NATIONAL COUNCIL FOR TECHNICAL AND VOCATIONAL EDUCATION AND TRAINING

FEBRUARY 2023

PROPOSED OCCUPATIONAL STANDARDS

OCCUPATION: ENVIRONMENTAL MONITORING TECHNICIAN

LEVEL: NTA 6

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ABBREVIATIONS

CBET	Competency Based Education and Training
COD	Chemical Oxygen Demand
CO	Carbon Monoxide
NACTVET	National Council for Technical and Vocational Education and Training
NO_X	Nitrogen Oxide
NOS	National Occupational Standards
OS	Occupational Standards
pH value	Hydrogen Ion Concentration Index
PPE	Personal Protective Equipment
SO_2	Sulfur Dioxide
SS	Suspended Solids
TET	Technical Education and Training
TP	Total Phosphorus
TSP	Total Suspended Particulate
TVET	Technical and Vocational Education and Training

GLOSSARY OF TERMS

Circumstantial knowledge:	Detailed knowledge, which allows the decision-making in regard to different circumstances and cross cutting issues.
Competence:	The ability to use knowledge, understanding, practical and thinking skills to perform effectively to the workplace standards required in employment.
Competency:	A description of the ability one possesses when able to perform a given occupational task effectively and efficiently.
Competency based education:	An instructional programme that derives its content from validated tasks and bases assessment on the learner's performance.
Curriculum:	A description or composite of statements about "what is to be learned" by the trainee/student in a particular instructional programme; a product that states the "intended learning outcomes".
Educational/training programme:	The complete curriculum and instruction (what and how) that is designed to prepare a person for employment in a job or other particular performance situation.
Occupation:	A specific position requiring the performance of specific tasks - essentially the same tasks are performed by all employees having the same title. (Example: baker)
Occupational area:	This is a broad grouping of related jobs. (Example: food service)
Occupational standards:	Specific requirements of competences people are expected to demonstrate in a particular occupational area, including knowledge and relevant attitudes. They also act as performance tool of assessment of the prescribed outcomes.
Performance criteria:	Indicate the expected end results or outcome in form of evaluative statements.
Skills:	The ability to perform occupational tasks with a high degree of proficiency within a given occupation. Skill is conceived of as a composite of three completely interdependent components: cognitive, affective, and psychomotor.
Standards:	It is a set of statement, which if proved true under working conditions, means that an individual is meeting an expected level and type of performance.
Task analysis:	The process of analysing each task to determine the steps, related knowledge, attitudes, performance standards, tools and materials needed, and safety concerns required of employees performing it.

Task:	A work activity that has a definite beginning and ending, is observable or measurable, consists of two or more definite steps, and leads to a product, service, or decision.
Underpinning knowledge:	This is crucial knowledge that an individual must acquire in order to demonstrate competences that are associated in performing a given task.
Verification process:	The process of having experts review and confirm the importance of the task (competency) statements identified through occupational analysis. Other questions, such as the degree of task learning difficulty are also frequently asked. This process is also sometimes referred to as validation.
Occupational competence:	The application of knowledge and skills to perform consistently to the standards required in the work context.

1.0. INTRODUCTION

Technical Education and Training (TET) is one of the most important education sub-sectors in Tanzania, responsible for developing a skilled workforce to support the country's industrialization economic agenda. Tanzania's *Development Vision 2025* intends to raise the country's economy to a middle-income status. This requires a skilled workforce that is aligned with the needs of the public and private sectors of the economy. The National Council for Technical Education has begun the job of drafting Occupational Standards that will eventually be adopted as National Occupational Standards for TET in order to ensure that it meets the needs of the labour market and the country's economic agenda.

National Occupational Standards (NOS) are performance criteria that are matched with labour market demands. Each National Occupation Standard describes functions, performance standards, and knowledge/understanding for one important function or task. They combine skills, knowledge, and attitudes to describe best practice. They are useful tools for establishing job roles, personnel recruiting, supervision, and appraisal, as well as TET standards. They're also helpful for benchmarking and harmonizing qualifications on a national and international level. Standards, in general, provide a solid framework for high-quality TET that is labour market-relevant, current, and consistent in delivery across all public and private institutions.

However, it must be noted that, Occupational Standards and Training standards/qualifications standards are different. Occupational standards are defined in terms of activities performed by a person in a selected occupation (e.g., an electrical engineer designs electrical wiring circuits, performs troubleshooting in electrical wiring, etc.) and they are usually defined by employers following procedures agreed upon by all stakeholders. Education and training standards are developed from the activities defined in occupational standards, and they include learning objectives to ensure that the necessary skills and knowledge are developed by a person to enable him or her to function at an agreed level in an occupation. Education and Training standards are used to define curricula in training institutions. It is however critical that there must be a direct link between the occupational standards and the training standards to respond to demands of the labour market.

In TET delivery, Tanzania adopted the Competence Based Education and Training (CBET) approach. The CBET approach focuses on providing learners with the skills and knowledge required to meet the occupational standards. Occupational standards are thus the starting point for developing

competency-based training (CBET) programmes. TET institutions will be required to benchmark their curricula with relevant occupational standards.

Occupational Standards are developed based on a given occupation's current and future demands. As a result, they serve as a means of bridging the gap between the worlds of employment and technical education and training (TET).

The Environmental Monitoring Technician Occupation has its own set of occupational standards. The document explains how the occupational standards were developed, as well as the scope, the occupational profile in the form of DACUM Charts, and the Occupational Standards.

2.0. OCCUPATIONAL STANDARD DEVELOPMENT PROCESS

The Occupational standards development process began with an examination of major documents that guide Tanzanian skill development. The *10-year National Skills Development Strategy (2016-2026)* was one of the documents reviewed, and it outlined six (6) economic sectors that should be prioritized when developing skills development programmes.

These sectors include: Transport and logistics, Tourism and Hospitality, Agribusiness, Construction, Energy and ICT. **NACTVET** labour market reports were also used in the literature review to determine the skills demand in the Tanzanian labour market as a whole.

After the literature review, a workshop comprised of expert workers and educators with substantial knowledge and experience in the occupation conducted an occupational analysis utilizing the DACUM approach to produce the occupational profile. The analysis resulted in DACUM Charts, which are attached as **Appendix 1** to this document.

