

ASSESSMENT GUIDE FOR ASSESSORS & FACILITATORS

Irrigation

Level 3

Copyright ©



P.O. Box 461, Hillcrest, 3650
(031) 313-3364

Title:		Monitor the Operation and Maintenance of Irrigation Systems					
Applied Title:		Monitor the Operation and Maintenance of Irrigation Systems in Citrus Orchards					
Field:		Agriculture and Nature Conservation					
Sub-Field:		Primary Agriculture					
SETA (SGB):		AgriSETA					
Skills Area:		Irrigation					
Context:		Citrus Production					
US No:	116266	Level:	3	Credits:	3	Notional Hours:	30
Author:		F. Kruger (BSc Agric (Mechanised Agriculture))					

Based on the Production Guidelines of:



Supported by:



Unit standard alignment and assessment tool development:

Cabeton Training and Development

Project coordinator:

Jacomien de Klerk

Disclaimer

By accepting this document and reading its contents you agree to be bound by the terms of this disclaimer.

The use of the contents of this document is at your own risk. Neither the Citrus Academy nor the CRI or the CGA warrant that the content of this document is suitable for your intended use or that it is free of inaccuracies or omissions. The opinions and advice expressed in this document are not necessarily those of the Citrus Academy, the CRI or the CGA. The Citrus Academy, the CRI and the CGA, their directors, officers, employees, agents and contractors shall not be liable for any loss or damage of any nature suffered by any person as a direct or indirect result of the use of, or inability to use any advice, opinion or information contained in this document, or any misrepresentation, misstatement or omission, whether negligent or otherwise, contained in this document.

You indemnify the Citrus Academy, the CRI and the CGA against any claim by any third party against the Citrus Academy, the CRI or the CGA, their directors, officers, employees, agents or contractors arising from, or in connection with, the use of, or reliance on, the contents of this document. It is your responsibility to determine suitability of the contents of this document for your intended use.

Table of Contents

Directions 4
Step 1 5
Step 2 6
Step 3 7
Step 4 8
Step 5 9
Step 6 18
Step 7 20
Step 8 25
Step 9 26
Step 10 33



Directions

Please Note: There is a separate assessment guide for the learner. The learner must use this guide to prepare himself / herself for the assessment.

This assessment guide contains all necessary activities and instructions that will enable the assessor and learner to gather evidence of the learner's competence as required by the unit standard. This guide was designed to be used by a trained and accredited assessor who is registered to assess this specific unit standard as per the requirements of the AgriSETA ETQA.

Prior to the delivery of the program the facilitator and assessor must familiarise themselves with content of this guide, as well as the content of the assessment guide for learners.

The assessor, facilitator and learner must plan the assessment process together, in order to offer the learner the maximum support, and the opportunity to reflect competence.

The policies and procedures that are applicable during the execution of this assessment are available on the website of the Citrus Academy, contained in a document named Policies and Procedures for Assessment, and must be strictly adhered to. The assessor must familiarise himself with this document before proceeding.

This guide provides step-by-step instructions for the assessment process of:

US No:	116266	Level:	3	Credits:	3
---------------	--------	---------------	---	-----------------	---

The step-by-step instructions agree and are conducted in concert with the steps described in the learner assessment guide. The steps are as follows:

Step	Description	Timeframe
1	Learner Assessment Contract	Before delivery of program
2	Learner Declaration of Authenticity	Before delivery of program
3	Diagnostic Assessment of Learning Assumed to be in Place	Before delivery of program
4	Assessment Plan for Gathering of Evidence	Before delivery of program
5	Learner Formative Assessment Activities	During delivery of program, assessment after delivery of program
6	Report Writing	After delivery of program
7	Integrated Summative Assessment Tool	After delivery of program
8	Re-assessment Procedures	After completion of assessment
9	Documentation	After completion of assessment
10	Administration and Completion of Portfolio of Evidence	After completion of assessment

Step 1

Pre-Assessment Briefing and Checklist

A pre-assessment briefing for learners is held before the delivery of the program. Use the checklist below to ensure that all these points are addressed and discussed with the learners.

Pre-Assessment Briefing Checklist		
	√	X
Organise resources – people, equipment, venue, etc.		
Explain the purpose of the assessment		
Discuss the standards or criteria to be used		
Discuss assessment roles and accountabilities		
Decide on assessment venues		
Negotiate evidence required, and where or how this evidence may be gathered		
Explain the methods of assessment that will be used during the gathering and summing up of evidence		
Negotiate the date of submission for the activity workbook and the date for the summative assessment		
Discuss resources required for the assessment e.g. equipment, materials, etc.		
Explain the procedure if the learner is found to be not yet competent		
Explain the appeal and review procedures		
Identify any potential learning barriers and negotiate strategies to overcome these		
Complete and sign the assessment plan with the learner		

The learner and assessors must sign the **Learner Contract** in the learner assessment guide.

