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1. Introduction

1.1 General

Sinclair Knights Merz has been commissioned by the Department of Transport and Works on behalf of the Northern Territory University to submit a development application and Notice of Intent for construction of a recreational lake, carpark and access road to the University.

The development application is to facilitate issue of a development permit, while the Notice of Intent is to advise the Minister of the proposed development. This document serves both purposes and we anticipate it will be accepted by the Department of Lands, Planning and Environment as a Notice of Intent under the requirements of the Environment Assessment Act.

The project has been called the Northern Territory University's 10th Anniversary Project and will be the final stage of the University's development. The project entails construction of the following:

- ❑ a lake, weir and associated works;
- ❑ an entry road (Ceremonial Drive);
- ❑ a roundabout, two carparks (northwest and southwest) and bicycle track;
- ❑ a vehicle bridge over the lake;
- ❑ landscape works;
- ❑ lighting; and
- ❑ sewer lines and services.

The development at the Casuarina campus covers part of Lots 9260, 8702 (drainage reserve), 8640 Town of Nightcliff, and vacant Crown Land adjoining Lots 9260 and 8640. It is understood that this vacant Crown Land is part of Lot 9375 Town of Nightcliff, which is the Casuarina Coastal Reserve. The reserve which has been allocated over Lot 9375 is Reserve Number 1677.

Development Application forms are attached to this report in **Appendix A**.

1.2 Proposed Timing

Civil construction works of this nature are difficult during the wet season. Work will therefore be planned to commence at the beginning of the dry season. It is anticipated that construction could be completed within five months and therefore within one dry season. An estimate of the time required to design, call and assess tenders and to awards packages is approximately four months. If project management could commence prior to the end of 2000, the works could be completed before the onslaught of the 2001/2002 wet season.

1.3 Proponent

The proponent for this project is:

The Department of Transport and Works – Construction Agency
Highway House
PO Box 61
Palmerston NT 0831

Contact: Dick Norris
Phone: 8999 3474
Facsimile: 8999 4601

2. Land Use Objectives and Control Plan

The Darwin Land Use Structure Plan 1990 is the relevant land use objectives document for the site. The site is identified for community purposes.

The *Darwin Town Plan* 1990 as at 31 May 2000 is the relevant control plan. The lots affected by this proposal are zoned as follows:

❑ Lot 9260 (Northern Territory University)	CP	Community Purposes
❑ Lot 8702 (Vacant Crown Land) Dept Transport & Works drainage reserve area of development – 9200m ²	CP	Community Purposes
❑ Lot 8640 (Darwin City Council) area of development – 11,500m ²	O1	Open Space
❑ Lot 9375 (Vacant Crown Land) Casuarina Coastal Reserve – Reserve 1677 area of development – 15,900m ²	O3	Conservation

Copies of the Certificates of Title for these Lots are attached in **Appendix B**.

The proposed development meets the *Darwin Town Plan* requirements for the existing zones. It infringes minimally on the Casuarina Coastal Reserve but meets the requirements of the plan through improved water quality, natural features and habitat. Maps showing the proposed extent of the development are attached in **Appendix C**.

The development that will infringe on Lot 9375 (the coastal reserve) includes the north-west carpark, a part of the lake and a part of the sewer easement. As a reserve has been placed over Lot 9375 (Reserve No. 1677), it will be necessary to undertake a partial revocation of the reserve to enable any development to occur within this area. The total area of Lot 9375 proposed for development is 15,900m².

There is also a part of Lot 9375 adjoining Lot 8640 (which belongs to the Darwin City Council) which is currently zoned O1 (Open Space).

It will be necessary to rezone this land to CP (Community Purpose) and to then subdivide and consolidate this with the adjoining University land (Lot 9260). The total area requiring subdivision and consolidation is 27,400 m².

Lot 8702 is Government land which has been set aside to the Department of Transport and Works. This land represents part of a drainage easement which runs through the University. Approximately 9,200m² of this drainage reserve will be required for construction of the lake. No rezoning or subdivision of this land is required.

