Community Water Planner Field Guide

Final Report
for the
National Water Commission

Robyn Grey-Gardner
August 2009

Acknowledgements

This report has been created by The Centre for Appropriate Technology on behalf of Water Quality Research Australia. This document was the final report for the National Water Commission's "Guidance and Best Practice Documentation Project. The aim of the project was to develop materials to help people manage water supplies in rural and remote Indigenous communities of Australia. Guided by a steering committee, it was developed by a working group representing all levels of government. The Desert Knowledge Cooperative Research Centre contributed in-kind expertise.

The National Water Commission http://www.nwc.gov.au
The Commission, which was created to drive the national water reform agenda, is an independent statutory authority within the federal Environment, Water, Heritage and the Arts portfolio. The Commission provides advice to the Council of Australian Governments (COAG) and the Australian Government on national water issues.

Water Quality Research Australia Limited (WQRA) http://www.wqra.com.au
WQRA is a national organisation that coordinates and manages high quality, collaborative research on water issues related to public health and aspects of water supply, water recycling and wastewater management.

The Centre for Appropriate Technology (CAT) http://www.icat.org.au
CAT works to secure sustainable livelihoods for communities of Indigenous people through appropriate technology**.**

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Executive Summary

Providing safe and reliable drinking water to Indigenous communities in remote and rural has just become easier.

The Community Water Planner field guide is an information package designed specifically for water management planning in Australian Indigenous communities. The information in the package is generic and when combined with the right facilitation, is suitable for Indigenous communities of any size in any location in Australia, with a functioning water supply system.

The field guide comprises of an instruction booklet and a series of posters and activity / worksheets to direct a water planning program. The principles within the field guide are consistent with the Australian Drinking Water Guidelines and apply the risk management approach to water supplies outlined in the Framework for the Management of Drinking Water Quality.

The field guide was extensively trialed throughout its development. Water management is a serious task that requires an understanding of infrastructure, the hazards that can affect a water supply and the potential risks to public health. The trial process highlighted the need for a facilitator to introduce Indigenous people to the main concepts of water risk management and apply the principles in a practical manner using workshops, hands-on training and capacity building activities.

Recommendations

The package has been developed for water utility service providers, health agencies, natural resource managers and Indigenous community support and resource agencies. The following recommendations are designed to secure uptake of the product. An effective adoption strategy that includes each of these agencies must be delivered for the package to be implemented.

1. Implement an effective adoption strategy that includes:
    - Develop a capacity building workshop plan that includes lecture materials and notes to teach potential facilitators in service delivery agencies and health department how to use the field guide
    - Delivery of skill development workshops (using the workshop plan above) in capital cities for the staff in service providers and health agencies to learn about the field guide and how to use it
    - Delivery of skill development workshops (using the workshop plan above) in remote Indigenous community regions for community representatives, service delivery staff, health agencies and natural resource managers. Key locations include the Kimberley, Cape York and Arnhem Land, Pilbara and Western Desert.

2. The effectiveness of the field guide can only be assessed with an evaluation, monitoring and on-going support. It is necessary to establish how many community water supplies have been improved due to use of the package. Design an evaluation process that measures:

    - The number of packages distributed and the location of distribution
    - The agencies that have used the package
    - The location and communities where package has been used
    - Identification of any strengths and weaknesses of the package
    - Identification of any material that requires updating
    - The number and type of materials used

Key Messages

The Community Water Planner field guide supplements the Community Water Planner (CWP) and should be used in conjunction with a CWP-generated plan. The product is generic however one size does not fit all. The field guide is adaptable and can be used in a flexible way to ensure that it suits the needs of Indigenous communities.

The field guide requires a facilitator to assist Indigenous communities to go through the planning and management process. The facilitators will require basic knowledge of water supplies (including the ability to generate a CWP plan) and be able to communicate effectively with Indigenous people.

It is anticipated that this version of the field guide should be relevant for five years. It is anticipated that after five years, the governance arrangements described in the field guide may have changed significantly and may require updating. The water supply poster series is expected to remain relevant and has been printed on water resistant and tear proof paper to ensure that they last.

A multi-stakeholder approach is required for a variety of reasons. It is unlikely that there will be many facilitators who have the combination of skills required to effectively facilitate the package. There are overlapping responsibilities and organisations that are involved and depending on the roles and responsibilities/regulations and water quality/infrastructure problems it will require communication and cooperation to attend to management effectively.

Introduction

Research conducted on remote communities has found that few small communities have a water management plan and that the knowledge and understanding of water risk management principles and the CWP are generally poor. However, the greatest gains that can be made in improving water supplies in remote communities are through management.
There are 1187 discrete Indigenous communities and it is anticipated that the field guide will be used in these communities by the following agencies:

- Water utilities
- NRM agencies
- Resource agencies
- NGOs
- Aboriginal Corporations

The field guide is designed to be used on location at Indigenous communities. The process underpinning the field guide utilizes the community strengths through identifying their knowledge of the water supply and builds on this to develop a transformative process that includes understanding the risks to the water supply, management and infrastructure requirements and the overarching roles and responsibilities.