The occupational standards were then developed. Experts in Occupational Analysis and the Development of Occupational Standards facilitated the workshop. Interviews, online surveys, and a stakeholder forum were used to validate the Occupational Standards. Engineers, supervisory technicians on the job, and experienced Environmental Monitoring Technicians were key informants in the survey to discover occupational trends. This information was used to gain insight from the

workplaces regarding trends and changes in the profession, including how well graduates are prepared for working in the occupation. A total of …….. online surveys were completed by experts from the labour market across the country. Apart from the survey aiding in defining the scope for the occupational analysis, they also served to engage a wide cross-section of experts in the occupation. Apart from this, the stakeholders' forum was attended by …….. participants from different parts of the country representing various companies.

3.0. THE SCOPE AND OVERVIEW OF THE OCCUPATION STANDARDS FOR ENVIRONMENTAL MONITORING TECHNICIANS

The standards cover a broad range of duties and tasks that can be performed by an Environmental Monitoring Technician. However, the occupational standards are not meant to replace individual job descriptions. Instead, they are to be used for guidance in defining skill levels and knowledge for the technician in specific settings or positions. The Environmental Monitoring Technician may perform tasks in a number of key areas of the occupational standards, but not necessarily in all areas. For example, in large operations, other individuals may be employed or designated to perform specific tasks.

In the laboratory, the Environmental Monitoring Technician shall complete detection and analysis, from sample handover to standard detection and analysis, original record filling, quality control, data processing, etc.

Generally, the Environmental Monitoring Technician performs the following duties:

a) Acquirement of the in-situ sampling plan

b) Preparation and calibration of sampling equipment

c) In-situ sampling

d) Cleaning of the sampling site

e) Detection and analysis of wastewater

f) Detection and analysis of waste gas

g) Detection and analysis of industrial enterprise noise

h) Overhaul and calibration of laboratory analytical instrument and equipment

i) Cleaning of the laboratory and disposal of the waste

j) Quality control

k) Communication with customers

l) Analysis of data and preparation of report

m) Review of the monitoring report

n) Management of occupational health and safety

The Occupational standards have been clustered into NTA qualification levels, i.e. NTA Level 4- 6

4.0. VALIDITY PERIOD

Due to the rapid development of technology, the validity period of occupational standards is 3-5 years. The review will proceed in the same manner as the one before it, with new occupational standards being developed based on current trends of the labour market.

5.0. OCCUPATIONAL STANDARDS

5.1 OCCUPATIONAL STANDARDS FOR ENVIRONMENTAL MONITORING TECHNICIAN – NTA 6

<table>
<tr><td>OCCUPATION</td><td>ENVIRONMENTAL MONITORING TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>QUALITY CONTROL</td><td>DUTY NO.</td><td>601</td></tr>
<tr><td>TASK TITLE</td><td>QUALITY AUDITS OF SAMPLING PROCESSES</td><td>TASK NO.</td><td>6011</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to implement quality control and quality audit of sampling processes according to technical specifications, work instructions, operating procedures, quality management requirements, etc., and form quality audit records.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in the sampling site or the meeting room under the supervision and guidance of senior technicians or environmental engineers.
The tools and equipment to be used include:
1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements;
2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles;
3. Notebook or record form, such as work records;
4. Calculator;
5. Photographing tools;
6. Computer;</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Ensure personal occupational health and safety protection on site;
2. Develop a quality inspection plan for the sampling process;
3. 3Perform inspections and take photos for recording purposes;
4. Fill out quality audit and inspection records for the sampling process;
5. Complete the quality audit report of the sampling process;
6. Verify the rectification effects of quality problems found in the sampling process.</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Identify occupational health and safety risks on the sampling site;
1.2 Prepare a quality inspection schedule and tools for the sampling process;
1.3 Identify key quality inspection points for the sampling process;
1.4 Judge the effectiveness of rectification.

2.0 Principle
The person performing this task must be able to explain the following principles:</td></tr>
</table>

	2.1 Valid data rounding rules; 2.2 Principle of objectivity in quality auditing; 2.3 Sampling specifications and technical standards. **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Theory of quality auditing; 3.2 Basic knowledge of quality control; 3.3 Data review process and requirements; 3.4 Quality control requirements for in-situ sampling; 3.5 Basic knowledge of the quality management system. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills;
DESCRIPTION OF THE END PRODUCT / SERVICE	Quality control and quality audit of sampling processes are implemented according to technical specifications, quality management requirements, etc., and quality audit records and conclusions are formed.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Occupational safety and health; 4. Post system; 5. Computer software; 6. Photographic equipment application techniques; 7. Geographic knowledge.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	QUALITY CONTROL	**DUTY NO.**	601
TASK TITLE	QUALITY AUDITS OF LABORATORY ANALYSES	**TASK NO.**	6012
PERFORMANCE CRITERIA	The person performing this task must be able to implement quality audit of laboratory analyses according to technical specifications, work instructions, operating procedures, quality management requirements, etc., and form quality audit records.		
RANGE STATEMENT	The task can be performed in the analysis laboratory or the meeting room under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. PPE, such as work clothes and goggles; 2. Photographing tools; 3. Standard sample (blind sample assessment); 4. Notebook or record form; 5. Calculator; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Ensure personal safety protection in the laboratory; 2. Develop a quality inspection plan for laboratory analyses; 3. Perform inspections and take photos for recording purposes; 4. Fill out quality audit and inspection records for the laboratory analyses; 5. Complete the quality audit report of laboratory analyses; 6. Verify the rectification effects of quality problems found in the laboratory analyses.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Identify occupational health and safety risks on the sampling site; 1.2 Prepare a quality inspection schedule and tools for the sampling process; 1.3 Identify key quality inspection points for the sampling process; 1.4 Judge the effectiveness of rectification. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Valid data rounding rules; 2.2 Principle of objectivity in quality auditing; 2.3 Laboratory analysing specifications and technical standards. **3.0 Theories** The person performing this task must be able to explain the following content:

	3.1 Valid data rounding rules; 3.2 Basic knowledge of quality control; 3.3 Data review process and requirements; 3.4 Quality control requirement of analytical method; 3.5 Basic knowledge of the quality management system. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills; 4.8 Quality document preparation and filling skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Quality audits of laboratory analyses are conducted according to technical specifications, quality management requirements, etc., and quality audit records and conclusions of laboratory analyses are formed.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Occupational safety and health; 4. Post system; 5. Computer software; 6. Chemical knowledge.