3. Other Planning Considerations

3.1 Environmental

3.1.1 Water Quality

A concrete lined drain currently exists in the location of the proposed lake. A stormwater network that services Casuarina, Nakara, Wanguri, Wagaman and a part of Woodleigh Gardens feeds the drain. The drain runs approximately east-west and outlets into Rapid Creek.

The design of the lake will be based on a weir across the existing stormwater drain, retaining the lake water level at RL 3.0 AHD. Seawater from Rapid Creek will regularly flow into the lake on high tides. This will raise the water level temporarily to between RL 3.0 and RL 4.0 AHD, recharging the lake water. The lake will be approximately 350m long and have an average width of 47m. The average depth will be 1.6m and it is anticipated that it will hold 28,000m³ of water.

The lake will receive inflow of sea-water from Rapid Creek during high tides and fresh water from the stormwater drain. Tidal inflow varies with every tide cycle. A review of tidal prediction data for Darwin Harbour for 1999 indicates the sea water recharge of the lake will occur at an average of 10 times a month. It is also calculated that the inflow will replace 50% of the lake water each tide cycle.

The lake will also be fed by stormwater from neighbouring suburbs. Stormwater recharge is seasonally dependant (wet and dry seasons). Flows during the dry months of the year will be almost zero. The flow that does occur will originate from garden irrigation and domestic activities, such as car washing etc., and could potentially be high in hydrocarbons, heavy metals, pesticides and nutrients. During the dry season, seawater will dominate, as stormwater flows will be negligible.

During the wet season, stormwater flows will dominate the recharging of the lake water, with minor storm events (1 in 2 years) expected to generate flows of 50m³/s and major storm events (1 in 100 years) generating around 160m³/s.

There are no water quality data available for the lower reaches of Rapid creek. The upper reaches of the catchment for the stormwater drain remain relatively undeveloped. Potential sources of pollution are restricted to urban and agricultural stormwater. The primary pollutants are likely to be nutrients (from fertilisers and animal wastes) and chemicals, including pesticides, herbicides, low concentrations of oils, greases and hydrocarbons from paved areas. Manure and other animal wastes could lead to eutrophication and/or bacterial contamination of the lake if tidal flushing is insufficient. As the catchment is not in a rural zone, this contamination should be low.

The drainage system is designed so that run-off from a minor storm is carried underground, while run-off from a major storm is carried

aboveground. Hence, flows from major storm events will be expected to have a high turbidity and heavy sediment load. There is also the potential for large quantities of litter to be carried by the stormwater. Gross pollution traps will be constructed at the stormwater inlet to the lake to remove litter and sediments from the stormwater. These currently discharge into Rapid Creek. This practice should provide a cleaner environment in the Rapid Creek conservation area. Nutrient, chemical and bacterial pollution will be removed by tidal and stormwater flushing of the lake.

3.1.2 Mosquitos

The concept of the lake, weir and associated works is to provide an aesthetically pleasing precinct for passive recreation. The development has been designed to ensure that the lake does not provide a habitat for mosquito breeding and that the environmental integrity of Rapid Creek is not compromised.

Hard edging to the lake provides a surface that will not promote mosquito breeding. The lake has also been designed so that stagnant isolated pools are not formed, thereby preventing mosquito breeding areas being created.

3.1.3 Coffee Bush

Large stands of the introduced plant 'Coffee Bush' presently flank the existing concrete lined drain. These plants out compete the native species and are dominant in the area. The development requires the removal of the introduced coffee bush stands along the existing drain and provides a larger habitat for native water birds and other aquatic life. The removal of Coffee Bush and revegetation below the weir will improve the conservation value of the area.

3.2 Merits of Development

The proposed lake development and the associated landscaping will be an aesthetically pleasing enhancement to the University grounds, providing a high quality passive recreational facility for the enjoyment of University students, staff and the wider community.

Ceremonial Drive will provide greater access to the University grounds, connecting to the internal ring road and relieving congestion at the Ellengowan Drive accesses. A carpark, with capacity for 158 cars, will enable easy access to the lake and the southern side of the University.