The Trial Process

Four Indigenous communities were selected to trial the field guide:

- Malabugilmah in New South Wales
- Buru in Queensland
- Yuelamu in the northern Territory
- Mandangala in Western Australia.

Figure 1 Location map of the trial sites

The community selection was based on the following criteria:

- a population between 20 and 200 people
- inclusion of examples of surface and groundwater supplies
- Community agreement to participate
- State government/institutional support.

To ensure the intended messages in the posters were not misinterpreted by the user group, pre-testing and continuous improvement of the products were carried out before the final design was confirmed. A methodology was designed with the aim to test the effectiveness of the field guide material in communicating water operation and management messages with a survey.

Thirty two community residents were surveyed during the trial. Trial site survey data are provided in Table 1. In most cases, more residents were involved in the trial process but did not undertake the formal survey. The survey process was designed to start with the people with the most water knowledge and then proceed to meet and test the products with a wider group of residents over time. The methodology was designed to capture the following groups in the survey:

- residents who have an interest, initiative or responsibility for the water supply
- visitors and people external to the resident community (transient populations)
- different social groups within the community (elders, women, transient people, young people)

A broad participation of community residents needed to be included in testing the materials so that during times of shock the resources are available to whoever is present.

"Lots of people should know those numbers of who to call".

Comment on Emergency Poster from resident at Mandangala

Table 1 Trial site survey information

Name of Community	State	Approx Population	Source of Water supply	Service provider	Total surveys completed
Buru (China Camp)	Qld	20	Surface water (river)	None	8
Malabugilmah	SA	40	Surface water (river) and rainwater	Clarence Valley Council	16
Mandangala (Glen Hill)	WA	60	Groundwater	Kimberley Regional Service Providers	13
Yuelamu (Mt Allen)	NT	250	Surface water (dam), groundwater and carted water	Power & Water	10

The methodology allowed for progressive learning using a staged approach to trial the field guide throughout all stages of development. Using this process, the main concepts were scoped using input from the working group, worked up into 'products' and tested in the trial sites. This process allowed prototypes to be tested, improved and re-tested. The final design of the field guide and posters were finalized only at the last stage of consultation. Feedback from community participants shaped the context of the package – the predominantly pictorial style and simple language with a limited number of technical references. Boxes 1 and 2 describe some feedback from the trials which were incorporated onto the final product.

The main challenge was the preparation of analogue material that could be adaptable to a range of Indigenous community settings. The generic feature of the field guide proved to be challenging. There are many engineering and planning terms that are not consistent around the country for example. In addition, the environment changes dramatically and Indigenous people differ between regions. It was difficult to incorporate local contexts and differences within a simple package. During the trial there was much feedback from participants on how to make the products locally-specific.

Box 1 Survey responses – what worked?

"*What bits [of the package components] would local people understand?"*

Most Indigenous residents responded that the pictures are the easiest for Indigenous people to understand. In particular, the simplicity and relevance made the package easy to understand.

Selected responses:

- *"Simple and we can understand it; it gets to the point without all the extra detail."*
- *"Not all just words, has pictures so people will be able to understand by looking."*
- *"The pictures with three quarters are good"* [referring to pictures showing volumes needed to chlorinate a tank]
- *"People that can read English can understand"*

Box 2 Survey responses - What could be improved?'

"What bits wouldn't local people understand?"

Indigenous residents in the trial sites suggested that the language was too technical, and that that numerical quantities would cause confusion, (1000L vs. 1000mL etc).
Some respondents confirmed that a verbal explanation of the concepts would bridge the difficulties.

Selected responses:

- "*The specialised writing bits. Just words are hard to read"*
- *"Need to have people explain it can't just understand it on its own"*
- *"The maths. People will think that 1000 Litres is a real lot and that 200 ml is even more"*
- *"Language is too technical. People don't know about measurements."*
- *"The laws"*
- *"Old people [here] can't read English"*

The field guide trial process also tested different styles of engagement and service delivery arrangements. Facilitators had different levels of experience in community engagement and different levels of knowledge of water systems, management and water quality. It became clear from the trial sites that there are core competencies that a facilitator will need to possess to be able to communicate, identify the most appropriate management plan and draw on support agencies as required. Service providers were unable to engage beyond their own scope of works. Clearly a range of stakeholders will need to be involved in the project if a holistic approach to water supply management using the field guide can be adopted.

"Everyone on the sheet needs to know all of it. Not just the community residents but all of the service providers too. That way we can share information and make sure it works"
Resident at Malabugilmah

The facilitator must have the following skills to be able to use the field guide effectively.