Step 2

Learner Declaration of Authenticity

The learner is requested to complete and sign the Declaration of Authenticity in the learner assessment guide. This should be checked and co-signed by the assessor.

The format is as reflected in the learner assessment guide.



Step 3

Diagnostic Assessment of Learning Assumed to be in Place

In the learner assessment guide, the learner is asked to indicate whether they have completed the learning assumed to be in place as prescribed by the unit standard.

The assessor must guide the learners through this step, explaining in detail the content of the mentioned learning areas, because names of learning programs do not always agree with the names of the unit standards, and learners might indicate the incorrect information.

If learners indicate that they have not yet completed the mentioned unit standards, the assessor should prescribe an action plan to allow the learner to obtain the skills required by recommending additional training, competence portfolios, or the relevant RPL assessment for the given unit standards.

The format is as reflected in the assessment guide for learners. Please read it and familiarise yourself with its content.



Step 4

Assessment Plan for Gathering of Evidence

A pro-forma assessment plan for this unit standard has been drafted in the learner assessment guide. Explain the plan to the learner and complete the dates and signatures as indicated.

The format for the assessment plan is as reflected in the assessment guide for learners. Please read it and familiarise yourself with its content. Make a note of the dates agreed upon in the table provided below.

Learner and Assessor Assessment Plan		
Unit Standard	Monitor the Operation and Maintenance of Irrigation Systems	
Registration Number	116266	
Step	Description	Completion / Submission Date
Step 5	Learner Formative Assessment Activities	
Step 6	Report Writing	
Step 7	Integrated Summative Assessment	
Step 8	Re-Assessment Procedures	
Step 9	Documentation	
Step 10	Administration and Completion of Portfolio of Evidence	

Step 5

Learner Formative Assessment Activities

The learner assessment guide contains comprehensive activities and worksheets that the learner must complete during the delivery of the learning program. It is imperative that these activities be completed as part of the learning process in order to give the learner the opportunity to develop the skills, knowledge and attitudes that are required for competence.

Learners must complete all the activities in the workbook.

Learners must be encouraged to take control of their learning by indicating areas in the workbook where they experience difficulty.

The learner hands in the learner assessment guide to the assessor or the facilitator, only if the facilitator is a subject matter expert, for the assessment of the formative assessment activities. The assessment of these activities must be done according to the prescribed benchmarks and according to the following marking matrix.

The learner should not move on to the next step before this step has been completed and learners show sufficient capacity and readiness for summative assessment. If problems areas are identified, the learner should be guided with a developmental action plan, which is documented separately and signed by the learner, the facilitator and the assessor.

Model answers are provided below.

Activity 1 – Practical Experiment			
• Fill a garden pot with dry soil. Ensure the pot has drainage holes at the bottom. • Weigh the pot with dry soil. • Pour water into the pot until water starts running through the drainage holes in the bottom of the pot. • Leave the pot until the water has stopped running from the drainage holes. • Weigh the pot again. • Answer the questions below?			
What did the pot weigh before and after the water was added?			
Before:	Observe measurement	After:	Must be more than "Before" measurement
Why is the weight of the pot different after water is added?			
When water is added to the soil, the soil absorbs some of the water. This absorbed water adds to the weight of the pot.			

Activity 2 – Practical Task
• Get the operations table, the irrigation schedule and the pressure table from the irrigation manager on your farm and implement the schedule practically. • Make notes for yourself as to what you did. • Attach signatures and dates from your mentor, coach, or the irrigation manager confirming that you completed the task.
Key Notes:

Notes must include:

- Times at which the valves are opened and closed for the different operations.
- How and when the pressure are checked and regulated.
- Stand times are observed.
- The correct operations and valves are opened / closed for the relevant days.

Learner's Signature

Date:

Assessor's Signature

Date:

Activity 3 – Worksheet

Complete the worksheet below.

Why do plants extract different amounts of water every day?

Climatic conditions like wind, sun, rain, humidity and cloud cover change every day.

Name some of the instruments we use to assess the rate of water extraction by the plant.

Evapotranspiration pan, tensiometers, probes

Describe what happens when you pour water into a pot of dry soil.

The dry soil soaks up the water until it is saturated. As soon as the soil is saturated, the excess water leaches out.

Describe the concept of mm/m.

This refers to the mm of water per meter of soil. The term mm of water relates to a volume of water per area of land.

Name the three components of the irrigation schedule.

The table of operations, the schedule table and the pressure table.

