

**Domain****WATER SUPPLIES****Title:****Carry out basic repair and maintenance of water infrastructure and pumps on the farm****Level: 2****Credits: 5****Purpose**

This unit standard specifies the competencies required to:

- Demonstrate knowledge of the basic principles of repairs and maintenance of water infrastructure and pumps on the farm
- Prepare to carry out repairs and maintenance of water infrastructure and pump installations
- Carry out repair and maintenance water infrastructure and pump installations
- Complete repair and maintenance activities of water infrastructure and water pump installations.

This unit is intended for people who work in agriculture as well as people in other occupations that work with water supplies on farms.

**Special Notes**

1. Entry information:

Prerequisites:

- None

2. This unit standard is to be delivered and assessed in the context of agricultural operations and can be assessed in conjunction with other relevant technical unit standards.

3. The evidence required to demonstrate competency in this unit must be relevant to workplace operations.

4. Assessment evidence may be collected from a real workplace or an appropriate simulated environment in which agricultural operations are carried out.

5. Assessment of competence in this unit is based on a minimum of two pumps and two types of infrastructure.

6. All inspection, operation and maintenance procedures associated with the use of tools and equipment shall comply with manufacturers' guidelines and instructions.

7. Glossary of terms

- *'Workplace procedures'* may include but are not limited to work notes, plans, product labels, manufacturer's specifications, operator's manuals, safety plans, fire control, waste disposal, recycling, re-use guidelines and supervisors oral or written instructions.

- ‘*Safety requirements*’ may include but are not limited to safe systems and procedures for safe worksite work practices, carrying out maintenance operations, manual handling, hazard and risk control, the handling, application and storage of hazardous substances, operating and handling equipment safe use of hand and power tools and equipment, clear communication signals between operators, maintaining personal hygiene, outdoor work and the appropriate use and maintenance of personal protective equipment.
- ‘*Workplace policies*’ may include but is not limited to the details of available expertise, required support, estimated costs and budgetary constraints, urgency of repairs and relevant maintenance programs.
- ‘*Hazards*’ may include but are not limited to, uneven surfaces, manual handling, hazardous substances, solar radiation, tools and equipment, dusts, hazardous noise, moving machinery and vehicles.
- ‘*Personal Protective Equipment (PPE)*’ may include but is not limited to boots, rubber boots, hat, overalls, gloves, eye and hearing protection and sun protection.

8. Regulations and legislation relevant to this unit standard include the following:

- Labour Act, No. 11, 2007
- Regulations relating to the Health and Safety of employees at work, 1997
- National Agricultural Policy , 1995
- National Drought Policy , 1997
- Environmental Management Act-No: 7 of 2007
- Standards Act, 2005, Standards Regulations: Standards Act, 2005 and relevant Namibian Standards as established

and all subsequent amendments to any of the above.

### **Quality Assurance Requirements**

This unit standard and others within this subfield may be awarded by institutions which meet the accreditation requirements set by the Namibia Qualifications Authority and the Namibia Training Authority and which comply with the national assessment and moderation requirements. Details of specific accreditation requirements and the national assessment arrangements are available from the Namibia Qualifications Authority on [www.namqa.org](http://www.namqa.org) and the Namibia Training Authority on [www.nta.com.na](http://www.nta.com.na)

### **Elements and Performance Criteria**

#### **Element 1. Demonstrate knowledge of the basic principles of repairs and maintenance of water infrastructure and pumps on the farm**

##### **Range**

Basic principles of repairs and maintenance of water infrastructure may include but is not limited to routine daily and seasonal maintenance.

##### **Performance Criteria**

1.1 Types of water infrastructure and pumps on the farm are described.

- 1.2 Water infrastructure and pumps on the farm are identified.
- 1.3 The parts of water infrastructure and pumps on the farm are named and identified.
- 1.4 An understanding of the basic principles of repairs and maintenance of water infrastructure is demonstrated.

**Element 2. Prepare to carry out repairs and maintenance of water infrastructure and pump installations**

**Range**

Tools, equipment and materials may include but are not limited to hand tools, hand held power tools, grease guns, chains, ropes, ladders, cleaning and maintenance supplies including grease, fuel, oil, chemicals and water.

Water point history includes but is not limited type and size of pumps used on the infrastructure, flow rates, maintenance history and equipment changes.