1. Knowledge of water supply infrastructure components
2. Knowledge of water supply management and risk assessment processes
3. Knowledge of water quality and quantity issues
4. Knowledge of the Framework for the Management of Drinking Water Quality in the Australian Drinking Water Guidelines and the Community Water Planner
5. Knowledge of stakeholders' roles and responsibilities
6. Facilitation skills – able to run a meeting with Aboriginal people in recognition of local and gendered roles and responsibilities.
7. Ability to conceptualise within a social and economic development context
8. Participatory planning experience in a complex service environment

Field Guide Elements

The field guide consists of a series of full colour posters with an instruction booklet (or facilitator's guide), that is housed in a durable cylinder. The product is easy to handle and ship and weighs less than one kilogram. The product will be:

- Available in hard copy
- Available as download from the WQRA website

The field guide has been developed for Indigenous communities that have a small or relatively low technology water system. It is anticipated that many of the communities will have a service provider. In this example the products relate the types of activities and decisions/responsibilities that are relevant to the people on site – such as an essential services officer or residents.

The principles of the risk management framework are embedded throughout the field guide to enhance the applicability of the Community Water Planner (NHMRC 2005). The products use demonstrative elements to identify the common hazards to drinking water quality (both health and aesthetic), water quantity and supply continuity using practical sessions with participants. Risk mitigation strategies via infrastructure, products and/or procedures are outlined in the poster series. The service structures specific to New South Wales, Northern Territory, South Australia, Western Australia and Queensland are provided. These jurisdictions were selected based on the advice from the steering committee and direct the resources to the regions with the greatest number of discrete Indigenous communities.

Standard design, installation and operating instructions have been developed within a poster series that includes installation and design principles for basic water supply infrastructure and common risk mitigation strategies.

The field guide consists of four steps:

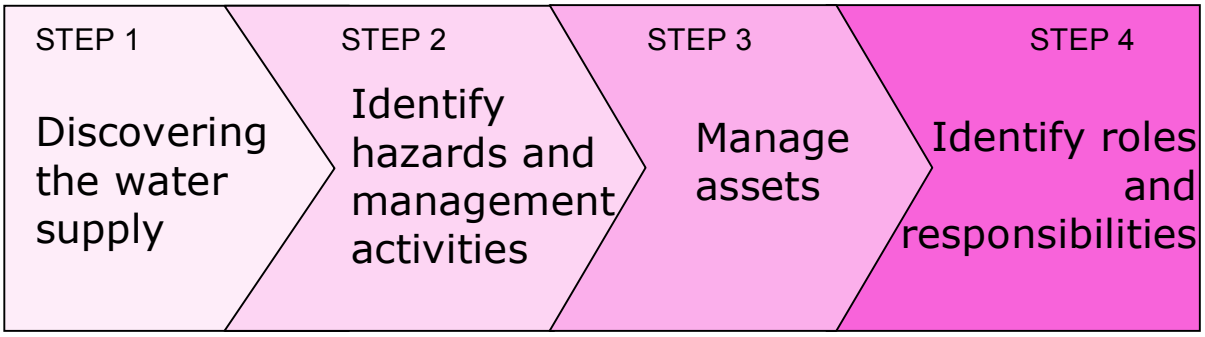
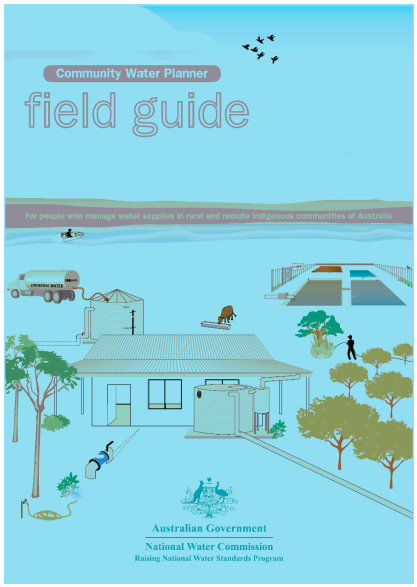


Figure 2 4 Step process for water management planning

The products are designed to be used in sequence. The beginning of the process is to create a map of the water supply. This activity engages the audience since it starts with the familiar and draws on the participants' knowledge to initiate the water management planning process and build knowledge and understanding. The four steps continue to build the knowledge of the components of the water supply and management requirements using hands-on activities to build skills and surveillance capacity. The step-by-step process is clearly described in the instruction booklet. Inside the booklet are plans for each management planning step with tips and a troubleshooting guide for general water quality issues.