Define and describe the following terms:

Field Capacity

Field capacity (FC) is defined as the depth of water per meter of soil when all free water drained out of the saturated soil. This is regarded as the "full" point of the soil reservoir.

Permanent Wilting Point

The Permanent Wilting Point (PWP) is described as the depth of water per meter soil where most plants will wilt permanently. This is the point where plants will not recover after 12 hours if they are watered. This is the "empty" point of the soil reservoir.

Plant Available Water

Plant Available Water (PAW) is defined as the depth of water per meter of soil between Field Capacity and Permanent Wilting Point. Thus $PAW = FC - PWP$.

Easily Available Water

Of the PAW about 50% is easily assessable to the plant this is called the Easily Available Water. If more than the easily available water is extracted the plant will start to stress. This stress can show in symptoms like the wilting of flowers or leaves. However should the water balance be corrected the plant will stop to stress.

Effective Root Depth

The term Effective Root Depth (ERD) is used to describe the depth of the roots that extract the water from the soil. This effective root depth is usually 600 mm for citrus.

Operations Table

The table of operations is a table containing the blocks that are operated together.

Irrigation Schedule	The schedule table is a table that list when and how long each operation must be executed.
Pressure Table	The pressure table is a table that lists the infield pressure for every block.
What problems should you look out for in blocks in low-lying areas and what can be the causes?	
Blocks in low lying areas can be over irrigated and become water logged. The problem can be block pressure incorrectly set, mainline draining into the block	
What problems should you look out for in blocks in high-lying areas and what could be the causes?	
Blocks in higher areas tend to be under irrigated because of lower mainline pressure or mainlines taking more time to fill at start up.	

Activity 4 – Worksheet

Complete the worksheet below.

What is an evaporation pan used for?	
The evaporation pan is used to determine the amount of water evaporation.	
What type of pan is used and recommended by the Weather Bureau?	
The class A pan.	
What is the rain gauge used for?	
A rain gauge is used to measure the amount of rain.	
What does the tensiometer determine?	
A tensiometer measures the osmotic pressure in the soil. This is directly related to the amount of water in the soil.	
Define osmotic pressure.	
Osmotic pressure refers to the pressure required by plant roots to draw water from the soil.	
What are probes and what are they used for?	
Probes are electronic instruments that measure the amount of water in the soil. Various types of probes are available, using waves, signals or neutrons to measure the amount of water in the soil.	
Describe how you would take readings from the following equipment and record the relevant data:	
E-pan	The reading of the evaporation pan is taken at 08:00 every morning. Taking a measurement is as simple as reading the water level from the scale on the side. Before a reading is taken the scale must be wetted by dipping your finger into the water and wetting the scale at the water level.
Rain gauge	The reading from the rain gauge is taken by reading the amount of water of from the scale on the side.
Tensiometer	Located on the tensiometer is a gauge resembling a pressure gauge. A reading is taken from this gauge.
Probe	The probe is lowered in to a tube in the ground and the correct tube number is noted on the data logger. The data logger will take a reading that can be downloaded onto a computer later on.
Complete the table below:	

<i>Date</i>	<i>Rainfall</i>	<i>Water Level Before Regulating</i>	<i>Water Level After Regulating</i>	<i>Calculations</i>	<i>Evapo-transpiration</i>
2006/01/06			50		
2006/01/07		68	68	$(68-50)/2+0$	9
2006/01/08	20	56	76	$(56-68)/2+20$	14
2006/01/09		98	98	$(98-76)/2+0$	11

Using data and other relevant information on the farm you work on, describe how you would do the following:

1. Draw up a water balance sheet.
2. Use the system application rate and data from the water balance sheet to determine the stand-time.
3. Schedule the irrigation using tensiometers.
4. Schedule the irrigation using probes.

Key Concepts to Observe:

The water balance sheet can be in the format of the example in the learner guide. Is important to note that the evapotranspiration or water use is accurate. Calculations and the cumulative water use must also be correct. The water use is divided by the system application rate (mm/h) to give the stand time in hours. Either the day on day water use or the weekly water use can be used. The scheduling using tensiometers and probes should focus on keeping the soil water balance between the parameters of field water capacity and easily assessable water.

In general terms what should the tensiometer readings be kept at?

-10 kPa and – 50 to – 60 kPa.

Describe how you would take a reading with a probe.

A reading is taken in the field by inserting the probe into the tube. Care must be taken to key in the right tube number. Once the probe has logged the date, the probe can be removed and the cap replaced on the tube.

Describe the maintenance required for an E-pan.

