

Delivering Essential Services in Desert Indigenous Settlements

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Abstract

Access to affordable and functional housing in remote Indigenous settlements is dependent on successful management and maintenance of essential services infrastructure. Access to these services is a measure of the settlement viability. Together they constitute the principal technical services that need to be sustained in by State and Territory government agencies, Indigenous community organizations and other enterprises.

The supply of essential services infrastructure, repairs and maintenance to large Indigenous desert settlements is provided through different arrangements across the various States and Territories delineated on whether the Commonwealth funding is pooled in the jurisdiction. In WA pooled funding into the Remote Area Essential Services Program (RAESP) provides capital, operation and maintenance to 78 large Indigenous settlements and allows supply of capital and emergency repairs to be extended to some smaller settlements (outstations, homelands, emerging communities less than 50 people) by one of 3 Regional Service Providers, which are an Indigenous community organisation or a community-private partnership. In other parts of Australia, Indigenous community councils or local government authorities in larger settlements (Indigenous and non-Indigenous) provide maintenance services to the smaller settlements. However, in these settlements, technical services (minor repairs and maintenance for power, water, sewerage, solid waste) are most often provided by regional Indigenous resource agencies, particularly in WA, NT and SA. The Commonwealth Community Development & Employment Program (CDEP) provides basic wages for Indigenous community members to participate in these activities. While these agencies are the preferred medium of service delivery, with their 'community development' focus, their asset management capacities vary considerably. The principal source of funding for these various arrangements was the Commonwealth Department of Family and Community Services' (FaCS) Community Housing and Infrastructure Program (CHIP). The overall aim of this Desert Knowledge Cooperative Research Centre (DKCRC) scoping study was to identify knowledge gaps and opportunities for improving the maintenance of essential services in small desert settlements by looking at 12 case studies. An 'integrated technical services' model was investigated and a number of initiatives were identified that would contribute to improved maintenance.

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Introduction

This Desert Knowledge CRC scoping study investigated peoples' access to basic services in desert settlements such as power, water and sewerage. CHINS data and other surveys have often reported the high level of dysfunction that exists for these essential services in Indigenous settlements. In order to ensure reliability the infrastructure that delivers these services must be regularly maintained. This is ordinarily achieved through planned cyclical maintenance programs. The aim of this study was to describe the current pattern of technical services, the providers, delivery models and complex interactions that occur in technical services for Indigenous settlements across the arid and semi-arid zones of Australia. This study also describes some best-practice attributes and emerging models that seek to improve peoples' access to these services. The study has focussed on small desert settlements and the "outstation resource agencies" that have typically been the key service provider but it has also reviewed technical services to the large settlements that exist alongside them in order to describe the complex interactions that occur amongst technical services programs. The study developed largely descriptive accounts across 12 case studies using a Social Assessment methodology that identified key issues. The case studies are situated in the 10 ICC (former ATSIC) regions that span desert Australia from the 30 regions in total. These results are summarised in Attachment 1.

An intent of this scoping exercise in the first 2 years, Stage 1, of the CRC's 7-year life, has been, along with a number of other related CRC Theme 2 projects, to gather data, identify knowledge gaps and define relevant research questions for the Stage 2 research program. This scoping study starts to develop an integrated technical services model that seeks to improve desert peoples access to services and extend lifecycles of housing and infrastructure assets.

What is maintenance and why is it important?

A key element for developing a sustainable settlement is planned maintenance. Planned maintenance involves regular care of machinery and equipment so that the expected lifetime can be achieved. The life expectancy of infrastructure in many small and remote Indigenous settlements for example can be as little as five years. An absence of planned maintenance leads to breakdowns, failures, higher running costs and a shorter asset lifespan. These in turn may have health, safety and environmental implications. Planned maintenance involves a modest expenditure now to avoid large asset replacement costs in a nearer future. Expenditure may consist of training of personnel, the provision of tools and spare parts and an asset management program amongst others.

Efficient operation and maintenance is key to the effective delivery of technical services to remote settlements. It is however also integral to capital works, regulations and policy, and financial and human management which comprise infrastructure, or public works, administration. The Canadian experience with public works management in First Nation settlements found "vision and direction", "effectiveness", "accountability" and "sustainability" as four of the key principles to sound public works management (see, INAC, 2000). "Capital programming, operations and maintenance, and asset management are core functions of any public works department. Each of the communities emphasises

maintenance and asset management systems. Cost savings associated with maintenance have not received sufficient attention in the past. The trend now is to preserve existing capital infrastructure rather than letting it deteriorate and incur premature replacement costs”.