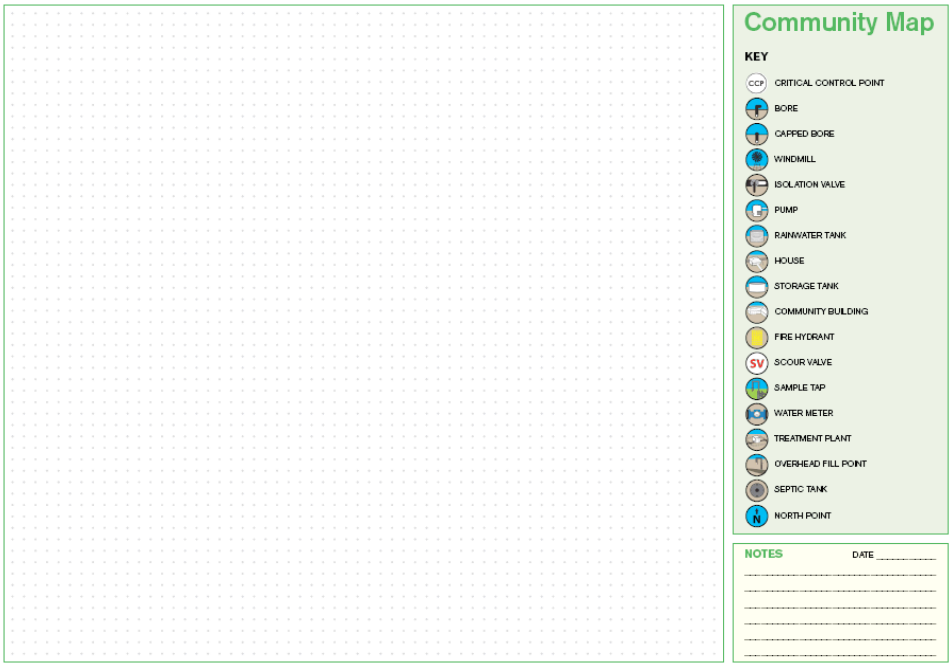
INSTRUCTION BOOKLET

Instruction booklet with troubleshooting guide



STEP 1

Community Map Activity Sheet
This Sheet is the template to map the water supply and share information. It is an A1 size worksheet with two pages of stickers with key icons for water supply features and parts.



STEP 2

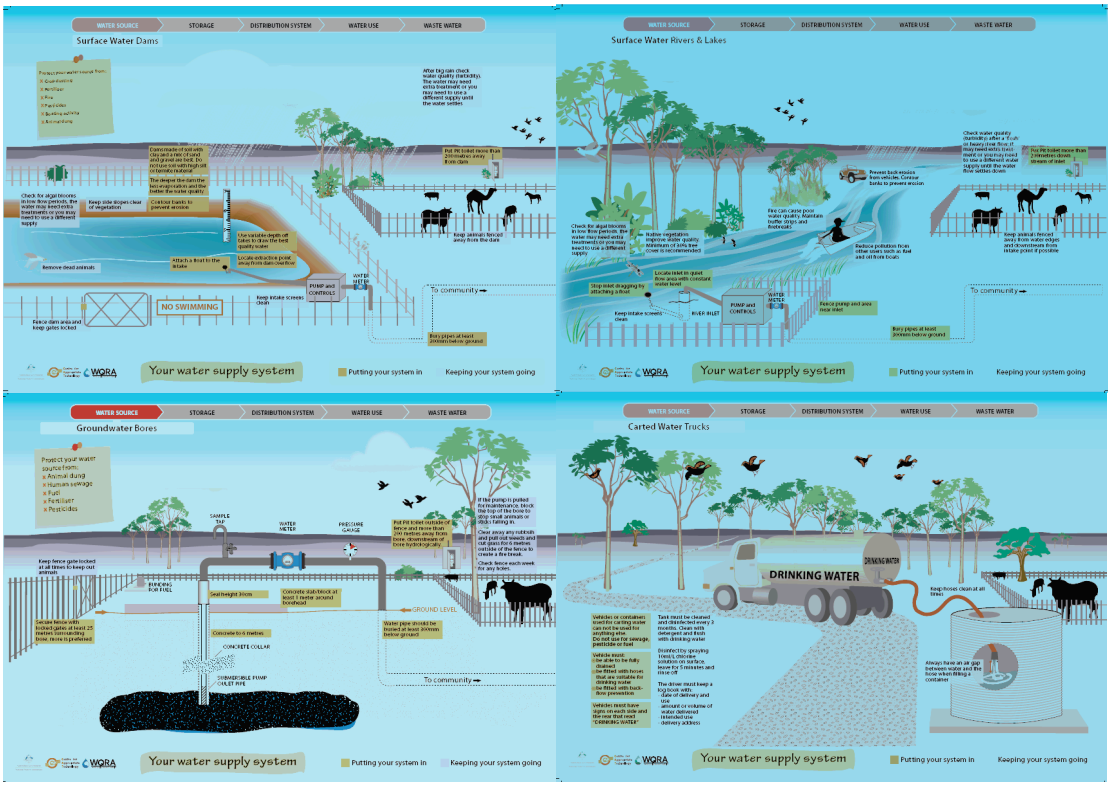
Water Supply Posters with the top tips for risk management and installation requirements. These posters will have each part of the water supply described so that the user can pick the posters that suit their system and fit them together in a frieze:

- Water source: carted, river, dam and bore water
- Storage tanks: header tanks and ground storage tanks
- Distribution system: pipes
- Water use: household water and rain water tanks and volume of water uses
- Waste water: evaporation ponds and septic systems