<table>
<tr><td>OCCUPATION</td><td>ENVIRONMENTAL MONITORING TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>QUALITY CONTROL</td><td>DUTY NO.</td><td>601</td></tr>
<tr><td>TASK TITLE</td><td>QUALITY AUDITS OF INSTRUMENTS AND EQUIPMENT</td><td>TASK NO.</td><td>6013</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to implement quality audit of instruments and equipment according to technical specifications, work instructions, operating procedures, quality management requirements, etc., and form quality audit records.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in the analysis laboratory or the meeting room under the supervision and guidance of senior technicians or environmental engineers.
The tools and equipment to be used include:
1. PPE, such as work clothes and goggles;
2. Photographing tools;
3. Notebook or record form;
4. Computer.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Ensure safety protection in the laboratory;
2. Develop a quality inspection plan for instruments and equipment;
3. Perform inspections and take photos for recording purposes;
4. Fill out quality audit and inspection records for the instruments and equipment;
5. Complete the quality audit report of instruments and equipment;
6. Verify the rectification effects of quality problems found in the instruments and equipment.</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Identify occupational health and safety risks in the laboratory;
1.2 Prepare a quality inspection schedule and tools for the instruments and equipment;
1.3 Identify key quality inspection points for the instruments and equipment;
1.4 Judge the effectiveness of rectification.

2.0 Principle
The person performing this task must be able to explain the following principles:
2.1 Principle of objectivity in quality auditing;
2.2 Specifications and technical standards for instruments and equipment.

3.0 Theories
The person performing this task must be able to explain the following content:</td></tr>
</table>

	3.1 Basic knowledge of measurement; 3.2 Underpinning knowledge of instrument and equipment management; 3.3 Basic knowledge of the quality management system. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Quality audits of instruments and equipment are conducted according to technical specifications, quality management requirements, etc., and quality audit records and conclusions of instruments and equipment are formed.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Occupational safety and health; 4. Post system; 5. Equipment operation and maintenance knowledge.

<table>
<tr><td>OCCUPATION</td><td>ENVIRONMENTAL MONITORING TECHNICIAN</td><td>OCCUPATION CODE</td><td></td></tr>
<tr><td>DUTY TITLE</td><td>QUALITY CONTROL</td><td>DUTY NO.</td><td>601</td></tr>
<tr><td>TASK TITLE</td><td>QUALITY AUDITS OF TECHNICAL METHODS</td><td>TASK NO.</td><td>6014</td></tr>
<tr><td>PERFORMANCE CRITERIA</td><td colspan="3">The person performing this task must be able to implement quality supervision and quality audit based on the applicability and current validity of the selected technical methods as well as controlled management requirements, and form quality audit records.</td></tr>
<tr><td>RANGE STATEMENT</td><td colspan="3">The task can be performed in the meeting room under the supervision and guidance of senior technicians or environmental engineers.
The tools and equipment to be used include:
1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements;
2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles;
3. Notebook or record form, such as work records;
4. Calculator;
5. Photographing tools;
6. Computer.</td></tr>
<tr><td colspan="4">EVIDENCE REQUIREMENT</td></tr>
<tr><td colspan="2">PRACTICAL PERFORMANCE</td><td colspan="2">UNDERPINNING KNOWLEDGE</td></tr>
<tr><td colspan="2">The person performing this task must be able to do the following:
1. Ensure safety protection in the laboratory;
2. Develop a quality inspection plan for laboratory testing technical methods;
3. Perform inspections and take photos for recording purposes;
4. Fill out quality audit and inspection records for laboratory testing technical methods;
5. Complete the quality audit report of laboratory testing technical methods;
6. Verify the rectification effects of quality problems found in laboratory testing technical methods.</td><td colspan="2">Detailed knowledge about:
1.0 Methods
The person performing this task must be able to explain how to:
1.1 Identify occupational health and safety risks in the laboratory;
1.2 Prepare a quality inspection schedule and tools for laboratory testing technical methods;
1.3 Identify key quality inspection points for laboratory testing technical methods;
1.4 Judge the effectiveness of rectification.

2.0 Principle
The person performing this task must be able to explain the following principles:</td></tr>
</table>

	2.1 Principle of objectivity in quality auditing; 2.2 Principles of applicability and effectiveness of sampling technical methods; 2.3 Principles of applicability and effectiveness of chemical test technical methods; 2.4 Principles of applicability and effectiveness of equipment calibrating technical methods. **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Underpinning knowledge of management of laboratory testing technical methods; 3.2 Basic knowledge of the quality management system. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Quality supervision and quality audit are implemented based on the applicability and current validity of the selected technical methods as well as controlled management requirements, and quality audit records and conclusions of technical methods are formed.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Underpinning knowledge of standard methods; 2. Selection of laboratory testing technical methods; 3. Quality assurance policies and manual; 4. Occupational safety and health; 5. Post system; 6. Computer software.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	COMMUNICATE WITH CUSTOMERS	**DUTY NO.**	602
TASK TITLE	COMMUNICATION ABOUT MAJOR PROBLEMS IN SAMPLING	**TASK NO.**	6021
PERFORMANCE CRITERIA	The person performing this task must be able to communicate with customers properly according to technical requirements and solve the major problems encountered during sampling.		
RANGE STATEMENT	The task can be performed in the meeting room under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Communicate with customers about the unreasonable setting of sampling points and make adjustments before sampling; 2. Communicate with customers about sampling conditions, such as changing the sampling arrangement due to factors such as weather; 3. Communicate with customers about the rationality of sampling hole design, adjust sampling points, and then conduct sampling; 4. Communicate with customers about the need for resampling and retesting due to container cleanliness and material issues; 5. Communicate with customers about the need for retesting due to improper sample preservation; 6. Communicate with customers about unreasonable sampling due	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Use methods and techniques to communicate with customers; 1.2 Use language expression skills to communicate with customers. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Basic principles for interacting with people; 2.2 Principles of consultation about major issues. **3.0 Theories** The person performing this task must be able to explain the following content:

to problems with online equipment, such as whether the filtration system of wastewater online monitoring equipment meets requirements; 7. Communicate with customers about responding to emergency situations during the sampling process, to guarantee sampling safety; 8. Maintain timely communication with customers to ensure the safety of in-situ sampling personnel; 9. Use good language expression, communication, and exchange skills to solve major sampling problems.	3.1 Wastewater and waste gas pollutants and their control methods, health hazards, and emission standards; 3.2 Sampling point selection, sample preservation, and sampling quality control methods; 3.3 Calibration of sampling instruments and sources of error. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Self-safety awareness.
DESCRIPTION OF THE END PRODUCT / SERVICE	Customers are timely communicated with and provided with corresponding solutions when major problems arise during sampling.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Operating principles of sampling and testing instruments and data processing methods; 2. Chemical toxicological effects of wastewater and waste gas; 3. Safety protection measures for hazardous environment; 4. Emergency measures; 5. Post system; 6. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	COMMUNICATE WITH CUSTOMERS	**DUTY NO.**	602
TASK TITLE	COMMUNICATION WITH CUSTOMERS ABOUT MAJOR DATA ISSUES	**TASK NO.**	6022
PERFORMANCE CRITERIA	The person performing this task must be able to communicate with customers properly according to technical requirements and solve the major problems encountered during sampling.		
RANGE STATEMENT	The task can be performed in the meeting room under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Flexibly respond to, effectively communicate or consult about, and properly handle the data issues raised by customers; 2. Communicate with customers about the causes of data anomalies or exceeding standard requirements; 3. Communicate with customers about solutions to abnormal results caused by the sampling environment; 4. Communicate with customers about solutions to abnormal results caused by unreasonable sampling point selection; 5. Communicate with customers about abnormal measured data results of in-situ sampling instruments and equipment and solutions thereto; 6. Communicate with customers about data issues caused by water sample collection and sample preservation	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Use methods and techniques to communicate with customers; 1.2 Use language expression skills to communicate with customers. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Basic principles of communication with people; 2.2 Principles of consultation about major issues. **3.0 Theories** The person performing this task must be able to explain the following content:

methods, preservation time, or other unfavorable environmental factors on the sampling site, consult with customers for solutions, and then conduct sampling and testing; 7. Communicate with and advise customers to conduct routine maintenance of waste gas, wastewater, and noise reduction facilities, and then arrange re-sampling and testing; 8. Communicate about the causes of data anomalies in the secondary sampling, take rectification measures, and arrange re-sampling and testing.	3.1 Principles of item testing and pollutant control methods; 3.2 Methods of sampling quality control and laboratory quality control; 3.3 Laboratory measured value traceability metho***ds.*** **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Self-safety awareness.
DESCRIPTION OF THE END PRODUCT / SERVICE	Customers are timely communicated with and provided with corresponding handling and solutions when major issues arise in the test data.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Operating principles of sampling and testing instruments and data processing methods; 2. Chemical toxicological effects of wastewater and waste gas; 3. Safety protection measures for hazardous environment; 4. Emergency measures; 5. Post system; 6. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ANALYSIS OF DATA AND PREPARATION OF REPORT	**DUTY NO.**	603
TASK TITLE	STUDY OF POLLUTANT EMISSION STANDARDS OR REFERENCE TO EPA AND EU EMISSION STANDARDS FOR DATA ANALYSIS	**TASK NO.**	6031
PERFORMANCE CRITERIA	The person performing this task must be able to compare and analyze test data and evaluate pollutant treatment or reduction, desulfurization, or dust removal effects as well as the compliance of test data and emission limits by reference to relevant Tanzanian national or local standards, pollutant emission permit requirements, EPA and EU pollutant emission concentrations, emission rates or volumes, limits, removal rates, reduction quantity, monitoring methods, sampling requirements, etc.		
RANGE STATEMENT	The task can be performed in the meeting room under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Refer to important international standards to determine or apply main monitoring objects or indicators (parameters), emission limits, emission volumes, removal rates, reduction ratios, etc. suitable for the pollution emission characteristics of the country, and timely update the latest standards; 2. Select appropriate sampling frequency, sampling methods, and monitoring methods with reference to standard requirements;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Comply with national environmental quality standards and pollutant emission standards, EPA and EU pollutant emission standards and limits, monitoring methods, sampling and reporting provisions, etc.; 1.2 Determine whether pollutant emission concentrations or removal rates (reduction quantity) meet the expected goals according to the standards. **2.0 Principle** The person performing this task must be able to explain the following principles:

3. Evaluate the conformity of the detection data and emission limits with reference to the standard limits; 4. Analyze and evaluate compliance with or exceeding of standard requirements in aspects of pollutant emission concentration, emission volume, removal rate, reduction quantity, etc.	2.1 Relevant national laws and standards on pollution emission control; 2.2 Methods for calculating emission volumes. **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Key terms or definitions; 3.2 NPDES Permit and industry-specific NPDES requirements; 3.3 EPA subchapter N; EPA subchapter C; EPA subchapter G; 3.4 91/271/EEC; 3.5 Directive 2010/75/EU on industrial emissions. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem identification and solution skills; 4.7 Customer service skills; 4.8 Logical thinking skills; 4.9 Continuous learning skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Emission data is analyzed and evaluated according to technical requirements and standards.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Meanings of pollutants or monitoring parameters stipulated in standards; 2. Representation of emission indicators in units.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ANALYSIS OF DATA AND PREPARATION OF REPORT	**DUTY NO.**	603
TASK TITLE	COLLECTION, SUMMARY, AND ANALYSIS OF WASTEWATER, WASTE GAS, AND NOISE SAMPLING RECORDS	**TASK NO.**	6032
PERFORMANCE CRITERIA	The person performing this task must be able to summarize and analyze wastewater, waste gas, and noise sampling records according to industry standards and technical specifications.		
RANGE STATEMENT	The task can be performed in the meeting room under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations; 2. Environmental protection standards; 3. Quality policies; 4. Quality manual; 5. Computer (installed with Word, Excel, and other common Office software).		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Judge the normativity of sampling original record; 2. Judge the integrity of sampling original record; 3. Summarize and review original sampling records with office software; 4. Analyze and determine errors and deviations in original sampling record data; 5. Analyze the rationality of original sampling record data; 6. Record project number, entity name/project name, and sampling date; 7. Record the sampling methods and bases; 8. Select sampling media (instruments, equipment, devices, etc.); 9. Select sampling methods, environmental conditions, and preservation methods;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Operate the instruments and equipment; 1.2 Analyze the rationality of sampling data; 1.3 Rectify faults; 1.4 Calibrate the performance of instruments and equipment. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Basic principles of in-situ sampling. **3.0 Theories** The person performing this task must be able to explain the following content:

10. Determine sampling points; 11. Analysis items; 12. Record sampling persons, reviewers, clients/enterprise representatives, and law enforcement officials; 13. Record on-site sample condition; 14. Analyze and review the normativity, integrity, and reasonableness of sampling record data.	3.1 Index sampling methods, procedures, purpose and result evaluation; 3.2 In-situ sampling points; 3.3 Analysis of causes of abnormal data and remedial measures. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem identification and solution skills; 4.7 Customer service skills; 4.8 Logical thinking skills; 4.9 Learning skills; 4.10 Self-awareness of safety.
DESCRIPTION OF THE END PRODUCT / SERVICE	Wastewater, waste gas, and noise sampling records are summarized and analyzed according to industry standards and technical specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Operation, use and maintenance of the instrument and equipment; 2. Calibration of on-site instruments and equipment before the task, and the warehouse leaving, upkeep, and maintenance thereof; 3. Sampling methods and sampling point arrangements; 4. Data summarization, analysis and judgement; 5. Emergency measures; 6. Occupational health and safety; 7. Post system; 8. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ANALYSIS OF DATA AND PREPARATION OF REPORT	**DUTY NO.**	603
TASK TITLE	COLLECTION, SUMMARY, AND ANALYSIS OF WASTEWATER, WASTE GAS, AND NOISE SAMPLING RECORDS	**TASK NO.**	6033
PERFORMANCE CRITERIA	The person performing this task must be able to summarize and analyze wastewater, waste gas, and noise detection records according to industry standards and technical specifications.		
RANGE STATEMENT	The task can be performed in the laboratory or the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations; 2. Environmental protection standards; 3. Quality policies; 4. Quality manual; 5. Computer (installed with Word, Excel, and other common Office software).		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Collect, summarize, receive, and register the original records of analysis and testing from various testing rooms, including the names of test items, test methods used, testing instruments used, sources of samples, sample descriptions, status, identifications, test dates, and test results; 2. Analyze and judge the rationality of the summarized test data; 3. Check calculations and data conversion, check the consistency and completeness of the test results in the reports for review against the original records, and take primary responsibility for the calculation accuracy of the finally issued data;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Operate instruments and equipment; 1.2 Analyze the rationality of detection data; 1.3 Rectify faults; 1.4 Calibrate instruments and equipment. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Basic principles of testing; 2.2 Operation and use methods of the equipment. **3.0 Theories** The person performing this task must be able to explain the following content:

4. Provide analysis and suggestions for abnormal values; 5. Keep and review original records and take responsibility for the fairness, scientificity, accuracy, and authenticity of the test results; 6. Conduct formal reviews of task completion and compliance with quality documents, reject those not in compliance and require corrections, and accept those in compliance by signing on the *Registration Form of Handover of Drafts for Review and Original Records*.	3.1 Index detection methods, procedures, purpose and result evaluation; 3.2 Operation of instruments and equipment; 3.3 Analysis of causes of abnormal data and remedial measures. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills; 4.8 Learning skills; 4.9 Customer service skills; 4.10 Self-awareness of safety.
DESCRIPTION OF THE END PRODUCT / SERVICE	Wastewater, waste gas, and noise detection records are summarized and analyzed according to industry standards and technical specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Operation, use and maintenance of the instrument and equipment; 2. Calibration of on-site instruments and equipment before the task, and the warehouse leaving, upkeep, and maintenance thereof; 3. Water quality testing methods; 4. Data summarization, analysis and judgement; 5. Emergency measures; 6. Occupational health and safety; 7. Post system; 8. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ANALYSIS OF DATA AND PREPARATION OF REPORT	**DUTY NO.**	603
TASK TITLE	PREPARATION OF MONITORING REPORTS ACCORDING TO FORMAT SPECIFICATIONS	**TASK NO.**	6034
PERFORMANCE CRITERIA	The person performing this task must be able to prepare monitoring reports according to format specifications.		
RANGE STATEMENT	The task can be performed in the laboratory or the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT

PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Fill out basic information on monitoring; 2. Fill out the cover with the client's name, sample name, and test category; 3. Fill out the test report statement, testing entity, and testing entity's address and contact information; 4. Fill out the sampling person, sampling date, analyst, analysis date, sample characteristics and status, and test points in the test information part; 5. Fill out the analysis and monitoring items, sampling points, monitoring frequency, instruments used, and analysis methods in the text part; 6. Fill out the test items, test bases, and instrument names and models in the test methods and analytical instruments part;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Fill in monitoring reports; 1.2 Check the integrity of reports. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Basic rules for preparing monitoring reports; 2.2 Operation and use methods of the equipment; 2.3 Principles of analysing and using test methods. **3.0 Theories** The person performing this task must be able to explain the following content:

7. Fill out the monitoring results by test item categories; 8. Check the integrity of the monitoring report content.	3.1 Basic information on monitoring; 3.2 Analytical methods and analytical instruments; 3.3 Basic data on each monitoring item; 3.4 Emission limit standards for various pollutants. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills; 4.8 Communication and collaboration skills; 4.9 Data summarization and organization skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Monitoring reports are prepared according to industry standards and technical specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Technical standards and specifications of the industry; 2. Operation, use and maintenance of the instrument and equipment; 3. Water quality sampling and testing methods; 4. Data summarization, analysis and judgement; 5. Emergency measures; 6. Occupational health and safety; 7. Post system; 8. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING REPORT PREPARER	**OCCUPATION CODE**	
DUTY TITLE	REVIEW OF THE MONITORING REPORT	**DUTY NO.**	604
TASK TITLE	REVIEW OF THE RATIONALITY AND ACCURACY OF ORIGINAL SAMPLING RECORDS	**TASK NO.**	6041
PERFORMANCE CRITERIA	The person performing this task must be able to review the rationality and accuracy of sampling records according to technical requirements and filling specifications.		
RANGE STATEMENT	The task can be performed in the laboratory or the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Explain environmental laws, regulations and standards; 2. Explain relevant quality policies and quality manuals; 3. Review whether basic information on the tested entity in the sampling records (including sampling date, entity name, relevant contact, enterprise production situation, and surrounding enterprises/residents) is consistent with the sampling plan and enterprise data; 4. Review whether the enterprise's working conditions, site plan, and process flow diagrams in the sampling records are consistent with the on-site environment and enterprise data;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Obtain environmental laws, regulations, standard clauses, quality policies, and quality manuals related to sampling and laboratory occupational skills; 1.2 Accurately fill out basic information and information sources in the sampling records; 1.3 Conduct in-situ sampling of wastewater (flow rate, flow, pH value, chemical oxygen demand, ammonia nitrogen, total phosphorus, and suspended solids), waste gas (particulate matter, sulfur dioxide, nitrogen oxides, Ringelmann blackness, carbon monoxide, oxygen content, moisture content, smoke temperature, flow rate,

