

Department of Resources, Energy and Tourism (DRET)

PROPOSED COMMONWEALTH  
RADIOACTIVE WASTE MANAGEMENT  
FACILITY, NORTHERN TERRITORY

# Land Use and Demographic Analysis Report



Proposed Commonwealth  
Radioactive Waste  
Management Facility,  
Northern Territory

LAND USE AND  
DEMOGRAPHIC  
ANALYSIS REPORT

13 March 2008

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**Department of Resources,  
Energy and Tourism (DRET)**

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Parsons Brinckerhoff Australia Pty Limited ABN 80 078 004 798

*PPK House*  
101 Pirie Street  
Adelaide SA 5000  
GPO Box 398  
Adelaide SA 5001  
Australia  
Telephone +61 8 8405 4300  
Facsimile +61 8 8405 4301  
Email [adelaide@pb.com.au](mailto:adelaide@pb.com.au)

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Author: N Smit, K Finch, C Haynes.....

Signed: .....

Reviewer: J Goode, M Drechsler .....

Signed: .....

Approved by: D Howard .....

Signed: .....

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# Contents

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	<b>Page number</b>
<b>Executive summary</b>	<b>vii</b>
<b>L1. Introduction</b>	<b>1</b>
<b>L2. Mount Everard</b>	<b>3</b>
L2.1 Site use and tenure	3
L2.2 Zoning	3
L2.3 Surrounding land use	4
L2.3.1 Infrastructure	4
L2.3.2 Airports	5
L2.3.3 Recreation	5
L2.4 Heritage	5
L2.5 Surrounding population centres	6
L2.5.1 Indigenous	6
L2.5.2 Other centres	8
L2.6 Demographics	9
L2.6.1 Data sources	9
L2.6.2 General information	9
L2.6.3 Population	9
L2.6.4 Education	11
L2.6.5 Employment	12
L2.7 Prominence in landscape	14
<b>L3. Harts Range</b>	<b>17</b>
L3.1 Site use and tenure	17
L3.2 Zoning	17
L3.3 Surrounding land use	18
L3.3.1 Infrastructure	18
L3.3.2 Airports	19

## Contents (Continued)

	<b>Page number</b>
L3.4 Heritage	19
L3.5 Surrounding population centres	20
L3.5.1 Indigenous	20
L3.5.2 Other centres	21
L3.6 Demographics	21
L3.6.1 Data sources	21
L3.6.2 General information	22
L3.6.3 Population	22
L3.6.4 Education	23
L3.6.5 Employment	26
L3.7 Prominence in landscape	27
<b>L4. Fishers Ridge</b>	<b>29</b>
L4.1 Site use and tenure	29
L4.2 Zoning	29
L4.3 Surrounding land use	30
L4.3.1 Infrastructure	30
L4.3.2 Airports	31
L4.3.3 Ports	31
L4.3.4 Tourism	31
L4.3.5 Defence	31
L4.4 Heritage	31
L4.5 Surrounding population centres	32
L4.5.1 Indigenous	32
L4.5.2 Other centres	34
L4.6 Demographics	34
L4.6.1 Data sources	34
L4.6.2 General information	34
L4.6.3 Population	36
L4.6.4 Education	38
L4.6.5 Employment	39
L4.6.6 Demographic summary	41
L4.7 Prominence in landscape	41
<b>L5. Muckaty Station</b>	<b>43</b>
L5.1 Site use and tenure	43
L5.2 Zoning	43

## Contents (Continued)

	<b>Page number</b>
L5.3 Surrounding land use	43
L5.3.1 Infrastructure	44
L5.3.2 Airports	44
L5.3.3 Tourism	44
L5.4 Heritage	45
L5.5 Surrounding population centres	45
L5.5.1 Indigenous	45
L5.5.2 Other centres	46
L5.6 Demographics	46
L5.6.1 Data sources	46
L5.6.2 General information	46
L5.6.3 Population	48
L5.6.4 Education	49
L5.6.5 Employment	51
L5.6.6 Demographic summary	51
L5.7 Prominence in landscape	52
<b>L6. Discussion</b>	<b>53</b>
L6.1 Proximity	53
L6.2 Surrounding land use	54
L6.2.1 Recreation	55
L6.3 Heritage and tourism	55
L6.4 Visibility to public	56
L6.5 Current ownership/operations	57
<b>L7. References</b>	<b>59</b>
<b>L8. Statement of limitations</b>	<b>63</b>

## List of tables

	<b>Page number</b>
Table L2.1 Aboriginal communities within 50 km of Mount Everard	7
Table L3.1 Aboriginal communities within 50 km of Harts Range	20
Table L4.1 Aboriginal communities within 50 km of Fishers Ridge	33
Table L5.1 Aboriginal communities within 50 km of Muckaty Station	46

## List of figures

	<b>Page number</b>	
Figure L1.1	Proposed repository sites	follows Page 2
Figure L2.1	Land tenure within 20 kilometres of Mount Everard	follows Page 4
Figure L2.2	Land use around Mount Everard	follows Page 4
Figure L2.3	Aboriginal communities within 50 km of Mount Everard	follows Page 6
Figure L2.4	Census collection districts and statistical local areas surrounding Harts Range and Mount Everard	follows Page 10
Figure L2.5	Total persons time series profile for Mount Everard SLA	10
Figure L2.6	Total Indigenous population time series profile for the Mount Everard SLA	11
Figure L2.7	Highest level of schooling completed at 2001 census for Mount Everard CCD	12
Figure L2.8	Highest level of schooling completed at 2001 census, Mount Everard CCD versus Australia	13
Figure L2.9	Employment status time series profile for Mount Everard SLA	13
Figure L2.10	Industry types by size for Mount Everard SLA	14
Figure L2.11	Northern Territory designated roads	15
Figure L3.1	Land tenure within 20 kilometres of Harts Range	follows Page 18
Figure L3.2	Land use around Harts Range	follows Page 18
Figure L3.3	Aboriginal communities within 50 kilometres of Harts Range	follows Page 20
Figure L3.4	Total persons time series profile for the Harts Range SLA	23
Figure L3.5	Total Indigenous population time series profile for the Harts Range SLA	24
Figure L3.6	Highest level of schooling completed at the 2001 census for the Harts Range CCD	25
Figure L3.7	Highest level of schooling completed at 2006 census, Harts Range CCD versus Australia	25
Figure L3.8	Employment status time series profile for Harts Range SLA	26
Figure L3.9	Industry types by size for Harts Range SLA	27
Figure L4.1	Land tenure within 20 kilometres of Fishers Ridge	follows Page 30
Figure L4.2	Land use around Fishers Ridge	follows Page 30
Figure L4.3	Aboriginal communities within 50 km of Fishers Ridge	follows Page 34
Figure L4.4	Census collection districts and statistical local areas surrounding Fishers Ridge	follows Page 34
Figure L4.5	Total persons time series profile for Fishers Ridge SLA	35
Figure L4.6	Total Indigenous population time series profile for the Fishers Ridge SLA	35
Figure L4.7	Total NT population projections (Series A, B and C)	37
Figure L4.8	Highest level of schooling completed at 2006 census for the Fishers Ridge CCD	38
Figure L4.9	Highest level of schooling completed at 2006 census, Fishers Ridge CCD versus Australia	39
Figure L4.10	Employment status time series profile for Fishers Ridge SLA	40
Figure L4.11	Industry types by size for Fishers Ridge CCD	40
Figure L5.1	Land tenure within 20 kilometres of Muckaty Station	follows Page 44
Figure L5.2	Land use around Muckaty Station	follows Page 44
Figure L5.3	Aboriginal communities within 50 km of Muckaty Station	follows Page 46
Figure L5.4	Census collection districts and statistical local areas surrounding Muckaty Station	follows Page 46
Figure L5.5	Total persons time series profile for Tablelands SLA	47



## List of figures (Continued)

		<b>Page number</b>
Figure L5.6	Total Indigenous population time series profile for the Tablelands SLA	47
Figure L5.7	Total NT population projections (Series A, B and C)	49
Figure L5.8	Highest level of schooling completed at 2001 Census for Muckaty Station	50
Figure L5.9	Highest level of schooling completed at 2001 Census, Muckaty Station CCD versus Australia	50
Figure L5.10	Employment status time series profile for Tablelands SLA	51
Figure L5.11	Industry types by size for Muckaty Station CCD	52



# Executive summary

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Parsons Brinckerhoff Australia Pty Ltd (PB) has been commissioned by the Department of Resources, Energy and Tourism (DRET) to undertake preliminary multi-disciplinary site assessments at four locations in the Northern Territory with regard to their suitability for use as a low to medium level radioactive waste management facility. The facility is to be known as the Commonwealth Radioactive Waste Management Facility (CRWF).

Three Commonwealth owned and Defence-managed sites were selected for the studies which formed part of a larger assessment process involving the collection, collating and provision of site suitability assessments. The studies will provide a basis from which the Commonwealth Government can consider the future project requirements. The three initial sites are listed below:

- Mount Everard – Approximately 25 km north-west of Alice Springs
- Harts Range – Approximately 100 km north-east of Alice Springs
- Fishers Ridge – Approximately 40 km south-east of Katherine.

During the investigations of these three sites, an additional fourth ‘volunteer’ site – Muckaty Station (located approximately 110 km north of Tennant Creek) was nominated by the Traditional Owners (the Ngapa clan) and added to the scope of the investigations.

The purpose of this report is to analyse and document the land uses and demographic characteristics of the sites from literature and existing information. No site specific data was collected. This factual report presents a summary of the land uses and demographic characteristics of the sites and does not include in-depth analysis of the data nor attempt to rank the sites with respect to their suitability for a CRWF.

The key factors affecting each site in terms of their suitability for a CRWF when compared with each other are have been considered as proximity to sensitive areas, surrounding land uses, visibility, economics and land ownership/management.

## **Proximity to sensitive areas**

In analysing the suitability of the four sites based on their proximity to areas of interest or sensitivity, factors considered include the nearest permanent residents, nearest Aboriginal communities and nearest permanent major population centre(s).

The Harts Range site has the nearest permanent resident(s) to the proposed facility, being the Defence personnel (including contractors) that live on-site, located approximately 1.5 kilometres from the proposed facility. The next closest dwelling (Alcoota Station) is located approximately 14 kilometres north of the site.

At Fishers Ridge, there are no dwellings on the Commonwealth land and the nearest permanent residents are the Utley family whose pastoral station adjoins the site to the west. The actual location of their residence is 5 kilometres up to 8 kilometres from the site depending on the location of the facility.

The nearest place of residence at Mount Everard is the Were-Therre Aboriginal community, located approximately 3 km south-west of the site. However, as the community is classified as a Family Outstation (this is defined as a community having up to 20 semi-permanent residents) it is unknown how permanent the community is at Were-Therre.

At Muckaty Station the nearest permanent resident(s) is located approximately 5 km to the north-east of the investigation area. As with the situation at Mount Everard, this community is classified as a Family Outstation (this is defined as a community having up to 20 semi-permanent residents). The Muckaty residence is located approximately 6 km to the north of the investigation area where Mr Ray Aylett, Manager of Muckaty Station, and his workers reside.

If the on-site personnel at Harts Range are demobilised, then the nearest permanent residents to the four sites would be:

- Mount Everard: Were-Therre (approximately 3 km south-west)
- Fishers Ridge: Utley residence (approximately 5–8 km west)
- Harts Range: Alcoota station (approximately 15 km north)
- Muckaty Station: Muckaty (approximately 5 km to the north-east).

When considering which site is closest to an Aboriginal community (as identified by the Northern Territory government), Mount Everard is the closest. Mount Everard has two family outstations within 5 km of the site (Were-Therre and Mount Twellar). Muckaty Station has one family outstation within 5 km of the site (Muckaty), Fishers Ridge has one Aboriginal community (Banatjarl – family outstation) located 5–10 km from the site and Harts Range's nearest Aboriginal community is the Engawala minor community located approximately 15 km north of that site.

Fishers Ridge is the closest site to a major population centre due to its proximity to Tindal Airbase (which houses Defence families) (approximately 25 km west) and Katherine (approximately 40 km north-west). The nearest major population centre to Harts Range and Mount Everard is Alice Springs with Mount Everard being 25 km north-west of Alice Springs and Harts Range being 100 km north-east of Alice Springs. The nearest major population centre to Muckaty Station is Tennant Creek located approximately 110 km south of the site.

## Surrounding land use

The suitability of each site was also analysed based on surrounding land use. This includes regional population density, development potential, zoning and neighbouring uses (including recreational and tourism).

The calculation of the general population density at each site gives a good indication of the nature of surrounding land use and proximity to sensitive receivers. The following figures indicate the population density within each site's Census Collection District. While this may not be truly indicative of the surrounding region, as high density areas would be in their own collection districts, it does give an idea of the regional population around each site.

- Fishers Ridge: 20 km<sup>2</sup>/person
- Mount Everard: 27.8 km<sup>2</sup>/person
- Harts Range: 215 km<sup>2</sup>/person
- Muckaty Station: 352 km<sup>2</sup>/person.

It is logical to assume that Fishers Ridge area would have a higher density population due to its proximity to Tindal Airbase and Katherine. This is supported by the figure above (even though the Collect District excludes Tindal and Katherine) showing that even regionally it is the most populated region. Mount Everard's population density (which excludes Alice Springs itself) is a result of it being closer to Alice Springs and therefore, includes population on the outskirts of the town. Harts Range low population density is due to its remote distance from Alice Springs and its climate not being suitable for intense agriculture. The Muckaty Station population density excludes Tennant Creek.

As stated earlier, in terms of surrounding development potential, urban growth eastwards from Katherine may be limited due to the position of the Tindal RAAF base. However, this is unlikely to limit the growth of irrigation agriculture in this region and there is little to stop the potential expansion of the Tindal RAAF base. As a result Fishers Ridge has the most potential to develop due to its climate being well suited to agriculture and its proximity to infrastructure and services at Katherine and Tindal. Development of such a facility at Fishers Ridge may pose an impediment to future neighbouring or regional land use development due to the nature of the land and climate. The Fishers Ridge site is also currently used for grazing land which would need to cease if the facility was positioned on this site.

Mount Everard is considered to have some potential to be affected by future development from a planning perspective due to its proximity to existing infrastructure at Alice Springs.

Harts Range has very little potential to be affected by development due to its isolation and desert climate with the exception of possible mining development.

As with Harts Range, Muckaty Station is considered to have very little potential to be affected by development due to its isolation. Given the freehold nature of the land there may be the potential for development to expand in the area e.g. mining however this will be limited by economics and landholder agreements

It is understood that, none of the sites are included within any council or territory zoning boundaries and it is, therefore, unlikely that any development will take place within the regions in the immediate future. In addition the *Commonwealth Radioactive Waste Management Act 2005* disapplies NT laws for all four sites.

## Recreation

Harts Range as a site currently experiences a relatively high level of recreational activity, generated solely by live-in or on-site Defence families (including contractors). The site is used for a range of activity including walking, bike riding and general recreation by children. This would need to cease or at least be restricted if Harts Range was selected. Naturally if Defence decides to demobilise these families and operated the Harts Range radar facility remotely, the recreational activity will cease.

Fishers Ridge also experiences recreational activities primarily in the form of fishing and potentially camping. It is understood that general public access remote sections of the King River via tracks through the Fishers Ridge site. Development of such a facility at Fishers Ridge will restrict such unauthorised access through the site and therefore impact on general recreational activity.

Mount Everard has no known current recreational activity on site.

Whilst not specifically used for recreational activities, Muckaty Station is Aboriginal Freehold land under a communal title and has heritage significance to the surrounding indigenous communities.

## Heritage and tourism

Heritage (both Aboriginal and European), the natural environment and tourism are intrinsically linked in the Northern Territory. The proximity of each site to these features was considered.

Assessment of the proximity of each of the sites to places of Aboriginal heritage was not conclusive as indigenous places listed on the Register of the National Estate are not specifically identified. Although sites were detected within the regions at Mount Everard and Harts Range, their exact proximity to the sites could not be determined.

The Aboriginal Areas Protection Authority identified sites near all four investigated sites. For the three original (Department of Defence owned sites), DRET received clearance for work and investigations within the vicinity of these sites.

Clearance for the investigation activities undertaken within Muckaty Station was obtained by DRET as part of the site nomination negotiations with the Northern Land Council and Muckaty Aboriginal Land Trust.

With regard to European Heritage, Fishers Ridge is the closest site with the Cutta Cutta Caves (14 km west) identified as a registered place on the Register of the National Estate and also a major tourism attraction. Leach Lagoon, located 2 km south of the Fishers Ridge site, is listed as an indicative place on the Register of the National Estate.

At Mount Everard, the closest European heritage site is Hamilton Downs Youth Camp (20 km west/south-west), listed as a Registered site on the Register of the National Estate. The Junction Waterhole Area, located 25 km east/south-east of the site, is also a Registered place on the Register of the National Estate.

Searches within the Harts Range region found no places of significant European cultural heritage.

## Visibility to public

The site most visible from a public place is Mount Everard, being positioned adjacent the Tanami Road

Harts Range is not visible from the Plenty Highway however the site could be visible from the higher elevation of Low Rock, situated near the access road to the site.

Fishers Ridge is not visible being located on a minor access road approximately 5 km off Stuart Highway.

Muckaty Station is not visible from the Stuart Highway.

## Current ownership/operations

Three of the investigated sites (Fishers Ridge, Mount Everard and Harts Range) are currently owned by the Commonwealth Government of Australia and operated by the Department of Defence. There are no differentiating factors between the sites with regard to ownership.

The disruption potential to current site use/operations at each of the Defence sites (from both the construction and operational phases of the CRWF) is quite different. The highest disruption potential is at Mount Everard due to the operations of the over-the-horizon radar. The second highest potential is at Harts Range due to the staff and their families who live on-site and that the site is currently used for



defence operations. The Defence site with the least disruption potential is Fishers Ridge as the site is currently not used for formal Defence operations.

The fourth “volunteer” site is Aboriginal Freehold land under a communal title to the Ngapa clan.





# L1. Introduction

---

Parsons Brinckerhoff Australia Pty Ltd (PB) has been commissioned by the Department of Resources, Energy and Tourism (DRET) to undertake preliminary multi-disciplinary site assessments at four locations in the Northern Territory with regard to their suitability for use as a low to medium level radioactive waste management facility. The facility is to be known as the Commonwealth Radioactive Waste Management Facility (CRWF).

Three Commonwealth owned and Defence-managed sites were selected for the studies which formed part of a larger assessment process involving the collection, collating and provision of site suitability assessments. The studies will provide a basis from which the Commonwealth Government can consider the future project requirements. The three initial sites are listed below:

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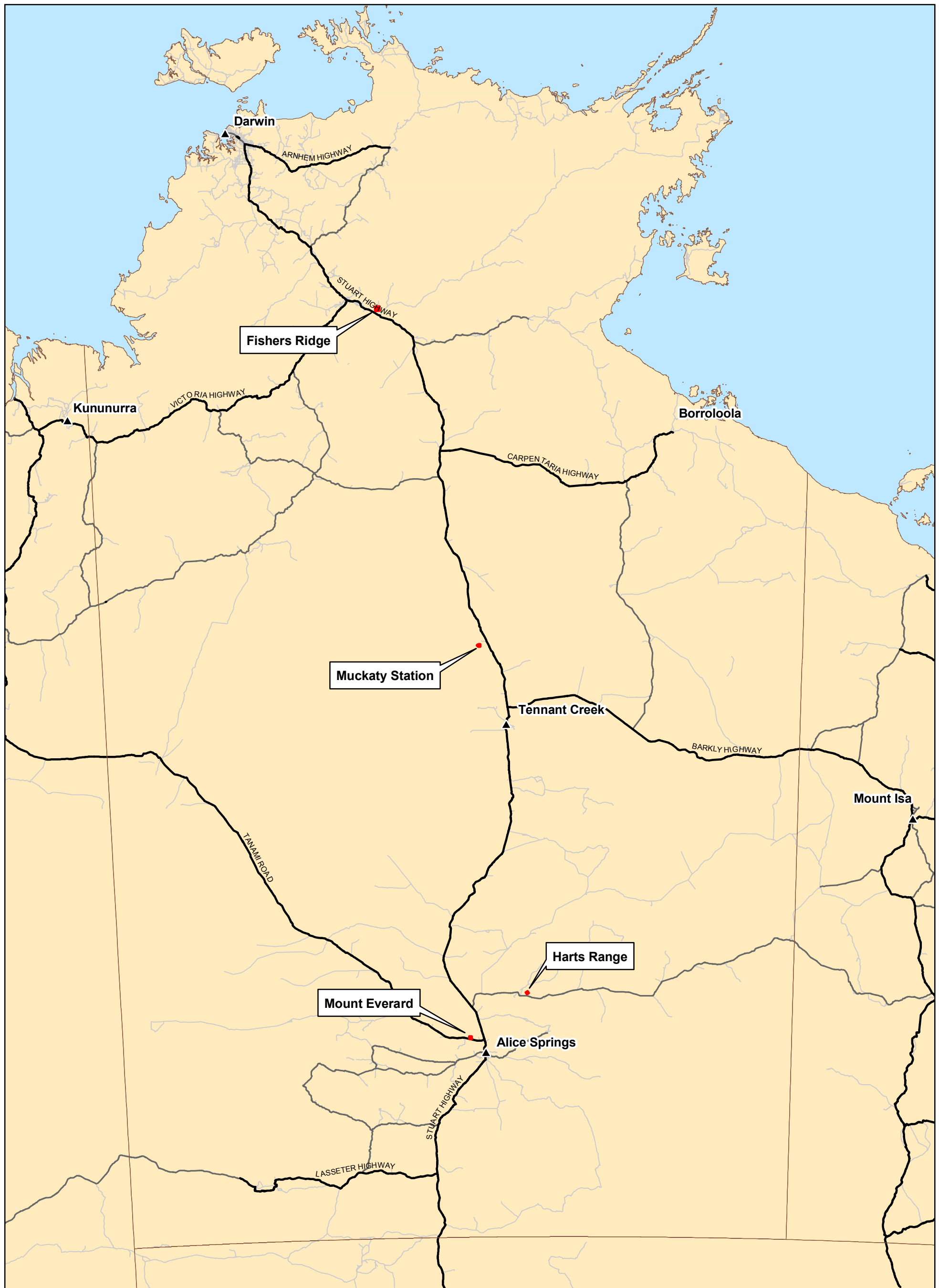
During the investigations of these three sites, an additional fourth ‘volunteer’ site – Muckaty Station (located approximately 110 km north of Tennant Creek) was nominated by the Traditional Owners (the Ngapa clan) and added to the scope of the investigations.

The four proposed sites are shown in Figure L1.1.

The purpose of this report is to analyse and document the land uses and demographic characteristics of the sites from literature and existing information. No site specific data was collected. This factual report presents a summary of the land uses and demographic characteristics of the sites and does not include in-depth analysis of the data nor attempt to rank the sites with respect to their suitability for a CRWF.

The following sections describe each site in detail followed by general discussion (Section 6) which summarises the key differences of each site.





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**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Proposed repository sites  
**Figure L1.1**



## L2. Mount Everard

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### L2.1 Site use and tenure

The Mount Everard site, nominated as a possible location for the Commonwealth Radioactive Waste Facility, is situated approximately 25 kilometres north-west of Alice Springs. The site was purchased by the Department of Defence in 1973 and is currently operated by BAE Systems under contract to the Over the Horizon Radar Systems Program Office (OTHRSPPO). As the site is owned by the Commonwealth Government, the *Commonwealth Radioactive Waste Management Act 2005* disapplies NT laws at this site.

The site was originally used as a cattle station from early 1880's until 1973. When Department of Defence purchased the site it was originally established as a high frequency radar receiving station, although this facility was replaced by the larger, present day facility in 1980. Today it operates as a receiver station for the over-the-horizon high frequency radar.

The site abuts the Tanami Road (a major transport route through to the north and west of the Northern Territory) approximately 19 kilometres off the Stuart Highway and immediately north of the West MacDonnell National Park. Other adjoining land is made up of perpetual pastoral leases (refer to Figure L2.1).

### L2.2 Zoning

A search was undertaken on the Northern Territory Government Department of Planning and Infrastructure website ([http://www.ipe.nt.gov.au/whatwedo/planning/new\\_scheme/index.html](http://www.ipe.nt.gov.au/whatwedo/planning/new_scheme/index.html)) to ascertain the location of the closest township/zoning controls. In this regard, the site is approximately 17.5 kilometres directly north-west of the Alice Springs Municipal boundary and, therefore, is not subject to local planning controls. It is further noted that within this Municipal boundary a significant area comprises National Park (approximately 4.5 kilometres) before any urban development is encountered.

Similar searches were undertaken to ascertain current and potential future zoning and planning control changes in land use for the greater area of Alice Springs. This revealed that there does not appear to be any past or current planning controls for the region (see Alice Springs Town Plan). Further it is not likely that future amendments to the current NT Planning Scheme – Alice Springs would result in any further local planning controls at Mount Everard as:

- the site is 17.5 kilometres outside of the Alice Springs Municipal boundary
- there is a National Park between the township and the site
- the Planning Scheme amendments identify a majority of future urban development/land release to be towards the town's eastern aspect (albeit small pockets are identified in the town's inner western aspect).

Given the distance of the site from the present township growth areas (and identified future growth areas), the presence of a National Park between the township and the site, meteorological conditions and topography of the natural environment between Alice Springs and the site, it is unlikely future zoning, planning controls or changes in land use are likely to impact on the area.

A state wide Development Plan is expected to be developed in the near future however was not available at the time of this report.

## L2.3 Surrounding land use

Generally, the extent of non-Aboriginal settlement in the NT has been limited to the key centres that are located on transport routes or those which support mining industries. It is only sparsely scattered homesteads associated with large rangeland grazing properties such as the pastoral leases typically surrounding the township of Alice Springs that are likely to be located in the vicinity.

The Mount Everard site falls within the Burt Surface Water Management Area which is an internally draining basin with no outlet to the sea. It is currently not used as a water resource. More details can be found in the *Proposed Commonwealth Radioactive Waste Management Facility — Northern Territory Hydrogeology and Hydrology Report* (Parsons Brinckerhoff 2008a).

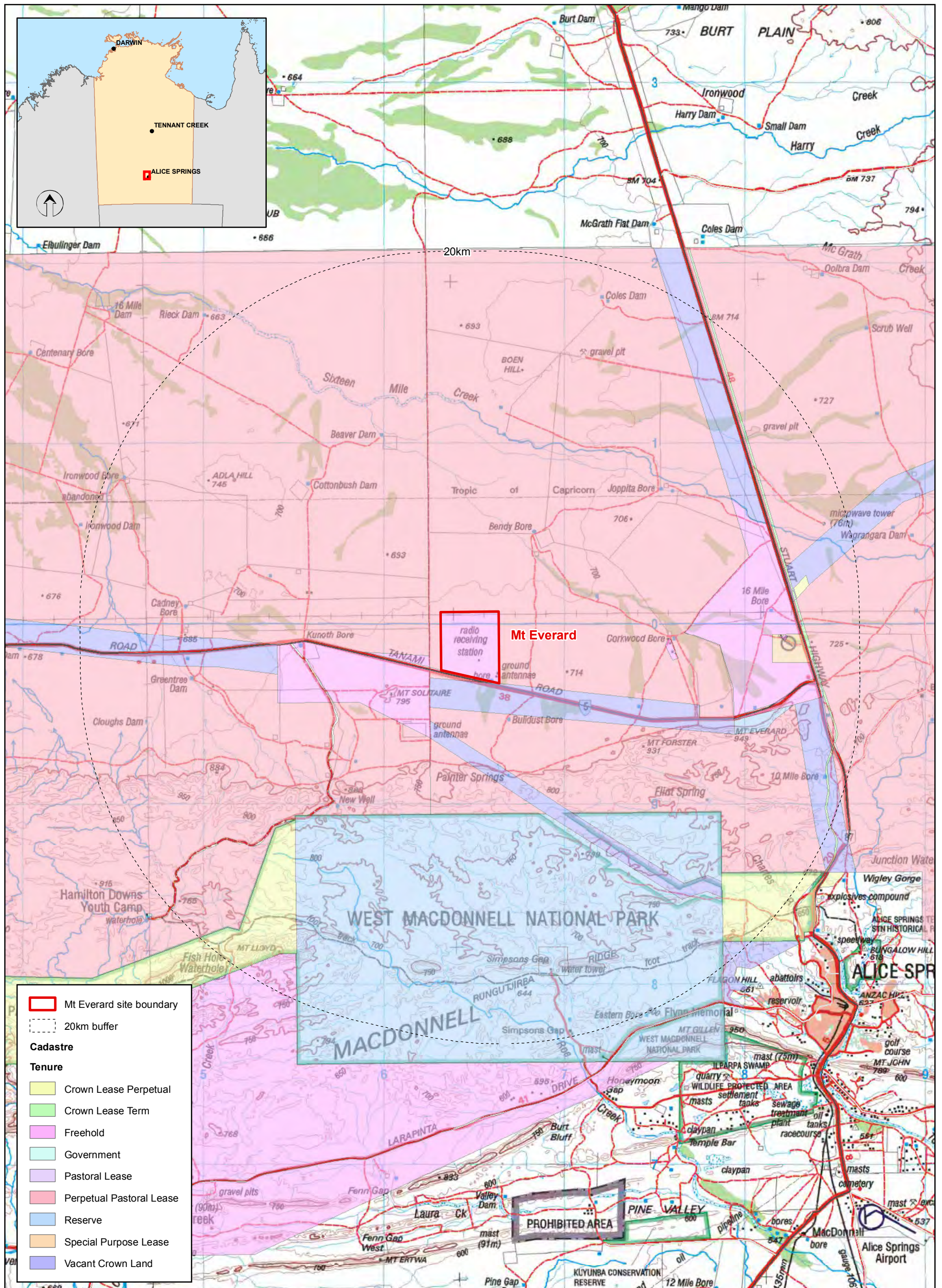
### L2.3.1 Infrastructure

A search on the NT Atlas found four sites within the Mount Everard region that are considered hazardous installations. These were (refer to Figure L2.2):

- Brewer Industrial Estate (noxious and hazardous materials) – 40 kilometres south-east of the site
- Anzac Hill (fuel storage facility) – 27 kilometres south-east of the site
- explosives compound – 22 kilometres south-east of the site
- gas pipeline enters Alice Springs from the South Eastern Aspect – varying distances, 30 kilometres.