Grass and weeds around the pan must be kept short. Wind must be able to move freely through the top 100 mm. Weeds and bush must be kept clean so that no shadowing occur. When algae are present the pan must be cleaned. The water is removed and the pan cleaned. When the pan is re-filled it must be calibrated.

Describe the maintenance required for a rain gauge.

Grass and weeds around the gauge must be kept short if the rain gauge is dirty it can be washed out and rinsed. Cracked or broken rain gauges must be replaced.

When must the tensiometer be reset?

When the reading dropped below -100 kPa

How would you fill the tensiometer with water?

The lid on top of the tensiometer is screwed off and the tensiometer is filled with water.

Activity 5 – Worksheet

Obtain the irrigation schedule from your farm and complete the worksheet below:

Explain step-by-step what you would instruct your team members to do to implement the schedule.

1. Draw up a work program.
2. List all appropriate tasks for each member.
3. Note comments on the tasks performed.

Draw up a checklist of critical checkpoints with a time schedule of when you will check on the system.

No model answer provided, depends on systems information.

Draw up a trouble shooting list for different problems that might occur on the system.

The trouble shooting list can be plain list, listing the effect and cause. It should concentrate on the problems associated with the different components of the irrigation system and possible remedies.

For example: the following problems are associated with pumps and can be rectified by:

1. **Cavitation:** check suction pipe, check water level, check if pump is fully primed.
 2. **Overloading:** is the overloading caused by too many blocks open or eminent mechanical failure.
 3. **Under loading:** is the pump cavitating or are too few valves open.
- Likewise, the filter system, pipe system and infield irrigation can be listed with the different problems.**

Activity 6 – Worksheet

Complete the worksheet below.

Name the five components of the pump system that must be inspected?

1. **Pumps**
2. **Filters**
3. **Valves**
4. **Pipes**
5. **Emitters**

Describe how you would clean and inspect a sand filter.

On sand filters, open the filter and remove the sand. If the same sand is going to be re-used, wash the sand properly to break up any cakes that have formed and to clean out debris trapped in the sand. Wash the inside of the filter before replacing the sand. In some cases, the sand has to be replaced, which is also done when the filter is opened and cleaned. The irrigation manager will advise when the sand must be replaced. When the sand has been removed inspect from a sand filter check the inside of the filter. At the bottom of the filter are perforated pipes or buttons. Visually inspect these for wear and tear. The material between the perforations tends to break, thus letting sand into the irrigation system. Report any suspicious pipes and buttons to the irrigation manager.

Describe how you should clean disc filters. What should you be looking for when cleaning the filters?

Filters can be cleaned by removing the filter element or cartridge, as follows:

- **Loosen the filter element**
- **Remove the individual discs**
- **Scrub each disc with a brush and water**
- **Replace in the same way and with the same amount in the filter element**
- **Reinsert the filter element into the filter**
- **Close the lid**

Clean and inspect the filter elements for signs of wear and tear.

Name three other items that are associated with filters that need to be inspected.

- **Hydraulic valves**
- **Diaphragms**
- **Tubing**
- **Lid seals**
- **Secondary filters**

Name the three items that should be inspected with regards to infield irrigation. Describe the specific points that should be noted.

- **Valves** – Check that valves open and close properly and that they do not leak. Check the gland packing for leaks and tighten it if necessary. Open hydraulic valves and inspect the rubber diaphragm for wear and cracks, and check the pilot valves. The pilot valves should regulate the pressure at the set value. Visually inspect the pilot valves for signs of leaks and wear.
- **Emitters** – The best evaluation of emitters is by means coefficient of uniformity (CU) test, which aims to ensure that all emitters are operating uniformly. Perform a visual inspection of the emitters and be on the look out for emitters that are spraying poorly or are blocked. Observe the spray pattern to see if it is overlapping or if dry spots occur. Micro-jets can be opened and cleaned, and drippers can be tapped lightly to loosen blockages. Do not hit or pierce the dripper as this will cause damage.
- **Pipes** – Visually inspect pipes for leaks and their general condition.

Name the function of the following:

Amp meter	It measures the electrical current that is used by the pump.
Volt meter	It gives the voltage reading of the electrical system.
Pressure gauge	It gives a reading of the system pressure.
Flow meter	It gives the system flow rate.

Name the factors that should be considered when normal operating characteristics are determined for a pump and motor.

Normal water levels, clean filters and the correct number of blocks open.

Describe how you would adjust the pressure on a block fitted with a hydraulic valve.

Adjust the pilot valve on the hydraulic valve to increase or decrease the water pressure. To decrease the pressure, turn the nut on top of the pilot valve anticlockwise. This will close the valve thus reducing the pressure. To increase the pressure, turn the nut clockwise. This will open the valve and increase the pressure. Note that the actuation of the valve by the pilot takes a few minutes. Adjust the pilot only a little bit at a time and wait for the pressure to stabilise before it adjusting again.

