graded Unit will give an opportunity to provide an integrated piece of work in the form of a project covering the four key Units of the programme. Work for the Graded Unit will take place over the duration of the course and will be staged to allow candidates to progress. This will give opportunities for guidance towards successful completion of the Unit.

Integration opportunities

There is an opportunity to integrate the assessment between the Units, eg *Water Resources* and *Water Treatment* and there are also opportunities within the Graded Unit.

Re-assessment

Graded Unit

The candidate's work will be monitored on a regular basis per subject submission in the form of draft copies of their work and support will be offered to them on an on-going basis. In the case of any candidate not attaining the requirements of an assessment they will be given the opportunity to re-submit another entire project at a later date. The project brief can be the same, however, in the case of total failure of the Graded Unit, candidates would need to select a different subject (eg different water treatment works) for their new project.

Unit assessment

Unit reassessment will be available and will be done in line with college and SQA Guidelines and procedures.

7 General information for centres

Disabled candidates and/or those with additional support needs

The additional support needs of individual candidates should be taken into account when planning learning experiences, selecting assessment instruments, or considering whether any reasonable adjustments may be required. Further advice can be found on our website www.sqa.org.uk/assessmentarrangement.

Internal and external verification

All instruments of assessment used within this Group Award should be internally verified, using the appropriate policy within the centre and the guidelines set by SQA.

External verification will be carried out by SQA to ensure that internal assessment is within the national guidelines for these qualifications.

Further information on internal and external verification can be found in *SQA's Guide to Assessment and Quality Assurance for Colleges of Further Education* (www.sqa.org.uk).

8 General information for candidates

Aims of the Group Award

The HNC Water Operations is intended primarily for those wishing to further their career in the UK Water Industry. The Qualification Design Team have developed the programme with the flexibility to allow candidates to study whilst still in employment. You will be given direction, which will provide you with a firm understanding of the organisation, operations and management of water and wastewater, and an opportunity to study specialist areas essential to the Water Industry. The eight mandatory Units of this qualification cover the principal operational areas of the water industry such as Water Resources, Water Quality and Treatment, Distribution and Wastewater Treatment. This is in line with the industry's drive to become multifunctional. By achieving the individual Unit competencies you will become a useful, adaptable employee within the UK water industry, able to contribute to the success and prosperity of the water company/authority or contractor.

Successful completion of this award will give you the opportunity to progress to higher education with De Montfort University in Leicester. Holders of the HNC Water Operations certificate will be able to access the BSc Environmental Protection program which is available on a distance study basis.

Typical candidates

This qualification is primarily intended for those employed in the water industry or involved in contracting or consultancy, across the entire spectrum of operational areas of the water industry, eg customer services, networks, treatment operatives, lab technicians, administration, planning and human resources.

For admission to the course you would normally be in possession of one of the following:

- ◆ An appropriate collection of SQA National Units or SVQ/NVQs (eg SVQ (2 or 3) or SCQF 5)
- ◆ City and Guilds of London Institute Water Industry Certificate
- ◆ Alternative qualification(s) at least at equivalent level to the above
- ◆ Any other qualification which demonstrates that you have attained a Core Skills profile that will allow you to have a realistic expectation of attaining the award.

However, applications are welcome from those without any of the above qualifications but who have significant work experience in an appropriate role within the water industry and who can be identified as being ready to undertake the qualification.

What level of study is involved?

It is anticipated that this qualification will require approximately 480 hours of study. Typically, this can be achieved within two academic years allowing four to five hours of study per week. You will have to successfully complete twelve credits over the nine mandatory Units to achieve the HNC qualification.

The content of each Unit will be delivered through a series of tutorials, site visits and activities. Tutor/student guidance sessions should also be set up to support candidates through the programme to build their confidence and monitor progress.