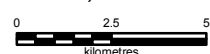
Three major transportation routes lie within the vicinity of the site: the Tanami Road (forms southern boundary of site), Alice Springs to Darwin Rail Corridor (approximately 20 km east) and the Stuart Highway (approximately 20 km east).

There is only one abandoned mine within the vicinity of Mount Everard and that is Johannsens Phlogophite (abandoned) mine (see map) located approximately 50 km north-east of the site.



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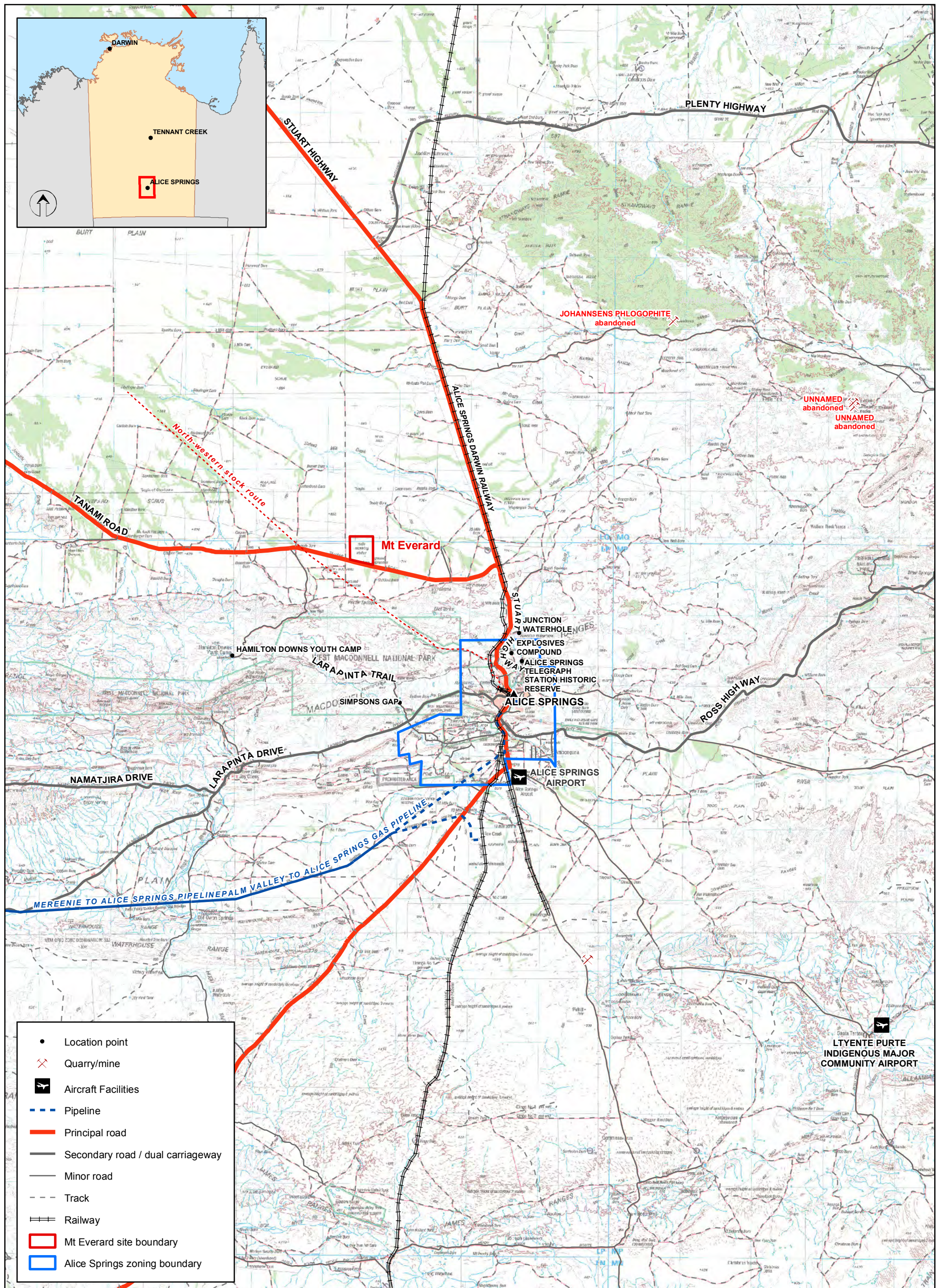


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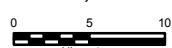
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**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Land tenure within 20 kilometres of Mt Everard  
Figure L2.1



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**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Land use around Mt Everard  
Figure L2.2



### L2.3.2 Airports

The nearest major airport to the site is in Alice Springs (refer to Figure L2.2). There are many air traffic corridors within the region which are occupied by both low altitude (private and small transport aeroplanes) and high altitude (commercial jets) aircraft. Within the area the lowest safe altitude for low altitude aircraft is 5,500 feet and the lowest safe altitude for high altitude aircraft is 5,500 feet. The specific low and high altitude flying routes can be seen on the Australian Airservices ERC's (En Route Charts) (refer to Australia ERC Low L7 and Australia ERC High H2 charts provided by Airservices Australia). It should be noted that the routes on these maps are only to be used as a guide as flight paths can change depending on weather conditions.

### L2.3.3 Recreation

Recreational uses of the surrounding area include (refer to Figure L2.2):

- Wiggley's Water Hole/Junction Water Hole – nearly 30 km west of the site
- Larapinta Trail (Mountain Bike route used by Mountain Bike Club and tourists) – 15 km south-east to south-west of the site
- Simpson's Gap – 17 km south of the site
- North Western Stock Route – 7.5–10 km south/south-east of the site
- The Telegraph Station Historic Reserve – 22 km east/south-east of the site.

## L2.4 Heritage

At the request of DEST the Aboriginal Areas Protection Authority (AAPA) gave advice on the location of registered sacred sites within the Mount Everard vicinity. While no sites were recorded within the Mount Everard site, there were four listed sites nearby:

- 5650-407 An isolated hill, in front of the range, to the west of Painter Springs
- 5650-87 Two isolated outcropping hill son the plain north of Mount Forster
- 5650-85 Mount Solitaire
- 5650-86 Painter Springs, located west of the Mount Everard/Mount Forster range, south of the Tanami Road.

These sites were listed as "recorded sacred sites". This means that they have not yet been evaluated or placed in the Register but there is information indicating that they are nonetheless significant according to Aboriginal tradition and therefore "sacred sites" within the meaning of the *Northern Territory Aboriginal Sacred Sites Act 1989*. The AAPA does not purport to hold detailed information regarding all these sites.

A search was conducted on the Australian Heritage Places Inventory database for sites listed on the Register of the National Estate, National Heritage List, Commonwealth Heritage List, World Heritage List and the NT Heritage Register, within the vicinity of the site. The closest listings to the proposed site are those listed below. Nine 'indigenous places' of interest were found during the search, however their location and information about them was not available for viewing and, therefore, their proximity to the site is unknown. Four of these sites were recognised as being registered (currently listed under the Register of the National Estate), four were indicative places (data regarding the sites has been entered into the Australian Heritage database and is at some stage in the assessment process – no decision

regarding whether the place should be entered in the Register has been made) and one was destroyed (the place was destroyed before being assessed or listed). Further investigation and Aboriginal community liaison would be required to identify these sites, however, that work is outside of the scope of this investigation.

1. Hamilton Downs Youth Camp – Registered place under the Register of the National Estate (Registered place means that the place is in the Register of the National Estate).  
Located approximately 20 km west/south-west of Mount Everard.
2. Junction Waterhole Area – Registered place under the Register of the National Estate (Registered place means that the place is in the Register of the National Estate).  
Located on the Todd River approximately 25 km east/south-east of Mount Everard.

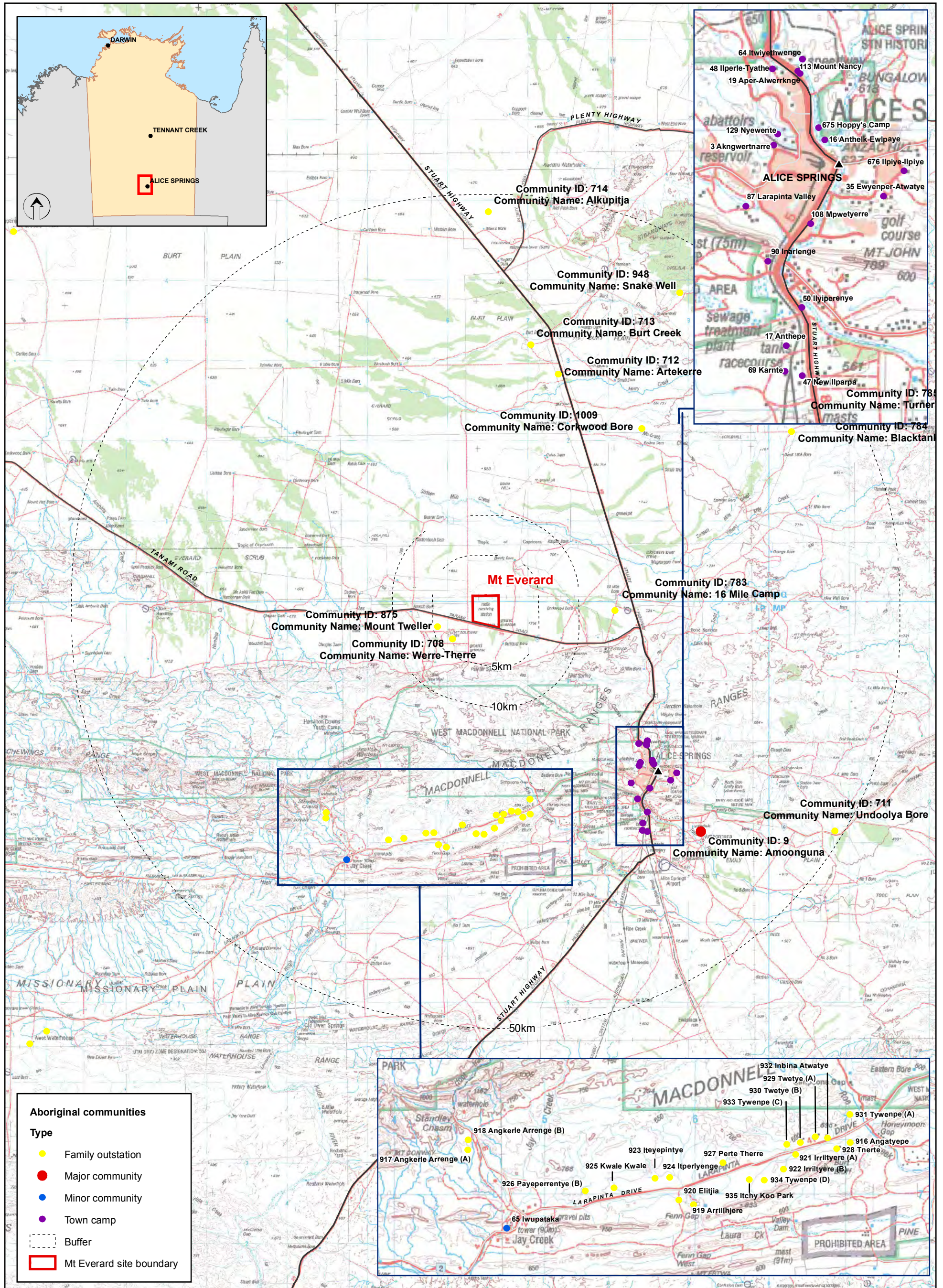
## L2.5 Surrounding population centres

### L2.5.1 Indigenous

The Thakeperte Aboriginal Trust Land sits 700 m to the west of the site. This is the closest Aboriginal Land, however, there are 2 other sites also within 20 km of Mount Everard: Athenge Aboriginal Trust Land (10 km west) and Iwupataka Aboriginal Trust Land (18 km south). The closest Aboriginal communities are identified in the table below (refer to Figure L2.3). There are 2 communities within 5 km of the site: Were-Therre Family Outstation and Mount Twellar Family Outstation.

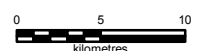
The Aboriginal communities identified in Table L2.1 below are categorised into different community types. The four different categories are Major, Minor, Family Outstation and Town Camp. The definitions of these categories are listed below:

- **Major:**
  - ▶ Community with more than 100 people (can be up to thousands)
  - ▶ Self-governing
  - ▶ It is expected it will contain the facilities of a town (e.g. School, health).
- **Minor:**
  - ▶ Community with between 20-100 people
  - ▶ Self-governing
  - ▶ May provide resources to smaller families.
- **Family Outstation:**
  - ▶ Permanent or semi-permanent residents of up to 20 people
  - ▶ Provides potable water.
- **Town Camp**
  - ▶ Situated within a major urban centre (e.g. Alice Springs)
  - ▶ All services are obtained from major urban centre.



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Source: Geoscience Australia,  
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Checked by:	MD
Client Ref:	RADWASTE

**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Aboriginal communities within 50 km of Mt Everard  
Figure L2.3



**Table L2.1 Aboriginal communities within 50 km of Mount Everard**

ID Number	Community Name	Alias	Community Type
<b>0 – 5 km</b>			
1	Mount Twellar	-	Family Outstation
2	Were-Therre	Davis Camp, Kubula Urbala, Kuputa Urbala, Hamilton Downs, McCormacks Camp, Thakaperte	Family Outstation
<b>5 – 10 km</b>			
	None		
<b>10 – 50 km</b>			
3	Akngwertnarre	Morris Soak	Town Camp
4	Amooguna	-	Major
5	Anthelk - Ewlpaye	Anthe-Ewlpaye, Charles Creek, Charles River	Town Camp
6	Anthepe	Drive-in, Ntapa	Town Camp
7	Aper-Alwerrkngge	Aper-Alnerrkngge, Palmer's Camp, Aper-Alwerrngge	Town Camp
8	Ewyenper-Atwatye	Hidden Valley, Ilpea Ilpea	Town Camp
9	New Ilpara	-	Town Camp
10	Ilperle -Tyathe	Lbilibi Tjatja, Motor Registry, Walpiri, Warpiri Camp	Town Camp
11	Ilyiperenye	Alice Springs Town Camp, Ilperentye, Ilyiperenye, Old Timers Camp	Town Camp
12	Itwiyethwenge	Alice Springs Town Camp, Basso's Farm, Bazzo's Farm	Town Camp
13	Iwupataka	Jay Creek	Minor
14	Karnte	Alice Springs Town Camp	Town Camp
15	Larapinta Valley	Alice Springs Town Camp, Yarrenty Altere, Yarrenty Arltere, Yarrintja Association	Town Camp
16	Inarlenge	Alice Springs Town Camp, Little Sisters	Town Camp
17	Mpwetyerre	Abbots Camp, Mbutjara, Mission Block, Bp Camp	Town Camp
18	Mount Nancy	Nyewente	Town Camp
19	Nyewente	Nyewente, Oothnarangatcha, Trucking Yards	Town Camp
20	Hoppy's Camp	Alice Springs Town Camp, Armitjira Camp, Lhenpa-Artne, Ntarka Ulpaya, Lhenpa-Artmeta	Town Camp
21	Ilpiye-Ilpiye	Alice Springs Town Camp, Ilpeye Ilpeye, Golders Camp	Town Camp
22	Undoolya Bore		Family Outstation
23	Artekerre	Arterre, Harry Creek, Mcgrath Flat	Family Outstation

			Community Type
Number			
24	Burt Creek	Rice's Camp, Yambah-Mpweringe	Family Outstation
25	Alkupitja	Gillan Bore, Gillans Bore	Family Outstation
26	16 Mile Camp	Bond Springs	Family Outstation
27	Blacktank Bore	Bore Springs	Family Outstation
28	Turner's Camp	Sandy Bore	Family Outstation
29	Angatyeppe		Family Outstation
30	Angkerle Arrenge (A)		Family Outstation
31	Angkerle Arrenge (B)		Family Outstation
32	Arrillhjere		Family Outstation
33	Elitjla		Family Outstation
34	Irriltyere (A)		Family Outstation
35	Irriltyere (B)		Family Outstation
36	Iteyepintye		Family Outstation
37	Itperlyenge		Family Outstation
38	Kwale Kwale	Payeperrentye (A)	Family Outstation
39	Payeperrentye (B)		Family Outstation
40	Perte Therre		Family Outstation
41	Tnerte		Family Outstation
42	Twetye (A)		Family Outstation
43	Twetye (B)		Family Outstation
44	Tywenpe (A)		Family Outstation
45	Inbina Atwatye	Tywenpe (B)	Family Outstation
46	Tywenpe (C)		Family Outstation
47	Tywenpe (D)		Family Outstation
48	Itchy Koo Park	Tywenpe (E)	Family Outstation
49	Snake Well	Snake Creek	Family Outstation
50	Corkwood Bore	Morris Dam	Family Outstation

(Northern Territory Government, 2006)

## L2.5.2 Other centres

The only other population centre within the vicinity of the site is Alice Springs which is discussed in more detail in section L2.6.2 of this report.

## L2.6 Demographics

### L2.6.1 Data sources

The demographic assessment in this section considers data compiled from the 1991, 1996 and 2001 Australian Census, provided by the Australian Bureau of Statistics (ABS) (refer to ABS, 2003d, 2003e, 2003f, 2006f, 2006g and 2006h). Specifically, the data considers the Sandover-Bal 710403209 Statistical Local Area (MAP) and the 7031304 Census Collection District (CCD) which both contain the Mount Everard site. The ABS Census Collection Districts are the smallest survey areas used in the Australian census and multiple CCD's make up a Statistical Local Area (SLA).

### L2.6.2 General information

Alice Springs is located 25 kilometres south-east of the site or a little over 35 kilometres via Tanami Road and the Stuart Highway. Alice Springs has a population of 26,047 (ABS, 2006a) which represents 14% of the Northern Territory population and of this population approximately 18.4% of the Alice Springs population was comprised of people of Aboriginal or Torres Strait Islander descent (at 2001) (ABS, 2006a). A review of census data (1996–2001) indicates that the Alice Springs population is generally characteristic of Northern Territory demographic averages.

Alice Springs is the main service centre in Central Australia and has traditionally serviced the surrounding mining industry and communities, tourist industries, Pine Gap Joint Defence Facility as well as indigenous communities and pastoral properties. Alice Springs typically comprises young working families, transient populations, tourists and a large contingent from United States presumably related to Pine Gap. There is also a strong focus on tourism and support facilities.

The Mount Everard site is within the Sandover-Bal Statistical Local Area (SLA) which comprises an area over 136,000 square kilometres and a population of approximately 3,600 people. Sandover-Bal SLA (710403209) incorporates 20 Census Collection Districts (CCD) (refer to Figure L2.4). Mount Everard is located within CCD 7031304 and comprises an area of over 15,000 square kilometres and has a population of 540 people (refer to map). Accordingly the area in question is extremely large with a sparse population with 27.8 square kilometre/person.

Alice Springs is the only regional centre in the area. The projected urban growth for the Alice Springs Township is estimated to be approximately 4%.

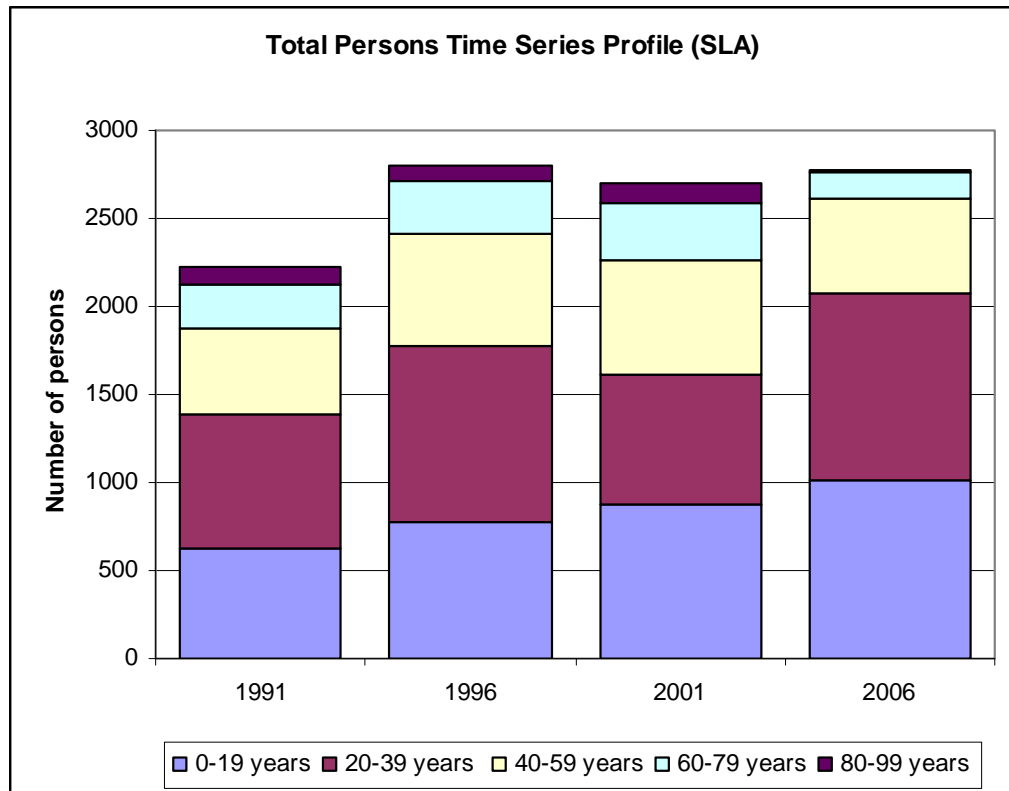
### L2.6.3 Population

The Australian Bureau of Statistics gives population data for the region in total number of persons from each year of age. For analysis purposes the data has been grouped into the following age brackets:

- 0–19 years
- 20–39 years
- 40–59 years
- 60–79 years
- 80–99 years
- 100+ years.

The population data for the Sandover-Bal SLA shows growth from 1991 to 1996 and then the numbers remain relatively similar from 1996 through to 2006 (refer to Figure L2.5). The 0–19 year age group was the only age group to show growth in each Census. All other age groups fluctuated between Census years.

The data suggests that the Sandover-Bal SLA did experience population growth between 2001 and 2006 as the total population remained similar to the 2001 numbers even though the Ltyente Purte Indigenous Community numbers were removed from the total.



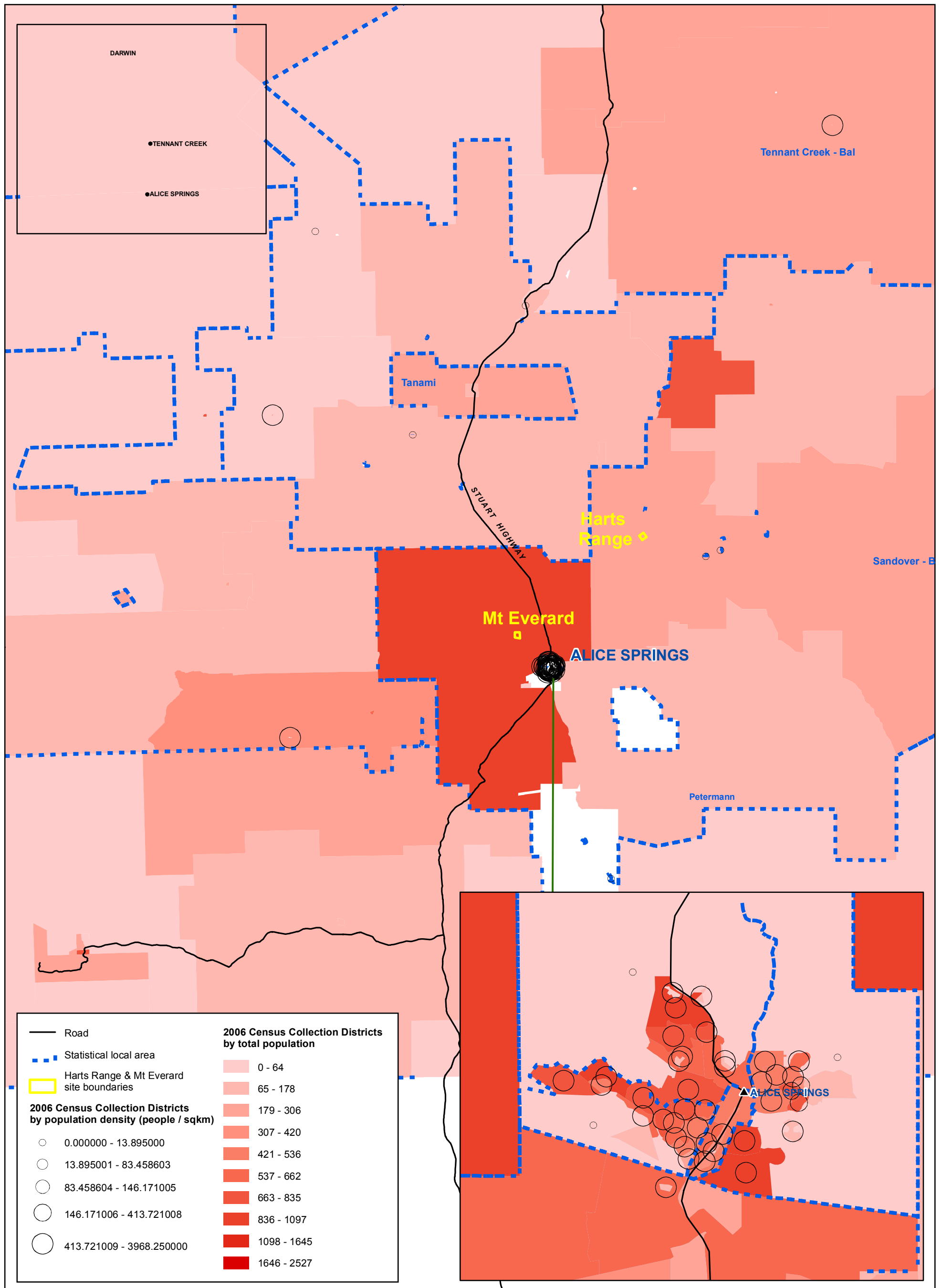
NOTE: At the time this report no employment status data was available for the Fishers Ridge SLA from the 2006 Census data

(Source: ABS, 2003f, 2006e)

**FIGURE L2.5**  
**Total persons time series profile for Mount Everard SLA**

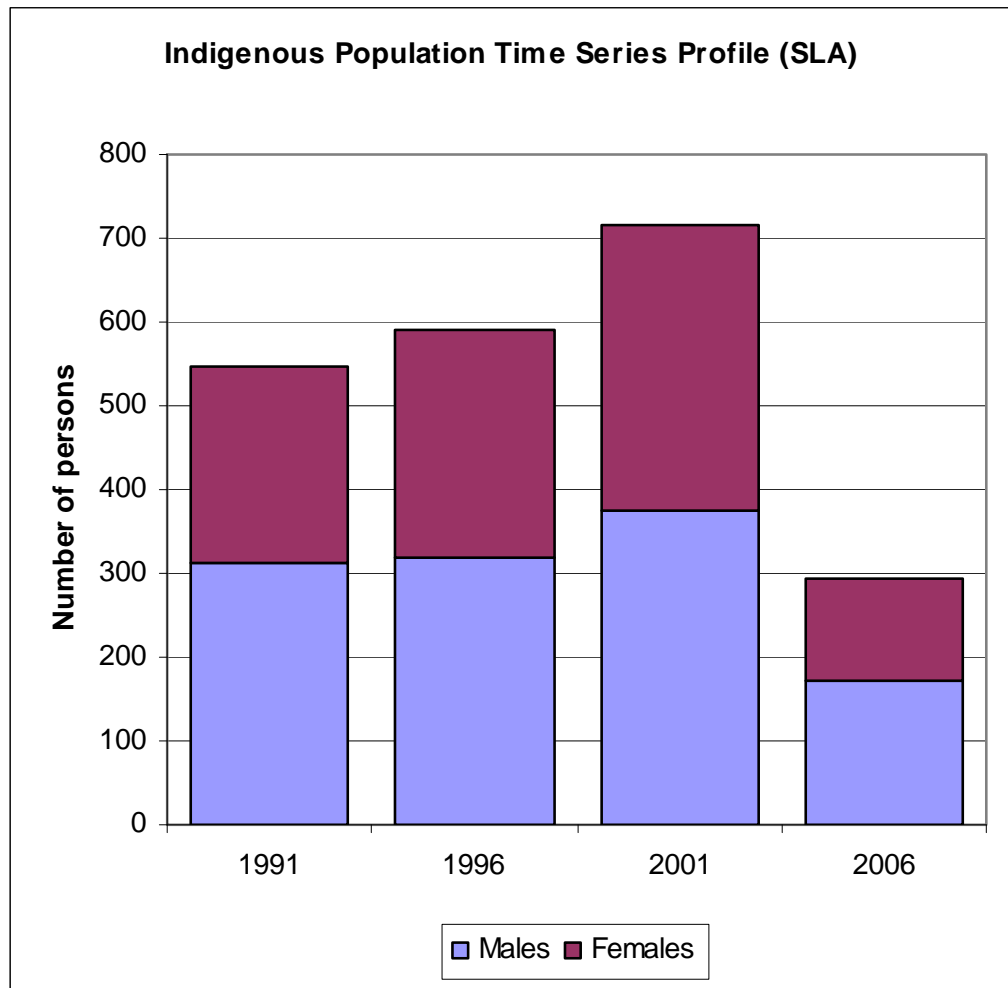
The ABS also provides Indigenous persons population data and for the Mount Everard SLA (Sandover-Bal). This data shows a steady increase in the number of Indigenous Persons within the region from 1991 to 2001. The total numbers grew from 1,586 in 1991 to 1,836 in 1996 to 2,685 in 2001 (refer to Figure L2.6). This represents a 69% increase over a 10 year period. However, the number significantly decreased in 2006. This is due to the fact that the Indigenous population at Ltyente Purte was removed from the total in 2006. Given the removal of this Indigenous Community (with a population of 573 in June 2006 – Northern Territory Government, 2006c), the Indigenous population within the remaining area is still estimated to have increased.