Activity 7 – Worksheet

Draw up a concept maintenance plan, keeping in mind the life expectancy and the replacement of equipment.

The example given in the learner guide can be used as a basis. The learner must be able to adapt the program for the specific equipment on the farm.

Activity 8 – Worksheet

Draw up a contingency plan for emergencies on your farm.

Learners must focus on events such as floods, fire, breakdowns, pipe bursts and chemical spills. Learners can use the guidelines set out in the learner guide. The plan must also include the specific tasks given to certain personnel as well as safety drills.

Marking Matrix and Assessor Report for Formative Assessment Activities
Formative Evidence Collection Summary for Unit Standard 116266 – Level 3

	<i>Action Required from Learner to Develop Competence</i>	<i>Competence Assessments</i>	<i>Standard for Activity</i>	<i>Allocation of Marks</i>	<i>Feedback to Learner and Comments on Evidence</i>
<i>Specific Outcome 1: Modify and implement irrigation schedules for various crops</i> <i>Range:</i> Includes but is not limited to the implementation of prescribed programs, adaptation of programs as a result of soil structure/depth, age of crop, growth of crop, prevailing climatic conditions, etc.	Attend classroom lesson, participate and ask questions	Activities in learner activity book were completed correctly	Activity answers must be at least 85% correct A signature + commentary from the supervisor / coach / mentor or facilitator in learner Workbook	As per model answer sheet	
<i>Specific Outcome 2: Ensure the efficient operation of irrigation systems</i> <i>Range:</i> Includes but is not limited to checking the functioning of pumps and motors, valves, timers, filters, sprinklers, etc.	Attend classroom lesson, participate and ask questions	Activities in learner activity book were completed correctly	Activity answers must be at least 85% correct A signature + commentary from the supervisor / coach / mentor or facilitator in learner Workbook	As per model answer sheet	
<i>Specific Outcome 3: Collect and record data in an agricultural field</i> <i>Range:</i> Includes but is not limited to soil moisture recorders (tensiometers, evaporation pans, neutron probes, manual determination of soil moisture, etc.), climatic data (manual/automatic weather stations), water application, fertigation, stage of crop growth, etc.	Attend classroom lesson, participate and ask questions	Activities in learner activity book were completed correctly	Activity answers must be at least 85% correct A signature + commentary from the supervisor / coach / mentor or facilitator in learner Workbook	As per model answer sheet	

Marking Matrix and Assessor Report for Formative Assessment Activities
Formative Evidence Collection Summary for Unit Standard 116266 – Level 3

	<i>Action Required from Learner to Develop Competence</i>	<i>Competence Assessments</i>	<i>Standard for Activity</i>	<i>Allocation of Marks</i>	<i>Feedback to Learner and Comments on Evidence</i>
Specific Outcome 4: Prepare maintenance programs for irrigation systems <i>Range:</i> Includes but is not limited to daily, weekly and seasonal maintenance, preventative maintenance, unforeseen maintenance, etc.	Attend classroom lesson, participate and ask questions	Activities in learner activity book were completed correctly	Activity answers must be at least 85% correct A signature + commentary from the supervisor / coach / mentor or facilitator in learner Workbook		
Specific Outcome 5: Supervise irrigation activities <i>Range:</i> Includes but is not limited to implementing Irrigation Manager's instructions, supervising junior workers, adapting/modifying in-field operations as and when required, preparing daily work programs for staff, etc.	Attend classroom lesson, participate and ask questions	Activities in learner activity book were completed correctly	Activity answers must be at least 85% correct A signature + commentary from the supervisor / coach / mentor or facilitator in learner Workbook		
US CCFO: Identifying	Attends all lessons, activities, practical and completes activities and workbook as per instructions	Attendance register and facilitator report	Learner must at least be present and no negative commentary about the learner should be made in the facilitator report.	N/a	
US CCFO: Working					
US CCFO: Organising					
US CCFO: Communicating					
US CCFO: Science					
US CCFO: Demonstrating					
US CCFO: Contributing					
US CCFO: Identifying					

Assessment Feedback Form		
	Comments / Remarks	
Feedback to learner on assessment		
Feedback from learner to assessor		
Learner's Signature		Date:
Assessor's Signature		Date:

Step 6

Report Writing

Before the summative task is undertaken, the learner must be reminded of what is expected from him / her in terms of summative and reflexive competence. Read and explain to the learner this section in the learner assessment guide. The learner and assessor must sign off this section to acknowledge that this step was completed.

