

NATIONAL OCCUPATIONAL STANDARD FOR ENVIRONMENT AND WATER QUALITY OFFICER



**NOS.EWQO.01
FIRST EDITION**

APPROVING AUTHORITY

This National Occupational Standard (NOS) has been prepared and published under the authority of the Zambia Qualifications Authority Board on 16th May, 2024.

ZAMBIA QUALIFICATIONS AUTHORITY

The Zambia Qualifications Authority (ZAQA) Act No. 13 of 2011 was enacted by the Government of the Republic of Zambia to ***“provide for the development and implementation of a national qualifications framework; establish the Zambia Qualifications Authority; provide for the registration and accreditation of qualifications; provide measures to ensure that standards and registered qualifications are internationally comparable; and provide for matters connected with, or incidental to the foregoing”***. Among other functions, ZAQA is responsible for ***determining national standards for any occupation***, through the various sector specific National Occupational Standards Development Teams (NOSDTs).

REVISION OF NATIONAL OCCUPATIONAL STANDARDS

National Occupational Standards (NOS) shall be revised every 5 years, or whenever it is deemed necessary, by the issuance of either amendments or revised editions. It is important that users of the NOS ascertain that they are in possession of the latest amendments or editions.

NOS DEVELOPMENT TEAM RESPONSIBLE

This National Occupational Standard was prepared by the Water NOSDT, upon which the following organisations were represented:

1. Technical Education Vocational and Entrepreneurship Training Authority (TEVETA) and Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) Thrive Project
2. Habitat for Humanity Zambia (HHZ)
3. Living Water International (LWI)
4. Ministry of Water Development and Sanitation (MWDS)
5. National Water Supply and Sanitation Council (NWASCO) / Lusaka Water Security Initiative (LuWSI)
6. Natural Resources Development College (NRDC)
7. The Copperbelt University (CBU)
8. The University of Zambia (UNZA)
9. Water Resources Management Authority (WARMA)
10. WaterAid Zambia (WAZ)
11. Zambia Environmental Management Agency (ZEMA)

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FOREWORD

The Zambia Qualifications Authority (ZAQA) is a statutory body under the Ministry of Education established by ZAQA Act No. 13 of 2011 to ***“provide for the development and implementation of a national qualifications framework; provide measures to ensure that standards and registered qualifications are internationally comparable; and provide for matters connected with, or incidental to the foregoing”***.

Among other functions, ZAQA is responsible for ***“determining national standards for any occupation”***, through the various sector specific National Occupational Standards Development Teams (NOSDTs) with experts composed of representation from the appropriate authorities, government departments, consumer associations, regulators, industry, academia, and non-governmental organisations, etc.

This National Occupational Standard (NOS) has been developed by the Water National Occupational Standards Development Team in accordance with the laid down procedures and guidelines of ZAQA. All users should ensure that they have the latest edition of this publication as the NOS are revised from time to time.

This NOS shall be used by, among others, industry, employers, quality assurance bodies, awarding and professional bodies, and education and training institutions, as a benchmark to identify training needs, develop job profiles/descriptions, develop curricula, and learning programmes in various sectors where the occupation exists. In the Water sector, demonstration of competence against this NOS may be required in order to run a business or practice a craft or profession.

JUSTIFICATION

Environment and Water Quality Officer (EWQO) is one of the critical trades for the water sector—someone who protects the environment, water sources in these times of climate change, environmental degradation, and water scarcity. Provision of safe and clean water is critical to human well-being, having a productive society, and for economic development.

This NOS highlights the core knowledge, skills, competences, and personal attributes that Environment and Water Quality Officers must possess to be successful in their jobs.

ACRONYMS AND ABBREVIATIONS

CS	Core Skills
EWQO	Environment and Water Quality Officer
K	Knowledge and Understanding
NOS	National Occupational Standard
NOSDT	National Occupational Standards Development Team
OK	Organisational Knowledge
OSHE	Occupational Safety, Health and Environment
PC	Performance Criteria
PS	Professional Skills
RK	Regulatory Knowledge
RPL	Recognition of Prior Learning
TK	Technical Knowledge
SOP	Standard Operating Procedure
ZAQA	Zambia Qualifications Authority
ZQF	Zambia Qualifications Framework

GLOSSARY OF TERMS

For the purposes of this NOS, the following terms and definitions shall apply:

Core Skills/Generic Skills: are a group of skills that are key to learning and working in today's world. These skills are typically needed in any work environment. In the context of the NOS, these include communication related skills that are applicable to most job roles.

Disability: is the physical or mental impairment that substantially limits one or more major life activities.

Function: is an activity necessary for achieving the key purpose of the sector, occupation or area of work, which can be carried out by a person or a group of persons. Functions are identified through functional analysis and form the basis of the NOS.

Job Title: defines a unique set of functions that together form a unique employment opportunity in an organisation.

Knowledge and Understanding: are statements, which together specify the technical, generic, professional, and organisational specific knowledge that an individual needs in order to perform to the required standard.

