

| QUALIFICATION SPECIFICATION | | | | | | | SECTION A | |
|--|--|--|----------------------------------|------------------|---------|---------------------|-----------|------------------|
| QUALIFICATION DEVELOPER | | Global Training Direct Services (GTDS) | | | | | | |
| TITLE | | Certificate III in Drilling Operations | | | | NCQF LEVEL | | 3 |
| FIELD | | Mining | | SUB-FIELD | | Drilling Operations | | |
| New qualification | | X | Review of existing qualification | | | | | |
| SUB-FRAMEWORK | | General Education | | | TVET | | | Higher Education |
| QUALIFICATION TYPE | | Certificate | | X | Diploma | | | Bachelor |
| | | Bachelor Honours | | | Master | | | Doctor |
| CREDIT VALUE | | | | | | | 40 | |
| RATIONALE AND PURPOSE OF THE QUALIFICATION | | | | | | | | |
| <p>Rationale</p> <p>At present in Botswana or for that matter throughout Africa there is no formal qualification and/or training in the Drilling Industry that allows for a person to enter the industry and progressively develop their skills and knowledge in alignment with a defined career pathway. Additionally, there is no means at present to provide formal certification for drilling operations for existing industry-based personnel e.g., drillers.</p> <p>There is a significant skills shortage in the Botswana Drilling Industry with no means to provide an opportunity for new persons to enter the industry due to the high-risk activities associated with drilling, drilling company's look predominately employ experienced personnel. This has created cyclic impact of current industry-based personnel undertaking roles such as Driller Assistants & Drillers.</p> <p>The qualification supports the requirements of the following policies and plans of:</p> <ul style="list-style-type: none"> • Botswana Ministry of Basic Education - Outcome-Based Education system (OBE) methodology; • Botswana Ministry of Basic Education/ World Bank - study Improving the Quality of Basic Education and Skills Development in Botswana; • Botswana Ministry of Employment, Labour, Productivity & Skills; • Botswana Human Resource Development Council (HRDC) – Work skills Training Plan/Fund; • Botswana Government – Education & Training Sector Strategic Plan (2015-202); • Botswana Ministry of Tertiary Education, Research, Science & Technology - National Implementation Plan for Sustainable Development – Employment (2016-2030); <p>Stakeholder Engagement</p> <p>Engagement from the Mining & Drilling Industry stakeholders itself is very supportive and proactive, as the current training available is provided only internally by the company's, providing no formal means to develop and determine the skills and knowledge of existing drilling personnel. Additionally, with the growing demand for drilling in Botswana there is a shortage of skilled personnel to support drilling operations.</p> | | | | | | | | |

There has been extensive engagement in the Botswana Mining & Drilling Industry with the major activity being a 3day workshop instigated by a prominent Botswana mining company involving representatives from the industry in November 2019.

Research Material

- Botswana Qualifications Authority BQA –National Credit & Qualifications Framework Act 24
- Botswana Vocational Training Act 22
- Botswana Mines, Quarries, Works & Machinery Regulations CHP44-02
- Australian Government Resource Industry Infrastructure (RII) Training Module – RII1131815 Certificate III in Drilling Operations;
- Australia Drilling Industry Association (ADIA) - DICAT

This qualification will provide students with an avenue not only to attain employment in Botswana but also internationally increasing employment opportunities and filling the skills gap shortage currently being experienced.

Purpose

The purpose of this qualification is to equip graduates with skills and knowledge to:

- Maintain workplace health and safety in the workplace;
- Apply risk management processes in the workplace;
- Communicate Information effectively;
- Conduct Health & Safety Investigation;
- Mobilise, setup & pack up drill sites;
- Run onsite drilling operations;
- Perform basic rig mechanics and operational maintenance;
- Conduct Drilling Applications & Methods;

ENTRY REQUIREMENTS (including access and inclusion)

The normal admission requirement is a Certificate II in Drilling Operations, or equivalent also utilising the RPL process to ascertain entry level requirements.