3.3 Physical Characteristics and Suitability for the Proposed Development

The site of the lake is dominated by the existing concrete lined drain that runs from the stormwater outlet to Rapid Creek and generally separates the main University campus from the Alawa recreational reserve.

The drain changes to an open drain approximately 200m downstream from the culvert headwall. Coffee bush chokes both sides of the drain from the first footbridge down to the mangrove fringe. The area is generally

unattractive and inaccessible due to the coffee bush infestation and rubbish dumping .

Water levels in the drain are under tidal influence, making the site ideal for a salt water lake that is flushed by the tidal cycle. No works will be required downstream of the weir as the existing open drain is sufficient for the purpose of the development.

3.4 Public Facilities

The development will open up an area that is presently inaccessible, creating additional open space and providing a passive recreation facility for the University and the wider community. Pedestrian and bicycle access will be provided, along with increased carparking facilities. Public toilets are already available in the Alawa Recreational Reserve and in the University grounds.

3.5 Public Utilities and Other Infrastructure

The lake, roads, stormwater drains, carparking and associated environmental protection measures will be constructed to the requirements of Darwin City Council and the Department of Transport and Works.

Proposed re routing of the existing sewerage system and the installation of street and effect lighting will be undertaken to the requirements of the Power and Water Authority.

3.6 Potential Impact on Existing and Future Amenity of the Area

The proposed development will provide a link between the University and the Alawa Recreational Reserve. This will increase the open space available, enhance the aesthetics and allow for possible combined use of both areas, thereby resulting in a positive impact on the surrounding suburbs.

Removal of litter and other pollutants from the stormwater system before reaching Rapid Creek, removal of Coffee Bush and an increased habitat for aquatic wildlife will also provide a positive environmental impact on the area.

The impact of an additional access from the University to Lakeside Drive is considered minimal, with little effect on traffic flows in Lakeside Drive. This is also offset through the closing of the existing access to Lakeside Drive, decreased congestion at the Lakeside Drive/Dripstone Rd roundabout, Dripstone Rd/Ellengowan Drive roundabout and the existing access on Ellengowan Drive.

3.7 Public Interest

The proposed lake and Ceremonial Drive are designed primarily to enhance the aesthetics, recreational facilities and access for University students and

staff. It will also serve the wider community through provision of a passive recreation facility and aesthetic enhancement of the suburb of Alawa.

3.8 Open Space

The proposed development increases the useable open space available for recreational use for both the University and the local community.

4. Conclusions and Recommendations

The proposed lake and landscaped area creates a passive recreation precinct within the university which complies with the *Darwin Town Plan* guidelines for Open Space and Community Purpose zones.

The natural environment of Rapid Creek conservation zone is enhanced through the removal and revegetation of coffee bush stands and the removal of litter and gross pollutants from the stormwater system.

Ceremonial Drive increases access to the University, simplifies traffic flows within the university grounds and has negligible effect on traffic flows on Lakeside Drive.

It is recommended that the Planning Authority support the proposed development. It will provide a valuable recreational facility for both the Northern Territory University and wider community, enhance the aesthetic qualities of the area while protecting the Rapid Creek Conservation zone.