National Occupational Standards (NOS): are statements of the standards of performance individuals must achieve when carrying out functions in the workplace, together with specifications of the underpinning knowledge and understanding. They are precise descriptions of what an individual is expected to be able to do in his/her work role.

National Occupational Standards (NOS) Code: is a unique reference code that identifies a NOS.

National Occupational Standards Development Team (NOSDT): means an established group of national stakeholders/experts responsible for the development of National Occupational Standards within a specific economic sector or occupation.

Occupation: is a set of job roles, which perform similar/related set of functions in an industry.

Organisational Context: includes the way the organisation is structured and how it operates, including the extent of operative knowledge that managers have in their relevant areas of responsibility.

Performance Criteria: are statements that together specify the standard of performance required when carrying out a task.

Scope: is the set of statements specifying the range of variables that an individual may have to deal with in carrying out the function which have a critical impact on the quality of performance required.

Sector: is a conglomeration of different business operations having similar businesses and interests. It may also be defined as a distinct subset of the economy, whose components share similar characteristics and interests.

Sub Sector: is derived from a further breakdown based on the characteristics and interests of its components.

Technical Knowledge: is the specific knowledge needed to accomplish specific designated responsibilities.

Unit Title: gives a clear overall statement about what the incumbent should be able to do.

Elements: set out competences the incumbent should possess to carry out the day-to-day activities.

1. OVERVIEW

This is an introductory section providing a summary and specific information or commentary about the content of the NOS, the targeted sector and occupation to help the user judge whether it is relevant to them.

NOS Code	NOS.EWQO.01
Occupation	Environment and Water Quality Management
Job Title	Environment and Water Quality Officer
Job Description	An Environment and Water Quality Officer undertakes environmental, social, and economic assessments, and develops standards to inspect water and wastewater treatment facilities. He/she also undertakes water and wastewater sampling tests, analysis, and reporting on their quality parameters, environmental surveillance, climate change adaptation, and mitigation interventions. They direct, monitor, and evaluate safety practices and procedures with respect to laboratory and field analytical work, to check if they meet health and hygiene standards. Coaching and mentoring subordinates, training of communities on environmental sustainability, water security and quality also forms part of their responsibilities.
Job Purpose	An Environment and Water Quality Officer is responsible for environmental management, and water and wastewater quality monitoring. He/she contributes to the development of standards for water and wastewater quality.
ZQF Level	7
Sector	Water
Sub sectors	Water Supply and Sanitation, Water Resources Management and Development, Environment.
Other Economic Sector(s) in which the Occupation is Practiced	Agriculture, Forestry, Environment, Fisheries & Livestock, Commerce, Tourism, Mining, Construction, etc.
Other Similar Jobs that can be Performed in the Occupation	Safety Coordinator, Safety Supervisor, Safety, Health and Environment Manager, Water Quality Assurance Officer, Environmental Inspector, Public Health Inspector, Lecturer, Tutor, etc.
Minimum Educational Job Entry Qualification(s)	Degree in Environmental Science, Natural Sciences, Chemical Engineering, Water Engineering, Environmental Engineering, Bsc WRM, etc.
Practicing License Requirements (if any)	Membership with the Engineering Institution of Zambia (EIZ) is recommended.
Training/RPL (Suggested)	<ol style="list-style-type: none"> 1. First Aid. 2. ICTS. 3. Participatory Approaches. 4. Water and Wastewater Standards (ISO, WHO, ZABS).

Minimum Job Entry Age	20 years
Prior Experience (Recommended)	1 year experience or internship
Performance Criteria	As described in the Units under Section 4

2. SCOPE

This NOS specifies the fundamental knowledge and understanding, skills and competences, and personal attributes that Environmental and Water Quality Officer must possess to be successful in their jobs.

3. PERSONAL ATTRIBUTES (VALUES, ETHICS AND ATTITUDES)

This job requires ability to:

- Do planning, assessments, analysis, reporting, and prioritising;
- work in a team;
- Have physique to sustain strenuous conditions;
- Have high technological exposure to handle various equipment, tools and materials;
- Have sensitivity towards safety for self, others, and equipment;
- Have willingness to work across various locations, be well versed with tasks, functions, standards, specifications, codes of practice, and safety norms applicable to the environment, water, and wastewater works;
- be honest, collaborative, accountable, transparent, professional, strong interpersonal and team-working skills, managing multiple priorities and competing demands, and results oriented;
- And willing to work in shifts, etc.

4. UNITS AND ELEMENTS

This National Occupational Standard is divided into 4 Units, representing the tasks that a jobholder should undertake in his/her day-to-day work. Each unit is further broken down into elements depicting the number of activities to be carried out for the successful execution of a particular task.