5. Review whether sampling points, test items, sample numbers, sample quantity, and sensory descriptions in the water sample collection record form are accurate; 6. Review whether samples in the water sample collection record form are preserved with fixatives according to the standard requirements; 7. Review whether the sampling point setting, sampling flow, sampling frequency, sampling duration, sampling volume, and sampling height in the waste gas sampling record form meet the standard requirements; 8. Review whether the flow calibration of sampling instruments in the waste gas sampling record form before and after sampling is within the standard range; 9. Review whether the setting of sampling points in the noise sampling record form is reasonable, and whether main noise sources and sensitive points are indicated in the plan; 10. Review whether the on-site detection results in the noise sampling record form exceed the limit requirements; check whether the noise calibration of the instruments before and after sampling is within the standard range; 11. Check whether all sample records are signed by customers and in-situ sampling personnel.	and flow), and noise (noise of industrial enterprises); 1.4 Determine whether the data recorded on the sampling record forms is accurate. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of setting wastewater, waste gas and noise sampling points; 2.2 Principles of setting sampling conditions; 2.3 Principles of wastewater, waste gas and noise sampling. **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Standardized requirements and on-site quality control requirements for wastewater sampling; 3.2 Standardized requirements and on-site quality control requirements for waste gas sampling; 3.3 Standardized requirements and on-site quality control requirements for noise sampling. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The rationality and accuracy of sampling records are reviewed according to technical requirements and filling specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. In-situ sampling of wastewater, waste gas, and noise;

	4. Quality control requirements for wastewater, waste gas and noise sampling; 5. Emergency measures; 6. Occupational health and safety; 7. Post system; 8. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING REPORT PREPARER	**OCCUPATION CODE**	
DUTY TITLE	REVIEW OF THE MONITORING REPORT	**DUTY NO.**	604
TASK TITLE	REVIEW OF THE RATIONALITY AND ACCURACY OF ORIGINAL DATA IN LABORATORY ANALYSES	**TASK NO.**	6042
PERFORMANCE CRITERIA	The person performing this task must be able to review the rationality and accuracy of sampling records according to technical requirements and filling specifications.		
RANGE STATEMENT	The task can be performed in the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Explain environmental laws, regulations and standards; 2. Explain relevant quality policies and quality manuals; 3. Review whether sample numbers in the laboratory analysis records are consistent with the sampling records and sample handover forms; 4. Review whether the laboratory analysis records are clear and neat and whether there are traces of alteration or manual modifications; 5. Review whether the laboratory analysis data is consistent with the sample characters described by the sampling person on site;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Obtain environmental laws, regulations, standard clauses, quality policies, and quality manuals related to sampling and laboratory occupational skills; 1.2 Accurately fill out basic information and information sources in the laboratory analysis records; 1.3 Conduct laboratory analysis of wastewater (pH value, chemical oxygen demand, ammonia nitrogen, total phosphorus, and suspended solids) and waste gas (particulate matter, sulfur dioxide, nitrogen oxides, and carbon monoxide); 1.4 Calculate laboratory analysis results**.**

6. Determine whether pretreatment descriptions in the laboratory analysis records are complete and in line with specification requirements; 7. Determine whether the selected test methods, experimental sample sizes, and used units of measurement in the laboratory analysis records comply with specification requirements; 8. Review whether working curves, calculation processes, calculation results, and result records in the laboratory analysis data are accurate; 9. Review whether the laboratory analysis results are consistent with additional materials such as graphs; 10. Check whether all laboratory analysis records have signatures of analysts and analysis dates; 11. Determine the rationality of the analysis time (such as overlapping time, and insufficient time for sample analysis).	**2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of laboratory analysis methods for wastewater (pH value, chemical oxygen demand, ammonia nitrogen, and total phosphorus); 2.2 Principles of laboratory analysis methods for waste gas (particulate matter, sulfur dioxide, nitrogen oxides, and carbon monoxide); 2.3 Operating principles of electrode method, titration, spectrophotometric method, and gravimetric method. **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Instruments, operation, and result calculation methods used in wastewater (pH value, chemical oxygen demand, ammonia nitrogen, and total phosphorus) testing and analysis; 3.2 Instruments, operation, and result calculation methods used in waste gas (particulate matter, sulfur dioxide, nitrogen oxides, and carbon monoxide) testing and analysis; 3.3 Exclusion of suspicious data from the test results. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.8 Data collection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	The rationality and accuracy of original data in laboratory analyses are reviewed according to technical requirements and filling specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Safe operation of laboratory analysis instruments; 4. Calculation methods and accuracy determination methods for experimental results; 5. Emergency measures; 6. Occupational health and safety; 7. Post system.

OCCUPATION	ENVIRONMENTAL MONITORING REPORT PREPARER	**OCCUPATION CODE**	
DUTY TITLE	REVIEW OF THE MONITORING REPORT	**DUTY NO.**	604
TASK TITLE	REVIEW OF QUALITY CONTROL THROUGHOUT THE SAMPLING AND LABORATORY TESTING PROCESSES	**TASK NO.**	6043
PERFORMANCE CRITERIA	The person performing this task must be able to review the implementation of quality control measures for sampling records and laboratory analysis records according to technical requirements and filling specifications, and collect and fill out quality control record forms.		
RANGE STATEMENT	The task can be performed in the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Explain environmental laws, regulations and standards; 2. Explain relevant quality policies and quality manuals; 3. Review whether the proportions of quality control measures (field blank samples, field parallel samples, and field spiked samples) in all samples in the sampling records meet specification requirements; 4. Review whether the proportions of quality control measures (linear correlation coefficient of working curves, curve verification points, quality control samples, process blank samples, parallel samples, and process spiked samples) in all samples in the laboratory analysis records meet specification requirements;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Obtain environmental laws, regulations, standard clauses, quality policies, and quality manuals related to sampling and laboratory occupational skills; 1.2 Implement quality control requirements for sampling sites; 1.3 Implement quality control requirements for laboratory analysis processes; 1.4 Calculate and implement the analysis results of quality control processes. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of quality control in in-situ sampling processes;

5. Review whether the analysis results of quality control measures (linear correlation coefficient of working curves, curve verification points, quality control samples, process blank samples, parallel samples, and process spiked samples) in the laboratory analysis records meet specification requirements; 6. Consolidate and summarize the collected reviewed quality control measures and fill out the quality control record forms.	2.2 Principles of quality control in laboratory analysis processes. **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Quality control measures, steps, and requirements in in-situ sampling processes; 3.2 Quality control measures, steps, and requirements in laboratory analysing processes; 3.3 Solutions to abnormal data found during quality control. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Quality control record forms are filled out according to technical requirements and filling specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Quality control measures of laboratory analysis; 4. Emergency measures; 5. Occupational health and safety; 6. Post system; 7. Social etiquette.