During the learning process your skills in the following areas will be developed:

- ◆ Organising
- ◆ Communicating
- ◆ Researching
- ◆ Problem solving
- ◆ Working and co-operating with others

The main topics of study are:

- ◆ Water Resources
- ◆ Water Treatment
- ◆ Water Quality
- ◆ Water Distribution
- ◆ Engineering Materials/Components
- ◆ Wastewater
- ◆ Water Industry Organisation

Unit and Graded Unit assessment styles

Each individual Unit in the qualification is assessed, although some or parts of Units may be assessed in an integrated way. The individual Units are assessed by a combination of assignments and an integrated end examination.

The Graded Unit is assessed by an integrated project which pulls together the skills and knowledge of the four key Units of *Water Resources*, *Water Treatment*, *Distribution* and *Wastewater*. This is undertaken on an ongoing basis over the duration of the course.

You will be expected to hand in work to meet specified deadlines, which are an essential element of the assessment process. You must achieve at least a pass mark in all assessments in the specified timescale to achieve this award.

9 Glossary of terms

SCQF: This stands for the Scottish Credit and Qualification Framework, which is a new way of speaking about qualifications and how they inter-relate. We use SCQF terminology throughout this guide to refer to credits and levels. For further information on the SCQF visit the SCQF website at www.scqf.org.uk

SCQF credit points: One HN credit is equivalent to 8 SCQF credit points. This applies to all HN Units, irrespective of their level.

SCQF levels: The SCQF covers 12 levels of learning. HN Units will normally be at levels 6–9. Graded Units will be at level 7 and 8.

Subject Unit: Subject Units contain vocational/subject content and are designed to test a specific set of knowledge and skills.

Graded Unit: Graded Units assess candidates' ability to integrate what they have learned while working towards the Units of the Group Award. Their purpose is to add value to the Group Award, making it more than the sum of its parts, and to encourage candidates to retain and adapt their skills and knowledge.

Dedicated Unit to cover Core Skills: This is a non-subject Unit that is written to cover one or more particular Core Skills.

Embedded Core Skills: This is where the development of a Core Skill is incorporated into the Unit and where the Unit assessment also covers the requirements of Core Skill assessment at a particular level.

Signposted Core Skills: This refers to the opportunities to develop a particular Core Skill at a specified level that lie outwith automatic certification.

Qualification Design Team: The QDT works in conjunction with a Qualification Manager/Development Manager to steer the development of the HNC/HND from its inception/revision through to validation. The group is made up of key stakeholders representing the interests of centres, employers, universities and other relevant organisations.

Consortium-devised HNCs and HNDs are those developments or revisions undertaken by a group of centres in partnership with SQA.

Specialist single centre and specialist collaborative devised HNCs and HNDs are those developments or revisions led by a single centre or small group of centres who provide knowledge and skills in a specialist area. Like consortium-devised HNCs and HNDs, these developments or revisions will also be supported by SQA.

10 Appendices

Appendix 1: Mapping of aims to Units

Appendix 2: Core Skills mapping of a Group Award

Appendix 3: National Occupational Standards relevant to this Group Award

Appendix 4: Mapping of National Occupational Standards to Units

Appendix 5: Credit transfer arrangements

Appendix 1: Mapping of aims to Units

Group Award title: HNC Water Operations

Unit No	Unit Name	Aim 1	Aim 2	Aim 3	Aim 4	Aim 5	Aim 6	Aim 7	Aim 8
F53S 34	Water Operations: Water Resources	X	X	X	X	X			
F53T 34	Water Operations: Water Treatment Processes	X	X	X	X	X			
F53R 34	Water Operations: Water Quality Management	X	X	X	X	X	X	X	
F53N 34	Water Operations: Water Distribution	X	X	X	X	X			
F53M 34	Water Operations: Waste Water Treatment Processes	X	X	X	X		X		
F53L 34	Water Operations: Materials and Components	X	X	X	X	X	X		
F53P 34	Water Operations: Water Industry Structure and Organisation	X	X	X	X				X
D5MT 34	Supervision & Management	X	X	X	X				X
F5GJ 34	Water Operations: Graded Unit	X	X	X	X	X	X	X	