UNIT 1 [This Unit covers the skills and knowledge required by an Environment and Water Quality Officer for environmental management]

Unit No.	01
Unit Title	Environmental Management
Description	This Unit describes the skills and knowledge required by an Environment and Water Quality Officer to undertake environmental management.
Scope	<p>This Unit covers the following:</p> <ul style="list-style-type: none"> • Assessment, analysis, and technical reports for environmental project briefs on environmental impact statements (environment, social, economic, health impacts) • Surveillance and monitoring of sites, etc. • Environment regulatory policing. • Environmental remediation.
Performance Criteria (PC) with respect to the Scope	
Element	Performance Criteria (PC)
Assessment, Analysis, and Technical Reports for Environmental Project Briefs on Environmental Impact Statements	<p>To be competent, the individual must be able to:</p> <p>PC1. Plan on how to undertake environmental, social, health, economic assessments, and sanitary inspections.</p> <p>PC2. Conduct environmental, social, health, economic assessments, and sanitary inspections.</p> <p>PC3. Analyse and interpret the data from the assessments and inspections.</p> <p>PC4. Undertake vulnerability analyses and risk ratings.</p> <p>PC5. Report and disseminate results of the assessments and inspections.</p> <p>PC6. Prepare environmental project briefs and environmental impact statements.</p>
Surveillance and Monitoring of Sites, etc.	<p>To be competent, the individual must be able to:</p> <p>PC7. Develop surveillance and monitoring plans.</p> <p>PC8. Undertake baseline surveys.</p> <p>PC9. Undertake surveillance to identify sources of pollution.</p> <p>PC10. Use tools and equipment for environmental analysis.</p> <p>PC11. Undertake geospatial analysis using GIS and remote sensing.</p>
Environment Regulatory Policing	<p>To be competent, the individual must be able to:</p> <p>PC12. Interpret and apply water, wastewater, environmental legislation, standards, and regulatory frameworks.</p> <p>PC13. Interpret and apply water, wastewater, and environmental policies.</p> <p>PC14. Undertake environmental inspections.</p> <p>PC15. Report on compliance levels.</p> <p>PC16. Enforce regulations.</p>
Environmental Remediation	<p>To be competent, the individual must be able to:</p> <p>PC17. Prepare environmental restoration and management plans.</p>

	<p>PC18. Undertake remediation interventions.</p> <p>PC19. Engage stakeholders on restoration and management plans.</p> <p>PC20. Undertake assessment of effectiveness of remediation interventions.</p>
<p>Knowledge and Understanding (K)</p>	
<p>A. Organisational Context (knowledge of the company/ organisation and its processes)</p>	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>OK1. Standard operating procedures.</p> <p>OK2. Organisation policies, regulations, and guidelines on safety, health, and environment.</p> <p>OK3. International agreements and protocols Government is party to.</p> <p>OK4. Organisation strategy (vision and mission).</p> <p>OK5. Institutional framework (stakeholder mapping).</p> <p>OK6. Sanitary inspection checklists for water points and on-site sanitation.</p>
<p>B. Technical Knowledge</p>	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>TK1. Processes for preparation of environmental project briefs and environmental impact statements.</p> <p>TK2. Environmental scoping techniques.</p> <p>TK3. Participatory approaches for engaging communities.</p> <p>TK4. First Aid skills.</p> <p>TK5. Procedures for undertaking surveillance and monitoring.</p> <p>TK6. Procedures for approval of projects (EBPs, ESs).</p> <p>TK7. Software packages for analysis and generation of reports (Excel, Microsoft Project, PowerPoint, Word, Access, GIS, Remote sensing).</p> <p>TK8. Environmental emergency procedures.</p> <p>TK9. Development, implementation, and review of environmental management plans.</p> <p>TK10. Preparation and providing evidence for environmental offences prosecution.</p> <p>TK11. Knowledge for environmental guidelines and procedures.</p> <p>TK12. Personal safety and health requirements for environmental emergencies.</p> <p>TK13. Preventive and remedial actions to be taken in case of exposure to toxic materials.</p> <p>TK14. Conflict resolution procedures.</p> <p>TK15. Code of conduct, ethics, and grievance procedures.</p> <p>TK16. Service charter for the organisation.</p> <p>TK17. Community complaint and feedback mechanisms.</p> <p>TK18. Review of complex reports, identifying key issues, and summarising them.</p>

C. Regulatory Context (knowledge of rules and regulation)	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>RK1. Laws and regulations related to environment, water, public health, and occupational health and safety.</p>
Skills (S)	
A. Core Skills/ Generic Skills	Writing Skills
	<p>The individual on the job must be able to:</p> <p>CS1. Write in English (at least working level), and be able to or have the means to give simple instructions in the local language used at the site.</p> <p>CS2. Prepare and provide clear and simple instructions, details, and sketches to co-workers.</p> <p>CS3. Prepare and present using PowerPoint.</p>
	Reading Skills
	<p>The individual on the job must be able to:</p> <p>CS4. Read English and be able to, or have the means to, give simple instructions in the local language used at the site.</p> <p>CS5. Read and interpret sketches, drawings or instructions provided for the required work.</p> <p>CS6. Read and interpret various safety and general signage, safety rules and tags, etc., provided at the workplace, including directions for exit routes during emergencies.</p>
	Oral Communication (Listening and Speaking skills)
<p>The individual on the job must be able to:</p> <p>CS7. Speak in English (at least working level), and be able to, or have the means to, give simple instructions in the local language used at the site.</p> <p>CS8. Listen attentively and interpret communication/ instructions from the supervisor and other co-workers.</p> <p>CS9. Convey information clearly and concisely to co-workers.</p> <p>CS10. Respond appropriately to any queries.</p>	
B. Professional Skills	Decision-Making
	<p>The individual on the job must be able to:</p> <p>PS1. Determine and report to the supervisor whether the working space is safe for operations.</p> <p>PS2. Follow the organisation's rule-based decision-making processes.</p> <p>PS3. Make decisions in emergency situations in the absence of the supervisor.</p>
	Plan and Organise
<p>The individual on the job should be able to:</p> <p>PS4. Plan work and organise required resources in coordination with team members and superiors.</p> <p>PS5. Prepare and contribute to annual work plans and budgets.</p>	

