



Established in terms of Act 58 of 1995

SOUTH AFRICAN QUALIFICATIONS AUTHORITY (SAQA)

In accordance with regulation 24(c) of the National Standards Bodies Regulations of 28 March 1998, the Standards Generating Body (SGB) for

Civil Engineering and Construction

Registered by NSB 12, Physical Planning and Construction, publishes the following qualifications and unit standards for public comment.

This notice contains the titles, fields, sub-fields, NQF levels, credits, and purpose of the qualification and unit standards upon which qualifications are based. The full qualification and unit standards can be accessed via the SAQA web-site at www.saqa.org.za. Copies may also be obtained from the Directorate of Standards Setting and Development at the SAQA offices, Hatfield Forum West, 1065 Arcadia Street, Hatfield.

Comment on the unit standards should reach SAQA at the address ***below and no later than 26 April 2004***. All correspondence should be marked **Standards Setting – SGB Civil Engineering and Construction** and addressed to

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JOE SAMUELS

Director: Standards Setting and Development

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Qualification Title:	National Certificate in Wastewater Reticulation Services
NQF Field:	Physical Planning and Construction - NSB 12
Sub-field:	Civil Engineering Construction
Level:	2
Credit:	128
Issue date:	
Review date:	

Rationale of the Qualification

As a result of past legacies many practitioners within the water sector were denied advancement and possible recognition as qualified tradesmen. Both employers and employees in the water sector have expressed the critical need for technical, skills based Qualifications for those working with the provision of wastewater reticulation systems. The introduction of a National Certificate in Wastewater Reticulation Services based on Unit Standards will allow learners the opportunity to reach their full potential of advancement without formal education becoming an impassable barrier and will also allow for the recognition of prior learning. This Qualification reflects the need of employers and employees both now and for the future. This Qualification provides learners with horizontal access to the National Certificate in Water Reticulation Services (NQF 2) and the National Certificate in Wastewater Process Operations (NQF 2), as there is a degree of flexibility, in terms of Unit Standards that appear in all three Qualifications. This will enable learners to pursue different careers within the water sector, enhance productivity and employability within the water sector and contribute towards the ecological sustainability and improvement of the water environment.

Purpose of the Qualification

The Qualification will provide the learner with the knowledge and skills to work in a wastewater reticulation services department or as a utility leader attending to the construction and operation of wastewater reticulation systems. Qualifying learners are able to:

- Apply health and safety legislation in the workplace;
- Plan work tasks;
- Operate in a team;
- Use power hand tools effectively;
- Read and interpret maps and drawings;
- Identify pipes, associated fittings and valves in a wastewater reticulation system;
- Join pipes and install associated fittings;
- Lay pipes for a wastewater reticulation system:

- Operate and maintain a wastewater reticulation system.

The scope of the Qualification provides a range of opportunities from large-scale urban conditions to small, rural community situations. This Qualification forms the foundation for advancement to the National Certificate in Wastewater Reticulation Services on NQF level 3 and will also lay the foundation for future career advancement across similar trades within the sector. The individual will have the capacity to advance and gain skills and self-respect, as the qualified learner will be able to competently fulfil wastewater reticulation contracts safely and professionally to ensure that industry standards are maintained. This Qualification has been developed to assist with standardisation across the wastewater reticulation industry.

Access to the Qualification

As this is a Unit Standard based Qualification, learners will have equal access provided that the learner meets the requirements for the learning assumed to be in place for each Unit Standard. Learners entering the wastewater reticulation field are advised to complete the General Education and Training Certificate: Water NQF level 1 as an overview and introduction to the sector. The completion of this certificate will enable the learner to develop foundational and life skills at NQF Level 1.

Learning assumed to be in place

A knowledge, comprehension and application of language and mathematics at NQF level 1.

Exit level Outcomes

On achieving this Qualification the qualifying learner will be able to:

Exit level 1: Plan and organise tasks and resources needed for tasks.

Associated Assessment Criteria

- Tasks are planned and prioritised.
- Work schedules or job cards are prepared.
- Materials requirements needed for the completion of stated tasks are determined.
- Labour and equipment requirements for the completion of stated tasks are determined.
- Transportation of resources to working location is arranged.

Exit level 2: Join and lay pipes and install connections.

Associated Assessment Criteria

- knowledge of pipe types, associated fittings and valves is demonstrated.
- pipes, associated fittings and valves are stored.
- Trenches are excavated safely
- Pipes are joined and associated fittings and connections are installed.
- The wastewater reticulation system is tested

Exit level 3: Use and maintain appropriate power hand tools in a wastewater reticulation context.**Associated Assessment Criteria**

- All relevant tools used on wastewater reticulation systems are identified.
- Tools are used effectively and for the correct purpose
- Tools are clean and maintained according to specifications.

Exit level 4: Operate and maintain a wastewater reticulation system effectively.**Associated Assessment Criteria**

- Maps and engineering drawings related to wastewater reticulation systems are read and interpreted.
- Knowledge of the materials used for construction and maintenance of wastewater reticulation systems is demonstrated.
- Pipeline systems are constructed and repaired.
- New or existing pipeline systems are constructed or maintained.

Exit level 5: Demonstrate knowledge of occupational health & safety.**Associated Assessment Criteria**

- Knowledge of occupational health & safety is demonstrated.
- Personal health, hygiene and presentation in the working environment is maintained according to the Occupational Health and Safety Act.
- Skills relevant to construction, maintenance and operation of wastewater reticulation systems appropriately are applied.

Exit level 6: Demonstrate interactive and communication skills.**Associated Assessment Criteria**

- The learner interacts with work colleagues, management and customers
- Communication skills are used to interact in a meaningful way with colleagues and customers
- A range of generic skills are used as a foundation for learning.
- The learner communicates effectively with others in both learning and work-oriented situations.

International comparability

The core and elective components have been developed taking into account South Africa's unique context. The working group has been unable to find any international wastewater reticulation Qualifications in America, Australia, Britain or Scotland against which to benchmark the Unit Standards. The working group did find a water Qualification in New Zealand, but it is combined Water and Wastewater and is therefore not really comparable. The fundamental components, reflecting

foundational learning and generic skills and knowledge have been derived from registered, local adult education Unit Standards.

Integrated Assessment

Integrated assessment at the level of Qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across Unit Standards to achieve competence that is grounded and coherent in relation to the purpose of the Qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to explain the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed, and the nature and level of the Qualification. The ratio between action and interpretation is not fixed, but varies according to the demands of the Qualification.

While the generic component (literacy, communication and life skills) of this Qualification at NQF Level 2 can be assessed through occupational contexts and activities relating to wastewater reticulation, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are truly portable. The primary aim of this Qualification is to ensure that learners have a sound base of general education to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills such as language, computation and learning skills etc across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place. Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Any learner wishing to be directly assessed may arrange to do so, without attending further-training or education. The assessor and learner will decide together on the most appropriate assessment route to be taken.

Articulation possibilities

This Qualification will allow a person to articulate vertically to the National Certificate in Wastewater Reticulation Services at NQF level 3. This Qualification will also provide articulation with a range of Qualifications in both technical and management areas in wastewater, water reticulation and other related sectors.

Criteria for registration of assessors

For an applicant to register as an assessor, the applicant needs:

- A minimum of two years practical, relevant occupational experience.
- Declared competent in all the outcomes of the generic assessor standard, and certificated by the relevant ETQA or by any other ETQA that has signed a memorandum of understanding (MoU).
- Detailed documentary proof of educational Qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence).
- Able to demonstrate competence in relation to these specified standards and Qualifications, at or above, the level of the Qualifications in question.
- Meet any other additional requirements laid down by their constituent ETQA.

The subject matter experience of the assessor can be established by recognition of prior learning.

The status of registered assessors can be checked on the appropriate ETQA database or website.

Moderation

Anyone assessing a learner against these standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these Unit Standards or will assess these Unit Standards must be accredited as a provider with the relevant ETQA.

Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant Qualification and the agreed ETQA procedures. Therefore anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

A note on the compilation of standards in this Qualification

In line with the SAQA principle of avoiding duplication, existing registered standards were used where possible.

A note on the definition of wastewater reticulation

Wastewater reticulation in this context refers to the entire pipe network.

National Certificate in Wastewater Reticulation Services
NQF Level 2 (128 credits)

FUNDAMENTAL			CORE			ELECTIVE		
Compulsory 40 credits	L	C	Compulsory 80 credits	L	C	Select a minimum of 8 credits	L	C
Demonstrate understanding of rational and irrational numbers, and number systems, within the context of relevant calculations (8982)	2	3	Demonstrate Knowledge Of Water Cycle, Water And Wastewater Systems (12033)	2	5	Perform Basic Building Works (11782)	3	8
Use mathematics to investigate and monitor the financial aspects of personal and community life (7469)	2	2	Demonstrate Knowledge of Wastewater Systems	1	3	Render Basic First Aid (9995)	2	3
Apply basic knowledge of statistics in order to investigate life and work related problems (14085)	2	3	Orientate Self In The Workplace (12036)	2	6	Operate A Wastewater Pump Station	3	12
Measure, estimate and calculate physical quantities and explore, describe and represent geometrical relationships in 2-dimensions in different life or workplace contexts (12444)	2	3	Apply Personal Safety Practices In The Water Sector (12035)	2	4	Connect A Customer Sewerage System To A Public Wastewater System	3	7
Work with a range of patterns and functions to solve problems (8963)	2	5	Operate In A Team (Registered)	2	4	Operate, Maintain and Provide Technical Support For On Site Sanitation Systems	3	8
Maintain and adapt oral communication (8962)	2	5	Read And Interpret Maps And Engineering Drawings of Water Reticulation Systems (14024)	2	4	Operate A Personal Computer (7547)	2	6
Access and use information from texts (8963)	2	5	Use and Maintain Power Hand Tools On A Construction Site (12878)	1	5			
Write for a defined context (8964)	2	5	Demonstrate Knowledge Of Pipes, Associated Fittings And Valves Used In Wastewater Reticulation Systems	2	10			
Use Language and Communication in Occupational learning programmes (8967)	2	5	Plan Team Work Functions And Complete Reports (14019)	3	4			
Demonstrate an understanding of HIV/AIDS and its implications (8494)	2	4	Join Pipes And Install Associated Fittings	3	10			
			Lay Pipes For A Wastewater Reticulation System	3	10			
			Operate And Maintain A Wastewater Reticulation System	3	15			
Total credits on level 2	2	40	Total credits on level 2		33			
Total credits	2	40	Total credits		80	Total credits		44

National Certificate in Wastewater Reticulation Services NQF 2**UNIT STANDARDS ON NQF LEVEL 1**

The learner must achieve all of the following Unit Standards.

Title 1: Demonstrate Knowledge Of Wastewater Systems

UNIT STANDARDS ON NQF LEVEL 2

The learner must achieve all of the following Unit Standards.

Title 1: Demonstrate Knowledge Of Pipes, Associated Fittings And Valves Used In Wastewater Reticulation Systems

UNIT STANDARDS ON NQF LEVEL 3

Title 1: Join Pipes And Install Associated Fittings

Title 2: Lay Pipes For A Wastewater Reticulation System

Title 3: Operate And Maintain A Wastewater Reticulation System

Title 4: Operate A Wastewater Pump Station

Title 5: Connect A Customer Sewerage System To A Public Wastewater System

Title 6: Operate, Maintain And Provide Technical Support For On Site Sanitation Systems

Unit Standards And Specific Outcomes For The National Certificate In Wastewater Reticulation Services NQF 2

UNIT STANDARDS ON NQF LEVEL 1

1. TITLE: DEMONSTRATE KNOWLEDGE OF WASTEWATER SYSTEMS
- Specific outcome 1.1: Explain the purpose of a wastewater system.
- Specific outcome 1.2: Discuss different types of sanitation systems.
- Specific outcome 1.3: Explain the principles and elements of a gravity wastewater system.
- Specific outcome 1.4: Identify the elements of a wastewater pumping system on site.
- Specific outcome 1.5: Identify and explain the purpose of wastewater maintenance equipment.