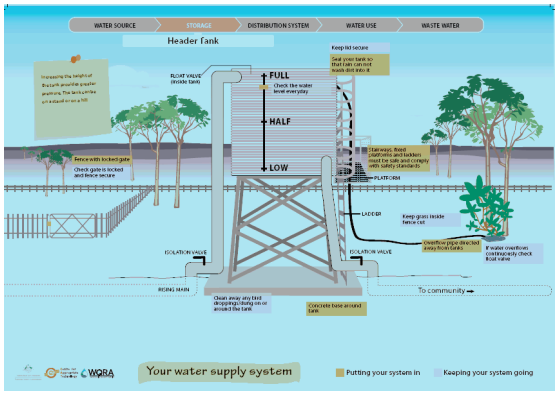
Additional Posters:

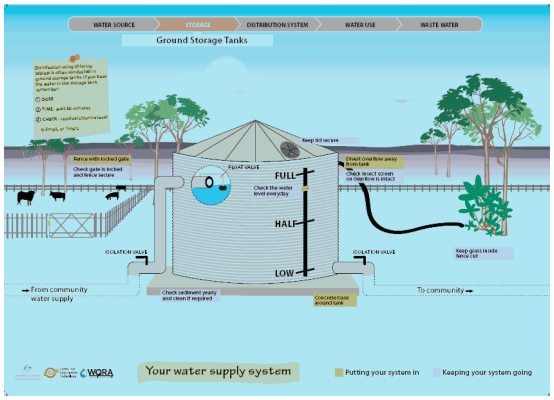
- Hydrological cycle
- Water quality

WATER SOURCE POSTERS

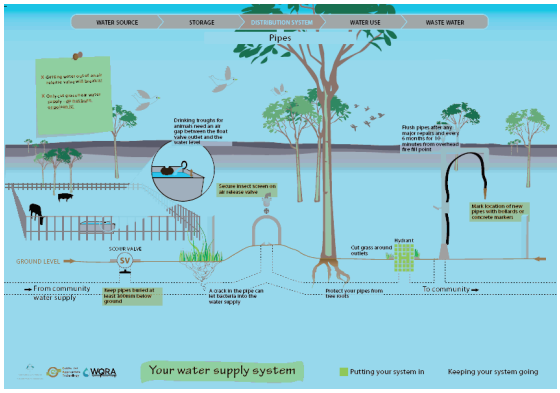


STORAGE POSTERS

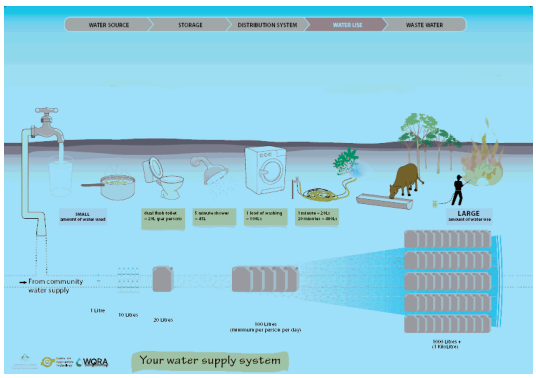


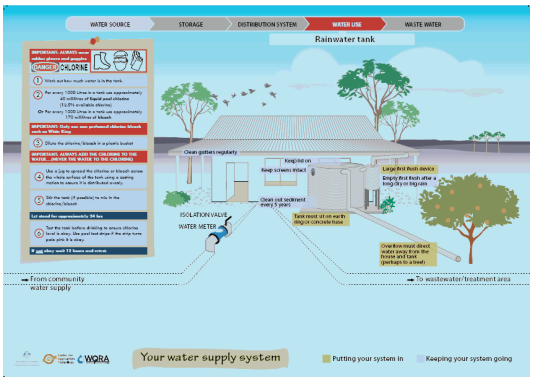


PIPES

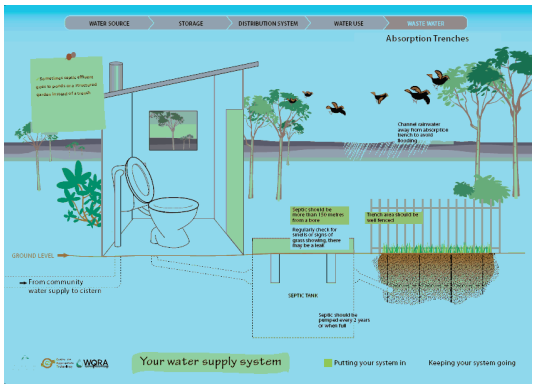


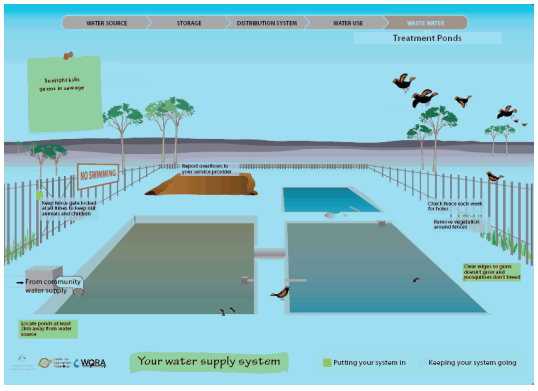
WATER USE



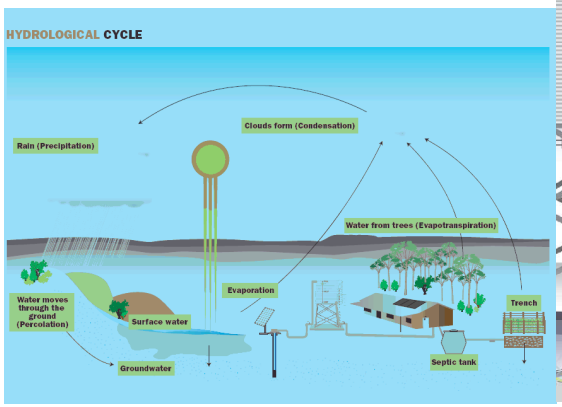