| QUALIFICATION SPECIFICATION | | SECTION B |
|--|--|------------------|
| GRADUATE PROFILE (LEARNING OUTCOMES) | ASSESSMENT CRITERIA | |
| 1. Demonstrate Knowledge and Practical Skills to Maintain Workplace Health, Safety & Environment | 1.1. Demonstrate basic knowledge and practical skills to identifying hazards and controlling risks. 1.2. Basic operational and theoretical knowledge of site safety protocols and procedures. 1.3. Basic operational and theoretical knowledge of managing environmental hazards. 1.4. Basic operational and theoretical knowledge of Accident and emergency response. | |
| 2. Apply Risk Management Processes in the workplace | 2.1. Basic operational and theoretical knowledge of risk management processes. 2.2. Demonstrate basic knowledge and practical skills in the performance of applying risk management processes. 2.3. Perform routine techniques for the completion of risk management processes. | |
| 3. Provide effective Communication of Information | 3.1. Basic operational and theoretical knowledge to effectively communicate Information Orally. 3.2. Basic operational and theoretical knowledge to effectively communicate Information in Writing. 3.3. Demonstrate basic knowledge and practical skills to achieve meeting outcomes. | |
| 4. Demonstrate Ability to Conduct Safety & Health Investigation | 4.1. Broad knowledge and practical concepts & process to Plan & Conduct Investigation. 4.2. Capacity to determine the objectives, gather Information, evaluate findings, identify causes and actions/recommendations. 4.3. Demonstrate independence, responsibility and accountability to Plan & conduct Investigation. 4.4. Capacity to prepare & present Report. | |
| 5. Demonstrate Knowledge and Practical Skills for Mobilising, Setting up and Packing up drill site operations. | 4.1. Basic operational and theoretical knowledge to effectively setup drill rig, layout the work site efficiently and safely. 4.2. Demonstrate basic knowledge and practical skills to effectively setup drill rig, layout the work site efficiently and safely. 4.3. Basic operational and theoretical knowledge of skills required for survival. 4.4. Demonstrate basic knowledge and practical skills to read maps and use navigation aids. 4.5. Demonstrate basic knowledge and practical skills to mobilise equipment safely. | |
| 6. Provide effective support to Assist Drilling Methods | 6.1. Basic operational and theoretical knowledge to recognize and how different drill bits are used in the relevant industry sector. 6.2. Basic operational and theoretical knowledge of the different functions of drill rods and pipe used in relevant industry sector. 6.3. Demonstrate basic knowledge and practical skills to support the drilling method/s used in relevant industry sector 6.4. Perform routine checks/maintenance of equipment used in relevant industry sector. | |

| GRADUATE PROFILE (LEARNING OUTCOMES) | ASSESSMENT CRITERIA |
|---|---|
| 7. Demonstrate Basic Knowledge and understanding of Geology and Mapping for Drillers | 7.1. Basic operational and theoretical knowledge to analyse the physical and chemical characteristics of rocks and their effect on drillability and stability. 7.2. Basic theoretical knowledge to list the various formations which permit groundwater movement and the factors affecting groundwater quality. 7.3. Demonstrate basic knowledge and practical skills to identify surface features on maps and determine distance and direction between features |
| 8. Apply Knowledge & Practical Skills to Running on Site Operations | 8.1. Demonstrate basic knowledge and practical skills to calculate cylinder volume, flow rate and flow velocity requirements related to drilling operations. 8.2. Basic operational and theoretical knowledge of drill rig loads and ratings. 8.3. Basic operational and theoretical knowledge of the basics of risk management in the workplace. 8.4. Perform running of routine site operations under supervision. 8.5. Basic operational and theoretical knowledge of record keeping requirements. |
| 9. Apply Basic Knowledge and understanding of Rig Mechanics and Operational Maintenance | 9.1. Basic operational and theoretical knowledge of the importance of attention to maintenance and the maintenance checks that must be performed regularly. 9.2. Basic operational and theoretical knowledge to identify different types of hydraulic components and filters. 9.3. Basic operational and theoretical knowledge to Identify Ancillary Equipment and Drilling Tools and their application associated with drilling. |
| 10. Demonstrate Basic Knowledge and understanding of Hole Stabilisation and Design | 10.1. Basic operational and theoretical knowledge of factors that contribute to stability in a circulated hole. 10.2. Basic operational and theoretical knowledge to identify the fluids available and their advantages. 10.3. Demonstrate basic knowledge and practical skills to Calculate water/bentonite/cement quantities for optimum grout properties and list grout placement methods and procedures. 10.4. Basic operational and theoretical knowledge of the use and application of casing in drill holes |
| 11. Demonstrate knowledge and practical skills to Conduct Drilling Applications and Methods | 11.1. Demonstrate basic knowledge and practical skills to Conduct downhole measurements and surveys. 11.2. Basic operational and theoretical knowledge of the drilling requirements of relevant drilling sector/s. 11.3. Basic operational and theoretical knowledge required to conduct the method or methods of drilling in the drilling sector or sectors I chose. |