	<p>PS6. Prepare surveillance and monitoring plans.</p> <p>PS7. Prepare environmental management and mitigation plans.</p> <p>PS8. Prepare environmental and social safeguard reports.</p>
	<p>Problem Solving</p>
	<p>The individual on the job should be able to:</p> <p>PS9. Identify and resolve any conflicts within the team.</p> <p>PS10. Know the procedures for handling disciplinary matters and grievances.</p> <p>PS11. Investigate, document, and engage relevant authorities to resolve community grievances.</p> <p>PS12. Identify problems and find solutions.</p> <p>PS13. Use modern problem-solving techniques.</p>
	<p>Analytical Thinking</p>
	<p>The individual on the job should be able to:</p> <p>PS14. Analyse information received from officers and subordinates.</p> <p>PS15. Analyse and convey to the supervisor information received and carry out remedial action.</p> <p>PS16. Use data and information for decision-making and evidence-based advocacy.</p> <p>PS17. Use software packages for analysis.</p>
	<p>Critical Thinking</p>
	<p>The individual on the job should be able to:</p> <p>PS18. Identify and deal with or report violation of any safety norms which may lead to accidents.</p> <p>PS19. Ask relevant questions for better understanding.</p> <p>PS20. Devise innovative solutions.</p>

UNIT 2 [This Unit covers the skills and knowledge required by an Environment and Water Quality Officer for water and wastewater quality management]

Unit No.	02
Unit Title	Water and Wastewater Quality Management
Description	This Unit describes the skills and knowledge required by an Environment and Water Quality Officer to undertake water and wastewater quality management.
Scope	<p>This Unit covers the following:</p> <ul style="list-style-type: none"> • Licensing, analysis, and technical reports. • Water and wastewater quality monitoring and surveillance. • Water and wastewater regulatory policing. • Restoration and protection of water sources and catchments.
Performance Criteria (PC) with respect to the Scope	
Element	Performance Criteria (PC)
Licensing, Analysis and Technical Reports	<p>To be competent, the individual must be able to:</p> <p>PC1. Plan how to undertake licensing processes and procedures for water and wastewater.</p> <p>PC2. Plan how to undertake field assessments and prepare technical reports for water and wastewater.</p> <p>PC3. Analyse and interpret data from the assessments.</p> <p>PC4. Undertake analysis of pollution potential and risk rating.</p> <p>PC5. Report and disseminate results of the assessments.</p> <p>PC6. Prepare water and wastewater quality reports.</p> <p>PC7. Participate in the development of water and wastewater quality standards.</p> <p>PC8. Enforce water and wastewater regulations.</p>
Water and Wastewater Quality Monitoring and Surveillance	<p>To be competent, the individual must be able to:</p> <p>PC9. Develop surveillance and monitoring plans.</p> <p>PC10. Undertake baseline surveys.</p> <p>PC11. Undertake surveillance to identify sources of pollution.</p> <p>PC12. Use tools and equipment for water and wastewater quality sampling and analysis.</p>
Water and Wastewater Regulatory Policing	<p>To be competent, the individual must be able to:</p> <p>PC13. Interpret and apply water and wastewater environmental legislation, standards, and regulatory frameworks.</p> <p>PC14. Interpret water and wastewater environmental policies</p> <p>PC15. Undertake environmental inspections.</p> <p>PC16. Report on compliance levels.</p> <p>PC17. Enforce regulations.</p>
Restoration and Protection of Water Sources and Catchments	<p>To be competent, the individual must be able to:</p> <p>PC18. Prepare water sources and catchment restoration and management plans.</p> <p>PC19. Undertake restoration and protection interventions.</p>

