Indigenous Essential Services Pty Ltd

Annual Report

2013

Power and Water Corporation

Power and Water Organisational Structure

LEADERSHIP TEAM

Remote Operations core areas

Remote Operations	Water Operations	Electrical Operations	Mechanical Operations	Planning and Development	Retail Services	Regional Operations
Darryl Day *General Manager* *Oversees electricity, water and sewerage services*	**Peter Poole** *Manager* *Supply of water and wastewater services*	**Stephen Benaim** *Manager* *Transmission and distribution of electricity to customers*	**Dennis Ryan** *Manager* *Generation of electricity to meet the needs of customers*	**Elise Vervetjes** *Group Manager* *Oversees service and infrastructure planning*	**Tammy Falconer** *Manager* *Manage retail services and contract management*	**Lee Morgan** *Manager* *Southern region services operations*

Remote Operations support areas

Fuel Supply and Asset Performance	Energy Strategy and SCADA	Water Quality & Treatment	Sustainable Water and Energy	Program Administration	Program Delivery	Land Development	Workforce/ Health & Safety
Scott Wheeler *Fuel supply and asset performance and regulatory reporting*	**Megan Jolley** *Energy planning, SCADA and communications*	**Amy Dysart** *Water and wastewater treatment planning and regulatory reporting*	**Nerida Beard** *Water resource management and water and energy efficiency programs*	**Linda Broomhall** Financial and contract management	**Duncan Griffin** *Program planning and delivery*	**Lindsay Smith** *Infrastructure development connections and GIS*	**Jon Harris** **Mick Cartwright** *Workforce planning, health safety and the environment*

Power and Water Corporation support
Specialised business management systems, retail services, system control, utilisation of operational facilities,

CONTENTS

INTRODUCTION

As a not-for-profit business, IES provides safe, reliable and efficient water, sewerage and electricity services to over 36 000 people living in remote Indigenous communities in the NT

MANAGING DIRECTOR'S REPORT

Indigenous Essential Services Pty Ltd (IES) is a not for profit subsidiary of Power and Water Corporation (PWC) with the challenging task of delivering quality utility services to remote Indigenous communities across the Northern Territory (NT). The services are charged at the NT standard Uniform Tariff to over 36 000 people in remote locations, which equates to over 16 per cent of the total population of the Northern Territory.

IES operations are funded from $35m collected in revenue from the sale of electricity, water and sewerage services and a grant of $55 million from the Northern Territory Government through a purchaser-provider agreement with the Department of Regional Development and Woman's Policy.

Safe, reliable and efficient electricity and drinking water underpin the Australian Government's and NT Government's commitments to improve the life and wellbeing of Indigenous people. They are essential to support the national challenge of Closing the Gap on Indigenous disadvantage, community wellbeing, social and economic outcomes.

IES delivers reliable utility services at a level highly regarded by our customers, which can be seen in its customer satisfaction ratings (7.9 out of 10). During 2012-13, IES delivered an extensive capital program to the value of $46 million. These achievements reflect our strong leadership, innovative and cost effective solutions, and dedication, commitment and professionalism of our staff and contractors.

The IES integrated utility delivery model allows for the efficient planning and operations for power generation, power networks and water services. We have a strong focus on long term whole-life costs and prudent and efficient services delivery. To balance the growing demand for services in remote areas with limited access and increased costs of diesel, we have advanced our management capability. This includes the implementation of improved asset management principles, geospatial information systems, further introduction of technology and remote control and monitoring systems. We are reducing the reliance of diesel as the main energy source and have commissioned three new high penetration solar power stations in partnership with a private operator. This is a major achievement and a significant part of our future strategic direction.

The investment in water treatment technologies has resulted in continuous disinfection of the water systems, which ensures the water is safe to drink. The sustainability of groundwater resources continues to be a concern with limitations on the natural resource in many communities. IES has invested in technology to evaluate and monitor groundwater sources and better understand them, along with any constraints.

PWC has worked with local communities since 1987 helping to build capacity in local communities. This year through its contracts, IES engaged over 150 Essential Service Operators who work in remote communities. Of these 40 per cent are Indigenous. These leadership roles are important in the communities and IES has invested heavily in the development and training of ESO's to ensure that they continue to deliver utility services in the future.

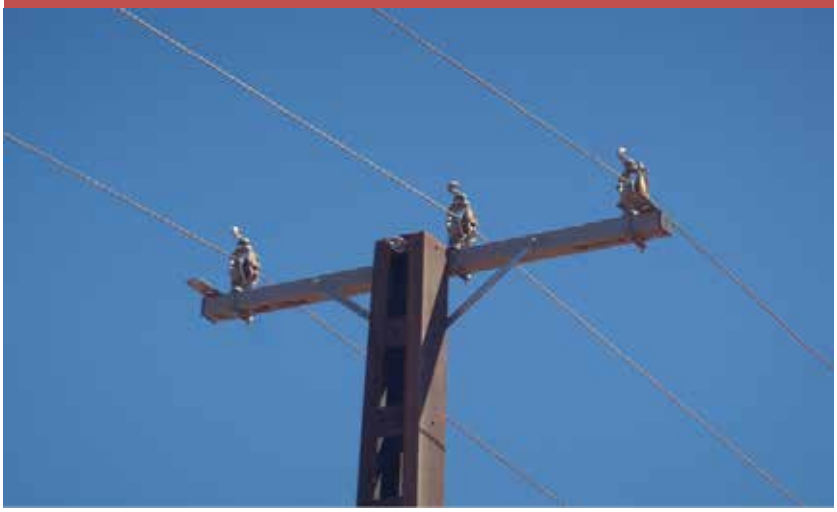
Every day IES meets the challenges of providing services to relatively small communities sparsely located throughout remote areas of the Northern Territory. The costs to provide these services are much higher than the revenue collected. PWC and IES have a strong focus on reducing the water demand through water and energy efficiency programs. This year, IES secured funding from the Australian Government for an energy efficiency program in defined communities in East Arnhem Land, which will inform the development of a best-practice model for achieving improved energy efficiency in low-income families in remote Indigenous communities.

I would like to take this opportunity to recognise the strong leadership, innovative approaches and ongoing commitment to deliver efficient services in an often extremely challenging environment. I thank all staff and contractors involved for their commitment, professionalism and dedication to the delivery of utility services in remote communities and improving their well-being and economic prospects.

HIGHLIGHTS OF 2012-13

- Commissioning of three solar systems at Ti Tree, Kalkarindji and Alpurrurulam (Lake Nash) in conjunction with a private operator that produce a total of almost one megawatt (MW) of solar power.
- Maintained efficient and reliable water and electricity services, valued by our customers as demonstrated by the high level customer satisfaction score of almost eight out of ten.
- Secured Australian Government funding for a Low Income Energy Efficiency program for households in defined communities in East Arnhem land and the establishment of a strong consortium to deliver it.
- 90 000 water quality tests to verify the quality of the water is safe for residents to drink.
- Improved sewerage services at Gunbalanya through the upgrade of the sewage pump station.
- Advanced water treatment plants constructed to improve water quality in three southern region communities, being Ali Curung, Kintore and Yuelamu.
- Commenced construction of the Hermannsburg power line connection from Alice Springs.
- Provided secured water supply on Groote Eylandt through the development of additional bores and construction of new water storages.
- Continued working with communities to reduce demand and ensure the sustainable delivery of services.
- Improved the ability to remotely monitor and control essential infrastructure in remote communities.

Maintained high level of customer satisfaction with a rating of 7.9 out of 10



OUTLOOK FOR 2013-14

To ensure prudent and efficient delivery of service, IES will continue to deliver operational improvements while robustly managing its financial challenges. The focus over 2013-14 includes:

Delivering safe, reliable and efficient services – Complete a strong focus on effective operation and maintenance of assets in-line with asset management principles to ensure assets meet functional requirements and deliver specified levels of service.

Managing ageing water and wastewater infrastructure – A large component of our assets has reached the end of their economic and technical life. Significant investment is required to replace the aging infrastructure and work will continue to explore opportunities for funding and partnerships**.**

Energy and water efficiency – Through strengthened water and energy efficiency programs with an emphasis on education and community engagement with local stakeholders to help reduce the cost of service delivery.

Energy source planning – The growing cost of diesel fuel means it is essential to replace it as a primary source of power generation. This will aid in minimising long-term service delivery costs and meeting community demand growth in an economic and environmentally sustainable manner. Economic and technical assessment of renewable energy options such as solar will be determined by factors including remoteness and funding options.

Workforce capability – Further developing our people by focusing on asset management capabilities and maintaining services on the ground through a sound careers pathway framework.

Financial sustainability – Using the asset management system to accurately record costs of services by location and allow for greater integration of asset performance and data. As IES works in an outsourced environment, a strong focus on optimising contracted goods and services will establish improved delivery for competitive rates. Two of the largest contracts will be retendered in 2013-14.

OUR BUSINESS

Power and Water Corporation has been providing electricity, water and sewerage services to customers across the Northern Territory since 1987. Indigenous Essential Services Pty Ltd (IES) is a not-for-profit subsidiary of the Corporation formed to provide electricity, water and sewerage services to 20 Major Remote Towns and 52 remote communities and 57 Outstations. The Northern Territory Government primarily funds the delivery of essential services through appropriation from the Department of Regional Development and Women's Policy. All revenue collected and other funding sources are invested in services.

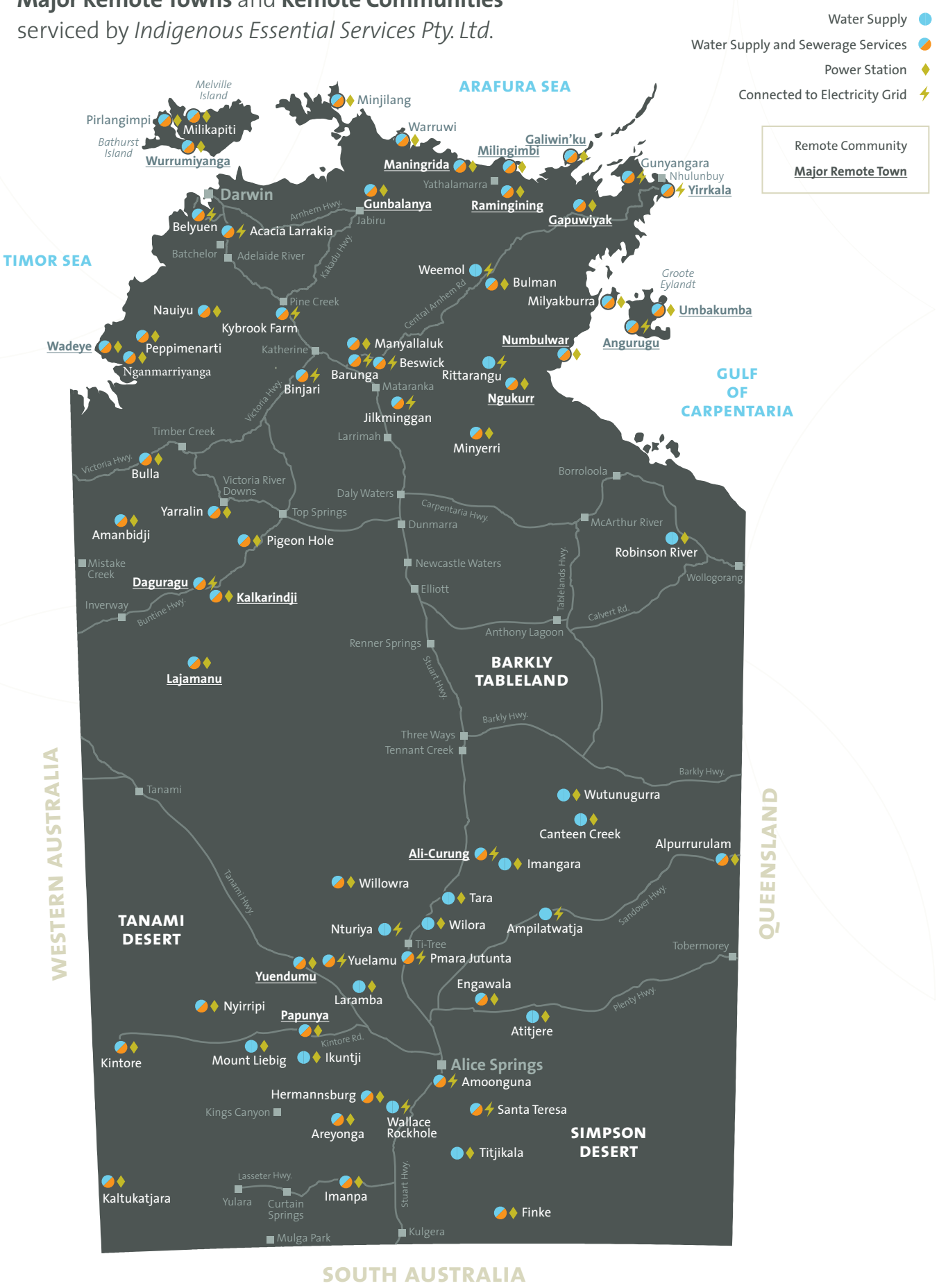
Remote Operations' professional, technical and administration staff work across the organisational matrix of operational, planning and project delivery from our regional bases in Darwin, Katherine, Tennant Creek and Alice Springs. Our team provides a comprehensive range of skills and understanding of water and energy, and implements various government reforms. These include renewable energy, water and energy conservation and supports local Indigenous employment and economic development.

The unique combination of an integrated utility structure with years of experience in the Northern Territory enables Power and Water to provide cost-effective and equitable essential services. This is optimised through:

- integration of electricity, water and sewerage services to maximise cost efficiencies
- planning and coordination of routine maintenance, asset replacement and capital investment
- increasingly using effective remote monitoring and control of infrastructure
- full use of our professional and technical skills with operational delivery and planning, thus reducing the need for expensive consultancies and
- engagement of local Essential Services Operators in communities, who are on the ground to respond quickly and effectively

The ability to maintain 'value for money' is particularly challenging. The majority of the communities serviced are relatively small, sparsely located and experience a vast array of climatic conditions from the cyclone and storm-prone tropics of the north to the deserts of Central Australia.

Major Remote Towns and **Remote Communities**
serviced by *Indigenous Essential Services Pty. Ltd.*



The following provides an overview of the utility services for each of the Major Remote Towns and remote communities serviced by IES Pty Ltd.

Additional information below

(533) POPULATION | CONNECTED TO ELECTRICITY GRID | DIESEL POWER STATION | SOLAR-DIESEL HYBRID POWER STATION

Remote Community

Major Remote Town

NORTHERN REGION

Acacia Larrakeyia (92) 0.2 GWh
- Plentiful groundwater source available
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Water township demand of 23 ML/yr
- 7 ML/yr sewage treated, secondary treatment, seasonally discharges to the environment

Angurugu (972) 4.3 GWh
- Plentiful groundwater source, which is continuously monitored and extraction licence is pending. Also a plentiful surface water source available, which is licensed
- Good quality water, treated with soda ash, disinfected with gas chlorine and monitored weekly for microbes
- Township water demand of 387 ML/yr
- 152 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Belyuen (181) 0.7 GWh
- Plentiful groundwater source available, which is continuously monitoring and extraction licensed
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 94 ML/yr
- 28 ML/yr sewage treated, secondary treatment, discharges to the environment

Galiwinku (2,471) 6.7 GWh
- Plentiful groundwater available
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand 840 ML/yr
- 317 ML/yr sewage treated, secondary treatment, discharges to the environment

Gapuwiyak (1,019) 3.3 GWh
- Limited groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored weekly for microbes
- Township water demand of 228 ML/yr
- 90 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Gunbalanya (1,371) 4.9 GWh
- Limited groundwater source available, which is continuously monitored. Also limited surface water source available and extraction licence is pending
- Good quality water, disinfected with sodium hypochlorite and ultraviolet and monitored weekly for microbes
- Township water demand of 455 ML/yr, and efficiency program started
- 173 ML/yr sewage treated, secondary treatment, discharges to the environment

Gunyangara (183) 0.9 GWh
- Plentiful groundwater available
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 140 ML/yr
- 55 ML/yr sewage treated, secondary treatment, provided by external service provider

Maningrida (2,678) 8.5 GWh
- Plentiful groundwater source available, which is continuously monitored
- Very good quality water, disinfected with calcium hypochlorite and ultraviolet and monitored weekly for microbes
- Township water demand of 619 ML/yr
- 104 ML/yr sewage treated, secondary treatment discharges to the environment

Milikapiti (523) 2.4 GWh
- Plentiful groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 293 ML/yr
- 83 ML/yr sewage treated, secondary treatment, discharges to the environment

Milingimbi (1,262) 3.5 GWh
- Very limited groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored weekly for microbes
- Township water demand of 292 ML/yr conservation education program started
- 110 ML/yr sewage treated, secondary treatment, discharges to the environment

Milyakburra (204) 1.0 GWh
- Plentiful groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 49 ML/yr
- 20 ML/yr sewage treated, secondary treatment, seasonally discharges to the environment

Minjilang (361) 1.3 GWh
- Plentiful groundwater available
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 143 ML/yr
- 58 ML/yr sewage treated, secondary treatment is seasonally discharged to the environment

Nauiyu (533) 3.1 GWh
- Plentiful groundwater source available, which is continuously monitored and extraction licence is pending
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 128 ML/yr
- 20 ML/yr sewage treated, secondary treatment, discharges to the environment

Nganmarriyanga (445) 1.5 GWh
- Plentiful groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 101 ML/yr
- Sewage treated, secondary treatment, discharges to the environment

Numbulwar (804) 3.7 GWh
- Plentiful groundwater source available, which is continuously monitored
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 236 ML/yr
- 89 ML/yr sewage treated, secondary treatment, discharges to the environment

Peppimenarti (221) 1.1 GWh
- Plentiful groundwater source available, continuously monitored
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 136 ML/yr
- 47 ML/yr sewage treated, secondary treatment, discharges to the environment

Pirlangimpi (436) 2.0 GWh
- Plentiful surface water source available and extraction licensed
- Very good quality water, filtered through sand, disinfected with sodium hypochlorite and ultraviolet and monitored monthly for microbes
- Township water demand of 137 ML/yr
- 59 ML/yr sewage treated, secondary treatment, discharges to the environment

Ramingining (972) 3.1 GWh
- Plentiful groundwater source available and continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 230 ML/yr
- 78 ML/yr sewage treated, secondary treatment, discharges to the environment

Umbakumba (516) 2.5 GWh
- Limited groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 176 ML/yr
- 82 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Wadeye* (2,498) 8.4 GWh
- Plentiful groundwater source available, which is continuously monitored and extraction licence is pending
- Very good quality water, disinfected with gas chlorine, fluoride added and monitored weekly for microbes
- Township water demand of 511 ML/yr
- 303 ML/yr sewage treated, secondary treatment, discharges to the environment

Warruwi (492) 1.6 GWh
- Limited groundwater source available, which is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 223 ML/yr
- 61 ML/yr sewage treated, secondary treatment, discharges to the environment

Wurrumiyanga (1,781) 6.2 GWh
- Plentiful groundwater source available, which is continuously monitored
- Good quality water, disinfected with gas chlorine, fluoride added and monitored weekly for microbes
- Township water demand of 633 ML/yr
- 417 ML/yr sewage treated, secondary treatment, discharges to the environment

Yirrkala (981) 3.1 GWh
- Plentiful groundwater available and extraction licence pending
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 352 ML/yr
- 117 ML/yr sewage treated, secondary treatment, discharges to the environment

KATHERINE REGION

Amanbidji (101) 0.3 GWh
- Limited groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite monitored monthly for microbes
- Township water demand of 12 ML/yr
- 7 ML/yr sewage treated, secondary treatment, discharges to an irrigation area

Barunga (361) 1.6 GWh
- Surface water source monitored by DNRETAS and licensed
- Good quality water, filtered through a cartridge system, disinfected with sodium hypochlorite and ultraviolet and monitored monthly for microbes
- Township water demand of 136 ML/yr
- 55 ML/yr sewage treated, secondary treatment, discharges to environment

Beswick (593) 1.7 GWh
- Plentiful groundwater source available, which is continuously monitored and extraction licence pending
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 149 ML/yr
- 46 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Binjari (281) 0.5 GWh
- Limited groundwater source available and extraction is licenced
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 14 ML/yr
- 3 ML/yr sewage treated, secondary treatment, seasonally discharges to the environment

Bulla (151) 0.4 GWh
- Limited groundwater source available
- Limited surface water source available and extraction is licenced
- Marginal quality water, filtered through sand, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 34 ML/yr
- 11 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Bulman (340) 1.2 GWh
- Plentiful groundwater source available and extraction licence pending
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 82 ML/yr
- 518 ML/yr sewage treated, secondary treatment, seasonally discharges to the environment

Dagaragu (219)
✣ Included in Kalkarindji electricity sent out
- Limited groundwater source available
- Good quality water, disinfected with gas chlorine and monitored monthly for microbes
- Township water demand of 50 ML/yr
- 518 ML/yr sewage treated, secondary treatment, discharge through evaporation

Jilkminggan (325) 0.9 GWh
- Plentiful groundwater source available and extraction is licenced
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 65 ML/yr
- 26 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Kalkarindji (393) 2.8 GWh
- Limited groundwater source available and extraction is monitored
- Good quality water, disinfected with gas chlorine and monitored monthly for microbes
- Township water demand of 80 ML/yr
- 8 ML/yr sewage treated, secondary treatment, discharges through evaporation

Kybrook Farm (77)
- Limited groundwater source available and extraction is continuously monitored
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 57 ML/yr
- 4 ML/yr sewage treated, secondary treatment, discharges to irrigation area

* Includes Manthatpe

Lajamanu (748) 3.1 GWh
- Limited groundwater source available and extraction is continuously monitored
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 239 ML/yr
- 60 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Manyallaluk (121) 0.5 GWh
- Plentiful groundwater source available and extraction licence is pending
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 57 ML/yr

Minyerri (568) 2.3 GWh
- Limited groundwater source available, extraction is continuously monitored and licence is pending
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 84 ML/yr efficiency awareness program in place
- 45 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Ngukurr (1,235) 4.3 GWh
- Limited groundwater source available and extraction is continuously monitored
- Surface water source available and extraction is licence is pending
- Marginal quality water, filtered through sand, disinfected with gas chlorine and monitored weekly for microbes
- Township water demand of 372 ML/YR
- 130 ML/yr, secondary treatment discharges to the environment

Pigeon Hole (145) 0.5 GWh
- Plentiful groundwater source available
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 25 ML/yr
- 18 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Rittarangu (117)
✣ Included in Ngukurr electricity sent out
- Plentiful groundwater source available and extraction licence is pending
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 46 ML/yr
- 1 ML/yr sewage treated, secondary treatment, discharges to irrigation area

Robinson River (304) 1.1 GWh
- Limited groundwater source available
- Surface water source available and extraction is licenced
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 46 ML/yr

Weemol (87)
✣ Included in Bulman electricity sent out
- Plentiful groundwater source available and extraction licence is pending
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 22 ML/yr

Yarralin (302) 1.5 GWh
- Limited groundwater source available and extraction is continuously monitored
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 74 ML/yr
- 37 ML/yr sewage treated, secondary treatment, discharges to irrigation area

BARKLY REGION

Ali Curung (622) 2.2 GWh
- Plentiful groundwater source available and extraction is licenced
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 367 ML/yr conservation education program in place
- 53 ML/yr sewage treated, secondary treatment, discharges through evaporation

Alpurrurulam (514) 2.0 GWh
- Limited groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 132 ML/yr
- 62 ML/yr sewage treated, secondary treatment, discharges through evaporation

Canteen Creek (253) 0.7 GWh
- Plentiful groundwater source available
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 47 ML/yr

Imangara (109) 0.3 GWh
- Limited groundwater source available and extraction is licenced
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 17 ML/yr

Nturiya (123) 0.2 GWh
- Plentiful groundwater source available and extraction is licenced
- Marginal quality water, disinfected with ultraviolet and monitored monthly for microbes
- Township water demand of 14 ML/yr

Tara (66) 0.3 GWh
- Plentiful groundwater source available and extraction is licenced
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 22 ML/yr

Willowra (254) 1.0 GWh
- Plentiful groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 65 ML/yr
- 10 ML/yr sewage treated, secondary treatment, discharges through evaporation

Wilora (129) 0.3 GWh
- Limited groundwater source available and extraction is licenced
- Marginal quality water, disinfected with ultraviolet and monitored monthly for microbes
- Township water demand of 17 ML/yr

Wutunugurra (240) 0.7 GWh
- Limited groundwater source available and extraction is continuously monitored
- Very good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 36 ML/yr

SOUTHERN REGION

Amoonguna (321) 0.8 GWh
- Plentiful groundwater source available
- Good quality water, disinfected with gas chlorine and monitored monthly for microbes
- Township water demand of 70 ML/yr
- 7 ML/yr sewage treated, secondary treatment, discharges through evaporation

Ampilatwatja (424) 3.0 GWh
✣ Connected to Arlparra electricity grid
- Plentiful groundwater source available
- Marginal quality water, disinfected with ultraviolet and monitored monthly for microbes
- Township water demand of 57 ML/yr

Areyonga (274) 1.1 GWh
- Limited groundwater source available
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 56 ML/yr
- 18 ML/yr sewage treated, secondary treatment, discharges through evaporation

Atitjere (216) 1.0 GWh
- Plentiful groundwater source available
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 51 ML/yr

Engawala (165) 0.6 GWh
- Limited groundwater source available and extraction is continuously monitored
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 25 ML/yr
- 10 ML/yr sewage treated, secondary treatment, discharges through evaporation

Finke (188) 1.0 GWh
- Plentiful groundwater source available and extraction is licenced
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 66 ML/yr
- 17 ML/yr sewage treated, secondary treatment, seasonally discharges to the environment

Ikuntji (173) 0.7 GWh
- Plentiful groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 36 ML/yr

Hermannsburg (726) 3.7 GWh
- Limited groundwater source available and extraction is continuously monitored
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 208 ML/yr
- 71 ML/yr sewage treated, secondary treatment, discharges through evaporation

Imanpa (211) 0.6 GWh
- Limited groundwater source available and extraction is continuously monitored
- Marginal quality water, aeration treatment, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 29 ML/yr
- 8 ML/yr sewage treated, secondary treatment, discharges through evaporation

Kaltukatjara (344) 1.4 GWh
- Plentiful groundwater source available
- Marginal quality water, aeration treatment, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 62 ML/yr
- 10 ML/yr sewage treated, secondary treatment, discharges through evaporation

Kintore (528) 1.9 GWh
- Limited groundwater source available and extraction is continuously monitored
- Marginal quality water, disinfected with ultraviolet and monitored monthly for microbes
- Township water demand of 66 ML/yr conservation education program in place
- 64 ML/yr sewage treated, secondary treatment, discharges through evaporation

