Qualification Specification

ProQual Level 2 Award in Understanding Drilling Fluids (Mud) Technology

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Introduction

The Level 2 Award in Understanding Drilling Fluids (Mud) Technology provides candidates with an understanding of drilling fluids technology used in oil and gas environments.

The Regulated Qualifications Framework (RQF) is the single framework for regulated qualifications, the regulatory body for this qualification is the Office of Qualifications and Examinations Regulation (Ofqual). This qualification is accredited onto the RQF.

Entry Requirements

There are no formal entry requirements for this qualification. Centres should carry out an **initial assessment** of candidate skills and knowledge to identify any gaps and help plan the assessment.

Qualification Profile

Qualification title	**ProQual Level 2 Award in Understanding Drilling Fluids (Mud) Technology**
Ofqual qualification number	610/0538/1
Level	2
Total Qualification Time	30 hours (30 GLH)
Assessment	Pass or fail Internally assessed and verified by centre staff External quality assurance by ProQual verifiers
Qualification start date	28/2/2022
Qualification end date	

Qualification Structure

Candidates must complete **ONE** Mandatory unit

R/650/1507 Understanding Drilling Fluids (Mud) Technology

Centre Requirements

Centres must be approved to offer this qualification. If your centre is not approved please complete and submit form **ProQual Additional Qualification Approval Application**.

Staff
Staff delivering this qualification must be appropriately qualified and occupationally competent.

Assessors/Internal Quality Assurance
For each competence-based unit centres must be able to provide at least one assessor and one internal quality assurance verifier who are suitably qualified for the specific occupational area. Assessors and internal quality assurance verifiers for competence-based units or qualifications will normally need to hold appropriate assessor or quality assurance verifier qualifications, such as:

- ProQual Level 3 Certificate in Teaching, Training and Assessing
- Award in Assessing Competence in the Work Environment
- Award in Assessing Vocationally Related Achievement
- Certificate in Assessing Vocational Achievement
- Award in the Internal Quality Assurance of Assessment Processes and Practices
- Certificate in Leading the Internal Quality Assurance of Assessment Processes and Practices

Support for Candidates

Materials produced by centres to support candidates should:

- enable them to track their achievements as they progress through the learning outcomes and assessment criteria;
- provide information on where ProQual's policies and procedures can be viewed;
- provide a means of enabling Internal and External Quality Assurance staff to authenticate evidence

Assessment

Candidates must demonstrate the level of knowledge and competence described in the unit. Assessment is the process of measuring a candidate's knowledge and understanding against the standards set in the qualification.

Each candidate is required to produce evidence which demonstrates their achievement of all of the learning outcomes and assessment criteria for each unit.

Evidence can include:

- assignments/projects/reports
- worksheets
- portfolio of evidence
- record of oral and/or written questioning

Learning outcomes set out what a candidate is expected to know, understand or be able to do.

Assessment criteria specify the standard a candidate must meet to show the learning outcome has been achieved.

Learning outcomes and assessment criteria for this qualification can be found from page 7 onwards.

Internal Quality Assurance

An internal quality assurance verifier confirms that assessment decisions made in centres are made by competent and qualified assessors, that they are the result of sound and fair assessment practice and that they are recorded accurately and appropriately.

Adjustments to Assessment

Adjustments to standard assessment arrangements are made on the individual needs of candidates. ProQual's Reasonable Adjustments Policy and Special Consideration Policy sets out the steps to follow when implementing reasonable adjustments and special considerations and the service that ProQual provides for some of these arrangements.

Centres should contact ProQual for further information or queries about the contents of the policy.

Results Enquiries and Appeals

All enquiries relating to assessment or other decisions should be dealt with by centres, with reference to ProQual's Enquiries and Appeals Procedures.

Certification

Candidates who demonstrate achievement of the qualification will be awarded a certificate giving the full qualification title -

ProQual Level 2 Award in Understanding Drilling Fluids (Mud) Technology

Claiming certificates

Centres may claim certificates for candidates who have been registered with ProQual and who have successfully achieved the required number of credits for a qualification. All certificates will be issued to the centre for successful candidates.

Replacement certificates

If a replacement certificate is required a request must be made to ProQual in writing. Replacement certificates are labelled as such and are only provided when the claim has been authenticated. Refer to the Fee Schedule for details of charges for replacement certificates.