Department of Resources, Energy and Tourism  	1:2,250,000 at A3  Source: ABS, Geoscience Australia, DEST Coord.: GDA94 MGA53	<small>© Parsons Brinckerhoff Australia Pty Ltd ("PB"). Copyright in the drawings, information and data recorded ("the information") is the property of PB. This document and the information are solely for the use of the authorized recipient and this document may not be used, copied or reproduced in whole or part for any purpose other than that which it was supplied by PB. PB makes no representation, undertakes no duty and accepts no responsibility to any third party who may use or rely upon this document or the information. NCSI Certified Quality System to ISO 9001 © APPROVED FOR AND ON BEHALF OF Parsons Brinckerhoff Australia Pty Ltd</small> NOT REQUIRED	Drawing No.: 2102701A_GIS_F078	<b>Commonwealth Radioactive Waste Management Facility Site Characterisation</b> Census collection districts and statistical local areas surrounding Harts Range and Mt Everard <b>Figure L2.4</b>
			Revision: B Drawn By: RP Client Ref: RADWASTE	





Source: (ABS, 2003f, 2006e)

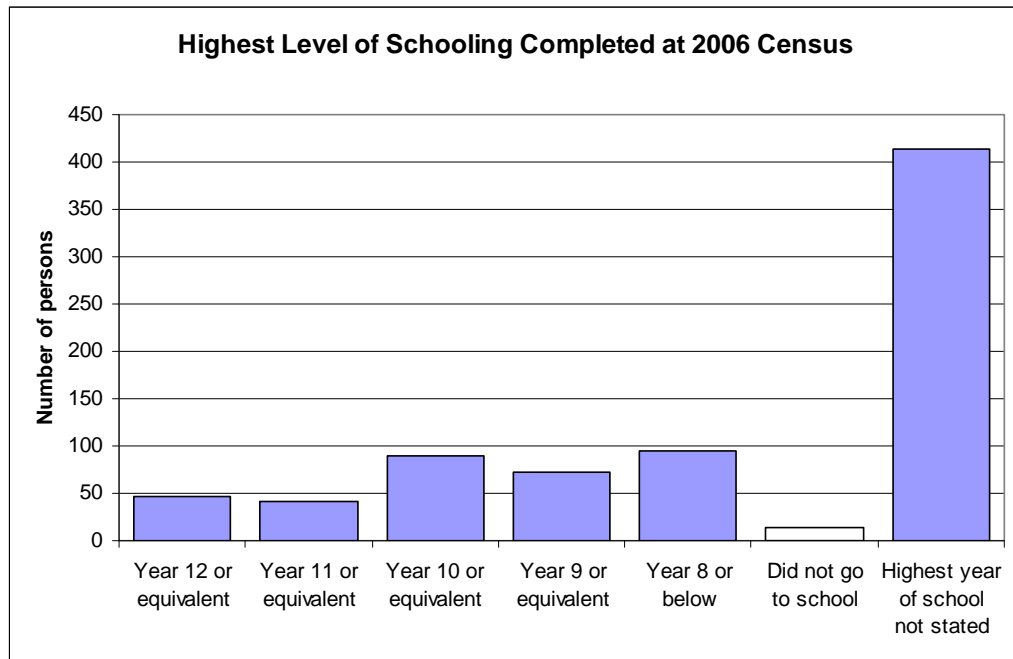
**FIGURE L2.6**  
**Total Indigenous population time series profile for the Mount Everard SLA**

While it appears there has been significant growth in Indigenous persons within the SLA, this growth can be explained by improved data collection of indigenous persons.

*[T]he growth in the Indigenous population in recent decades can not be explained by natural increase alone. Much of the unexplained growth can be attributed to an increasing prevalence of persons to be identified as Indigenous on census forms. (ABS, 1998).*

#### L2.6.4 Education

The 2006 census ABS data gives detailed information about numbers of people who completed each level of schooling in 2006. The data in this section was taken from the ABS 2006 Census data for the CCD 7031304 (which Mount Everard lies within). The data shows that most people in the CCD did not state their highest year of schooling completed (refer to Figure L2.7).



(Source: ABS, 2006j)

**FIGURE L2.7**  
**Highest level of schooling completed at 2001 census for Mount Everard CCD**

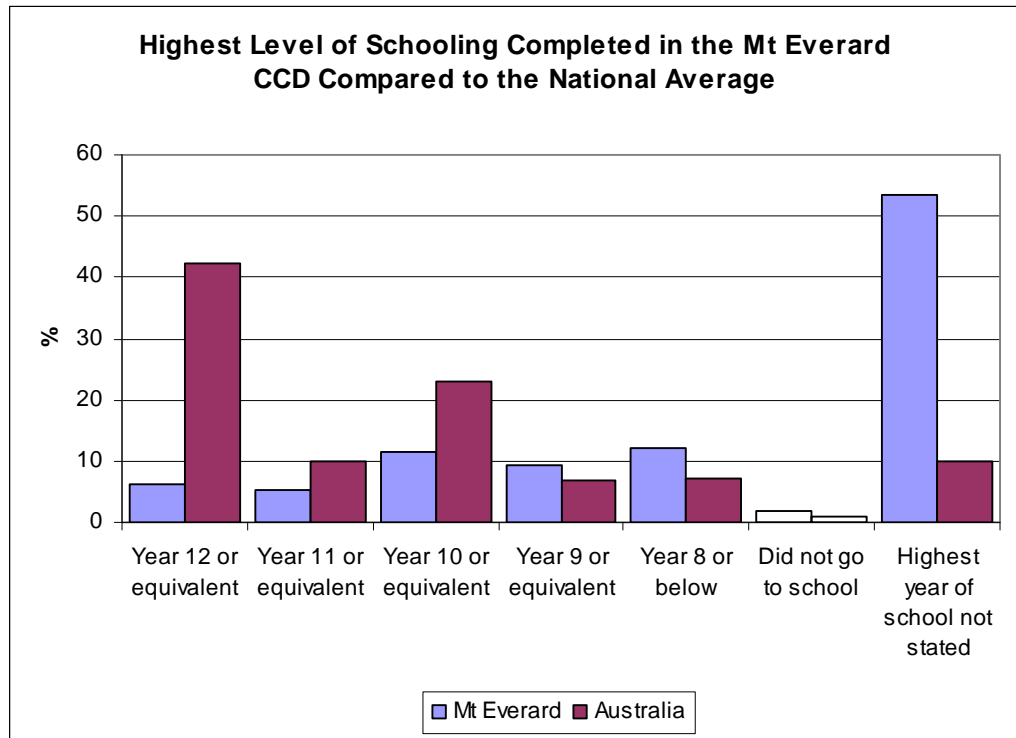
The number of people who did not state their highest level of schooling completed in the Mount Everard CCD was much higher than the national average. While the number of people who completed Year 12 or equivalent in the Mount Everard CCD was almost 35% lower than the national average. The retention rate of school goers in the Mount Everard CCD is much lower than the national average with most people leaving school in Years 8, 9 and 10 (refer to Figure L2.8).

### L2.6.5 Employment

Over the last 10 year Census period from 1991 to 2001, within the Mount Everard SLA, the percentage of persons 'not in the labour force' increased from 1996 to 2001 and the percentage of persons unemployed decreased significantly (refer to Figure L2.9).

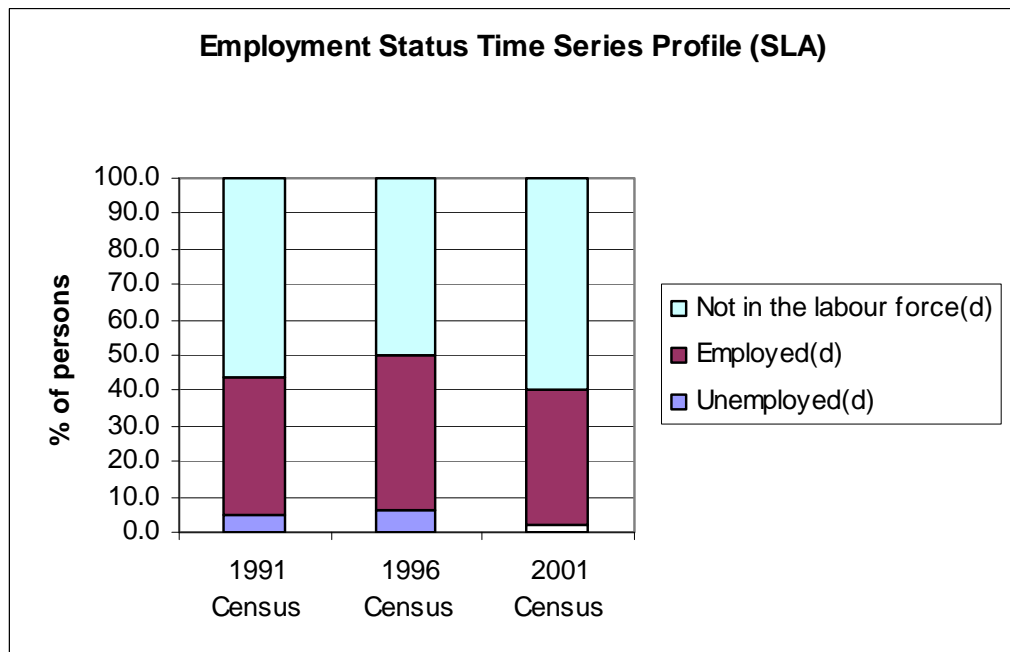
The biggest employment industries in the Mount Everard SLA are 'Government Administration and Defence' and 'Agriculture, forestry and Fishing' (refer to Figure L2.10). This would be due to the fact that the Mount Everard defence site employs a large number of people and that the Harts Range defence site is also contained within the SLA. Also the surrounding land is mainly pastoral leases.

Mount Everard is outside the regional hub of Alice Springs. While there is some employment associated with the defence facility compound, which is occupied by Defence and British Aerospace (BAE) staff, employment opportunities are considered limited in the immediate region.



(Source: ABS, 2006i, 2006j)

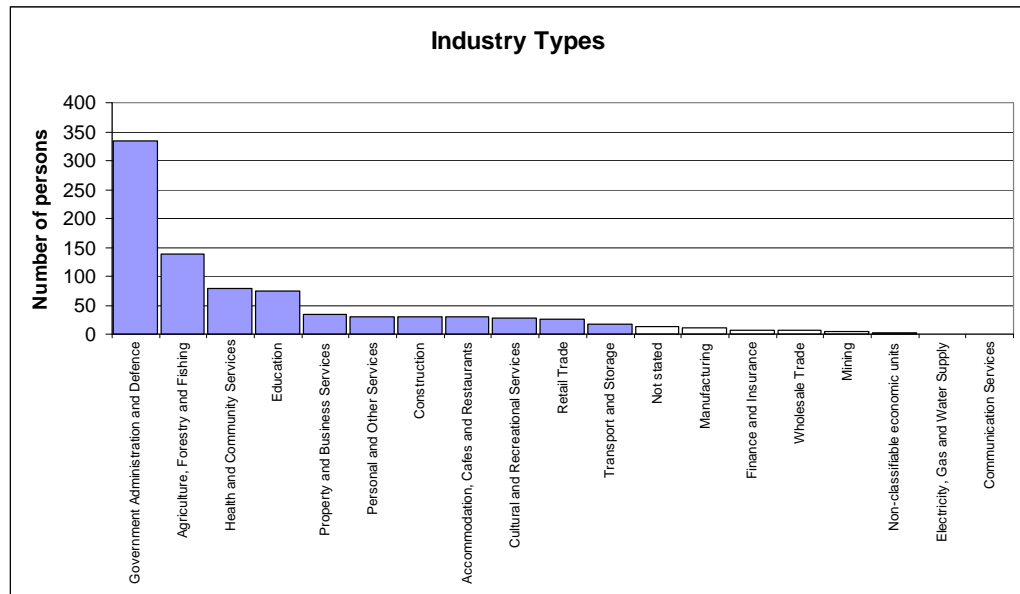
**FIGURE L2.8**  
**Highest level of schooling completed at 2001 census, Mount Everard CCD versus Australia**



NOTE: At the time this report no employment status data was available for the Fishers Ridge SLA from the 2006 Census data

(Source: ABS, 2003f)

**FIGURE L2.9**  
**Employment status time series profile for Mount Everard SLA**



NOTE: At the time this report was written there was no industry type data released for the Mount Everard SLA from the 2006 Census data

(Source: ABS, 2002d)

**FIGURE L2.10**  
**Industry types by size for Mount Everard SLA**

Alice Springs and its regional communities have a range of facilities comparable with any town of similar size. The main industries/employment includes:

- government administration and banking
- trucking and transport
- Regional Centre – shops, supermarkets, car yards, hardware
- support to mining industries
- general industries (heavy and light)
- hospitality and tourism
- Pine Gap
- social services – schools, hospitals, childcare, health facilities.

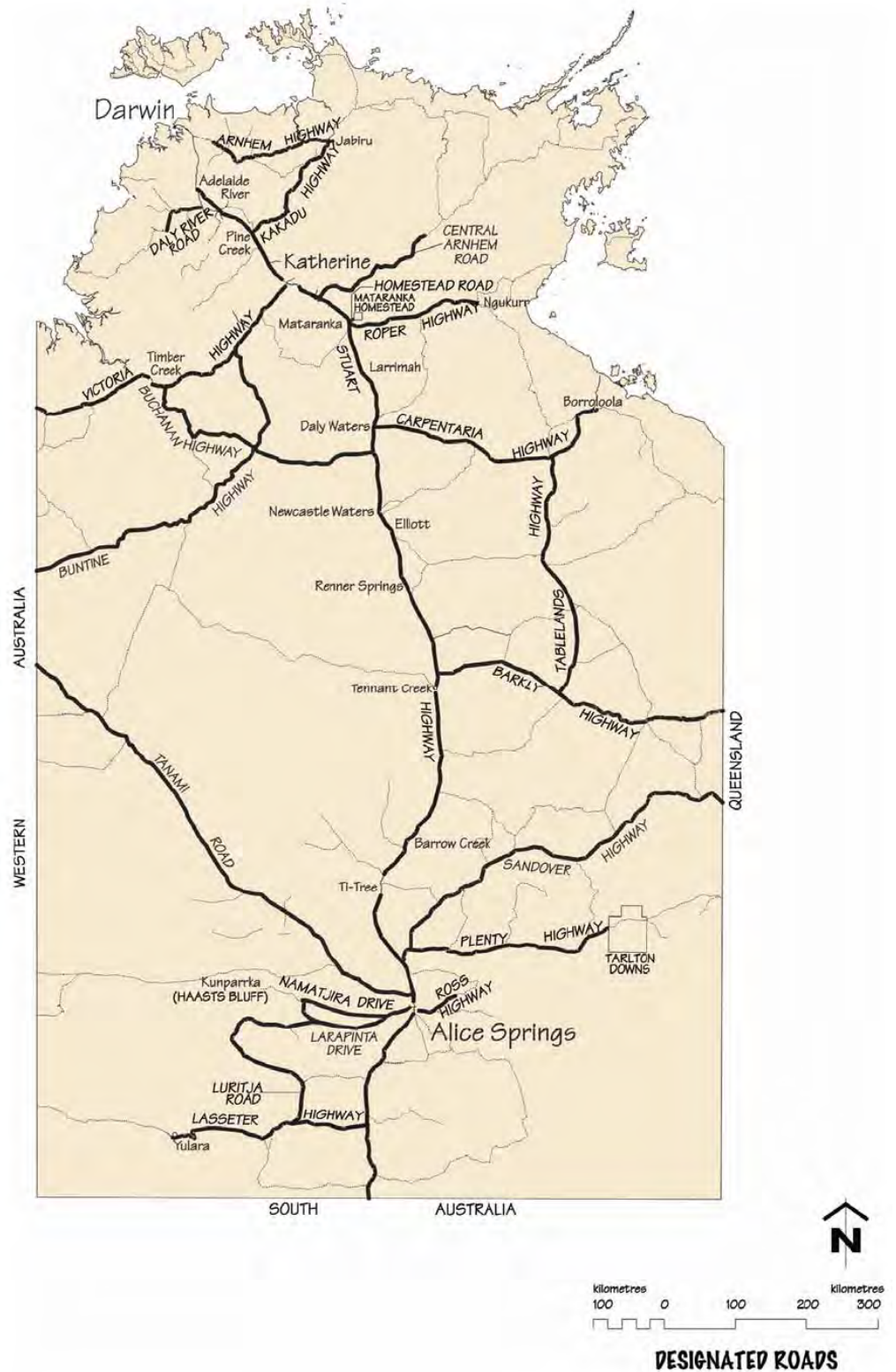
## L2.7 Prominence in landscape

The Tanami Road is a designated road (refer Figure L2.11) pursuant to Part 7 (Section 13.4) of the Northern Territory Planning Scheme:

*1. The purpose of this clause is to ensure inappropriate development does not compromise the safety or **amenity** of a designated road.*

*2. Despite clause 1.3 this clause applies to a use or development that is proposed on unzoned land which:*

*(a) is within 500m of the road reserve of a designated road or, where there is no road reserve, within 500m of the centre line of the designated road;*  
*and*



(Source: Northern Territory Government, 2007)

**FIGURE L2.11**  
**Northern Territory designated roads**

- (b) is not within:*
- (c) a local or community government area (other than those parts of the Mataranka and Pine Creek Community Government Areas outside the towns of Mataranka or Pine Creek); or*
- (d) a town within the meaning of the Crown Lands Act.*

*3. Land subject to this clause may:*

- (a) be used or developed for a **single dwelling** or **agriculture** without **consent**;*
- (b) not be used or developed for any other purpose without **consent**.*

Whilst approvals for such a facility are dealt with by Commonwealth legislation, regard should be given to intent of the Northern Territory Planning Scheme.

The proposed facility, if located at Mount Everard, may be situated within 500 metres of the Tanami Road and therefore would be visible. Visual impacts may be minimised through construction of a landscape mound adjacent the Tanami Road recognising that growing screening vegetation is difficult in these arid regions.



## L3. Harts Range

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### L3.1 Site use and tenure

The Harts Range site, nominated as a possible location for the Commonwealth Radioactive Waste Facility, is situated approximately 100 km north-east of Alice Springs. The site is on Commonwealth owned land, specifically owned by the Department of Defence and operated by British Aerospace on a contract basis. The *Commonwealth Radioactive Waste Management Act 2005* disapplies NT laws at this site.

The site itself is used as a transmitter station for the Over the Horizon Radar Systems Program Office (OTHRSPPO). As the site is owned by the Commonwealth Government it is not subject to Northern Territory legislative requirements. In addition to the radar-related infrastructure, an operational landfill site is located 1 km to the east and residential accommodation (for 10–12 families) is situated approximately 1.3 km south. Families and Defence personnel utilise the on-site accommodation and use the Harts Range site for recreational activities (including bike riding). A disused landfill site is situated approximately 500 metres due south of the main site.

The adjoining land is under perpetual pastoral leases with a Land Use Agreement 4 km west and 5 km south of the site (refer to Figure L3.1).

It is understood that the Department of Defence is considering the long term operation of this facility in term of live-in versus remote operation. If Defence opt for a remote operation, the families currently living onsite will be relocated, thereby removing a current site restriction and sensitive receiver.

### L3.2 Zoning

A search was undertaken on the Northern Territory Government Department of Planning and Infrastructure website ([http://www.ipe.nt.gov.au/whatwedo/planning/new\\_scheme/index.html](http://www.ipe.nt.gov.au/whatwedo/planning/new_scheme/index.html)) to ascertain the location of the closest township/zoning controls or Aboriginal Community Land Living Areas to determine if land use planning issues are evident. The subject site is 90 km directly north/north-east of the Alice Springs Municipal boundary and is therefore not subject to local planning controls. There are, however, a number of Aboriginal Community Land Living Areas control plans within the region. These are:

- Atitjere Control Plan 1990 (10 October 1990)
- Engawala (Alcoota NT Portion 1648) Control Plan 1988 (18 May 1988)
- Angula (NT Portion 2096) Control Plan 1991 (27 March 1991)
- Angula (NT Portion 3235) Control Plan 1991 (16 October 1991)
- Alatyeye (Alcoota NT Portion 3559) Control Plan 1991 (16 October 1991).

Whilst development controls are proposed (or refined) in the current round of NT Planning Scheme amendments, given the proximity of the site to Aboriginal Community Land, it is unlikely that any Aboriginal Community Land Living Areas community plans or amendments to those plans will result in activities likely to impact upon the site.

It is unlikely that past, current or future zoning planning controls will be changed due to the site's distance from Alice Springs and its proximity to Aboriginal Community Land Living Areas. A description of the Aboriginal communities in the area is contained in Section L3.5.1 below.

A state wide Development Plan is expected to be developed in the near future however was not available at the time of this report.

## L3.3 Surrounding land use

Land in this region is predominantly used for dry land cattle grazing, mining and tourism.

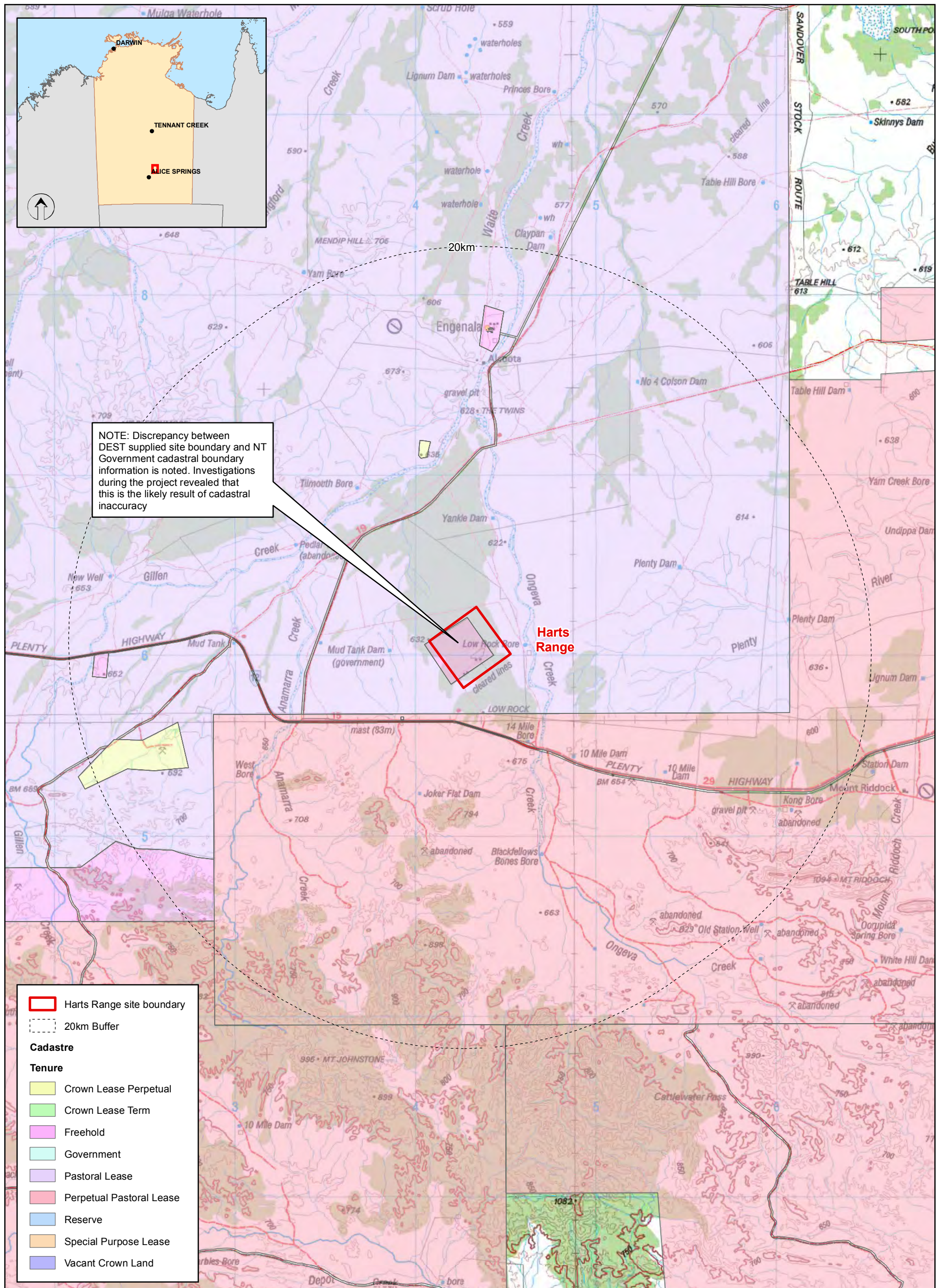
The Harts Range site falls within the Georgina River Surface Water Management Area which is currently not used as a water resource. More details can be found in the *Proposed Commonwealth Radioactive Waste Management Facility — Northern Territory Hydrogeology and Hydrology Report* (Parsons Brinckerhoff, 2008a).