Laramba (293) 0.9 GWh
- Plentiful groundwater available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 85 ML/yr

Mt Liebig (183) 0.6 GWh
- Limited groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 44 ML/yr

Nyirripi (242) 1.16 GWh
- Limited groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 50 ML/yr
- 19 ML/yr sewage treated, secondary treatment, discharges through evaporation

Papunya (485) 1.6 GWh
- Plentiful groundwater source available
- Marginal quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 89 ML/yr
- 30 ML/yr sewage treated, secondary treatment, discharges through evaporation

Pmara Jutunta (227) 0.3 GWh
- Plentiful groundwater source available;
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 32 ML/yr
- 12 ML/yr sewage treated, secondary treatment, discharges through evaporation

Santa Teresa (647) 2.5 GWh
- Plentiful groundwater source available
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 154 ML/yr
- 10 ML/yr sewage treated, secondary treatment, discharges through evaporation

Titjikala (233) 1.4 GWh
- Plentiful groundwater source available
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 51 ML/yr

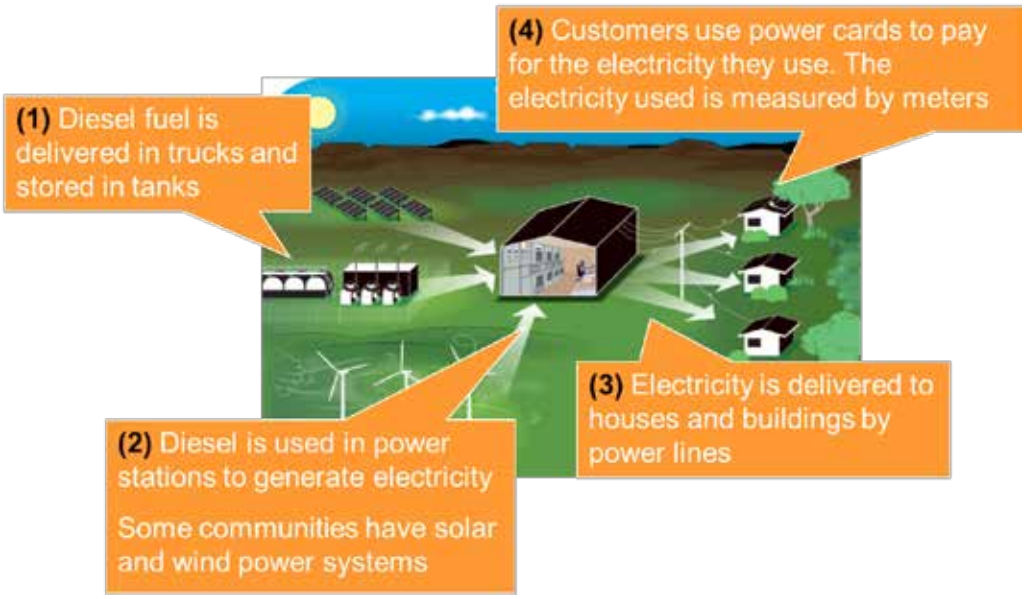
Wallace Rockhole (80)
✣ Included in Hermannsburg electricity sent out
- Plentiful groundwater available
- Adequate quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 46 ML/yr

Yuelamu (237)
✣ Included in Yuendunn electricity sent out
- Limited groundwater source available and extraction is continuously monitored
- Limited surface water source and extraction is licenced
- Marginal quality water, filtered through sand, disinfected with calcium hypochlorite and ultraviolet and monitored monthly for microbes
- Township water demand of 34 ML/yr
- 6 ML/yr sewage treated, secondary treatment, discharges through evaporation

Yuendumu (793) 4.5 GWh
- Limited groundwater source available and extraction is continuously monitored
- Good quality water, disinfected with sodium hypochlorite and monitored monthly for microbes
- Township water demand of 239 ML/yr
- 15 ML/yr sewage treated, secondary treatment, discharges through evaporation

ELECTRICITY SERVICES

IES owns and operates one of the largest generation fleets with almost 200 generators across 52 diesel-fired power stations, including seven diesel-solar hybrid facilities. Electricity is provided to residents through over 1000km of power distribution lines across the remote towns and communities. Where customers are close to existing electricity services with available capacity, power is purchased through agreements, such as with Rio Tinto Alcan at Gove and GEMCo on Groote Eylandt.



IES uses renewable energy in eight solar/diesel hybrid mini-grid power systems operating that provide electricity to eleven communities. These systems use a range of solar technologies including concentrating photovoltaic (CPV) dishes and flat plate photovoltaic (PV) solar systems, and have an installed capacity of over 1.7 megawatts (MW).

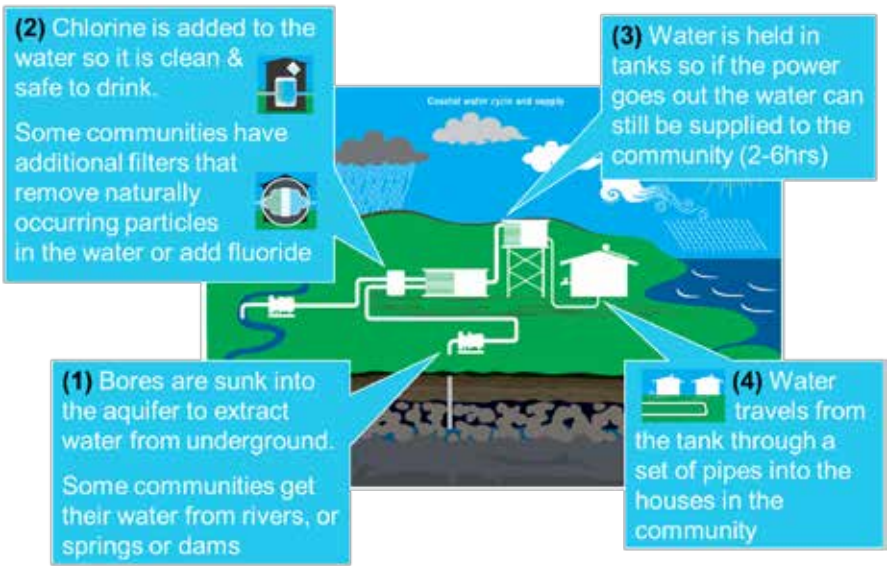
The Remote Energy Supply Strategy provides the integrated plan for all energy investments. The principal objective is to ensure provision of long term, least cost, reliable and safe utility-grade electricity services. Power and Water will gradually displace distillate in many remote communities with solar and gas where it is economically efficient to do so. Power and Water will also continue to optimise the operational efficiency of its power stations with more efficient diesel generation and innovative control systems. Power and Water supports the connection of customer-owned rooftop solar PV systems in remote towns and communities by providing a buyback tariff for solar energy exported to the grid. Currently there is over 450 kilowatts (kW) of solar installed across schools, health clinics and other buildings; assisting to reduce diesel fuel consumption.

For more information see appendices:

Providing reliable power
Renewable energy

WATER SERVICES

Power and Water is committed to providing safe and reliable water supplies to residents. Drinking water is regularly tested to confirm it complies with national guidelines. Power and Water has a Memorandum of Understanding (MoU) with the Department of Health for managing drinking water quality in its area of control. Drinking water is supplied through more than 250 production bores, more than 300 monitoring bores, 160 water storage tanks and 600km of water distribution systems to deliver water to households.



Water is obtained from 70 isolated groundwater and surface water sources to supply drinking water to the Major Remote Towns and remote communities.

In 63 towns and communities the water comes exclusively from groundwater contained in aquifers, which is extracted through production bores. Another three communities exclusively use surface water sources, such as rivers, creeks and dams, while the remaining five communities use a combination of groundwater and surface water sources. All water is disinfected before it is provided for drinking. The amount of water available and the natural quality of the water found in these diverse water sources presents significant challenges to ensure each community has a safe and reliable water supply that is consistent with Australian Drinking Water Guidelines.

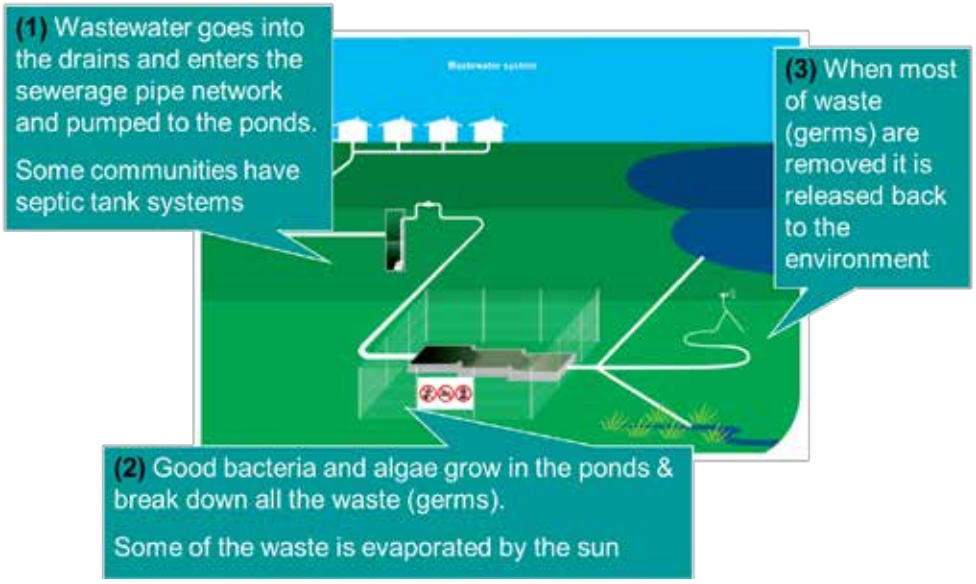
Power and Water has developed the Water for Healthy Communities program, which includes water quality, water sustainability and wastewater management, to ensure the provision of appropriate water and sewerage services in Major Remote Towns and remote communities. This is based on the principles of risk management and focuses on making adequate safe water available for community use, with appropriately treated wastewater being returned to the catchments.

For more information see appendices:

Providing safe water supplies
Water quality test results

SEWERAGE SERVICES

Power and Water manages more than 300km of reticulated sewerage pipe and 56 waste stabilisation pond treatment systems across 56 of the Major Remote Towns and remote communities.



Sixteen communities rely on on-site wastewater treatment systems, which are managed privately or as part of the public housing portfolio. These are primarily septic tanks with a soak-away to dispose of the excess effluent. Three communities use a combination of these systems.

The Wastewater Management Strategy defines how Power and Water will further improve wastewater treatment systems in 56 of the Major Remote Towns and remote communities. The strategy priorities our investment in wastewater management including design, management, commissioning and ownership of the technology, public health issues, energy requirements, maintenance and security of assets, monitoring, approvals and stakeholder engagement.

For more information see appendices:

Effective sewerage services

RETAIL SERVICES

The total demand for electricity and water services in remote communities is increasing, with the amount of growth significantly varying for each region, community and services provided. This increasing demand is consistent with population growth and more investment in community facilities through various Government initiatives aimed at improving lifestyle and health outcomes. It is expected that these on-going programs will continue to lead to greater use of electricity and water services into the future.

All non-residential (commercial and government) customers pay for electricity, water and sewerage at the uniform tariffs set by the Northern Territory Government. Residential customers (within domestic Indigenous public housing properties) pay for electricity services, which is predominately purchased through pre-payment meter tokens. These residential customers are not currently charged for water and sewerage services.

The 2012-13 financial year saw electricity sales of $28.8 million, water sales valued at $4.4 million, and sewerage services valued at $2.5 million.

Demand for utility services is continuing to grow with population and the on-going investment in services for remote areas

Over the 2012-2013 reporting period there were a range of tariff reforms implemented by the Northern Territory Government. Overall tariffs were increased by 20% across all service areas of power, water and sewerage. Additional 5 per cent increases are effective from 1 January 2014 and 1 January 2015.

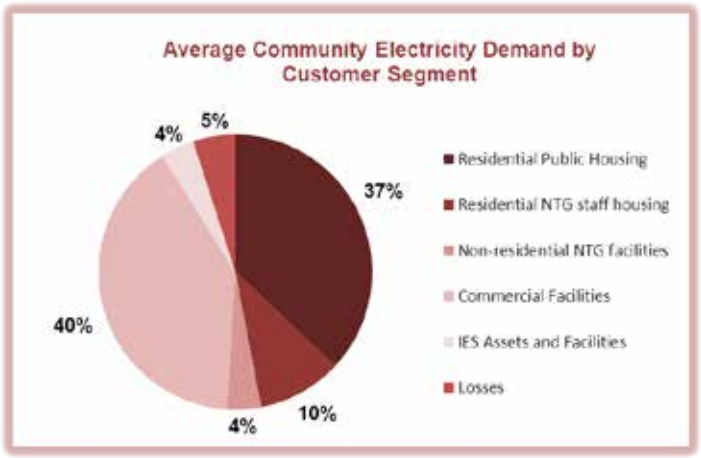
Efficient implementation of the multiple tariff changes in a short timeframe across the sparsely located communities was a significant logistical feat. Approximately 5000 pre-payment meters were manually adjusted for the tariff change followed by application of $50 credit for the backdated tariff roll-back. This was particularly challenging during the record-breaking high temperatures in Central Australia and the usual impacts of the wet season in the North. Changes for the remaining credit customers, who received bills from Power and Water, were reasonably straight forward and implemented through Power and Water's integrated billing system.

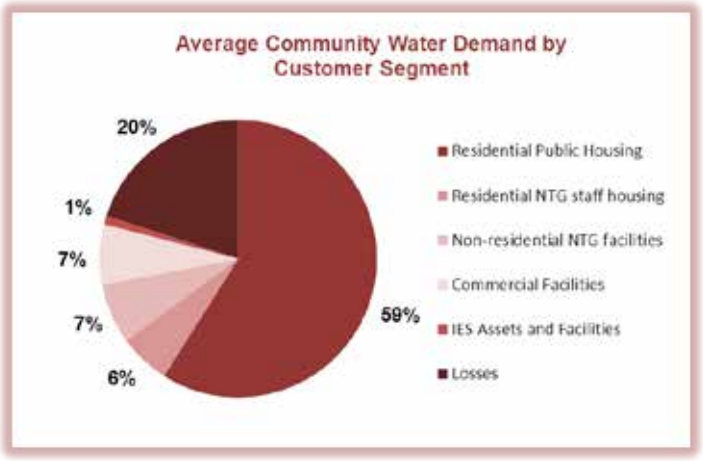
Water and Energy Demand Management

Total demand for electricity, water and sewerage services across the remote communities has increased at an average of six per cent per annum since 2007. Record investment in Indigenous housing and infrastructure, combined with increased per capita demand for essential services has contributed record growth. With rising costs of service provision, the cost of services to remote communities is exceeding tariff charges. The growing need for increased capital investment from unchecked demand means new investment will be required, or demand must reduce to sustainable limits. This presents a compelling business case for investment in reducing demand for services, as demand management is the least cost solution to addressing growing demand. Additionally, high demand growth is unsustainable in some locations due to limited water sources.

Over recent years IES began developing and delivering residential water and energy education programs in key communities, tailored to an Indigenous audience. Programs were based on engaging with remote residents and key community stakeholders, all of whom have a part to play in reducing water and energy usage.

Current average demand for water and electricity by customer segment is illustrated on the next page for representative communities. Energy demand is dominated by the public housing residential and commercial sectors, whereas water demand is dominated by public housing residential demand.





In recognition of the importance of demand management as part of the IES business model, a dedicated energy and water efficiency team was established early in 2013. The program expanded in late 2013 and now includes more targeted demand management programs including working with the commercial and government sectors, where audits identified that improving water and energy efficiency of large community facilities has the potential to produce significant savings and to defer the need for capital expenditure.

The Water and Energy Efficiency Implementation Plan 2013-2016 outlines priority actions over the next three years and includes:

- policy, regulation and metering changes to support demand management
- residential, government and commercial customer demand management programs
- loss and leakage management initiatives
- efficiency considered in new development assessment processes

For more information see appendices:

Water and energy demand management

DEVELOPMENT SERVICES

The implementation of various Government policy and initiatives aimed at improving the lives of Indigenous people has resulted in billions of dollars invested in remote communities and a significant increase in development activities.

All new buildings or developments that need to connect into the supply system require approval and assessment to determine the capacity and impact on utility services. This includes small developments such as servicing vacant land, a single dwelling or duplex, to larger developments such as offices, stores or a new subdivision.

Prior to this, the relatively small number of developments meant requests for connections to utility services were managed within existing operational capacity, as they were generally of a small scale and there was sufficient redundancy capacity within the supply system to avoid significant system augmentation. Increasing development activity has resulted in very little serviced land remaining across the remote communities and limited utility redundant supply system capacity for development to occur without system augmentation.

For more information see appendices:

Remote development services

MONITORING AND CONTROL OF INFRASTRUCTURE

Supervisory Control and Data Acquisition (SCADA) systems are deployed in 52 power systems and 24 water systems across the Northern Territory. This approach has proven to significantly improve the effectiveness of service delivery, decrease the time taken to respond to issues and reduce the cost of managing services. Power and Water intends to continue to invest and expand monitoring and control infrastructure to:

- improve infrastructure performance and operating efficiency
- improve asset management, maintenance and infrastructure upgrade planning
- ensure supply of reliable power services
- ensure safe water supplies
- enable effective monitoring of sewerage system overflows
- enable improved reporting on infrastructure performance
- support increasing regulatory requirements
- better support community-based Essential Services Operators to do their jobs

For more information see appendices:

Remote monitoring and control

MAJOR ACHIEVEMENTS

This section highlights the major activities Power and Water has undertaken to provide utility services across remote towns and communities throughout the Northern Territory. This includes major projects, which have been prioritised from a large list of potential projects to maintain the delivery of utility services in the short to medium term.

During 2013 the project delivery team delivered over $45 million in major capital investment projects across remote communities, with support from Power and Water's procurement, finance and property (leasing) teams.

COMPLETED PROJECTS

PROVIDING MORE WATER TO RESIDENTS ON GROOTE EYLANDT

Following the drilling of new bores at Angurugu and Umbakumba in 2012, this major capital project involved connecting new water infrastructure at both communities to ensure there is enough water to meet current and future demands of residents.

At Angurugu (population of nearly 1 000 people) two new production bores began providing water to the community during 2013. A monitoring bore was also established to enable Power and Water to monitor the health of the water resource to ensure water is available in the future. The bores were connected into the water supply system 1km of new underground pipework moving the water from the bores to the new 1.9 million litre storage tank (pictured below). During the project Power and Water also implemented SCADA across the supply system to improve our ability to remotely monitor and control the on-going operation of the infrastructure.

Umbakumba (population of over 500 people) also had three new production bores (pictured right) integrated into the water supply system, along with three monitoring bores to monitor the health of the aquifer. This included the construction of 600 meters of underground pipework to connect the new bores into the system and an additional 340 000 litre ground level storage tank at the existing water tank compound. Similar to Angurugu, the opportunity was taken to install SCADA across the supply system.

Building new water infrastructure improves the security of the supply so that there is enough water for the remote communities as they grow in the future

More Water for Galiwin'ku and Maningrida

The two projects in East Arnhem involved integrating previously drilled production bores into the water supply systems to meet the needs of these growing Major Remote Towns.

In Maningrida, the connection of three new production bores and one kilometre of underground pipework has increased the amount of water available to the community and allowed an existing bore to be removed from service, reducing the risk of potential contamination of the water supply. Similarly in Galiwin'ku, introduction of three new production bores and 3.5km of underground pipework has increased the water supply capacity to cater for further growth of the community.

Ngukurr's Water Supply Expanded

Ngukurr is in the Katherine region with a resident population of over 1200 people.

During 2012-13 Power and Water connected two new production bores and replaced 6km of underground pipework to improve the water supply security for Ngukurr. A new elevated water storage tank (pictured right) was also constructed, which is 15m high, to provide sufficient water pressure to residents. This new infrastructure has an increased capacity to meet the growing demand of the community and at the same time, replaced infrastructure that had reached the end of its serviceable life.

Improving Sewerage Services at Gunbalanya

To ensure that the sewerage system at Gunbalanya (population of over 1 300 people) continues to effectively remove sewage from the community, Power and Water has replaced two of the sewerage pump stations.

The upgrades have significantly increased the capacity of the system and will meet the needs of the rapidly growing township into the future. SCADA systems were also installed to improve the monitoring and control of the new infrastructure.

Solar Power in Three More Communities

Power and Water installed almost one megawatt of solar energy potential across three systems at Ti Tree, Kalkarindji and Alpurrurulam (TKLN) this year.

This exciting and collaborative project was funded with $5 million from the Australian Government, $4 million from the Northern Territory Government and $5 million invested from private industry. Power and Water has signed a 20 year power purchase agreement with Epuron Pty Ltd and its subsidiary TKLN Solar Pty Ltd for solar electricity

TKLN Renewable Energy Project recently won a prestigious Engineering Excellence Award and will be represented in Canberra at the Engineers Australia National Awards

produced by the systems. The flat plate photovoltaic solar systems are expected to save between 20 and 30 per cent of previous annual diesel fuel requirements and significantly reduce carbon emissions. These sites also help to offset Power and Water's legislative Renewable Energy Target obligations.

Resources to help Reduce Energy Demand

During 2012-13 Power and Water developed resources about energy demand management initiatives and education to assist when working with residential customers in remote communities. The resources include a pictorial based book and talking books, which are recorded in English and Indigenous languages to better engage with people who do not have English as their first language. Information covers the electricity supply system and how electricity is consumed including:

- the different sources of energy and how power is supplied and delivered to remote communities, and each house
- how a prepayment meter works
- a comparative cost of running different power items in a home
- how to be power wise in the home
- how to stay safe around electricity inside and outside

Promotional materials such as posters and stickers complement education programs and communicate and encourage more efficient use of energy in remote areas (an example of these materials is pictured below). Water and energy efficiency tips in six key Indigenous languages were also broadcast on Aboriginal radio across the NT.

Collaborative Project at Gunbalanya to Reduce Water Demand

The Gunbalanya Local Government and Household Water Efficiency Program is a partnership between Power and Water, the NT Government Department of Community Services and Department of Housing, and the West Arnhem Shire Council. The program is grant funded by a $298 000 grant from the Australian Government Department of Regional Development.

Power and Water is working in partnership with key stakeholders and community residents to help conserve water and energy

The water demand management project implements a community action plan that describes what the partnership and residents could do to reduce water demand:

- partner agencies responding to leak reports and water leak data to rectify any leaks
- employment of local Indigenous Water Conservation Officers (pictured previous page), who deliver household education and undertake household water audits and spread key water conservation messages through posters, stickers, DVDs, talking books, radio interviews and presentations
- community commitment to reporting all leaks and not let running water go to waste
- provision of outdoor water saving appliances, for example this involves replacing existing outdoor taps with more efficient ones and talking to people about water wise gardening

In 2012 smart meters were installed at each lot across the Gunbalanya community and are providing valuable information about where water is being used. This aids in targeting further household education and repairs and maintenance requirements to fix leaks. Each representative on the project partnership is fundamental to enable transparency and cooperation and actioning reported leaks. The project will be independently evaluated and Power and Water will use the findings to refine its community engagement approach and improve future demand management projects.

CONTINUING PROJECTS

CONSTRUCTION OF THREE WATER TREATMENT SYSTEMS

Three advanced water treatment systems will improve water quality in the Southern region communities of Ali Curung, Kintore and Yuelamu. The recently constructed treatment plants will enhance the water supply system during 2013-14 following commissioning and testing.

The advanced treatment technology will reduce levels of naturally occurring nitrate and fluoride as well as salinity and hardness. Please refer to appendix – "Water quality test results" for further information. The technology selected is Electrodialysis Reversal, a desalination technology proven to be robust for both the water quality and remote operating environment.

During the delivery, Power and Water has worked with all three communities to engage and inform them about the project. This included a launch event with the Minister for Regional Development, presentations at community forums at all three communities and providing education programs for community groups on water conservation and water treatment. (One of systems being installed is pictured right)

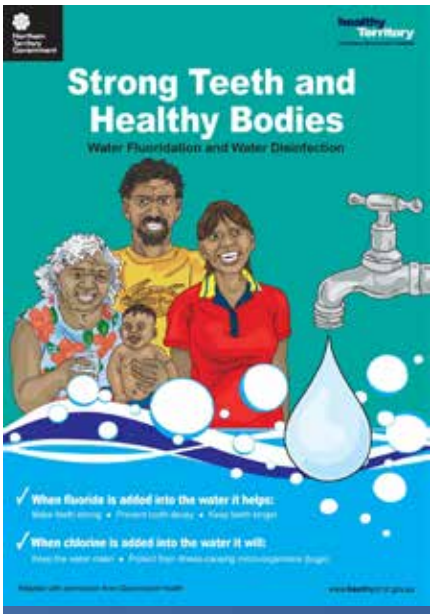
This is the first time that advanced treatment technology is being used to reduce levels of naturally occurring nitrate and fluoride in remote communities in the Northern Territory

Strong Teeth and Healthy Bodies

Strong Teeth and Healthy Bodies is a partnership between the Department of Health and Power and Water to install new gas chlorination and fluoridation systems to help improve the health and wellbeing of people living in remote communities. The fluoridation systems add fluoride to the drinking water to improve oral health outcomes in the community by helping to prevent tooth decay. Importantly, the fluoridation systems are installed in conjunction with upgrades to chlorination, which improve the disinfection efficiency and reliability to protect public health.

This is the second year of the project, which involved the installation of chlorination and fluoridation systems at Maningrida and chlorination at Gunbalanya.

Power and Water will continue to roll out the project during 2013-14 with chlorination and fluoridation systems at Angurugu and fluoridation at Umbakumba.



Extending Remote Monitoring Capability

Power and Water will continue to improve remote monitoring and control of infrastructure in remote communities by establishing a faster, more reliable communications network and fitting infrastructure with Supervisory Control and Data Acquisition (SCADA) systems.

During 2012-13, nine community water SCADA systems and three renewable energy-diesel hybrid power stations were commissioned and connected to the communication network to enable remote monitoring of this essential infrastructure. This brings the total number of communities where the water system can be remotely monitored to 24. The data from each of these systems is stored on a central database. This aids proactive responses to infrastructure faults to minimise service outages, improved infrastructure capacity planning and maintenance management.

Ongoing investment in SCADA and communication systems will be made in conjunction with major capital investment. As an interim measure, telemetry systems are being installed on critical water assets such as production bores, tanks and sewerage pump stations until long-term SCADA systems are established. These systems enable remote monitoring and control supply systems and ensure they run as effectively as possible and automatically turn equipment on and off as required. This helps ensure precious water isn't wasted through water storage tank overflows and leaks.