A maintenance management system (MMS) is a system framework which goes from the initial step of inventory gathering to preparing a settlement maintenance budget for asset maintenance planning and monitoring. Whilst “operation” (the day to day operation of a piece of equipment) is often used interchangeably with “maintenance” the difference is important to recognise. Maintenance tasks and their typical skilled personnel requirements can be categorised as follows:

<i>a) Routine</i>	On-going maintenance activities such as cleaning, grading roads which are required as a result of normal continuous use;	Tasks that could be done by local personnel in a remote settlement.
<i>b) Preventive</i>	Periodic lubrication, adjustment etc (eg changing oil and air filters) to ensure continuing working condition;	Tasks that could be done by local personnel but may require cyclical visitation by technical personnel.
<i>c) Major overhaul</i>	Engine re-conditioning, major components replaced etc;	Will require cyclical visitation by technical personnel with parts.
<i>d) Emergency or unplanned</i>	Unexpected breakdowns of assets or equipment. These necessarily are unpredictable and difficult to schedule.	Will require visitation by technical personnel to repair and supply parts.

It is worth noting that the incidence of emergency/unplanned maintenance is likely to be directly proportional to the age of the asset or equipment being considered and may confound attempts at any direct comparison, for example between two similar sized settlements.

Examples of the cost benefits achievable with cyclical or planned maintenance in Indigenous settlements can be found in essential service infrastructure under the RAESP program for Western Australia (see, Arup, 2005) and Indigenous housing maintenance modelling in Spiller (2000).

Case Studies

There were about 67 Indigenous Community Housing Organisations (ICHOs) in the desert that received FaCS CHIP Municipal funds (these funds, along with other sources, are used for the maintenance of settlement infrastructure). There were about 94 CDEP organisations in the desert whose participants are often employed in technical services and maintenance activities. The NT has the largest amount of Indigenous people living in small remote settlements. In the NT arid zone there were 34 Indigenous resource agencies servicing 294 outstations (<50 people).

Of the 30 ICC (former ATSIC) regions in Australia this DKCRC scoping study has profiled 12 case studies across 10 of the regions. These case studies describe the complex interactions that occur in technical services programs between the “major community” programs, the regional Indigenous organization programs and the settlement-based activities. The difficulties faced by many of these poorly resourced ORAs (Outstation Resource Agency) were documented as well as some creative initiatives that have emerged.

The 12 case studies that are the result of extensive consultation and fieldwork are listed in Attachment 1. The case studies were selected as a mix of “major communities” (“hub”) from which services were provided to outstations, major regional service providers under State/Territory programs, and outstation resource agencies across four states and the Northern Territory.

At the time of writing written consent had been received from some but not all of the case study settlements. In order to preserve the anonymity of these settlements and for the purposes of consistency all the case study settlements were given codes which identify their state/territory and ICC region only. Service providers were identified and therefore do not follow this coding system.

A summary of maintenance strategies for a range of service providers is tabulated in Attachment 1. These include two regional service providers, two community government councils/corporations and four outstation resource agencies from across desert WA, NT and SA. These were service providers who were willing to participate in this research and describe their dominant service methods, current issues and future directions and needs. Common maintenance methods, issues and emerging strategies are apparent.

The case studies profile a range of Indigenous service organisations across all jurisdictions with large numbers of small desert settlements and with a wide range of attributes. For example, AP Services and Ngaanyatjarra Services are part of larger Indigenous organisations and thus are part of a network of integrated service delivery. This is particularly the case for Ngaanyatjarra Council. Pitjantjatjarra Council’s AP Services is currently involved in a major restructure which may lead to a greater level of integration. Julalikari and Mamubalunjin are examples of town-based resource agencies that offer a range of services to a range of settlement sizes including outstations. Ingkerreke and Ngoonjuwah are examples of town-based Indigenous resource agencies that have a specific focus on outstations. Daguragu and Wulainj are examples of resource agencies based in “hub” settlements servicing outlying outstations. Tjuwanpa is an example of a remote stand-alone resource agency servicing outlying outstations. Thus the location of the service provider is listed in Attachment 1 column 3 as being in a major regional centre, large settlement (Indigenous “major community”) or in a remote stand-alone location.