### L3.3.1 Infrastructure

There are four major transportation routes in relatively close proximity to the site: the Plenty Highway (approximately 2 km south), the Sandover Highway (approximately 60 km west), the Alice Springs to Darwin Rail Corridor (approximately 65 km west) and the Stuart Highway (approximately 100 km west).

There are no abandoned mines immediately surrounding the site however, there are some within the vicinity of Harts Range (refer to Figure L3.2):

- Copper Queen Mine (abandoned) approximately 30 km south-east of the site
- Stones Mine (abandoned) approximately 40 km south-east of the site
- Junction Claim (abandoned) approximately 40 km south of the site
- An unnamed abandoned mine approximately 40 km south of the site
- Johannsens Phlogophite (abandoned) approximately 45 km south-west of the site.

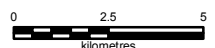


NOTE: Discrepancy between DEST supplied site boundary and NT Government cadastral boundary information is noted. Investigations during the project revealed that this is the likely result of cadastral inaccuracy

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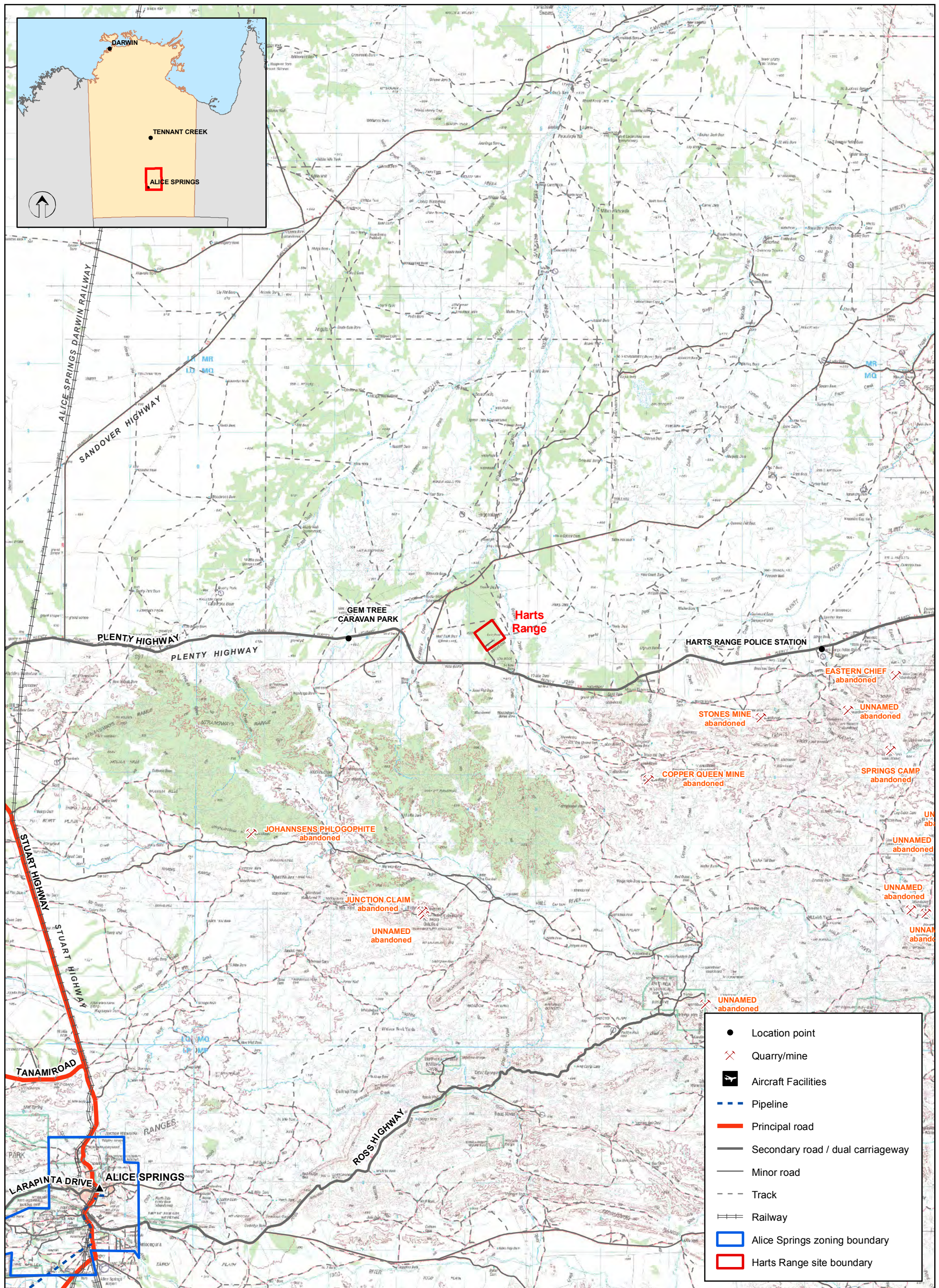


Source: Geoscience Australia,  
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Coord.: GDA94 MGA53

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Client Ref:	RADWASTE	

**Commonwealth Radioactive Waste Management Facility Site Characterisation**  
Land tenure within 20 kilometres of Harts Range  
Figure L3.1



- Location point
- ✕ Quarry/mine
- ✈ Aircraft Facilities
- Pipeline
- Principal road
- Secondary road / dual carriageway
- Minor road
- - - Track
- ≡≡≡ Railway
- Alice Springs zoning boundary
- Harts Range site boundary

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**Commonwealth Radioactive Waste Management Facility Site Characterisation**  
Land use around Harts Range  
Figure L3.2



Source: Geoscience Australia, NTLIS

Coord.: GDA94 MGA53

### L3.3.2 Airports

The nearest major domestic airport to the site is in Alice Springs (refer to Figure L3.2). There are many air traffic corridors within the region which are occupied by both low altitude (private and small transport aeroplanes) and high altitude (commercial jets) aircraft. Within the area the lowest safe altitude for low altitude aircraft is 5,400 feet and the lowest safe altitude for high altitude aircraft is 5,200 feet. The specific low and high altitude flying routes can be seen on the Airservices Australia ERC (En Route Chart) maps (refer to Australia ERC Low L7 and Australia ERC High H2 charts provided by Airservices Australia). It should be noted that the routes on these maps are only to be used as a guide as flight paths can change depending on weather conditions.

An airstrip also exists at the Ltyente Purte (Santa Teresa) Community, 80 kilometres southeast of Alice Springs. The airstrip is for use during daylight hours and may not be regularly inspected by the Department of Aviation.

## L3.4 Heritage

At the request of DEST the Aboriginal Areas Protection Authority (AAPA) gave advice on the location of registered sacred sites within the Harts Range vicinity. While no sites were recorded within the Harts Range site, there were three listed sites nearby:

- 5752-2 Soakage located south of Annamurra Creek
- 5751-22 A lump of white rock and a soakage 5 m in from the Plenty Highway on the far side of Annamurra Creek
- Soak located east side of Ongeva Creek approximately 1 km north of Blackfella Bones Bore.

These sites were listed as “recorded sacred sites”. This means that they are significant according to Aboriginal tradition and therefore “sacred sites” within the meaning of the *Northern Territory Aboriginal Sacred Sites Act 1989*. The AAPA does not purport to hold detailed information regarding all these sites.

A search was conducted on the Australian Heritage Places Inventory database for sites listed on the Register of the National Estate, National Heritage List, Commonwealth Heritage List, World Heritage List and the NT Heritage Register, within the vicinity of the site. Nine ‘indigenous place(s)’ of interest were found during the search, however their location and information about them was not available for viewing and, therefore, their proximity to the site is unknown. Four of these sites were recognised as being registered (currently listed under the Register of the National Estate), four were indicated as being indicative places (data regarding the sites has been entered into the Australian Heritage database and is at some stage in the assessment process – no decision regarding whether the place should be entered in the Register has been made) and one was indicated as being destroyed (the place was destroyed before being assessed or listed). Further investigation and Aboriginal community liaison would be required to identify these sites, however, that work is outside of the scope of this investigation.

## L3.5 Surrounding population centres

### L3.5.1 Indigenous

The Aboriginal communities closest to the Harts Range site are identified in Table L3.1 below (refer to Figure L3.3). The closest community is the Engawala Community located approximately 15 km to the north of Harts Range. The Engawala Community is classified as a minor community and has a population of approximately 68 people covering 2 outstations (Mulga Bore and Angula). It is located 105 km north-east of Alice Springs in Alcoota Station (refer to Figure L3.3). Services provided include garbage disposal, essential services, parks and gardens, community store and roads maintenance. Their main source of employment is from cattle grazing and Territory Government funding. Therefore, it is unlikely the community will see significant growth in the near future based on these two sources of income.

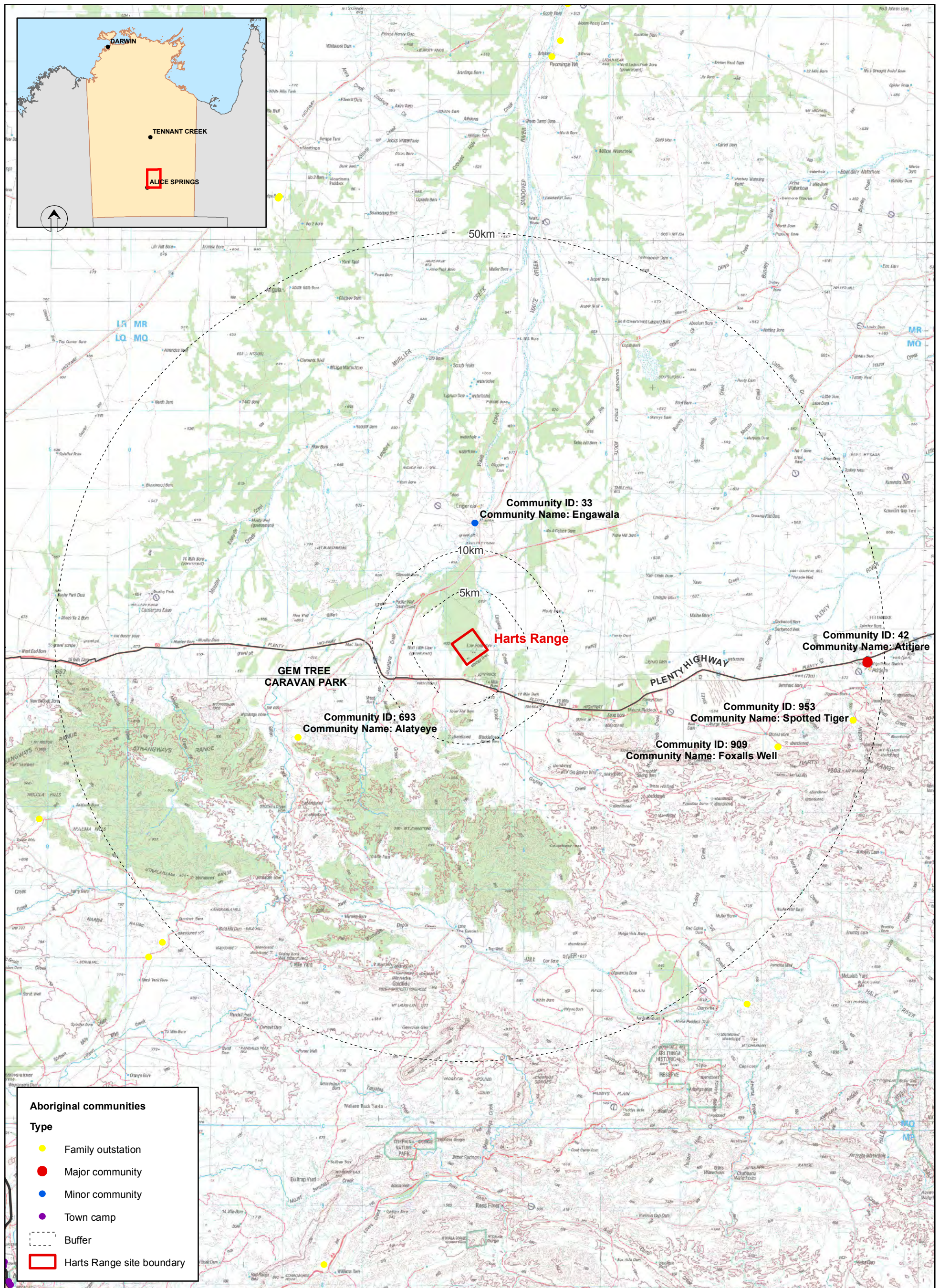
The Aboriginal communities identified in Table L3.1 below are categorised into different community types. The four different categories are Major, Minor, Family Outstation and Town Camp. The definitions of these categories are listed below:

- **Major:**
  - ▶ Community with more than 100 people (can be up to thousands)
  - ▶ Self-governing
  - ▶ It is expected it will contain the facilities of a town (e.g. School, health).
- **Minor:**
  - ▶ Community with between 20–100 people
  - ▶ Self-governing
  - ▶ May provide resources to smaller families.
- **Family Outstation:**
  - ▶ Permanent or semi-permanent residents of up to 20 people
  - ▶ Provides potable water.
- **Town Camp:**
  - ▶ Situated within a major urban centre (e.g. Alice Springs)
  - ▶ All services are obtained from major urban centre.

**Table L3.1 Aboriginal communities within 50 km of Harts Range**

ID Number	Community Name	Alias	Community Type
<b>0 – 5 km</b>			
	None		
<b>5 – 10 km</b>			
	None		
<b>10 – 50 km</b>			
1	Engawala	Alcoota	Minor
2	Atitjere	Arltarlpilta, Harts Range	Major
3	Alatyeye	Turners Camp	Family Outstation
4	Foxalls Well	Foxells Well, Foxhalls Well	Family Outstation
5	Spotted Tiger	Unpeyekenhe	Family Outstation

(Northern Territory Government, 2006a)



**Aboriginal communities**

**Type**

- Family outstation
- Major community
- Minor community
- Town camp
- Buffer
- Harts Range site boundary

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Drawn By:	RP	Checked by: MD
Client Ref:	RADWASTE	

**Commonwealth Radioactive Waste Management Facility Site Characterisation**  
Aboriginal communities within 50 kilometres of Harts Range  
Figure L3.3





The other Aboriginal communities within a 50 km radius of the site are family outstations with the exception of one major community, the Atitjere Aboriginal Community (approximately 48 km east of the site). This Community consists of<sup>1</sup>:

- a police station with 2 staff
- a school with primary and limited secondary year 10 facilities. School of the Air via Alice Springs is also an option
- a health clinic with a permanent sister as well as a doctor from Alice Springs who visits once a month
- a 24-hour power station two kilometres east of the police station
- an all-weather gravel airstrip allowing regular mail deliveries.

It can, therefore, be assumed that these areas would generally comprise households of relatively small family groups that either work or live off the land with limited or relatively basic infrastructure and facilities. There would be limited potential for growth of such communities and the significant possibility of decline.

### L3.5.2 Other centres

The Gem Tree Caravan Park – approximately 20 km west of the site or 70 kilometres east of the Stuart Highway along the Plenty Highway – is predominantly made up of tourist accommodation but also has a number of permanent residents and offers gem stone fossicking and basic supplies such as petrol. It is also the site of a Bureau of Meteorology recording station.

The Alcoota Station (approximately 14 km north of Harts Range) is a beef cattle station currently managed by Christopher Nott. The station currently houses 130 people including the Engawala community located within the station's boundaries.

The only other population centre within the vicinity of Harts Range is Alice Springs which is discussed in more detail in section 3.6.3 of this report.

## L3.6 Demographics

### L3.6.1 Data sources

The demographic assessment in this section considers data compiled from the 1991, 1996 and 2001 Australian Census, provided by the Australian Bureau of Statistics (ABS) (refer to ABS 2002c, 2002d, 2003e, 2003f, 2006f, 2006g and 2006h). Specifically, the data considers the Sandover-Bal 710403209 Statistical Local Area (MAP) and the 7031301 Census Collection District (CCD) which both contain the Harts Range site. The ABS Census Collection Districts are the smallest survey areas used in the Australian census and multiple CCD's make up a Statistical Local Area.

Between the 2001 and 2006 Census years the Harts Range SLA (Sandover-Bal) changed in area. While the outer boundary remained the same, the Ltyente Purte Community became its own SLA (refer to Figure L2.4), meaning any Census data

<sup>1</sup> *Olympia Resources Limited, Harts Range Garnet Project Public Environment Report, November 2004 prepared by Martinick Bosch Sell Pty Ltd (MBS Environmental)*

collected inside this new SLA is not included in the 2006 Census (although it was included in the 1991, 1996 and 2001 Census data).

### L3.6.2 General information

Alice Springs is the only regional centre in the area. The projected urban growth for the Alice Springs Township is estimated to be approximately four per cent.

The Harts Range site lies within the Sandover-Bal 710403209 Statistical Local Area (SLA) which comprises an area of over 136,000 square kilometres and a population of approximately 3,600 people. Sandover-Bal SLA incorporates 20 Census Collection Districts (CCDs). Harts Range is contained within CCD 7031301 and covers an area of over 77,000 square kilometres with a population of approximately 359 people (refer to Figure L2.4). Accordingly the area in question is extremely large with an extremely sparse population with 215 square kilometres/person.

### L3.6.3 Population

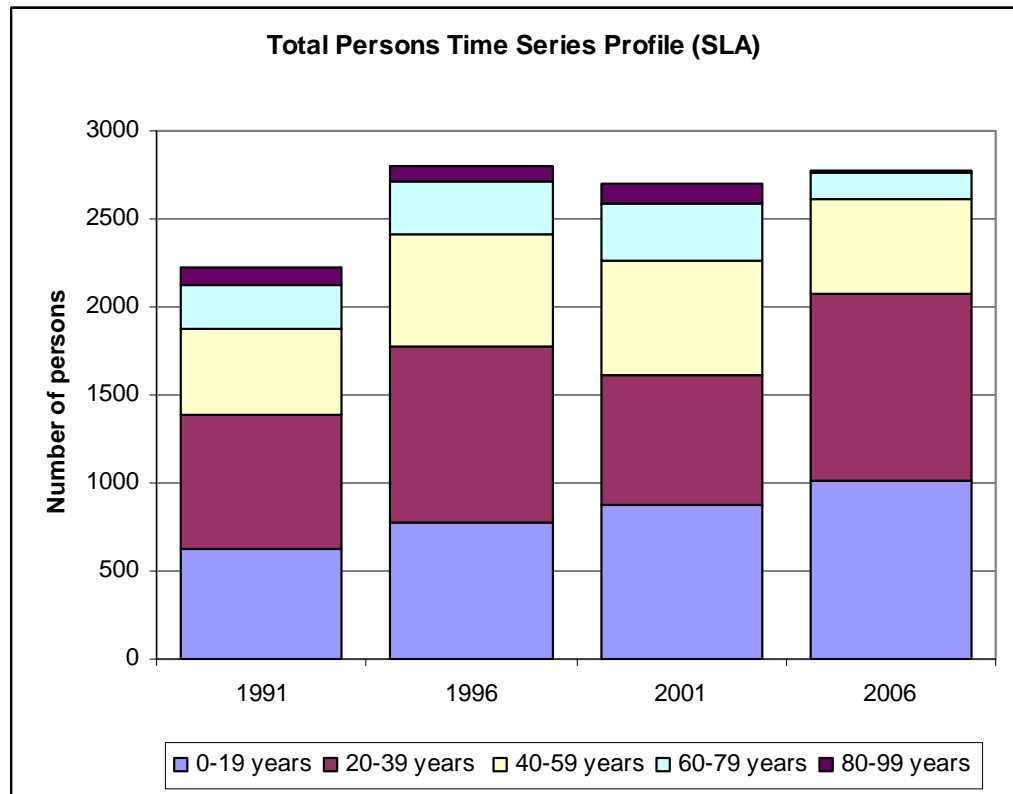
The Australian Bureau of Statistics gives population data for the region in total number of persons from each year of age. For analysis purposes the data has been grouped into the following age brackets:

- 0–19 years
- 20–39 years
- 40–59 years
- 60–79 years
- 80–99 years
- 100+ years.

The population data for the Sandover-Bal SLA shows growth from 1991 to 1996 and then the numbers remain relatively similar from 1996 through to 2006 (refer to Figure L3.4). The 0–19 year age group was the only age group to show growth in each Census. All other age groups fluctuated between Census years.

The data suggests that the Sandover-Bal SLA did experience population growth between 2001 and 2006 as the total population remained similar to the 2001 numbers even though the Ltyente Purte Indigenous Community numbers were removed from the total.

The ABS also provides Indigenous persons population data and for the Harts Range SLA (Sandover-Bal). This data shows a steady increase in the number of Indigenous Persons within the region from 1991 to 2001. The total numbers grew from 1,586 in 1991 to 1,836 in 1996 to 2,685 in 2001 (refer to Figure L3.5). This represents a 69% increase over a 10 year period. However, the number significantly decreased in 2006. This is due to the fact that the Indigenous population at Ltyente Purte was removed from the total in 2006. Given the removal of this Indigenous Community (with a population of 573 in June 2006 – Northern Territory Government, 2006c), the Indigenous population within the remaining area is still estimated to have increased.



NOTE: There were no persons over 100 years of age in any of the Census years, so the data set has not been included.

(Source: ABS, 2003f, 2006h)

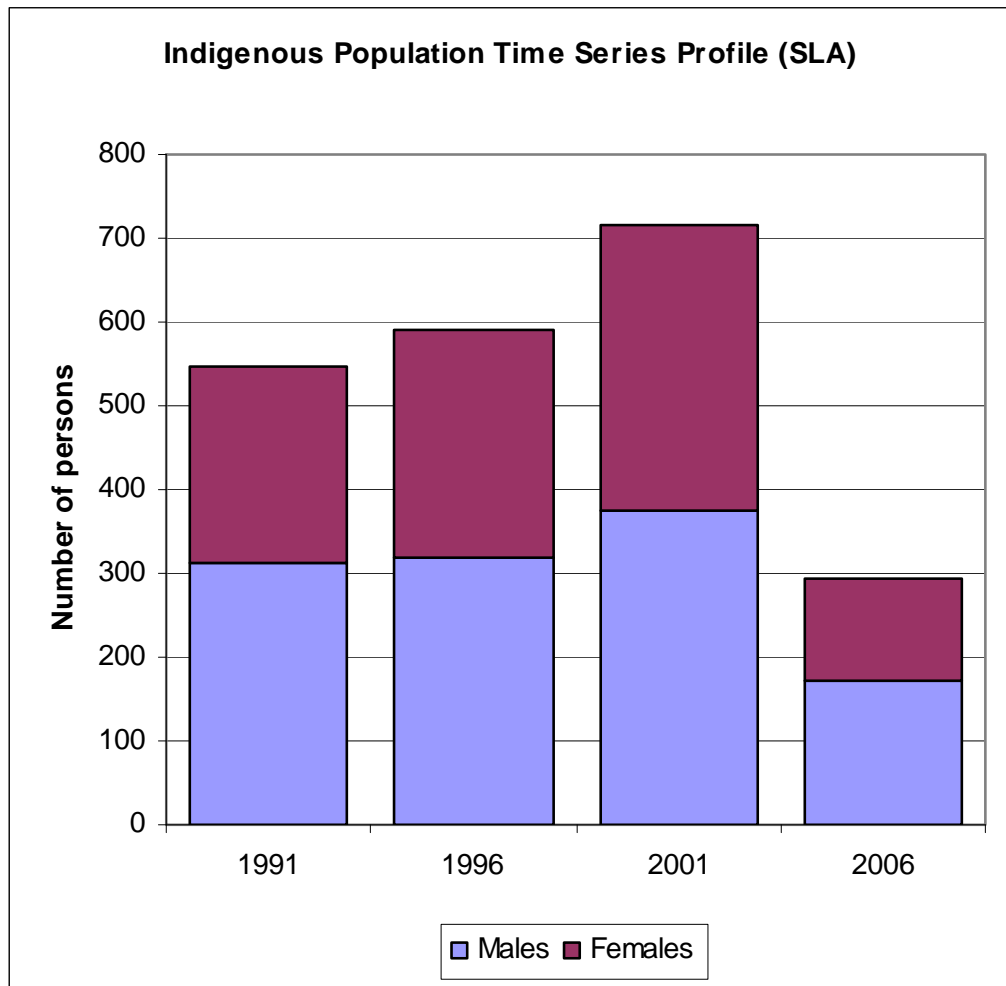
**FIGURE L3.4**  
**Total persons time series profile for the Harts Range SLA**

While it appears there has been significant growth in Indigenous persons within the SLA, this growth can be explained by improved data collection of indigenous persons.

*[T]he growth in the Indigenous population in recent decades can not be explained by natural increase alone. Much of the unexplained growth can be attributed to an increasing prevalence of persons to be identified as Indigenous on census forms. (ABS, 1998).*

### L3.6.4 Education

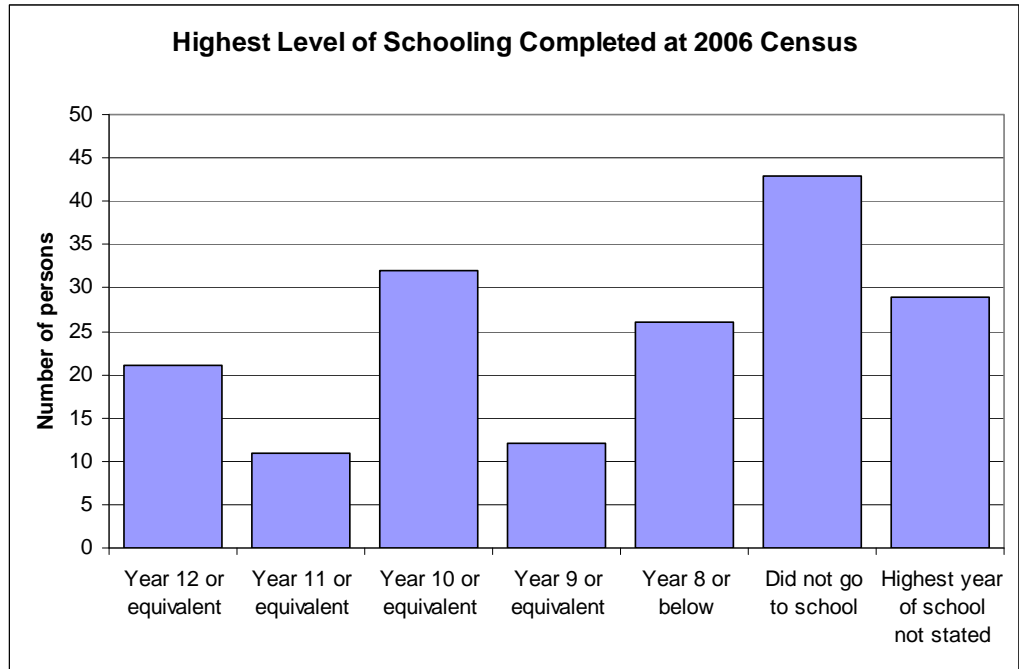
The 2001 Census ABS data gives detailed information about numbers of people who completed each level of schooling in 2006. The data in this section was taken from the ABS 2006 Census data for the 7031301 Census Collection District (which Harts Range lies within). The data shows that most people either did not go to school or left after Year 10 or equivalent (refer to Figure L3.6). There were also significant numbers that had only completed to Year 8 and 12 or equivalent.