UNIT STANDARDS ON NQF LEVEL 2

1. TITLE: DEMONSTRATE KNOWLEDGE OF PIPES, ASSOCIATED FITTINGS AND VALVES USED IN WASTEWATER RETICULATION SYSTEMS
- Specific outcome 1.1: Identify and explain different pipe sizes, classes and types used in wastewater reticulation systems.
- Specific outcome 1.2: Identify and explain the characteristics of associated fittings in wastewater reticulation systems.
- Specific outcome 1.3: Identify and explain the types and functions of valves used on wastewater reticulation systems.
- Specific outcome 1.4: Store pipes, associated fittings and valves.

UNIT STANDARDS ON NQF LEVEL 3

1. TITLE: JOIN PIPES AND INSTAL ASSOCIATED FITTINGS
- Specific outcome 1.1: Identify safety risks and implement safety procedures.
- Specific outcome 1.2: Secure, lift and lower pipes and associated fittings.
- Specific outcome 1.3: Join similar pipe types.
- Specific outcome 1.4: Join different pipe types.
- Specific outcome 1.5: Install associated fittings.

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2. TITLE: LAY PIPES FOR A WASTEWATER RETICULATION SYSTEM
- Specific outcome 2.1: Check relevant resources are available on site in accordance with work plan.
- Specific outcome 2.2: Excavate trenches safely.
- Specific outcome 2.3: Install shoring.
- Specific outcome 2.4: Lay the pipeline.
- Specific outcome 2.5: Connect and test the system.
- Specific outcome 2.6: Complete final backfill and construction work.
3. TITLE: OPERATE A WASTEWATER PUMP STATION
- Specific outcome 3.1: Identify and explain pumps.
- Specific outcome 3.2: Comply with safety procedures in pump station.
- Specific outcome 3.3: Operate pumping system.
- Specific outcome 3.4: Provide basic maintenance for pumps.
- Specific outcome 3.5: Maintain and repairs valves in a pumping system.
- Specific outcome 3.6: Service drive-units of pumps.
4. TITLE: CONNECT A CUSTOMER SEWERAGE SYSTEM TO A PUBLIC WASTEWATER SYSTEM
- Specific outcome 4.1: Plan work and prepare work site for wastewater connection.
- Specific outcome 4.2: Set out work site and excavate to required levels.
- Specific outcome 4.3: Lay and joint pipes and connect to sewer connecting points.
- Specific outcome 4.4: Inspect connection laid by others to ensure compliance with work procedures.

5. TITLE: OPERATE, MAINTAIN AND PROVIDE TECHNICAL SUPPORT FOR ON SITE SANITATION SYSTEMS

Specific outcome 5.1: Explain different on site sanitation systems.

Specific outcome 5.2: Advise on application of new on site sanitation system.

Specific outcome 5.3: Monitor the construction of on site sanitation system.

Specific outcome 5.4: Operate and maintain on site sanitation system.

6. TITLE: OPERATE AND MAINTAIN A WASTEWATER RETICULATION SYSTEM

Specific outcome 6.1: Identify cause and scope of faults in a wastewater reticulation system.

Specific outcome 6.2: Communicate effectively with customers.

Specific outcome 6.3: Complete repairs on wastewater rising mains.

Specific outcome 6.4: Clear obstructions in a wastewater gravity system.

Specific outcome 6.5: Repair wastewater gravity system.

Specific outcome 6.6: Conduct preventative maintenance procedures.

Specific outcome 6.7: Demonstrate contamination prevention methods in wastewater operations.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

Qualification Title: Further Education and Training Certificate in Supervision of Wastewater Reticulation Operations NQF Level 4

NQF Field: Physical Planning and Construction - NSB 12

Sub-field: Civil Engineering Construction

Level: 4

Credit: 149 credits

Issue date:

Review date:

Rationale of the Qualification

This Qualification reflects the needs of the wastewater reticulation sector, both now and in the future, for a general skills pool. This Qualification is intended for a supervisor and will include working as a leader and supervising several wastewater reticulation teams including resources and equipment. Once having gained this competence, learners may choose to develop further management competences or specialise in water specific Qualifications.

This Qualification is intended for those with prior work experience or the NQF3 Qualification in wastewater reticulation or an equivalent. The prospective candidate for this Qualification may be a person who is entering the work place or who has been working in the workplace with limited formal wastewater reticulation supervisory competence.

The Qualification gives accessibility and flexibility to the learner and to the employed. The level of flexibility reflects the multiple job roles, organisational requirements and changing technological nature of the industry and at the same time it allows the individual to work towards a nationally recognised Qualification. This will enable learners to pursue different careers within the water sector, enhance productivity and employability within the water sector and contribute towards the ecological sustainability and improvement of the water environment.

Purpose of the Qualification

The National Certificate in Supervision of Wastewater Reticulation Operations (NQF level 4) will prepare learners to function independently in a supervisory capacity. This Qualification focuses on the full development of the learner and further mobility and transportability within the water sector. The Qualification will provide the learner with the knowledge and skills to supervise a wastewater reticulation services department attending to the construction and operations of a wastewater reticulation system. Qualifying learners are able to:

- Supervise teams of people;
- Supervise health and safety practices in the workplace;

- Plan, organise and supervise the implementation of work tasks on a wastewater reticulation system;
- Complete administrative tasks;
- Handle a range of customer complaints; and
- Monitor the departmental budget

This Qualification forms the foundation for advancement to management Qualifications within the sector and will also lay the foundation for future career advancement across similar trades. For those who have been in the workplace for a long time, this Qualification can be used in the recognition of prior learning to recognise workplace skills acquired without the benefit of formal education and training.

This Qualification has been developed to assist with standardisation across the wastewater reticulation industry. The individual will have the capacity to advance and gain skills and self-respect, as the qualified learner will be able to work in a professional manner, to ensure that industry standards are maintained.

Access to the Qualification

As this is a Unit Standard based Qualification, learners will have open access provided that the learner meets the requirements for the learning assumed to be in place for each Unit Standard. The achievement of the National Certificate For Water Reticulation Services NQF level 3 will assist with progression and access to the Qualification. It is not considered essential to have achieved the National Certificate in Wastewater Reticulation at level 3.

Learning assumed to be in place

A knowledge, comprehension and application of language and mathematics at NQF level 3. Candidates will be required to demonstrate competence in all the core Unit Standards described in the National Certificate For Wastewater Reticulation Services at NQF level 3.

Exit level Outcomes

On achieving this Qualification the qualifying learner will be able to:

Exit level 1: Demonstrate supervisory skills.

Associated Assessment Criteria

-
- Staff is supervised and developed within own scope of responsibility
- Staff is supervised to achieve work objectives
- Interaction with staff, work colleagues, customers and management is achieved satisfactory
- Conflict within own scope of responsibility is handled
- Technology is used appropriately to achieve objectives

Exit level 2: Demonstrate administrative skills required on a wastewater treatment works.

Associated Assessment Criteria

- Skills relevant to a wastewater reticulation context appropriately are applied
- Administrative skills required in the workplace are demonstrated
- An ability to prioritise administrative tasks to facilitate an efficient flow of documentation is demonstrated

Exit level 3: Demonstrate planning and organising skills.**Associated Assessment Criteria**

- Knowledge of the development and review of action plans and year plans is demonstrated
- Knowledge of staff development plans is demonstrated
- Staff is developed in accordance with development plans
- Knowledge of all reports and forms required in the workplace and their completion is demonstrated

Exit level 4: Implement and control construction, operation and maintenance tasks.**Associated Assessment Criteria**

- Teams are briefed on tasks and the availability of the required resources is ensured
- Construction, operation and maintenance tasks are supervised in accordance with legislation and work policies and procedures
- Check completion of construction, operation and maintenance tasks
- Supervise health and safety practices in the workplace

Exit level 5: Demonstrate financial control within own department.**Associated Assessment Criteria**

- Analyse and prioritise cash flow needs of different disciplines to determine budget percentage allocation
- Allocate available budget based on identified needs
- Monitor the budget by checking income and expenditure at regular, appropriate intervals
- Maintain effective and accurate records of financial expenditure in accordance with work policies and procedures.
- Obtain authorisation for any modifications to agreed budgets during the accounting period
- Provide feedback regularly to relevant role players.

Exit level 6: Deal with customers.**Associated Assessment Criteria**

- Customers complaints are identified and responded to in an appropriate manner
- correct solution to customers' problems are planned, organised and provided
- Effectively communication with all relevant stakeholders with regard to customer problems is maintained
- Practical business solutions to customer problems are provided

International comparability

The core and elective components have been developed taking into account South Africa's unique context. The working group has been unable to find any international wastewater reticulation Qualifications in America, Australia, Britain or Scotland against which to benchmark the Unit Standards. The working group did find a water Qualification in New Zealand, but it is combined Water and Wastewater and is therefore not comparable. The fundamental components, reflecting foundational learning and generic skills and knowledge have been derived from registered, local adult education Unit Standards.

Integrated Assessment

Integrated assessment at the level of Qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across Unit Standards to achieve competence that is grounded and coherent in relation to the purpose of the Qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to explain the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed, and the nature and level of the Qualification. The ratio between action and interpretation is not fixed, but varies according to the demands of the Qualification.

While the generic component (literacy, communication and life skills) of this Qualification at NQF Level 4 can be assessed through occupational contexts and activities relating to wastewater reticulation, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are truly portable. The primary aim of this Qualification is to ensure that learners have a sound base of general education to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills such as language, computation and learning skills etc across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place. Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Any learner wishing to be directly assessed may arrange to do so, without attending further training or education. The assessor and learner will decide together on the most appropriate assessment route to be taken.

Articulation possibilities

This Qualification has been developed for mobility across similar trades within the industry and is intended to allow for further learning towards management certificates or diplomas within this sector or other sectors on NQF level 5 or 6. This Qualification will provide articulation with a range of Qualifications in both technical and management areas.

Criteria for registration of assessors

For an applicant to register as an assessor, the applicant needs:

- A minimum of two years practical, relevant occupational experience.
- Declared competent in all the outcomes of the generic assessor standard, and certificated by the relevant ETQA or by any other ETQA that has signed a memorandum of understanding (MoU).
- Detailed documentary proof of educational Qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence).

- Able to demonstrate competence in relation to these specified standards and Qualifications, at or above, the level of the Qualifications in question.
- Meet any other additional requirements laid down by their constituent ETQA.

The subject matter experience of the assessor can be established by recognition of prior learning. The status of registered assessors can be checked on the appropriate ETQA database or website.

Moderation

1. Anyone assessing a learner against these standards must be registered as an assessor with the relevant ETQA.
2. Any institution offering learning that will enable achievement of these Unit Standards or will assess these Unit Standards must be accredited as a provider with the relevant ETQA.
3. Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant Qualification and the agreed ETQA procedures.
4. Therefore anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

Notes

A note on the compilation of standards in this Qualification

In line with the SAQA principle of avoiding duplication, existing registered standards were used where possible.

A note on the definition of wastewater reticulation

Wastewater reticulation in this context refers to the entire pipe network.