	<p>PC20. Engage stakeholders on development of restoration and management plans.</p> <p>PC21. Undertake assessment of effectiveness of restoration and protection interventions.</p>
Knowledge and Understanding (K)	
<p>A. Organisational Context (knowledge of the company/ organisation and its processes)</p>	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>OK1. Standard operating procedures.</p> <p>OK2. Organisation policies, regulations, and guidelines on safety, health, and environment; safeguarding equipment and workplace.</p> <p>OK3. International agreements and protocols Government is party to.</p> <p>OK4. Organisation strategy (vision and mission).</p> <p>OK5. Institutional framework (stakeholder mapping)</p>
<p>B. Technical Knowledge</p>	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>TK1. Participatory approaches for engaging communities.</p> <p>TK2. Processes for obtaining of water permits and wastewater licences.</p> <p>TK3. Water and wastewater scoping techniques.</p> <p>TK4. First Aid skills</p> <p>TK5. Procedures for undertaking surveillance and monitoring.</p> <p>TK6. Software packages for analysis and generation of reports (Excel, Microsoft Project, PowerPoint, Word, Access, GIS, Remote sensing).</p> <p>TK7. Water and wastewater emergency procedures.</p> <p>TK8. Development, implementation, and review of water sources and catchment management plans.</p> <p>TK9. Preparing and providing evidence for water and wastewater offences prosecution.</p> <p>TK10. Water and wastewater guidelines and procedures.</p> <p>TK11. Personal safety and health requirements for emergencies.</p> <p>TK12. Preventive and remedial actions to be taken in case of exposure to toxic materials.</p> <p>TK13. Conflict resolution procedures.</p> <p>TK14. Code of conduct, ethics, and grievance procedures.</p> <p>TK15. Service charter for the organisation.</p> <p>TK16. Community complaint and feedback mechanisms.</p> <p>TK17. Water quality standards and guidelines (ZABS, WHO).</p> <p>TK18. Use of portable laboratories.</p> <p>TK19. Ethical sampling methods.</p> <p>TK20. Calibration of laboratory equipment.</p> <p>TK21. Use of Nature-based Solutions (NbS) for water sources restoration.</p>

<p>C. Regulatory Context (knowledge of rules and regulation)</p>	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>RK1. Laws and regulations related to environment, water, sanitation, public health, and occupational health and safety.</p> <p>RK2. ISO 17025 (testing and calibration labs).</p> <p>RK3. ZS:190:2010 Drinking Water Quality Standards.</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p>
	<p>The individual on the job must be able to:</p> <p>CS1. Write in English (at least working level), and be able to, or have the means to, give simple instructions in the local language used at the site.</p> <p>CS2. Prepare and provide clear and simple instructions, details, and sketches to co-workers.</p> <p>CS3. Prepare and present using PowerPoint.</p>
	<p>Reading Skills</p>
	<p>The individual on the job must be able to:</p> <p>CS4. Read English and be able to. or have the means to, give simple instructions in the local language used at the site.</p> <p>CS5. Read and interpret sketches, drawings or instructions provided for the required work.</p> <p>CS6. Read and interpret various safety and general signage, safety rules and tags, etc., provided at the workplace, including directions for exit routes during emergencies.</p>
	<p>Oral Communication (Listening and Speaking skills)</p>
<p>B. Professional Skills</p>	<p>The individual on the job must be able to:</p> <p>CS7. Speak in English (at least working level), and be able to, or have the means to, give simple instructions in the local language used at the site.</p> <p>CS8. Listen attentively and interpret communication/ instructions from the supervisor and other co-workers.</p> <p>CS9. Convey information clearly and concisely to co-workers.</p> <p>CS10. Respond appropriately to any queries.</p>
	<p>Decision-Making</p>
<p>The individual on the job must be able to:</p> <p>PS1. Determine and report to the supervisor whether the working space is safe for operations.</p> <p>PS2. Follow the organisation rule-based decision-making processes.</p> <p>PS3. Make decisions in emergency situations in the absence of the supervisor.</p>	

	Plan and Organise
	The individual on the job should be able to:
	PS4. Plan work and organise required resources in coordination with team members and superiors.
	PS5. Prepare and contribute to annual work plans and budgets.
	PS6. Prepare surveillance and monitoring plans.
	PS7. Prepare water sources and catchment restoration management plans.
	PS8. Prepare environmental and social safeguard reports.
	Problem Solving
The individual on the job should be able to:	
PS9. Identify and resolve any conflicts within the team.	
PS10. Know the procedures for handling disciplinary matters and grievances.	
PS11. Investigate, document, and engage relevant authorities to resolve community grievances.	
PS12. Identify problems and find solutions.	
PS13. Use modern problem-solving techniques.	
Analytical Thinking	
The individual on the job should be able to:	
PS14. Analyse information received from officers and subordinates.	
PS15. Analyse and convey information received to the supervisor and carry out remedial action.	
PS16. Use data and information for decision-making and evidence-based advocacy.	
PS17. Use software packages for analysis.	
Critical Thinking	
The individual on the job should be able to:	
PS18. Identify and deal with or report violation of any safety norms which may lead to accidents.	
PS19. Ask relevant questions for better understanding.	
PS20. Devise innovative solutions.	