Source: (ABS, 2003f, 2006g)

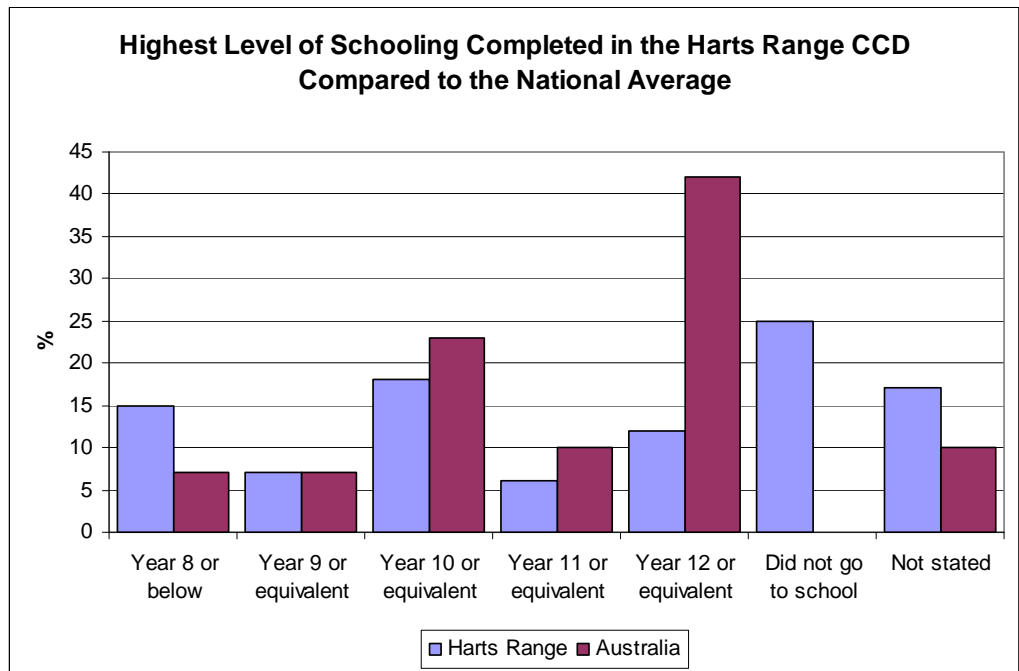
**FIGURE L3.5**  
**Total Indigenous population time series profile for the Harts Range SLA**

The number of people that did not attend school or completed to Year 8 or below in the Harts Range CCD is much higher than the corresponding national average (refer to Figure L3.7). Also the percentage of people who completed school to Year 12 or equivalent in the Harts Range CCD is reasonably lower than the national average. This suggests that the school level people are completing within the CCD is much lower than the national average, with many people completing to Year 8 or below or not attending school at all and much fewer completing to Year 12 or equivalent than the national figures. This trend is likely to be explained by the remote nature of the district, the lack of school facilities and difficult access to schooling.



(Source: ABS, 2006f)

**FIGURE L3.6**  
 Highest level of schooling completed at the 2006 census  
 for the Harts Range CCD

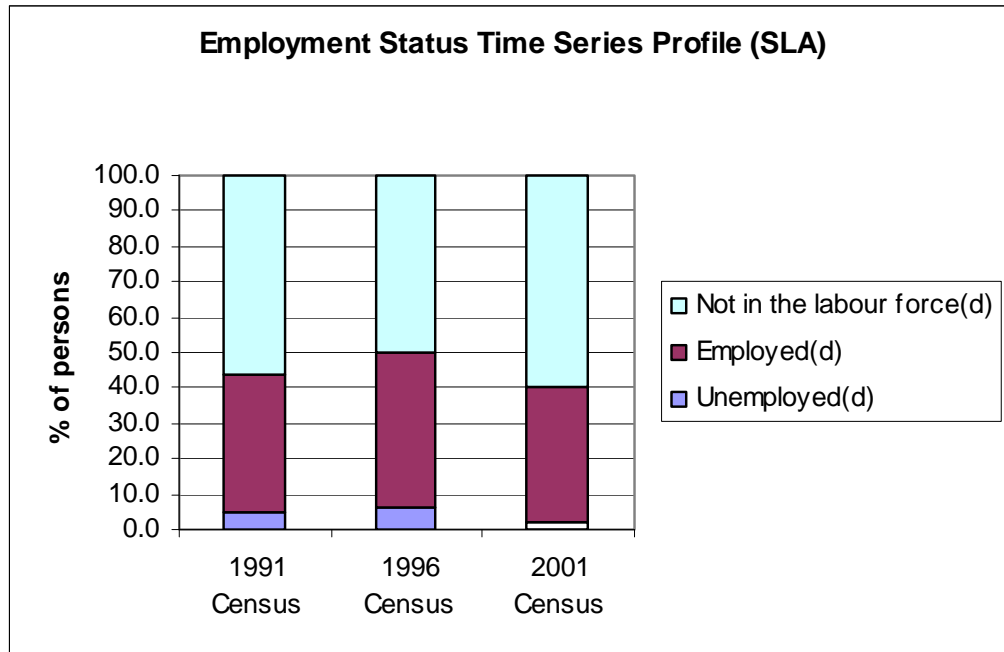


(Source: ABS, 2002c)

**FIGURE L3.7**  
 Highest level of schooling completed at 2006 census,  
 Harts Range CCD versus Australia

### L3.6.5 Employment

Over the last 10 year Census period from 1991 to 2001, within the Harts Range SLA, the percentage of persons 'not in the labour force' increased from 1996 to 2001 and the percentage of persons unemployed decreased significantly (refer to Figure L3.8).



NOTE: At the time this report was written there was no employment status data released for the Harts Range SLA from the 2006 Census data.

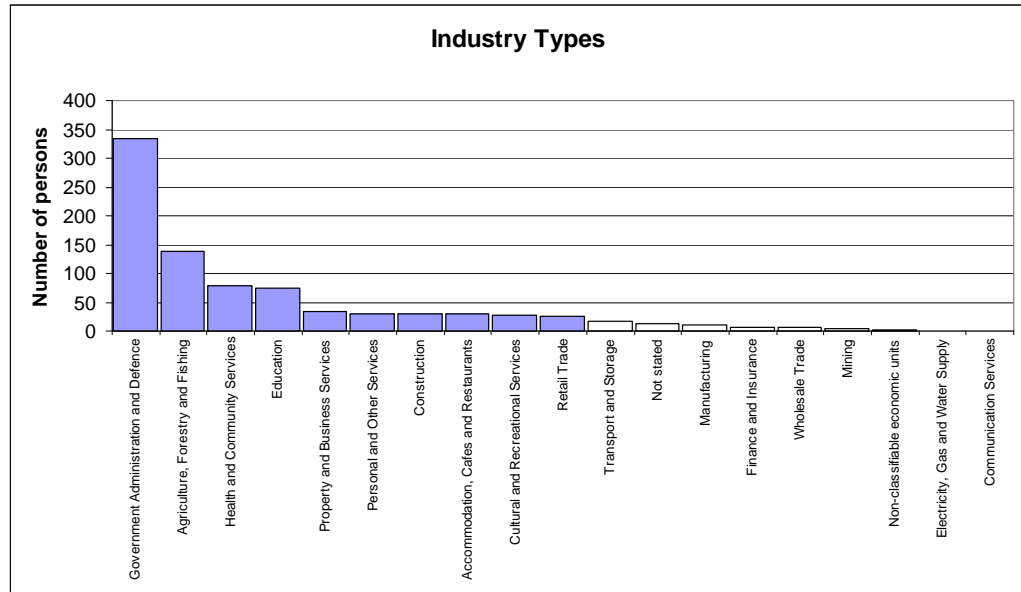
(Source: ABS, 2003f)

**FIGURE L3.8**  
**Employment status time series profile for Harts Range SLA**

The biggest employment industries in the Harts Range SLA are 'Government Administration and Defence' and 'Agriculture, Forestry and Fishing' (refer to Figure L3.9). This would be due to the fact that the Harts Range Defence site employs a large number of people and also that the surrounding land is mainly pastoral leases. At a more regional level employment opportunities are generally limited to cattle grazing; minor tourism; capitalising on passing trade; and maintaining township facilities, services and infrastructure.

Alice Springs and its regional communities have a range of facilities comparable with any town of similar size. The main employment industries include:

- government administration and banking
- trucking and transport
- regional centre – shops, supermarkets, car yards, hardware
- support to mining industries
- general industries (heavy and light)
- hospitality and tourism
- Pine Gap
- social services – schools, hospitals, childcare, health facilities.



NOTE: At the time this report no employment status data was available for the Fishers Ridge SLA from the 2006 Census data

(Source: ABS, 2002d)

**FIGURE L3.9**  
**Industry types by size for Harts Range SLA**

## L3.7 Prominence in landscape

The Plenty Highway is a designated Road (refer Figure L2.11) pursuant to Part 7 (Section 13.4) of the Northern Territory Planning Scheme:

1. The purpose of this clause is to ensure inappropriate development does not compromise the safety or **amenity** of a designated road.

2. Despite clause 1.3 this clause applies to a use or development that is proposed on unzoned land which:

(a) is within 500m of the road reserve of a designated road or, where there is no road reserve, within 500m of the centre line of the designated road; and

(b) is not within:

(c) a local or community government area (other than those parts of the Mataranka and Pine Creek Community Government Areas outside the towns of Mataranka or Pine Creek); or

(d) a town within the meaning of the Crown Lands Act.

3. Land subject to this clause may:

(a) be used or developed for a **single dwelling** or **agriculture** without **consent**;

(b) not be used or developed for any other purpose without **consent**.

Whilst approvals for such a facility are dealt with by Commonwealth legislation, regard should be given to intent of the Northern Territory Planning Scheme.



The proposed facility, if located at Harts Range, would not be visible from Plenty Highway but may be visible from the access road to the Defence facility or from an elevated location such as Low Rock.



## L4. Fishers Ridge

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### L4.1 Site use and tenure

The Fishers Ridge site nominated as a possible location for the Commonwealth Radioactive Waste Facility is located approximately 40 km south-east of Katherine on Commonwealth owned Defence land. As the site is owned by the Commonwealth Government the *Commonwealth Radioactive Waste Management Act 2005* disappplies NT laws at this site. The site is surrounded by perpetual pastoral leases, freehold land, crown land leased for development purposes and vacant crown land (refer to Figure L4.1).

### L4.2 Zoning

A search was undertaken on the Northern Territory Government Department of Planning and Infrastructure website ([http://www.ipe.nt.gov.au/whatwedo/planning/new\\_scheme/index.html](http://www.ipe.nt.gov.au/whatwedo/planning/new_scheme/index.html)) to ascertain the location of the closest township/zoning boundary. In this regard, the site is approximately 19 km directly east of the Katherine Municipal boundary and is therefore not subject to local planning controls (refer to Figure L4.2).

A similar search was undertaken to determine potential future zoning and planning control changes in land use for the greater area of Katherine. This search revealed that there does not appear to be any past or current planning controls for the region that would impact upon the site (Northern Territory Government, 1981).

The current 'Northern Territory Planning Scheme – Katherine' does not include the Fishers Ridge site; meaning there are no government planning controls for the Fishers Ridge site. This is likely to be due to the fact that:

- the site is 19 km outside of the Katherine Municipal boundary; and
- the Tindal RAAF Base on the eastern outskirts of Katherine may inhibit residential and associated land uses towards the eastern outskirts of the town (refer to Figure L4.2).

Given the distance of the site from the present township growth area (and identified future growth areas) and the presence of the Tindal RAAF Base on the eastern outskirts of the township, it is unlikely that future zoning, planning controls or changes in land use will impact on the site.

A state wide Development Plan is expected to be developed in the near future however was not available at the time of this report.

## L4.3 Surrounding land use

While the Fishers Ridge site is located on Defence owned land, the surrounding region is made up of pastoral leases, Aboriginal Community Land, freehold land and the Township of Katherine. Scott (2006) identifies that the site falls within two major catchments, the Daly River Surface Water Management Area (east half of the site) and the Roper River Surface Water Management Area (west half of site). Both of these catchments are used by the nearby human populations for source water. More details can be found in the *Proposed Commonwealth Radioactive Waste Management Facility – Northern Territory Hydrogeology and Hydrology Report* (PB, 2008a) for this project.

The Fishers Ridge site is currently used for cattle grazing by adjacent land owners. In addition, the access track running through the site is currently used by recreational fishers to reach their fishing grounds further north. Occasionally the access road used to be used by people hunting animals within the Fishers Ridge site but this is not common today.

Within the Fishers Ridge/Katherine region there are a number of irrigated horticultural/agricultural crops (e.g. citrus, mango, peanut, sorghum, banana, melon and forestry) (Puhlovich, 2005), the closest of these being a major irrigation area approximately 10 km west of the Fishers Ridge site.

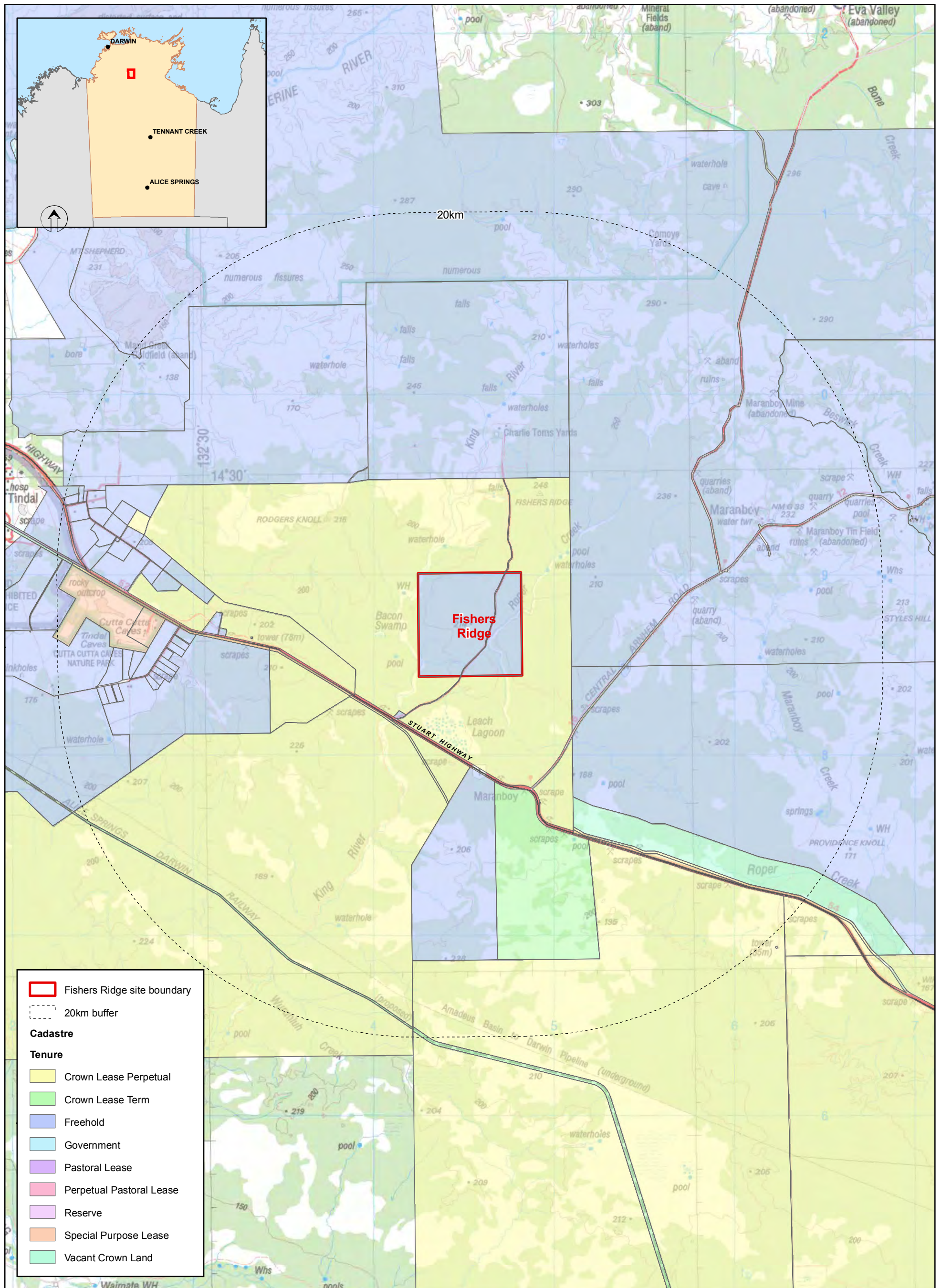
### L4.3.1 Infrastructure

The Amadeus Basin to Darwin Gas Pipeline sits approximately 20 km south-east of the Fishers Ridge site and runs along the railway easement within the vicinity of the site (refer to Figure L4.2). The Department of Planning and Infrastructure is the pipeline's custodian and it is completely within the Northern Territory's jurisdiction.

Two major transportation routes lie within the vicinity of the site: Alice Springs to Darwin Rail Corridor (located approximately 18 km south west) and the Stuart Highway (located approximately 4.5 km south west) (refer to Figure L4.2). Details of these transport corridors can be found in 'Commonwealth Radioactive Waste Management Facility Transport Assessment' (Parsons Brinckerhoff, 2007b). There are also numerous abandoned drilling and mining operations within the region (refer to Figure L4.2). The closest of these being:

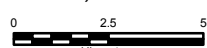
- an unnamed abandoned quarry, approximately 10 km east of the site
- an unnamed abandoned quarry, approximately 12 km north-east of the site
- an unnamed abandoned mine, approximately 13 km north-east of the site
- Maranboy Mine (abandoned) approximately 14 km north-east of the site
- Maranboy Tin Field (abandoned) approximately 16 km north-east of the site
- Southern Claim Mine (abandoned) approximately 16 km east/north-east of the site.

(*Geoscience Australia, 2006*)



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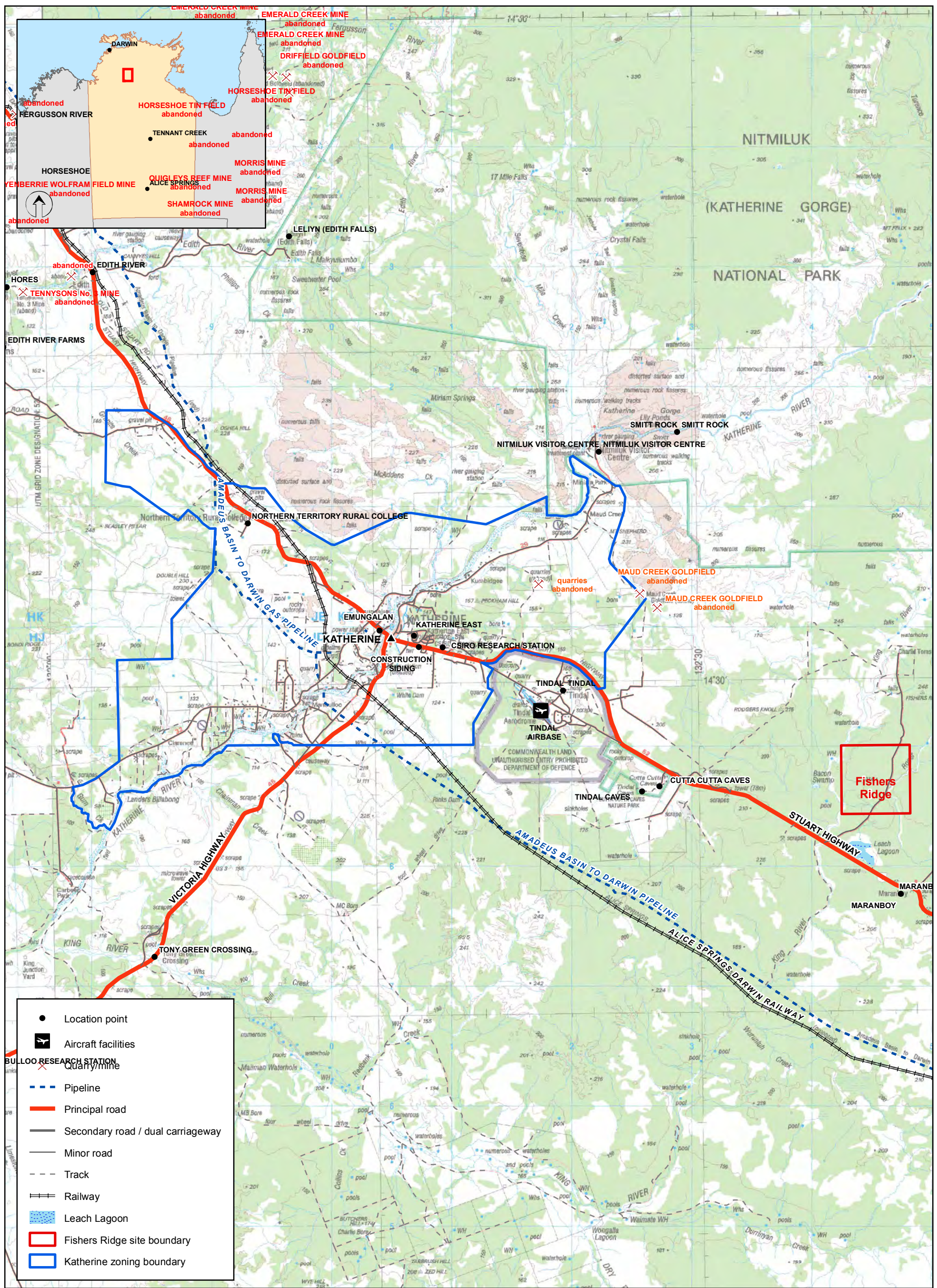
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Revision: B Date: 21/07/2008

Drawn By: RP Checked by: MD

Client Ref: RADWASTE

**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Land tenure within 20 kilometres of Fishers Ridge  
**Figure L4.1**



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**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Land use around Fishers Ridge  
Figure L4.2

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Coord.: GDA94 MGA53

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### L4.3.2 Airports

The nearest major domestic/international airport to the site is in Darwin and the nearest air base is the Tindal RAAF base (refer to Figure L4.2). The Royal Australian Air Force (RAAF) Base Tindal is located 17 km south-east of Katherine. It was originally constructed in 1942 but established as an operational air force base by the government in 1984. Tindal officially opened on 1 October 1988 and is home to the:

- No 322 Combat Support Wing
- No 75 Squadron
- No 2 Control and Reporting Unit
- No 1 Air Terminal Squadron
- No 44 Wing Detachment.

The Tindal Base personnel (including their families) make up almost 25% of Katherine's population.

There are many air traffic corridors within the region which are occupied by both low altitude (private and small transport aeroplanes) and high altitude (commercial jets) aircraft. Within the area the lowest safe altitude for all types of aircraft is 2,400 feet. The specific low and high altitude flying routes are available from the Airservices Australia ERC's (En Route Charts). It should be noted that the routes on these maps are only to be used as a guide as flight paths can change depending on weather conditions. Given that these routes can change and that Tindal is only 17 km away from the site it is possible that aircraft will fly directly over the site, as may already occur now.

### L4.3.3 Ports

The nearest shipping port is in Darwin, approximately 350 km north of the site. Port facilities have direct road and rail linkages to Katherine.

### L4.3.4 Tourism

The Cutta Cutta Caves (15 kilometres from site) are a popular tourist location within the region (refer to Figure L4.2). No information on visitor numbers was able to be obtained from the operators during the course of this investigation.

### L4.3.5 Defence

Refer Section L3.3.2 Airports.

## L4.4 Heritage

At the request of DEST the Aboriginal Areas Protection Authority (AAPA) gave advice on the location of registered sacred sites within the vicinity of Fishers Ridge. Two sites were identified within the Fishers Ridge site boundary. One lies just inside the north-western boundary of the site and the second sits in the south-eastern corner.

These sites were listed as “recorded sacred sites”. This means that they are significant according to Aboriginal tradition and therefore “sacred sites” within the meaning of the *Northern Territory Aboriginal Sacred Sites Act 1989*. The AAPA does not purport to hold detailed information regarding all these sites.

A search was conducted on the Australian Heritage Places Inventory database for sites listed on the Register of the National Estate, National Heritage List, Commonwealth Heritage List, World Heritage List and the NT Heritage Register. The closest listings to the Fishers Ridge site are listed below. Three places identified within the Katherine region were described as being an “indigenous place” and were registered under the Register of the National Estate. However, the information was not available for viewing and the location was also not available so their proximity to the site is unknown. Further investigation and Aboriginal community liaison would be required to identify these sites, however, that work is outside of the scope of this investigation.

Australian Heritage Places Inventory listings:

1. *Cutta Cutta Caves* – Registered place under the Register of the National Estate (Registered place meaning the place is listed in the Register of the National Estate). Located approximately 14 km west of the site adjoining Stuart Highway (refer to Figure L4.2).
2. *Leach Lagoon* – Located approximately 2 km south of the site (between Fishers Ridge site and Stuart Highway and comprises an area of approximately 280 ha (refer to Figure L4.2). Leach Lagoon is listed as an Indicative Place under the Register of the National Estate (Indicative place meaning the data provided to or obtained by the Australian Heritage Council or the former Australian Heritage Commission has been entered into the database and the place is at some stage in the assessment process. A decision on whether the place should be entered in the Register has not been made).

## L4.5 Surrounding population centres

### L4.5.1 Indigenous

Five kilometres to the north of the Fishers Ridge site is an area of Aboriginal Community Land which is held as Aboriginal Freehold Land. There is also an Aboriginal Trust Land site 2.5 km to the east of the site.

The Aboriginal communities identified in Table L4.1 below are categorised into different community types. The four different categories are Major, Minor, Family Outstation and Town Camp. The definitions of these categories are listed below:

- **Major:**
  - ▶ Community with more than 100 people (can be up to thousands)
  - ▶ Self-governing
  - ▶ It is expected it will contain the facilities of a town (e.g. School, health).

- **Minor:**
  - ▶ Community with between 20–100 people
  - ▶ Self-governing
  - ▶ May provide resources to smaller families.
- **Family Outstation:**
  - ▶ Permanent or semi-permanent residents of up to 20 people
  - ▶ Provides potable water.
- **Town Camp**
  - ▶ Situated within a major urban centre (e.g. Alice Springs)
  - ▶ All services are obtained from major urban centre.

The Aboriginal communities closest to the Fishers Ridge site are identified in Table L4.1 below (see also Figure L4.3) There is only one community within 10 km of the site – Banatjarl. The Banatjarl (King Valley) area is classified as a Family Outstation. It has a potable water source and is approximately 12,000 hectares of land comprising a homestead area that contains 3 old cottage houses and a large workshop shed with a kitchen in a single room demountable with power, water and satellite telephone. Banatjarl is a traditional area for women and children used by the Katherine, Wugularr, Barunga and Manyallaluk Indigenous communities. It provides a retreat from violence and substance abuse (Australian Government, 2005).

**Table L4.1 Aboriginal communities within 50 km of Fishers Ridge**

ID Number	Community Name	Alias	Community Type
<b>0 – 5 km</b>			
	None		
<b>5 – 10 km</b>			
1	Banatjarl	King Valley	Family Outstation
<b>10 – 50 km</b>			
2	Barunga	Bamyili	Major
3	Beswick	Wugularr	Major
4	Binjari	Binjarri, Wylunba	Minor
5	Eva Valley	Manyallaluk	Minor
6	Jodetluk	Gorge Camp, Katherine Town Camp, Maude Creek Camp	Family Outstation
7	Walpiri Transient Camp		Town Camp
8	Miali Brumby	Kalamo, Mialli, Kalano Farm, Kalano, Kalamo – Mali Brumby	Town Camp
9	Rockhole	Rochole	Minor
10	Bishops Bore		Family Outstation

(Northern Territory Government, 2006b)

#### L4.5.2 Other centres

The only non-indigenous population centre within the vicinity of the site is the city of Katherine. Population characteristics for Katherine are discussed in Section L4.6.3 of this report.

### L4.6 Demographics

#### L4.6.1 Data sources

The demographic assessment in this section considers data compiled from the 1991, 1996, 2001 and 2006 Australian Census, provided by the Australian Bureau of Statistics (ABS) (refer to ABS, 2002a, 2002b, 2003a, 2003b, 2003c, 2006c, 2006d and 2006e). Specifically, the data considers the Eley-BAL 710301409 Statistical Local Area and the 7030706 Census Collection District (CCD) which both contain the Fishers Ridge site (refer to Figure L4.4). The ABS Census Collection Districts are the smallest survey areas used in the Australian census and multiple CCD's make up a Statistical Local Area (SLA).

Between the 2001 and 2006 Census dates the ABS boundary for the Eley-Bal SLA changed (refer to Figure L4.4). As a result, the data collected from the Eley-Bal SLA in the 1991, 1996 and 2001 Census' cannot be directly compared to the 2006 Census data. This explains the significant change in results of population figures from the 2001 and 2006 Census data as shown in Figures L4.5 and L4.6 below.