Models

Large Settlements (“Major Communities”)

Over the last 20 years the State/Territory technical services programs to large settlements (major communities) have continued to evolve as policies, funding and bilateral agreements with the Commonwealth continued to be renegotiated.

In the Northern Territory, where the majority of desert settlements in the form of discrete Indigenous “major communities” exist, the NT Government program manages a single provider, the NT utility Power Water, to deliver all power, water and wastewater services. Construction works and some operation and planned maintenance tasks may be subcontracted to a local provider. Local participation is through the recruitment and training of community-based ESOs where this can be sustained.

In South Australia the SA Government program manages three separate providers:

the SA utility SA Water for water and wastewater services, the private contractor Cavill Power Products for electrical generation, and the SA utility ETSA for electrical distribution. Local participation is through the recruitment and training of community-based ESOs where this can be sustained.

In Western Australia the WA Government funds a contracted Program Manager by tender, currently Parsons Brinkerhoff, to manage three regional service providers (RSP) – currently Ngaanyatjarra Services, Pilbara Meta Maya and Kimberley Regional Service Provider (KRSP) – each of which have some parts of the arid zone in their regions. Two of these RSPs are an Indigenous community-controlled organization and one is an Indigenous community/private sector partnership. Each RSP may subcontract some parts of their cyclical maintenance program to other contractors depending on the geographical spread of settlements. Local participation is through the recruitment and training of community-based ESOs where this can be sustained. The new program management arrangements include three new contracted partners, two are Indigenous organisations, to enhance community participation and skills development.

In the desert region of far west NSW and Queensland arrangements for the operation and maintenance of essential services are typically through local government authorities for water and sewerage. All settlements in far west NSW are rural towns that receive power supply via the interstate, interconnected grid managed in that region by utility Country Energy.

In brief, most jurisdictions’ essential services delivery in large settlements has evolved over 20 years as a “supply-side” model, using the mainstream utilities as the provider, with mainstream standards of performance from the infrastructure as an important target. A central objective in all of these programs is to maximise the lifecycle of the assets and this is achieved by scheduling planned maintenance on a cyclical basis. The case in WA is somewhat different where in recent years, while managing cyclical schedules, a more “demand-responsive” model has evolved. Through the use of both Indigenous organizations and private sector partners at the program management and regional service provider levels more community participation is sought. In all jurisdictions the model of local recruitment of ESOs through formal training and part-time employment is challenged by the technical skills required, mobility and low levels of retention.

Small Settlements (outstations or homelands)

Over the last 20 years technical services have generally been provided to small settlements (outstations) via Indigenous community-controlled organizations commonly known as outstation resource agencies (ORAs) or centres (ORCs) and funded by the Commonwealth in all jurisdictions. These agencies commonly operate in NT, WA and SA where there are the greatest number of outstations.

Resource agencies are typically grants based organizations receiving funds to maintain essential services largely from the Commonwealth Department of FaCS’ CHIP Municipal program based on the number of people serviced in outstations. These funds are then used for salaries of technically qualified personnel or to pay subcontractors to carry out maintenance tasks, administrative overheads, fuel and transport. A resource

agency may also act as a CDEP organisation funded through the Commonwealth DEWR and recruit community members for its municipal works program in the settlements. A resource agency may also provide housing management and maintenance services, collecting rent and receiving annual maintenance funds allocated on a per house basis from the State/Territory housing departments. The latter are often subcontracted to carpentry, plumbing and electrical trades personnel.

Prior to FaCS, ATSIC and then ATGIS were the funders of the resource agencies and outstations with CHIP Municipal. The ATSIC Regional Councils were able to successfully prepare annual reports, strategic plans and outstation policies that clearly defined the roles and responsibilities of the resource agencies in receipt of CHIP Municipal funds. Under the CHIP policy of 2002-2005, and usually the ATSIC outstation policies, resource agencies were required to prepare the following for ATSIC and now FaCS at the regional ICC office:

- Business Plan showing outstation, populations, assets, conditions and projected incomes and expenditures (usually prepared by a consultant);
- A Plan for each outstation articulating the settlement goals and activities (usually expected to be prepared by the outstation residents);
- A service agreement between the outstation and resource agency;
- An annual summary report of all repairs and maintenance conducted.