| QUALIFICATION STRUCTURE | | | |
|--|---|-------|-----------|
| | | | SECTION C |
| FUNDAMENTAL COMPONENT Subjects / Units / Modules /Courses | Title | Level | Credits |
| | Maintain Workplace Safety, Health & Environment | 3 | 2 |
| CORE COMPONENT Subjects / Units / Modules /Courses | Apply Risk Management Processes | 3 | 2 |
| | Communicate Information | 3 | 1 |
| | Conduct Safety & Health Investigation | 4 | 3 |
| | Mobilising, Setting Up & Packing Up | 3 | 2 |
| | Assisting Drilling Methods | 3 | 2 |
| | Geology and Mapping for Drillers | 3 | 1 |
| | Running Onsite Operations - Supervised | 3 | 4 |
| | Rig Mechanics and Operational Maintenance | 3 | 2 |
| | Hole Stabilising and Design | 3 | 2 |
| | Conducting Drilling Applications and Drilling Methods | 3 | 4 |
| ELECTIVE COMPONENT Subjects / Units / Modules /Courses | Choose 1 – (Current industry sector) | | |
| | Conduct Air Drilling | 3 | 15 |
| | Conduct Conventional Core Drilling | 3 | 15 |
| | Conduct Wireline Core Drilling | 3 | 15 |
| | Conduct Mud Rotary Drilling | 3 | 15 |
| | Conduct Surface Directional Drilling | 3 | 15 |
| | Conduct Downhole Hammer Drilling | 3 | 15 |
| | Conduct Top Hole Hammer Drilling | 3 | 15 |
| | Conduct Continuous Flight Auger Drilling | 3 | 15 |
| | Conduct Large Diameter Auger Drilling | 3 | 15 |
| Rules of combinations, Credit distribution (where. applicable): | | | |

The following provides the packaging rules for this qualification, followed by the list of relevant units of competency.

Total number of units = 12

1 fundamental component plus

10 core units plus

9 elective units, of which: (conduct drilling)

One (1) must be chosen that is current to the candidate's industry sector.

Electives & Method of Delivery

CR = Classroom, RPL = Recognition of Prior Learning, CT = Credit Transfer (Certificate Held)

Level 3 consists of 40 Credits

- Fundamental Component 2 Credits
- Core Component: 23 Credits
- Elective Component 15 Credits

Total Credits= 40

The credit combination for this qualification is from, 2 fundamental component, 23 core component and the remaining 15 is from the elective component where candidates would choose only one (1) module.

ASSESSMENT AND MODERATION ARRANGEMENTS

FORMATIVE ASSESSMENT (60%)

Formative assessment or continuous assessment contributing towards the award of credits should be based on module (unit) outcomes.

The contribution of formative assessment to the final grade shall be 60%.

SUMMATIVE ASSESSMENT (40%)

Candidates may undergo assessment including written and practical examinations or projects. The final assessment for each module (unit) contributes 40% of the final mark for that module.

Assessment shall be carried out by BQA registered and accredited Assessors.

MODERATION ARRANGEMENTS

Internal moderation requirements

In this stage all the assessment materials are provided to the Internal Moderator for quality check. The respective Assessor/s provide questions for Each module. The Internal moderator assures the Validity, consistency and reliability of the assessment instruments and checks whether they are appropriate in achieving the intended learning outcomes. The Internal Moderator assesses the assessment instruments to ensure they are valid, consistent and appropriate in addressing the outcomes of the modules against the appropriate levels.