OCCUPATION	ENVIRONMENTAL MONITORING REPORT PREPARER	**OCCUPATION CODE**	
DUTY TITLE	REVIEW OF THE MONITORING REPORT	**DUTY NO.**	604
TASK TITLE	ISSUANCE OF MONITORING REPORTS	**TASK NO.**	6044
PERFORMANCE CRITERIA	The person performing this task must be able to review the content of monitoring reports according to technical requirements and filling specifications, and sign to confirm and issue monitoring reports.		
RANGE STATEMENT	The task can be performed in the office or the printing shop under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Explain environmental laws, regulations and standards; 2. Abide by the environmental laws, regulations and standards; 3. Explain relevant quality policies and quality manuals; 4. Review whether basic information on the tested entity in the monitoring reports (including sampling date, entity name, relevant contact, enterprise production situation, and surrounding enterprises/residents) is consistent with the enterprise data; 5. Review whether the in-situ sampling information (sampling points, sampling time, test items, and sample numbers) in monitoring reports is consistent with the sampling records;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Obtain environmental laws, regulations, standard clauses, quality policies, and quality manuals related to sampling and laboratory occupational skills; 1.2 Confirm the process of monitoring report preparation and sources of information in the reports; 1.3 Review the processes and key points of monitoring reports; 1.4 Determine whether the data in monitoring reports meets the requirements of relevant environmental laws, regulations, and standards. **2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Principles of quality control for monitoring reports; 2.2 Principles of information source tracing for monitoring reports.

6. Review whether the laboratory analysis results and methods in monitoring reports are consistent with the laboratory analysis records; 7. Determine whether the analysis results exceed the requirements of relevant environmental laws, regulations, and standards; 8. After making modifications and improvements, print monitoring reports and sign to confirm and issue the reports.	**3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Steps and requirements for preparing monitoring reports; 3.2 Steps and key points for reviewing monitoring reports; 3.3 Criteria for determining the rationality and accuracy of monitoring data. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Monitoring reports are issued according to technical requirements and filling specifications.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Quality control measures of laboratory analysis; 4. Emergency measures; 5. Occupational health and safety; 6. Post system; 7. Editing and typesetting of reports.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ENSURING OCCUPATIONAL HEALTH AND SAFETY	**DUTY NO.**	605
TASK TITLE	MANAGEMENT ON OCCUPATIONAL HEALTH AND SAFETY OF SAMPLING AND TESTING POSTS	**TASK NO.**	6051
PERFORMANCE CRITERIA	The person performing this task must be able to supervise the implementation of occupational health and safety protection by sampling and laboratory technicians according to the provisions of environmental laws and regulations, health and safety regulations, environmental standards and policies, and rules and regulations; identify hazards and major problems related to sampling and laboratory positions, avoid safety accidents and significant problems in sampling and laboratory positions, and reduce the harm of potential accidents.		
RANGE STATEMENT	The task can be performed in the laboratory or the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Obtain relevant national environmental laws, regulations, standards and policies, and position systems for the task; 2. Explain occupational health and safety management plans, operating guidelines, and applicable regulatory requirements; 3. Define safety terminology related to occupational safety and health hazards in practice; 4. Correctly apply sampling and laboratory position rules and	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Collect reagents, consumables, equipment, and labor protective equipment, and record sampling and laboratory work records; 1.2 Conduct the safe handling and disposal of waste and management of work records at sampling and laboratory posts; 1.3 Use measures that reduce accidents, diseases, incidents, quality problems in monitoring, and other adverse occupational health and safety hazards; 1.4 Effectively implement occupational health and safety management clauses for positions.

regulations and health and safety principles in the work environment; 5. Explain the core principles of occupational health and safety applicable to the work environment; 6. Explain the importance of a safe work environment; 7. 8. Keep warehouse entry and exit records of reagents, consumables, equipment, labor protective equipment, and sampling and laboratory work records; 8. Monitor the safe handling and disposal of waste and management of work records at sampling and laboratory posts; 9. Monitor historical evidence of accidents, diseases, incidents, and other undesirable occupational health and safety and performance; 10. Be devoted to the position and possess good professional ethics and code of conduct.	**2.0 Principle** The person performing this task must be able to explain the following principles: 2.1 Law abiding principles; 2.2 Institutional constraints; 2.3 Good Manufacturing Practice (GMP). **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Production safety theory; 3.2 Occupational health theory. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Occupational health and safety clauses for sampling and laboratory positions are reviewed according to the requirements of position health and safety management and checked whether they can be effectively implemented.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Occupational safety and health; 4. Post system; 5. Computer software.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ENSURING OCCUPATIONAL HEALTH AND SAFETY	**DUTY NO.**	605
TASK TITLE	IDENTIFICATION OF THE SAFETY HAZARDS AND SOLUTIONS OF WORKPLACE	**TASK NO.**	6052
PERFORMANCE CRITERIA	The person performing this task must be able to immediately identify workplace safety hazards and propose solutions according to specific projects and site surveys.		
RANGE STATEMENT	The task can be performed in the sampling site or the laboratory under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Guide sampling work and identify on-site safety hazards; 2. Guide chemical testing work and identify on-site safety hazards; 3. Apply workplace first-aid skills; 4. Use emergency rescue equipment and escape routes; 5. Take effective emergency protection measures to protect personal health and safety; 6. Explain impacts on the environment and health after accidents; 7. Explain the proper disposal of waste.	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Identify safety hazards and emergency rescue measures during the sampling process; 1.2 Identify safety hazards and emergency rescue measures during the sampling process; 1.3 Correctly apply workplace first-aid skills in emergencies; 1.4 Conduct emergency drills using emergency rescue equipment and escape routes; 1.5 Prevent accidents from posing harm to personal health and safety; 1.6 Judge impacts on the environment and health after accidents; 1.7 Avoid safety hazards related to improper disposal of waste. **2.0 Principle**

	The person performing this task must be able to explain the following principles: 2.1 Law abiding principles; 2.2 Institutional constraints; 2.3 Good Manufacturing Practice (GMP). **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Production safety theory; 3.2 Occupational health theory. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Workplace safety hazards and solutions are identified, accidents are avoided, and measures are taken to reduce the impact of accidents.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Occupational safety and health; 4. Post system; 5. Computer software.

OCCUPATION	ENVIRONMENTAL MONITORING TECHNICIAN	**OCCUPATION CODE**	
DUTY TITLE	ENSURING OCCUPATIONAL HEALTH AND SAFETY	**DUTY NO.**	605
TASK TITLE	ORGANIZATION OF OCCUPATIONAL HEALTH AND SAFETY INSPECTION	**TASK NO.**	6053
PERFORMANCE CRITERIA	The person performing this task must be able to organize annual self-inspection and self-correction related to occupational health and safety based on work records and accept inspections by higher-level departments.		
RANGE STATEMENT	The task can be performed in the laboratory or the office under the supervision and guidance of senior technicians or environmental engineers. The tools and equipment to be used include: 1. Environmental laws and regulations, environmental protection standards, position system, quality policy, quality manual, technical specifications, work instructions, operating procedures, and quality management requirements; 2. PPE, such as work clothes, safety helmet, safety shoes, gloves, and goggles; 3. Notebook or record form, such as work records; 4. Calculator; 5. Photographing tools; 6. Computer.		