- Use the planning and questioning format below to help you collect evidence for foundational and embedded knowledge as prescribed by the outcomes of the unit standards.
- Provide the questions as listed to the learners as a guide.
- Ensure that you apply the exact same methodology for each learner in order to ensure that VACS principles are adhered to.
- The benchmark for learner competence is an 85% overall test score.
- Only a suitably qualified and registered assessor who is ALSO a subject matter expert in this specific field can mark this assessment tool for learner assessment.
- If no such a person can be found to assess the learner, then it is advised that a qualified assessor consults with the appropriate subject matter expert prior to the assessment in order to establish key points for competence and / or uses model answers as supplied by a subject matter expert to allocate marks. The subject matter expert should be consulted for any answers that the assessor might have queries on.
- Use a header in the following format for each test paper:

Unit Standard:	116266	NQF Level:	3
Learner Name			

- The assessor should use the questions below as a marking matrix and to gather evidence and to check for completeness.

Explain to a new member of the team how to read and implement an irrigation schedule on the farm.	15%
Explain to a new member of the team what "irrigation scheduling" is and why it happens.	
Explain the terminology to a new member of the team and explain to them what is expected from them: • Stand time • Flow rate • Start time • Stop time • Pressure • Electric measurements such as Volt, Amp	10%

How would the irrigation schedule be adapted if: - It rained 5 mm last night - The berg wind is going to blow today at 30km/h - There is a frost warning for this morning	10%
Explain which parts of the system have to be checked and maintained.	10%
Explain when these parts of the system have to be checked and maintained.	
Explain how these parts of the system must be checked and maintained.	
Explain the start-up and shut-down procedures of the irrigation system.	15%
Explain the shut-down of the irrigation system after the completion of the irrigation season.	
Explain which measurement instruments are used on the farm to determine the irrigation schedule.	10%
Give a brief explanation of how these instruments work.	
Explain which problems you might encounter with the instruments.	
Explain the reporting system on the farm for any problems or faults encountered with the irrigation system.	10%
Explain which irrigation system emergencies you could expect and how you would react if it occurred. (An example of an emergency is when floods occur)	10%
Explain the safety regulations that people have to adhere to when working with the irrigation system.	10%

Step 7

Integrated Summative Assessment Tool

Two assessment tools are provided in this step, being:

1. Practical Assessment Tool
2. Attitudes and Attributes Assessment Tool

These assessment tools have been drafted in its entirety and follows below. It must be copied and completed for every learner in the same manner and according to the same procedure.

Learners must not be given these tools in preparation for summative assessment. This corresponding step in the learner assessment guide is a direct reflection of these tools and is drafted in a format that is appropriate to the learner's level of language competence.

1. Practical Assessment Tool

- All the sections of this document must be completed and signed where appropriate by the learner and the assessor.
- The learner must be given appropriate feedback and told whether they were declared competent or not yet competent. The assessor must record the appropriate commentary and guide the learner with detailed action plans for areas where the learner is found not yet competent.
- In line with the policies and procedures, the assessor must offer learners an opportunity for feedback on the assessment as well as an opportunity to appeal against the declaration.
- Should learners be found not yet competent, a detailed action plan with specific commentary on development must be drafted together with the learner and the facilitator in order to develop the necessary competence. A date for re-assessment must be agreed upon with the learner.
- All the evidence must be signed and copied, if necessary, to be placed in the learner's portfolio of evidence.
- Use this checklist to help collect evidence of practical competence as prescribed by the specific outcomes of the unit standards.
- Ask the questions as listed in order to test foundational and reflexive competence relevant to the specific task.
- Ensure that the exact same methodology is applies for each learner in order to ensure that VACS principles are adhered to.
- The benchmark for learner competence in this tool is 85% in EVERY task.
- This assessment tool can only be used for learner assessment by a suitably qualified and registered assessor who is ALSO a subject matter expert in this specific field.
- If no such a person can be found to assess the learner, then it is advised that a qualified assessor consults with the appropriate subject matter expert prior to the physical assessment in order to establish key points for observation. The subject matter expert should attend the assessment in order to judge competence of the learner.

2. **Attitudes and Attributes Assessment Tool**

- Use this rating scale to judge the learner's CCFO competence according to the unit standard.
- The learner's entire performance and all the stages of learning, as well as all gathered evidence must be considered for this section.
- It is advised that the assessor consult with facilitators, mentors, coaches and supervisors in order to ensure that an objective rating is allocated.
- A rating between 1 and 5 should be given, as follows:

<i>Rating</i>	<i>Description</i>
1	No evidence can be found
2	The evidence found is weak and this is still a major development area for the learner
3	The evidence found meets the average expectation for a learner on this level
4	The evidence found is of a high quality and exceeds the average standard expected
5	The evidence found is outstanding and the learner attitudes and traits are very well developed

- Learner must be given constructive feedback on each rating.
- Ensure that you apply the exact same methodology for each learner in order to ensure that VACS principles are adhered to.
- The benchmark for learner competence in this tool is 3:5 in EVERY CCFO.