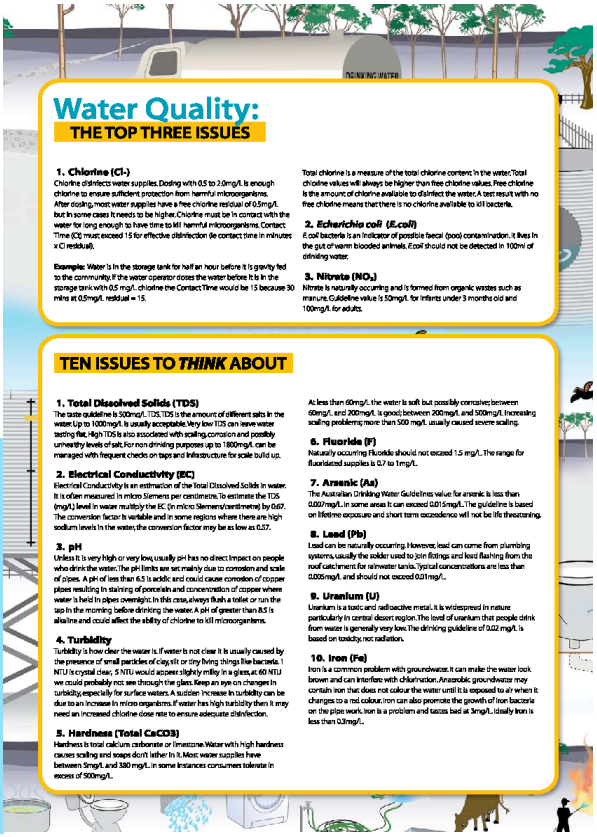
WASTE WATER





HYDROLOGICAL CYCLE AND WATER QUALITY

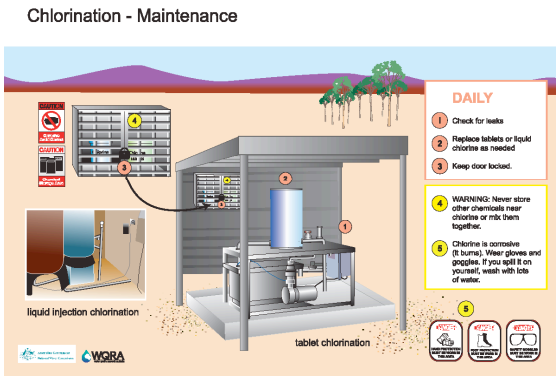


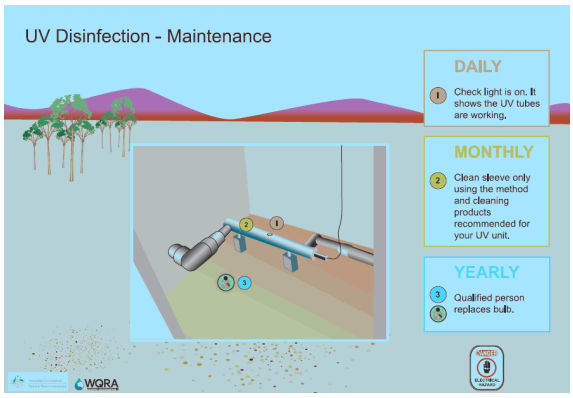


STEP 3

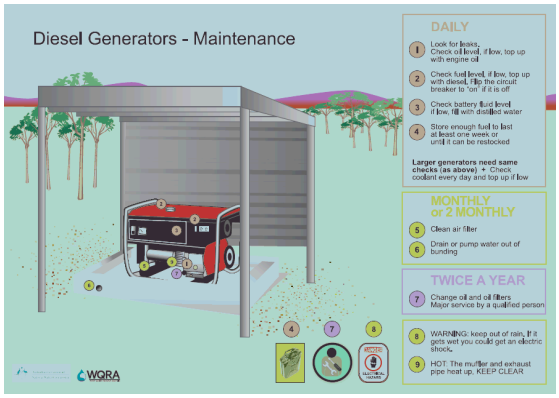
Asset Management posters contain the core maintenance tasks for electrical and mechanical equipment. Asset management activity chart contains a timeline to outline asset age and prioritise replacement.