Further Education and Training Certificate in Supervision of Wastewater Reticulation Operations

NQF Level 4 (149 credits)

FUNDAMENTAL		CORE				ELECTIVE		
Compulsory 70 credits	L	C	Compulsory 69 credits	L	C	Select a minimum of 10 credits	L	C
Use mathematics to investigate and monitor the financial aspects of personal, business, and national issues (7468)	4	6	Supervise Personal Safety Practices In The Water Sector (12061)	4	4	Conduct CCTV Pipe Inspections	4	8
Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems (9015)	4	6	Lead And Supervise Construction Teams (14417)	4	8	Operate Telemetric and Electronic Equipment and Scientific Instrumentation (12066)	4	12
Measure, estimate and calculate physical quantities and explore, critique and prove geometrical relationships in two and three-dimensional space in the life and workplace of the adult with increasing responsibilities (12417)	4	4	Plan And Organise Construction, Operation And Maintenance Of A Wastewater Reticulation System.	4	8	Demonstrate Basic Knowledge Of Different Types Of Trenchless Technologies in Water and Wastewater Environment	5	8
Engage in sustained oral communication and evaluate spoken texts (8974)	4	5	Implement And Control Construction, Operation And Maintenance Tasks On A Water Reticulation System (14025)	4	12	Demonstrate Sound Environmental Practices In Wastewater Operations	4	7
Use language and communication in occupational learning programmes (8979)	4	5	Demonstrate Knowledge of The Principles Of Hydraulics (12059)	4	6			
Read, analyse and respond to a variety of texts (8975)	4	5	Demonstrate Knowledge Of Corrosion Control (12341)	5	7			
Write for a wide range of contexts (8976)	4	5	Handle A Range of Customer Complaints (10025)	4	4			
Accommodate audience and context needs in oral communication (level 3) (8968)	3	5	Demonstrate Knowledge and Operation of Mechanical and Electrical Systems (12058)	4	5			
Interpret and use information from text (8969)	3	5	Perform Site Administration Functions (14425)	4	10			
Write texts for a range of communicative contexts (8970)	3	5	Apply The Budget Function In A Business Unit (13941)	4	5			
Use language and communication in occupational learning programmes (8973)	3	5						
Demonstrate Knowledge of and Produce Computer Spreadsheets using Basic Functions (7572)	2	3						
Operate Personal Computer Systems (7547)	2	6						
Produce word processing documents for business (7570)	3	5						
Total credits on level 4		36	Total credits on level 4		62			
Total credits		70	Total credits		69	Total credits		35

Further Education and Training Certificate in Supervision of Wastewater Reticulation Operations NQF Level 4

UNIT STANDARDS ON NQF LEVEL 4

- Title 1: Plan And Organise Construction, Operation And Maintenance Of A Wastewater Reticulation System.
- Title 2: Conduct CCTV Pipe Inspections
- Title 3: Demonstrate Sound Environmental Practices In Wastewater Operations

UNIT STANDARDS ON NQF LEVEL 5

- Title 1: Demonstrate Basic Knowledge Of Different Types Of Trenchless Technologies in Water and Wastewater Environment

Unit Standards And Specific Outcomes For The Further Education and Training Certificate In Wastewater Reticulation Services NQF 4

1. TITLE: PLAN AND ORGANISE CONSTRUCTION, OPERATION AND MAINTENANCE OF A WASTEWATER RETICULATION SYSTEM.

- Specific outcome 1.1: Prepare and review action plans.
- Specific outcome 1.2: Prepare and review year plan.
- Specific outcome 1.3: Communicate with relevant stakeholders.
- Specific outcome 1.4: Brief work teams on daily tasks.

2. TITLE: CONDUCT CCTV PIPE INSPECTIONS

- Specific outcome 2.1: Plan for CCTV inspections.
- Specific outcome 2.2: Inspect and prepare site.
- Specific outcome 2.3: Carry out inspections.
- Specific outcome 2.4: Re-instate work site.
- Specific outcome 2.5: Complete reports including recommendations.

3. TITLE: DEMONSTRATE SOUND ENVIRONMENTAL PRACTICES IN WASTEWATER OPERATIONS

- Specific outcome 3.1: Explain the harmful effects of wastewater spillage on the environment.
- Specific outcome 3.2: Demonstrate contamination prevention methods in wastewater operations.
- Specific outcome 3.3: Demonstrate remedial techniques regarding wastewater spillages.
- Specific outcome 3.4: Demonstrate knowledge of odours and remedial techniques in wastewater systems

Unit Standards And Specific Outcomes at NQF 5

1. TITLE: DEMONSTRATE BASIC KNOWLEDGE OF DIFFERENT TYPES OF TRENCHLESS TECHNOLOGIES IN WATER AND WASTEWATER ENVIRONMENT

- Specific outcome 1.1: Explain trenchless technologies.
- Specific outcome 1.2: Explain the preparation for the execution of trenchless technologies.
- Specific outcome 1.3: Identify potential problems that may occur during execution and recommend solutions
- Specific outcome 1.4: Evaluate and recommend the optimal solution for a specific application.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY



Qualification Title: National Certificate in Wastewater Reticulation Services
NQF Level 3

NQF Field: Physical Planning and Construction - NSB 12

Sub-field: Civil Engineering Construction

Level: 3

Credit: 120

Issue date:

Review date:

Rationale of the qualification

Many people working within the wastewater reticulation sector have no formal qualification in wastewater reticulation, yet they are required to lead small teams of people out into the field to install, operate and maintain wastewater reticulation systems in a range of contexts. Whereas the National Certificate In Wastewater Reticulation Services at NQF level 2 will provide all the operational skills required to provide wastewater reticulation services, the National Certificate In Wastewater Reticulation Services at NQF level 3 will prepare the operators to investigate problems on a wastewater reticulation system, consider environmental issues, operate more complex equipment and function more independently in the work place.

Having a qualification and unit standards at this level will make the framework of wastewater reticulation qualifications more flexible and accessible and enable candidates to obtain recognition for their knowledge and experience. It will also enable providers to structure training programmes in accordance with nationally recognised standards.

Candidates who obtain the National Certificate In Wastewater Reticulation Services at NQF level 3 will be able to progress to the supervisory qualification at NQF level 4. The achievement of the wastewater level 4 qualification will give them access to higher qualifications in the field of water or management qualifications.

Purpose of the qualification

The qualification will provide the learner with the knowledge and skills to work in a wastewater reticulation services department as a team leader or junior supervisor. Qualifying learners are able to:

- Supervise a team;
- Operate and maintain a wastewater pump station;
- Investigate problems on a wastewater reticulation system;
- Demonstrate knowledge of wastewater treatment processes;
- Operate and maintain on site sanitation systems;
- Connect customer sewerage systems to a public wastewater systems;

- Provide customer service; and
- Perform general office administrative tasks

This qualification forms the foundation for advancement to the National Certificate in Supervision of Wastewater Reticulation Services on NQF level 4 and will also lay the foundation for future career advancement across similar trades and to other supervisory qualifications within the sector.

For those who have been in the workplace for a long time, this qualification can be used in the recognition of prior learning to recognise workplace skills acquired without the benefit of formal education and training. For the new entrant this qualification describes the learning outcomes required to effectively participate in a structured workplace. For education and training providers this qualification provides guidance for the development of relevant training programmes and assessment material.

This qualification has been developed to assist with standardisation across the wastewater reticulation industry. The individual will have the capacity to advance and gain skills and self-respect, as the qualified learner will be able to work in a professional manner, to ensure that industry standards are maintained.

Access to the Qualification

As this is a unit standard based qualification, learners will have open access provided that the learner meets the requirements for the learning assumed to be in place for each unit standard. The achievement of the National Certificate For Water Reticulation Services NQF level 2 will assist with progression and access to the qualification. It is not considered essential to have achieved the National Certificate For Wastewater Reticulation at level 2.

Learning assumed to be in place

A knowledge, comprehension and application of language and mathematics at NQF level 2. Candidates will be required to demonstrate competence in all the core unit standards described in the National Certificate For Wastewater Reticulation Services at level 2.

Exit level Outcomes

On achieving this qualification the qualifying learner will be able to:

Exit level 1: Lead and supervise a small team of workers.

Associated Assessment Criteria

- Knowledge of the principles of team work is demonstrated
- The team is briefed on tasks to be completed
- The team is led in a manner which ensures the achievement of tasks in accordance with work and safety standards
- Effective working relationships with team members are maintained
- Problems associated with team members are identified and solved
- Communication skills are used to interact in a meaningful way with work colleagues, team members, customers and management

Exit level 2: Plan and organise tasks in an effective manner and complete administrative tasks.

Associated Assessment Criteria

- Tasks are planned and prioritised.
- Work schedules or job cards are prepared.

- Materials, labour and equipment requirements are determined for the completion of stated tasks
- Administration tasks are completed and accurate records are kept

Exit level 3: Operate and maintain a wastewater pump station.

Associated Assessment Criteria

- Wastewater pumps are identified and explained
- Wastewater pumps are operated in accordance with safety procedures
- basic maintenance for wastewater pumps and valves is provided
- Drive units on wastewater pumps are serviced
- Problems associated with wastewater pumps are identified and solved

Exit level 4: Investigate and rectify problems on a wastewater reticulation system.

Associated Assessment Criteria

- Elementary hydraulics on a wastewater reticulation system are explained.
- Potential faults on a wastewater system are identified
- Faults and abnormal sewer flows on a wastewater reticulation system are investigated.
- Problems in a wastewater reticulation system are rectified in accordance with safety procedures and report back is provided on action taken
- Customer service is provided in accordance with work procedures
- Wastewater treatment processes and the impact of poor, faulty wastewater reticulation on wastewater treatment processes are explained.

Exit level 5: Supervise the procurement, use and storage of materials used for wastewater reticulation tasks

Associated Assessment Criteria

- Relevant construction materials and resources are procured
- Construction materials and resources are received, checked and stored
- Construction materials and resources are issued and reconciled.
- The use of materials and resources is supervised when completing wastewater reticulation tasks

Exit level 6: Operate and maintain on site sanitation systems.

Associated Assessment Criteria

- Different on site sanitation systems are explained
- Consumers are advised on suitable on site sanitation options based on site and environmental conditions and operation and maintenance costs
- The construction of on site sanitation systems is monitored
- On site sanitation systems, including the identification and rectification of problems are operated and maintained

International comparability

The core and elective components have been developed taking into account South Africa's unique context. The working group has been unable to find any international wastewater reticulation qualifications in America, Australia, Britain or Scotland against which to benchmark the unit

standards. The working group did find a water qualification in New Zealand, but it is combined Water and Wastewater and is therefore not really comparable. The fundamental components, reflecting foundational learning and generic skills and knowledge have been derived from registered, local adult education unit standards.

Integrated Assessment

Integrated assessment at the level of qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across unit standards to achieve competence that is grounded and coherent in relation to the purpose of the qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to explain the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed, and the nature and level of the qualification. The ratio between action and interpretation is not fixed, but varies according to the demands of the qualification.

While the generic component (literacy, communication and life skills) of this qualification at NQF Level 3 can be assessed through occupational contexts and activities relating to wastewater reticulation, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are truly portable. The primary aim of this qualification is to ensure that learners have a sound base of general education to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills such as language, computation and learning skills etc across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place. Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Any learner wishing to be directly assessed may arrange to do so, without attending further training or education. The assessor and learner will decide together on the most appropriate assessment route to be taken.

Articulation possibilities

This qualification will allow a person to articulate vertically to the National Certificate in Supervision of Wastewater Reticulation Services at NQF level 4. This qualification will also provide articulation with a range of qualifications in both technical and management areas in wastewater and other related sectors.

Criteria for registration of assessors

For an applicant to register as an assessor, the applicant needs:

- A minimum of two years practical, relevant occupational experience.

- Declared competent in all the outcomes of the generic assessor standard, and certificated by the relevant ETQA or by any appropriate ETQA.
- Detailed documentary proof of educational qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence).
- Able to demonstrate competence in relation to these specified standards and qualifications, at or above, the level of the qualifications in question.
- Meet any other additional requirements laid down by their constituent ETQA.

The subject matter experience of the assessor can be established by recognition of prior learning. The status of registered assessors can be checked on the appropriate ETQA database or website.

Moderation

Anyone assessing a learner against these standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA.

Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against this qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

A note on the compilation of standards in this qualification

In line with the SAQA principle of avoiding duplication, existing registered standards were used where possible.

A note on the definition of wastewater reticulation

Wastewater reticulation in this context refers to the entire pipe network.