At the end of this step, an assessment feedback form is provided which must be completed and signed by the assessor, learner and moderator, where applicable.



Practical Assessment Tool				
Unit Standard:	116266	NQF Level:	3	
Learner Name				
Tasks and Question	Criteria Checked For / Key Concepts Observed (to be completed as per the real contexts and examples used whilst in the field)	Learner Competent	Learner Not Yet Competent and Recommended Revision	Assessor Comments
Start-up the irrigation system				
Shut-down the irrigation system				
Irrigate the crop correctly according to interpretation from an irrigation schedule				
Check and maintain the irrigation system				
Report faults or problems encountered with the irrigation system				
Maintain the irrigation system				

*These are generic questions that will differ from irrigation system to irrigation system and farm to farm. No model answers are thus supplied.

Attitudes and Attributes Assessment Tool

Use the following rating table in this assessment:

Rating	Description
1	No evidence can be found
2	The evidence found is weak and this is still a major development area for the learner
3	The evidence found meets the average expectation for a learner on this level
4	The evidence found is of a high quality and exceeds the average standard expected
5	The evidence found is outstanding and the learner attitudes and traits are very well developed

CCFO Criteria	Rating
Identifying – The learner can identify problems and deficiencies correctly.	
Working in a Team – The learner is able to work well as member of a team.	
Organising – The learner works in an organised and systematic way whilst performing all tasks and tests.	
Communicating – The learner is able to communicate his or her knowledge orally and in writing, in a way that shows what knowledge he or she has gained.	
Demonstrating – The learner is able to show and perform the tasks required correctly.	
Contributing – The learner is able to link the knowledge, skills and attitudes that he or she has acquired in this module of learning to specific duties in their job or in the community where he or she lives.	
Science – Learner is able to utilise and use science and technology effectively	
Collecting – Learner can effectively gather information	



Assessment Feedback Form			
		Comments / Remarks	
Feedback to learner on assessment and / or overall recommendations and action plan for competence			
Feedback from learner to assessor			
Assessment Judgement	You have been found: ☐ Competent ☐ Not yet competent in this unit standard		Actions to follow: ☐ Assessor report to ETQA ☐ Learner results and attendance certification issued
Learner's Signature		Date:	
Assessor's Signature		Date:	
Moderator's Signature		Date:	

Step 8

Re-Assessment Procedures

- Note that only outcomes on which the learner was found not yet competent must be re-assessed.
- The same procedures in steps 6 and 7 are repeated.
- The tool must be adapted at discretion of the assessor. Best practice is not to present the exact same format and questions if possible.
- Use your expertise and judgement to ensure that the method of re-assessment remains integrated and relevant to the expected outcomes.



Step 9

Documentation

The following documentation is addressed in this step:

1. Learner and assessor information reports;
2. Assessor report and summative evidence collection summary;
3. Learner assessment re-actionnaire;
4. Assessor's assessment review and improvement document;
5. Assessment appeal form

1. Learner and Assessor Information Forms

The learner information form is in the assessment guide for learners. The assessor information form follows. These forms must be completed for each individual learner and placed in the learner's portfolio of evidence.

2. Assessor Report and Summative Evidence Collection Summary

This report follows after the information report. Use it to summarise the findings during assessment. Please complete the copy of this report that is in the learner assessment guide.

3. Learner Assessment Re-Actionnaire

A pro-forma for the learner assessment re-actionnaire is included in the learner assessment guide. Ask the learner to complete this form and sign it.

4. Assessor's Assessment Review and Improvement Document

The assessor is expected to complete the assessor review of the assessment process, using the pro-forma document of which an example follows. Please complete the copy of the document in the learner assessment guide. This document must be discussed with the learner and any learner commentary should be recorded.

5. Assessment Appeal Form

The assessment appeal form is also provided in the learner assessment guide. Assist the learner to complete the document if necessary.

The learner must be requested to sign-off all reports and documents before they are placed in the portfolio of evidence.