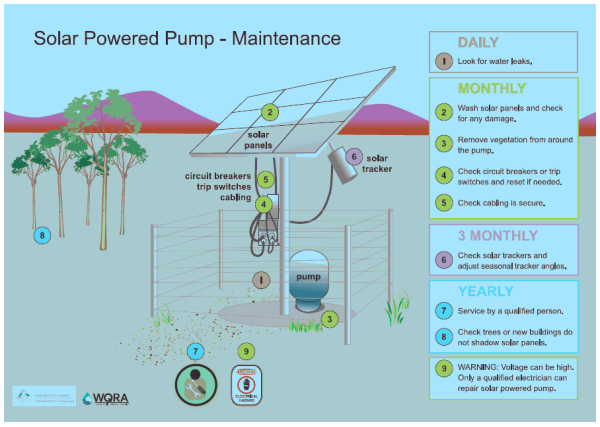
CHLORINATION AND UV DISINFECTION



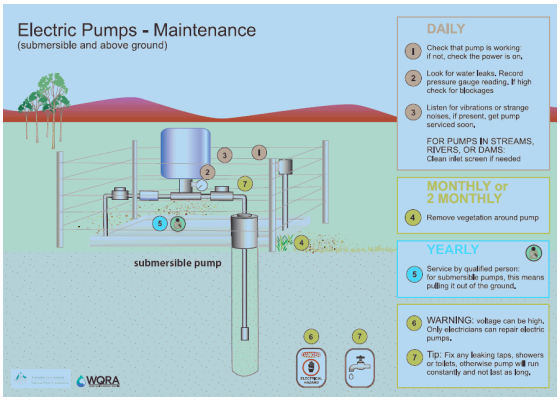


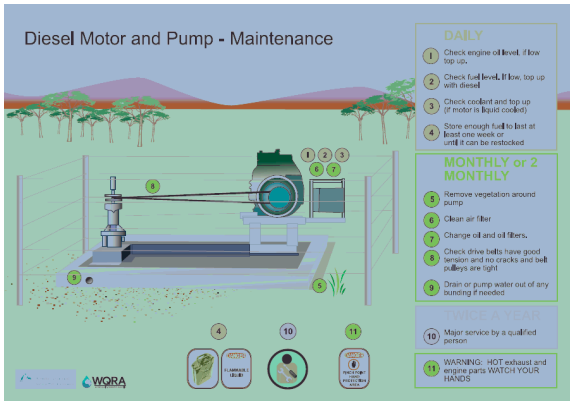
POWER GENERATORS





PUMPS





ASSET MANAGEMENT PLANNING

ASSET MANAGEMENT TABLE

Asset	Years	Asset	Years	Asset	Years	Asset	Years	Asset	Years
Absorption trenches	10-20	Chlorination equipment	10-15	Meters	15	Septic tank	20-30	Taps	1-2
Backflow prevention devices	35-40	Float valves	5-10	Poly pipes	10-15	Solar panels	15-20	UV Disinfection	10-15
Bore casing	25	Generators	5	Pressure pump	5-7	Storage tank poly/ fibreglass/concrete	35-40	Valves	35-40
Bore pump	10-15	Isolation valves	15	Rainwater tanks galvanised iron/poly	35-40	Tank stand	50	Windmill	20-25

Asset	Quantity	Date fitted	Working life (in years)	Expected replacement date	Approximate cost	Other Information

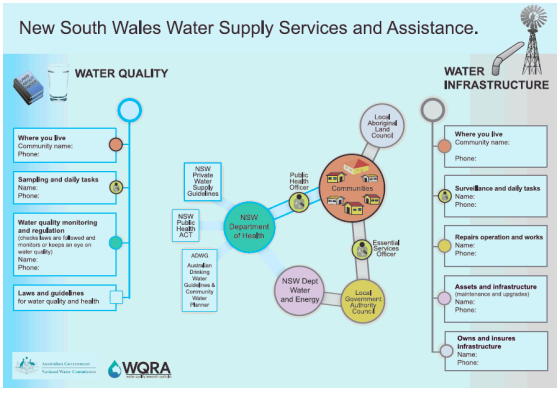
ASSET MANAGEMENT TIMELINE

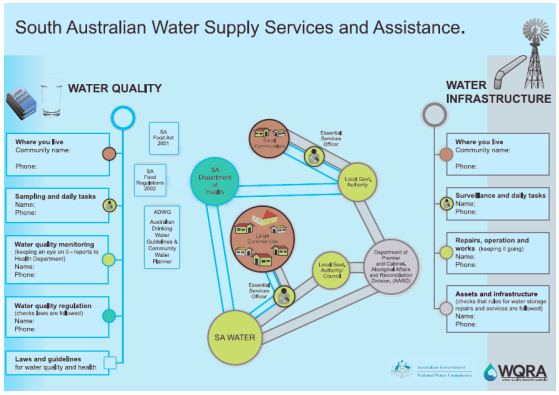
2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025