Business Plans were usually prepared and submitted to the regional ATSIC/ICC office, sometimes service agreements were made but the case study research revealed that rarely were the other reporting requirements fulfilled. This reflects the low level of human and physical resource capacity experienced by many resource agencies. It is often difficult to recruit and retain skilled personnel in remote areas with few and unreliable services. These personnel build the necessary administrative, managerial and maintenance systems to sustain the services that ideally should remain in place when they leave for other staff members to continue. ATSIC/FaCS generally did not provide a service to assist in this capacity building aspect. It was also reported that the large geographic spread of outstations meant that it was not economically feasible for a resource agency to deliver some services.

Rarely did the case studies show resource agencies delivering full cyclical maintenance programs for the power and water services assets in the outstations. Skilled personnel were often able to sustain a program of *ad hoc* maintenance driven by emergency repairs or other services such as carting fuel, water or firewood, where other maintenance activities would be conducted on such visits.

Emerging Models

There are some emerging trends that may indicate future alternative models:

- a) In WA the RAESP regional service providers sometimes extend their cyclical maintenance to “emerging communities” and visits to outstations for emergency repairs or capital works with FaCS funding when approved by the Program Manager to improve access to services for residents;

- b) In WA FaCS decided to recruit CAT as a program manager to provide performance-based cyclical maintenance services to 22 outstations in the Kimberley region. CAT put the work to tender which was won by a private contractor;
- c) In SA many small outstation resource agencies have been wound up in favour of having AP Services as the single large resource agency providing all technical services to all outstations in this region to achieve economies of scale;
- d) In the NT where distance allows outstations are being grid-connected to larger power stations in hub settlements using NAHS funds to centralise the maintenance requirement and improve reliability of power supply for residents.
- e) Across Australia the Bushlight program is rolling out small-scale renewable energy power supply systems to small settlements. It is currently in the phase of consolidating its management agreements with regional resource agencies as the key maintenance providers. The Bushlight model summarized as follows can be investigated for its potential to be expanded into a full integrated technical services model: 1. Prepare, 2. Select, 3. Install, 4. Maintain, 5. Sustain.

The anecdotal evidence from the case studies was that where access to services can be improved as above people will prefer to live on outstations rather than in town. However, there are knowledge gaps that need to be filled in order to fully describe current models and develop new integrated technical services models.

Findings

The key issues that emerged from the Social Assessment methodology used in this study were organised into five distinguishable themes that may help to characterise attributes of integrated technical services models in the future. Some of the principal findings of this scoping study are presented below under these five themes:

A. Sustainable Enterprises

- i) Can a uniform “maintenance management system” be developed for effective planned (cyclical) and unplanned (minor and emergency repairs) maintenance for use across a new ‘demand-responsive’ resource agency sector?
- ii) How can integrated maintenance service planning be extended to small desert settlements? This project has identified the current cash inputs of Municipal Services funding, CDEP places, CHIP Capital funds (these inputs may be via OIPC “Shared Responsibility Agreements”), Housing Maintenance funds; community inputs such as EHWs and ESOs as well as future possible private sector technical support inputs from regional mining, tourism or agricultural companies.

B. Sustainable Livelihoods

- i) Can “settlement maintenance plans” adapted to the new Commonwealth arrangements for Indigenous affairs contribute to livelihoods in small desert settlements, a new integrated technical services model and a “sustainable desert settlement”? This scoping study has developed some prototypes that with some further development can be trialled as part of a future action research program.

- ii) Can a community based researcher (CBR) be further developed as part of a long-term Indigenous engagement and employment strategy in Desert Australia?

C. Sustainable Design & Technology

- i) Can an electronic decision support tool for total strategic asset management, and in particular for cyclical planned maintenance, be developed for a new resource agency sector? A review of maintenance management systems in the case studies and a preliminary investigation of suitable web-based platforms was undertaken in this scoping study and there may not be an ideal software program currently in existence in the market. A resource agency could develop a 'settlement maintenance plan' as part of the Business Plan or as a standalone document supported by an office-based computer software to guide the works program.
- ii) Can innovative new digital office management systems, remote sensing for asset monitoring and management and other business information systems be integrated to contribute to a new resource agency sector?

D. Sustainable Resources

- i) Why are resource conservation initiatives not usually effective amongst desert Indigenous communities? Can a new system of resource conservation strategies be developed as part of an integrated technical services model?
- ii) Is smart card technology, for household water and energy resources, a path towards ownership and responsibility and can it encourage conservation and efficiency along with ongoing awareness raising? What are the real savings resulting from the use of this technology?

E. Sustainable Diffusion

- i) Can a web-based information service to enable networking amongst a new resource agency sector be established eg. as a professional association, for sharing best practices, capacity building and other mutual benefits?