UNIT 3[This Unit covers the skills and knowledge required by an Environment and Water Quality Officer for climate change adaptation and mitigation interventions]

Unit No.	03
Unit Title	Climate Change Adaptation and Mitigation Interventions
Description	This Unit describes the skills and knowledge required by an Environment and Water Quality Officer to undertake climate change adaptation and mitigation interventions.
Scope	This Unit covers the following: <ul style="list-style-type: none"> • Climate change adaptation mechanisms. • Climate change mitigation mechanisms.
Performance Criteria (PC) with respect to the Scope	
Element	Performance Criteria (PC)
Climate Change Adaptation Mechanisms	To be competent, the individual must be able to: <p>PC1. Plan and package community communication materials on climate adaptation.</p> <p>PC2. Educate communities on adaptation mechanisms against floods, droughts, and storms.</p> <p>PC3. Share information on climate change early warning systems.</p> <p>PC4. Prepare community action planning on adaptation mechanisms.</p> <p>PC5. Capture information that could help communities to adapt and build resilience to climate variability (rainfall variability, floods, etc).</p> <p>PC6. Report on climate variability effects from communities.</p>
Climate Change Mitigation Mechanisms	To be competent, the individual must be able to: <p>PC7. Plan and implement climate change mitigation mechanisms.</p> <p>PC8. Implement campaigns on mitigation mechanism (tree planting, agroforestry, etc).</p> <p>PC9. Map vulnerable communities.</p>
Knowledge and Understanding (K)	
A. Organisational Context (knowledge of the company/ organisation and its processes)	The individual on the job must demonstrate knowledge and understanding of: <p>OK1. Standard operating procedures.</p> <p>OK2. Organisation policies, regulations, and guidelines on safety, health, and environment; safeguarding equipment and workplace.</p> <p>OK3. International agreements and protocols Government is party to.</p> <p>OK4. Organisation strategy on climate change.</p> <p>OK5. Institutional framework (stakeholder mapping).</p>
B. Technical Knowledge	The individual on the job must demonstrate knowledge and understanding of: <p>TK1. Climate change adaptation and mitigation.</p> <p>TK2. Role of ecosystems in climate change adaptation.</p>

	<p>TK3. Local community adaptation mechanisms. TK4. Multi-lateral agreements on climate change. TK5. Policies and regulations on climate change. TK6. Climate change early warning systems. TK7. Preparation of action planning on adaptation mechanisms. TK8. Mainstreaming gender in climate adaptation and mitigation. TK9. Participatory approaches. TK10. Climate technology transfer. TK11. Role of indigenous knowledge on climate change adaptation and mitigation.</p>
<p>C. Regulatory Context (knowledge of rules and regulation)</p>	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>RK1. Laws and regulations related to environment, water, forests, climate change, public health, and occupation health and safety.</p>
<p>Skills (S)</p>	
<p>A. Core Skills/ Generic Skills</p>	<p>Writing Skills</p>
	<p>The individual on the job must be able to:</p> <p>CS1. Write in English (at least working level), and be able to, or have the means to, give simple instructions in the local language used at the site. CS2. Prepare and provide clear and simple written instructions, as well as provide details and sketches to co-workers.</p>
	<p>Reading Skills</p>
	<p>The individual on the job must be able to:</p> <p>CS3. Read English and be able to, or have the means to, give simple instructions in the local language used at the site. CS4. Read and interpret sketches, drawings or instructions provided for the required work. CS5. Read and interpret various policies, legislation, and multi-lateral environmental agreements (MEAs) on climate change.</p>
	<p>Oral Communication (Listening and Speaking skills)</p>
<p>The individual on the job must be able to:</p> <p>CS6. Speak in English (at least working level), and be able to, or have the means to, give simple instructions in the local language used at the site. CS7. Listen attentively and interpret communication/ instructions from the supervisor and other co-workers. CS8. Convey information clearly and concisely to co-workers.</p>	

B. Professional Skills	Decision-Making
	The individual on the job must be able to:
	PS1. Determine and report to the supervisor whether the working space is safe for operating.
	PS2. Follow the organisation rule-based decision-making processes.
	PS3. Make decisions in emergency situations in the absence of the supervisor.
	Plan and Organise
	The individual on the job should be able to:
PS4. Plan work and organise required resources in coordination with team members and superiors.	
PS5. Prepare and contribute to annual work plans and budgets.	
PS6. Prepare community climate change adaptation and mitigation plans.	
Problem Solving	
The individual on the job should be able to:	
PS7. Identify and resolve any conflicts within the team.	
PS8. Know the procedures for handling disciplinary matters and grievances.	
PS9. Investigate, document, and engage relevant authorities to resolve community grievances.	
PS10. Identify problems and find solutions.	
PS11. Use modern problem-solving techniques.	
Analytical Thinking	
The individual on the job should be able to:	
PS12. Analyse information received from officers and subordinates.	
PS13. Analyse and convey the information received to the supervisor and carry out remedial action.	
PS14. Use data and information for decision-making and evidence-based advocacy.	
PS15. Use software packages for analysis.	
Critical Thinking	
The individual on the job should be able to:	
PS16. Ask relevant questions for better understanding.	
PS17. Devise innovative solutions.	