External moderation requirements

Once the Internal Moderator is satisfied with the assessment instruments, they passed to the External Moderator for the second-round quality check. The assessment instruments will be assessed again across the expected learning outcomes with respect to the appropriate level descriptors. The finally moderated Assessments then passed to the Academic and Quality Assurance Manager for the finalisation.

Reports and associated documents to be in place for external moderation should include but not be limited to:

- Qualification document
- Assessment Instrument

Assessment design and alignment matrix

- Marking key
- Internal Moderation report
- List of candidates and scores attained
- Examination Attendance register

Both Internal & External Moderators must be BQA accredited.

RECOGNITION OF PRIOR LEARNING (if applicable)

RPL is granted where the candidate is able to provide sufficient evidence of their competence in a module as determined by the appointed by the RPL Assessor via means of supporting certification which is equivalent and/or documentation which clearly defines the students ability to achieve identified learning outcomes..

The institution shall review all evidence presented and will match that evidence against the Learning Outcome and Assessment Criteria stated in the Unit of Competency.

The institution may find it necessary to ask questions about the evidence or ask the candidate to perform an activity or undergo a test to provide evidence where there are gaps between what has been provided and what is required.

RPL can provide an avenue for completion of qualification or part completion for identified individual modules.

PROGRESSION PATHWAYS (LEARNING AND EMPLOYMENT)

A Certificate III provides for articulation with and progression to a Certificate IV, or a Certificate V provided that the qualification includes at least 20 credits at level 4.

Learning Pathways

Vertical Articulation

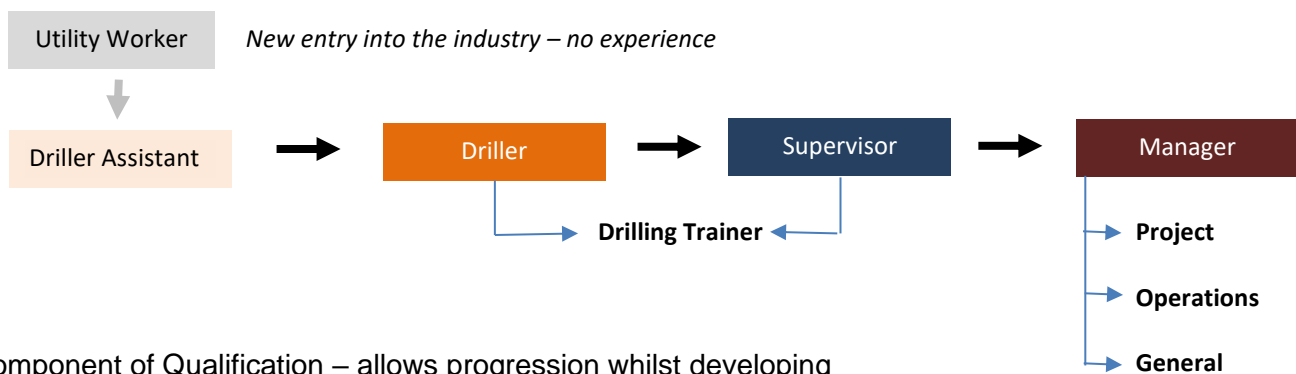
- Certificate IV in Drilling Operations
- Certificate IV in Training & Assessment

Horizontal Articulation

- Certificate III in Work Health & Safety

Employment Pathways

The qualification is specifically designed to allow for a progressive career pathway allowing person existing in the Drilling Industry to progress their career, however more importantly it provides and avenue for new persons entering into the Drilling Industry with a well-structured and progressive career pathway



Component of Qualification – allows progression whilst developing

- Utility Worker
- Driller Assistant

Qualification Outcome

- Driller

Career Pathway

- Senior Driller
- Drilling Trainer
- Supervisor
- Project Manager
- Operations Manager

QUALIFICATION AWARD AND CERTIFICATION

Candidates meeting the prescribed requirements will be awarded the qualification in accordance with the qualification composition rules and applicable policies.

Total No. of Credits required for the Qualification – 40

To be eligible for the qualification of Certificate III in Drilling Operations, candidates should have:

- Achieve 65% aggregate score on all written assessments;
- Successfully complete all workbook activities / Questionnaires
- Successfully complete all work-based activities
- Successfully complete all practical based assessments
- Provide a completed and detailed training logbook

Only after passing all modules in the qualification and obtaining 40 credits, the student can successfully be awarded the Certificate III in Drilling Operations. Therefore, there is only one exit award, which is awarded.