We are improving communication data links by utilising existing government infrastructure such as the Northern Territory Government satellite and fibre optic network. Ongoing investment in SCADA and communication systems will be made in conjunction with the upgrade and replacement of infrastructure.

Securing Water for the Future

During 2013-14 Power and Water will continue with projects to install and replace water supply infrastructure in three Major Remote Towns (refer table below):

Major Remote Town	Water Supply Infrastructure		
	Production bores and monitoring bores	Underground pipework	Water storages
Milingimbi **(population over 1 200)**	8 monitoring bores to monitor the health of the water resource	3 kilometres of underground pipework	291 kilolitre elevated storage tank on a 18m stand and two 486 kilolitre ground level storage tanks
Gunbalanya **(population over 1 300)**	6 new production bores as well as upgrading production capacity of 12 existing production bores	8.5 kilometres of underground pipework to interconnect new production bores to the storage tanks	532 kilolitre ground level storage tank
Hermannsburg **(population over 700)**	5 new production bores	2.9 kilometres of underground pipework to interconnect new production bores to the storage tanks	389 kilolitre ground level storage tank

Hermannsburg Electricity Grid Connection

Power and Water is preparing for the installation of a 90km powerline to connect Hermannsburg, and the outstations currently connected to the Alice Springs electricity grid. Construction of the powerline is scheduled late in 2013 with connection to Alice Sprigs early in 2014.

Once the power line is in place the old, less efficient diesel power station at the community will be decommissioned. This interconnection will save millions of litres of diesel fuel and provide a secure power supply from the more efficient gas-fired urban station at Alice Springs.

East Arnhem Energy and Water Efficiency project

In late 2012, Power and Water led a successful bid for funding under the Australian Government's Low Income Energy Efficiency Program (LIEEP). This $12.4 million project was established in May 2013 with the completion of a Funding Agreement and will run until April 2016, delivering energy efficiency education, local employment of efficiency officers and efficient retrofits to over 500 households across six east Arnhem land communities; Yirrkala, Gunyangara, Ramingining, Gapuwiyak, Galiwinku and Milingimbi.

The project aims to identify and address the key barriers to achieving energy and water efficiency for participating households, evaluate measurable improvements to efficiency as a result of the project and develop a best-practice model for achieving improved energy efficiency with low-income families in remote indigenous communities.

The project is being led by Power and Water along with a consortium of project partners including Bushlight (Centre for Appropriate Technology), Charles Darwin University, Remote Housing NT and the East Arnhem Shire Council. The Yolngu peoples of East Arnhem Shire are central to the project design and delivery, with a process of two-way knowledge exchange.

The results of this exciting project are intended to inform the design and delivery of future demand management projects across remote regions of the NT.

Barge delivery of gas chlorination and fluoridation systems to Groote Eylandt

OUR PERFORMANCE

To provide electricity, water and sewerage services IES operates essential infrastructure including:

- electricity generation infrastructure comprising mostly of diesel power stations
- electrical distribution systems, up to and including customers' meters
- water infrastructure including surface water harvesting, groundwater production bores, bore-pumps, tanks, transfer pumping stations, water treatment and water supply reticulation systems, up to the customers' property boundaries
- sewerage infrastructure, starting at the customers' boundaries, including collection mains, pumping stations and wastewater treatment, reuse and disposal systems.

Indigenous Essential Services as at June 2013

ELECTRICITY	Units	2009	2010	2011	2012	2013
Generation						
Installed Capacity *(including solar)*	MW	60	69	71	74	78
Installed Capacity *(solar only)*	MW	1	1	1	1	1
Electricity Generated *(including solar)*	GWh	106	112	103	108	115
Electricity Generated *(solar only)*	GWh	1	1	0	0	1
Electricity Sent Out (including solar, purchases from PWC and private suppliers)[1]	GWh	123	129	119	125	134
Purchases from PWC (electricity purchased from PWC electricity grids and sent out to IES communities)[1]	GWh	11	12	9	10	12
Purchases from Private Suppliers	GWh	8	8	8	9	9
Network Distribution (22/11 kV & Below)[2]						
HV Overhead[3]	km	473	513	579	579	876
HV Underground	km	5	5	7	7	8
LV Overhead	km	278	278	325	325	319
LV Underground	km	3	3	3	3	2
SWER All Voltages	km	87	87	87	87	121
Sales[4,5]	MWh	104,501	112,030	112,726	119,540	119,250
Customers	No. of	7,540	8,116	8,478	8,507	9,179
WATER	**Units**	**2009**	**2010**	**2011**	**2012**	**2013**
Total Sourced Water	ML	9,848	9,792	9,002	9,680	10,306
Length of Mains[2]	km	652	654	654	654	623
Sales	ML	1,666	1,855	1,491	1,916	2,180
Customers[6]	No. of	1,341	2,175	2,213	2,549	2,563
SEWERAGE	**Units**	**2009**	**2010**	**2011**	**2012**	**2013**
Volume of Sewage Treated	ML	3,940	3,917	3,601	2,897	3,337
Length of Sewer Mains[2]	km	305	307	303	310	334
Volume of Effluent Reused	ML	-	-	-		-
Customers (ie. Installations)[6,7]	No. of	1,122	1,467	1,793	1,834	2,292

[1] Electricity Sent Out and Purchases from PWC are estimated as this data is not metered. This was not included prior to 2008-09.
[2] Due to issues gaining data for 2011-12 figures were estimated. Improved reporting systems have allowed for actual figures to be reported for 2012-13.
[3] Increased HV Overhead distribution is due to the interconnection of the number of communities.
[4] From 2008-09, Electricity Sales includes all prepayment and credit meter sales. Previous years data does not include all prepayment meter sales.
[5] Due to system issues prepayment token sales were utilised rather than prepayment metered consumption for 2012-13.
[6] Due to changes to the calculation methodology, historical data for 2010-11 and prior years have been re-stated.
[7] INCREASE IS DUE TO THE IMPACT OF ONGOING REVENUE ASSURANCE PROGRAMS WHICH HAVE IDENTIFIED ADDITIONAL CUSTOMERS

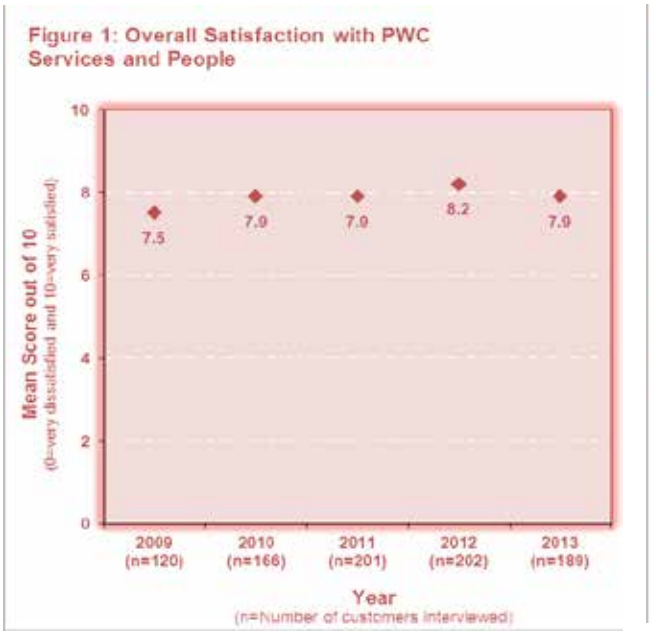
CUSTOMER SATISFACTION

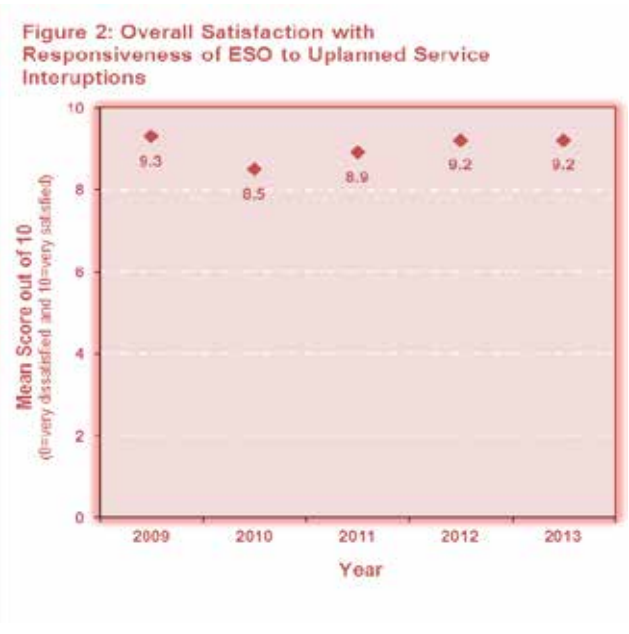
The 2013 customer satisfaction survey results indicate that Power and Water is trusted and appreciated and we are satisfying the needs of customers and stakeholders

Power and Water undertakes annual customer satisfaction research among its stakeholders in Major Remote Towns and remote communities.

Almost 190 customers, including school principals, health clinic managers, Shire Service Managers, Australian Government business managers, police officers and community store managers were interviewed by telephone between October and November 2012.

Customers' overall satisfaction with Power and Water's services has been steadily increasing since it was first tracked in 2007 and is now approximately 8 out of 10 (see Figure 1).





Our Essential Service Operators (ESOs) are a successful and critical part of successfully providing utility services in these remote areas. This is demonstrated by a very positive score of 9.2 out of 10 given for the level of customer satisfaction with the ESOs' responsiveness or time taken to attend to unplanned service interruptions (Figure 2).

Power and Water's investment in remote monitoring and control of essential infrastructure will further support the continued improvement in ESOs responsiveness. These systems automatically send 'alarm' signals to ESOs advising them of problems with critical infrastructure, enabling immediate responses.

REPORTING

WATER RESOURCE EXTRACTION

Power and Water monitors the amount of water extracted from more than 70 water sources to supply drinking water to remote towns and communities. Ground and surface water extraction licences are required from the Water Resources Division of the Department of Land Resource Management (DLRM) as part of the *Northern Territory Water Act (2008)* for 26 of the 72 communities.

Currently, Power and Water holds licences in 14 communities and has submitted 12 licence applications to DLRM with approvals pending. These licences require the amount of water extracted be reported to the regulator to ensure set limits are not exceeded and the long-term sustainability of water resources is maintained.

In 2012-13, extraction exceeded the licence limit for just one community, Bulla. Bulla relies on both groundwater and surface water from the East Baines River to supply the community. The natural levels of barium in the groundwater need to be diluted with water from the river in order to ensure the supply is safe for consumption. In 2012/13 extraction was 17ML and our licence limit is 10ML. Power and Water is working with DLRM to reduce water consumption and is investigating new water sources or increasing licence extraction limits based on the sustainability of the resource.

Power and Water holds a number of water extraction licences, which report the amount of water extracted to the regulator to ensure set limits are not exceeded and the long-term sustainability of water resources is maintained

GROUNDWATER MONITORING

Power and Water has gone to considerable lengths to install an automated groundwater monitoring network to monitor the health and efficiency of aquifers. There are currently 54 groundwater loggers installed across 32 communities and a total of 50 data downloads were completed from these loggers in 2012/13.

The loggers compliment a program of manual groundwater monitoring which covers 65 communities. In 2012/13 a total of 126 manual water level measurements were taken.

WATER QUALITY MONITORING

Power and Water regularly tests drinking water to confirm it is in line with the Australian Drinking Water Guidelines (ADWG) to ensure it is safe to drink, which is determined in consultation with the Department of Health (DoH) and approved by the Chief Health Officer

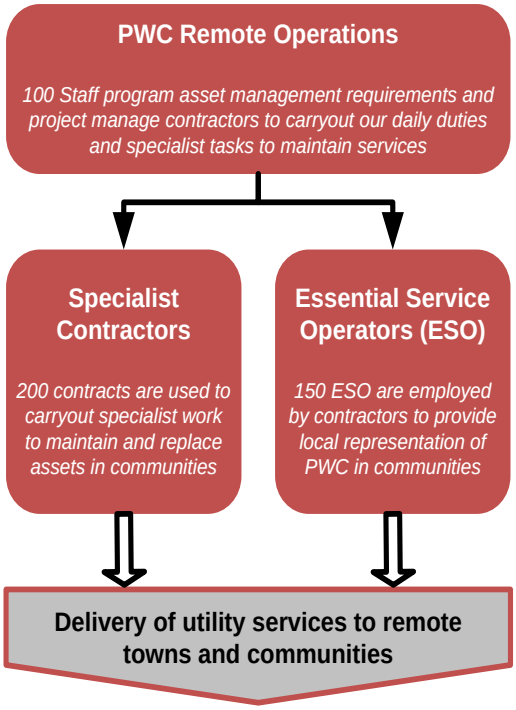
Power and Water has a Memorandum of Understanding (MoU) with the Department of Health for managing drinking water quality in its area of control. Regular water samples are collected from each of the communities and tested at laboratories in Darwin and Alice Springs. The MoU outlines actions that need to be taken when water tests identify issues, including when *E. coli* is detected in the distribution system, as part of the Drinking Water Quality Monitoring Program. In some instances, the Department of Health will take an extra step and issue a Precautionary Advice for Drinking Water to advise a community that drinking water should be boiled before consumption.

In 2012-13, *E. coli* detections occurred at Kaltukatjara and Pirlangimpi. These detections did not indicate a significant risk to public health and a 'Precautionary Advice for Drinking Water' was not required.

OUR PEOPLE

The delivery of utility services through IES to remote towns and communities is provided using an outsourced model (refer figure below). This outsourced model allows Power and Water to utilise a range of service providers to ensure the lowest cost services. For example a Power Purchase Agreement with industry is used to integrate generation of electricity using solar systems in a selection of communities.

Power and Water will continue to seek opportunities to utilise outsource arrangements where it is cost effective to drive down the cost to deliver services to the Northern Territory Government.



REMOTE OPERATIONS

Power and Water's Remote Operations unit provides management, technical and professional services to IES, with administrative and technical support from Power and Water. This integrated structure allows operational delivery and planning teams to work closely together and work collaboratively with other teams within Power and Water's electricity, water and sewerage business. Across the Territory a team of multidisciplinary professionals and technical staff are committed to improving the environments of remote residents through reliable electricity, water and wastewater services.

The leadership, staff professionalism, dedication and commitment to deliver efficient services in an often extremely challenging environment are exceptional. Our people have to work independently in often isolated, challenging, remote and extreme climatic environments. Our people ensure that the integrity of services is maintained across more than 1.3 million square kilometres – nearly one sixth of Australia's land mass.

Over 30 years

During 2013 Darryl Day, General Manager of Remote Operations celebrated over 30 years in the utility industry and infrastructure delivery in the Northern Territory. With a background in engineering, Darryl made a significant contribution to Power and Water, providing expertise and leadership while sharing his extensive knowledge and passion for the industry. In his career Darryl has been involved in all aspects of the industry from designing and delivering water and sewerage systems in the bush, to leading the team at Remote Operations, where he helped to create a highly motivated professional and technical team that is committed to making a difference to the lives of people living in remote communities.

Specialist Contractors

Working in partnership with a dedicated team of specialist contractors spread across the Territory, Power and Water manages the maintenance and replacement of utility infrastructure assets. Selection of contractors is by using a range of procurement strategies to ensure lowest cost and value for money without compromising response times and service reliability, while supporting local economic development where possible.

Essential Services Operators

Essential Services Operators (ESOs) play a key role in keeping utility services operating in some of the Territory's most remote areas, often in harsh and difficult conditions. Across the Territory there are over 150 ESOs who operate and maintain the supply systems through contracts with shires, councils or private contractors.

ESOs carry out a range of regular tasks as part of the operation and maintenance of essential services including water quality testing, diesel generator servicing and meter reading for retail services. They require a variety of skills, knowledge and experience in power, water and sewerage infrastructure, operations and customer services to safely, effectively and efficiently carry out all duties. Power and Water supports ESOs through a range of initiatives including inductions, familiarisation courses, Occupation Health and Safety (OH&S) training, on-site training and mentoring.

For over a decade, Power and Water has been working in partnership with local training organisations to provide vocational education and training opportunities for locals to work as ESOs, which leads to real jobs employing Indigenous people in their own communities. During this time the training and employment pathway has been linked to a nationally recognised qualifications delivered by registered training organisations.

The current ESO career pathway framework is established in partnership with Group Training Northern Territory (GTNT) and registered training providers including Charles Darwin University (CDU) and Centre for Appropriate Technology (CAT). The framework provides a career pathway from secondary school, primarily Kormilda College, through to an Essential Services Trainee or Essential Services Operator. They progress to Certificate II and ultimately ESO Supervisor at Certificate III qualification level. Progress through the career pathway, supported by Certificate qualifications, is provided in the table below with a particular focus on increasing the portion of ESOs that are Indigenous or identified as Aboriginal and Torres Strait Islander (ATSI).

	Number ESO Employed		Total ESOs	
ESO Career path	**Non ATSI**	**ASTI**	**Number**	**% ASTI**
ESO Technician (Cert. III)	24	3	27	11%
Qualified ESO (Cert. II)	20	9	29	31%
Trainee ESO (Undergoing Cert. I or II)	8	30	38	79%
Experienced or Relief ESO	42	22	64	34%
			158	**41%**

For more information see appendices:

ESO training and development

OUR PARTNERSHIPS

Power and Water understands that continuous improvement of services is achieved through strategic partnerships with government and key organisations. More information on other key partnerships established through regulatory relationships, service agreements and research and development is provided below.

REGULATORY RELATIONSHIPS

Power and Water maintains regulatory partnerships with the following departments and agencies:

- The **Department of Health** (DoH) regulates drinking water quality in the Northern Territory. Power and Water works very closely with the Chief Health Officer to establish and review monitoring programs to verify water quality, incident response protocols and proposed actions to improve infrastructure for extraction, treatment, storage and distribution of potable water. The Memorandum of Understanding between Power and Water and the Department of Health documents the commitment by both parties to providing quality drinking water. The MoU confirms the Australian Drinking Water Quality Guidelines as the key reference for water quality management in Major Remote Towns and remote communities. This *Indigenous Essential Services Annual Report 2011-12* is provided to the Chief Health Officer in compliance with regulatory obligations.

- The **Department of Land Resource Management** (DLRM) administers the *Water Act*, which provides for the investigation, allocation, use, control, protection, management and administration of water resources, and related purposes. Power and Water works with DLRM to obtain licences and report on water extraction from production required water sources.
- The **Northern Territory Environment Protection Authority** (NT EPA) is an independent corporation established under the Northern Territory Environment Protection Authority Act. The NT EPA is responsible for providing advice on the environmental impacts of development proposals and policy advice and regulatory services to provide for effective waste management, pollution control and sustainable practices, including discharges into waterways from wastewater treatment ponds.

SERVICE AGREEMENTS

On 1 July 2013 the 'Agreement for the Provision of Essential Services to Nominated Indigenous Communities' (the Agreement) was signed between IES Pty Ltd and the Northern Territory Government, represented by Department of Regional Development and Women's Policy for the next three years.

The objectives of the agreement are to provide:

- reliable utility services to the nominate remote communities
- effective management of the assets including asset optimisation and repair and maintenance programs taking into account whole of life costs
- efficient financial management, through a coordinated approach to least cost provision of utility services ensuring value for money consideration, works programming and repair and maintenance programs
- support to regional development and Indigenous employment and training

Power and Water and the Department of Regional Development and Women's Policy work in close partnership to deliver services. The purchase of additional services by the Department of Regional Development and Women's Policy is on a fee-for-service basis.

Ownership of electricity, water and sewerage assets is vested in IES Pty Ltd. The agreement with the Northern Territory Government establishes the services to be provided and specifies service level guidelines.

RESEARCH AND DEVELOPMENT

As part of the continuous improvement of services and innovation, Power and Water partners and participates in a number of research and development initiatives. Key initiatives undertaken during 2012-13 include:

- commencement of the Daly River Solar Research Project, funded by the Australian Renewable Energy Agency (ARENA). The 18-month project involves researching and developing methods to enable higher solar energy penetration in diesel mini-grids, focussing on generator optimization and load management opportunities, based on a case study of Daly River. For further information on the project refer to the Renewable energy in the appendix.

- establishing the "Validation of maturation ponds in order to enhance safe and economical water recycling" project, in partnership with Charles Darwin University (CDU) as part of a larger national study led by Griffith University. Power and Water will support a post-doctorate research position at CDU to undertake field sampling and validation of one of the IES waste stabilisation ponds. The project will help us assess the risks and impacts associated with remote wastewater treatment systems and understand the risks associated with reusing or recycling treated wastewater. The expected outcomes include new techniques for determining the treatment efficacy of ponds; a user-friendly design, operation and maintenance model; and an evidence-based, decision-support tool for assessing potential human and ecological risks associated with reuse.

OUR GOVERNANCE

Indigenous Essential Services Pty Ltd is a wholly owned, not-for-profit subsidiary of Power and Water Corporation. IES has its own governance model, requirements and Board of Directors who are also members of the Power and Water Corporation Board of Directors. As of 30 June 2013 the Board members were:

Mr Michael Burgess (Chairman) BEng, FIE(Aust)

Mr Burgess has over 30 years' experience working in the Territory and has expertise across water and electricity supply, wastewater and sustainable natural resource management. Living and working in Darwin, Katherine and Alice Springs, Mr Burgess has been involved in the development of major infrastructure projects and strategies to improve essential services in urban and remote areas of the Northern Territory. In recent years, he served as the Chief Executive of the Department of Chief Minister, the Department of Local Government, Housing and Sport, the Department of Business Economic and Regional Development and the Department of Business Industry and Resource Development. He has also served on the boards of various NT authorities and research institutions, including the Darwin Waterfront Corporation, the Tropical Savannas Cooperative Research Centre (CRC), the Darwin Port Corporation, the NT Land Development Corporation, the Major Events Company, the Conservation Land Corporation and the Tourism NT Advisory Board. Mr Burgess joined the Power and Water Corporation Board in March 2013.

Mrs Jennifer Prince

Mrs Prince commenced with the Department of Health in 1979 where she worked in health policy and hospital management. She transferred to Treasury in 1985 and was responsible for intergovernmental finance and budget policy. In 1997 she was appointed as Deputy Under Treasurer and was the Territory's Under Treasurer from 2002 until 2012. In this role, Mrs Prince was the prime advisor to the Northern Territory Government on financial, economic, and intergovernmental financial issues as well as economic regulatory matters. She joined the Power and Water Corporation Board in March 2013.

Mr John Baskerville

Mr Baskerville joined Power and Water Corporation as Managing Director in March 2013. He has extensive operational and technical experience relevant to the Corporation. After managing the Ben Hammond workshops for the NT Electricity Commission, he led the establishment of the Power and Water Authority (PAWA) in Alice Springs in 1984. During his 25 years in Central Australia, he served 22 years as the Chief Minister's regional Executive Director. This role required leadership across several key agencies including PAWA, the Department of Transport and Works and the Department of Chief Minister with a strategic focus on the regions. More recently, Mr Baskerville played a pivotal role in the 'Alice in 10' initiative, which led to the development of the Alice Springs Convention Centre and Desert Knowledge Australia.

FUNDING ARRANGEMENTS

In 2012-13 revenue collected from the sale of electricity, water supply and sewerage services was $35.7 million (2012: $28.2 million). Total revenue for 2012-13 was $196.7 million. This included $55.0 million of recurrent grant funding (2012: $56.0 million) and $46.2 million of capital grant funding (2012: $38.3 million) which was received from the Northern Territory Government. The capital grant is used to replace existing assets and maintain service standards.

Major cost drivers over the 2012-13 financial year resulted from:

- A tariff increase from 1 January 2013 impacted sales revenue which resulted in a favourable variance of $5.06 million which was due to electricity ($3.49 million), water ($1.06 million) and sewerage ($0.51 million).
- Distillate was unfavourable to budget by $4.29 million, the 2012-13 distillate budget matches the level of funding as per the Treasury Model and does not reflect the true cost of distillate for the financial year.
- Repairs and Maintenance costs were above budget by $0.53 million, the budget reflects the level of funding provided under the Treasury Model and this can result in constraints being applied to limit the overspend.

APPENDICES:

FINANCIAL STATEMENTS

PROVIDING RELIABLE POWER

RENEWABLE ENERGY

PROVIDING SAFE WATER

WATER QUALITY TEST RESULTS

EFFECTIVE SEWERAGE SERVICES

WATER AND ENERGY DEMAND MANAGEMENT

REMOTE DEVELOPMENT SERVICES

REMOTE MONITORING AND CONTROL

ESO TRAINING AND EMPLOYMENT

Indigenous Essential Services Pty Limited
(ACN 105 269 636)

FINANCIAL STATEMENTS

For the Year Ended

30 June 2013

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DIRECTORS' REPORT
Indigenous Essential Services Pty Limited for the year ended 30 June 2013

The directors present their report together with the financial report of the Indigenous Essential Services Pty Limited (the Company) for the year ended 30 June 2013 and the auditor's report thereon.

Directors

The directors of the Company at any time during or since the end of the financial year were:

Mr Michael Burgess	Director since 28 March 2013; Appointed Chairman 28 March 2013.
Ms Jennifer Prince	Director since 28 March 2013.
Mr John Baskerville	Director since 28 March 2013.
Mr Mervyn Davies	Director since 4 May 2011; Resigned on 28 March 2013.
Mr Michael Hannon	Director since 1 August 2009; Resigned on 28 March 2013.
Ms Judith King	Director since 26 June 2003; Appointed Chairman 1 July 2007; Resigned on 26 October 2012.
Mr Andrew Macrides	Director since 1 July 2007; Resigned on 28 March 2013.

Company Particulars

Indigenous Essential Services Pty Limited is an Australian proprietary company, incorporated and operating in Australia.

Principal Registered Office and Principal Place of Business:	Level 2 Mitchell Centre 55 Mitchell Street Darwin NT 0800
Company Secretary:	Mr Kelvin Strange

Principal Activities

The Company was formed on 26 June 2003 and commenced operations on 1 July 2003.

During the course of the financial year the principal activities of the Company as a not-for-profit entity were to provide electricity, water and sewerage services to remote Indigenous communities in the Northern Territory.

Controlling Entity

The Company's controlling entity is the Power and Water Corporation, a government owned corporation pursuant to the *Government Owned Corporation Act 2001.* In this report, the controlling entity is referred to as Power and Water.

Operating and Financial Review

The Company's net profit for the period of $90,239,186 was higher than last year's (2012: $25,908,420) principally due to the receipt of gifted assets and additional capital funding being spent during the course of the financial year.