Appendix 2: Core Skills mapping of a Group Award

Group Award title: HNC Water Operations

		Communications		Numeracy		Information technology	Problem solving			Working with others
Unit No	Unit name	Oral	Written	Using Graphical Information	Using Number	Using IT	Critical Thinking	Planning & Organising	Reviewing & Evaluating	WWO
F53S 34	Water Operations: Water Resources	S6	S6		S5	S5	S6	S6	S6	S6
F53T 34	Water Operations: Water Treatment Processes		S6			S5	S5			
F53R 34	Water Operations: Water Quality Management	S6	S6			S5	S6	S6	S6	S6
F53N 34	Water Operations: Water Distribution		S6	S5	S5	S5	S6	S6	S6	S6
F53M 34	Water Operations: Waste Water Treatment Processes		S6			S5	S6	S6	S6	S6
F53L 34	Water Operations: Materials and Components		S6			S5	S5	S5	S5	
F53P 34	Water Operations: Water Industry Structure and Organisation	S6	S6	S5	S5	S5	S5	S5	S5	
F5GJ 34	Water Operations: Graded Unit		S6	S5	S5	S5	S6	S6	S6	S6

Enter SCQF level and S for signposted and C for certificated

Appendix: 3 National Occupational Standards relevant to this award

1 Distribution Control

- Operate safely on the distribution network
- Carry out valve operations
- Determine location of water loss
- Cleanse water mains
- Disinfect water mains
- Carry out simple sampling

2 Leakage Detection and Control

- Determine leakage detection methods and techniques in response to water loss
- Resolve leakage related issues
- Implement and validate leakage control

3 Treatment Process Operations

- Monitor and maintain the quality of treatment processes
- Receive, store and handle processing chemicals
- Receive and store sludge for processing
- On-site sampling
- On-site storage
- Samples and measurements for quality assurance

4 Sewerage Maintenance

- Restore sewers and ancillaries to an appropriate condition
- Carry out inspection and operational maintenance of sewers and ancillaries
- Prepare resources and segregate the area of site

5 Maintain Water Supply Network

- Carry out operational planning for network activities
- Develop an understanding of techniques for minimum disruption of the distribution network during operational activities
- Maintain budgetary and regulatory requirements for network activities

6 Water Fittings Regulations / Byelaws / Enforcement

- Secure compliance with water fittings regulations / byelaws

Appendix 4: Mapping of National Occupational Standards to Units
Group Award title: HNC Water Operations

Unit No	Unit name	1	2	3	4	5	6
F53S 34	Water Operations: Water Resources	X	X				
F53T 34	Water Operations: Water Treatment Processes			X			
F53R 34	Water Operations: Water Quality Management			X		X	
F53N 34	Water Operations: Water Distribution	X	X				X
F53M 34	Water Operations: Waste Water Treatment Processes				X		
F53L 34	Water Operations: Materials and Components						X
F53P 34	Water Operations: Water Industry Structure and Organisation	X	X	X	X	X	
F5GJ 34	Water Operations: Graded Unit	X	X	X	X	X	

Appendix 5: Credit transfer arrangements

Old Unit	New Unit code	Comments
A79C 04 The Measurement & Control of Water and Waste Water Quality	F53R 34 Water Operations: Water Quality Management	Yes
A79H 04 Water Treatment Processes	F53T 34 Water Operations: Water Treatment Processes	Yes
A79B 04 Water Industry Organisation & A79B041 Related Activities	F53P 34 Water Operations: Water Industry Structure & Organisation	Yes
A79D04 Water Resources	F53S 34 Water Operations: Water Resources	Yes
D5PY04 Water Industry Materials & Components	F53L 34 Water Operations: Materials & Components	Yes
A79G04 Water Distribution Function & Operation	F53N 34 Water Operations: Water Distribution	Yes
A79E04 Waste Water Collection & Treatment	F53T 34 Water Operations: Waste Water Treatment	Yes

These credit transfer arrangements should be regarded as guidelines and centres should bear in mind that the award has been revised to update the skills and knowledge required in the water industry and related employers.