In relation to the RPL (Recognition of Prior Learning) process to be eligible for the qualification of Certificate III in Drilling Operations, candidates shall have:

- Achieved 65% score on final written assessment;
- Successfully completed Practical Assessment – Verification of Competence
- Submit Correctly Detailed Document Evidence Register;
- Submit Supporting Documented Evidence as outlined and required;

REGIONAL AND INTERNATIONAL COMPARABILITY

This qualification compares with the following:

Australian Skills Quality Authority (ASQA) – RII31815 Certificate III in Drilling Operations

This qualification has been developed for people in the drilling industry specifically to determine competence level of Drillers. It brings together all basic aspects and requirements of performing drilling operations and basic supervision in the drilling. It brings together elements of workplace health & safety, risk management and conducting drilling operations. This qualification is applicable to all sectors of the drilling industry. The qualification leads toward Certificate IV in Drilling Operations and provides articulation with the Drilling Industry and standards. The Qualification consists of a Fundamental, a Core and an Elective Component. To be awarded the Qualification learners are required to complete 8 core and 5 elective components as detailed below. The Fundamental Component consists of Unit Standards all of which are compulsory.

CORE

The Core Component consists of 8 Unit Standards all of which are compulsory.

The Elective Component consists of individual unit standards from which the learner must choose 5 unit standards. This qualification compares well with the RII31815 Certificate III in Drilling Operations qualifications studied in terms of content scope; the credits for BQA Certificate in III in Drilling Operations are similar.

The similarities are as follows: these qualifications have workplace health & safety, risk management and conducting drilling operations as their main exit outcome and their domains cover Drilling Operations respectively. What sets this qualification apart from the ones studied is that it emphasizes more on key skills practical skills and knowledge which are more important for employability.

Australian Drilling Industry Association (ADIA) – DICAT Drilling Certification

DICAT course materials which are an alternative to the RII National Qualifications. They are established to take an employee from entry level through to supervisor. As an example, DICAT is recognised by the New Zealand government as their National Qualifications in drilling.

This qualification has been developed to be delivered to people in the drilling industry via correspondence to specifically to determine and provide certification of competence level of Drillers. It brings together all basic aspects and requirements of performing drilling operations and basic supervision in the drilling. It brings together elements of workplace health & safety, risk management and conducting drilling operations. This qualification is applicable to all sectors of the drilling industry. The qualification leads toward Certificate IV in Drilling and provides articulation with the Drilling Industry and standards. The Qualification consists of a Fundamental, a Core and an Elective Component. To be awarded the Qualification learners are required to complete 10 core and 1 elective component as detailed below. The Fundamental Component consists of Unit Standards all of which are compulsory.

BQA NCQF Qualification Template

DNCQF.FDMD.GD04

Issue No.: 01

CORE

The Core Component consists of 11 Unit Standards all of which are compulsory.

The Elective Component consists of individual unit standards from which the learner must choose 1 unit standard. The individual has the avenue to choose additional elective standards pertaining to methodology of drilling to which This qualification also compares well with the RII31815 Certificate III in Drilling Operations qualifications as it is the foundation to which this qualification was established. The credits for BQA Certificate III in Drilling Operations are similar in structure supported predominately via practical delivery components and forms the foundation of this qualification.

The qualification compares well with those against which it was compared. These Institutions follow different credit systems and currently this qualification follows the NCQ Framework to allocate the number of credits with the total number of credits for the qualification is (40 credits).

REVIEW PERIOD

This qualification will be reviewed in a period 5 years upon registration.

Other information – please add any supplementary information to help the application for this qualification for NCQF Registration.

For Official Use Only:

| CODE (ID) | BQA DECISION NO. | REGISTRATION START DATE | REGISTRATION END DATE |
|--------------------------------|----------------------------------|--------------------------------|------------------------------|
| REGISTRATION STATUS | | | |
| LAST DATE FOR ENROLMENT | LAST DATE FOR ACHIEVEMENT | | |
| | | | |