National Certificate in Wastewater Reticulation Services
NQF Level 3 (120 credits)

FUNDAMENTAL			CORE			ELECTIVE		
Compulsory 40 credits	L	C	Compulsory 67 credits	L	C	Select a minimum of 13 credits	L	C
Accommodate audience and context needs in oral communication (8968)	3	5	Operate A Wastewater Pump Station	3	12	Conduct CCTV Pipe Inspections	4	8
Interpret and use information from texts (8969)	3	5	Investigate Problems In A Wastewater Reticulation System	3	10	Operate Telemetric and Electronic Equipment and Scientific Instrumentation (12066)	4	12
Demonstrate an understanding of HIV/AIDS and its implications (9386)	2	4	Operate, Maintain And Provide Technical Support For On Site Sanitation Systems	3	8	Demonstrate Knowledge of The Principles Of Hydraulics (12059)	4	6
Write texts for a range of communicative contexts (8970)	3	5	Demonstrate Knowledge of Wastewater Treatment Processes	3	4	Demonstrate Knowledge Of Corrosion Control (14053)	5	7
Use language and communication in occupational learning programmes (8973)	3	5	Connect A Customer Sewerage System To A Public Wastewater System	3	7	Demonstrate Basic Knowledge Of Different Types Of Trenchless Technologies in Water and Wastewater Environment	5	8
Demonstrate understanding of the use of different number bases and measurement units and an awareness of error in the context of relevant calculations (9010)	3	2	Maintain Effective Working Relationships With Other Members of Staff (12510)	3	1	Demonstrate Sound Environmental Practices in Wastewater Operations	4	7
Use Mathematics to investigate and monitor the financial aspects of personal and business issues (9011)	3	5	Provide Customer Service	4	8	Operate A Personal Computer system (7547)	2	6
Investigate life and work related problems, using data and probabilities (9012)	3	5	Supervise The Procurement, Use And Storage Of Construction Materials (14430)	4	10	Demonstrate Knowledge of and Produce Computer Spreadsheets using Basic Functions (7568)	2	3
Describe, apply, analyse and calculate shape and motion in two and three-dimensional space in different contexts (14108)	3	4	Executing General Office Administration (8015)	2	4	Produce word-Processing documents for business (7570)	3	5
			Render Basic First Aid	2	3			
Total credits on level 3	3	36	Total credits on level 3	3	42			
Total credits		40	Total credits		67	Total credits		62

National Certificate in Wastewater Reticulation Services NQF 3**UNIT STANDARDS ON NQF LEVEL 3**

- Title 1: Operate A Wastewater Pump Station
- Title 2: Investigate problems In A Wastewater Reticulation System
- Title 3: Operate Maintain and provide Technical Support For On Site Sanitation Systems
- Title 4: Demonstrate Knowledge of Wastewater Treatment Processes
- Title 5: Connect A Customer Sewerage System To A Public Wastewater System

UNIT STANDARDS ON NQF LEVEL 4

- Title 1: Conduct CCTV Pipe Inspections
- Title 2: Demonstrate Sound Environmental Practices in Wastewater Operations

UNIT STANDARDS ON NQF LEVEL 5

- Title 1: Demonstrate Basic Knowledge Of Different Types Of Trenchless Technologies in Water and Wastewater Environment

Unit Standards And Specific Outcomes For The National Certificate In Wastewater Reticulation Services NQF 3**1. TITLE: INVESTIGATE PROBLEMS IN A WASTEWATER RETICULATION SYSTEM**

- Specific outcome 1.1: Explain elementary hydraulics.
- Specific outcome 1.2: Investigate abnormal sewer flows.
- Specific outcome 1.3: Locate irregularities in wastewater infrastructure.
- Specific outcome 1.4: Report back on investigations and irregularities.
- Specific outcome 1.5:

2. TITLE: DEMONSTRATE KNOWLEDGE OF WASTEWATER TREATMENT PROCESSES

- Specific outcome 2.1: Explain and identify wastewater treatment processes.
- Specific outcome 2.2: Identify and explain the inlet works.
- Specific outcome 2.3: Identify and explain the primary treatment process.
- Specific outcome 2.4: Identify and explain the secondary treatment processes.
- Specific outcome 2.5: Demonstrate knowledge of the disinfection process.
- Specific outcome 2.6: Explain the sludge treatment processes.

3. TITLE: OPERATE A WASTEWATER PUMP STATION

- Specific outcome 3.1: Explain the working principles of pumps.
- Specific outcome 3.2: Comply with safety procedures in pump station.
- Specific outcome 3.3: Operate pumping system.
- Specific outcome 3.4: Provide basic maintenance for pumps.
- Specific outcome 3.5: Maintain and repairs valves in a pumping system.
- Specific outcome 3.6: Service drive-units of pumps.

4. TITLE: CONNECT A CUSTOMER SEWERAGE SYSTEM TO A PUBLIC WASTEWATER SYSTEM
- Specific outcome 4.1: Plan work and prepare work site for wastewater connection.
- Specific outcome 4.2: Set out work site and excavate to required levels.
- Specific outcome 4.3: Lay and joint pipes and connect to sewer connecting points.
- Specific outcome 4.4: Inspect connection laid by others to ensure compliance with work procedures.
5. TITLE: OPERATE, MAINTAIN AND PROVIDE TECHNICAL SUPPORT FOR ON SITE SANITATION SYSTEMS
- Specific outcome 5.1: Explain different on site sanitation systems.
- Specific outcome 5.2: Advise on application of new on site sanitation system.
- Specific outcome 5.3: Monitor the construction of on site sanitation system.
- Specific outcome 5.4: Operate and maintain on site sanitation system.

Unit Standards And Specific Outcomes at NQF 4

1. TITLE: CONDUCT CCTV PIPE INSPECTIONS
- Specific outcome 1.1: Plan for CCTV inspections.
- Specific outcome 1.2: Inspect and prepare site.
- Specific outcome 1.3: Carry out inspections.
- Specific outcome 1.4: Re-instate work site.
- Specific outcome 1.5: Complete reports including recommendations.
2. TITLE: DEMONSTRATE SOUND ENVIRONMENTAL PRACTICES IN WASTEWATER OPERATIONS
- Specific outcome 2.1: Explain the harmful effects of wastewater spillage on the environment.
- Specific outcome 2.2: Demonstrate contamination prevention methods in wastewater operations.
- Specific outcome 2.3: Demonstrate remedial techniques regarding wastewater spillages.
- Specific outcome 2.4: Demonstrate knowledge of odours and remedial techniques in wastewater systems

Unit Standards And Specific Outcomes at NQF 5

1. TITLE: DEMONSTRATE BASIC KNOWLEDGE OF DIFFERENT TYPES OF TRENCHLESS TECHNOLOGIES IN WATER AND WASTEWATER ENVIRONMENT

Specific outcome 1.1: Explain trenchless technologies.

Specific outcome 1.2: Explain the preparation for the execution of trenchless technologies.

Specific outcome 1.3: Identify potential problems that may occur during execution and recommend solutions

Specific outcome 1.4: Evaluate and recommend the optimal solution for a specific application.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY



Established in terms of Act 58 of 1995

**Further Education and Training Certificate in Sanitation Project Facilitation
NQF level 4**

Field: Physical Planning and Construction - NSB 12

Sub-field: Civil Engineering Construction

Level: 4

Credits: 151

Issue date:

Review date:

Rationale of the Qualification

This Qualification reflects the workplace-based needs of project agents implementing primarily on-site, dry sanitation projects in the water and health sectors that are expressed by employers and employees, both now and for the future. While at this level the person will work to a large extent on his or her own, it is likely that this work will be done under the supervision of a project coordinator. This qualification provides the learner with a career path and progression within the water and health sectors. It is applicable to employed and unemployed learners. This qualification will enable learners to reach their full potential of advancement without formal education becoming an impassable barrier and in addition will allow for the recognition of prior learning. There is an on-going need for highly skilled, sanitation project personnel and a need for a well developed learning pathway to cater for these personnel at the various levels at which they operate. The Qualification provides learners with access to Project Management Qualifications on NQF level 4 and 5 and the National Certificate in Sanitation Project Management on NQF level 5. This will enable learners to pursue different careers within the water and health sectors, enhance productivity and employability and contribute towards the ecological sustainability and improvement of the water environment. This qualification reflects the skills, knowledge and understanding required to participate effectively in the water and health sectors, whether in micro, small, medium or large operations.

The National Certificate in Sanitation Project Facilitation at NQF level 4 is the second Qualification in a learning pathway that starts with the National Certificate In Community Water, Health And Sanitation Promotion NQF level 2 and progresses to the National Certificate in Sanitation Project Management NQF Level 5. It is planned that tertiary institutions will develop a postgraduate diploma in Sanitation at level 6 as the final step in the learning pathway.

The National Certificate in Sanitation Project Facilitation at NQF Level 4 supports the objectives of the NQF in that it gives the learner access to a registered Qualification. It will ensure that the quality of education and training in the sub-field is enhanced

and of a world-class standard. The Qualification will also allow learners to develop their knowledge and skills in the field of sanitation project facilitation.

Purpose of the Qualification

This Qualification is for any individual who is, or wishes to be, involved in the sanitation project facilitation field in any organization or business as well as in non-commercial organisations such as non-governmental organisations and charitable organisations.

This Qualification will enable the learner to define core competencies required for field based practitioners to implement an integrated approach to sanitation improvement, which addresses hygiene awareness, behaviour and infrastructure. The qualified learner will be able to competently complete a range of project tasks relating to the improvement of sanitation and hygiene in a professional manner that ensures consistency of performance and sustainability of interventions.

The qualifying learner will be able to:

- Explain sanitation and the sanitation environment;
- Promote health and hygiene improvement;
- Facilitate processes using participatory methodologies and tools;
- Work in a project team and co-ordinate project processes in accordance with the project quality plan;
- Assist with the preparation phase of a community sanitation improvement project;
- Assist with the implementation of a community sanitation improvement project;
- Collect and interpret data required for sanitation improvement projects ;
- Complete required project documentation; and
- Plan and organise project meetings and workshops.

This Qualification has been developed to assist with standardisation in the implementation of sanitation projects. This will allow learners to lay a foundation for future career advancement and access to other community based Qualifications within the water sector. This Qualification has been developed to enhance the sustainability of sanitation projects, which will contribute towards improved health and reduce sanitation and water related diseases within communities. This competence will contribute to assisting the individual with the capacity to advance and gain skills, which are portable, and in so doing gain self-respect.

The Qualification has building blocks that can be developed further in Qualifications at a higher level. It contains all the competencies, skills and values required by a learner who wishes to access the National Certificate in Sanitation Project Management at NQF Level 5. It also focuses on the skills, knowledge, values and attitudes required to progress further. The intention is:

- To promote the development of knowledge, skills and values that are required for service excellence within the field of administration;
- To release the potential of people; and
- To provide opportunities for people to progress.

Access to the Qualification

The Qualification is available to anyone because it is aimed at opening access and addressing past imbalances. The achievement of the National Certificate for Community Water, Health And Sanitation Promotion at NQF level 3 together with literacy at NQF level 3 and numeracy at NQF level 3, will assist with progression and

access to this qualification. It is considered essential to have achieved a level 3 National Certificate but the achievement of this Qualification will provide a foundation for the learning required in the level 4 certificate.

Learning assumed to be in place

A knowledge, comprehension and application of two languages at NQF level 3 and mathematics at NQF level 3.

Exit level Outcomes

In particular, assessors should check that the learner can demonstrate an ability to apply learned competencies, skills and knowledge in an integrated way, as well as an ability to consider a range of options and make decisions.

On achieving this qualification the qualifying learner will be able to:

Exit level 1: Explain sanitation and relevant policies.**Associated Assessment Criteria**

- Knowledge and comprehension of sanitation improvement in the context of sustainable development is demonstrated.
- Sanitation concepts are discussed and issues of why sanitation matters to people are explained
- Knowledge and comprehension of relevant sanitation policy is demonstrated.
- Factors that influence the sustainability of sanitation interventions are discussed
- The relevance of gender and equity principles in sanitation improvement are discussed.