**Performance Criteria**

- 2.1 Tools, equipment and materials appropriate to job requirements are selected and inspected for serviceability.
- 2.2 Existing and potential hazards in the workplace are identified, risks assessed and controlled according to workplace procedures.
- 2.3 Suitable personal protective equipment is selected, used and maintained according to safety requirements and workplace procedures.
- 2.4 Water point history is established according to workplace procedures.
- 2.5 Workplace records are accessed and inspected; water pump installation history is established according to workplace procedures.
- 2.6 Safety requirements are followed in accordance with safety plans and policies.
- 2.7 Workplace policies regarding service and repairs to water pump installations is established in consultation with the supervisor.
- 2.8 Specialist instructions and assistance is sought as required from recognised industry sources according to workplace procedures.
- 2.9 Faulty or unsafe infrastructure and pumps are identified and segregated for repair or replacement according to workplace procedures.

**Element 3. Carry out repair and maintenance of water infrastructure and pump installations**

**Range**

Service and repair may include but is not limited to the pulling of the pipes, fitting clamps, removing rods and pipes, the laying out of rods and pipes, replacing worn or faulty parts,

checking rods for straightness, checking stabilisers and spacers for wear, checking for wear on pipes, rods, wires and cables, checking boreholes for obstructions and removing tree roots.

The service and repair of solar pumps may involve cleaning the solar panels and checking wiring. Repair of the submersed pumps may include the checking and replacement of cup washer seals and bearings, the checking and testing or replacing of foot valves and submersibles and replacing worn or faulty parts.

Service and repair of pump heads and power sources may include checking of the belt condition, glands, pulleys, vibration or noise, slipping, throwing, or loose belts, low flows, correct rotation, worn parts and bearings and checking all guards are in place, checking for loose bolts, stability of the block and replacing worn parts where necessary.

Power source may include but is not limited to solar, mains, wind, stationary engine or generator.

### **Performance Criteria**

- 3.1 Present power source is disconnected according to workplace procedures.
- 3.2 Alternative power source is reconnected or power source for water supply is changed according to workplace procedures.
- 3.3 Pre start checks are carried out according to workplace procedures.
- 3.4 Service and repairs to water infrastructure and pump installations are carried out according to manufacturer's specifications, operators manual and workplace procedures.
- 3.5 Hazards are identified, risk assessed and suitable controls implemented according to workplace procedures.
- 3.6 Suitable personal protective equipment is selected, used, maintained and stored according to workplace procedures.
- 3.7 Intakes and outlets are inspected, potential blockages are reported and actual blockages are cleared in accordance with workplace procedures.
- 3.8 If water filters are fitted they are checked, cleaned and replaced as required.
- 3.9 Troughs are cleaned according to workplace procedures.
- 3.10 Where water quality problems or contamination is found, treatment is carried out in accordance with workplace procedures.
- 3.11 More complex faults and repair requirements are reported to the supervisor according to workplace procedures.
- 3.12 Water infrastructure and pump installation components are reassembled and tested for operation according to manufacturer's specifications to ensure the restoration of full function and flow.

#### **Element 4. Complete repair and maintenance activities of water infrastructure and water pump installations**

##### **Range**

Environmental procedures may include but are not limited to the safe use and disposal of maintenance debris including oils, oil containers, materials, fuel and chemical residues.

Relevant information to document includes but is not limited to tool and equipment usage, water pump servicing, repair procedures and outcomes, mechanical faults or malfunctions and damage details.

Specifications refer to any or all of the following: manufacturers' specifications and recommendations, as well as workplace specific requirements.

Report may include but is not limited to oral and/or written.

##### **Performance Criteria**

- 4.1 Water infrastructure and pump installation components are reassembled and tested for operation according to manufacturer's specifications to ensure the restoration of full function and flow.
- 4.2 Work site, tools and equipment are cleaned, returned to operating order and stored according to workplace procedures and specifications.
- 4.3 Unused materials and waste from service and repair activities is collected, treated and disposed or recycled according to workplace and environmental procedures.
- 4.4 Equipment faults or malfunctions, irregular performance or damage are identified, detailed and reported to the supervisor according to workplace procedures.
- 4.5 Repair and maintenance records are completed and relevant information is documented and reported according to workplace procedures.

##### **Registration Data**

<b>Subfield:</b>	Infrastructure
<b>Date first registered:</b>	25 November 2015
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<b>Body responsible for review:</b>	Namibia Training Authority