#### L4.6.2 General information

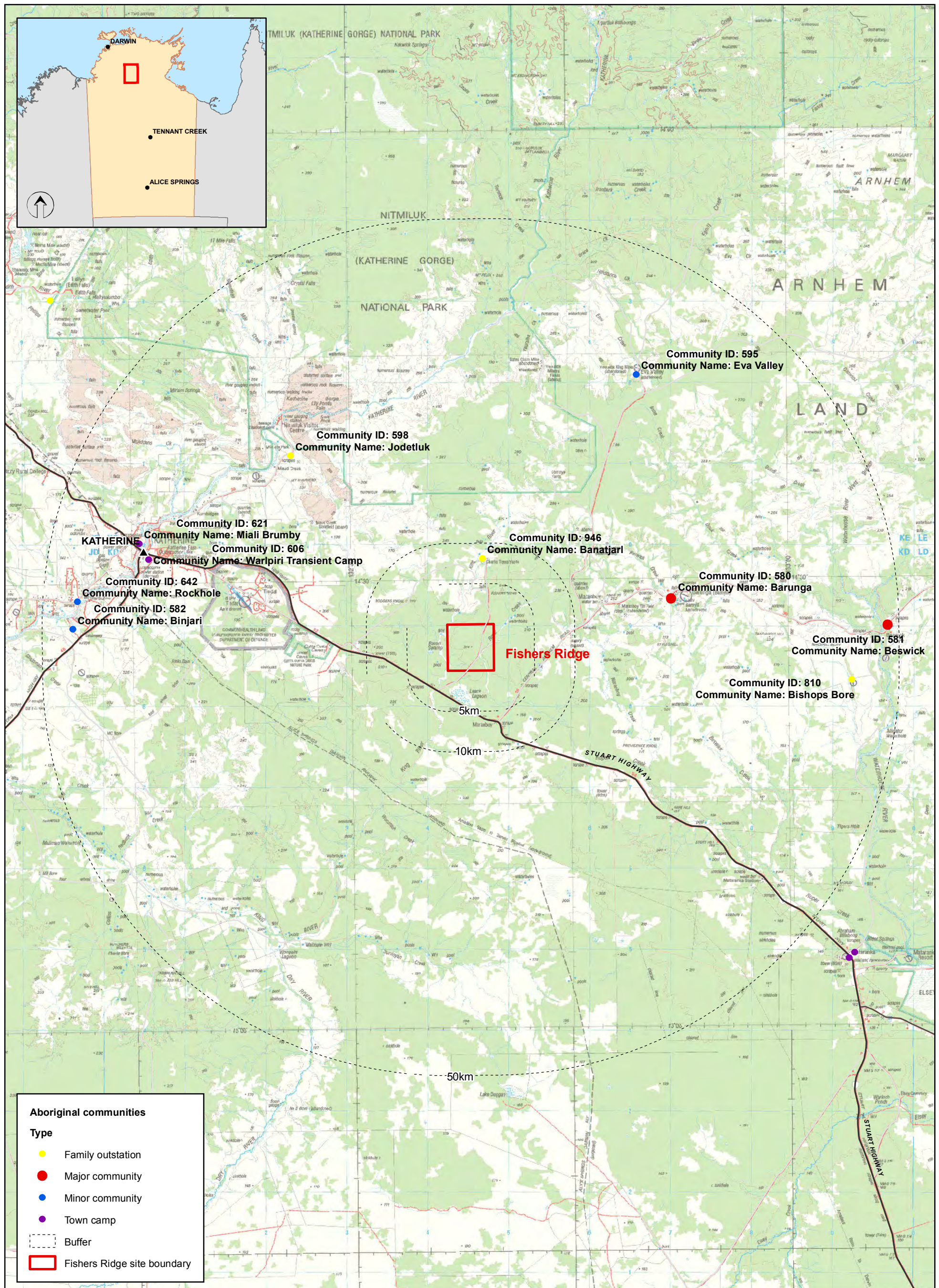
Generally, the extent of concentrated post-European-settlement in this region has been limited to the township of Katherine. The only other settlements in the area are associated with large rangeland grazing stations.

Katherine is the fourth largest town in the Northern Territory, located 312 kilometres south-east of Darwin on the Katherine River. Katherine is a regional centre that offers a wide range of services to communities from the Western Australian border to the Gulf of Carpentaria on the Queensland border. It is located on the junction of the Stuart Highway linking with the north and south and the Victoria Highway to Western Australia.

Katherine has a population of approximately 10,000 people which represents approximately 5% of the Northern Territory Population. Of this population approximately 25% is of Aboriginal descent and approximately 22% of the Katherine population including families are associated with the Tindal RAAF Base. The greater Katherine region comprises in excess of 18,000 people spread over a 500 kilometre radius.

Katherine has traditionally serviced the surrounding mining industry and communities. This includes the Tindal RAAF and its surrounds such as Aboriginal communities and pastoral properties.





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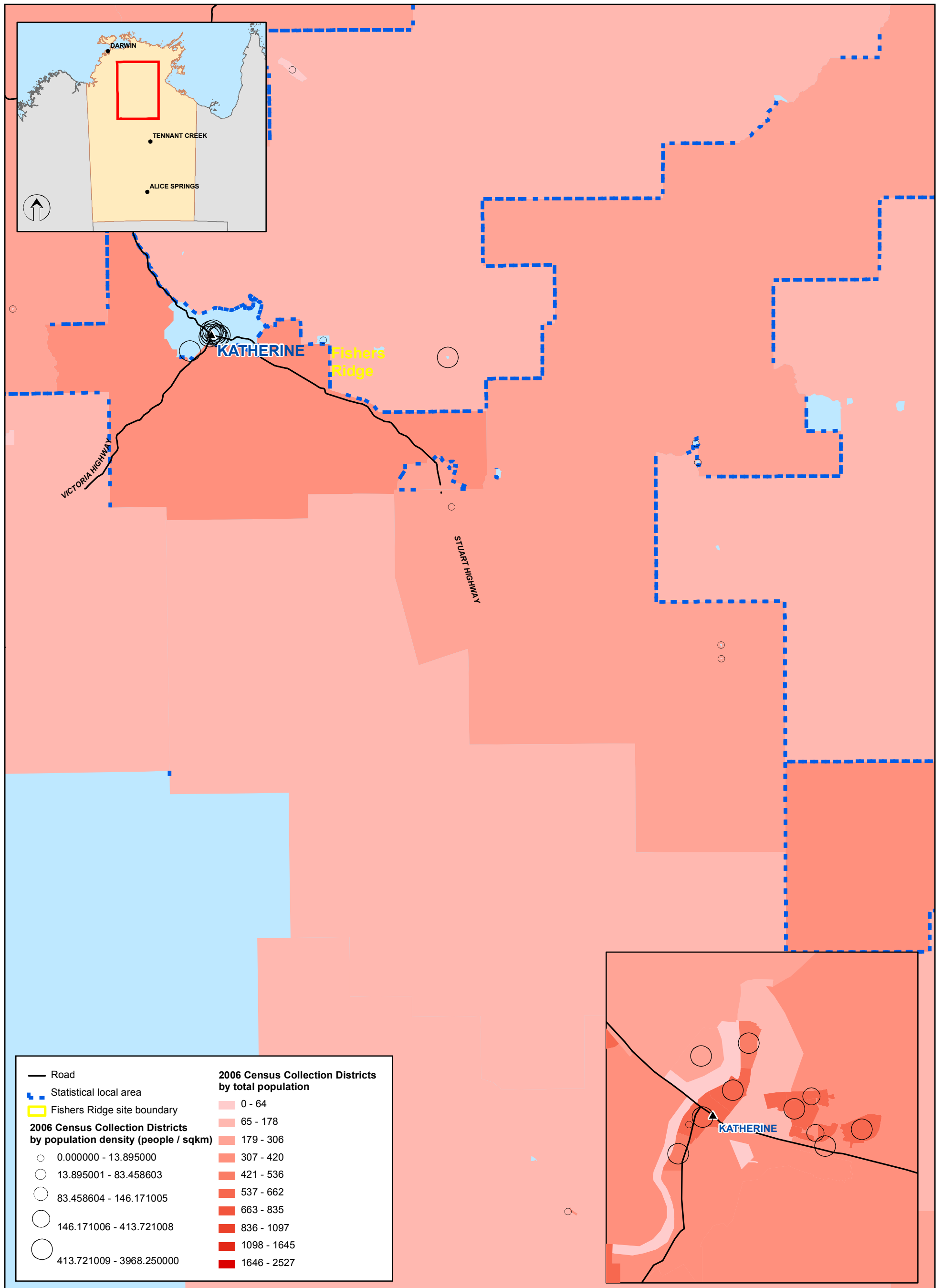
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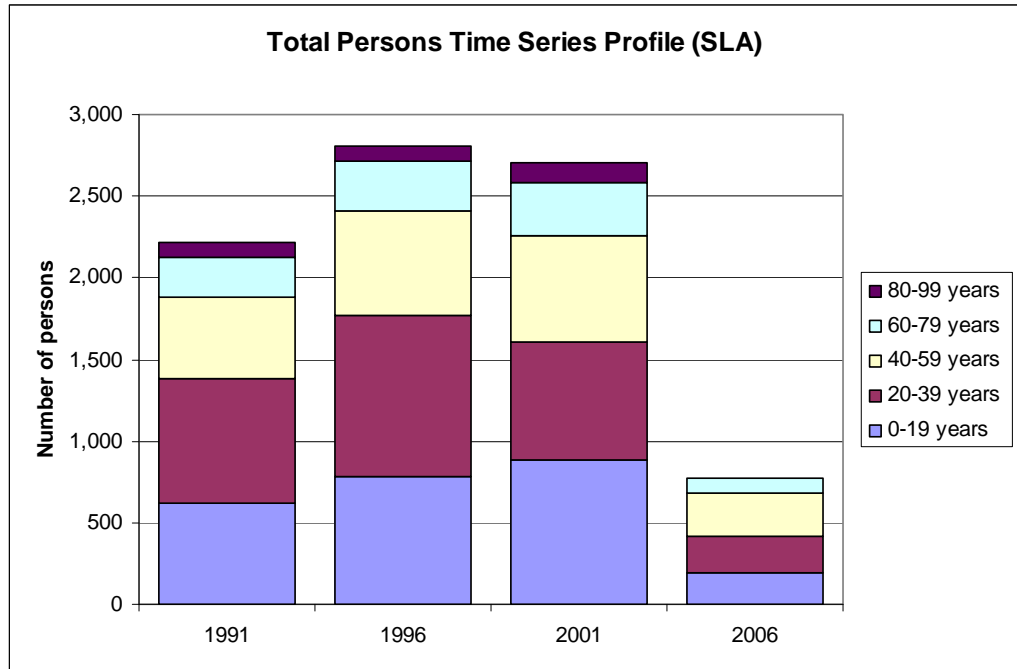
**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Aboriginal Communities within 50 km of Fishers Ridge  
Figure L4.3



Source: Geoscience Australia,  
NT Government

Coord.: GDA94 MGA53

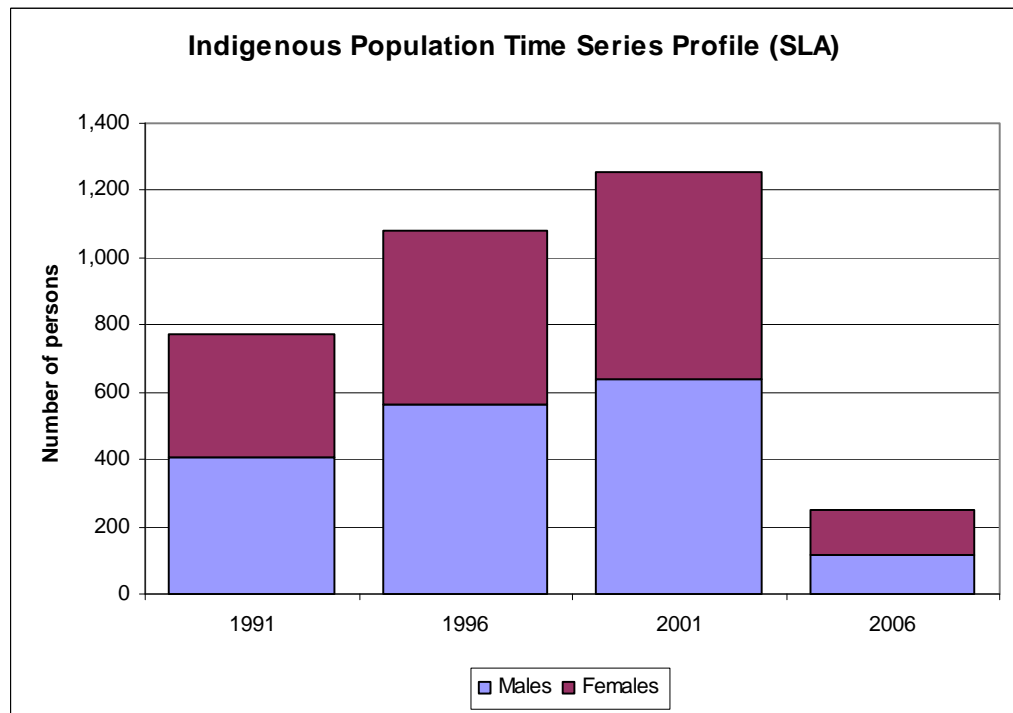




NOTE: There were no persons over 100 years of age in any of the Census years, as a result the data set has not been included.

(Source: ABS, 2003b, 2006e)

**FIGURE L4.5**  
 Total persons time series profile for Fishers Ridge SLA



(Source: ABS, 2003b, 2006d)

**FIGURE L4.6**  
 Total Indigenous population time series profile for the Fishers Ridge SLA

The Fishers Ridge site is within the Elsey-BAL Statistical Local Area (SLA) which comprises an area of over 63,000 square kilometres and a population of approximately 2,600 people. Elsey-BAL SLA incorporates 12 Census Collection Districts (CCDs). The CCD in which Fishers Ridge is contained is CCD 7030706 and covers an area of approximately 12,000 square kilometres with a population of approximately 590 people (refer to Figure L4.4). The relevant area is large with a sparse population of approximately 20 square kilometres/person.

The Aboriginal communities discussed in Section L4.5.1 of this report are contained within the Census SLA but not within the CCD. The highest concentrations of communities within the CCD appear to fall within the north-western section of the Census Collection District to the north-west of Katherine (refer to Figure L4.4).

### L4.6.3 Population

The Australian Bureau of Statistics gives population data for the region in total number of persons for each year of age. For analysis purposes the data has been grouped into the following age brackets:

- 0–19 years
- 20–39 years
- 40–59 years
- 60–79 years
- 80–99 years
- 100+ years.

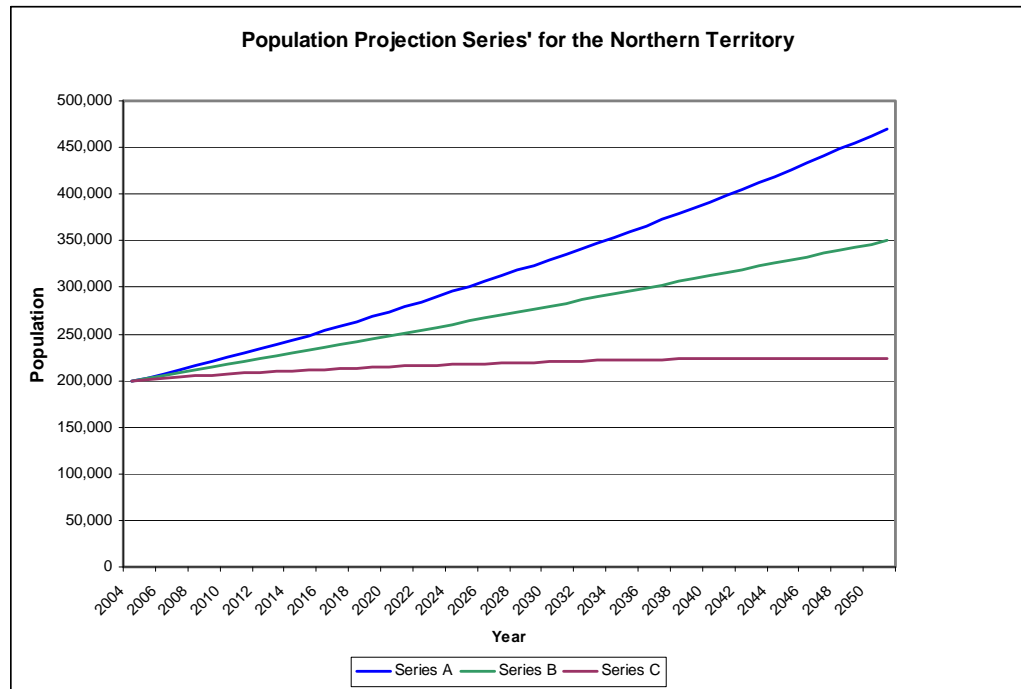
The population data for the Elsey-BAL Statistical Local Area shows no distinct pattern of growth in the total number of persons from the 1991 Census to the 2001 Census, however there are growth patterns within some age groups (refer to Figure L4.5). All age groups, with the exception of 20–39 years, showed patterns of steady growth across each census date. The 20–39 years age group increased in size from 1991-1996 but then dropped off in 2001. All age groups decreased in size for the 2006 Census. This can be attributed to the change in SLA boundary, which meant a different demographic of people were surveyed from the earlier Census'.

The ABS also provides current population data for Indigenous people. The ABS Indigenous population data for the Fishers Ridge SLA shows a steady growth in the number of Indigenous persons within the area (refer to Figure L4.6). The exception is the 2006 Census data which shows a decrease in the total number of Indigenous people. Once again this can be attributed to the change in SLA boundary rather than an actual representation of population growth or decrease. The total number of Indigenous persons increased from 774 in 1991 to 1,083 in 1996 and to 1,256 in 2001.

While it appears there has been significant growth in Indigenous persons within the SLA (prior to the SLA boundary being changed in 2006), this growth can be explained by improved data collection of indigenous persons.

*[T]he growth in the Indigenous population in recent decades can not be explained by natural increase alone. Much of the unexplained growth can be attributed to an increasing prevalence of persons to be identified as Indigenous on census forms. (ABS, 1998).*

The ABS provides three different population projection scenarios for the Northern Territory (refer to Figure L4.7 below). The scenarios project growth through the period of 2004 to 2051. Series B projects continuing population growth throughout the period while Series A assumes higher levels of population growth through higher fertility rates, life expectancy and migration rates. Series C assumes lower levels. As a result, Series A results in larger projected populations by 2051 and Series C results in lower populations.



(Source: ABS, 2006b)

**FIGURE L4.7**  
**Total NT population projections (Series A, B and C)**

*The Northern Territory’s population is projected to increase by 150,200 people between 2004 and 2051 (based on Series B projections) to 350,000 people. Although this is a smaller absolute increase than those projected for the larger states, it is a significant increase (75%, second only to Queensland’s projected increase of 77%) relative to the Northern Territory’s 2004 population of just under 200,000 people. (ABS, 2006b:5)*

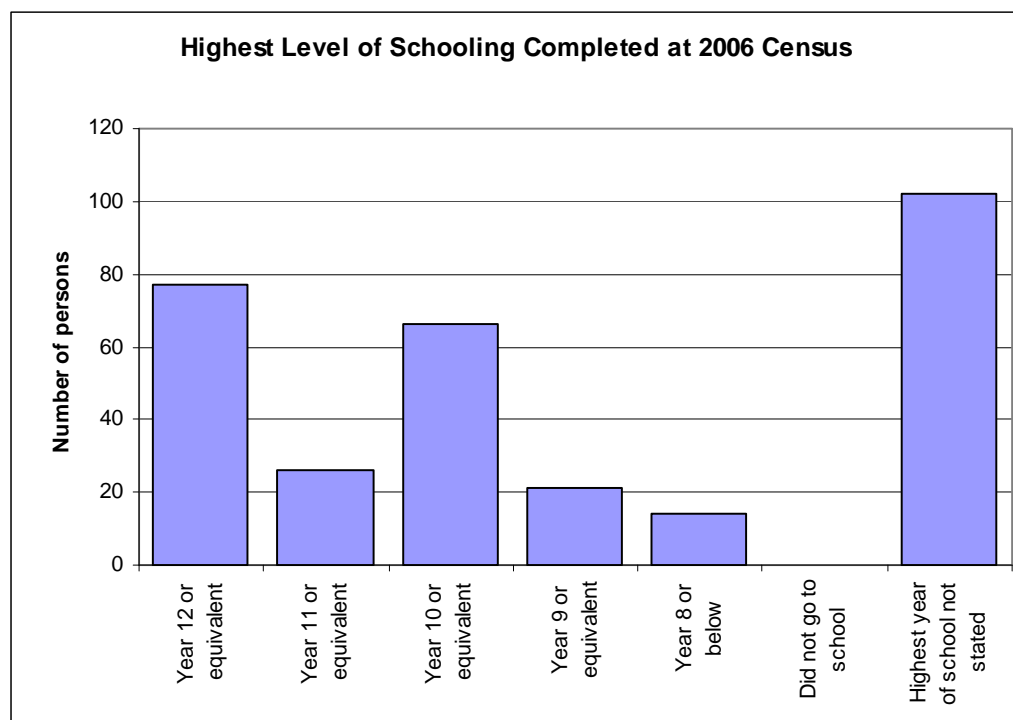
While the ABS projections suggest a large population increase in the Northern Territory, it is not likely the Fishers Ridge site and the immediate surrounding areas will experience much, if any, of this growth. The ABS Populations Projections report (2006b) states that:

*“(i)n series B, all capital cities are projected to experience higher percentage growth than their respective balances, resulting in further concentration of Australia’s population within the capital cities.....the population of Darwin is expected to exceed that of Hobart in 2048”*  
 (ABS, 2006b:5)

It is likely that the majority of the population growth in the Northern Territory will be focussed in Darwin, with some growth possible in Alice Springs and Katherine townships. The regional areas such as Fishers Ridge are not expected to experience significant growth.

#### L4.6.4 Education

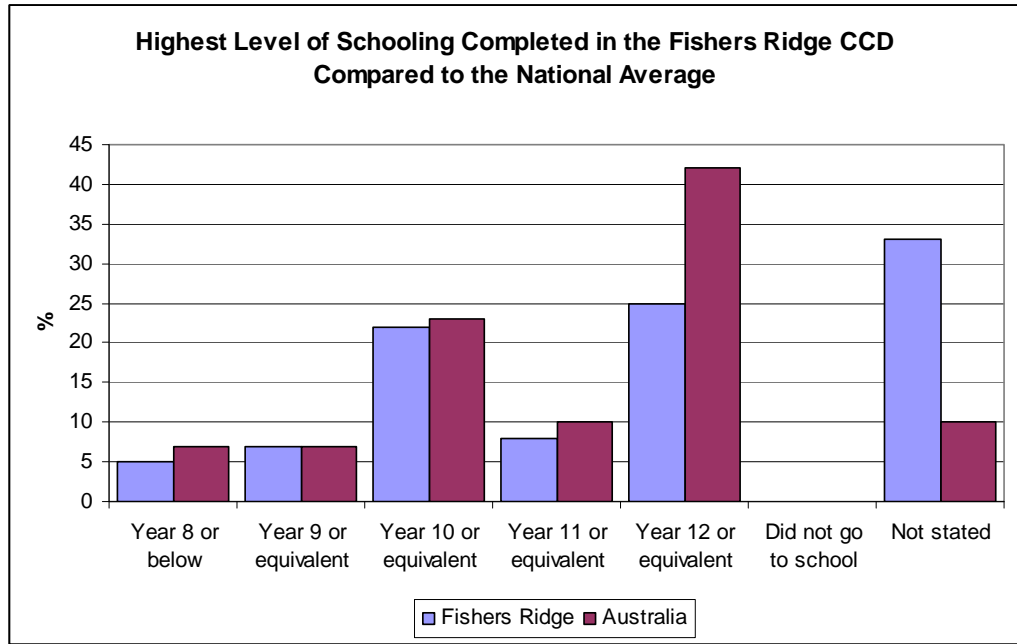
The 2006 Census ABS data gives detailed information about numbers of people who completed each level of schooling in 2001. The data in this section was taken from the ABS 2006 census data for the Fishers Ridge Census Collection District 70301409. The data shows most people did not state their highest year of school completed. Of those persons that did state their highest level of schooling completed most people either finished school or dropped out after year 10 (refer to Figure L4.8).



(Source: ABS, 2006c)

**FIGURE L4.8**  
**Highest level of schooling completed at 2006 census for the Fishers Ridge CCD**

The levels of schooling completed within the Fishers Ridge CCD are very similar to the national levels. Figure L4.9 below shows the only significant differences between the Fishers Ridge CCD data and the national data is at a national level more people completed to Year 12 or equivalent compared to the Fishers Ridge CCD and more people did not state their highest level of schooling completed in the Fishers Ridge CCD compared to the national data.



(Source: ABS, 2006c, 2006i)

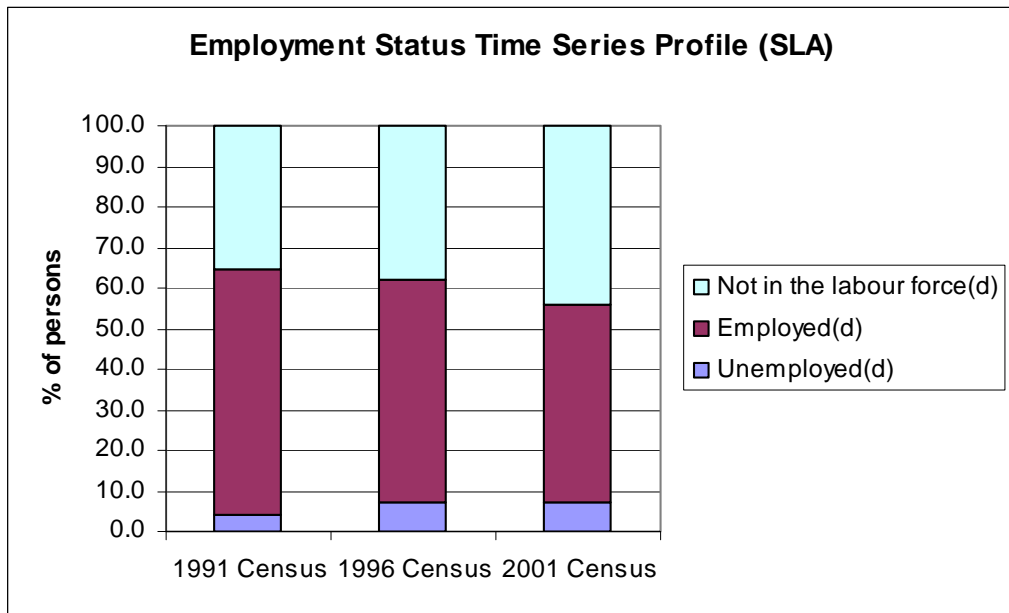
**FIGURE L4.9**  
**Highest level of schooling completed at 2006 census,**  
**Fishers Ridge CCD versus Australia**

#### L4.6.5 Employment

Over the last 10 year Census period from 1991 to 2001, the employment data has shown that the percentage of people 'not in the labour force' was the only status group to show steady growth (refer to Figure L4.10). The percentage of people 'employed' has decreased and the percentage of unemployed increased from 1991 to 1996 and then levelled off in 2001. The employed and unemployed percentages could fluctuate seasonally and therefore should only be taken as an approximate value.

The industries that employ the most number of people in the Fishers Ridge CCD are 'Agriculture, Forestry and Fishing' and 'Education' (refer to Figure L4.11). The number employed in each industry is quite low as the data was taken from the CCD which has a total population of 587. At a more regional level employment opportunities are limited to maintaining community facilities, services and infrastructure within the Barunga community.