UNIT 4 [This Unit covers the skills and knowledge required by an Environment and Water Quality Officer on health and safety for field operations that need to be followed to maintain a healthy, safe, and secure work environment]

Unit No.	04
Unit Title	Health, Safety, and Environment in Field Operations
Description	This Unit describes the skills and knowledge required by an Environment and Water Quality Officer in maintaining health, safety, and environmental protection for individuals and the environment during field operations related to water and wastewater.
Scope	This Unit covers the following: <ul style="list-style-type: none"> • Work safety in the field, and water and wastewater laboratory. • Appropriate emergency procedures.
Performance Criteria (PC) with respect to the Scope	
Element	Performance Criteria (PC)
Work Safety in the Field, and Water and Wastewater Laboratory	To be competent, the individual must be able to: <p>PC1. Develop or update operating procedures relating to health and safety.</p> <p>PC2. Train staff on health and safety, and enforce health and safety rules and standards.</p> <p>PC3. Follow safety checks when conducting inspections, and when sampling raw and treated water and wastewater.</p> <p>PC4. Identify work for which protective clothing or equipment is required, and perform duties in accordance with workplace policies.</p> <p>PC5. Use protective clothing or equipment when performing field work.</p> <p>PC6. Recognise risks for bystanders and take action to reduce risk associated with the jobs in the workplace.</p> <p>PC7. Complete all health, safety, and security activities, such as safety drills, and prepare records legibly and accurately.</p> <p>PC8. Perform work in a manner that minimises environmental damage.</p> <p>PC9. Report all accidents, incidents or problems without delay to appropriate personnel, and take necessary remedial action to reduce further danger.</p>
Appropriate Emergency Procedures	To be competent, the individual must be able to: <p>PC10. Implement emergency procedures.</p> <p>PC11. Follow procedures for dealing with accidents, fires, and emergencies, including issuing instructions and directives for emergency evacuation.</p> <p>PC12. Follow emergency procedures to company standard/ workplace requirements.</p>

	PC13. Use emergency equipment in accordance with manufacturers' specifications and workplace requirements.
Knowledge and Understanding (K)	
A. Organisational Context (knowledge of the company/ organisation and its processes)	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>OK1. Standard operating procedures. OK2. Organisational safety, health, and environmental policies, procedures, regulations, and guidelines. OK3. International agreements and protocols Government is party to. OK4. Organisation strategy (vision and mission). OK5. General duties under relevant health and safety legislation. OK6. Personal protective equipment to be worn and how it is cared for; correct and safe way to use materials and equipment required for the work. OK7. Importance of good housekeeping in the workplace. OK8. Safe disposal methods of waste. OK9. Methods for minimising environmental damage during work.</p>
B. Technical Knowledge	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>TK1. Risks to health and safety, and the measures to be undertaken to control such risks in the workplace. TK2. Basic emergency First Aid procedures. TK3. Local emergency services. TK4. Firefighting (different fires and quenching methods). TK5. Preventive and remedial actions to be taken in case of exposure to toxic materials. TK6. Reporting all accidents, incidents, and problems, and the appropriate action to be taken.</p>
C. Regulatory Context (knowledge of rules and regulations)	<p>The individual on the job must demonstrate knowledge and understanding of:</p> <p>RK1. Laws and regulations related to environment, water, public health, and occupational health and safety.</p>
Skills (S)	
A. Core Skills/ Generic Skills	<p>Writing Skills</p> <p>The individual on the job must be able to:</p> <p>CS1. Write in English (at least working level), and be able to, or have the means to, give simple instructions in the local language used at the site. CS2. Prepare and provide clear and simple instructions, details, and sketches to co-workers.</p>

	<p>Reading Skills</p> <p>The individual on the job must be able to:</p> <p>CS3. Read English and be able to, or have the means to, give simple instructions in the local language used at the site.</p> <p>CS4. Read and interpret sketches, and instructions provided for the required work.</p> <p>CS5. Read and interpret various safety and general signage, safety rules and tags, etc., provided at the workplace, including directions for exit routes during emergencies.</p>
	<p>Oral Communication (Listening and Speaking skills)</p> <p>The individual on the job must be able to:</p> <p>CS6. Speak English (at least working level), and be able to or have the means to give simple instructions in the local language used at the site.</p> <p>CS7. Listen attentively and interpret communication/ instructions from the supervisor and other co-workers.</p> <p>CS8. Convey information clearly and concisely to co-workers</p>
B. Professional Skills	<p>Decision-Making</p> <p>The individual on the job must be able to:</p> <p>PS1. Determine and report to the supervisor whether the working space is safe for operating.</p> <p>PS2. Follow the organisation rule-based decision-making processes.</p> <p>PS3. Make decisions in emergency situations in the absence of the supervisor.</p>
	<p>Plan and Organise</p> <p>The individual on the job should be able to:</p> <p>PS4. Plan work and organise required resources in coordination with team members and superiors.</p>
	<p>Customer Centricity</p> <p>The individual on the job should be able to:</p> <p>PS5. Manage relationships with customers with intent to satisfying their requirements.</p>
	<p>Problem Solving</p> <p>The individual on the job should be able to:</p> <p>PS6. Identify and resolve any conflicts within the team.</p> <p>PS7. Know the procedures for handling disciplinary matters and grievances.</p> <p>PS8. Investigate, document, and engage relevant authorities to resolve customer grievances.</p> <p>PS9. Identify problems and find solutions.</p> <p>PS10. Use modern problem-solving techniques.</p>

	Analytical Thinking
	The individual on the job should be able to:
	PS11. Analyse the information received from officers and subordinates. PS12. Analyse and convey to the supervisor technical reports. PS13. Use data and information for decision-making and evidence-based reporting
	Critical Thinking
	The individual on the job should be able to:
	PS14. Identify and deal with, or report violation of any safety norms which may lead to accidents. PS15. Ask relevant questions for better understanding. PS16. Come up with innovative solutions.