Exit level 2: Promote health and hygiene improvement in sanitation projects.**Associated Assessment Criteria**

- The link between sanitation, water, health and the environment is explained.
- Required health and hygiene processes are identified.
- The promotion of health and hygiene process is planned.
- Promote awareness of health and hygiene improvement using participatory methodologies
- Health and hygiene improvement is monitored using appropriate tools
- Progress and improvements are reported to project co-ordinator

Exit level 3: Demonstrate communication skills.**Associated Assessment Criteria**

- Communication skills are used to interact in a meaningful way with work colleagues and all relevant stakeholders including community members.
- The learner communicated effectively with others in both learning and work-oriented situations.
- Different communicateeffectively orally and in writing.

Integrated Assessment

Integrated assessment at the level of qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across unit standards to achieve competence that is grounded and coherent in relation to the purpose of the qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to give an account of the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed, and the nature and level of the Qualification. The ratio between action and interpretation is not fixed, but varies according to the demands of the Qualification.

While the generic component (literacy, communication and life skills) of this Qualification at NQF Level 3 and 4 can be assessed through occupational contexts and activities relating to community sanitation projects, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are truly portable. The primary aim of this Qualification is to ensure that learners have a sound base of general education to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills such as language, computation and learning skills etc across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place. Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Any learner wishing to be directly assessed may arrange to do so, without attending further training or education. The assessor and learner will decide together on the most appropriate assessment route to be taken.

Articulation possibilities

This Qualification allows for vertical articulation to, inter alia, the National Certificate in Sanitation Project Management NQF level 5, a tertiary qualification such as a diploma in sanitation or a degree. This Qualification will also provide articulation with a range of Qualifications in both technical and management areas in water and other related sectors.

Exit level 4: Demonstrate facilitation skills using participatory methodologies.**Associated Assessment Criteria**

- Relevant situations or context are identified for the use of participatory tools.
- The process is planned according to the chosen method
- Participatory tools are used in an appropriate manner.
- Effective participation in groups is facilitated using participatory methodologies.
- The implementation of the intervention plan is developed and monitored.

Exit level 5: Monitor the construction of two types of on-site dry sanitation technologies.**Associated Assessment Criteria**

- A range of sanitation technology options, and the advantages and disadvantages of each option are explained.
- The application of each option is explained.
- The most relevant option in a specific community based on situational factors is determined.
- The construction of two types of on-site dry toilet constructions is monitored.

Exit level 6: Assist with the preparation and implementation of monitor sanitation projects.**Associated Assessment Criteria**

- The key leaders and stakeholders involved in the sanitation project are identified
- The baseline survey process is facilitated using appropriate participatory methods and tools.
- The decision-making process is facilitated using appropriate participatory methods and tools.
- Project tasks are scheduled and implemented in accordance with the work plan.
- The implementation of sanitation projects is monitored in accordance with the key indicators and the quality plan.
- Progress is reported and appropriate action is taken within own scope of responsibility.

International comparability

The core and elective components have been developed taking into account South Africa's unique context. The working group has used GHK Search and Training Limited (London UK) to do an international search for a project agent qualification. No existing qualifications have been found on NQF level 4. The search revealed that only sanitation courses exist in the international arena. The fundamental components, reflecting foundational learning and generic skills and knowledge have been derived from registered, local adult education unit standards.

Criteria for registration of assessors

For an applicant to register as an assessor, the applicant needs:

- To be competent at the same level or be at a level above this level 4 Qualification /Unit Standards;
- A minimum of two years sanitation practical, relevant occupational experience.
- Declared competent in all the outcomes of the of the generic assessor standard, and certificated by the the relevant ETQA or by any appropriate ETQA in agreement with the the relevant ETQA in this regard.
- Detailed documentary proof of educational qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence).
-
- Meet any other additional requirements laid down by their constituent ETQA.

The subject matter experience of the assessor can be established by recognition of prior learning. The status of registered assessors can be checked on the appropriate ETQA database or website.

Moderation

Anyone assessing a learner against these standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA.

Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

Notes

Level credits and learning components assigned to the Qualification

This certificate is made up of a planned combination of learning outcomes that have a defined purpose and will provide qualifying learners with applied competence and a basis for further training. The Qualification is made up of Unit Standards that are classified as Fundamental, Core and Elective. A minimum of 151 credits are required to complete the Qualification.

In this Qualification the credits are allocated as follows

Fundamental	56 credits	37%
Core	80 credits	53%
Electives	15 credits	10%
TOTAL	151 credits	100%

Note that 53% of the credits, therefore, relate directly to sanitation project facilitation. The elective component allows the learner to select Unit Standards that are:

- Directly related to the work done by the learner in an organisation.
- Related to specialist areas of sanitation project related work that the learner might be interested in.

This is to ensure that while there is a strong sanitation project focus, there is scope for learners to select additional Unit Standards that are relevant to their own situations.

Motivation for number of credits assigned to fundamental, core and elective

Allocation of Fundamental credits

Unit Standards to the value of 20 credits in Communication, 16 credits in Mathematical Literacy and 20 credits in a second language in accordance with the SAQA rules of combination have been selected for the Fundamental Component. These Unit Standards will add value to learners both socially and economically in terms of their ability to operate and communicate as literate and numerate workers in a global economy. All these Unit Standards are compulsory.

Allocation of Core credits

Eighty credits have been allocated to Unit Standards in the Core Component of this qualification. This is to ensure that the qualification has a strong sanitation project facilitation focus. The Unit Standards classified as Core describe sanitation knowledge and skills that are generic to sanitation projects and facilitation processes. They provide an opportunity to develop knowledge of sanitation project facilitation through case studies, formal learning and workplace practice and/or simulated situations. The Unit Standards encourage application of knowledge and skills in real situations. The Core Unit Standards provide the basic knowledge and skills that all workers need to know about sanitation project facilitation. All Unit standards are compulsory.

Allocation of Elective credits

There are Unit Standards totalling 55 credits in this component. Learners are required to select electives that add up to at least 15 credits from the Elective Component of the qualification. The elective unit standards will enhance the learner's work performance.

A note on the compilation of standards in this Qualification

In line with the SAQA principle of avoiding duplication, existing registered standards were used where possible.

FETC IN SANITATION PROJECT FACILITATION
NQF level 4 (151 credits)

FUNDAMENTAL			CORE			ELECTIVE		
Compulsory 56 credits	L	C	Compulsory 80 credits	L	C	Select a minimum of 15 credits	L	C
Use mathematics to investigate and monitor the financial aspects of personal, business, and national issues (7468)	4	6	Demonstrate Knowledge Of Sanitation And The Sanitation Environment	4	4	Plan An Integrated School Sanitation Project	5	6
Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems (9015)	4	6	Promote Health And Hygiene Improvement In A Project-Level Sanitation Project	4	12	Apply A Range Of Project Management Tools (10140)	4	8
Measure, estimate and calculate physical quantities and explore, critique and prove geometrical relationships in two and three-dimensional space in the life and workplace of the adult with increasing responsibilities (12417)	4	4	Monitor Dry On-Site Construction In Order To Recognise & Report Problems	4	4	Contribute To The Management Of Project Risk Within Own Field Of Expertise (10141)	4	5
Engage in sustained oral communication and evaluate spoken texts (8974)	4	5	Carry Out Activities That Support The Preparation Phase Of A Community Sanitation Improvement Project	4	12	Produce Word Processing Documents for Business (7570)	3	5
Use language and communication in occupational learning programmes (8979)	4	5	Carry Out Activities That Support The Implementation Phase Of A Community Sanitation Improvement Project	4	16	Demonstrate Knowledge of and Produce Computer Spreadsheets Using Basic Functions (7572)	2	3
Read, analyse and respond to a variety of texts (8975)	4	5	Collect and Interpret Data (14015)	4	4	Build block walls (9364)	3	14
Write for a wide range of contexts (8976)	4	5	Facilitate Community Participation Processes (12353)	4	12	Fulfil Procurement Activities And Supervise Procurement Administration (10142)	4	8
Accommodate audience and context needs in oral communication (8968)	3	5	Conduct Project Documentation Management To Support Project Processes (10137)	4	6	Participate in the estimation and preparation of cost budgets for an element of work and monitor and control actual cost against budget (10134)	4	6
Interpret and use information from text (8969)	3	5	Provide Assistance In Implementing And Assuring Project Work Is Conducted In Accordance With The Project Quality Plan. (10150)	3	6			
Write texts for a range of communicative contexts (8970)	3	5	Plan, Organise And Support Project Meetings And Workshops (10136)	4	4			
Use language and communication in occupational learning programmes (8973)	3	5	Credits on level 4	4	74			
Total credits		56	Total credits		80	Total credits		55

Learners exiting this Qualification before completion, retain the credits for Unit Standards successfully completed and may carry them over to other Qualifications to which they are applicable. Learners may also retain the credits until a later stage should studies be recommenced, provided the Unit Standards are still relevant to the Qualification.

The table below shows the spread of Critical Cross-field Outcomes across the Unit Standards that are classified as Core for sanitation project facilitation.

Unit Standard Title	Critical Cross-field outcomes supported by the Unit Standard						
	Solve problems	Team work	Organisation	Information	Communicate	Technology	Related systems
Core							
Demonstrate knowledge of sanitation and the sanitation environment					X	X	X
Promote health and hygiene improvement in a project-level sanitation project	X	X	X	X	X	X	X
Monitor dry on-site construction in order to recognise & report problems	X	X		X	X	X	X
Carry out activities that support the preparation phase of a community sanitation improvement project	X	X	X	X	X	X	X
Carry out activities that support the implementation phase of a community sanitation improvement project	X	X	X	X	X	X	X
Plan an integrated school sanitation project			X	X	X	X	X

**Further Education and Training Certificate in Sanitation Project
Facilitation NQF level 4****UNIT STANDARDS ON NQF LEVEL 4**

- Title 1: Demonstrate Knowledge Of Sanitation And The Sanitation Environment
- Title 2: Promote Health And Hygiene Improvement In A Project-Level Sanitation Project
- Title 3: Monitor Dry On-Site Construction In Order To Recognise & Report Problems
- Title 4: Carry Out Activities That Support The Preparation Phase Of A Community Sanitation Improvement Project
- Title 5: Carry Out Activities That Support The Implementation Phase Of A Community Sanitation Improvement Project

UNIT STANDARDS ON NQF LEVEL 5

- Title 6: Plan An Integrated School Sanitation Project

Unit Standards And Specific Outcomes For The Further Education and Training Certificate in Sanitation Project Facilitation NQF level 4**UNIT STANDARDS ON NQF LEVEL 4**

1. TITLE: DEMONSTRATE KNOWLEDGE OF SANITATION AND THE SANITATION ENVIRONMENT
- Specific outcome 1.1: Explain sanitation and why sanitation matters to people.
- Specific outcome 1.2: Explain the national sanitation policy and the legislative framework.
- Specific outcome 1.3: Discuss the factors that influence the sustainability of sanitation interventions.
- Specific outcome 1.4: Discuss the relevance of gender and equity principles in sanitation improvement.
2. TITLE: PROMOTE HEALTH AND HYGIENE IMPROVEMENT IN A PROJECT-LEVEL SANITATION PROJECT
- Specific outcome 2.1: Identify what health and hygiene interventions will be necessary based on information collected locally.
- Specific outcome 2.2: Undertake sanitation-related health and hygiene promotion using appropriate methods.
- Specific outcome 2.3: Assist in health monitoring and data collection using appropriate tools.
- Specific outcome 2.4: Report monitoring indicators to the project co-ordinator.
3. TITLE: MONITOR DRY ON-SITE CONSTRUCTION IN ORDER TO RECOGNISE & REPORT PROBLEMS
- Specific outcome 3.1: Monitor the construction of pits and soakaways for VIP and UDS toilets.
- Specific outcome 3.2: Monitor the construction of the cover slab.
- Specific outcome 3.3: Monitor the construction of a pedestal and toilet seat.
- Specific outcome 3.4: Monitor construction of the toilet top structure and ventilation.
- Specific outcome 3.5: Monitor the construction of hand washing facilities.
- Specific outcome 3.6: Monitor the operation and maintenance practices of users in the initial handover period.