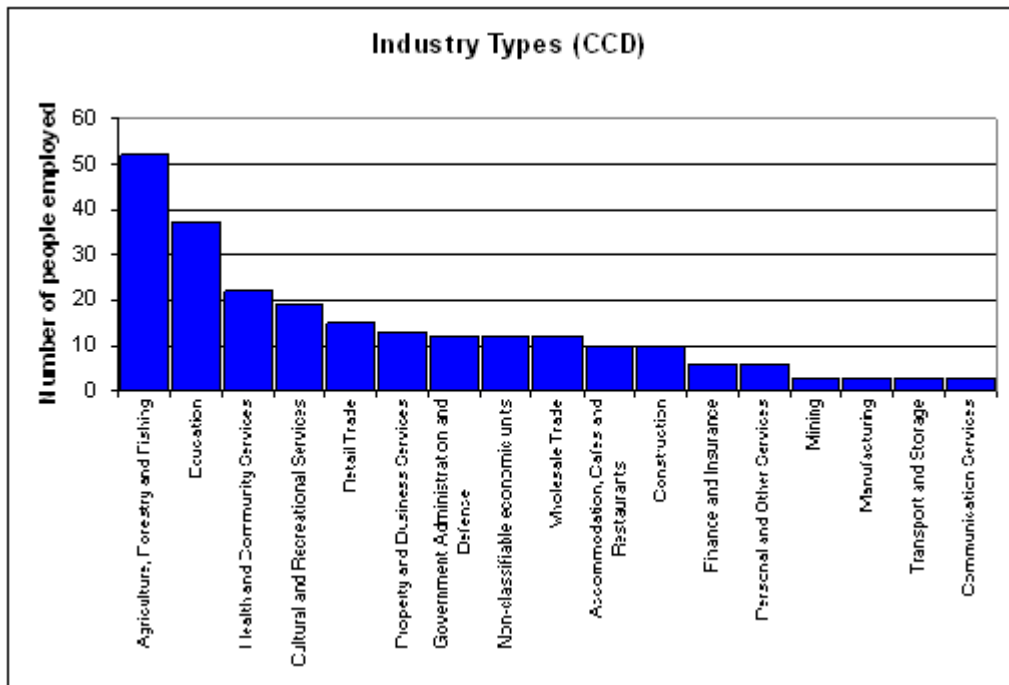
Katherine and its regional communities have a range of facilities comparable with any town of similar size. The main industries include government, administration and banking; trucking and transport; and Regional Centres – shops, supermarkets, car yards and hardware.



NOTE: At the time this report no employment status data was available for the Fishers Ridge SLA from the 2006 Census data.

(Source: ABS, 2003b)

**FIGURE L4.10**  
**Employment status time series profile for Fishers Ridge SLA**



NOTE: At the time this report no employment status data was available for the Fishers Ridge SLA from the 2006 Census data

(Source: ABS, 2003c)

**FIGURE L4.11**  
**Industry types by size for Fishers Ridge CCD**



#### L4.6.6 Demographic summary

While demographic data indicates minimal population growth, it is anticipated that due to climate and therefore improved productivity of the land in the Katherine region, it is likely that population density in the region of the Fishers Ridge site will grow to a greater extent compared to other regions analysed in this study.

### L4.7 Prominence in landscape

The proposed facility, if located at Fishers Ridge, may be visible from Fishers Ridge Road depending on final location within the site however it would not be visible from the Stuart Highway.

Fishers Ridge Road has limited access and does not have high traffic volumes therefore visual impacts would be low. Landscape screening around the facility would assist with minimising visual impacts if required.



## L5. Muckaty Station

---

Muckaty Station, otherwise known as Muckaty Aboriginal Land Trust is Aboriginal Freehold land under the *Aboriginal Land Rights (NT) Act*. This means it is privately owned under a special freehold title. It is inalienable (cannot be bought, acquired or forfeited) and is granted as a communal title.

### L5.1 Site use and tenure

Muckaty Station is Aboriginal Freehold land under a communal title to the Ngapa clan. It is formally held by a land trust (a group of Aboriginal people who hold the title for the benefit of all traditional owners and people with a traditional interest in the land). Part of this land is then leased to Mr Ray Aylett who manages the station from Muckaty homestead located 6 km to the north of the investigation site. The Muckaty residence includes station residence, yards, airstrip and workers accommodation. Muckaty Station is grazed by cattle.

### L5.2 Zoning

Muckaty Station is not within any zoning areas. The nearest municipal boundaries are the Municipality of Tennant Creek (110 km south) and the Community Government Council Elliott District (130 km north).

### L5.3 Surrounding land use

The land surrounding Muckaty Station is owned by a number of different parties as outlined in Figure L5.1.

- to the north of the Station are the small townships of Helen Springs and Renner Springs
- to the south is Karlantijpa North Aboriginal Land Trust which is Aboriginal Freehold land and Banka Banka which is a privately owned pastoral lease
- to the east are privately owned pastoral leases (Helen Springs and Banka Banka)
- to the west is Karlantijpa North Aboriginal Land Trust (Aboriginal Freehold).

### L5.3.1 Infrastructure

There are two main works of infrastructure located on the site (refer Figure L5.2). These are:

- the Alice Springs Darwin Railway line (which runs north to south through Muckaty Station)
- AILERON – Darwin Gas Pipeline (which runs north to south through Muckaty Station).

There are no current or abandoned drilling and/or mining operations within the immediate site vicinity, however there are a number within the region. The closest of these being:

- an unnamed, abandoned mine approximately 76 km south-east of the site
- Whippet Mine, abandoned approximately 80 km south east of the site
- Bootu Creek Mine, a manganese mine to the east of the Stuart Highway and connected to rail siding to the west of Muckaty Station by a 60 km long haul road. The road is used by three-trailer road trains of approximately 120 t to deliver product to the rail head.

### L5.3.2 Airports

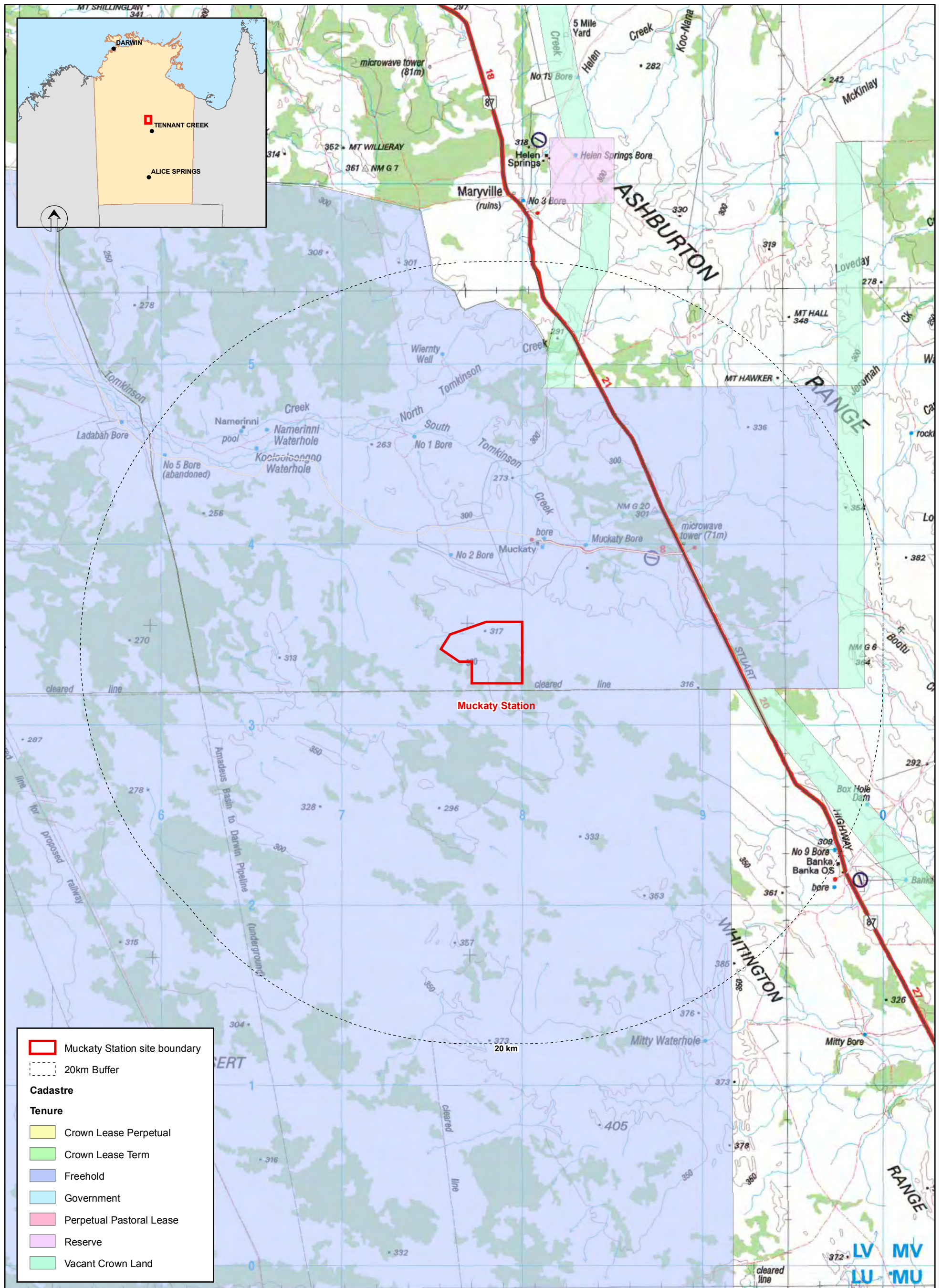
The nearest airport is located approximately 1 km from Tennant Creek and has two runways. There are no current commercial flights however it has facilities for handling minor air freight.

### L5.3.3 Tourism

Tourism across the region focuses on the areas unique location, history, scenery and cultural attributes.

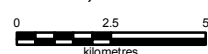
The main tourist attractions of the region are:

- The Battery Hill Mining Centre (1.5 km east of Tennant Creek): Provides Underground and Battery Tours and mineral and history museums.
- The Pebbles (18 km north of Tennant Creek): Unusual granite rock formations. Also a sacred site and women's dancing place for the Munga Munga dreaming.
- Juno Horse Centre (8 km east of Tennant Creek): Bush camping ground.
- The Old Telegraph Station (11 km north of Tennant Creek): Historical site.
- Lake Mary Ann (5 km north of Tennant Creek): Lake used for swimming, sailing, canoeing, fishing and bush walking.
- Nyinkka Nyunyu Arts and Cultural Centre (Tennant Creek): Opened in July 2003 it promotes Aboriginal life, history and the land in the region.
- Renner Springs (approximately 40 km north of Muckaty Station): Now a roadhouse and motel, the area was originally a medical post for workers constructing the Overland Telegraph Line in 1870s.
- Banka Banka Station (Tennant Creek): Was the first operational cattle lease in region and served as an army camp during World War II.



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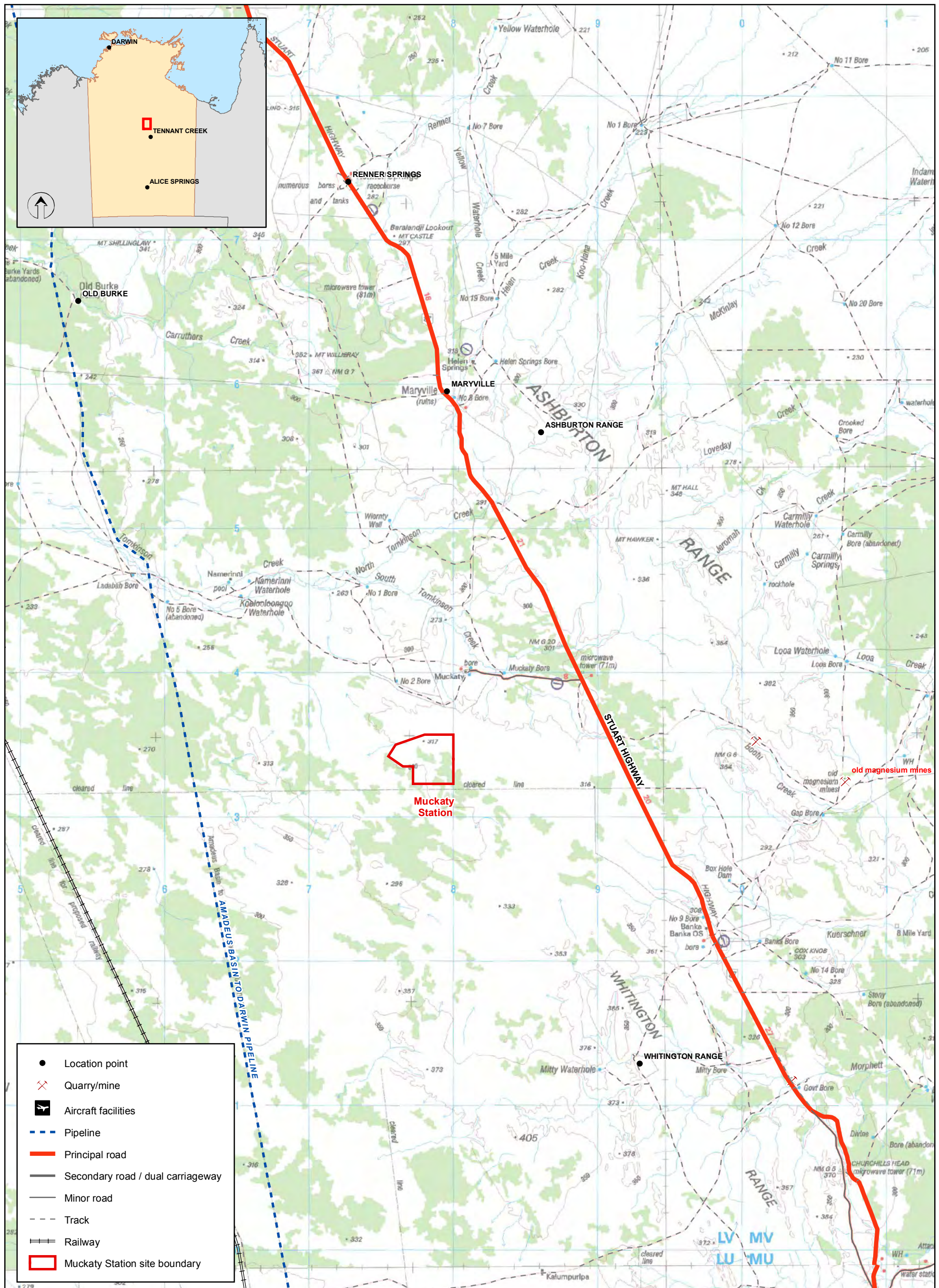
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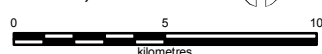
**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Land tenure within 20 kilometres of Muckaty Station  
Figure L5.1



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**Commonwealth Radioactive Waste  
Management Facility Site Characterisation**  
Land use around Muckaty Station  
Figure L5.2

## L5.4 Heritage

A search was conducted on the Australian Heritage Places Inventory database for sites listed on the Register of the National Estate, National Heritage List, Commonwealth Heritage List, World Heritage List and the NT Heritage Register. The closest listings to the Muckaty Station site are listed below. The terms used to search the database were Banka, Banka Banka, Barkly, Helen Springs, Karlantijpa, Muckaty, Muckaty Station, Renner Springs and Tennant Creek. Results were returned for the Tennant Creek search only.

Australian Heritage Places Inventory listings:

1. Tennant Creek Hospital Outpatients Department  
Lot 2068, Tennant Creek, NT  
Identifier: 111  
NT Heritage Register  
The site was completed in 1942 and was used as a military camp.
2. Tennant Creek Hospital Outpatients Department (former)  
53 Schmidt St, Tennant Creek, NT  
Identifier: 18223  
Register of the National Estate  
Same site as above.
3. Tennant Creek Telegraph Station Complex  
Stuart Highway, Tennant Creek  
Identifier: 13878  
Register of the National Estate  
Rare NT telegraph station, virtually intact.
4. Tennant Creek Telegraph Station Heritage Place – OTL Site  
Stuart Highway, Tennant Creek, NT  
Identifier: 103291  
Register of the National Estate  
Part of a series of places associated with construction and operation of Adelaide to Darwin Overland Telegraph Line (OTL).

## L5.5 Surrounding population centres

### L5.5.1 Indigenous

There are six Aboriginal communities within 50 km of the Muckaty Station site (refer to Figure L5.3). They are listed in Table L5.1 below. They are each categorised as Family Outstations which are defined as:

- permanent or semi-permanent residents of up to 20 people
- provides potable water.

**Table L5.1 Aboriginal communities within 50 km of Muckaty Station**

ID Number	Community Name	Alias	Community Type
<b>0 – 5 km</b>			
	None		
<b>5 – 10 km</b>			
1	Muckaty	Marnywungu	Family Outstation
<b>10 – 50 km</b>			
2	Namerinni	Tomkinson Creek	Family Outstation
3	Kumunu	Kunumu	Family Outstation
4	Kalumpurlpa	Akulumpulpa, Blue Bush Bore, Kalampurlpa, Kalumparlpa, Kalumpulpa, Kulumpurlpa	Family Outstation
5	Blue Bush	Bluebush	Family Outstation
6	Pingala	Jurnta, Jungu, Jruntu, Jangu, Jurntu Jungu, Nualidu	Family Outstation

### L5.5.2 Other centres

The nearest non-Indigenous population centre beside Muckaty is Tennant Creek, located approximately 110 km south of the site.

## L5.6 Demographics

### L5.6.1 Data sources

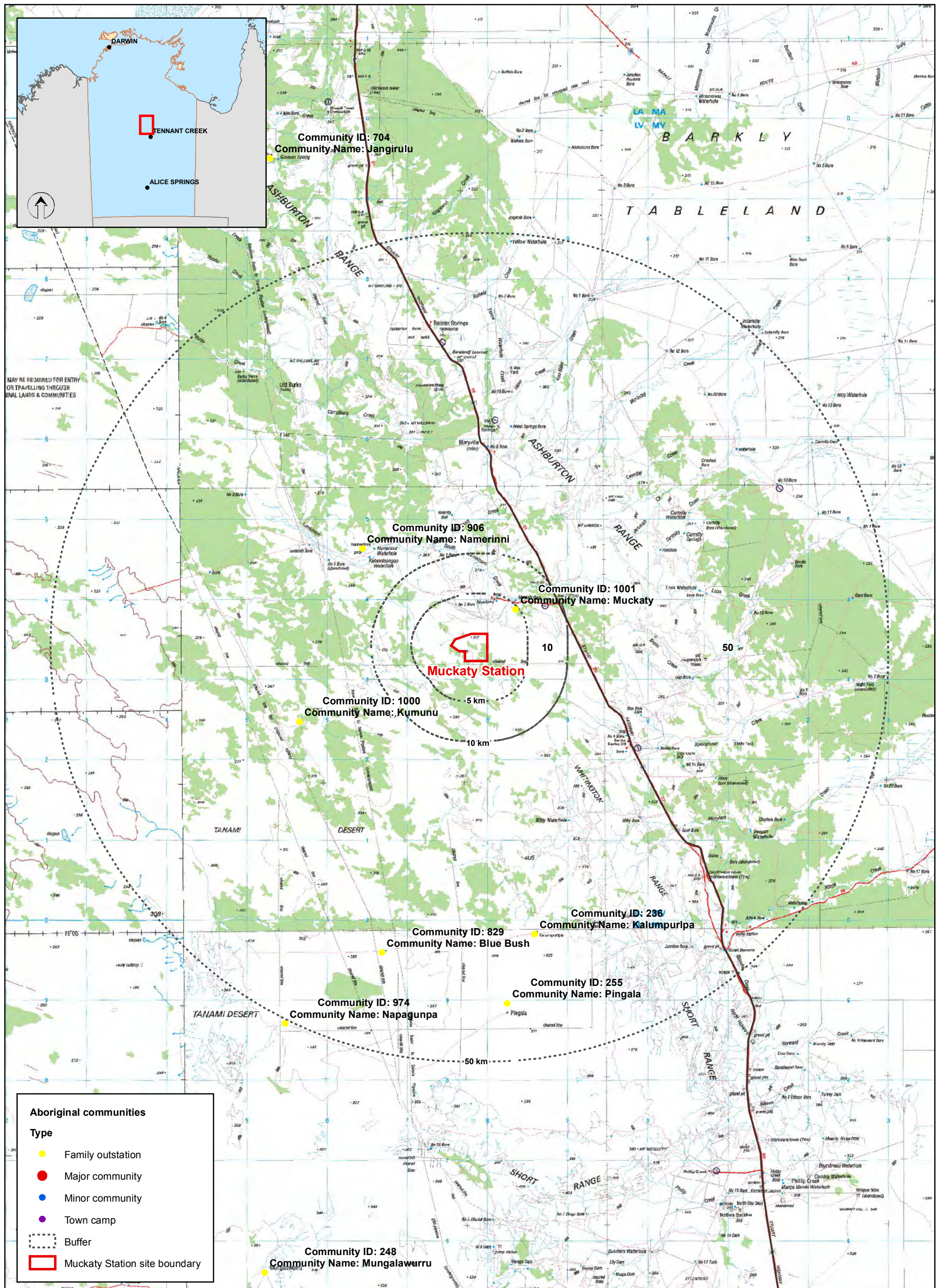
The demographic assessment in this section considers data compiled from the 2001 Australia Census, provided by the Australian Bureau of Statistics (ABS). Specifically the data considers the Tableland 710353409 Statistical Local Area (SLA) and the 7031001 Census Collection District (CCD) which both contain the Muckaty Station site. The ABS Census Collection Districts are the smallest survey areas used in the Australian census and multiple CCD's make up a Statistical Local Area (SLA).

Between the 2001 and 2006 Census dates the ABS boundary for the Tableland SLA changed (refer to Figure L5.4). As a result, the data collected from the Tableland SLA in the 1991, 1996 and 2001 Census' cannot be directly compared to the 2006 Census data. This explains the significant change in results of population figures from the 2001 and 2006 Census data as shown in Figures L5.5 and L5.6 below.

### L5.6.2 General information

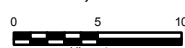
Tennant Creek is the only major town in central Northern Territory. It lies within the Barkly Region which is an area of 240,000 km<sup>2</sup> between the tropical 'Top End' and the arid 'Red Centre' of NT.





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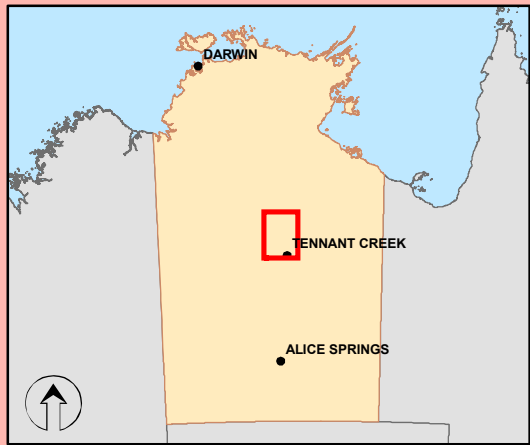
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**Commonwealth Radioactive Waste  
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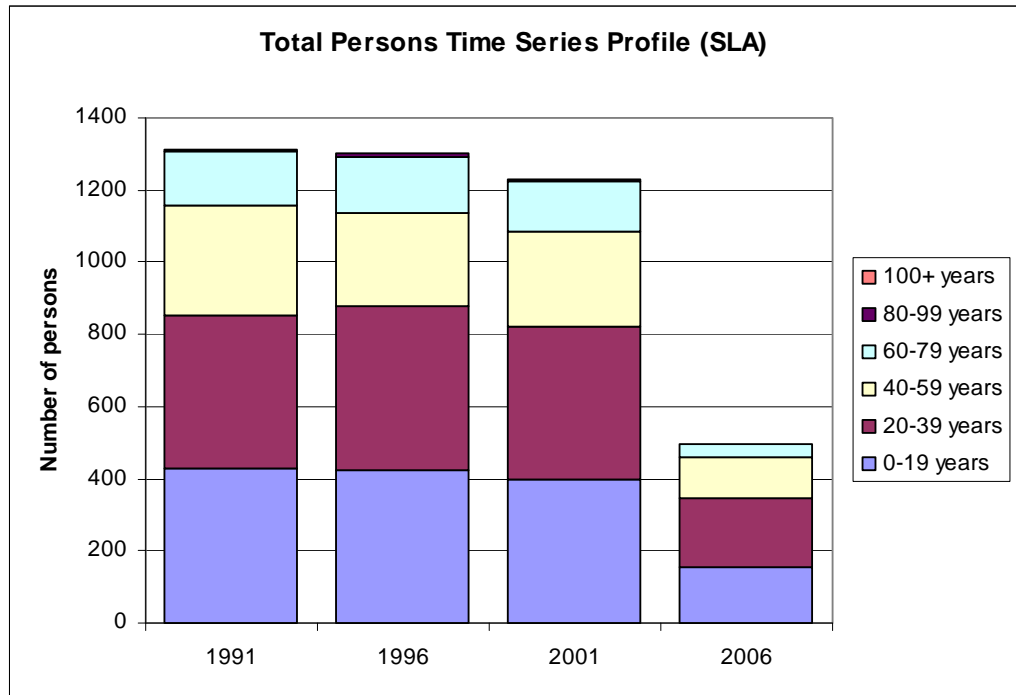
Aboriginal communities  
within 50km of Muckaty Station  
**Figure L5.3**



Muckaty Station

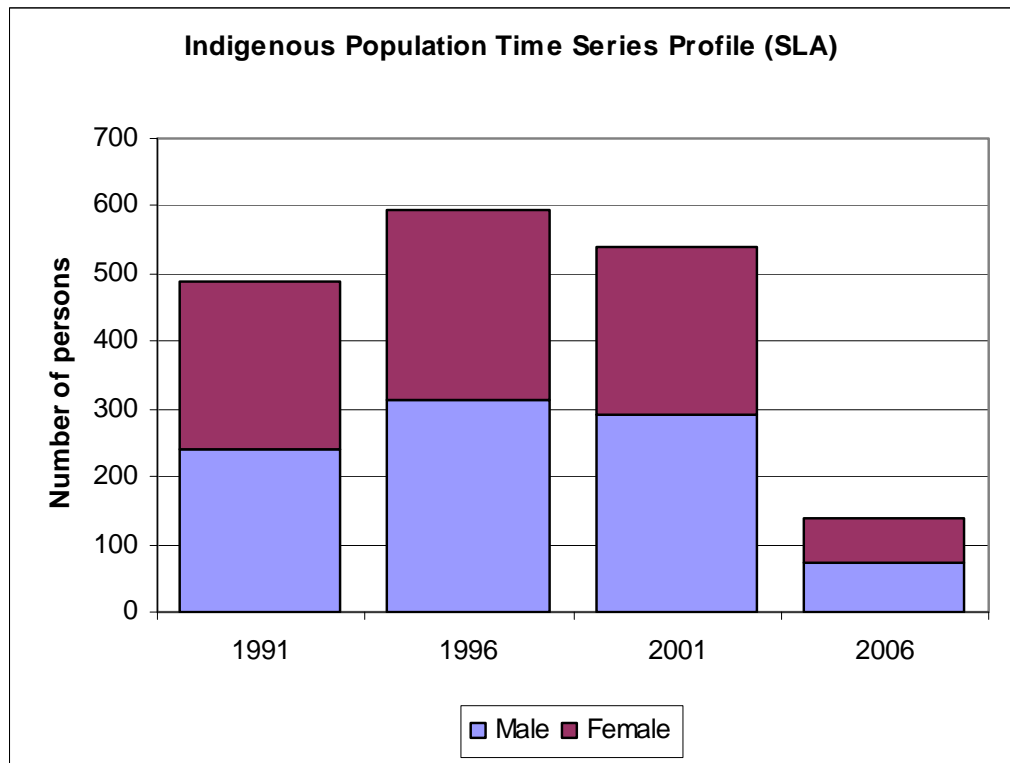
— Road	<b>2006 Census Collection Districts by total population</b>
□ Muckaty Station site boundary	0 - 64
■ Statistical local area	65 - 178
<b>2006 Census Collection Districts by population density (people / sqkm)</b>	179 - 306
○ 0.000000 - 13.895000	307 - 420
○ 13.895001 - 83.458603	421 - 536
○ 83.458604 - 146.171005	537 - 662
○ 146.171006 - 413.721008	663 - 835
○ 413.721009 - 3968.250000	836 - 1097
	1098 - 1645
	1646 - 2527

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			Revision: B      Date: 21/07/2008	
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(ABS, 2003,2006k)

**FIGURE L5.5**  
 Total persons time series profile for Tablelands SLA



(ABS, 2003g, 2006c)

**FIGURE L5.6**  
 Total Indigenous population time series profile for the Tablelands SLA

### L5.6.3 Population

The Australian Bureau of Statistics (ABS) gives population data for the region in total number of persons for each year of age. For analysis purposes the data has been grouped into the following brackets:

- 0–19 years
- 20–39 years
- 40–59 years
- 60–79 years
- 80–99 years
- 100+ years.