Appendix A Development Application Forms

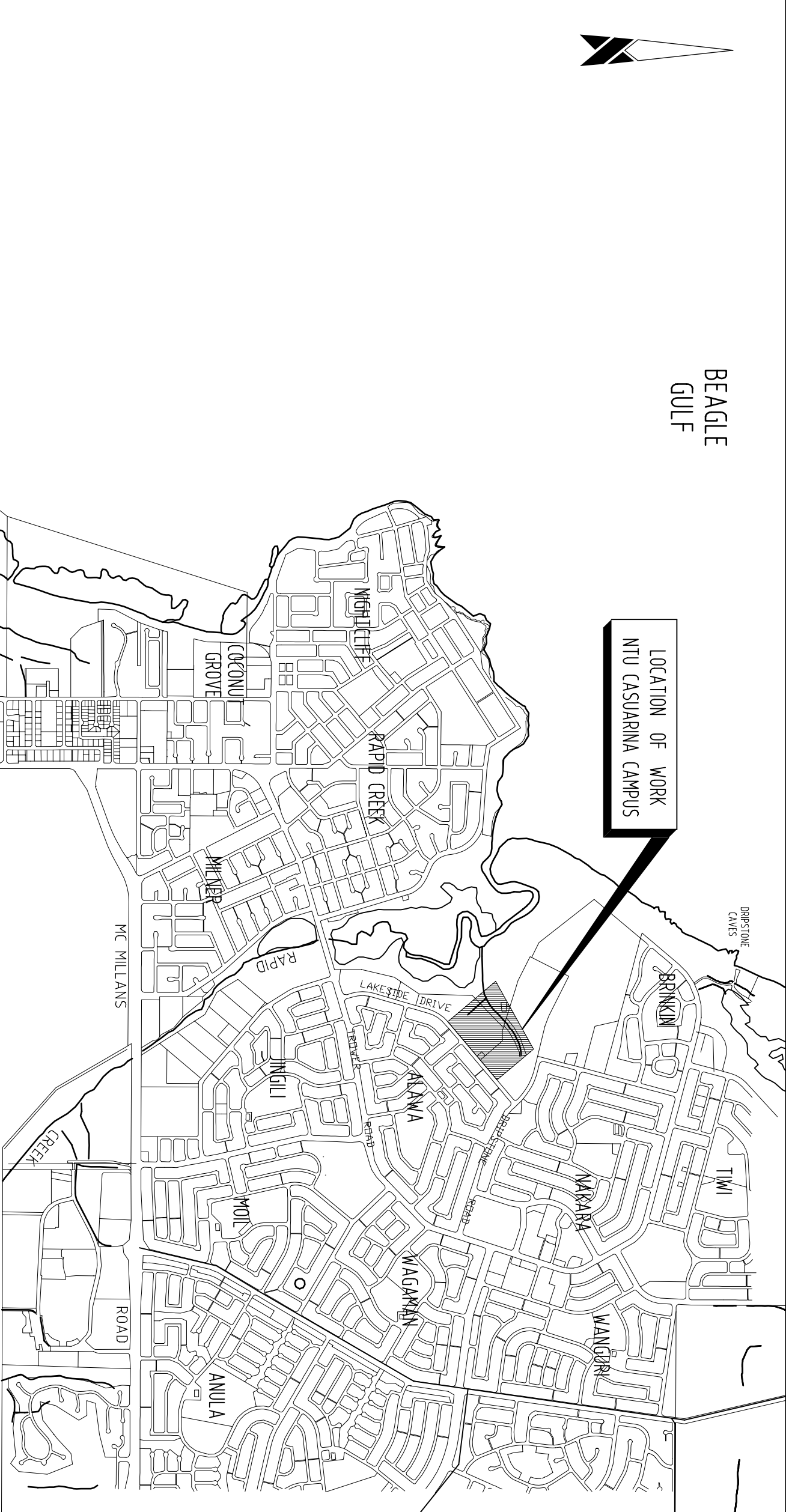
Appendix B Certificates of Title

Appendix C Figures



BEAGLE GULF

LOCATION OF WORK
NTU CASUARINA CAMPUS



A	AUGUST 2000	ORIGINAL ISSUE
NO.	DATE	DESCRIPTION
AMENDMENTS		

SINCLAIR KNIGHT MERZ

Incorporating
SLEEMAN DUNKLEY TREACY



A.C.N. No 001 024 095

DESIGNED	S.B	CHECKED
DRAWN	B.S	CHECKED
APPROVED		
ASSOCIATION		

CLIENT



NORTHERN TERRITORY
UNIVERSITY

PROJECT

CASUARINA CAMPUS
PROPOSED LAKE AND
CEREMONIAL DRIVE

DRAWING TITLE

FIGURE 1
LOCALITY PLAN

REAL SIZE		0	10	20	30	40	50	60	70mm
AS SHOWN		SHEET		1	of	5	SKM REF.		DR04631
DRAWING NO.				REV.					
4631-SK01								A	