Gifted assets totalling $57,800,903 were received from the Department of Housing, NTG Land Servicing and Essential Services Program, and the National Partnership Agreement for Remote Indigenous Housing (DOH) as part of the NTG Strategic Indigenous Housing and Infrastructure Program (SIHIP). The gifted assets' market value has been recognised as revenue in the profit and loss and the assets added to the fixed asset register in the balance sheet.

DIRECTORS' REPORT
Indigenous Essential Services Pty Limited for the year ended 30 June 2013

Changes in state of affairs

In the opinion of the directors, other than the matters mentioned above there were no significant changes in the state of affairs of the Company that occurred during the financial year under review.

Dividends

As a not-for-profit entity the Company paid no dividends during the financial year (2012: nil).

Environmental Regulation

The Company's operations are subject to various environmental regulations under both Commonwealth and Territory legislations.

The Company regularly monitors compliance with environmental regulations. The directors are not aware of any significant breaches during the period covered by this report.

Events Subsequent to Reporting Date

There has not arisen in the interval between the end of the financial year and the date of this report any item, transaction or event of a material or unusual nature likely, in the opinion of the directors of the Company, to affect significantly the operations of the Company, the results of those operations, or the state of affairs of the Company in future financial years.

Future Developments

At the date of this report, there are no developments in the operations of the Company that, in the opinion of the directors, are likely to significantly impact the Company during the 2014 financial year.

A purchaser/provider agreement between the Company and the Northern Territory Government for the provision of water supply, sewerage and electrical services to remote Indigenous communities in the Northern Territory has been established for a period of three years from 01 July 2013 to 30 June 2016.

Lead Auditor's Independence Declaration Under Section 307C of the *Corporations Act 2001*

The lead auditor's declaration of independence is set out on page 6 of the financial report.

Indemnification and Insurance of Directors and Officers

Indemnification

The Northern Territory Government has indemnified the directors of IES Pty Limited's controlling entity Power and Water as well as the directors of Power and Water's wholly controlled entities for all liabilities that may arise from their position, except where the liability is incurred or arises out of actual dishonesty on the part of the director. The indemnity covers the full amount of any such liabilities, including costs and expenses.

Insurance Premiums

The following insurance policies were purchased by Power and Water to cover its directors and officers, and those of its subsidiaries. In accordance with normal commercial practices, under the terms of the insurance contracts, the nature of the liabilities insured against and the amount of premiums are confidential.

Group Personal Accident Insurance

Professional Indemnity Insurance

Directors' and Officers' Liability

This report is made in accordance with a resolution of Directors pursuant to s.298(2) of the Corporations Act 2001.

Mr Michael Burgess
Director and Chairman

Mr John Baskerville
Managing Director

Dated at Darwin this 30th day of September 2013

DIRECTORS' DECLARATION
Indigenous Essential Services Pty Limited for the year ended 30 June 2013

In the opinion of the directors of Indigenous Essential Services Pty Limited ("the Company"):

(a) the financial statements and notes, set out on pages 9 to 24, are in accordance with the *Corporations Act 2001*, including:

  (i) giving a true and fair view of the financial position of the Company as at 30 June 2013 and its performance for the year ended on that date; and

  (ii) complying with Accounting Standards in Australia; and

(b) there are reasonable grounds to believe that the Company will be able to pay its debts as and when they become due and payable.

Signed in accordance with a resolution of directors made pursuant to s.295(5) of the Corporations Act 2001.

Mr Michael Burgess
Director and Chairman

Mr John Baskerville
Managing Director

Dated at Darwin this 30th day of September 2013

AUDITOR-GENERAL

The Board of Directors
Indigenous Essential Services Pty Limited
Level 2, Mitchell Centre
55 – 59 Mitchell Street
Darwin NT 0800

30 September 2013

Dear Members of the Board,

Indigenous Essential Services Pty Limited

In accordance with section 307C of the *Corporations Act 2001*, I am pleased to provide the following declaration of independence to the directors of Indigenous Essential Services Pty Limited.

As auditor for the audit of the financial statements of Indigenous Essential Services Pty Limited for the financial year ended 30 June 2013, I declare that to the best of my knowledge and belief, there have been no contraventions of:

1. the auditor independence requirements of the *Corporations Act 2001* in relation to the audit; and
2. any applicable code of professional conduct in relation to the audit.

Yours sincerely,

F McGuiness
Auditor-General for the Northern Territory

Auditor-General

Independent Auditor's Report
to the Members of Indigenous Essential Services Pty Limited
Year ended 30 June 2013

I have audited the accompanying financial report of Indigenous Essential Services Pty Limited ("the Company"), which comprises the statement of financial position as at 30 June 2013, the statement of profit and loss and other comprehensive income, the statement of cash flows and the statement of changes in equity for the year ended on that date, notes comprising a summary of significant accounting policies and other explanatory information, and the directors' declaration as set out on pages 10 to 25.

Directors' Responsibility for the Financial Report

The directors of the company are responsible for the preparation of the financial report that gives a true and fair view in accordance with Australian Accounting Standards and the *Corporations Act 2001* and for such internal control as the directors determine is necessary to enable the preparation of the financial report that is free from material misstatement, whether due to fraud or error.

Auditor's Responsibility

My responsibility is to express an opinion on the financial report based on my audit. I conducted my audit in accordance with Australian Auditing Standards. Those standards require that I comply with relevant ethical requirements relating to audit engagements and plan and perform the audit to obtain reasonable assurance whether the financial report is free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial report. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial report, whether due to fraud or error. In making those risk assessments, the auditor considers internal control, relevant to the entity's preparation of the financial report that gives a true and fair view, in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the entity's internal control. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of accounting estimates made by the directors, as well as evaluating the overall presentation of the financial report.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my audit opinion.

Auditor's Independence Declaration

In conducting my audit, I have complied with the independence requirements of the *Corporations Act 2001*. I confirm that the independence declaration required by the *Corporations Act 2001*, which has been given to the directors of Indigenous Essential Services Pty Limited, would be in the same terms if given to the directors as at the time of this auditor's report.

Opinion

In my opinion, the financial report of Indigenous Essential Services Pty Limited is in accordance with the *Corporations Act 2001*, including:

a) giving a true and fair view of the company's financial position as at 30 June 2013 and of its performance for the year ended on that date; and

b) complying with Australian Accounting Standards and the *Corporations Regulations 2001.*

F McGuiness
Auditor-General for the Northern Territory
Darwin, Northern Territory

30 September 2013

Statement of Profit and Loss and Other Comprehensive Income

Indigenous Essential Services Pty Limited for the year ended 30 June 2013

	Note	2013 $	2012 $
Continuing Operations			
Revenue from sale of goods	3 (a)	33,224,366	26,197,330
Revenue from rendering of services	3 (b)	103,791,985	96,310,618
Interest revenue		1,249,216	2,076,800
Gifted assets		57,800,903	-
Other Income	3 (c)	596,273	605,074
Total revenue and income		196,662,743	125,189,822
Raw materials and consumables used		40,649,519	35,428,434
Depreciation and amortisation expenses		15,525,087	13,455,146
Finance costs		5,647	-
Other expenses	3 (d)	50,243,304	50,397,822
Surplus for the year from continuing operations		90,239,186	25,908,420
Surplus for the year		**90,239,186**	**25,908,420**
Other comprehensive income		-	-
Total comprehensive income for the year		**90,239,186**	**25,908,420**
Surplus attributable to Owner of the Company		90,239,186	25,908,420
Comprehensive income attributable to Owner of the Company		90,239,186	25,908,420

The Statement of Profit and Loss and Other Comprehensive Income is to be read in conjunction with the notes to the financial statements.

Statement of Changes in Equity

Indigenous Essential Services Pty Limited for the year ended 30 June 2013

	Note	2013 $	2012 $
Contributed Equity			
Balance at the beginning of the year		10	10
Balance at the end of the year	10	10	10
Retained Earnings			
Balance at the beginning of the year		236,574,850	210,666,430
Surplus for the year		90,239,186	25,908,420
Other comprehensive income		-	-
Balance at the end of the year	11	326,814,036	236,574,850
Total equity		**326,814,046**	**236,574,860**

The statement of changes in equity is to be read in conjunction with the notes to the financial statements.

Statement of Financial Position

Indigenous Essential Services Pty Ltd as at 30 June 2013

	Note	2013 $	2012 $
CURRENT ASSETS			
Cash and cash equivalents	4 (a)	50,934,826	55,266,383
Trade and other receivables	5	292,009	8,304,577
Inventories	6	7,029,338	6,799,437
Other assets		26,567	11,674
Total current assets		58,282,740	70,382,072
NON-CURRENT ASSETS			
Property, plant and equipment	7	327,857,291	229,757,150
Total non-current assets		327,857,291	229,757,150
Total assets		386,140,031	300,139,222
CURRENT LIABILITIES			
Trade and other payables	8	51,291,118	63,564,363
Finance lease liability	9	714,536	-
Total current liabilities		52,005,654	63,564,363
NON-CURRENT LIABILITIES			
Finance lease liability	9	7,320,331	-
Total non-current liabilities		7,320,331	-
Total liabilities		59,325,985	63,564,363
Net assets		326,814,046	236,574,860
EQUITY			
Contributed equity	10	10	10
Retained earnings	11	326,814,036	236,574,850
Total equity		326,814,046	236,574,860

The statement of financial position is to be read in conjunction with the notes to the financial statements.

Statement of Cash Flows

Indigenous Essential Services Pty Limited for the year ended 30 June 2013

	Note	2013 $	2012 $
CASH FLOWS FROM OPERATING ACTIVITIES			
Receipts from customers		36,569,613	28,601,210
Payments to suppliers		(88,149,227)	(93,785,511)
Receipt of Government Grants		93,839,736	94,409,964
Interest received		1,330,637	2,039,274
Net cash provided by operating activities	4 (b)	43,590,759	31,264,937
CASH FLOWS USED IN INVESTING ACTIVITIES			
Proceeds from sale of property, plant and equipment		25,498	40,209
Purchase of property, plant and equipment		(46,674,067)	(38,559,709)
Net cash used in investing activities		(46,648,569)	(38,519,500)
CASH FLOWS USED IN FINANCING ACTIVITIES			
Repayment of finance leases		(1,273,747)	-
Net cash used in investing activities		(1,273,747)	-
Net increase/(decrease) in cash and cash equivalents		(4,331,557)	(7,254,563)
Cash and cash equivalents at beginning of year		55,266,383	62,520,946
Cash and cash equivalents at end of year	4 (a)	50,934,826	55,266,383

The statement of cash flows is to be read in conjunction with the notes to the financial statements.

1) Company Information

Indigenous Essential Services Pty Limited (the Company) is a not-for-profit proprietary company operating and domiciled in Australia. On 30 September 2013, Directors authorised the issue of the Company's financial report for the year ended 30 June 2013.

2) Statement of significant accounting policies

The significant accounting policies which have been adopted in the preparation of this report are:

(a) Statement of compliance

This general purpose financial report has been prepared in accordance with Accounting Standards and Interpretations and the Corporations Act 2001. Accounting Standards include Australian equivalents to International Financial Reporting Standards (A-IFRS). The Government Owned Corporations Act 2001 requires the financial statements of the Company to comply with the requirements of the Corporations Act 2001.

Adoption of new and revised Accounting Standards

In the current year, the Company has adopted all of the new and revised Standards and Interpretations issued by the Australian Accounting Standards Board (the AASB) that are relevant to its operations and effective for the current annual reporting period. Where applicable, details of the impact of the adoption of these new accounting standards are set out in the individual accounting policy notes below.

Standards and Interpretations effective for the first time in the current period

The following new and revised Standards and Interpretations have been adopted in the current period and have affected the amounts reported or the presentation/disclosure in these financial statements:

Standard or Interpretation	*Nature of Change to Accounting Policy*
AASB 101 'Presentation of Financial Statements'	Under the Amendments to AASB 101, the Statement of Comprehensive Income is renamed as the Statement of Profit and Loss and Other Comprehensive Income. Other than the above mentioned presentation changes, the application of the amendments to AASB 101 does not result in any impact on profit and loss, other comprehensive income and total comprehensive income.

There are no new or revised Standards and Interpretations adopted in these financial statements affecting the reporting results or financial position.

Standards and Interpretations issued not yet effective

At the date of authorisation of the financial report, the following Standards and Interpretations were in issue but not yet effective. The Company does not intend to adopt any of these pronouncements before their effective dates.

Standard or Interpretation	*Effective annual reporting periods beginning on or after*	*Expected to be initially applied in the financial year ending*
AASB 10 'Consolidated Financial Statements'	1 January 2013	30 June 2014
AASB 12 'Disclosure of Interests in Other Entities'	1 January 2013	30 June 2014
AASB 13 'Fair Value Measurement' and related AASB 2011-8 'Amendments to Australian Accounting Standards arising from AASB 13'	1 January 2013	30 June 2014
AASB 119 'Employee Benefits' (2011) and AASB 2011-10 'Amendments to Australian Accounting Standards arising from AASB 119 (2011)'	1 January 2013	30 June 2014
AASB 127 'Separate Financial Statements' (2011) and AASB 2011-7 'Amendments to Australian Accounting Standards arising from the consolidation and Joint Arrangements standards'	1 January 2013	30 June 2014
AASB 2012-2 'Amendments to Australian Accounting Standards – Disclosures – Offsetting Financial Assets and Financial Liabilities'	1 January 2013	30 June 2014
AASB 2012-5 'Amendments to Australian Accounting Standards arising from Annual Improvements 2009–2011 Cycle'	1 January 2013	30 June 2014
AASB 2012-10 'Amendments to Australian Accounting Standards – Transition Guidance and Other Amendments'	1 January 2013	30 June 2014
AASB 1053 'Application of Tiers of Australian Accounting Standards' and AASB 2010-2 'Amendments to Australian Accounting Standards arising from Reduced Disclosure Requirements'	1 July 2013	30 June 2014
AASB 2011-4 'Amendments to Australian Accounting Standards to Remove Individual Key Management Personnel Disclosure Requirements'	1 July 2013	30 June 2014

Standard or Interpretation	*Effective annual reporting periods beginning on or after*	*Expected to be initially applied in the financial year ending*
AASB 2012-3 'Amendments to Australian Accounting Standards – Offsetting Financial Assets and Financial Liabilities'	1 January 2013	30 June 2015
AASB 9 'Financial Instruments', and the relevant amending standards	1 January 2015	30 June 2016

(b) Basis of preparation

The financial report is prepared on a historical cost basis. Cost is based on the fair values of the consideration given in exchange for assets.

These accounting policies have been consistently applied by the Company unless otherwise stated and are consistent with those of the previous year.

The financial report is presented in Australian dollars.

(c) Use and revision of accounting estimates

In the application of the Company's accounting policies, management is required to make judgements, estimates and assumptions about carrying values of assets and liabilities that are not readily apparent from other sources. The estimates and associated assumptions are based on historical experience and other factors that are considered to be relevant. Actual results may differ from these estimates.

The estimates and underlying assumptions are reviewed on an ongoing basis. Revisions to accounting estimates are recognised in the period in which the estimates are revised if the revision affects only that period, or in the period of the revision and future periods if the revision affects both current and future periods.

(d) Revenue recognition

Revenue is recognised to the extent that it is probable that the economic benefits will flow to the Company and the revenue can be reliably measured. The following specific recognition criteria must also be met before revenue is recognised:

Sale of goods

Revenue from the sale of goods is recognised (net of discounts and allowances) when the significant risks and rewards of ownership of the goods have passed to the buyer and the costs incurred or to be incurred in respect of the transaction can be measured reliably. Risks and rewards of ownership are considered passed to the buyer at the time of delivery of goods to the customer. Sale of goods includes estimates for unbilled consumption of electricity and water as at reporting date.

Rendering of services

Revenue from the rendering of services is recognised when the service is provided, having regard for the costs incurred in providing those services.

Government grants

Revenue in the form of government grants is received from the Northern Territory Government. Government grants are assistance by the government in the form of transfers of resources to the Company in return for past or future compliance with certain conditions relating to the operating activities of the Company. Government grants also include government assistance where there are no conditions specifically relating to the operating activities of the Company other than the requirement to operate in certain regions or industry sectors.

Government grants are not recognised until there is reasonable assurance that the Company will comply with the conditions attaching to them and the grants will be received.

Where the grant relates to an expense or capital item, it is recognised initially as deferred income in the statement of financial position and recognised as income over the periods necessary to match the grant on a systematic basis to the costs that it is intended to compensate.

Interest Revenue

Interest revenue is recognised as it accrues.

(e) Finance Costs

All finance costs are recognised as an expense in the period in which they are incurred.

(f) Goods and services tax

Revenues, expenses and assets are recognised net of the amount of goods and services tax (GST), except where the amount of the GST incurred is not recoverable from the taxation authority. In these circumstances, the GST is recognised as part of the cost of acquisition of the asset or as part of the expense.

Receivables and creditors are stated with the amount of GST included. The net amount of GST recoverable from, or payable to, the taxation authority (through Power and Water) is included as a current asset or liability in the statement of financial position.

Cash flows are included in the statement of cash flows on a gross basis. The GST components of cash flows arising from investing and financing activities which are recoverable from, or payable to, the taxation authority (through Power and Water) are classified as operating cash flows.

(g) Income tax consolidation

The Power and Water Company is the head entity in a tax-consolidated group comprising all of its wholly-owned subsidiaries apart from Indigenous Essential Services Pty Limited. Indigenous Essential Services Pty Limited was removed from the National Tax Equivalent Regime effective 1 July 2003 as a not-for-profit entity.

(h) Cash and cash equivalents

Cash assets include cash on hand and at bank.

(i) Trade and other receivables

Trade and other receivables are recognised and carried at the original invoice amount less an allowance for any uncollectible amounts. Trade receivables are on 14 day terms and other receivables are on 30 day terms.

(j) Inventories

Inventories are carried at the lower of cost and net realisable value. Costs are assigned to inventory based on the weighted-average purchase cost of bringing each item to its present location and condition. Net realisable value represents the amounts expected to be realised from the use of the inventory.

(k) Property, plant and equipment

Acquisition of assets

Freehold land, buildings and plant and equipment are originally stated at cost less accumulated depreciation (apart from Freehold Land as this is not depreciated) and any accumulated impairment losses. Such cost includes, for qualifying assets, borrowing costs capitalised in accordance with the Company's accounting policy. Subsequent expenditure is capitalised only when it is probable that the future economic benefits associated with the expenditure will flow to the Company. Ongoing repairs and maintenance is expensed as incurred.

Where an asset is acquired at no cost or for nominal value, the cost is recorded at fair value as at the date of acquisition.

Depreciation and amortisation

Complex assets

The components of major assets that have materially different useful lives, are effectively accounted for as separate assets, and are separately depreciated.

Useful lives

All assets, excluding freehold land, have limited useful lives and are depreciated/amortised using the straight-line method over their estimated useful lives.

Assets are depreciated or amortised from the date of acquisition or, in respect of internally constructed assets, from the time an asset is completed and held ready for use.

Depreciation rates and methods are reviewed annually for appropriateness. When changes are made, adjustments are reflected prospectively in current and future periods only. Depreciation and amortisation is expensed.

The depreciation useful lives used for each class of asset are as follows:

Building, plant and equipment	June 2013	June 2012
Building and improvements	8 to 60 years	8 to 60 years
Plant and equipment	1 to 99 years	1 to 99 years
Intangibles	1 to 2 years	1 to 2 years

The depreciation useful lives used for each class of asset relating to finance leases are as follows:

Building, plant and equipment situated on finance leased land	June 2013	June 2012
Building and improvements	8 to 40 years	8 to 60 years
Plant and equipment	1 to 40 years	1 to 99 years
Finance leases	12 to 40 years	n/a

Impairment of assets

The carrying values of plant and equipment are assessed for indicators of impairment at each reporting date, with recoverable amounts being estimated when events or changes in circumstances indicate that the carrying value may be impaired.

The recoverable amount of plant and equipment is the depreciated replacement cost.

Depreciated replacement cost is defined as the current replacement cost of an asset less, where applicable, accumulated depreciation calculated on the basis of such cost to reflect the already consumed or expired future economic benefits of the asset.

An impairment exists when the carrying value of an asset exceeds its estimated recoverable amount. The asset is then written down to its recoverable amount.

For property, plant and equipment, impairment losses are recognised in the Statement of Profit and Loss and Other Comprehensive Income.

Derecognition and disposal
An item of property, plant and equipment is derecognised upon disposal or when no further future economic benefits are expected from its use or disposal.

Any gain or loss arising on derecognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the Statement of Profit and Loss and Other Comprehensive Income in the year in which the asset is derecognised.

(l) Intangible assets
All intangible assets are acquired separately and are carried at cost less accumulated amortisation and accumulated impairment losses. Assets are amortised from the date of acquisition or from the time the asset is held ready for use. Amortisation rates and methods are reviewed annually for appropriateness. When changes are made, adjustments are reflected prospectively in current and future periods only.

The Company doesn't have internally-generated intangible assets.

Purchased software
All purchased software items have limited useful lives and are amortised using the straight-line method over their estimated useful lives. Subsequent expenditure is capitalised only when it increases the future economic benefits embodied in the specific asset to which it relates.

(m) Payables
Trade payables and other payables are carried at amortised cost and represent liabilities for goods and services provided to the Company prior to the end of the financial year that are unpaid and arise when the Company becomes obligated to make future payments in respect of the purchase of these goods and services. Trade accounts payable are normally settled within 30 days.

(n) Financial Instruments
Financial instruments held by the Company consist of cash, trade and other receivables classified as 'loans and receivables' and payables classified as other financial liabilities measured and recognised in line with AASB 139 *'Financial Instruments: Recognition and Measurement'*. Interest revenue recognised is solely incurred by cash held.

(o) Leased Assets
The determination of whether an arrangement is or contains a lease is based on the substance of the arrangement and requires an assessment of whether the fulfilment of the arrangement is dependent on the use of a specific asset or assets and the arrangement conveys a right to use the asset.

Finance leases
Leases under which the Company assumes substantially all the risks and benefits of ownership are classified as finance leases.

Finance leases are capitalised as at the inception of the lease at the fair value of the leased property or, if lower, at the present value of the minimum lease payments. The corresponding liability to the lessor is included in the Statement of Financial Position as a finance lease obligation. Lease payments are apportioned between the finance charges and reduction of the lease liability so as to achieve a constant rate of interest on the remaining balance of the liability. Finance charges are recognised as an expense in profit or loss.

Capitalised leased assets are depreciated over the shorter of the estimated useful life of the asset and the lease term if there is no reasonable certainty that the consolidated entity will obtain ownership by the end of the lease term.

Operating leases
Operating lease payments are recognised as an expense in profit or loss on a straight-line basis over the lease term. Lease incentives are recognised in profit or loss as an integral part of the total lease expense.

		2013 $	2012 $
3	**Revenue and expenses**		
	Revenue and expenses from continuing operations		
(a)	**Sale of goods**		
	Electricity	28,809,524	23,064,554
	Water	4,414,842	3,132,776
		33,224,366	26,197,330
(b)	**Rendering of services**		
	Recurrent grant	55,059,485	55,965,150
	Capital grant	46,197,892	38,274,335
	Services Rendered	2,534,608	2,071,133
		103,791,985	96,310,618
(c)	**Other income**		
	Capital contributions and recoverable works	439,452	285,374
	Net profit/(loss) on disposal of property, plant and equipment	(132,857)	(78,193)
	Other Income	289,678	397,893
		596,273	605,074
(d)	**Other expenses**		
	Repairs and maintenance	15,050,290	16,063,062
	Direct personnel costs	14,955,356	14,145,302
	Agents - Community Contract Fees	8,660,179	7,699,904
	Other	11,577,479	12,489,554
		50,243,304	50,397,822

	2013 $	2012 $
4 Cash and cash equivalents		
(a) Reconciliation of cash		
Cash at the end of the financial year as shown in the Statement of Cash Flows is reconciled to the related items in the Statement of Financial Position as follows:		
Cash at bank	50,934,826	55,266,383
The weighted average interest rate on cash assets at 2013 is 2.43% (2012 : 4.08%)		
(b) Reconciliation of net surplus to net cash flows from operations		
Net Surplus	90,239,186	25,908,420
Adjustments for:		
Depreciation	15,525,087	13,455,146
Contributed assets provided free of charge	(57,800,903)	-
Net (profit)/loss on disposal of property, plant and equipment	132,857	78,193
Changes in assets and liabilities		
(Increase)/decrease in inventories	(229,900)	(908,406)
(Increase)/decrease in trade and other receivables	8,012,567	(6,564,905)
(Increase)/decrease in prepayments	(14,891)	(11,674)
(Decrease)/increase in trade and other payables	(12,273,244)	(691,837)
Net cash flows from operating activities	43,590,759	31,264,937
5 Trade and other receivables		
Current		
Interest receivable	75,731	157,151
Other debtors	216,278	8,147,426
	292,009	8,304,577
Ageing of trade and other receivables:		
0-30 days	292,009	8,281,737
30 - 60 days	-	5,390
60 - 90 days	-	-
90 + days	-	17,449
	292,009	8,304,576
Receivables at 30 June 2013 are non-interest bearing.		
6 Inventories		
Materials and stores	12,742	-
Distillate Stocks	7,016,596	6,799,437
	7,029,338	6,799,437

The cost of inventories recognised as an expense during the year in respect of continuing operations was $764,577 (2012: $712,283).

The cost of distillate recognised as an expense during the year in respect of continuing operations was $32,655,330 (2012: $29,753,460).