4. TITLE: CARRY OUT ACTIVITIES THAT SUPPORT THE PREPARATION PHASE OF A COMMUNITY SANITATION IMPROVEMENT PROJECT

- Specific outcome 4.1: Facilitate the project initiation phase.
Specific outcome 4.2: Facilitate the baseline survey process using participatory methods and tools as appropriate.
Specific outcome 4.3: Facilitate public decision-making process to select project options using participatory methods and tools as appropriate.
Specific outcome 4.4: Communication, liaising and reporting to relevant project role-players.

5. TITLE: CARRY OUT ACTIVITIES THAT SUPPORT THE IMPLEMENTATION PHASE OF A COMMUNITY SANITATION IMPROVEMENT PROJECT

- Specific outcome 5.1: Facilitate household or public participation in the implementation phase.
Specific outcome 5.2: Support construction of toilet and hand washing facilities.
Specific outcome 5.3: Undertake activities to promote sustainability of sanitation promotion interventions.
Specific outcome 5.4: Undertake project completion and handover activities.

UNIT STANDARDS ON NQF LEVEL 5

1. TITLE: PLAN AN INTEGRATED SCHOOL SANITATION PROJECT

- Specific outcome 1.1: Plan the implementation of a school sanitation programme.
Specific outcome 1.2: Describe and plan an effective school management and maintenance system according to participatory principles.
Specific outcome 1.3: Identify opportunities and plan for local community involvement and local economic development in a school sanitation project.
Specific outcome 1.4: Develop an outline plan of the in-school elements of a school sanitation project according to participatory principles.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY

**National Certificate in Sanitation Project Co-ordination NQF level 5**

Field: Physical Planning and Construction - NSB 12
Sub-field: Civil Engineering Construction
Level: 5
Credits: 148
Issue date:
Review date:

Rationale of the qualification

This qualification reflects the needs of the water and sanitation sector for a project manager with a sound knowledge base and experience for implementing primarily on-site, dry sanitation projects. A generic project management qualification in the past did not satisfy the needs of the sector. A sanitation project co-ordination qualification contextualised within the sanitation sector is a need expressed by employers and employees, both now and for the future. This qualification provides the learner with a career path and progression within the water and health sectors. It is applicable to employed and unemployed learners. This qualification will enable learners to reach their full potential of advancement without formal education becoming an impassable barrier and in addition will allow for the recognition of prior learning.

There is an on-going need for highly skilled, sanitation project co-ordinators/managers and a need for a well developed learning pathway to cater for these personnel at the various levels at which they operate. The qualification provides learners with access to tertiary qualifications such as diplomas and degrees. This will enable learners to pursue different careers within the water and health sectors, enhance productivity and employability and contribute towards the ecological sustainability and improvement of the water environment. This qualification reflects the skills, knowledge and understanding required to participate effectively in the water and health sectors, whether in micro, small, medium or large operations.

The National Certificate in Sanitation Project Co-ordination at NQF level 5 is the third qualification in a learning pathway that starts with the National Certificate In Community Water, Health And Sanitation Promotion NQF level 2, progresses to the National Certificate in Sanitation Project Facilitation NQF Level 4 and currently ends in the National Certificate in Sanitation Project Co-ordination at NQF level 5. It is planned that tertiary institutions will develop a postgraduate diploma in Sanitation at level 6 as the final step in the learning pathway.

The National Certificate in Sanitation Project Co-ordination at NQF Level 5 supports the objectives of the NQF in that it gives the learner access to a registered qualification. It will ensure that the quality of education and training in the sub-field is enhanced and of a world-class standard. The qualification will allow learners to develop their knowledge and skills in the field of sanitation project co-ordination and management.

Purpose of the qualification

A person acquiring this qualification will be able to effectively manage team performance, co-ordinate sanitation project implementation, control a quality assurance system and manage project related documentation. This qualification will contribute to the full development of the learner within the sanitation environment by providing recognition, further mobility and transportability within the sector. The skills, knowledge and understanding demonstrated within this qualification are essential for social and economic transformation and contribute to the upliftment and economic growth of sanitation personnel.

This qualification will enable the learner to define core competencies required for sanitation project managers to co-ordinate an integrated approach to sanitation improvement, which addresses hygiene awareness, behaviour and infrastructure. The qualified learner will be able to competently complete a range of project tasks relating to the improvement of sanitation and hygiene in a professional manner that ensures consistency of performance and sustainability of interventions.

The qualifying learner will be able to:

- Explain sanitation and the sanitation environment in the context of a development-oriented approach to planning and implementing sanitation improvement
- Co-ordinate sanitation-related health and hygiene promotion activities at sanitation project level
- Develop a sanitation project implementation plan according to accepted practices
- Develop a reporting framework for sanitation projects according to current best practice
- Implement and co-ordinate a sanitation project
- Develop a quality management system for a sanitation improvement projects
- Develop contracts for sanitation projects
- Implement and monitor project activities in accordance with the project implementation plan
- Prepare supporting documents for monitoring and evaluation of the project

This qualification has been developed to assist with standardisation in the implementation and co-ordination of sanitation projects. This will allow learners to lay a foundation for future career advancement and access to other community based qualifications within the water sector. This qualification has been developed to enhance the sustainability of sanitation projects, which will contribute towards improved health and reduce sanitation and water related diseases within communities. This competence will contribute to assisting the individual with the capacity to advance and gain skills, which are portable, and in so doing gain self-respect.

The intention is:

- To promote the development of knowledge, skills and values that are required for service excellence within the field of administration
- To release the potential of people
- To provide opportunities for people to progress

Access to the Qualification

The achievement of the National Certificate in Sanitation project Facilitation at NQF level 4 together with literacy and numeracy at NQF level 4, will assist with progression and access to this qualification. It is not considered essential to have achieved the level 4 national certificate but the achievement of this qualification will provide a foundation for the learning required in the level 5 certificate.

Learning assumed to be in place

A knowledge, comprehension and application of language and mathematics at NQF level 4.

Exit level Outcomes

In particular assessors should check that the learner can demonstrate an ability to apply learned competencies, skills and knowledge in an integrated way, as well as an ability to consider a range of options and make decisions.

On achieving this qualification the qualifying learner will be able to:

Exit level 1: Explain sanitation and relevant policy.

Associated Assessment Criteria

- Demonstrate knowledge and comprehension of sanitation improvement in the context of sustainable development.
- Explain sanitation and why sanitation matters to people
- Demonstrate knowledge and comprehension of relevant sanitation policy and legislative framework
- Discuss the factors that influence the sustainability of sanitation interventions including the principles of technological, social, environmental and financial sustainability
- Describe a development-oriented approach to planning and implementing sanitation improvement
- Contrast and explain demand-responsive and supply-driven approaches to sanitation improvement

Exit level 2: Co-ordinate the promotion of health and hygiene improvement in sanitation projects.

Associated Assessment Criteria

- Identify what health and hygiene processes are required
- Use appropriate tools to conduct water and sanitation-related health and hygiene promotion and education activities
- Provide support to team members promoting health and hygiene education activities
- Set up a health and hygiene monitoring and data collection system
- Monitor the indicators and report on progress/ problems

Exit level 3: Demonstrate communication skills.

Associated Assessment Criteria

- Use communication skills to interact in a meaningful way with work colleagues and all relevant stakeholders including community members.
- Communicate effectively with others in both learning and work-oriented situations.
- Communicate effectively orally and in writing.

Exit level 4: Plan a sanitation project.**Associated Assessment Criteria**

- Identify what sanitation improvement interventions are needed in a given settlement
- Identify most viable and sustainable sanitation technical options
- Facilitate effective participation in groups using participatory methodologies
- Develop a sanitation project implementation plan that indicates the outputs, costings and sequencing of processes
- Develop a reporting framework for the sanitation project

Exit level 5: implement and manage a sanitation project.**Associated Assessment Criteria**

- Develop a quality management system for a sanitation improvement project.
- Develop contracts for sanitation projects.
- Develop supporting documents for monitoring and evaluation of the project.
- Set up a reporting system for sanitation projects
- Implement, co-ordinate and monitor all aspects of sanitation projects
- Report on project progress to relevant role players

Exit level 6: Evaluate and improve the project team's performance**Associated Assessment Criteria**

- Identify best practices relevant to operational human resource responsibilities
- Identify strengths and areas for improvement in team members and provide appropriate interventions and support
- Monitor team performance and report to relevant role players
- Identify strengths and areas for improvement in own learning through self-reflection

International comparability

The core and elective components have been developed taking into account South Africa's unique context. The working group has used GHK Search and Training Limited (London UK) to do an international search for a project co-ordination and management qualification. No existing qualifications have been found on NQF level 4 or 5. The search revealed that only sanitation courses exist in the international arena. The fundamental components, reflecting foundational learning and generic skills and knowledge have been derived from registered, local adult education unit standards.

Integrated Assessment

Integrated assessment at the level of qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across unit standards to achieve competence that is grounded and coherent in relation to the purpose of the qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to give an account of the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed, and the nature and level of the qualification. The ratio between action and interpretation is not fixed, but varies according to the demands of the qualification.

While the generic component (literacy, communication and life skills) of this qualification at NQF Level 3 and 4 can be assessed through occupational contexts and activities relating to community sanitation projects, care must be taken in both the learning programme and the assessment to ensure that these foundational skills are truly portable. The primary aim of this qualification is to ensure that learners have a sound base of general education to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills such as language, computation and learning skills etc across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place. Unit standards in the qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

Recognition of prior learning

This qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Any learner wishing to be directly assessed may arrange to do so, without attending further training or education. The assessor and learner will decide together on the most appropriate assessment route to be taken.

Articulation possibilities

This qualification allows for vertical articulation to The National Certificate in Sanitation Project Management NQF level 5, a tertiary qualification such as a diploma in sanitation or a degree. This qualification will also provide articulation with a range of qualifications in both technical and management areas in water and other related sectors.

Criteria for registration of assessors

For an applicant to register as an assessor, the applicant needs:

- A minimum of two years practical, relevant occupational experience.

- Declared competent in all the outcomes of the of the generic assessor standard, and certificated by the ETDP SETA or by the relevant ETQA in agreement with the ETDP SETA in this regard.
- Detailed documentary proof of educational qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence).
- Able to demonstrate competence in relation to these specified standards and qualifications, at or above, the level of the qualifications in question.
- Meet any other additional requirements laid down by their constituent ETQA.

The subject matter experience of the assessor can be established by recognition of prior learning. The status of registered assessors can be checked on the appropriate ETQA database or website.

Moderation

Anyone assessing a learner against these standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these unit standards or will assess these unit standards must be accredited as a provider with the relevant ETQA.

Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant qualification and the agreed ETQA procedures. Therefore anyone wishing to be assessed against this qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

Notes

Level credits and learning components assigned to the qualification

The certificate is made up of a planned combination of learning outcomes that have a defined purpose and will provide qualifying learners with applied competence and a basis for further training. The qualification is made up of Unit Standards that are classified as Fundamental, Core and Elective for the purpose of this qualification. A minimum of 148 credits is required to complete the qualification.

In this qualification the credits are allocated as follows

Fundamental	38 credits	26%
Core	90 credits	60%
Electives	20 credits	14%
TOTAL	148 credits	100%

Note that 60% of the credits, therefore, relate directly to sanitation project co-ordination and management. The elective component allows the learner to select Unit Standards that are:

- Directly related to the work done by the learner in an organisation.
- Related to specialist areas of sanitation project related work that the learner might be interested in.

This is to ensure that while there is a strong sanitation project focus, there is scope for learners to select additional Unit Standards that are relevant to their own situations.

Motivation for number of credits assigned to fundamental, core and elective

Allocation of Fundamental credits

Unit Standards to the value of 15 credits in Communication, 10 credits in Mathematical Literacy, 8 credits in computer literacy and 5 credits in life skills (managing conflict) have been selected for the Fundamental Component. These Unit Standards will add value to learners both socially and economically in terms of their ability to operate and communicate as literate and numerate workers in a global economy. All these Unit Standards are compulsory.