5. EQUIPMENT, TOOLS AND CONSUMABLE MATERIALS

Equipment, tools, and consumable materials used by the job holder include, but are not limited to:

Hand Tools: Hammer, gauge measure, spanners, sampling bottles, fire lighter, rope, portable lab, cooler box, GPS, camera, calculator, etc.

Measuring Instruments: Titration apparatus, try scale, spirit level, measuring tape, analytical tools, etc.

Power Tools: Blending machine, heaters, incubators, water distiller, etc.

Consumables and General Requirements: Cotton wool, mutton cloth, methylated spirit, ethanol, reagents, stationery, cleaning detergents, distilled water, First Aid kit, fire extinguishers, etc.

Personal Protective Equipment: Safety goggles, safety shoes, PVC gloves, dust and gas mask, apron or dust coat, etc.

6. DILEMMAS/CHALLENGES AND COMPLEXITIES FOR A JOBHOLDER

Dilemmas associated with the job of an Environment and Water Quality Officer include: exposure to fumes and toxic gases; working around environments that could be toxic and slippery; working in dangerous areas with likelihood of flammable materials; working in confined spaces with likelihood of suffocation; working in wet and dusty environments and for long working hours; pressure from supervisors and colleagues; pressure from government regulators, etc.

6.1 Alternative Choices (Solutions) to Dilemmas and Complexities

Solutions to dilemmas include: wearing protective clothing, and ensuring their availability and use by other employees; exercising regularly to maintain physical fitness; exercising proper work ergonomics; participating in workplace safety sensitisation and awareness meetings/training sessions; adhering to company safety and standard operating procedures at all times; consulting extensively within and outside one's department / team on environment; water and wastewater safety issues; planning and prioritising work, etc.; provision of milk for those working in dusty and fume producing environments; providing routine medical checkups.

7. WORKING CONDITIONS/ENVIRONMENT

Working conditions include: indoor and outdoor involving field work; community engagements and office work. This may include working in conditions that may be dusty, slippery, with fumes and flammable materials, exposure to seasonal heat and cold, or adverse weather conditions; emergency call-outs; standing for long hours, and lifting relatively heavy objects. In most cases, the job involves

working normal hours, but in some instances, shift work and regular overtime may be required. The job also requires wearing suitable protective clothing such as works suits, safety visors or goggles, gloves, and safety harnesses etc.

8. PARTIES INVOLVED/INTERACTING WITH THE JOB HOLDER OR TRAINEE

8.1 Internal – Within the Organisation

Parties involved/interacting with the jobholder who are internal to the organisation include: supervisors/superiors, trainers, occupational health and safety teams, other colleagues, etc.

8.2 External – Outside the Organisation

Parties involved/interacting with the jobholder who are external to the organisation include: government regulators, trainers, professional bodies, clients, suppliers of equipment/tools/consumables, fellow Environment and Water Quality Officers from other companies, labour unions, occupational health and safety associations, communities, etc.

9. PHYSICAL DEMANDS ON THE BODY

- Ability to sustain strenuous conditions such as climbing heights.
- Walking and standing for long periods of time.
- Bending, stretching, twisting or reaching out.
- Lifting, carrying, pushing, and pulling heavy objects.
- Using fingers, hands, and feet with ease to complete the assigned task (dexterity).
- Etc.

ANNEX A

Criteria for Assessments based on this NOS

A.1 Guidelines for Assessment

A.1.1 Criteria for assessment for curricula and learning programmes based on this NOS will be created by curricula and programme developers, and each Performance Criteria (PC) will be assigned marks proportional to its importance in the NOS. Curricula and programme developers will also lay down proportion of marks for theory and practical skills for each performance criteria, giving more weight to practical skills.

There shall be allocated 'Total Marks', which will be the sum of all marks in each Unit, distributed across the number of PCs in that particular Unit. The 'Out of mark will be the mark allocated to each PC, which will be shared between theory and skills practical assessments.

A.1.2 Individual awarding/assessment bodies, or institutions and other users of the NOS, will create unique question papers for the theory part and evaluations for the skill practical part for their respective candidates.

ANNEX B NOS Version Control

This Annex gives details necessary for the tracking of the NOS versions based on the number of revisions.

NOS Code	NOS.EWQO.01		
ZQF Level	7	Version Number	01
Sector	Water	Date of Approval	May 2024
Sub Sector	Water Supply and Sanitation, Water Resources Management and Development, Environment.	Date of Last Review	N/A
Occupation	Environment and Water Quality Management	Date of Next Review	May 2029

*“You learn,
We Standardise”*

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