7 Property, plant and equipment

June 2013	Land $	Buildings $	Plant and Equipment $	Finance Leases $	Intangible Assets $	Work in Progress $	Total Property, Plant and Equipment $
Cost							
Opening Balance	21,332	43,925,266	367,527,525	-	109,428	32,599,928	444,183,479
Transfer / Restructure	-	-	-	-	-	-	-
Additions	-	3,642,865	54,158,038	9,308,613	-	46,673,782	113,783,298
Transfer From WIP	-	1,402,944	11,978,632	-	287	(13,381,576)	287
Disposals	(10,000)	-	(750,741)	-	-	-	(760,741)
Closing Balance	**11,332**	**48,971,075**	**432,913,454**	**9,308,613**	**109,715**	**65,892,134**	**557,206,323**
Accumulated Depreciation							
Opening Balance	-	(25,046,974)	(189,339,993)	-	(39,357)	-	(214,426,324)
Depreciation	-	(1,418,390)	(13,161,191)	(920,403)	(25,105)	-	(15,525,089)
Disposals	-	-	602,386	-	-	-	602,386
Closing Balance	**-**	**(26,465,364)**	**(201,898,798)**	**(920,403)**	**(64,462)**	**-**	**(229,349,027)**
Written Down Value							
Opening Balance	21,332	18,878,292	178,187,532	-	70,071	32,599,923	229,757,150
Transfer / Restructure	-	-	-	-	-	-	-
Additions	-	3,642,865	54,158,038	9,308,613	-	46,673,782	113,783,298
Depreciation	-	(1,418,390)	(13,161,191)	(920,403)	(25,105)	-	(15,525,089)
Transfer From WIP	-	1,402,944	11,978,632	-	287	(13,381,576)	287
Disposals	(10,000)	-	(148,355)	-	-	-	(158,355)
Closing Balance	**11,332**	**22,505,711**	**231,014,656**	**8,388,210**	**45,253**	**65,892,129**	**327,857,291**

June 2012	Land $	Buildings $	Plant and Equipment $	Finance Leases $	Intangible Assets $	Work in Progress $	Total Property, Plant and Equipment $
Cost							
Opening Balance	21,332	40,900,251	336,704,568	-	24,768	31,280,120	408,931,039
Transfer / Restructure	-	20,629	(35,411)	-	-	14,782	-
Additions	-	-	-	-	-	38,559,711	38,559,711
Transfer From WIP	-	3,177,023	33,993,002	-	84,660	(37,254,685)	-
Disposals	-	(172,637)	(3,134,634)	-	-	-	(3,307,271)
Closing Balance	**21,332**	**43,925,266**	**367,527,525**	**-**	**109,428**	**32,599,928**	**444,183,479**
Accumulated Depreciation							
Opening Balance	-	(24,069,918)	(180,065,362)	-	(24,768)	-	(204,160,048)
Transfer / Restructure	-	-	-	-	-	-	-
Depreciation	-	(1,149,249)	(12,291,308)	-	(14,589)	-	(13,455,146)
Disposals	-	172,193	3,016,677	-	-	-	3,188,870
Closing Balance	**-**	**(25,046,974)**	**(189,339,993)**	**-**	**(39,357)**	**-**	**(214,426,324)**
Written Down Value							
Opening Balance	21,332	16,830,333	156,639,206	-	-	31,280,120	204,770,991
Transfer / Restructure	-	20,629	(35,411)	-	-	14,782	-
Additions	-	-	-	-	-	38,559,711	38,559,711
Depreciation	-	(1,149,249)	(12,291,308)	-	(14,589)	-	(13,455,146)
Transfer From WIP	-	3,177,023	33,993,002	-	84,660	(37,254,685)	-
Disposals	-	(444)	(117,957)	-	-	-	(118,401)
Closing Balance	**21,332**	**18,878,292**	**178,187,532**	**-**	**70,071**	**32,599,923**	**229,757,150**

	2013 $	2012 $
8 Trade and other payables		
Payable to controlling entity	10,300,135	7,951,066
Other creditors and accruals	10,650,356	10,005,390
Unearned revenue	30,340,627	45,607,907
	51,291,118	63,564,363

Trade and other payables are non-interest-bearing. The policy of the Company is to settle trade payables within 30 days. The Company has financial risk management policies in place to ensure that all payables are paid within the credit timeframe.

	2013 $	2012 $	2013 $	2012 $
9 Finance lease liability				
	Minimum lease payments		**Present value of the minimum lease payments**	
Not later than one year	748,262	-	714,536	-
1 to 5 years	2,993,047	-	2,550,275	-
Later than 5 years	9,778,358	-	4,770,056	-
	13,519,667	-	8,034,867	-
Less future finance charges	(5,484,801)	-	-	-
	8,034,867	-	8,034,867	-

Leasing arrangements
The Company leased land for its existing infrastructure assets on Indigenous land in 38 communities throughout the Northern Territory. The lease terms vary between 12 and 40 years with most of them providing the Company with lease extension options.

The present value discount factor used for the minimum lease payments was 4.72% at the inception of the leases in 2013.

	2013 $	2012 $
10 Contributed equity		
Issued and paid-up share capital		
10 (2013: 10) ordinary shares of $1 fully paid	10	10
	10	10

Fully paid ordinary shares carry one vote per share and carry the right to dividends. The shares have no par value.

11 Retained earnings		
Retained earnings at beginning of year	236,574,850	210,666,430
Net surplus for the year	90,239,186	25,908,420
Retained earnings at end of the year	326,814,036	236,574,850
12 Commitments		
Capital expenditure commitments		
Contracted but not provided for and payable: within one year	19,220,841	13,993,648
13 Operating Lease Arrangements		
Payments recognised as an expense		
Minimum lease payments	865,698	838,234
	865,698	838,234

14 Financial instruments

(a) Financial risk management objectives and policies

The Company has various financial instruments such as trade receivables and trade payables. It is, and has been throughout the period under review, the Company's policy that no trading in financial instruments shall be undertaken. The main risks arising from the Company's financial instruments are liquidity risk and credit risk. The Board of Directors reviews and agrees policies for managing each of these risks and they are summarised below.

The Company's overall strategy remains unchanged from 2012.

(b) Market Risk

The Company provides electricity, water and sewerage services to remote Indigenous communities in the Northern Territory.

The Company receives grant funding from the Northern Territory Government to construct and maintain assets required to provide electricity, water and sewerage services to remote Indigenous communities in the Northern Territory. The Company is the only provider of these services to remote Indigenous communities in the Northern Territory.

A purchaser/provider agreement between the Company and the Northern Territory Government for the provision of water supply, sewerage and electrical services to remote Indigenous communities in the Northern Territory has been established for a period of three years from 01 July 2013 to 30 June 2016.

The following table sets out the source of the Company's income.

	2013		2012	
Source of Income	$	%	$	%
Grant funding	101,257,377	52%	94,239,485	75%
Electricity	28,809,524	15%	23,064,554	18%
Water	4,414,842	2%	3,132,776	3%
Services Rendered	2,534,608	1%	2,071,133	2%
Gifted Assets	57,800,903	29%	0	0%
Capital contributions and recoverable works	439,452	0%	285,374	0%
Interest	1,249,216	1%	2,076,800	2%
Other	156,821	0%	319,700	0%
Total Revenue	**196,662,743**	**100%**	**125,189,822**	**100%**

(c) Credit risk management

Credit risk represents the loss that would be recognised if counterparties failed to perform as contracted. The credit risk on receivables of the Company that has been recognised in the Statement of Financial Position is the carrying amount net of any provision for doubtful debts.

The Company performs works on behalf of Northern Territory Government agencies and private companies on a recoverable works basis. Funding for general recoverable works is obtained upfront thereby reducing credit risk associated with these transactions.

(d) Liquidity risk management

The Company's objective is to provide continued and reliable services to remote Indigenous communities in the Northern Territory within the grant funding and sales revenue it receives. Each year the Company limits expenditure to the level of grant funding and sales revenue it receives for that year.

14 Financial Instruments (continued)

(e) Commodity price risk

The Company is exposed to changes in the price of distillate which is used to power electricity generators. Each year grant funding received from the Northern Territory Government is based on an operational budget that includes an estimated cost of distillate consumption. In the event the distillate price varies upwards and the Company does not have sufficient grant funds to continue operating, the Company can apply to the Northern Territory Government for additional grant funds.

(f) Interest rate risk

Interest revenue is incurred solely on the cash balance held by the Company throughout the year. No interest expenses are incurred by the Company. Therefore the Company's exposure to interest rate risk is immaterial.

(g) Fair values

Net fair values of financial assets and liabilities approximate carrying values.

(h) Capital risk management

The Company's objectives when managing capital are to safeguard the principal business activities as a not-for-profit entity to provide electricity, water and sewerage services to remote Indigenous communities in the Northern Territory.

The capital structure of the Company consists of mainly cash and cash equivalents and equity attributable to the equity holder of the Company, comprising issued capital and retained earnings as disclosed in notes 9 and 10 respectively.

Operating cash flows are used to maintain and expand the Company's assets.

The Company is not subject to any externally imposed capital requirements.

The Company overall strategy remains unchanged from prior years.

15 Related party information

The following table provides the total amount of transactions that were entered into with related parties for the relevant financial year (for information regarding outstanding balances at year end refer to note 5 and note 8).

		Sales to related parties $	Purchases from related parties $	Amounts owed by related parties $	Amounts owed to related parties $
Related party					
Power and Water Corporation	2013	375,000	24,690,006	-	10,300,135
	2012	216,153	17,662,401	-	7,951,066
Northern Territory Government	2013	101,696,832	826,171	51,010,557	27,855,580
	2012	94,524,860	778,611	62,488,340	45,045,079

(i) The controlling entity of the Company is Power and Water Corporation, a government owned corporation pursuant to the *Government Owned Corporations Act 2001*. Power and Water Corporation is wholly owned by the Northern Territory Government.

(ii) The Company purchases electricity, water and sewerage services from Power and Water Corporation's infrastructure for remote Indigenous communities that are able to be connected to this infrastructure rather than requiring stand alone infrastructure. In addition, the Company purchases labour, accounting, computing, human resources, secretarial services and utility services for its operations from Power and Water Corporation.

(iii) The Company receives operational and capital grants from the Northern Territory Government enabling it to provide electricity, water and sewerage services to remote Indigenous communities. The Company also receives recoverable works funds for specific projects undertaken on behalf of the Northern Territory Government and unrelated third parties.

16 Economic dependency

The Company's revenue is derived from two main sources as follows:

	2013 %	2012 %
Revenue derived from the Northern Territory Government	81%	75%
Revenue from provision of utility services	19%	25%
	100%	100%

17 Auditor's remuneration

	2013 $	2012 $
Audit Services:		
Auditors of the Company - NT Auditor-General	35,940	29,316

18 Director and executive disclosures

Directors

The names of each person holding the position of director within Indigenous Essential Services Pty Limited during the financial year are listed in the Directors' report.

Directors do not receive any compensation for their directorship. No director has entered into a material contract with the Company since the end of the previous financial year and there were no material contracts involving directors' interest subsisting at year-end.

Compensation of key management personnel

Indigenous Essential Services Pty Ltd has no employees.

19 Events after the reporting period

After the reporting period and before the date of this report, one further finance lease has been executed between the Company and the Office of Township Leasing on behalf of the Angurugu community.

There has not arisen in the interval between the end of the financial year and the date of this report any other item, transactions or event of a material or unusual nature likely, in the opinion of the directors of the Company, to affect significantly the operations of the Company, the results of those operations, or the state of affairs of the Company in future financial years.

Providing reliable power

The demand for electricity is increasing steadily, particularly in major remote towns where various government initiatives are delivering additional housing, infrastructure and services. In addition, the increasing costs of operating stand–alone power stations and rising diesel fuel costs continue to impact the costs of delivering electricity services in remote areas.

Power and Water has a three-pronged approach to ensure reliable power supplies, meet growing demands and minimise the financial cost and environmental impact of its operations.

1. Ensure there is enough power available

At each power station there are up to four diesel generators, the size of which is chosen to match the daily and annual power needs of the community.

The generators are sized to meet the demand with the largest generator offline, which can happen for routine maintenance or as a result of a fault. As the communities grow and need more power, the smallest generator is upgraded with a larger generator to maintain this capability. This allows each generator to operate within its optimal range, using the least amount of diesel fuel.

The generators that are removed are relocated to other sites that require upgrading. This power station upgrade and generator relocation program requires annual evaluation of over 170 generators to ensure that each power station operates efficiently, return on capital investment is maximised and demand is met.

Power and Water has always worked to improve key power station infrastructure in all of its communities, including:

- Constructing new power stations;
- Upgrading control systems with technological advances;
- Installing larger generator capacity to keep up with demand growth;
- Increasing diesel fuel storage capacity and upgraded bunding consistent with national standards

Power stations are managed through a fully automated control system that brings generators online as the load increases or decreases to ensure each is operating within its optimal range to maximise fuel efficiency and engine life. In the event of a generator failure or fault on the power distribution network, these control systems can be accessed remotely to maintain electricity supply to as many customers as possible.

Diesel is the primary source of fuel for remote power stations and maintaining fuel reserves at each community is a major logistical feat. Fuel storage at each location is determined considering the fuel efficiency of the generators, the method of delivery and how often they can be made.

Power and Water works closely with fuel contractors to overcome distance, access limitations and extreme climatic conditions to ensure the right amount of fuel is delivered at the right time and cost-effectively.

This year 30.8 million litres of diesel fuel was transported to remote Territory power stations

2. Maximising operational efficiencies

Power and Water works to generate and distribute electricity to its customers at the lowest cost possible.

Through regular monitoring, we determine where efficiency gains can be achieved toward our target of generating at least one kilowatt-hour of electricity for each 0.28 litres of diesel fuel used. When new generators are required or when generators have reached the end of their economic life, we replace them with modern, more efficient systems.

Power and Water has a continuous program to decommission less efficient power stations by connecting power distribution networks between communities or to urban centers where communities are geographically close. To date, this has lead to the decommissioning of five power stations.

In recent years the cost of diesel fuel has increased dramatically. As a result, it has become more cost effective to switch to alternative energy sources in some locations. We monitor the cost of alternative energy sources to identify opportunities to maintain a least cost energy supply mix.

Power and Water is committed to reducing carbon emissions from electricity generation by increase the use of renewable energy and gas generated electricity to replace more carbon intensive fuel generation.

Power and Water has established eight solar-diesel hybrid power stations supplying electricity to eleven communities. We are also looking to switch communities to gas-generated power where possible by connecting to the Darwin-Katherine, Tennant Creek or Alice Springs electricity networks or by converting power stations close to gas pipelines.

Power and Water aims to build solar systems where they can be economically integrated with diesel power station. Solar-diesel hybrid systems of this type provide long-term cost savings by replacing diesel fuel used for energy generation with renewable energy.

3. Meeting environmental and safety obligations

In 2013, three new solar systems were installed in Ti Tree, Kalkarindji and Lake Nash along with a wind system in Lake Nash. Works progressed on the gas power station for Wadeye and construction commenced on the Hermannsburg to Alice Springs powerline. These projects all contribute to reducing the environmental impact of our operations via reducing the reliance on diesel fuel for power generation.

To ensure we meet our environmental and safety obligations, Power and Water continues to adopt best practice operational procedures suitable to the unique and challenging operating environment. These procedures have been supported with business improvements which help ensure that we continue to maintain the safety of power station operators.

Measures include the removal of asbestos from a further two communities in 2013 and the replacement of lead acid batteries with maintenance-free batteries. Suitable fuel storage infrastructure is required to comply with relevant standards and licensing.

Power and Water is upgrading fuel storage bunding and other containment measures to prevent release of fuel to the environment in the event of a spill.

In addition, the personnel access and refueling procedure has been improved to further protect the safety of operators. The program has been prioritised to upgrade the highest risk sites, with over 75 per cent of sites now compliant with Australian fuel storage standards.

For more information on Power and Water's initiatives about integrating alternative energy sources see:

Renewable energy

Renewable Energy

Power and Water has been increasing its capacity and capability in renewable energy electricity generation and in particular, diesel-solar hybrid power station integration. Renewable energy power stations have been integrated with diesel power stations to supply 11 remote communities and reduce the amount of diesel consumed for electricity generation.

Power and Water is working to reduce reliance on fossil fuels for electricity generation in remote communities to

- reduce the carbon footprint,
- provide long-term least cost electricity services; and
- manage diesel price volatility.

Renewable energy power stations

TKLN Renewable Energy Project

In January 2013, the Ti Tree, Kalkarindgi and Alpurrurulam high penetration renewable energy power stations were commissioned. Almost 1 megawatt of solar capacity was constructed across the three communities and a 45 kilowatt wind system at Lake Nash.

An innovative approach to integrating the renewable systems with the diesel power stations was employed to achieve very high levels of solar penetration. The systems provide up to 85% of community power supply and 35% of community daily energy demand. This project was delivered under a Power Purchase Agreement between Power and Water and Epuron Pty Ltd. It received grant funding from the Northern Territory and Australian Governments.

Solar Concentrating Power Stations

In 2011, Power and Water purchased existing concentrating photovoltaic solar dish power stations at Lajamanu, Hermannsburg and Yuendumu. These are very sophisticated systems employing highly efficient solar cell technology. All systems are operational and since that time we have been working to upgrade the systems to improve their performance. System capacity totals 720 kilowatts across the three communities.

Power and Water is leading new approaches to Solar Diesel Power Station integration

Bulman Solar System

The 55 kilowatt Bulman Solar Power Station was the first of two facilities built in 2002 as part of the "*NT Solar PV Commercialisation Pilot Project*.

The diesel/PV peak lopping principle employed at Bulman was believed to be the first such application in the world. The project aimed to demonstrate the commercial viability of peak lopping using an optimal mix of solar and diesel technology.

Daly River Solar Research Project

The 18-month project involves researching and developing methods to enable higher solar energy penetration in diesel mini-grids, focusing on generator optimization and load management opportunities, based on a case study of Daly River. Learnings will be applied to existing and future solar/diesel mini-grids to improve operational efficiency and increase diesel fuel savings.

An open-source modeling tool has been developed to simulate solar-diesel power system operation and evaluate its technical and financial performance. The model has been validated against real world systems and is a valuable reference tool for planning, design and optimization.

A Solar/Diesel Mini-Grid Handbook being developed will provide information about key design and operational factors that need to be considered when implementing solar/diesel hybrid systems in remote Australia.

Providing safe water

Power and Water obtains water from 70 isolated natural groundwater and surface water sources to supply water services to remote communities. These natural water sources vary significantly in quantities and qualities of the water available. The variation presents a significant challenge in ensuring an adequate amount of safe water is available at residential taps.

Power and Water works to provide safe drinking water to residents spread across 1.3 million square kilometers while minimising the financial cost and environmental impact of our operations.

1. Ensuring adequate water is available

Most of the water supplied to remote communities comes from underground aquifers (groundwater sources), pumped to the surface via production bores. The number of bores at each community varies depending on the amount of water available and the demand. Ideally, production bores are able to pump enough water to meet the needs of the community, including in the event of a failure or routine maintenance of the largest production bore.

However, as the communities grow and need more water, Power and Water has to locate new water sources and / or work with the community to reduce water demand. Power and Water routinely searches for and develops water sources. This may involve drilling more production bores within the existing aquifer or integrating new water sources into the water supply system.

New sources are required when the existing water source is at risk of over-extraction which could impact the quantity or quality of water or result in the resource drying up altogether. Approximately one third of the water sources used to supply remote communities are at risk of over-extraction.

Drilling new monitoring bores

Some water from aquifers in Central Australia is believed to be more than 10,000 years old while groundwater in the Top End may only be a few years old and are recharged each year

Power and Water manages a robust water source monitoring program to reduce the risk of over-extraction. This is carried out by routinely collecting water level data on 232 bores to determine their security and the impact of current extraction on the long-term viability of the water source. This data is used to inform the operation of the production bores and for replacement planning and prioritisation of water efficiency programs.

2. Protecting public health

Over the last five years, Power and Water has applied a "multiple barrier" approach to drinking water delivery. Multiple barriers are in place so that if one fails, other systems still prevent or reduce potentially harmful contaminants from reaching consumers. This approach reflects more than a century of service providers experience in supplying water and supporting public health practices. Ensuring that water supplies are continuously disinfected is essential to reducing consumers' exposure to disease-causing micro-organisms. Chlorine is the preferred purifier as it is simple to use, destroys pathogenic micro-organisms effectively and provides protection through the distribution system.

Chlorine levels are maintained in the optimum range high enough to combat any microbiological contamination and low enough to avoid affecting the taste of the water.

Power and Water has installed nearly 40 new automatic disinfection systems (chlorination, ultraviolet) and Supervisory Control and Data Acquisition (SCADA) systems to allow online monitoring. We will continue to replace older disinfection systems with modern systems to improve the reliability and efficiency of disinfection.

In addition to potential microbiological contamination, the interaction between the water in the aquifer and the surrounding geology can result in a wide range of naturally occurring minerals and deposits in the water. When the water is stored for longer periods in deeper aquifers this can result in 'rich' water chemistry. In some communities these characteristics exceed the levels recommended in the Australian Drinking Water Guidelines (ADWG). Power and Water are installing advanced water treatment systems to improve the physical and chemical quality in the three highest priority communities. We have also developed a number of fact sheets to provide more information on aspects of water quality relevant to some communities.

Power and Water monitors the quality of drinking water supplied to consumers in all remote locations, verifying consistency with the ADWG. The program is reviewed annually in consultation with the Department of Health (DoH) and includes daily testing for chlorine residual to ensure effective disinfection and regular water sampling to test for microbiological contamination. The physical and chemical characteristics of the water are also analysed.

3. Maximising operational efficiencies and meeting safety obligations

Power and Water is introducing online monitoring at critical water supply points, allowing signals to be sent to operators immediately when problems occur. This significantly reduces response times, enabling staff to identify and address problems without necessarily having to travel to site.

The storage and handling of chemicals used to treat water supplies is subject to relevant standards. The new chlorine disinfection systems being installed are more efficient and comply with national safety and chemical standards. In the short-to medium-term, Power and Water continues to improve existing chlorine disinfection facilities until these system are replaced.

Sampling water at a public tap to check the chlorine levels of water delivered to customers.

Improvements include shade structures, safety showers for operators and bunding to contain stored chemicals to prevent release to the surrounding environment in the event of a spill.

To ensure environmental and safety obligations are met, Power and Water continues to adopt those best practise operational procedures suitable to our operational environment. These have been supported with business improvements that help ensure the safety of our water system operators through the development of emergency response procedures for the installation of the new chlorination and fluoridation systems.

For more information on water quality see:

Water quality test results

Water quality test results

Power and Water regularly tests drinking water to confirm it is in line with the Australian Drinking Water Guidelines (ADWG). The frequency of testing is outlined in the Drinking Water Quality Monitoring Program, which is developed in consultation with the Department of Health (DoH) and approved by the Chief Health Officer.

Water samples are collected by Essential Service Operators (ESOs) from particular points in the water supply system in each location and sent to laboratories for analysis. To ensure that the water samples reach the laboratory in time for testing, Power and Water charter small planes to collect samples from communities and deliver them to testing laboratories in Darwin and Alice Springs.

More than 90,000 analyses a year are carried out to determine microbiological, physio chemical, trace metal and radiological characteristics of the water so we can confirm it is safe to drink.

A charter plane collecting water quality samples

Following is an overview of the drinking water quality in each of the remote communities serviced by Power and Water. Additional information and explanation is provided on some key water quality characteristics relevant to these water supplies to assist interpretation of water quality results.

Further information can be obtained from the Australian Drinking Water Guidelines fact sheets at: http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/eh52_aust_drinking_water_guidelines_update_120710_0.pdf

Each year more than 100 charter flights occur across the Territory to collect more than 5,000 water samples

Health parameters

Health parameters are water quality characteristics that may present a risk if the consumer was exposed to concentrations above ADWG levels over a lifetime.

Arsenic in drinking water is recommended by ADWG not to exceed 0.01 mg/L.

Arsenic can occur naturally in ground and surface water through the dissolution of minerals and ores. These minerals and ores can make a significant contribution to the arsenic concentration in drinking water. Industrial effluent, atmospheric deposition (through the burning of fossil fuels and waste incineration), drainage from old gold mines, or some types of sheep dip are also sources of arsenic.

In Australia, arsenic concentrations typically range from less than 0.001 mg/L to 0.03 mg/L. Studies into the consumption of drinking water containing arsenic above 0.3 mg/L over five to 25 years have shown effects on the skin, vascular system and nervous system, with the possibility of being carcinogenic.

Barium in drinking water is recommended by ADWG to be less than 2.0 mg/L. A number of epidemiological studies have been carried out on the effects of barium in drinking water on cardiovascular disease. No adverse effects were found with barium concentrations up to 7 mg/L. In a study using a small number of volunteers, no adverse effects were observed after eight weeks' exposure to drinking water with up to 10 mg/L of barium.

Health parameters (continued)

Escherichia coli (E. coli) is a bacterial coliform excreted from the intestines of warm-blooded animals, including humans, and is an indicator of recent faecal contamination.

If *E. coli* is detected in a drinking water supply, immediate action is taken in accordance with established protocols.

Fluoride is one of the most abundant elements in the Earth's crust. It naturally occurs in groundwater supplies and is present in most food and beverage products and toothpaste.

The concentration of natural fluoride in Territory groundwater supplies depends on the type of soil and rock that the water comes into contact with. Generally, surface water sources have low natural fluoride concentrations (around <0.1 to 0.5 mg/L) and groundwater sources may have relatively high levels (range from 1-10 mg/L).

In the correct amounts, fluoride in drinking water helps build strong, healthy teeth that resist decay. The minimum fluoride for protection against dental caries is about 0.5mg/L, although about 1.0 mg/L is optimal in temperate climates. At concentrations of 1.5 to 2.0 mg/L, teeth may become mottled due to dental fluorosis.

The majority of communities in the Barkly and Southern regions have fluoride levels between 0.5 mg/L and 1.5 mg/L, with two communities very close to the guideline value and Ali Curung above the ADWG value of 1.5 mg/L (Figure 1).

Figure 1: Fluoride concentrations above ADWG value across the remote communities

Power and Water has installed a water treatment system at Ali Curung to reduce fluoride levels below the guideline of 1.5 mg/L, which is expected to be providing water during 2013-14

In contrast, most water supplies in the Northern and Katherine regions have naturally low fluoride levels due to the nature of the shallow groundwater supplies and use of surface water supplies in some communities.

Over recent years, Power and Water has begun implementing fluoridation in priority communities in conjunction with works to upgrade the disinfection systems. To date five fluoridation systems have either been installed or will be by the end of 2013.

Gas Chlorination and Fluoride Plant at Wurrumiyanga

Nitrate in Territory drinking water supplies has been partially attributed to nitrogen fixing by native vegetation and cyanobacteria crusts on soils. Termite mounds appear to be a significant nitrate source, possibly due to the presence of nitrogen-fixing bacteria in many termite species and the nitrogen-rich secretions used to build mounds.

The ADWG recommend that nitrate levels between 50 -100 mg/L are a health consideration for infants less than three months, although levels up to 100 mg/L can be safely consumed by adults.

Elevated levels of nitrate have been identified in Pmara Jutunta, Kintore and Ali Curung (Figure 2).

Figure 2: Nitrate levels between 50 – 100 mg/L

Power and Water has installed a water treatment system at Ali Curung and Kintore to reduce nitrate levels below the guideline of 100 mg/L.

Uranium is widely distributed in geological formations. It can be found in groundwater aquifers surrounded by granite rocks and pegmatites as well as in sedimentary rocks like sandstones.

Uranium occurs as three naturally occurring isotopes and under appropriate conditions can become soluble and therefore present in a region's groundwater. The transport of uranium in groundwater varies widely according to the aquifer conditions. Uranium may also be present in the environment as a result of mine tailings and the use of phosphate pesticides.

Aesthetic parameters

Aesthetic parameters are characteristics associated with the acceptability of water to the consumer in terms of appearance, taste and odour of the water.