Allocation of Core credits

Ninety credits have been allocated to Unit Standards in the Core Component of this qualification. This is to ensure that the qualification has a strong sanitation project co-ordination focus. The Unit Standards classified as Core describe sanitation knowledge and skills that are generic to sanitation project co-ordination. They provide an opportunity to develop knowledge of sanitation project co-ordination and management through case studies, formal learning and workplace practice and/or simulated situations. The Unit Standards encourage application of knowledge and skills in real situations. The Core Unit Standards provide the basic knowledge and skills that all practitioners need to know about sanitation project co-ordination and management. All Unit standards are compulsory.

Allocation of Elective credits

There are Unit Standards totalling 70 credits in this component. Learners are required to select electives that add up to at least 20 credits from the Elective Component of the qualification. The elective unit standards will enhance the learner's work performance.

A note on the compilation of standards in this qualification

In line with the SAQA principle of avoiding duplication, existing registered standards were used where possible.

NATIONAL CERTIFICATE IN SANITATION PROJECT CO-ORDINATION
NQF level 5 (148 credits)

FUNDAMENTAL			CORE			ELECTIVE		
Compulsory 38 credits	L	C	Compulsory 90 credits	L	C	Select a minimum of 20 credits	L	C
Apply workplace communication skills (8647)	5	10	Demonstrate Integrated Knowledge Of Sanitation & The Sanitation Environment	5	4	Supervise a project team of a business project to deliver project Objectives (10148)	5	14
Present information in a public setting (13925)	5	5	Undertake And Co-Ordinate Sanitation-Related Health And Hygiene Promotion Activities At Sanitation Project Level	5	8	Supervise a project team of a technical project to deliver project objectives (10147)	5	14
Participate in the management of conflict (14609)	5	4	Plan A Sanitation Project	5	8	Lead a Complex Team	5	15
Mathematical literacy	5	10	Implement And Co-ordinate A Sanitation Project	5	16	Solve Complex Problems	5	10
Demonstrate the ability to use a database for business purposes (7576)	3	5	Monitor Dry On-Site Construction In Order To Recognise & Report Problems	4	4	Conduct on-the-job coaching (7818)	5	5
Demonstrate knowledge of and produce a presentation using base functions (7572)	2	3	Supervise A Project Team Of A Developmental Project To Deliver Project Objectives (10146)	5	14	Guide and support learners (9932).	5	12
			Plan An Integrated School Sanitation Project	5	6			
			Support The Project Environment And Activities To Deliver Project Objectives (Registered 10149)	5	14			
			Apply A Range Of Project Management Tools (10140)	4	8			
			Evaluate And Improve The Project Team's Performance (10145)	5	8			
Credits on level 5		29	Credits on level 5		78	Credits on level 5		70
Total credits		37	Total credits		90	Total credits		70

Learners exiting this qualification before completion, retain the credits for Unit Standards successfully completed and may carry them over to other qualifications to which they are applicable. Learners may also retain the credits until a later stage should studies be recommenced, provided the Unit Standards are still relevant to the qualification.

Table showing the spread of Critical Cross-field Outcomes across the Unit Standards that are classified as Core for sanitation project facilitation for the purpose of this qualification.

Unit Standard Title	Critical Cross-field outcomes supported by the Unit Standard						
	Solve problems	Team work	Organisation	Information	Communicate	Technology	Related systems
Core							
Demonstrate Integrated Knowledge Of Sanitation & The Sanitation Environment	X			X	X	X	X
Undertake And Co-Ordinate Sanitation-Related Health And Hygiene Promotion Activities At Sanitation Project Level	X	X	X	X	X	X	X
Plan A Sanitation Project	X	X	X	X	X	X	X
Implement And Co-ordinate A Sanitation Project	X	X	X	X	X	X	X
Plan An Integrated School Sanitation Project			X	X	X	X	X
Monitor Dry On-Site Construction In Order To Recognise & Report Problems	X	X		X	X	X	X

Unit Standards Titles

- Title 1: Demonstrate Integrated Knowledge Of Sanitation & The Sanitation Environment
 Title 2: Implement And Co-ordinate A Sanitation Project
 Title 3: Plan a sanitation project
 Title 4: Plan An Integrated School Sanitation Project
 Title 5: Undertake And Co-Ordinate Sanitation-Related Health And Hygiene Promotion Activities At Sanitation Project Level

Unit Standards Titles and Associated Specific Outcomes at NQF level 5**Title 1: Demonstrate Integrated Knowledge Of Sanitation & The Sanitation Environment**

- Specific outcomes 1.1: Explain sanitation and why sanitation matters to people
 Specific outcomes 1.2: Explain the national sanitation policy and the legislative framework.
 Specific outcomes 1.3: Discuss the factors that influence the sustainability of sanitation interventions.
 Specific outcomes 1.4: Describe a development-oriented approach to planning and implementing sanitation improvement.

Title 2: Implement And Co-ordinate A Sanitation Project

- Specific outcomes 2.1: Develop a quality management system for a sanitation improvement project.
 Specific outcomes 2.2: Develop contracts for sanitation projects.
 Specific outcomes 2.3: Prepare effective supporting documents for monitoring and evaluation of the project.
 Specific outcomes 2.4: Set up a reporting system within overall programme requirements.
 Specific outcomes 2.5: Implement activities in accordance with the project implementation plan.
 Specific outcomes 2.6: Monitor project progress in relation to own and project plan.
 Specific outcomes 2.7: Report on project progress.

Title 3: Plan a sanitation project

- Specific outcomes 3.1: Identify what sanitation improvement interventions are needed in a given settlement.
 Specific outcomes 3.2: Identify different sanitation technical options and

include the most viable and sustainable ones for the situation in the planning process.

- Specific outcomes 3.3: Develop a sanitation project implementation plan in accordance with current best practice.
- Specific outcomes 3.4: Develop a reporting framework for the sanitation project in accordance with current best practice.

Title 4: Plan An Integrated School Sanitation Project

- Specific outcomes 4.1: Plan the implementation of a school sanitation programme.
- Specific outcomes 4.2: Describe and plan an effective school management and maintenance system according to participatory principles.
- Specific outcomes 4.3: Identify opportunities and plan for local community involvement and local economic development in a school sanitation project.
- Specific outcomes 4.4: Develop an outline plan of the in-school elements of a school sanitation project according to participatory principles.

Title 5: Undertake And Co-Ordinate Sanitation-Related Health And Hygiene Promotion Activities At Sanitation Project Level

- Specific outcomes 5.1: Undertake sanitation-related health and hygiene promotion using appropriate methods and support the project team to do so.
- Specific outcomes 5.2: Set up a health and hygiene monitoring and data collection system in a sanitation project.
- Specific outcomes 5.3: Report on health and hygiene promotion activities to programme management using appropriate tools.
- Specific outcomes 5.4: Ensure that sanitation technologies and practices that improve health are in place.

SOUTH AFRICAN QUALIFICATIONS AUTHORITY



Established in terms of Act 58 of 1995

Qualification Title: Further Education and Training Certificate In Water Purification Processes NQF Level 4

NQF Field: Physical Planning and Construction - NSB 12

Sub-field: Civil Engineering Construction

Level: 4

Credits: 160

Issue date:

Review date:

Rationale of the Qualification

This Qualification reflects the workplace-based needs of water purification process controllers working in the water sector that is expressed by employers and employees, both now and for the future. This Qualification is intended for supervisors and will include supervising operators on a water purification plant. Learners may further choose to develop further management competences or specialise in water specific Qualifications once having gained this competence.

Many water purification process operators and controllers have no formal Qualification in water purification yet they are required to perform the job. This Qualification provides the learner with a career path and progression from water purification process operations to water purification process control. The prospective candidate for this Qualification may be a person who is entering the work place or a person who has been working on a water purification plant with limited formal water purification supervisory competence.

The Qualification gives accessibility and flexibility to the new entrant and to the employed. The level of flexibility reflects the multiple job roles, organisational requirements and changing technological nature of the industry, and at the same time, it allows the individual to work towards a nationally recognised Qualification. This will enable learners to pursue different careers within the water sector, enhance

productivity and employability within the water sector and contribute towards the ecological sustainability and improvement of the water environment.

Purpose of the Qualification

The National Certificate in Water Purification Process Control will prepare learners to function independently and in a supervisory capacity on a water purification plant. Qualifying learners are able to:

- Supervise teams of people;
- Manage conflict within the workplace;
- Supervise health and safety practices in the workplace;
- Plan, organise and supervise processes at a water purification plant;
- Manage stock and fixed assets at the workplace; and
- Complete administrative tasks and reports

This Qualification forms the foundation for advancement to management or tertiary Qualifications and will also lay the foundation for future career advancement across similar trades. For those who have been in the workplace for a long time, this Qualification can be used in the recognition of prior learning to recognise workplace skills acquired without the benefit of formal education and training.

This Qualification has been developed to assist with standardisation in water purification operations. The qualified learner will have the capacity to advance and gain skills and self-respect, work in a professional manner, as well as ensure that industry standards are maintained in a range of water purification contexts.

Access to the Qualification

As this is a Unit Standard based Qualification, learners will have open access provided that the learner meets the requirements for the learning assumed to be in place for each Unit Standard. The achievement of the National Certificate In Water Purification Process Operations (NQF level 2) together with literacy and numeracy at NQF level 3, will assist with progression and access to this Qualification. It is considered essential to have achieved the level 3 National Certificate but the achievement of this Qualification will provide a foundation for the learning required in the level 4 certificate.

Learning assumed to be in place

A knowledge, comprehension and application of language and mathematics at NQF level 3. Candidates will be required to demonstrate competence in all the core Unit Standards described in the National Certificate For Water Purification Process Operations at NQF level 3. These may also be achieved through RPL.

Exit level Outcomes

Qualifying learners can:

Exit level 1: Monitor the application of relevant health and safety legislation.

Associated Assessment Criteria

- Knowledge and comprehension regarding personal safety practices is applied in a water purification environment in accordance with standard operating procedures and safety requirements.

- Personal health, hygiene and presentation in a water purification environment is maintained in accordance with the Occupational Health and Safety Act,
- Good housekeeping on a water purification plant is maintained in accordance with legislation and work policies and procedures
- Compliance of treated water is ensured in accordance with SABS241 (latest version)

Exit level 2: Demonstrate supervisory skills in the workplace.

Associated Assessment Criteria

- Active interaction with staff, work colleagues, customers and management is maintained.
- The development of staff within own scope of responsibility is supervised
- Staff is supervised to achieve work objectives
- Conflict is handled within own scope of responsibility
- Computer technology is used appropriately to achieve objectives

Exit level 3: Monitor and Co-ordinate the Water Treatment Process

Associated Assessment Criteria

- Tasks are planned and co-ordinated in accordance with priorities and daily requirements
- Relevant laboratory tests are conducted, results analysed and appropriate actions are implemented.
- Water science principles are applied to the chemical process involved in water treatment
- The efficiency of the plant is optimised.
- Routine production maintenance and other tasks are co-ordinated
- Mechanical and electrical equipment and hydraulic control systems relevant to water purification are operated.

Exit level 4: Demonstrate planning and organising skills.

Associated Assessment Criteria

- Knowledge of the development and review of action plans, development plans and year plans is demonstrated
- Staff is developed in accordance with development plans
- Knowledge of all reports and forms required in the workplace and their completion is demonstrated
- Technology is used appropriately to complete work tasks
- The ability to organise administrative tasks in priority order and to facilitate an efficient flow of documentation is demonstrated.

Exit level 5: Implement and co-ordinate operation and maintenance tasks.

Associated Assessment Criteria

- Staff is briefed on tasks and ensure required resources are available.
- Stock and fixed assets on a water purification plant are monitored.
- Operation and maintenance tasks are supervised in accordance with legislation and work policies and procedures.

- Effective and accurate records of financial expenditure are maintained in accordance with work policies and procedures.
- Authorisation for any modifications to agreed budgets during the accounting period is obtained
- Feedback is provided regularly to relevant role players.