The population data for the Tablelands Statistical Local Area shows a steady decline in the total number of persons from the 1991 to 2001 Census (refer to Figure L5.5). In 2006 the total population drops off significantly, however this can be explained by the change in SLA boundary.

The ABS also provides current population data for Indigenous people (refer Figure L5.6). The ABS Indigenous population data for the Muckaty Station SLA (Tablelands) shows an increase in numbers from 1991 to 1996 Census, and then a decrease from 1996 to 2001. As was seen in Figure L5.5 above, there is a significant drop off in the population for the 2006 data due to the change in SLA boundary.

The general growth in Indigenous persons within the Tablelands SLA could be due to a number of factors, one being the improved data collection techniques.

*[T]he growth in the Indigenous population in recent decades can not be explained by natural increase alone. Much of the unexplained growth can be attributed to an increasing prevalence of persons to be identified as Indigenous on census forms. (ABS, 1998)*

The ABS provides three different population projection scenarios for the Northern Territory (refer to Figure L5.7 below). The scenarios project growth through the period of 2004 to 2051. Series B projects continuing population growth throughout the period while Series A assumes higher levels of population growth through higher fertility rates, life expectancy and migration rates. Series C assumes lower levels. As a result, Series A results in larger projected populations by 2051 and Series C results in lower populations.

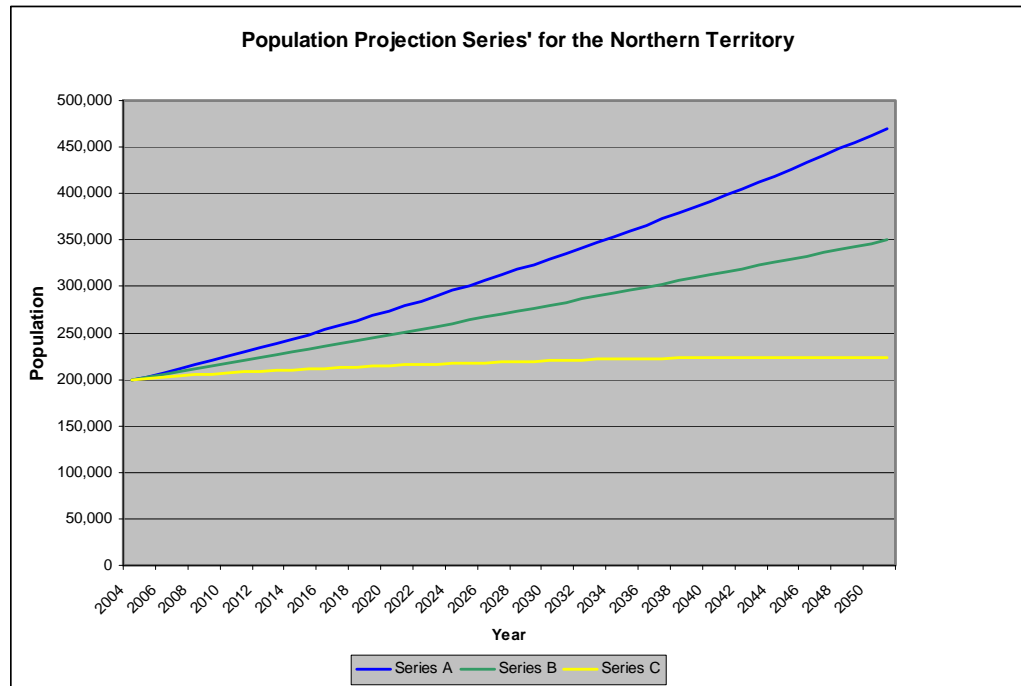
*The Northern Territory's population is projected to increase by 150,200 people between 2004 and 2051 (based on Series B projections) to 350,000 people. Although this is a smaller absolute increase than those projected for the larger states, it is a significant increase (75%, second only to Queensland's projected increase of 77%) relative to the Northern Territory's 2004 population of just under 200,000 people. (ABS, 2006:5)*

While the ABS projections suggest a large population increase in the Northern Territory (Figure L5.7), it is not considered likely that the Muckaty Station site and the immediate surrounding areas will experience much, if any, of this growth. The ABS Populations Projections report (2006) states that:

*“(i)n series B, all capital cities are projected to experience higher percentage growth than their respective balances, resulting in further concentration of Australia's*

*population within the capital cities.....the population of Darwin is expected to exceed that of Hobart in 2048”*  
 (ABS, 2006:5)

It is likely that the majority of the population growth in the Northern Territory will be focussed in Darwin, with some growth possible in Alice Springs and Katherine townships. The regional areas such as Muckaty Station with minimal services and infrastructure are not expected to experience significant growth.



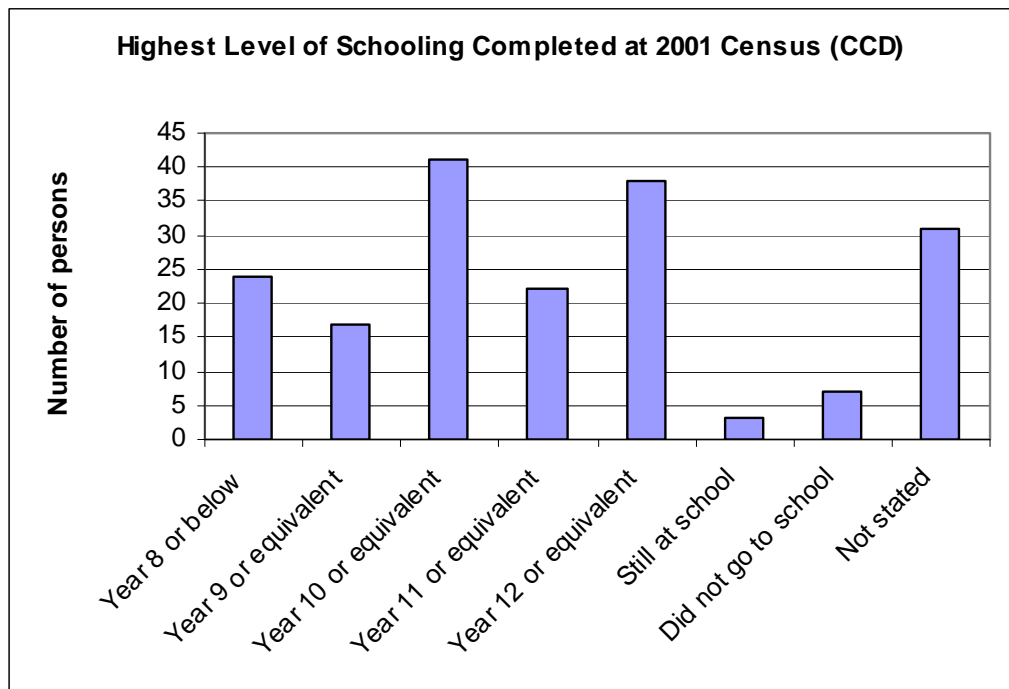
(ABS, 2006b)

**FIGURE L5.7**  
**Total NT population projections (Series A, B and C)**

#### L5.6.4 Education

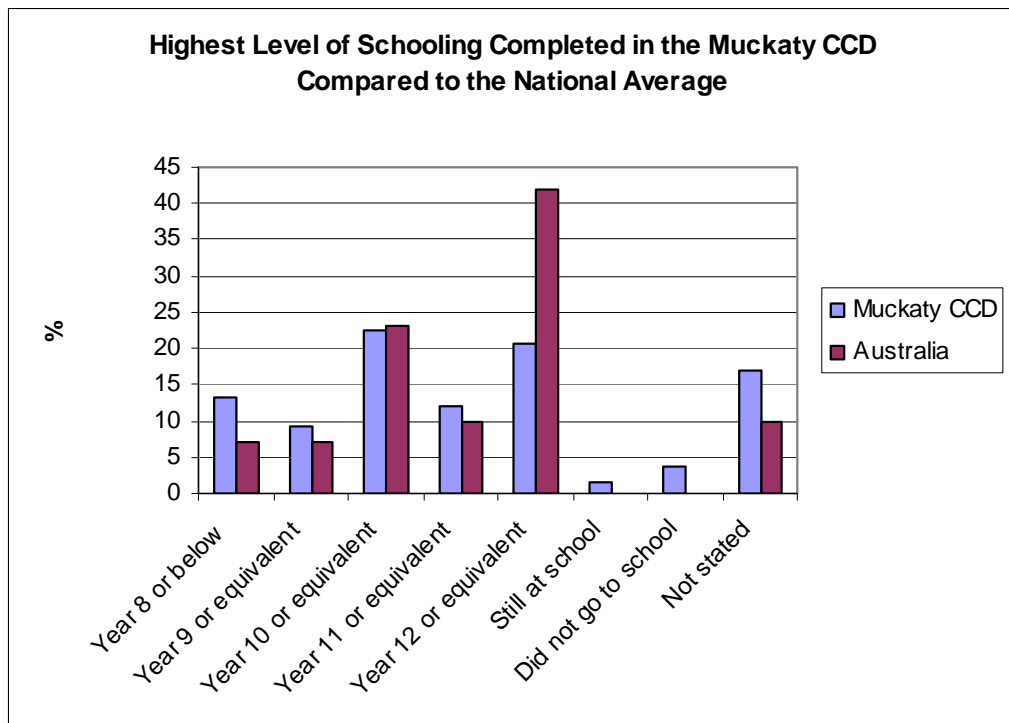
The 2006 Census had a very low population count for this area and as such was not suitable for analysis. The 2001 ABS Census data was used for the analysis of this area as the best available information. The Census data gives detailed information about numbers of people who completed each level of schooling in 2001. The data in this section was taken from the CCD Muckaty Station lies within – 7031001. The data shows that most people either finished school or left after completing year 10 (refer to Figure L5.8).

The levels of schooling completed within the Muckaty Station CCD are similar to the national levels (refer to Figure L5.9 below). The only significant difference is that at a national level 17% more people completed year 12 or equivalent compared to the Muckaty station CCD.



(ABS, 2002e)

**FIGURE L5.8**  
**Highest level of schooling completed at 2001 Census for Muckaty Station CCD**



(ABS, 2002e)

**FIGURE L5.9**  
**Highest level of schooling completed at 2001 Census, Muckaty Station CCD versus Australia**

### L5.6.5 Employment

Gold mining has been a major industry at Tennant Creek since the 1930s. Around Tennant Creek there are new mining prospects to the west (Rover Field), to the east (re-working of tailings from Peko Mine), to the north (Bootu Creek mine has commenced exporting manganese to China) and to the SE (mining of unspecified minerals) (Tennant Creek Town Council, 2007).

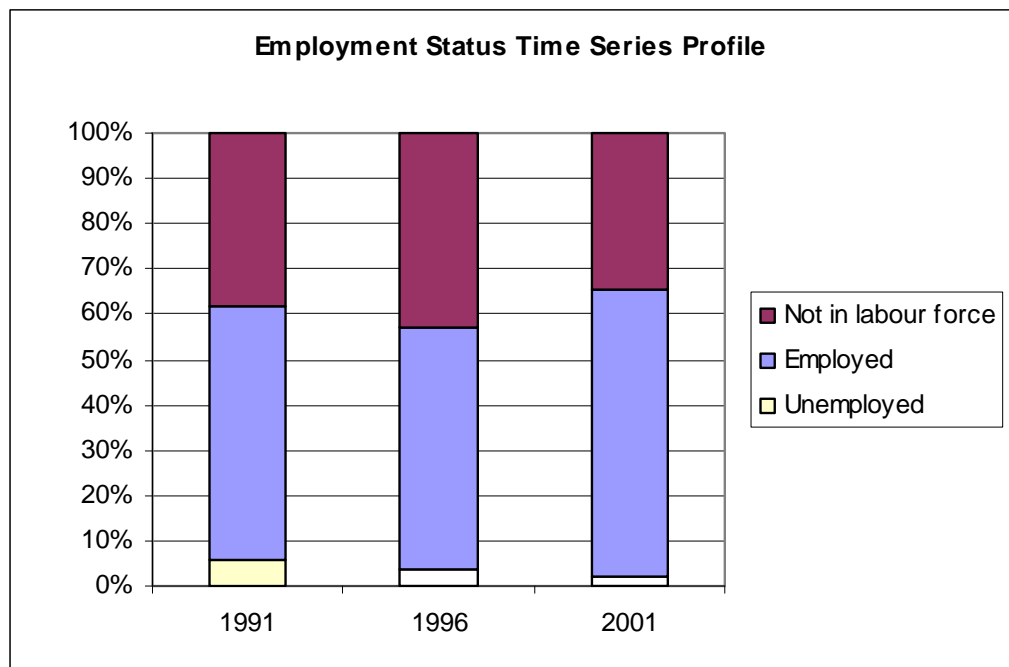
There are scattered cattle properties across the region, mainly stocked with herds of Brahman and Santa Gatrudis Cattle.

Over the 10 year Census period from 1991 to 2001, the employment data has shown that the percentage of people 'employed' has increased, 'unemployed' has decreased and while the percentage 'not in the labour force' fluctuated overall it remained the same (refer Figure L5.10). The 'employed' and 'unemployed' percentages may fluctuate seasonally and are therefore only general trends should be considered, not exact figures.

The industry that employs the most number of people in the Muckaty Station CCD is 'Agriculture, Forestry and Fishing' (refer to Figure L5.11). The number employed by each industry is low as the data was taken from the CCD which has a total population of 247 persons.

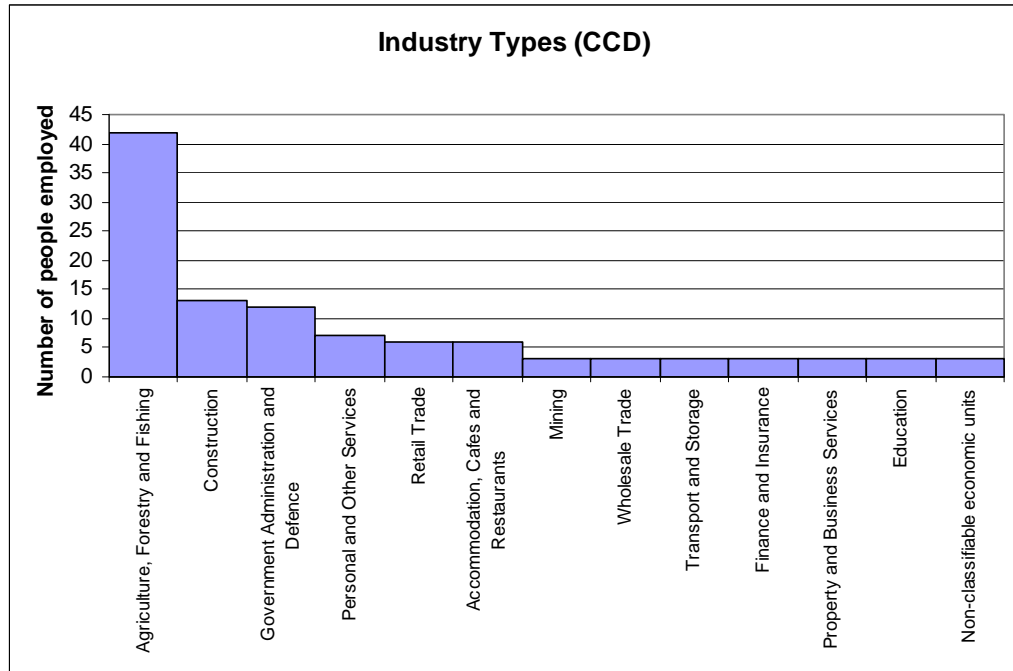
### L5.6.6 Demographic summary

The demographic data analysed in this section suggests there is likely to be minimal to no population growth experienced in and around Muckaty Station. The area has few services and maintained infrastructure and as a result there is limited scope for growth.



(ABS, 2003g)

**FIGURE L5.10**  
**Employment status time series profile for Tablelands SLA**



(ABS, 2002e)

**FIGURE L5.11**  
**Industry types by size for Muckaty Station CCD**

## L5.7 Prominence in landscape

The proposed facility, if located within Muckaty Station, would not be visible from the Stuart Highway.

Muckaty Station has limited access and does not have high traffic volumes therefore visual impacts would be low. Landscape screening around the facility would assist with minimising visual impacts if required.



## L6. Discussion

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The following sections discuss the key factors affecting each site in terms of their suitability when compared with each other. This includes proximity to sensitive areas, surrounding land uses, visibility, economics and land ownership/management.

### L6.1 Proximity

In analysing the suitability of the four sites based on their proximity to areas of interest or sensitivity, factors considered include the nearest permanent residents, nearest Aboriginal communities and nearest permanent major population centre(s).

The Harts Range site has the nearest permanent resident(s) to the proposed facility, being the Defence personnel (including contractors) that live on-site, located approximately 1.5 kilometres from the proposed facility. The next closest dwelling is Alcoota Station located approximately 14 kilometres north of the site.

At Fishers Ridge, there are no dwellings on the Commonwealth land and the nearest permanent residents are the Utley family whose pastoral station adjoins the site to the west. The actual location of their residence is between 5 kilometres to 8 kilometres from the site (depending on the location of the facility).

The nearest place of residence at Mount Everard is the Were-Therre Aboriginal community, located approximately 3 km south-west of the site. However, as the community is classified as a Family Outstation (this is defined as a community having up to 20 semi-permanent residents) it is unknown how permanent the community is at Were-Therre.

At Muckaty Station the nearest permanent resident(s) is located approximately 5 km to the north-east of the investigation area. As with the situation at Mount Everard, this community is classified as a Family Outstation (this is defined as a community having up to 20 semi-permanent residents). The Muckaty residence is also situated about 6 kms to the north of the site.

If the on-site personnel at Harts Range demobilised, then the nearest permanent residents to the four sites would be:

- Mount Everard: Alice Springs (approximately 3 km south-west)
- Fishers Ridge: Utley residence (approximately 5–8 km west)

- Harts Range: Alcoota station (approximately 14 km north)
- Muckaty Station: Muckaty (approximately 5 km to the north-east).

When considering which site is closest to an Aboriginal community (as identified by the Northern Territory government), Mount Everard is the closest. Mount Everard has two family outstations within 5 km of the site (Were-Therre and Mount Twellar). Muckaty Station has one family outstation within 5 km of the site (Muckaty), Fishers Ridge has one Aboriginal community (Banatjarl – family outstation) located 5–10 km from the site and Harts Range's nearest Aboriginal community is the Engawala minor community located approximately 15 km north of that site.

Fishers Ridge is the closest site to a major population centre due to its proximity to Tindal Airbase (which houses Defence families) (approximately 25 km west) and Katherine (approximately 40 km north-west). The nearest major population centre to Harts Range and Mount Everard is Alice Springs with Mount Everard being 25 km north-west of Alice Springs and Harts Range being 200 km north-east of Alice Springs. The nearest major population centre to Muckaty Station is Tennant Creek located approximately 110 km south of the site.

## L6.2 Surrounding land use

The suitability of each site was also analysed based on surrounding land use. This includes regional population density, development potential, zoning and neighbouring uses (including recreational and tourism).

The calculation of the general population density at each site gives a good indication of the nature of surrounding land use and proximity to sensitive receivers. The following figures indicate the population density within each site's Census Collection District. While this may not be truly indicative of the surrounding region, as high density areas would be in their own collection districts, it does give an idea of the regional population around each site.

- Fishers Ridge: 20 km<sup>2</sup>/person
- Mount Everard: 27.8 km<sup>2</sup>/person
- Harts Range: 215 km<sup>2</sup>/person
- Muckaty Station: 352 km<sup>2</sup>/person.

It is logical to assume that Fishers Ridge area would have a higher density population due to its proximity to Tindal Airbase and Katherine. This is supported by the figure above (even though the Collect District excludes Tindal and Katherine) showing that even regionally it is the most populated region. Mount Everard's population density (which excludes Alice Springs itself) is a result of it being closer to Alice Springs and therefore, includes population on the outskirts of the town. Harts Range low population density is due to its remote distance from Alice Springs and its climate not being suitable for intense agriculture. The Muckaty Station population density excludes Tennant Creek.

As stated earlier, in terms of surrounding development potential, urban growth eastwards from Katherine may be limited due to the position of the Tindal RAAF base. However, this is unlikely to limit the growth of irrigation agriculture in this region and there is little to stop the potential expansion of the Tindal RAAF base. As a result Fishers Ridge has the most potential to develop due to its climate being well suited to

agriculture and its proximity to infrastructure and services at Katherine and Tindal. Development of such a facility at Fishers Ridge may pose an impediment to future neighbouring or regional land use development due to the nature of the land and climate. The Fishers Ridge site is also currently used for grazing land which would need to cease if the facility was positioned on this site.

Mount Everard is considered to have some potential to be affected by future development from a planning perspective due to its proximity to existing infrastructure at Alice Springs.

Harts Range has very little potential to be affected by development due to its isolation and desert climate with the exception of possible mining development.

As with Harts Range, Muckaty Station is considered to have very little potential to be affected by development due to its isolation. Given the freehold nature of the land there may be the potential for development to expand in the area e.g. mining however this will be limited by economics and landholder agreements

It is understood that, none of the sites are included within any council or territory zoning boundaries and it is, therefore, unlikely that any development will take place within the regions in the immediate future. In addition, the *Commonwealth Radioactive Waste Management Act 2005* disappplies NT laws at these sites.

### L6.2.1 Recreation

Harts Range as a site currently experiences a relatively high level of recreational activity, generated solely by live-in or on-site Defence families (including contractors). The site is used for a range of activity including walking, bike riding and general recreation by children. This would need to cease or at least be restricted if Harts Range was selected. Naturally if Defence decides to demobilise these families and operated the Harts Range radar facility remotely, the recreational activity will cease.

Fishers Ridge also experiences recreational activities primarily in the form of fishing and potentially camping. It is understood that general public access remote sections of the King River via tracks through the Fishers Ridge site. Development of such a facility at Fishers Ridge will restrict such unauthorised access through the site and therefore impact on general recreational activity.

Mount Everard has no known current recreational activity on site.

Whilst not specifically used for recreational activities, Muckaty Station is Aboriginal Freehold land under a communal title and has heritage significance to the surrounding indigenous communities. Further discussion regarding sites of heritage significance are discussed in Section L6.3 below.

## L6.3 Heritage and tourism

Heritage (both Aboriginal and European), the natural environment and tourism are intrinsically linked in the Northern Territory. The proximity of each site to these features were considered.

### **Aboriginal Heritage**

Assessment of the proximity of each of the sites to places of Aboriginal heritage was not conclusive as indigenous places listed on the Register of the National Estate are not specifically identified. Although sites were detected within the regions at Mount Everard and Harts Range, their exact proximity to the sites could not be determined.

The Aboriginal Areas Protection Authority identified sites near all four investigated sites. For the three original (Department of Defence owned sites), DRET received clearance for work and investigations within the vicinity of these sites.

Clearance for the investigation activities undertaken within Muckaty Station was obtained by DRET as part of the site nomination negotiations with the Northern Land Council and Muckaty Aboriginal Land Trust.

### **European Heritage**

With regard to European Heritage, Fishers Ridge is the closest site with the Cutta Cutta Caves (14 km west) identified as a registered place on the Register of the National Estate and also a major tourism attraction. Leach Lagoon, located 2 km south of the Fishers Ridge site, is listed as an indicative place on the Register of the National Estate.

At Mount Everard, the closest European heritage site is Hamilton Downs Youth Camp (20 km west/south-west), listed as a Registered site on the Register of the National Estate. The Junction Waterhole Area, located 25 km east/south-east of the site, is also a registered place on the Register of the National Estate.

Searches within the Harts Range region found no places of significant European cultural heritage.

## **L6.4 Visibility to public**

The site most visible from a public place is Mount Everard, being positioned adjacent the Tanami Road.

Harts Range is not visible from the Plenty Highway however the site could be visible from the higher elevation of Low Rock, situated near the access road to the site.

Fishers Ridge is not visible being located on a minor access road approximately 5 km off Stuart Highway.

Muckaty Station is not visible from the Stuart Highway.

As part of the Northern Territory Planning Scheme, if a development falls within 500 m of a designated road it will need consent to be built. Whilst approvals for such a facility are dealt with by Commonwealth legislation, regard should be given to intent of the Northern Territory Planning Scheme. The Mount Everard site falls within this 500 m buffer and therefore would be visible. Visual impacts may be minimised through construction of a landscape mound adjacent the Tanami Road recognising that growing screening vegetation is difficult in these arid regions. Harts Range and

Fishers Ridge are not within 500 m of a designated road, however, Harts Range is much closer to a designated road (Plenty Highway) than Fishers Ridge.

## L6.5 Current ownership/operations

Three of the investigated sites (Fishers Ridge, Mount Everard and Harts Range) are currently owned by the Commonwealth Government of Australia and operated by the Department of Defence. There are no differentiating factors between the sites with regard to ownership.

The disruption potential to current site use/operations at each of the Defence sites (from both the construction and operational phases of the CRWMF) are quite different. The highest disruption potential is at Mount Everard due to the operations of the over-the-horizon radar. The second highest potential is at Harts Range due to the staff and their families who live on-site and that the site is currently used for defence operations. The Defence site with the least disruption potential is Fishers Ridge as the site is currently not used for formal Defence operations.

The fourth “volunteer” site is Aboriginal Freehold land under a communal title.



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Bootu Mine [http://www.nt.gov.au/dpifm/MineralsEnergy/Content/File/AMEC2006/Industry\\_Case\\_Study\\_Bootu\\_Creek.ppt#287,1,ASX/20Code:/20OMH%20Website:%20www.omholdingsltd.com](http://www.nt.gov.au/dpifm/MineralsEnergy/Content/File/AMEC2006/Industry_Case_Study_Bootu_Creek.ppt#287,1,ASX/20Code:/20OMH%20Website:%20www.omholdingsltd.com)

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## L8. Statement of limitations

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### **Scope of services**

This environmental site assessment report (“the report”) has been prepared in accordance with the scope of services set out in the contract, or as otherwise agreed, between the Client and Parsons Brinckerhoff (PB) (“scope of services”). In some circumstances the scope of services may have been limited by a range of factors such as time, budget, access and/or site disturbance constraints.

### **Reliance on data**

In preparing the report, PB has relied upon data, surveys, analyses, designs, plans and other information provided by the Client and other individuals and organisations, most of which are referred to in the report (“the data”). Except as otherwise stated in the report, PB has not verified the accuracy or completeness of the data. To the extent that the statements, opinions, facts, information, conclusions and/or recommendations in the report (“conclusions”) are based in whole or part on the data, those conclusions are contingent upon the accuracy and completeness of the data. PB will not be liable in relation to incorrect conclusions should any data, information or condition be incorrect or have been concealed, withheld, misrepresented or otherwise not fully disclosed to PB.

### **Environmental conclusions**

In accordance with the scope of services, PB has relied upon the data and has not conducted any environmental field monitoring or testing in the preparation of the report. The conclusions are based upon the data and visual observations and are therefore merely indicative of the environmental condition of the site at the time of preparing the report, including the presence or otherwise of contaminants or emissions.

Within the limitations imposed by the scope of services, the assessment of the site and preparation of this report have been undertaken and performed in a professional manner, in accordance with generally accepted practices and using a degree of skill and care ordinarily exercised by reputable environmental consultants under similar circumstances. No other warranty, expressed or implied, is made.

### **Report for benefit of client**

The report has been prepared for the benefit of the Client and no other party. PB assumes no responsibility and will not be liable to any other person or organisation for

or in relation to any matter dealt with or conclusions expressed in the report, or for any loss or damage suffered by any other person or organisation arising from matters dealt with or conclusions expressed in the report (including without limitation matters arising from any negligent act or omission of PB or for any loss or damage suffered by any other party in relying upon the matters dealt with or conclusions expressed in the report). Other parties should not rely upon the report or the accuracy or completeness of any conclusions and should make their own enquiries and obtain independent advice in relation to such matters.

#### **Other limitations**

PB will not be liable to update or revise the report to take into account any events, emergent circumstances or facts occurring or becoming apparent after the date of the report.

The scope of services did not include any assessment of the title to nor ownership of the properties, buildings and structures referred to in the report, nor the application or interpretation of laws in the jurisdiction in which those properties, buildings and structures are located.