Hardness (as calcium carbonate) is primarily the amount of calcium and magnesium ions in water and is expressed as a calcium carbonate ($CaCO_3$) equivalent. High hardness usually requires more soap to achieve lather and may lead to excessive scaling in hot water pipes and fittings.

Soft water, or water low in total calcium and magnesium ions, may also cause corrosion in pipes although this will depend on other physical and chemical characteristics such as pH, alkalinity and dissolved oxygen. The ADWG recommend hardness levels below 200 mg/L to minimise scaling in hot water systems.

The ADWG describe various degrees of hardness as:

<60 mg/L $CaCO_3$	Soft but possibly corrosive
60-200 mg/L $CaCO_3$	Good quality
200-500 mg/L $CaCO_3$	Increasing scaling problems
>500 mg/L $CaCO_3$	Severe scaling

Hard water or water with calcium carbonate levels above 500mg/L (Figure 3) may lead to excessive scaling of pipes and fittings, which can impact on infrastructure service life and indirectly impact health through impeding access to water.

Typically across the Territory groundwater supplies close to coast are described as 'soft', as the water is drawn from relatively shallow aquifers with naturally low pH and hardness levels.

Inland water supplies are often described as 'hard', as the water is stored for longer periods in deeper aquifers resulting in 'rich' water chemistry.

Figure 3: Communities with average hardness levels greater than 500 mg/L in drinking water

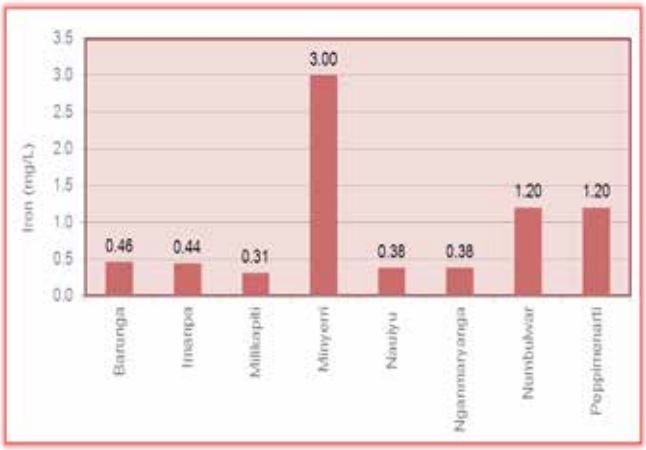
Iron has a taste threshold of about 0.3 mg/L in water and becomes objectionable above 3 mg/L.

High iron concentrations give water a rust-brown appearance and can cause staining of laundry and plumbing fittings and blockages in irrigation systems. Growths of iron bacteria, which increase the concentration of iron, may cause taste and odour problems and lead to pipe restrictions, blockages and corrosion. The concentration of iron at the tap can also be influenced by factors such as rusting iron pipes.

There are a number of communities regularly monitored for iron levels above 0.3 mg/L and a limited number above 1.0 mg/L (Figure 4).

Power and Water has identified alternative groundwater sources for Nauiyu that have reduced levels of iron and these will be developed in coming years to improve the water quality. Options to reduce iron levels in remaining communities with high levels are also being investigated. Some options include infrastructure changes to maximise iron oxidation and fall out; altering the operation of the production bores to maximise the use of those with reduced iron levels; and also preliminary assessments of water treatment plants. For instance, Peppimenarti has had infrastructure installed within the ground level storage tanks which maximise iron fall out, therefore providing cleaner water within the community.

Figure 4: Communities with an average iron concentration greater than 0.3mg/L in the distribution system



Aesthetic parameters (continued)

pH is a measure of the hydrogen ion concentration of water. It is measured on a logarithmic scale from 0 to 14. A pH of 7 is neutral, greater than 7 is alkaline and less than 7 is acidic. The ADWG recommend pH levels in drinking water should be between 6.5-8.5. Levels below 6.5 are likely to cause corrosion of pipes and fittings while levels above 8.5 can cause scaling, particularly on hot water systems.

Water sample point on a production bore.

Typically, Territory communities that rely on groundwater supplies near the coast are described as 'corrosive', as the water is drawn from relatively shallow aquifers and has naturally low pH and hardness levels.

Sodium is an essential element for humans although there is currently no agreement on the minimum amount required.

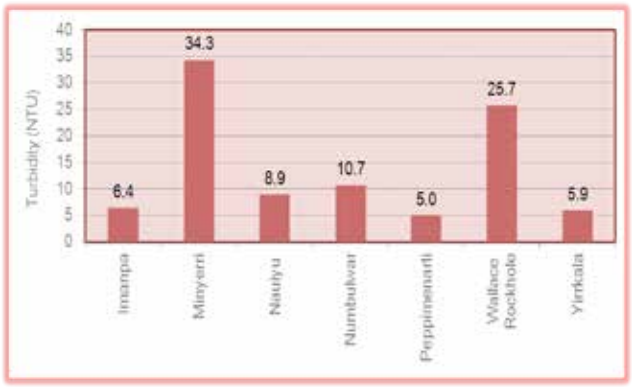
The sodium ion is widespread in water due to the high solubility of sodium salts and the abundance of mineral deposits. The ADWG recommend action on levels above 180mg/L, when the taste becomes noticeable.

Turbidity is a measure of "discolouration" of water caused by fine suspended matter such as clay or silt. The degree of "discolouration" depends on the amount, size and composition of the suspended matter.

At low levels, turbidity can only be measured by instruments, however at higher levels water has a 'muddy' or 'milky' appearance.

As a guide, 'crystal clear' water usually has a turbidity of less than 1 Nephelometric Turbidity Units (NTU), water with a turbidity of 5 NTU appears slightly muddy or milky in a glass, while at >60 NTU, it is not possible to see through the water.

Figure 4: Communities with turbidity levels above ADWG value of 5NTU



Power and Water considers turbidity when managing community disinfection systems and adjusts the disinfection doses to ensure adequate disinfection is achieved. Routine monitoring is also undertaken to check that disinfection systems are effective and safe water is being supplied.

Total dissolved solids (TDS) are small organic and inorganic particles dissolved in water that can affect how the water tastes.

TDS comprise sodium, potassium, calcium, magnesium, chloride, sulphate, bicarbonate, carbonate, silica, organic matter, fluoride, iron, manganese, nitrate and phosphate.

Water with low TDS can taste flat, while water with TDS above 500 mg/L could cause scaling in taps, pipes and hot water systems. Levels greater than 900 mg/L significantly affect taste and may also cause moderate to severe scaling.

Based on taste, the ADWG recommend TDS levels below 600 mg/L. The Guidelines provide guidance in the palatability of drinking water according to TDS concentration:

0–600 mg/L	Good
600–900 mg/L	Fair
900–1200 mg/L	Poor
>1200 mg/L	Unacceptable (unpalatable)

More information is also available from the Power and Water website:

http://www.powerwater.com.au/news_and_publications/publications/remote_communities

The specific results of water quality testing for each of the communities are provided in the following tables:

DRINKING WATER QUALITY IN NORTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	**Acacia Larrakeyah**	**Angurugu**	**Belyuen**	**Galiwinku**	**Gapuwiyak**	**Gunbalanya**
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.0009	0.0005 [5]	0.001 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]
Barium	mg/L	2	0.05 [5]	0.05 [5]	0.05 [2, 5]	0.05 [5]	0.05 [5]	0.05 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.02 [5]	0.02 [5]	0.02 [2, 5]	0.02 [5]	0.02 [5]	0.02 [5]
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.10 [5]	0.10 [5]	0.16 [2, 5]	0.10 [5]	0.10 [5]	0.10 [5]
Lead	mg/L	0.01	0.0015 [5]	0.0012 [5]	0.0016 [2, 5]	0.001 [5]	0.0066 [5]	0.0011 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [2, 5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [2, 5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	1.8 [5]	1 [5]	1.2 [2, 5]	1.4 [5]	2.5 [5]	1 [5]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	PASS	PASS	PASS	PASS
Selenium	mg/L	0.1	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.0004	0.00003	0.001 [2]	0.00002 [5]	0.00002	0.00003
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.04 [5]	0.03 [5]	0.03 [2, 5]	0.02 [5]	0.02 [5]	0.12 [5]
Chloride	mg/L	250	7	11	8 [2, 5]	12	13	7 [5]
Copper	mg/L	2	0.02 [5]	0.02 [5]	0.07 [2, 5]	0.02 [5]	0.09	0.03 [5]
Hardness	CaCO3 mg/L	200	**216**	10	17 [2, 5]	22	13	8
Iodine	mg/L	0.15	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]
Iron	mg/L	0.3	0.04 [5]	0.06 [5]	0.12 [2, 5]	0.05 [5]	0.02 [5]	0.22
Manganese	mg/L	0.1	0.006 [5]	0.011 [5]	0.009 [2, 5]	0.006 [5]	0.005 [5]	0.008 [5]
pH	pH Units	6.5-8.5	7.9	7.7	**6.3** [2]	**5.8**	**6.0**	**5.9**
Sodium	mg/L	180	5	44	7 [2]	8	8	4
Sulfate	mg/L	250	2	1	1 [2]	1	0.3 [5]	1
Total Dissolved Solids	mg/L	600	234	121	72 [2]	43	47	54
True Colour	HU	15	2.6	2.5	2.6 [2]	2.7	3.2	6.0
Turbidity	NTU	5	1.6	0.5	1.6 [2]	0.4	0.8	3.6
Zinc	mg/L	3	0.01 [5]	0.01 [5]	0.03 [2, 5]	0.01 [5]	0.05 [5]	0.02 [5]
Other Characteristics[3]								
Alkalinity	mg/L	#	218	87 [5]	25 [2, 5]	20 [5]	16 [5]	15 [5]
Bromine	mg/L	#	0.02	0.03	0.008 [2, 5]	0.02	0.02	0.02
Calcium	mg/L	#	43	3	6 [2]	7	4	2
Conductivity	µS/cm	#	435	199	60 [2]	57	60	33
Magnesium	mg/L	#	27	0.7	0.6 [2, 5]	1	0.8	0.6
Potassium	mg/L	#	1.5	0.2 [5]	3.5 [2]	1	0.1 [5]	0.2
Silica	mg/L	#	21	12	35 [2]	14	12	12
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:

**Radiological results are reported as PASS if all screening levels of gross alpha and gross beta are less than 0.5 Bq/L. If any levels are above 0.5Bq/L the annual dosage is reported as 95th percentile for large data sets (>30 datapoints) and the maximum value is reported for small datasets (<30 datapoints).*

**Radiological results also include raw water data*

**Exceedances in Bold*

LEGEND:

HU - Hazen Units

mg/L - milligrams per litre

mSv/yr - millisieverts per year

N/A - Not Available

NTU - Nephelometric Turbidity Units

µS/cm - microsiemens per centimetre

[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN NORTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	Gunyangara	Maningrida	Milikapiti	Milingimbi	Milyakburra	Minjilang
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]
Arsenic	mg/L	0.01	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [5]	0.0005 [2, 5]	0.0005 [5]
Barium	mg/L	2	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [2, 5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [2, 5]
Boron	mg/L	4	0.02 [5]	0.02	0.02	0.04 [5]	0.05	0.02 [2, 5]
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [2, 5]
Fluoride	mg/L	1.5	0.10 [5]	0.10 [5]	0.12 [5]	0.10 [5]	0.10 [5]	0.10 [2, 5]
Lead	mg/L	0.01	0.0013 [5]	0.0025 [5]	0.0015 [5]	0.0021 [5]	0.0039 [5]	0.0014 [2, 5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [2, 5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [2, 5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [2, 5]
Nitrate	mg/L	50	1.8 [5]	2 [5]	1 [2, 5]	4.3 [5]	2.1 [5]	1 [2, 5]
Annual Exposure to Radioactivity	mSv/yr	1	N/A	PASS	PASS	PASS	PASS	PASS
Selenium	mg/L	0.1	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [2, 5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]
Uranium	mg/L	0.017	0.00002 [5]	0.00005	0.00002 [5]	0.0002	0.00003	0.0001 [2]
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.02 [5]	0.02 [5]	0.03	0.06 [5]	0.02 [5]	0.09 [2, 5]
Chloride	mg/L	250	16	10	12 [5]	80	62	17 [2]
Copper	mg/L	2	0.03 [5]	0.01 [5]	0.02 [5]	0.03 [5]	0.05 [5]	0.02 [2, 5]
Hardness	CaCO3 mg/L	200	11	13	16 [2]	42	37	11 [2, 5]
Iodine	mg/L	0.15	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]
Iron	mg/L	0.3	0.05 [5]	0.06 [5]	**0.31 [5]**	0.05 [5]	0.17 [5]	0.09 [2, 5]
Manganese	mg/L	0.1	0.005 [5]	0.005 [5]	0.005 [5]	0.014 [5]	0.024 [5]	0.005 [2, 5]
pH	pH Units	6.5-8.5	6.9	**6.0**	**5.7 [2]**	**5.3**	**5.6**	**5.3 [2]**
Sodium	mg/L	180	8	5	9 [2]	44	37	12 [2]
Sulfate	mg/L	250	0.3 [5]	1	1 [2]	9	4	4 [2]
Total Dissolved Solids	mg/L	600	36	39	47 [2]	179	132	55 [2]
True Colour	HU	15	1.9	1.9	2.8 [2]	2.8	2.9	2.2 [2]
Turbidity	NTU	5	0.7	1.5	2.6 [2]	0.7	0.9	1.36 [2]
Zinc	mg/L	3	0.02 [5]	0.05 [5]	0.04 [5]	0.07	0.04 [5]	0.11 [2]
Other Characteristics[3]								
Alkalinity	mg/L	#	18 [5]	17 [5]	21 [2, 5]	15 [5]	18 [5]	16 [5]
Bromine	mg/L	#	0.02	0.02	0.02	0.2	0.1	0.05 [2]
Calcium	mg/L	#	4	4	6 [2]	9	11	3 [2]
Conductivity	µS/cm	#	60	45	56 [2]	326	244	82 [2]
Magnesium	mg/L	#	0.5	0.8	0.6 [2, 5]	5	2.6	0.7 [2]
Potassium	mg/L	#	0.2 [5]	1.2	0.5 [2, 5]	0.7	0.3	0.1 [2, 5]
Silica	mg/L	#	11	14	12 [2]	18	16	13 [2]
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]

NOTES:

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**Radiological results also include raw water data*

**Exceedances in Bold*

LEGEND:

HU - Hazen Units

mg/L - milligrams per litre

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NTU - Nephelometric Turbidity Units

µS/cm - microsiemens per centimetre

[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN NORTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	Nauiyu	Nganmarriyanga	Numbulwar	Peppimenarti	Pirlangimpi
Health Characteristics[3]							
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	**1** [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	98 [4]
Antimony	mg/L	0.003	0.0004 [2, 5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.004 [2, 5]	0.0009 [5]	0.001	0.0006 [5]	0.0005 [5]
Barium	mg/L	2	0.05 [2, 5]	0.2 [5]	0.3	0.07	0.05 [5]
Beryllium	mg/L	0.06	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.02 [2, 5]	0.03 [5]	0.04	0.04	0.02 [5]
Cadmium	mg/L	0.002	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.40 [2, 5]	0.23 [5]	0.14 [5]	0.50 [5]	0.10 [5]
Lead	mg/L	0.01	0.0012 [2, 5]	0.0011 [5]	0.001 [5]	0.0012 [5]	0.002 [5]
Mercury	mg/L	0.001	0.0001 [2, 5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [2, 5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	1.9 [2, 5]	1.5 [5]	1.1 [5]	1.1 [5]	2.3 [5]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	PASS	PASS	PASS
Selenium	mg/L	0.1	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.0001 [2]	0.00001 [5]	0.0001	0.00003 [5]	0.00001 [5]
Aesthetic Characteristics[3]							
Aluminium	mg/L	0.2	0.08 [2, 5]	0.02 [5]	0.02 [5]	0.02 [5]	0.08
Chloride	mg/L	250	7 [5]	25	27	14	9
Copper	mg/L	2	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Hardness	CaCO3 mg/L	200	129 [2]	64	193	62	5 [5]
Iodine	mg/L	0.15	0.02 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Iron	mg/L	0.3	**0.38** [2]	**0.38**	**1.2**	**1.2**	0.11
Manganese	mg/L	0.1	**0.31** [2]	**0.1** [5]	**0.2**	**0.15**	0.005 [5]
pH	pH Units	6.5-8.5	7.6 [2]	7.3	8.1	7.3	**6.1**
Sodium	mg/L	180	18 [2]	35	21	17	6
Sulfate	mg/L	250	5 [2]	11	31	3	0.3
Total Dissolved Solids	mg/L	600	193 [2]	182	283	117	27
True Colour	HU	15	4.2 [2]	3.8	5.6	3.8	5.1
Turbidity	NTU	5	**8.9** [2]	2.0	**10.7**	**5.0**	3.3
Zinc	mg/L	3	0.02 [2, 5]	0.01 [5]	0.02 [5]	0.03 [5]	0.03 [5]
Other Characteristics[3]							
Alkalinity	mg/L	#	165 [2]	99 [5]	182	84	15 [5]
Bromine	mg/L	#	0.02 [2]	0.05	0.07	0.03	0.01
Calcium	mg/L	#	28 [2]	18	61	16	2
Conductivity	µS/cm	#	334 [2]	302	484	208	37
Magnesium	mg/L	#	14 [2]	4.8	11	5	0.2
Potassium	mg/L	#	0.9 [2]	5.2 [5]	2.4	6	0.1 [5]
Silica	mg/L	#	38 [2]	36	17	25	10
Tin	mg/L	#	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:

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µS/cm - microsiemens per centimetre

[2] *95th percentile reported*

[3] *value indicates data from 2008-2013*

[4] *value includes data from 2012-2013*

[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*

DRINKING WATER QUALITY IN NORTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	Ramingining	Umbakumba	Wadeye	Warruwi	Wurrumiyanga	Yirrkala
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.0006 [5]	0.0005 [5]	0.0005 [5]	0.0006 [5]	0.0005 [5]	0.0005 [5]
Barium	mg/L	2	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]	0.05 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.02 [5]	0.02 [5]	0.02 [5]	0.02	0.02 [5]	0.02 [5]
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.10 [5]	0.10 [5]	0.20 [5]	0.10 [5]	0.23 [5]	0.10 [5]
Lead	mg/L	0.01	0.0032 [5]	0.0034 [5]	0.0015 [5]	0.0015 [5]	0.0014 [5]	0.0016 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	1.3 [5]	1 [5]	1.9 [5]	1 [5]	1.8 [5]	1 [5]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	PASS	PASS	PASS	PASS
Selenium	mg/L	0.1	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.00002	0.00002	0.0002	0.00005	0.00001 [5]	0.0001
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.02 [5]	0.02 [5]	0.07 [5]	0.06 [5]	0.02 [5]	0.15 [5]
Chloride	mg/L	250	10 [5]	33	11 [5]	40	8 [5]	16
Copper	mg/L	2	0.02 [5]	0.04 [5]	0.02 [5]	0.03 [5]	0.02 [5]	0.02 [5]
Hardness	CaCO3 mg/L	200	21	23	22	31	15	10
Iodine	mg/L	0.15	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Iron	mg/L	0.3	0.08 [5]	0.07 [5]	0.03 [5]	0.05 [5]	0.02 [5]	0.14 [5]
Manganese	mg/L	0.1	0.005 [5]	0.011 [5]	0.008 [5]	0.006 [5]	0.005 [5]	0.005 [5]
pH	pH Units	6.5-8.5	**5.7**	**5.6**	**5.6**	**5.3**	**5.9**	**5.6**
Sodium	mg/L	180	6	21	6	21	5	7
Sulfate	mg/L	250	0.3	5	1	7	0.4	2
Total Dissolved Solids	mg/L	600	48	93	37	95	34	37
True Colour	HU	15	2.0	2.2	2.4	2.3	2.2	2.0
Turbidity	NTU	5	0.8	1.4	2.5	1.0	1.3	**5.9**
Zinc	mg/L	3	0.02 [5]	0.03 [5]	0.02 [5]	0.04 [5]	0.04 [5]	0.03 [5]
Other Characteristics[3]								
Alkalinity	mg/L	#	18 [5]	20 [5]	19 [5]	19 [5]	20 [5]	20 [5]
Bromine	mg/L	#	0.007 [5]	0.08	0.01	0.08	0.01	0.02
Calcium	mg/L	#	7	5	8	7	6 [5]	3
Conductivity	µS/cm	#	48	144	44	168	38	57
Magnesium	mg/L	#	1	2.6	0.6	3.6	0.4	0.6
Potassium	mg/L	#	0.3	0.6	0.2	0.2 [5]	0.1 [5]	0.5
Silica	mg/L	#	15	9	15	11	13	13
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:

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µS/cm - microsiemens per centimetre

[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN KATHERINE REGION COMMUNITIES

	Reported unit	ADWG 2011	Amanbidji	Barunga	Beswick	Binjari	Dagaragu	Bulla
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0004 [5]	0.001 [5]	**0.007** [2]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.002	0.001 [5]	0.007 [2]	0.001 [5]	0.001	0.0007 [5]
Barium	mg/L	2	0.2	0.07 [5]	0.2 [2]	0.2 [5]	0.08	**5.32**
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.5	0.02 [5]	0.02 [2, 5]	0.02	0.08	0.1
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.29 [5]	0.10 [5]	0.11 [5]	0.42 [5]	0.26 [5]	0.77 [5]
Lead	mg/L	0.01	0.001 [5]	0.0012 [5]	0.0026 [2, 5]	0.0012 [5]	0.0013 [5]	0.001 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [2, 5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [2, 5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	1.3 [5]	1.4 [5]	3.2 [5]	1.2 [5]	2.9	1.7 [5]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	PASS	**1.12**	PASS	0.28
Selenium	mg/L	0.1	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.0009	0.0001 [5]	0.0002 [2]	0.001	0.002	0.0002
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.03 [5]	0.07 [5]	0.02 [2, 5]	0.03 [5]	0.02 [5]	0.04 [5]
Chloride	mg/L	250	129	8 [5]	6 [5]	13 [5]	22	44
Copper	mg/L	2	0.01 [5]	0.03 [5]	0.1 [2]	0.01 [5]	0.02 [5]	0.01 [5]
Hardness	CaCO3 mg/L	200	**372**	152	**296**	**289**	**247**	**227**
Iodine	mg/L	0.15	0.02 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]
Iron	mg/L	0.3	0.1 [5]	**0.46** [5]	0.04 [2, 5]	0.08 [5]	0.02 [5]	0.06
Manganese	mg/L	0.1	0.014 [5]	0.021 [5]	0.011 [2, 5]	0.007 [5]	0.019 [5]	0.026 [5]
pH	pH Units	6.5-8.5	7.8	6.7	7.5	7.6	7.8	8.2
Sodium	mg/L	180	177	7	5	10	28	30
Sulfate	mg/L	250	156	2	2	6	8	2
Total Dissolved Solids	mg/L	600	**876**	176	317	334	330	307
True Colour	HU	15	2.7	10.3	2.2	2.7	2.1	3.5
Turbidity	NTU	5	1.9	2.3	0.6	0.9	0.8	1.7
Zinc	mg/L	3	0.02 [5]	0.33 [5]	0.3 [2]	0.04 [5]	0.04 [5]	0.01 [5]
Other Characteristics[3]								
Alkalinity	mg/L	#	470	154 [5]	319	314	294	250
Bromine	mg/L	#	0.2	0.02	0.02 [2]	0.06	0.07	0.1
Calcium	mg/L	#	58	31	58	64	47	36
Conductivity	µS/cm	#	1478	290	591	602	612	597
Magnesium	mg/L	#	56	18	37	32	31	33
Potassium	mg/L	#	4.1	1.3	1.9	4.7	4.1	5.4
Silica	mg/L	#	34	22	23	28	26	18
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:

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[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN KATHERINE REGION COMMUNITIES

	Reported unit	ADWG 2011	Bulman	Jilkminggan	Jodetluk	Kalkarindji	Kybrook Farm	Lajamanu
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0003 [2, 5]	0.0003 [5]
Arsenic	mg/L	0.01	0.0005 [5]	0.0007 [5]	0.0005 [5]	0.001	0.008 [2]	0.0006 [5]
Barium	mg/L	2	0.05 [5]	0.05 [5]	0.05 [5]	0.1	0.05 [2, 5]	0.10
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]
Boron	mg/L	4	0.02	0.5	0.02 [5]	0.1	0.02 [2, 5]	0.2
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]
Fluoride	mg/L	1.5	0.10 [5]	0.51 [5]	0.10 [5]	0.30 [5]	0.63 [2, 5]	0.33 [5]
Lead	mg/L	0.01	0.0011 [5]	0.0024 [5]	0.0012 [5]	0.001 [5]	0.0014 [2, 5]	0.001 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [2, 5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.006 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.004 [5]	0.002 [5]	0.002 [5]	0.002 [2, 5]	0.002 [5]
Nitrate	mg/L	50	1 [5]	1.3 [5]	1 [5]	4.6	1.2 [2, 5]	7.9 [2]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	N/A	PASS	0.27	PASS
Selenium	mg/L	0.1	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]
Uranium	mg/L	0.017	0.0003 [5]	0.011	0.00001 [5]	0.002	0.0003 [2]	0.002
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.02 [5]	0.08 [5]	0.02 [5]	0.02 [5]	0.04 [2, 5]	0.02 [5]
Chloride	mg/L	250	10	**285**	10 [5]	29	10 [2, 5]	141 [2]
Copper	mg/L	2	0.01 [5]	0.03 [5]	0.01 [5]	0.02 [5]	0.02 [2, 5]	0.02 [5]
Hardness	CaCO3 mg/L	200	**309**	**568**	9	**253**	140 [2]	**288 [2]**
Iodine	mg/L	0.15	0.01 [5]	**0.18**	0.01 [5]	0.02 [5]	0.01 [2, 5]	**0.15 [2]**
Iron	mg/L	0.3	0.03 [5]	**0.31 [5]**	0.08 [5]	0.02 [5]	0.07 [2, 5]	0.06 [5]
Manganese	mg/L	0.1	0.005 [5]	**0.15**	0.006 [5]	0.005 [5]	0.040 [2, 5]	0.006 [5]
pH	pH Units	6.5-8.5	7.8	7.5	7.6	7.8	7.1 [2]	7.6 [2]
Sodium	mg/L	180	8	**222**	8	35	42 [2]	90 [2]
Sulfate	mg/L	250	1	214	0.2	12	3 [2]	58 [2]
Total Dissolved Solids	mg/L	600	332	**1331**	43	352	256 [2]	**636 [2]**
True Colour	HU	15	2.6	3.4	3.3	1.8	3.6 [2]	2.0 [2]
Turbidity	NTU	5	0.2	2.4	0.9	0.7	1.6 [2]	0.9 [2]
Zinc	mg/L	3	0.02 [5]	0.04 [5]	0.20	0.01 [5]	0.05 [2, 5]	0.02 [5]
Other Characteristics[3]								
Alkalinity	mg/L	#	340	525	23 [5]	298	215 [2]	261 [2]
Bromine	mg/L	#	0.02	1.4	0.01	0.1	0.03 [2]	0.6
Calcium	mg/L	#	60	86	2	51	23 [2]	44 [2]
Conductivity	µS/cm	#	619	2175	58	662	438 [2]	1040 [2]
Magnesium	mg/L	#	39	86	1	31	20 [2]	43 [2]
Potassium	mg/L	#	2.4	26	0.6	4.6	1.4 [2]	8.6 [2]
Silica	mg/L	#	25	60	15	25	43 [2]	100 [2]
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]