International comparability

The core and elective components have been developed taking into account South Africa's unique context, but also looking at international best practice. Benchmarking was done against Certificate IV in Water Industry Operations from Australia. The Australian Qualification has no fundamental Unit Standards. The core consists of two Unit Standards on Health and Safety, and Environmental Plans and Procedures. The South African Qualification has an equivalent for Health and Safety but no equivalent for Environmental Plans. The Australian Qualification has electives that cover all fields of water whereas the South African Qualification is specific to water operators. Similarities were found in content, level and degree of complexity with the four Unit Standards that relate to water operators. The Australian Qualification is at a slightly higher level and has a greater emphasis on management. Management will be accommodated at level five in the South African context. The fundamental components, reflecting foundational learning and generic skills and knowledge have been derived from registered, local adult education Unit Standards.

Integrated Assessment

Integrated assessment at the level of Qualification provides an opportunity for learners to show that they are able to integrate concepts, ideas and actions across Unit Standards to achieve competence that is grounded and coherent in relation to the purpose of the Qualification. Integrated assessment should show how already demonstrated competence in individual areas can be linked and applied for the achievement of a holistic outcome.

Integrated assessment must judge the quality of the observable performance, and also the quality of the thinking that lies behind it. Assessment tools must encourage learners to give an account of the thinking and decision-making that underpin their demonstrated performance. Some assessment practices will demand practical evidence while others may be more theoretical, depending on the type of outcomes to be assessed, and the nature and level of the Qualification. The ratio between action and interpretation is not fixed, but varies according to the demands of the Qualification.

While the generic component (literacy, communication and life skills) of this Qualification at NQF Level 4 can be assessed through occupational contexts and activities relating to water purification care must be taken in both the learning programme and the assessment to ensure that these foundational skills are truly portable. The primary aim of this Qualification is to ensure that learners have a sound base of general education to prepare them for further learning, whatever career path they may choose. Learners must be able to transfer generic skills such as language, computation and learning skills etc across a number of different contexts, and apply them within a number of learning areas.

A broad range of task-orientated and theoretical assessment tools may be used, with the distinction between practical knowledge and disciplinary knowledge maintained so that each takes its rightful place. Unit Standards in the Qualification must be used to assess specific and critical cross-field outcomes. During integrated assessments the assessor should make use of formative and summative assessment methods and should assess combinations of practical, applied, foundational and reflexive competencies.

Recognition of prior learning

This Qualification may be achieved in part or completely through the recognition of prior learning, which includes formal, informal and non-formal learning and work experience. Any learner wishing to be directly assessed may arrange to do so, without attending further training or education. The assessor and learner will decide together on the most appropriate assessment route to be taken.

Articulation possibilities

This Qualification has been developed for mobility across similar trades within the industry and is intended to allow for further learning towards management certificates or diplomas within this sector or other sectors on NQF level 5 or 6. This Qualification will provide articulation with a range of Qualifications in both technical and management areas.

Criteria for registration of assessors

For an applicant to register as an assessor, the applicant needs:

- A minimum of five years practical, relevant occupational experience.
- Declared competent in all the outcomes of the of the generic assessor standard, and certificated by the relevant ETQA or by any other appropriate ETQA in agreement with the ETDP SETA in this regard.
- Detailed documentary proof of educational Qualification, practical training undergone, and experience gained by the applicant must be provided (Portfolio of evidence).
- Able to demonstrate competence in relation to these specified standards and Qualifications, at or above, the level of the Qualifications in question.
- Meet any other additional requirements laid down by their constituent ETQA.

The subject matter experience of the assessor can be established by recognition of prior learning.

The status of registered assessors can be checked on the appropriate ETQA database or website.

Moderation

Anyone assessing a learner against these standards must be registered as an assessor with the relevant ETQA.

Any institution offering learning that will enable achievement of these Unit Standards or will assess these Unit Standards must be accredited as a provider with the relevant ETQA.

Moderation of assessment will be overseen by the relevant ETQA according to the moderation guidelines in the relevant Qualification and the agreed ETQA procedures.

Therefore anyone wishing to be assessed against this Qualification may apply to be assessed by any assessment agency, assessor or provider institution that is accredited by the relevant ETQA.

A note on the compilation of standards in this qualification

In line with the SAQA principle of avoiding duplication, existing registered standards were used where possible.

FETC IN WATER PURIFICATION PROCESS CONTROL NQF level 4 (160 credits)

FUNDAMENTAL Total 68 credits	L	C	CORE Total 80 credits	L	C	ELECTIVE Select a minimum of 12 credits	L	C
Use mathematics to investigate and monitor the financial aspects of personal, business, and national issues (9014)	4	6	Supervise Personal Safety Practices In The Water Sector (12061)	4	4	Operate and Maintain Various Disinfection and Oxidation Processes	5	6
Apply knowledge of statistics and probability to critically interrogate and effectively communicate findings on life related problems (9015)	4	6	Demonstrate Knowledge of the Principles and Application of Potable Water Science	4	20	Operate An Alternative Filter System	4	6
Measure, estimate and calculate physical quantities and explore, critique and prove geometrical relationships in two and three-dimensional space in the life and workplace of the adult with increasing responsibilities (9016)	4	4	Supervise Work Unit To Achieve Work Unit Objectives (individuals and teams) (10981)	4	12	Control Water Intakes	4	8
Engage in sustained oral communication and evaluate spoken tests (8974)	4	5	Supervise And Optimise The Operation Of Separation Processes	4	8	Conduct On The Job Coaching (7818)	5	5
Evaluate literary texts (8977)	4	5	Describe And Apply The Management Of Stock And Fixed Assets In A Business Unit. (13945)	4	2	Operate Telemetric And Electronic Equipment And Scientific Instrumentation (12066)	4	12
Read, analyse and respond to a variety of texts (8975)	4	5	Operate And Maintain a Rapid Gravity Filter (12070)	4	5	Apply The Budget Function In A Business Unit (13941)	4	5
Write for a wide range of contexts (8976)	4	5	Demonstrate Knowledge and Operation of Mechanical and Electrical Systems (12058)	4	5	Read and Interpret and Use Construction Drawings and specifications (144260)	4	10
Use language and communication in occupational learning programmes (8973)	3	5	Operate Mechanical, Electrical and Hydraulic Equipment and Control Systems	4	10			
Demonstrate Knowledge of and Produce Computer Spreadsheets using Basic Functions (7572)	2	3	Plan and Implement a Sampling Program to Monitor Water Quality	4	4			
Produce Word Processing Documents for Business (7570)	3	5	Calculate and Control Chemical Dosing Parameters	4	5			
Participate in Management of Conflict (14609)	5	4	Monitor and Co-ordinate the Water Treatment Process	4	5			
Accommodate audience and context needs in oral communication (8968)	3	5						
Interpret and use information from texts (8969)	3	5						
Write texts for a range of communicative contexts (8970)	3	5						
Total credits on level 4		36	Total credits on level 4		80			
Total Credits		68	Total Credits		80	Total Credits		52

Further Education and training Certificate In Water Purification Processes NQF**4****UNIT STANDARDS ON NQF LEVEL 4**

- Title 1: Demonstrate Knowledge of the Principles and Application of Potable Water Science
 Title 2: Supervise And Optimise The Operation Of Separation Processes
 Title 3: Operate Mechanical, Electrical and Hydraulic Equipment and Control Systems
 Title 4: Plan and Implement a Sampling Program to Monitor Water Quality
 Title 5: Calculate and Control Chemical Dosing Parameters
 Title 6: Monitor and Co-ordinate the Water Treatment Process
 Title 7: Operate An Alternative Filter System
 Title 8: Control Water Intakes

UNIT STANDARDS ON NQF LEVEL 5

- Title 9: Operate and Maintain Various Disinfection and Oxidation Processes

Unit Standards And Specific Outcomes For The Further Education and Training In Water Purification Processes NQF 4**NQF Level 4 Unit Standards**

1. TITLE: DEMONSTRATE KNOWLEDGE OF THE PRINCIPLES AND APPLICATION OF POTABLE WATER SCIENCE
- Specific outcome 1.1: Describe the chemical characteristics of raw water and perform relevant laboratory tests.
 Specific outcome 1.2: Describe the physical characteristics of raw water and perform relevant laboratory tests.
 Specific outcome 1.3: Explain water microbiology and perform microbiological tests.
 Specific outcome 1.4: Describe and apply water science principles to the chemical process involved in water treatment.
2. TITLE: SUPERVISE AND OPTIMISE THE OPERATION OF SEPARATION PROCESSES
- Specific outcome 2.1: Explain the principles of separation processes and calculate load factors.
 Specific outcome 2.2: Explain and evaluate the performance of different separation processes.
 Specific outcome 2.3: Demonstrate the removal of different contaminants.
 Specific outcome 2.4: Supervise the operation of separation processes.
 Specific outcome 2.5: Optimise the operation of separation processes.
3. TITLE: PLAN AND IMPLEMENT A SAMPLING PROGRAM TO MONITOR WATER QUALITY

- Specific outcome 3.1: Plan a sampling program.
Specific outcome 3.2: Prepare the implementation of a sampling program.
Specific outcome 3.3: Monitor the collection of microbiological, physical and chemical samples.
Specific outcome 3.4: Liaise with customers.
Specific outcome 3.5: Compile and complete reports.
4. TITLE: CALCULATE AND CONTROL CHEMICAL DOSING PARAMETERS
- Specific outcome 4.1: Prepare chemical solutions of pre-determined strengths.
Specific outcome 4.2: Calculate the mass of chemical required obtaining a given dosage in a fixed volume of water.
Specific outcome 4.3: Calculate the chemical application rate in order to obtain a fixed dosage within a constant flow rate of water.
Specific outcome 4.4: Calibrate chemical dosing equipment for dosing liquids and solids.
Specific outcome 4.5: Interpret jar test results to determine the optimum dosage.
Specific outcome 4.6: Calculate chemical use (daily, weekly and monthly) and related costs for past or future time periods.
5. TITLE: MONITOR AND CO-ORDINATE THE WATER TREATMENT PROCESS
- Specific outcome 5.1: Plan work tasks.
Specific outcome 5.2: Identify and arrange for required resources for the plant.
Specific outcome 5.3: Complete and submit reports.
Specific outcome 5.4: Co-ordinate routine production and maintenance tasks.
Specific outcome 5.5: Optimise efficiency of the plant.
6. TITLE: OPERATE AN ALTERNATIVE FILTER SYSTEM
- Specific outcome 6.1: Demonstrate knowledge of the design and functioning of the relevant filtration process.
Specific outcome 6.2: Operate the filter.
Specific outcome 6.3: Complete the cleaning process.
Specific outcome 6.4: Maintain the filtration system.
7. TITLE: CONTROL WATER INTAKES
- Specific outcome 7.1: Maintain catchment area.
Specific outcome 7.2: Operate and maintain abstraction works.
Specific outcome 7.3: Monitor and adjust flow rates at rivers and reservoirs.
Specific outcome 7.4: Monitor and adjust flows at boreholes in accordance with works procedures.
Specific outcome 7.5: Monitor abstraction point quality and conditions.
Specific outcome 7.6: Isolate the abstraction point in emergency conditions in accordance with works procedures.
Specific outcome 7.7: Maintain and update records.
8. TITLE: OPERATE AND MAINTAIN VARIOUS DISINFECTION AND OXIDATION PROCESSES
- Specific outcome 8.1: Demonstrate knowledge of principles of oxidation for disinfection

- Specific outcome 8.2: purposes.
Operate and maintain various disinfection processes in accordance with work policies and procedures.
- Specific outcome 8.3: Monitor and control oxidant dosing in accordance with work policies and procedures

NQF Level 5 Unit Standards

9. TITLE: OPERATE AND MAINTAIN VARIOUS DISINFECTION AND OXIDATION PROCESSES
- Specific outcome 9.1: Demonstrate knowledge of principles of oxidation for disinfection purposes.
- Specific outcome 9.2: Operate and maintain various disinfection processes.
- Specific outcome 9.3: Monitor and control oxidant dosing.
- Specific outcome 9.4: Monitor and control oxidant storage and handling.