Assessor Information Form			
Unit Standard	116266		
Program Date(s)			
Surname			
First Name			
Company Name			
Job / Role Title			
Home Language			
Gender	Male		Female
Race	African	Coloured	Indian/Asian White
Employment	Permanent		Non-permanent
Disabled	Yes		No
Date of Birth			
ID Number			
Contact Telephone Numbers			
Email Address			
Postal Address			

Assessor Report and Formative and Summative Evidence Collection Summary for Unit Standard 116266 – Level 3					
Description	Evidence Gathered		Benchmark	Competent / Not yet Competent	Feedback and Comments
	Foundational and Embedded Knowledge	Practical Skills, Underpinning Knowledge and Reflexive Competence			
Specific Outcome 1: Modify and implement irrigation schedules for various crops <i>Range:</i> Includes but is not limited to the implementation of prescribed programs, adaptation of programs as a result of soil structure/depth, age of crop, growth of crop, prevailing climatic conditions, etc.	Demonstration	CCFO Rating Scale	85% competence in all areas		
Specific Outcome 2: Ensure the efficient operation of irrigation systems <i>Range:</i> Includes but is not limited to checking the functioning of pumps and motors, valves, timers, filters, sprinklers, etc.	Demonstration	CCFO Rating Scale	85% competence in all areas		
Specific Outcome 3: Collect and record data in an agricultural field <i>Range:</i> Includes but is not limited to soil moisture recorders (tensiometers, evaporation pans, neutron probes, manual determination of soil moisture, etc.), climatic data (manual/automatic weather stations), water application, fertigation, stage of crop growth, etc.	Demonstration	CCFO Rating Scale	85% competence in all areas		

Assessor Report and Formative and Summative Evidence Collection Summary for Unit Standard 116266 – Level 3

<i>Description</i>	<i>Evidence Gathered</i>		<i>Benchmark</i>	<i>Competent / Not yet Competent</i>	<i>Feedback and Comments</i>
	Foundational and Embedded Knowledge	Practical Skills, Underpinning Knowledge and Reflexive Competence			
<i>Specific Outcome 4: Prepare maintenance programs for irrigation systems</i> <i>Range:</i> Includes but is not limited to daily, weekly and seasonal maintenance, preventative maintenance, unforeseen maintenance, etc.	Demonstration	CCFO Rating Scale	85% competence in all areas		
<i>Specific Outcome 5: Supervise irrigation activities</i> <i>Range:</i> Includes but is not limited to implementing Irrigation Manager's instructions, supervising junior workers, adapting/modifying in-field operations as and when required, preparing daily work programs for staff, etc.					

Assessor Report and Formative and Summative Evidence Collection Summary for Unit Standard 116266 – Level 3

<i>Description</i>	<i>Evidence Gathered</i>		<i>Benchmark</i>	<i>Competent / Not yet Competent</i>	<i>Feedback and Comments</i>
	Foundational and Embedded Knowledge	Practical Skills, Underpinning Knowledge and Reflexive Competence			
<i>Embedded Knowledge:</i> The learner is able to demonstrate basic knowledge of: 1. Occupational Health and Safety Act. 2. Regulations pertaining to water/irrigation utilization. 3. Names and functions of all tools and equipment used during irrigation. 4. Names and functions of Irrigation systems and components used in a particular crop.			Overall minimum test score of 85%		
<i>Unit Standard CCFOs:</i> • Identifying • Working in a Team • Organising • Communication • Demonstrating • Contributing • Science • Collecting	N/a	Rating Scale	Minimum rating of 3:5 in each criteria or overall average of 3:5		

Assessor's Assessment Review and Improvement Document	
Issues	Comments
Did the assessment go according to plan?	
Did anything unexpected happen?	
Were you pleased with the assessment decision; i.e. was it what you expected?	
How could the process have been carried out more efficiently?	
How could the process of assessing the knowledge be improved?	
How could the Performance Observation checklist be improved?	
Was the evidence you gathered sufficient to make a judgment of competence?	
Was the way you obtained feedback from the learner effective?	
Were you pleased with the way you communicated your decision to the learner? If not, how could this have been improved?	
How would you improve the assessment process?	

Any learner has the right of appeal against any not-yet-competent decision by the assessor. If the learner wishes to appeal, please assist him / her to complete the form below.

Appeal Form			
I hereby appeal against the outcome of my assessment.			
Date:			
Learner's Name:			
Assessors Name:			
Organisation:			
Assessment Details: Criteria, role, standards Used, etc.			
Issue to be Reviewed:			
Learner's Signature		Date:	
Assessor's Signature		Date:	

Step 10

Administration and Completion of Portfolio of Evidence

All the documents or copies thereof, as prescribed previously, must be kept on file as part of the learner portfolio of evidence.

Learner's portfolio of evidence must be readily available for internal and external moderation and verification by the appropriate practitioners, until after the verification process has taken place. The portfolio of evidence may then be kept or returned to the learner according to the service provider's policy.

The prescribed learner results form should be submitted to the ETQA or the National Learner Database as per the SETA procedure.