Conclusions

The three key technical service areas that occur in a large Indigenous desert settlement are essential services (infrastructure), municipal services (general amenities around the settlement) and domestic or household services (equipment within the property boundary or ring mains to a single residence). In general, these are currently supported by FaCS CHIP Capital and Municipal Services, DEWR CDEP and State/Territory health and housing departments respectively up until June 30, 2005.

Over the last 20 years technical services have generally been provided to small settlements (outstations) via outstation resource agencies with grants from the Commonwealth FaCS CDEP and Municipal programs in all jurisdictions.

For service delivery to small desert settlements CDEP and resource agencies can be a focus for future business and enterprise development opportunities as it attracts a greater pool of participants from which to divert the more entrepreneurial into commercial activity ie tendering for contracted service provision.

Integration across the three sectors can occur to maximise business opportunities for some maintenance activities. An electronic decision support tool for total strategic asset management, a maintenance management system, can be developed as part of a new resource agency sector. Individual settlements with the support of ORAs where necessary can develop “Settlement Maintenance Plans” after the organisation’s business plan and as a subset of the maintenance management system. The SMP can define which activities can be conducted under a Contracted Service Provider (CSP) or regional CDEP enterprise, residents or a mix.

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Attachment 1: Summary of Essential Services Maintenance Strategies across 12 Desert Australia Case Studies

Case Study (# Jurisdiction ICC)	# Out- stations	Large Settlement = X, Y or Z	Current Maintenance Strategy	Felt Needs - Future Aims
1 WA Kalgoorlie	3	X and Y	RAESP 38 day cyclical maintenance program to large settlement. Some outstations assisted but discouraged.	Software for better project costing, scheduling maintenance and data recoding. Better training of ESOs. Difficult to retain professional staff in these remote areas.
2 WA Broome	7	X and Y	Cycle of 4 visits per year. RAESP 38 day cyclical scheduled maintenance program to large settlement and emergency repairs to outstations.	Road access is a major challenge. Need qualified plumbers for wastewater services.
3 WA Derby	22	X	Six week cyclical program for power and water only.	Settlement maintenance plans. Water quality testing.
4 WA Kununurra	5	X	Emergency repairs only. RAESP will do emergency repairs on call if cannot be done themselves.	Prefer to be on RAESP list and receive cyclical maintenance. Difficult to retain professional staff.
5 NT Alice Springs	20	X	No scheduled maintenance program. Primarily emergency response.	Started data collection for future scheduling. Need data collection, asset management, scheduling system.
6 NT Alice Springs	44	Z	Emergency repair response + visitation once a month. All infrastructure assets in a GIS program. Distances to outstations result in infrequent visits.	Telemetry monitoring current, voltage, power output, load, water flow. Centralised power via mini-grids.
7 NT Alice Springs	5	Y	Power Water cyclical scheduled maintenance program to large settlement plus local ESO gives weekly visit and emergency repairs to outstations.	Would prefer more local participation but ESO too busy for TAs or training. Bushlight systems.

Attachment 1: Summary of Essential Services Maintenance Strategies across 12 Desert Australia Case Studies (continued)

Case Study (# Jurisdiction ICC)	# Out-stations	Large Settlement = X, Y or Z	Current Maintenance Strategy	Felt Needs - Future Aims
8 NT Tennant Creek	43	X	Try cyclic but sometimes only emergency repairs.	Standardised gensets, solar bores. Need electronic decision support, database and reporting tool - cannot purchase software. More Bushlight systems.
9 NT Katherine	11	Y	Self managed with private funding.	Development of a private sector business model.
10 SA Port Augusta	36	X and Z	Newly initiated cyclic maintenance program where homelands officers will visit each outstation at least every fortnight, but preferably each week.	Need web-based system that enables better information sharing among maintenance personnel. Consolidation of data from several sources in maintenance management computer program. New data needs to be easily entered.
11 NSW Bourke	0	X	Statewide grid connected power cyclical maintenance by utility Country Energy. Water by local government authority.	Employment, better access to water, household septics replaced with centralized recycling system.
12 QLD Mt Isa	1	X	Self managed with some assistance from local government authority.	Improved access to power and water services.

Notes: X = the outstations have access to services via a resource agency in a mainstream regional centre; Y = the outstations have access to services via a resource agency in a large indigenous settlement; Z = the outstations have access to services via a resource agency in its own remote setting;