EVIDENCE REQUIREMENT	
PRACTICAL PERFORMANCE	**UNDERPINNING KNOWLEDGE**
The person performing this task must be able to do the following: 1. Conduct annual maintenance, repairs and calibration of monitoring equipment; 2. Review sampling technical methods and monitoring technical methods; 3. Conduct annual reviews of monitoring report quality; 4. Conduct annual assessments of sampling and monitoring technical personnel; 5. Collect and organize archived occupational health and safety work records and files; 6. Perform self-inspections of occupational health and safety within the year and hold a seminar for summarization;	**Detailed knowledge about:** **1.0 Methods** The person performing this task must be able to explain how to: 1.1 Maintain, repair, and calibrate monitoring equipment; 1.2 Explain and review the rationality of sampling technical methods and monitoring technical methods; 1.3 Review monitoring reports and explain and analyze the rationality of technical reports on monitoring; 1.4 Assess sampling and monitoring technical personnel according to assessment measures; 1.5 Obtain records of equipment application situations and technical reports on monitoring; 1.6 Conduct self-inspection and self-correction of work problems and potential risks to reduce significant quality problems in sampling and laboratory testing. **2.0 Principle**

7. Conduct self-inspection and self-correction of existing problems and potential risks; 8. Cooperate with inspections by higher-level departments.	The person performing this task must be able to explain the following principles: 2.1 Law abiding principles; 2.2 Institutional constraints; 2.3 Good Manufacturing Practice (GMP). **3.0 Theories** The person performing this task must be able to explain the following content: 3.1 Production safety theory; 3.2 Occupational health theory. **4.0 Essential Skills** 4.1 Communication skills; 4.2 Expression skills; 4.3 Collaboration skills; 4.4 Computer skills; 4.5 Adaptability skills; 4.6 Problem-solving skills; 4.7 Data collection skills.
DESCRIPTION OF THE END PRODUCT / SERVICE	Annual occupational health and safety inspections by higher-level departments are passed.
CIRCUMSTANTIAL KNOWLEDGE	**Detailed knowledge about:** 1. Environmental laws, regulations and standards; 2. Quality assurance policies and manual; 3. Occupational safety and health; 4. Post system; 5. Computer software.

TABLE 1: DACUM CHARTS FOR ENVIRONMENTAL MONITORING TECHNICIAN – NTA 6

DUTIES	TASKS	ENABLERS
1.0 Quality control	1.1 Quality audits of sampling processes. 1.2 Quality audits of laboratory analyses. 1.3 Quality audits of instruments and equipment. 1.4 Quality audits of laboratory testing technical methods.	**General skills and knowledge** · Communication skills · Computer application skills · Equipment operation skills · Application of regulations, standards, and position system documents **Tools and equipment** · Personal protective equipment (PPE), such as work clothes, safety helmet, safety shoes, gloves, goggles, and hearing protection device · Photographic tool, operation manual, ledger, computer and pen **Materials** · Standard Operating Procedures (SOP) · Local environmental standards from local authorities · International Operational Standards (ISO) **Requirements for employees** · Teamwork · Communication skills · Being trustworthy · Time management · Sense of responsibility · Professional quality

2.0 Communication with customers	2.1 Communication about major problems in sampling. 2.2 Communication with customers about major data issues.	**General skills and knowledge** · Communication skills · Computer application skills · Equipment operation skills · Application of regulations, standards, and position system documents **Tools and equipment** · Personal protective equipment (PPE), such as work clothes, safety helmet, safety shoes, gloves, goggles, and hearing protection device · Photographic tool, operation manual, ledger, computer and pen **Materials** · Standard Operating Procedures (SOP) · Local environmental standards from local authorities · International Operational Standards (ISO) · Post system requirements **Requirements for employees** · Teamwork · Communication skills · Being trustworthy · Time management and sense of responsibility · Professional quality

3.0 Analysis of data and preparation of report	3.1 Study of pollutant emission standards or reference to EPA and EU emission standards for data analysis. 3.2 Collection, summary, and analysis of wastewater, waste gas, and noise sampling records. 3.3 Collection, summary, and analysis of wastewater, waste gas, and noise sampling records. 3.4 Preparation of monitoring reports according to format specifications.	**General skills and knowledge** · Communication skills · Computer application skills · Equipment operation skills · Application of regulations, standards, and position system documents **Tools and equipment** · Personal protective equipment (PPE), such as work clothes, safety helmet, safety shoes, gloves, goggles, and hearing protection device · Photographic tool, operation manual, ledger, computer and pen **Materials** · Standard Operating Procedures (SOP) · Local environmental standards from local authorities · International Operational Standards (ISO) · Post system requirements **Requirements for employees** · Teamwork · Communication skills · Being trustworthy · Time management · Sense of responsibility · Professional quality

4.0 Review of monitoring report	4.1 Review of the rationality and accuracy of original sampling records. 4.2 Review of the rationality and accuracy of original data in laboratory analyses. 4.3 Review of quality control throughout the sampling and laboratory testing processes. 4.4 Issuance of monitoring report.	**General skills and knowledge** · Communication skills · Computer application skills · Equipment operation skills · Use of manufacturer manuals and recommendations · Relevant environmental laws, regulations, and standard clauses · Relevant quality policies and quality manuals · Principles of measured value traceability **Tools and equipment** · Computer (installed with Word, Excel, and other common Office software). · Audio file, pen **Materials** · Standard Operating Procedures (SOP) · Local environmental standards from local authorities · International Operational Standards (ISO) **Requirements for employees** · Teamwork · Communication skills · Being trustworthy · Time management · Sense of responsibility · Professional quality

5.0 Management of occupational health and safety	5.1 Management of the occupational health and safety of sampling and testing posts. 5.2 Identification of the safety hazards and solutions of workplace. 5.3 Organization of occupational health and safety inspection.	**General skills and knowledge** · Communication skills · Computer application skills · Equipment operation skills · Application of regulations, standards, and position system documents **Tools and equipment** · Personal protective equipment (PPE), such as work clothes, safety helmet, safety shoes, gloves, goggles, and hearing protection device · Photographic tool, operation manual, ledger, computer and pen **Materials** · Standard Operating Procedures (SOP) · Local environmental standards from local authorities · International Operational Standards (ISO) · Post system requirements **Requirements for employees** · Teamwork · Communication skills · Being trustworthy · Time management · Sense of responsibility · Professional quality