NOTES:

**Radiological results are reported as PASS if all screening levels of gross alpha and gross beta are less than 0.5 Bq/L. If any levels are above 0.5Bq/L the annual dosage is reported as 95th percentile for large data sets (>30 datapoints) and the maximum value is reported for small datasets (<30 datapoints).*

**Radiological results also include raw water data*

**Exceedances in Bold*

LEGEND:

HU - Hazen Units

mg/L - milligrams per litre

mSv/yr - millisieverts per year

N/A - Not Available

NTU - Nephelometric Turbidity Units

µS/cm - microsiemens per centimetre

[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN KATHERINE REGION COMMUNITIES

	Reported unit	ADWG 2011	Manyalalluk	Minyerri	Ngukurr	Pigeon Hole	Rittarangu
Health Characteristics[3]							
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [2, 5]	0.0002	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.0005 [5]	0.004 [2, 5]	0.0005 [2, 5]	0.0005 [5]	0.0005 [5]
Barium	mg/L	2	0.05 [5]	0.4 [2]	0.5 [2, 5]	0.05 [5]	0.2
Beryllium	mg/L	0.06	0.001 [5]	0.001 [2, 5]	0.001 [2, 5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.02 [5]	0.2 [2]	0.06 [2, 5]	0.08	0.04
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [2, 5]	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [2, 5]	0.005 [2, 5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.10 [5]	0.30 [2, 5]	0.25 [2, 5]	0.29 [5]	0.10 [5]
Lead	mg/L	0.01	0.0026 [5]	0.0014 [2, 5]	0.0022 [2, 5]	0.001 [5]	0.0013 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [2, 5]	0.0001 [2, 5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [2, 5]	0.005 [2, 5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [2, 5]	0.002 [2, 5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	1 [5]	1 [2, 5]	1.5 [2, 5]	18	2.8
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	PASS	PASS	PASS
Selenium	mg/L	0.1	0.001 [5]	0.001 [2, 5]	0.001 [2, 5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [2, 5]	0.01 [2, 5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.00007	0.00001 [2]	0.001 [2]	0.002	0.0008
Aesthetic Characteristics[3]							
Aluminium	mg/L	0.2	0.02	0.02 [2, 5]	0.11 [2, 5]	0.02 [5]	0.02 [5]
Chloride	mg/L	250	8 [5]	16 [5]	**335** [2]	25	59
Copper	mg/L	2	0.02 [5]	0.02 [2, 5]	0.04 [2, 5]	0.04 [5]	0.02 [5]
Hardness	CaCO3 mg/L	200	16	102 [2]	**596** [2]	**311**	**287**
Iodine	mg/L	0.15	0.01 [5]	0.01 [2, 5]	0.02 [2, 5]	0.01 [5]	0.01 [5]
Iron	mg/L	0.3	0.19 [5]	**3** [2]	0.27 [2, 5]	0.02 [5]	0.09 [5]
Manganese	mg/L	0.1	0.005 [5]	**0.29** [2]	0.010 [2, 5]	0.005 [5]	0.005 [5]
pH	pH Units	6.5-8.5	**5.2**	7.3 [2]	7.5 [2]	7.4	7.5
Sodium	mg/L	180	4	24 [2]	87 [2]	28	26
Sulfate	mg/L	250	0.3	11 [2]	33 [2]	8	3
Total Dissolved Solids	mg/L	600	47	181 [2]	**870** [2]	440	368
True Colour	HU	15	2.0	4.4 [2]	3.3 [2]	2.0	1.9
Turbidity	NTU	5	0.6	**34.3** [2]	4.1 [2]	1.1	0.9
Zinc	mg/L	3	0.06	0.14 [2, 5]	0.06 [2, 5]	0.02 [5]	0.06 [5]
Other Characteristics[3]							
Alkalinity	mg/L	#	20 [5]	128 [2]	335 [2]	359	281
Bromine	mg/L	#	0.02	0.04 [2]	1 [2]	0.06	0.2
Calcium	mg/L	#	5	22 [2]	103 [2]	69	53
Conductivity	µS/cm	#	30	317 [2]	1689 [2]	730	696
Magnesium	mg/L	#	0.7	12 [2]	83 [2]	34	37
Potassium	mg/L	#	0.5	5.1 [2]	6.6 [2]	2	2.9
Silica	mg/L	#	24	31 [2]	24 [2]	58	24
Tin	mg/L	#	0.01 [5]	0.01 [2, 5]	0.01 [2, 5]	0.01 [5]	0.01 [5]

NOTES:

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**Exceedances in Bold*

LEGEND:

HU - Hazen Units

mg/L - milligrams per litre

mSv/yr - millisieverts per year

N/A - Not Available

NTU - Nephelometric Turbidity Units

µS/cm - microsiemens per centimetre

[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN KATHERINE REGION COMMUNITIES

	Reported unit	ADWG 2011	**Robinson River**	**Weemol**	**Yarralin**
Health Characteristics[3]					
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0003 [2, 5]	0.0002 [5]	0.0002 [2, 5]
Arsenic	mg/L	0.01	0.0005 [2, 5]	0.0005 [5]	0.003 [2]
Barium	mg/L	2	1.2 [2]	0.05 [5]	1 [2]
Beryllium	mg/L	0.06	0.001 [2, 5]	0.001 [5]	0.001 [2, 5]
Boron	mg/L	4	0.1 [2, 5]	0.04 [5]	0.09 [2]
Cadmium	mg/L	0.002	0.0002 [2, 5]	0.0002 [5]	0.0002 [2, 5]
Chromium	mg/L	0.05	0.005 [2, 5]	0.005 [5]	0.005 [2, 5]
Fluoride	mg/L	1.5	0.91 [2, 5]	0.13 [5]	0.10 [5]
Lead	mg/L	0.01	0.0022 [2, 5]	0.001 [5]	0.0014 [2, 5]
Mercury	mg/L	0.001	0.0002 [2, 5]	0.0001 [5]	0.0001 [2, 5]
Molybdenum	mg/L	0.05	0.005 [2, 5]	0.005 [5]	0.005 [2, 5]
Nickel	mg/L	0.02	0.003 [2, 5]	0.002 [5]	0.002 [2, 5]
Nitrate	mg/L	50	3.8 [2, 5]	1 [5]	3.4 [5]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	PASS
Selenium	mg/L	0.1	0.001 [2, 5]	0.001 [5]	0.001 [2, 5]
Silver	mg/L	0.1	0.01 [2, 5]	0.01 [5]	0.01 [2, 5]
Uranium	mg/L	0.017	0.003 [2]	0.0003	0.001 [2]
Aesthetic Characteristics[3]					
Aluminium	mg/L	0.2	0.03 [2, 5]	0.02 [5]	0.02 [2, 5]
Chloride	mg/L	250	36 [2]	10	30
Copper	mg/L	2	0.04 [2, 5]	0.02 [5]	0.01 [2, 5]
Hardness	CaCO3 mg/L	200	**500 [2]**	**345**	**375**
Iodine	mg/L	0.15	0.02 [2, 5]	0.01 [5]	0.04 [2, 5]
Iron	mg/L	0.3	0.09 [2, 5]	0.02 [5]	0.12 [2, 5]
Manganese	mg/L	0.1	0.011 [2, 5]	0.005 [5]	0.062 [2, 5]
pH	pH Units	6.5-8.5	7.4 [2]	7.5	7.5
Sodium	mg/L	180	20 [2]	10	30
Sulfate	mg/L	250	6 [2]	0.5	7
Total Dissolved Solids	mg/L	600	559 [2]	382	488
True Colour	HU	15	2.5 [2]	3.0	3.9
Turbidity	NTU	5	1.2 [2]	0.2	3.2
Zinc	mg/L	3	0.06 [2, 5]	0.02 [5]	0.10 [2]
Other Characteristics[3]					
Alkalinity	mg/L	#	541 [2]	383	434
Bromine	mg/L	#	0.2 [2]	0.02	0.2 [2]
Calcium	mg/L	#	43 [2]	61	69
Conductivity	µS/cm	#	1033 [2]	691	859
Magnesium	mg/L	#	95 [2]	47	49
Potassium	mg/L	#	3.8 [2]	2.8	3.1
Silica	mg/L	#	34 [2]	35	42
Tin	mg/L	#	0.01 [2, 5]	0.01 [5]	0.01 [2, 5]

NOTES:
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**Exceedances in Bold*

LEGEND:
HU - Hazen Units
mg/L - milligrams per litre
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N/A - Not Available
NTU - Nephelometric Turbidity Units
µS/cm - microsiemens per centimetre

[2] 95th percentile reported
[3] value indicates data from 2008-2013
[4] value includes data from 2012-2013
[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN BARKLEY REGION COMMUNITIES

	Reported unit	ADWG 2011	Ali Curung	Alpurrurulam	Canteen Creek [4]	Imangara	Nturiya [4]	Willowra
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0003 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.002	0.002	0.0005 [5]	0.001 [5]	0.0005 [5]	0.002
Barium	mg/L	2	0.08	0.1	0.1 [5]	0.5 [5]	0.05 [5]	0.05
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.7	0.3	0.2	0.3	0.6	0.5
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	**1.96** [5]	**1.52** [5]	0.51 [5]	0.73 [5]	0.98 [5]	0.80 [5]
Lead	mg/L	0.01	0.001 [5]	0.001 [5]	0.0011 [5]	0.001 [5]	0.0011 [5]	0.001 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	**77**	2.6	7.3	8.7	37	36 [2]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	PASS	0.33	0.25	PASS	0.45
Selenium	mg/L	0.1	0.003 [5]	0.002 [5]	0.001 [5]	0.001 [5]	0.003	0.003
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.011	0.011	0.002	0.012	0.014	**0.025**
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.03 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	250	188	191	93	21	**352**	175 [2]
Copper	mg/L	2	0.03 [5]	0.06 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.01 [5]
Hardness	CaCO3 mg/L	200	**229**	**459**	153	**200**	**304**	**249** [2]
Iodine	mg/L	0.15	**0.27**	**0.16**	0.11	0.07	**0.30**	**0.22** [2]
Iron	mg/L	0.3	0.03 [5]	0.02 [5]	0.05 [5]	0.02 [5]	0.08 [5]	0.04 [5]
Manganese	mg/L	0.1	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
pH	pH Units	6.5-8.5	8.1	7.6	7.2	7.9	7.7	8.1 [2]
Sodium	mg/L	180	**202**	144	88	32	**230**	138 [2]
Sulfate	mg/L	250	90	89	37	11	185	81 [2]
Total Dissolved Solids	mg/L	600	**908**	**921**	489	432	**1164**	**755** [2]
True Colour	HU	15	3.2	2.5	2.8	1.8	3.4	2.6 [2]
Turbidity	NTU	5	0.9	0.8	0.8	0.4	0.7	0.7 [2]
Zinc	mg/L	3	0.01 [5]	0.02 [5]	0.02 [5]	0.01 [5]	0.04 [5]	0.04
Other Characteristics[3]								
Alkalinity	mg/L	#	350	480	243	334	212	259 [2]
Bromine	mg/L	#	0.9	0.7	0.4	0.08	2	0.8
Calcium	mg/L	#	31	60	28	39	70	49 [2]
Conductivity	µS/cm	#	1540	1550	843	714	1857	1243 [2]
Magnesium	mg/L	#	37	76	30	38	32	31 [2]
Potassium	mg/L	#	48	7.3	13	30	24	32 [2]
Silica	mg/L	#	61	67	60	80	81	87 [2]
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:

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µS/cm - microsiemens per centimetre

[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN BARKLEY REGION COMMUNITIES

	Reported unit	ADWG 2011	Wilora [4]	Wutunugurra [4]	Tara
Health Characteristics[3]					
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0003 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.001 [5]	0.0006 [5]	0.0006 [5]
Barium	mg/L	2	0.05 [5]	0.4 [5]	0.05 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.7	0.1	0.4
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.91 [5]	0.23 [5]	0.90 [5]
Lead	mg/L	0.01	0.0011 [5]	0.001 [5]	0.0016 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.004 [5]	0.007 [5]
Nitrate	mg/L	50	17	3.6	23
Annual Exposure to Radioactivity	mSv/yr	1	0.79	PASS	0.29
Selenium	mg/L	0.1	0.004 [5]	0.001 [5]	0.002 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	**0.019**	0.002	0.004
Aesthetic Characteristics[3]					
Aluminium	mg/L	0.2	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	250	**526**	44	**485**
Copper	mg/L	2	0.02 [5]	0.02 [5]	0.1 [5]
Hardness	CaCO3 mg/L	200	**606**	176	**304**
Iodine	mg/L	0.15	**0.30**	0.06	**0.30**
Iron	mg/L	0.3	0.03 [5]	0.02 [5]	0.07 [5]
Manganese	mg/L	0.1	0.009 [5]	0.011 [5]	0.005 [5]
pH	pH Units	6.5-8.5	7.9	7.5	7.1
Sodium	mg/L	180	**301**	33	**214**
Sulfate	mg/L	250	234	13	152
Total Dissolved Solids	mg/L	600	**1690**	337	**1026**
True Colour	HU	15	3.9	2.4	2.3
Turbidity	NTU	5	0.6	0.8	1.6
Zinc	mg/L	3	0.06	0.03	0.05
Other Characteristics[3]					
Alkalinity	mg/L	#	395	198	197
Bromine	mg/L	#	2.8	0.2	1.4
Calcium	mg/L	#	97	39	39
Conductivity	µS/cm	#	2706	554	1741
Magnesium	mg/L	#	90	19	55
Potassium	mg/L	#	60	7.9	28
Silica	mg/L	#	91	64	21
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:
**Radiological results are reported as PASS if all screening levels of gross alpha and gross beta are less than 0.5 Bq/L. If any levels are above 0.5Bq/L the annual dosage is reported as 95th percentile for large data sets (>30 datapoints) and the maximum value is reported for small datasets (<30 datapoints).*
**Radiological results also include raw water data*
**Exceedances in Bold*

LEGEND:
HU - Hazen Units
mg/L - milligrams per litre
mSv/yr - millisieverts per year
N/A - Not Available
NTU - Nephelometric Turbidity Units
µS/cm - microsiemens per centimetre

[2] 95th percentile reported
[3] value indicates data from 2008-2013
[4] value includes data from 2012-2013
[5] one or more values in calculation were below detection limits. Result may be higher than actual value

DRINKING WATER QUALITY IN SOUTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	Ampilawatja	Areyonga	Atitjere	Engawala	Finke	Hermma-nsburg
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0003 [5]	0.0003 [5]	0.0003 [5]	0.0003 [5]	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.0005 [5]	0.0008 [5]	0.0005 [5]	0.0005 [5]	0.0006 [5]	0.0005 [5]
Barium	mg/L	2	0.05 [5]	0.1	0.05	0.1	0.1	0.05 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.3	0.2	0.1	0.1	0.07	0.2
Cadmium	mg/L	0.002	0.0002 [5]	0.0003 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	1.11 [5]	0.40 [5]	0.5 [5]	0.55 [5]	0.20 [5]	0.37 [5]
Lead	mg/L	0.01	0.0015 [5]	0.0018 [5]	0.002 [5]	0.0021 [5]	0.0018 [5]	0.0011 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.003 [5]	0.010	0.002 [5]	0.002 [5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	29	7.7	29	15	8.9	4.8
Annual Exposure to Radioactivity	mSv/yr	1	0.21	0.24	PASS	PASS	PASS	PASS
Selenium	mg/L	0.1	0.002 [5]	0.002 [5]	0.003 [5]	0.002 [5]	0.001 [5]	0.001 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.008	0.008	0.007	0.004	0.003	0.005
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Chloride	mg/L	250	166	108	120	117	146	113
Copper	mg/L	2	0.01 [5]	0.02 [5]	0.03 [5]	0.02 [5]	0.02 [5]	0.02 [5]
Hardness	CaCO3 mg/L	200	**446**	**416**	**282**	**359**	187	**322**
Iodine	mg/L	0.15	**0.17**	0.09	0.09	0.10	0.03	0.06
Iron	mg/L	0.3	0.06 [5]	0.04 [5]	0.07 [5]	0.03 [5]	0.1 [5]	0.16 [5]
Manganese	mg/L	0.1	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [5]	0.008 [5]
pH	pH Units	6.5-8.5	7.8	8.0	8.0	7.9	7.6	7.8
Sodium	mg/L	180	117	57	114	79	85	64
Sulfate	mg/L	250	223	77	136	52	57	64
Total Dissolved Solids	mg/L	600	**987**	**640**	**694**	**657**	462	539
True Colour	HU	15	2.7	1.8	3.0	2.7	2.2	2.5
Turbidity	NTU	5	0.4	1.2	0.8	3.0	0.9	1.7
Zinc	mg/L	3	0.05 [5]	0.05 [5]	0.03	0.03	0.15	0.04
Other Characteristics[3]								
Alkalinity	mg/L	#	301	341	217	337	123	268
Bromine	mg/L	#	0.9	0.3	0.5	0.5	0.2	0.5
Calcium	mg/L	#	97	75	45	67	53	62
Conductivity	µS/cm	#	1503	1121	1125	1109	869	982
Magnesium	mg/L	#	54	55	41	47	13	40
Potassium	mg/L	#	24	8.4	8.7	7	6.4	7.1
Silica	mg/L	#	39	19	35	68	16	15
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:

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**Exceedances in Bold*

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mg/L - milligrams per litre

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[2] 95th percentile reported

[3] value indicates data from 2008-2013

[4] value includes data from 2012-2013

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DRINKING WATER QUALITY IN SOUTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	Ikuntji	Imanpa	Kaltukatjara	Kintore	Laramba	Mt Liebig
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	**1** [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	98 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0003 [5]	0.0003 [5]	0.0003 [5]	0.0002 [2]	0.0003 [5]	0.0003 [5]
Arsenic	mg/L	0.01	0.0005 [5]	0.0006	0.0005 [5]	0.0008 [2, 5]	0.0007 [5]	0.0006 [5]
Barium	mg/L	2	0.05 [5]	0.05	0.05 [5]	0.05 [2, 5]	0.3	0.05 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.3	0.8	0.1	0.3 [2]	0.4	0.3
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.006 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.50 [5]	0.83	0.41 [5]	0.75 [2, 5]	1.10 [5]	1.16 [5]
Lead	mg/L	0.01	0.0023 [5]	0.0013 [5]	0.0011 [5]	0.0011 [2, 5]	0.0023 [5]	0.0011 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [5]	0.0001 [2, 5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.004	0.002 [5]	0.002 [2, 5]	0.002 [5]	0.002 [5]
Nitrate	mg/L	50	7.4 [2]	30	1	**83** [2]	36 [5]	18
Annual Exposure to Radioactivity	mSv/yr	1	0.66	0.78	PASS	PASS	0.56	PASS
Selenium	mg/L	0.1	0.002 [5]	0.004	0.001 [5]	0.003 [2, 5]	0.003 [5]	0.002 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.01	0.011	0.00001 [5]	0.002 [2]	**0.038**	0.006
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.02 [5]	0.02 [5]	0.02 [5]	0.02 [2, 5]	0.02 [5]	0.02 [5]
Chloride	mg/L	250	**371** [2]	**378**	87	118 [2]	103	116
Copper	mg/L	2	0.04 [5]	0.02 [5]	0.02 [5]	0.2 [2, 5]	0.08 [5]	0.02 [5]
Hardness	CaCO3 mg/L	200	**582** [2]	**431**	**276**	**472** [2]	**282**	**271**
Iodine	mg/L	0.15	**0.24** [2]	**0.53**	0.10	0.14 [2]	**0.28**	**0.19**
Iron	mg/L	0.3	0.06 [5]	**0.44** [5]	0.13	0.04 [2, 5]	0.07 [5]	0.05 [5]
Manganese	mg/L	0.1	0.005 [5]	0.016 [5]	0.008 [5]	0.005 [2, 5]	0.006 [5]	0.005 [5]
pH	pH Units	6.5-8.5	7.6 [2]	8.1	8.3	7.6 [2]	7.8	7.7
Sodium	mg/L	180	165 [2]	**229**	55	95 [2]	73	98
Sulfate	mg/L	250	**259** [2]	245	64	67 [2]	38	94
Total Dissolved Solids	mg/L	600	**1263** [2]	**1268**	461	**851** [2]	**644**	**614**
True Colour	HU	15	3.8 [2]	3.8	2.4	2.2 [2]	2.5	1.9
Turbidity	NTU	5	1.2 [2]	**6.4**	1.3	0.5 [2]	0.5	1.1
Zinc	mg/L	3	0.14	0.22	0.02 [5]	0.03 [2, 5]	0.10 [5]	0.02 [5]
Other Characteristics[3]								
Alkalinity	mg/L	#	241 [2]	207	266	407 [2]	302	252
Bromine	mg/L	#	1.4	1.7	0.4	1.1 [2]	0.5	0.4
Calcium	mg/L	#	110 [2]	83	53	75 [2]	57	59
Conductivity	µS/cm	#	1987 [2]	1996	844	1340 [2]	1034	1048
Magnesium	mg/L	#	75 [2]	54	35	69 [2]	34	30
Potassium	mg/L	#	29 [2]	29	11	5 [2]	39	14
Silica	mg/L	#	52 [2]	30	12	89 [2]	97	50
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]

NOTES:

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[2] *95th percentile reported*

[3] *value indicates data from 2008-2013*

[4] *value includes data from 2012-2013*

[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*

DRINKING WATER QUALITY IN SOUTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	Nyirripi	Papunya	Pmara Jutunta	Santa Teresa	Titjikala	Wallace Rockhole
Health Characteristics[3]								
E. coli detections	per year	0	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0003 [5]	0.0002 [2]	0.0007 [5]	0.0002 [5]	0.0003 [5]
Arsenic	mg/L	0.01	0.002 [5]	0.0007 [5]	0.001 [2]	0.0005 [5]	0.0012	0.0008 [5]
Barium	mg/L	2	0.09 [5]	0.1	0.1 [2]	0.5	0.3	0.06 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]	0.001 [2, 5]	0.001 [5]	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.3	0.3	0.3 [2]	0.06	0.1	0.4
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]	0.0002 [2, 5]	0.0002 [5]	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.039 [5]
Fluoride	mg/L	1.5	**1.58** [5]	0.96 [5]	0.80 [2, 5]	0.20 [5]	0.54 [5]	0.78 [5]
Lead	mg/L	0.01	0.0012 [5]	0.001 [5]	0.0021 [2, 5]	0.002 [5]	0.0011 [5]	0.0018 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]	0.0001 [2, 5]	0.0001 [5]	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]	0.005 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [5]	0.002 [5]	0.002 [2, 5]	0.002 [5]	0.002 [5]	0.008 [5]
Nitrate	mg/L	50	26 [2]	21	**51** [2]	12	20	16
Annual Exposure to Radioactivity	mSv/yr	1	0.32	PASS	N/A	0.63	PASS	0.5
Selenium	mg/L	0.1	0.002	0.006 [5]	0.002 [2]	0.003 [5]	0.001 [5]	0.004
Silver	mg/L	0.1	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.009	0.011	0.008 [2]	0.005	0.004	0.005
Aesthetic Characteristics[3]								
Aluminium	mg/L	0.2	0.02 [5]	0.02 [5]	0.02 [2, 5]	0.02 [5]	0.06 [5]	**0.72** [5]
Chloride	mg/L	250	102 [2]	209	66 [2]	13	32	155
Copper	mg/L	2	0.01 [5]	0.02 [5]	0.04 [2, 5]	0.02 [5]	0.02 [5]	0.03 [5]
Hardness	CaCO3 mg/L	200	**242** [2]	**265**	**201** [2]	**254**	**221**	**284**
Iodine	mg/L	0.15	**0.15**	**0.24**	0.13 [2]	0.02	0.03	0.11
Iron	mg/L	0.3	0.03 [5]	0.06 [5]	0.05 [2, 5]	0.06 [5]	0.08 [5]	0.18
Manganese	mg/L	0.1	0.005 [5]	0.005 [5]	0.006 [2, 5]	0.005 [5]	0.005 [5]	0.005 [5]
pH	pH Units	6.5-8.5	8.1 [2]	8.0	8.0 [2]	7.8	7.6	7.6
Sodium	mg/L	180	88 [2]	**228**	65 [2]	7	32	97
Sulfate	mg/L	250	43 [2]	93	37 [2]	11	17	73
Total Dissolved Solids	mg/L	600	**602** [2]	**958**	514 [2]	306	336	**603**
True Colour	HU	15	2.2 [2]	2.4	2.8 [2]	2.3	3.0	3.5
Turbidity	NTU	5	1.5 [2]	0.4	0.7 [2]	0.7	3.6	**25.7**
Zinc	mg/L	3	0.02 [5]	0.01 [5]	0.03 [2, 5]	0.03 [5]	0.05	0.15
Other Characteristics[3]								
Alkalinity	mg/L	#	287 [2]	412	212 [2]	271	220	226
Bromine	mg/L	#	0.4	1.1	0.4 [2]	0.5	0.1	0.4
Calcium	mg/L	#	46 [2]	54	46 [2]	65	64	65
Conductivity	µS/cm	#	989 [2]	1601	784 [2]	546	599	1109
Magnesium	mg/L	#	31 [2]	32	22 [2]	22	15	30
Potassium	mg/L	#	27 [2]	12	18 [2]	4.5	4.3	9.6
Silica	mg/L	#	90 [2]	65	96 [2]	18	33	14
Tin	mg/L	#	0.01 [5]	0.01 [5]	0.01 [2, 5]	0.01 [5]	0.01 [5]	0.01 [5]

NOTES:
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**Radiological results also include raw water data*
**Exceedances in Bold*

LEGEND:
HU - Hazen Units
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[2] *95th percentile reported*
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[4] *value includes data from 2012-2013*
[5] *one or more values in calculation were below detection limits. Result may be higher than actual value*

DRINKING WATER QUALITY IN SOUTHERN REGION COMMUNITIES

	Reported unit	ADWG 2011	**Yuelamu**	**Yuendumu**
Health Characteristics[3]				
E. coli detections	per year	0	0 [4]	0 [4]
E. coli performance	%	-	100 [4]	100 [4]
Antimony	mg/L	0.003	0.0002 [5]	0.0002 [5]
Arsenic	mg/L	0.01	0.0006 [5]	0.0005 [5]
Barium	mg/L	2	0.06 [5]	0.05 [5]
Beryllium	mg/L	0.06	0.001 [5]	0.001 [5]
Boron	mg/L	4	0.1	0.3
Cadmium	mg/L	0.002	0.0002 [5]	0.0002 [5]
Chromium	mg/L	0.05	0.005 [5]	0.005 [5]
Fluoride	mg/L	1.5	0.63 [5]	0.57 [5]
Lead	mg/L	0.01	0.0016 [5]	0.0012 [5]
Mercury	mg/L	0.001	0.0001 [5]	0.0001 [5]
Molybdenum	mg/L	0.05	0.005 [5]	0.005 [5]
Nickel	mg/L	0.02	0.002 [2, 5]	0.002 [2, 5]
Nitrate	mg/L	50	5.2 [5]	3.3 [5]
Annual Exposure to Radioactivity	mSv/yr	1	PASS	0.62
Selenium	mg/L	0.1	0.001 [5]	0.002 [5]
Silver	mg/L	0.1	0.01 [5]	0.01 [5]
Uranium	mg/L	0.017	0.005	0.010
Aesthetic Characteristics[3]				
Aluminium	mg/L	0.2	0.05 [5]	0.02 [5]
Chloride	mg/L	250	87	207
Copper	mg/L	2	0.06 [5]	0.03 [5]
Hardness	CaCO3 mg/L	200	114	**337**
Iodine	mg/L	0.15	0.06	**0.23**
Iron	mg/L	0.3	0.05 [5]	0.21 [5]
Manganese	mg/L	0.1	0.007 [5]	0.014 [5]
pH	pH Units	6.5-8.5	8.0	7.9
Sodium	mg/L	180	80	117
Sulfate	mg/L	250	91	117
Total Dissolved Solids	mg/L	600	372	**725**
True Colour	HU	15	5.0	2.2
Turbidity	NTU	5	2.2	4.6
Zinc	mg/L	3	0.04 [5]	0.19
Other Characteristics[3]				
Alkalinity	mg/L	#	100	248
Bromine	mg/L	#	0.3	0.9
Calcium	mg/L	#	30	68
Conductivity	µS/cm	#	669	1259
Magnesium	mg/L	#	9.8	40
Potassium	mg/L	#	6.3	17
Silica	mg/L	#	6	16
Tin	mg/L	#	0.01 [5]	0.01 [5]

NOTES:
**Radiological results are reported as PASS if all screening levels of gross alpha and gross beta are less than 0.5 Bq/L. If any levels are above 0.5Bq/L the annual dosage is reported as 95th percentile for large data sets (>30 datapoints) and the maximum value is reported for small datasets (<30 datapoints).*
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HU - Hazen Units
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[2] 95th percentile reported
[3] value indicates data from 2008-2013
[4] value includes data from 2012-2013
[5] one or more values in calculation were below detection limits. Result may be higher than actual value

Effective sewerage services

Maintaining sewerage services is an important, however often overlooked part of the delivery of utility services. Power and Water plans to provide effective sewerage services and meeting the growing demands while minimising the financial cost and environmental impact of our operations.