STEP 4

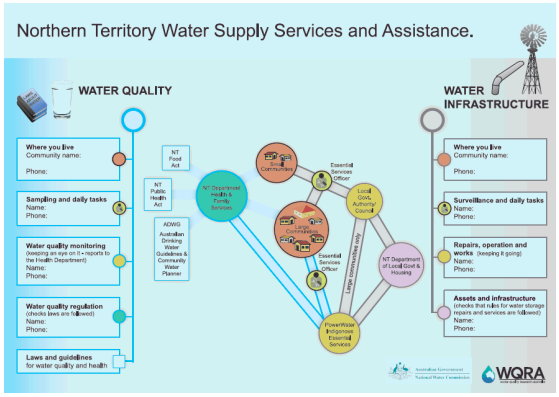
Activity charts for each State and Territory that outline responsibilities for supply and service of water quality and infrastructure. The overarching legal requirements for supplying water are included.

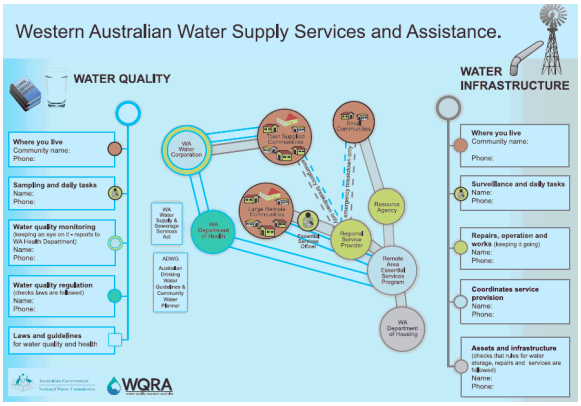
NEW SOUTH WALES and SOUTH AUSTRALIA



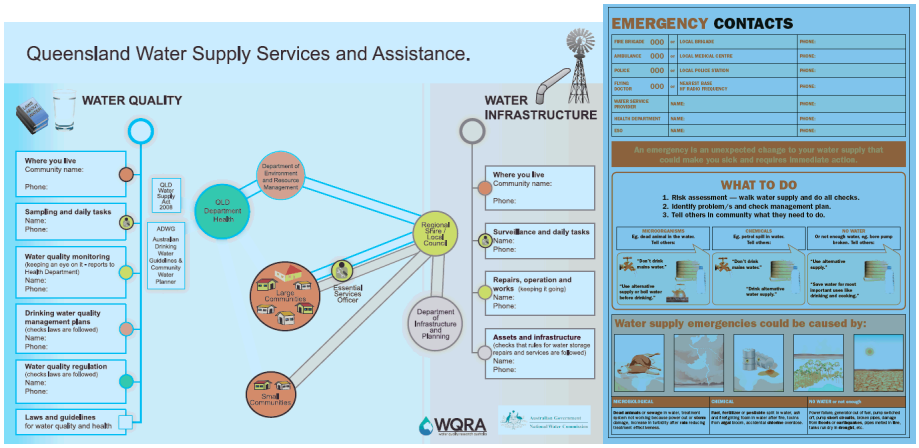


NORTHEN TERRITORY and WESTERN AUSTRALIA





QUEENSLAND and EMERGENCY CHART



The field guide endorses a process that requires direct engagement with Indigenous community residents combined with provision of information that can be used in a variety of settings and forums. The booklet outlines workshop activities, the anticipated time expected to carry out each activity and the expected outcomes. The process starts with building a schematic of the water supply to create a base from which to build the process. The second stage identifies problems of the water supply and activities to rectify the problems. The third stage consists of planning an asset management and maintenance strategy. The fourth stage concludes the program with understanding broader institutional roles and the allocation and delineation of water management responsibilities.

The information posters can separate into charts that can be used to facilitate knowledge sharing for workshops or forums, to hang as information at key locations around the community or as a compilation to create a manual or wall frieze. Information or poster sheets for example, can be laminated and distributed to targeted populations for particular circumstances (such as instructions for emergency water chlorination procedures). This structure is flexible and adaptable for the broad range of community contexts.

"I would definitely put this up in our community. I didn't know that a dead cow made the water no good to drink and water pipe depth is good to know. Things at our camp might be wrong and we can get ideas from this".

Resident at Buru

The Community Water Planner field guide has been designed specifically to address the transfer of knowledge for water management planning in remote Indigenous communities. It is appropriate information and guidance material for water management plans to be developed and implemented at the local level. It is anticipated that appropriate utilization of the field guide will address a large gap in remote water supply management and contribute to the improvement of health and livelihood outcomes for Indigenous people.