Learning Outcomes and Assessment Criteria

Unit R/650/1507
Understanding Drilling Fluids (Mud) Technology

Learning Outcome - the learner will:		Assessment Criterion - the learner can:	
1	Understand drilling fluids, their composition and general properties	1.1	Describe drilling mud and its relevance in petroleum engineering
		1.2	Describe the basic components of drilling fluids
		1.3	Highlight the basic functions of drilling fluids
		1.4	Describe the general properties, characteristics and application of the different types of drilling fluids
		1.5	Explain the types and functions of additives commonly added to drilling mud
2	Understand the basic functions of drilling fluids	2.1	List 7 basic functions of drilling mud
		2.2	Explain the importance of drilling mud to the control of formation pressure during drilling operations
		2.3	Explain how drilling mud is used for the removal of cuttings during drilling operations
		2.4	Highlight the importance of the cooling, lubrication and buoyancy provided by the drill bits and the drill string by the drilling fluid
		2.5	Explain how drilling mud is used to maintain wellbore stability
3	Understand a drilling fluid system and its different phases	3.1	Describe the main types of drilling fluid systems and their characteristics
		3.2	Explain the 3 phases of a mud system listed below • Continuous phase (liquid) • Discontinuous phase (solid) • Gas phase
4	Understand the specific application of each drilling fluid types	4.1	Describe the composition and benefits of • Water-based mud • Oil-based mud • Synthetic-based mud
		4.2	Explain the factors to be considered when selecting drilling fluid type
		4.3	Explain 5 factors that influence drilling fluid performance
5	Understand the recommended practice of drilling fluid testing	5.1	State the recommended practices and procedures for testing and determining the characteristics of drilling fluids
		5.2	Identify the basic instruments required for drilling fluids field testing and laboratory testing
		5.3	List the common testing parameters for the laboratory testing of drilling fluids
		5.4	Describe a mud report by stating the key information that should be contained within the report

6	Understand the basic functions and components of a drilling fluid circulation system	6.1	Describe a typical mud circulation system explaining the mud travel path and the major components the mud travels through
		6.2	State the basic functions of the mud circulation system
		6.3	Explain the factors that affects the removal of cuttings from a well during the drilling process
		6.4	Explain the effect of annular velocity on the ability of drilling fluids to carry different sizes of cuttings away from the wellbore
		6.5	Describe the process of removal of solid and gaseous contaminants from the drilling fluids after its return to the surface
7	Understand drilling fluid density, its effects on bit penetration rate and potential kicks	7.1	Explain mud density and its functions (both negative and positive) in relation to hydrostatic pressure in the wellbore and formation pressure.
		7.2	Describe the standard procedure for checking mud density
		7.3	Describe the effect of mud density on • Rate of Penetration (ROP) • The ability of cuttings to settle to the bottom of the wellbore
		7.4	Explain the term “kick”, the circumstances in which it may occur and the importance of a controlled drilling fluid hydrostatic pressure in the prevention of a “blowout”
		7.5	List the parameters for kick detection
		7.6	Describe procedures to prevent a kick
8	Understand troubleshooting for mud systems	8.1	Explain the types, causes and mechanisms of the common drilling fluids operational issues
		8.2	Describe the effect of each of the following technical challenges that may be encountered during the use of drilling fluids • Lost Circulation • Mud Contamination • Formation Damage • Excessive Fluid Loss • Fluid backflow
		8.3	Highlight the relevant mud calculations, precautions and operational checklist items required to ensure smooth operations when using drilling mud
9	Understand solids control, drilling waste management and sustainability	9.1	Explain solids control in relation to drilling fluids
		9.2	List the essential parts of the solids control system
		9.3	Describe the different stages of solids control
		9.4	Highlight the benefits of effective solids control on • Organisations • The environment

		9.5	Explain drilling waste management and sustainability in relation to - • Source Reduction • Recycling/Reuse • Treatment • Disposal
		9.6	Explain the Thermal Desorption process as it applies to drilling fluids and drill cuttings
		9.7	Explain the possible impact of improper disposal of drilling fluids on the environment
10 .	Understand innovations and future trends of drilling fluids	10.1	Describe the effects and benefits of technological advancement and innovations in drilling mud applications
		10.2	Describe the benefits of drilling fluid simulations
		10.3	Explain how drilling fluids composition optimization may be achieved with the use of Nanomaterials, Biomass and additives for HTHP applications
		10.4	Highlight the contributions of Big Data Analytic applications to drilling fluids management

Assessment

There must be valid, authentic and sufficient for all the assessment criteria. However, one piece of evidence may be used to meet the requirements of more than one learning outcome or assessment criterion.

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