Sewerage services are provided by taking wastewater off site through pipes and pump stations to centralised waste stabilisation ponds for treatment and appropriate disposal

1. Effectively removing sewage from households

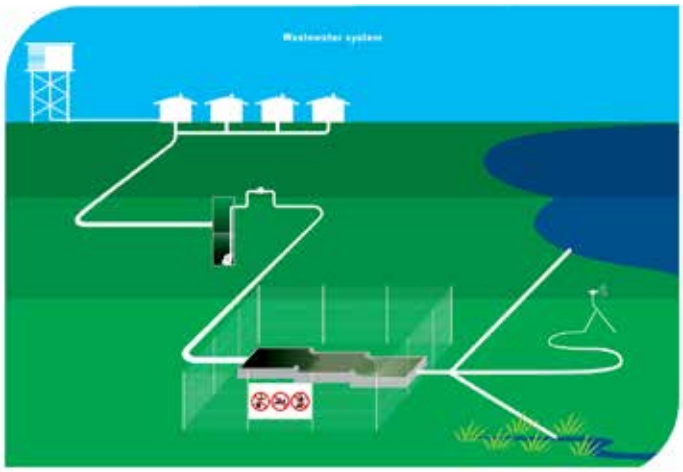
Safe drinking water is provided to each house through one set of pipes. Another set of pipes takes away the wastewater, collected through the drains such as kitchen and bathroom sinks, and from the toilet.

In most communities, the wastewater drains into a network of underground pipes and flows to the treatment ponds. Power and Water staff and Essential Service Officers (ESOs) make sure these pipes don't get damaged or blocked.

Where communities don't have sewerage ponds, the wastewater from the house goes into privately owned and managed septic tanks.

2. Maximising operational efficiencies

The selection of appropriate sewerage infrastructure is a key aspect of our approach to maximising operational efficiencies and ensuring the delivery of effective sewerage services.



In the majority of communities Power and Water services, wastewater is collected from households using the force of gravity, which minimises the operational costs. Sewerage pump stations are only used in low areas of the network to raise the wastewater and effectively transport it to the wastewater treatment system.

While in many other parts of Australia, wastewater is treated using complex energy-intensive mechanical systems, our waste stabilisation ponds are simple, efficient and very effective at treating the wastewater to an acceptable level. These pond systems require very little maintenance as they make the most of our surroundings by using the sun and warm temperatures to create a perfect environment for natural treatment to occur.

Power and Water is continuing to roll out telemetry systems on critical parts of sewerage infrastructure to provide real-time information about system performance until Supervisory Control and Data Acquisition (SCADA) systems are installed.

As with the water distribution system, the management of wastewater reticulation systems is challenging as the assets are buried. Power and Water routinely use Closed Circuit Television (CCTV) to inspect these systems to identify the need for replacement or repair.

Power and Water continues to investigate and trial innovative inspection and maintenance methods to further improve our operational efficiencies in the future.

3. Minimising impact on the environment

Wastewater is collected in treatment ponds. In these ponds sunlight, algae and bacteria work together to break down the organic matter, nutrients and disease-causing organisms. Two or more ponds designed to hold the water for at least a month are used at each site to achieve appropriate quality for release. Following treatment, the treated wastewater evaporates is used for irrigation adjacent to the pond area and/or released into a river or the ocean. Even after treatment, low levels of pollutant remain, and these need to be considered when disposing of or reusing effluent.

Power and Water will continue to work with the NT Environment Protection Authority (EPA) towards licensing remote area wastewater discharges. Licensing will allow us to better collect data on wastewater systems and the environments they discharge to, as well as meeting regulatory requirements.

Status of wastewater systems

Over half of the wastewater system infrastructure was constructed prior to Northern Territory self-government and since their construction investment in these systems has been largely focused on maintaining operational availability.

As a result, at some locations there are growing concerns with the infrastructure condition and capacity. Concerns relate to aged wastewater reticulation networks which are at risk of collapse, and sewerage pump stations and wastewater treatment ponds, which are currently operating significantly over their original design capacity.

A significant new investment program is required across the wastewater assets to replace infrastructure and increase system capacities, including for wastewater reticulation networks, sewerage pump stations, wastewater ponds and discharge systems. This is currently largely unfunded.

Water and energy demand management

Demand management is an essential part of the provision of water, power and sewerage services. Influencing the demand of consumers to be within reasonable limits enables government to meet the growing demand for essential services while minimising the financial costs and environmental impacts.

Water and energy demand management is achieved through improving our operations, influencing policy and our customers to shape more efficient users of valuable water, power and sewerage services.

The case for demand management

There are several significant demand challenges facing service delivery to Territory remote communities over the coming decade:

- An increase in demand for water and electricity due to unprecedented government investment in community housing and facilities
- A rise in customer expectations in service delivery to similar sized towns
- Exposure to international fuel pricing – most remote electricity is provided through diesel-fired power stations
- Water sources in some areas are reaching the limits of sustainable extraction
- Limited access to economically viable water sources
- Legacy infrastructure assets reaching end of life
- Volumetric charges for water do not yet apply to all customers
- Current cost recovery will not meet the projected increases

As demand grows, the gap between uniform tariffs and cost to service will only widen. Consequences of failing to reduce demand could include unacceptable interruptions to services and the need to resort to higher cost options such as desalination of groundwater or development of new capacity. It is therefore essential to ensure demand is mitigated to within reasonable limits, to ensure quality services can be economically delivered to remote community residents well into the future. Demand management can be achieved through a host of water and energy efficiency programs.

Household energy efficiency educational materials

Demand management terminology

Energy/ or water 'efficiency' is achieving the maximum benefit from energy used. Similar to water efficiency, this means getting the same benefit from the energy or water use (e.g. cooling, cooking, watering, washing) while using less electricity or less water.

Energy demand management is the modification of consumer demand for energy through various methods. Usually, the goal of demand side management is to encourage the consumer to use less energy during peak hours, which is the time when most energy is being used. Supplying this peak demand requires costly infrastructure investment and makes up a large portion of capital costs for energy generation.

Water demand management also refers to modifying consumer demand, but the focus is on overall demand, not just peak periods. Water demand management strategies include measures such as regulations, price changes and infrastructure improvements intended to reduce overall demand on potable water supplies.

Water conservation refers to preventing wasteful or excessive use of water resources, and reducing usage.

Action Plan for Water and Energy Efficiency

The Demand Management team are delivering a 'Water and Energy Efficiency Implementation Plan 2013-2016', that sets out priority actions to address demand in the remote communities in the near term. This involves:

Policy, Regulation and Metering

- Policy levers such as water conservation rules, pricing signals and efficiency requirements for new construction will be investigated and applied
- Extending trials of 'smart meters' to further communities. 'Smart' meters enable more precise analysis of water usage, leaks and above average usage on particular lots, and enable demand programs to be pinpointed to areas of highest need.
- Improvements to water metering are proposed, including metering all residential public housing – currently 4000 of the 5000 lots do not have water meters

Customer Education and Behaviour Change

- The **Manymak Energy Efficiency Program** in East Arnhemland is targeting six high-priority communities from 2013-2016 with intensive water and energy efficiency education campaigns, energy retrofits in public housing, household energy and water metering and analysis (funded by the Australian Government).
- Intensive water efficiency programs in key communities will be conducted as they are funded.
- Awareness sessions with new NTG staff in remote area Inductions, including Police, Health and Education staff
- Partnership development with key stakeholders on household water use, including the NT Department of Housing
- Commercial and Government customer engagement, audits and follow up to ensure large facilities are operating efficiently

Power and Water continues to investigate and trial innovative operational, policy, education and measurement methods to further improve our operational efficiencies and efficiency program impacts into the future.

Example energy and water efficiency educational materials

Capital and Operational Programs

- Feasibility study on the impact of Water Loss across the remote communities
- Water leak and loss identification and management
- Development of an Efficiency Economic Model to ascertain the highest priority actions and locations across all 72 communities
- Partnerships with key government programs with complementary objectives and outcomes
- Inclusion of efficiency elements in new developments where possible

Community water education officers undertaking training in Galiwin'ku for a household education program during 2012

Key Achievements 2012-13

- Establishment of a dedicated demand management team to focus on remote efficiency initiatives
- Establishment of the 'Manymak' East Arnhem Energy Efficiency Program (LIEEP) (2013-2016). A partnership between Power and Water, NTG Agencies, CDU, Bushlight and East Arnhem Shire to train and employ local people in energy efficiency education, retrofitting and evaluation to determine a best-practice model.
- The Gunbalanya Household Efficiency Program (2012-13) developed a partnership between Power and Water, Department of Housing and West Arnhem Shire Council to improve response times to leaks reported by public housing tenants.
- Trials of 'smart' water metering on residential and non-residential properties in three additional communities (Gunbalanya, Ali Curung and Milingimbi)

Further information on ways to become more water and energy efficient and save on utility bills is available from our website:

http://www.powerwater.com.au/sustainability_and_environment/remote_sustainability_initiatives/water_resource_management/use_less_water_campaign

Remote development services

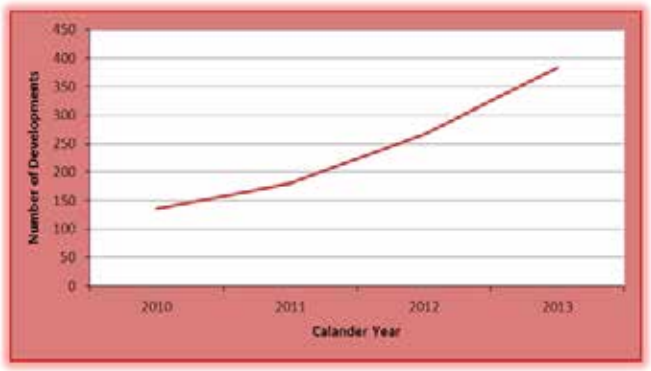
Power and Water provides integrated development services for power, water and sewerage services to the 72 remote communities. This includes 20 Major Remote Towns, which have been identified as key service hubs for the remote areas and are being targeted with significant investment in infrastructure and increasing the associated development activity.

The implementation of the various Government policy and initiatives aimed at improving the lives of Indigenous people has resulted in billions of dollars investment in remote communities and a significant increase in development activities. All new buildings or developments that need to utility services require approval and assessment to determine the capacity and impact on services. This includes small developments such as servicing vacant land, a single dwelling house or duplex to larger developments like offices, stores or a new subdivision.

Increasing development activity

This acceleration in development activity drove the formation of a dedicated development assessment team in 2009, to establish and coordinate development assessment appropriate for remote locations. During this time there has been a 285% increase in the number of developments managed through IES (Figure below), which excludes SIHIP as this work was completed by NTG seconded team.

Number of development assessments per year across the remote communities



During 2013, of the 384 developments, 297 required either a new electricity, water or sewer connection and in most cases they need all three services. This included subdivision developments at Gapuwiyak, Ramingining and Wadeye (each classed as one development in the statistics), which are now almost fully utilised with a total of 41 new lots.

New developments will increasingly require extensions or upgrades to existing utility services (such as generator capacity, transformer size, storage tanks, pipework or sewerage ponds) in order to connect.

The increasing development activity over recent years has resulted in very little serviced land remaining across the remote communities and limited redundant utility system capacity for development to occur without system augmentation.

The situation in many places is now critical. In some large communities (with service populations of 1,000 to 3,000) further important development associated with housing, health, education and other programs cannot proceed without funding associated utility service upgrades.

Remote development processes

Remote Community Development operates differently to the urban systems in the Northern Territory due to differences in the Planning Act and specific land tenure that operate within each Remote Community.

The major differences are:

- Transition to formal planning and land tenure arrangements. This is starting with the Major Remote Towns being included in the NT Planning Scheme including area plans and zoning.
- The utility systems are small and projects or development can have a large impact on the utility capacity. This is often not a as noticeable in a larger systems like Darwin, Alice Springs or Katherine.
- The travel, transport and supervision costs of a remote project are considerably larger than an equivalent project delivered in an urban environment.

- Standard drawings for urban areas are used except where installations require consideration of the local water quality conditions.
- Third parties often complete water and sewer connections to our existing networks. This is generally completed by the building developer's plumber based on the established site servicing plans and the contractor/developer is required to supply field return information containing connection details and photos of the installations.

Maningrida – demonstrates the large impact that the new subdivision (right hand site of airstrip) for the housing program had on the size and spread of the community.

Supporting remote development

Power and Water's multidisciplinary remote development team:

- Provides advice on utility services to developers and contractors to facilitate development initiatives across the Territory.
- Provides planning assistance to ensure that infrastructure constructed now will cater for future growth and long term plans.
- Is committed to improving the services provided as communities transform into towns, by providing clear and direct guidance to developers, governments and customers on connection to remote utility infrastructure.
- Collaborate with all levels of government, community and the private sector to streamline and clarify remote development processes.
- Promote the efficient use of water and power in development approval processes.
- Provide structural and policy advice to Australian, Northern Territory and Local governments on changes necessary in town planning, land tenure, processes and capital contribution for economic and workload sustainability.

Improving services to customers

During 2014, new improved remote development processes will be put in place along with supporting documentation. This involves the creation of three customer classifications to streamline processes and 'cut down red tape'.

Customer's developments will be classified as:

Renovation

Small Project

Major Project

The improved process will be available through the Power and Water's website, including:

- Checklists for each development classification and standard notes for customers to complete a development.
- Preliminary Impact Assessment form - for customers to complete to enable Power and Water to complete an assessment of the impact of the development of the utility infrastructure, including advice on the broad range cost estimates for network upgrades if required.
- Frequently Asked Questions – for customers to advise of the information Power and Water require require to complete a project and update as constructed data.

Further information on remote development services is available from our website:

http://www.powerwater.com.au/networks_and_infrastructure/remote_operations

Marking out a new power-line

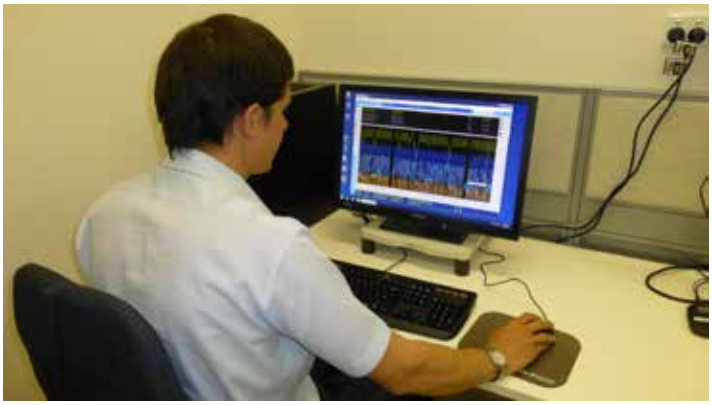
Remote monitoring and control

Power and Water utilises Supervisory Control and Data Acquisition (SCADA) to remotely monitor and control utility infrastructure. This approach enables us to effectively and efficiently manage our assets and services, while providing data to meet our reporting and asset planning requirements.

Power and Water continues to upgrade and extend the capability of the remote monitoring and control network across the 72 remote communities.

Currently, SCADA systems are currently deployed in:

- all 52 diesel power stations, including the 6 diesel-solar hybrid generation sites; and
- various combinations of water infrastructure in 24 communities.



Continuing to invest in SCADA

The advantages of investing in SCADA are:

- to remotely monitor and control utility infrastructure, which reduces maintenance costs by enabling diagnosis of issues without travelling to site – either preventing the need to go to site or ensuring appropriate skills or equipment is taken to site;
- reduce length of service outages by real-time notification of faults and additional information on system performance to enable timely responses;
- provides evidence of asset performance to inform requirements for asset replacement and capital, including timing to maximise cost efficiencies;
- report utility service performance through the historical data storage systems and meet compliance reporting requirements; and
- effective tool to monitor contractor or supplier performance as well as provide opportunities for remote training for ESO's on-site.

SCADA is an automation system that consists of:

- ***Sensors and remote units*** *that gather the monitoring information from the assets (bores, generators, meters);*
- ***Communications (cable, radio, fibre, satellite)*** *that transmits the information from the remote communities back to regional centres;*
- ***Computer, software and data historian*** that stores the information for analysis onsite and in the regional centres.

Benefits from SCADA

- Reduced operational and capital expenditure:
  - remote diagnostics enabling a more informed response to faults and outages;
  - reduced travel costs to site or expensive emergency mobilisation of staff and contractors - saving airfares, charters, driving, travel allowance and time / labour; and
  - defer asset replacement and capital investment requirements evidenced by asset performance.
- Improved service reliability:
  - immediate notification of faults or outages improves response times;
  - ability to control remotely reduces down-time of services;
- Better planning:
  - efficient data collection and reporting of services and asset performance & standards compliance; and
  - provides evidence to inform long-term planning of capital investment.

CASE STUDY:

Community: Wurrumiyanga, Bathurst Island

Service: Water supply System

Project: $220,000 to install SCADA capability

Payback period: 18 months, due to the more efficient operation of the supply system reduced pumping costs, reduced water losses (saving precious water) and reduced ESO labour time.

The average capital investment to establish remote monitoring and control infrastructure per community is in the order of $200,000 $300,000 with on going operational costs of 5% per annum.

Achievements for 2012-2013

The RO SCADA team has achieved over the past 2 years.

Water Services:

- Designed, implemented and commissioned Telemetry and SCADA systems in 9 communities;
- Upgraded Telemetry and SCADA systems in 4 communities;
- Changed Telemetry Radio frequencies for 10 telemetry systems, (to comply with licensing requirements);
- Commenced the high level design utilising telemetry and SCADA for automating and monitoring 36 community water systems;
- Integrated 12 SCADA systems to the Historian accessed through the RO SCADA WAN; and
- Integrated Pervasive Telemetry with the data historian.

Electricity Services:

- Managed the SCADA development for the Ti Tree, Kalkarindji & Alpurrurulam (TKLN) renewable energy project;
- Developed software to manage the TKLN Power Purchase agreement, utilising the SCADA WAN;
- Integrated 5 Power station SCADA systems to the RO SCADA WAN; and
- Interfaced 4 Generation sites to the Data Historian.

Communication:

- Established connection with the Dept. of Education Satellite systems and extended the SCADA WAN to 15 communities;
- Commissioned Department of Corporate and Information Services (DCIS) Fibre to power stations in 3 communities;
- Established a SCADA WAN presence at RO Offices in Darwin; and
- Established an agreement with PWC Water Services to utilise capacity on their Data Historian, and interfaced it to the SCADA WAN.

POWER AND WATER CORPORATION

ESO training and employment

Power and Water regard Essential Services Operators (ESOs) as a vital partner in the delivery of power, water and sewerage services in remote communities. The ESOs manage our assets on a daily basis, and provide the first response to unscheduled supply interruptions and emergencies. **Power and Water regard Essential Services Operators (ESOs) as a vital partner in the delivery of power, water and sewerage services in remote communities. The ESOs are responsible for regular duties to**

The role of ESOs is provided through contracts with Shires or private suppliers. Over the next 12 months, new contracts arrangements for the provision of ESO role will be established to:

- Improve utility service outcomes;
- achieve greater competitiveness through a public tender process; and
- support local training and employment outcomes through the ESO career pathway.

ESO's career pathway

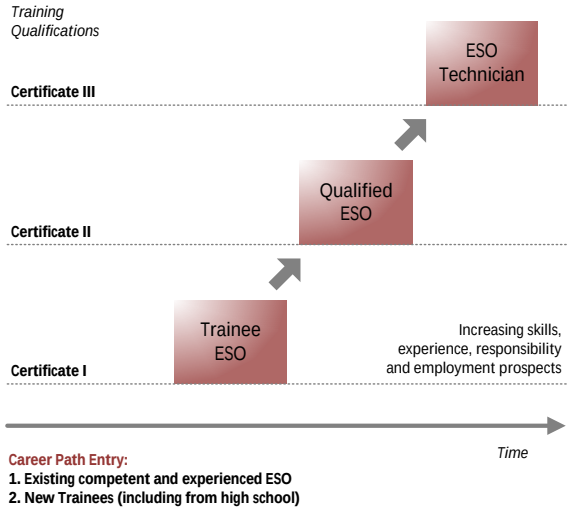
For a number of years, Power and Water has been building local capacity, providing training and developing opportunities in partnerships with contractors, to provide real jobs in remote communities.

As part of this process, Power and Water has developed the ESO career pathway to provide a framework for trainees and ESOs to develop their skills, knowledge and capabilities, whilst working in their remote community. The career path enables people to progress progressively obtain appropriate qualifications and skills to carry out the role of ESO. Starting from secondary school (Kormilda College) through to an Essential Services Trainee or Essential Services Operator, and progressing to the Certificate II, and ultimately an ESO Technician at the Certificate III qualification level (see diagram to right).

The pathway has been developed in conjunction with the following partners:

- Charles Darwin University (CDU);
- Centre for Appropriate Technology (CAT);
- Group Training Northern Territory (GTNT);
- Advance Training International (ATI);
- Government funding agencies; and
- Contractors.

ESO Career Path:
Training and Development Program



The career pathway is incorporated in contracts for the provision of ESO role including requirements for:

- on-the-job tuition;
- assistance with formal training; and
- mentoring to support ESO trainees along their career path.

In the longer term, Power and Water aims to have at least 50 per cent of ESOs having Certificate II or III qualification by 2014 and the proportion employed that are Indigenous increasing to 60 per cent by 2020.

Over 150 ESO have completed a Certificate II in Remote Area Essential Services since 2003, with a third of these continuing as ESO's today

Accomplishment to date

The following achievements have formed the building blocks of the training and development program:

- Over 35 new trainees commenced a Certificate II Qualification in Remote Area Essential Services, which involves on the job training sessions in their communities and training at CAT (Alice Springs) and ATI's (Darwin) training campuses.
- Completed specialised training for ESO's in:
    - Gas chlorine disinfection and fluoridation training specifically for ESO's working in six communities utilising this technology as part of Certificate II Water Operations.
    - Breathing Apparatus, a national qualification.
- Up skill ESO's and contactors of the fundamentals of Workplace, Health and Safety obligations and requirements as part of emerging legislative changes.

Outcomes for communities

The approach to training and development of our ESO supports local Indigenous employment by increasing community employment capacity with long-term jobs in the communities.

The structured career path provides a framework for trainees and ESOs to progress their competencies and capabilities while staying within the communities.

Once qualified, this will provide the ESO with other career opportunities in the utility, local government and mining sectors.

Focus for 2014

Power and Water will continue working with our partners to successfully deliver training for people in remote communities throughout the Northern Territory.

This will include:

- Working with schools to deliver a Certificate I in Remote Area Essentials Services, the students will be able to incorporate both school and on-the-job training back in their community, to gain the skills necessary to work as an ESO. Once the student completes the Certificate I, they will be able to enroll in the Certificate II Qualification as well as being qualified to become employed as a Trainee ESO.

  The Certificate I will commence in mid-2014, collaborating with Registered Training Organisations, E-OZ, and other utilities who deliver essentials services in remote locations.
- Continue to implement Certificate II training in Remote Area Essential Services for Trainee ESOs.
- Continue to implement Certificate II in Water Operations for ESO's who have completed the Certificate II in Remote Area Essential Services. This quantification provides more specific knowledge on the water and sewer system infrastructure.
- Meeting the requirements of the National Uniform Legislation ACT 2011, through the establishment of a complete database on all ESO's, qualifications and Licenses.