Yirrkala
Review of Water Supply
Source Options

Report No. 45/2002D
P Jolly
Palmerston NT
November 2002
Yirrkala - Review of Water Supply Source Options

In response to a query by the Power Water Corporation regarding water supply development options for Yirrkala, a review of relevant data held by the Natural Systems Division of DIPE was undertaken.

The community water supply was sourced solely from Yirrkala Lagoon until 1996. Ongoing bacteriological problems with water sourced from Yirrkala Lagoon led to the construction of production bore RN30257 in 1995. The Yirrkala Lagoon source is currently being utilised as an irrigation water supply source and as a standby water supply source.

Yirrkala has a population of about 890. The mean daily water supply requirement, based on 800 litres per person per day, would be about 712kL. The peak daily water supply requirement, based on 1200 litres per person per day, would be about 1068 kL. Assuming the peak day demand will be delivered in 20 hours the borefield should be capable of supplying about 15 L/s.

Production bore RN30257 is capable of supplying approximately 30 L/s. The requirement, therefore, is for a standby bore capable of supplying at least 15 L/s. The standby bore should be located about 100 metres from the existing bore and constructed similar to it.

The recommended work at Yirrkala is a review of the performance of the existing production bore and the groundwater resource the production bore extracts water from and the construction of a new production bore.

The following work is required:
- Review of existing data and a reconnaissance visit to site.
- Hydrogeological assessment of existing data.
- Construction of new production bore
- Test Pumping of production bore.
- Hydrogeological analysis of data.
- Recommendations regarding pump rate and pump setting.
- Detailed reporting of all work undertaken and recommendations regarding future source development.

The estimated cost of this Division undertaking the work required for Yirrkala is $100,000. A more detailed estimate can be provided after a decision is made to proceed with the work.
Bore Completion Report
RN 30256 - 30258
YIRRKALA

I Matthews
Hydrogeologist
Water Resources Division
Darwin NT
January 1996
Report 57/95D
POlY~R
WATER
WATER
RESOURCES DIVISION
AUTHORITY
TEST REPORT — BORE RN. 30257

Bore Location: Yirrkala
Map: GOVE 1:100,000 Sheet: 6273.
Grid Reference: 056 - 427.

Client: AES.
Purpose: Domestic.

********************************************************************************
RECOMMENDATION: Pumping Rate: 30 L/s. Pump Setting: 70 m.
For alternative pumping rates or settings contact: Water Resources.
General recommendations are on the reverse side.
In all correspondence please quote bore RN 30257.
********************************************************************************

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For alternative pumping rates or settings contact: Water Resources.
General recommendations are on the reverse side.
In all correspondence please quote bore RN 30257.

BORE DATA:

Finished depth: 93.2 m. Completion Date: 20.11.95.
Standing Water Level: 24.79 m on 4.12.95.
Test Date: 10.01.96.
Test Rates: up to 30 L/s.
Test Duration: 24 hrs.

Construction Details:

<table>
<thead>
<tr>
<th>Interval</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 - 13.0 m</td>
<td>254 mm ID steel casing.</td>
</tr>
<tr>
<td>0 - 85.0 m</td>
<td>192 mm ID AES casing.</td>
</tr>
<tr>
<td>84.0 - 85.0 m</td>
<td>160 mm stainless steel liner</td>
</tr>
<tr>
<td>85.0 - 91.2 m</td>
<td>154 mm ID stainless steel screens, 1 mm apertures.</td>
</tr>
<tr>
<td>91.2 - 93.2 m</td>
<td>160 mm ID stainless steel sump.</td>
</tr>
</tbody>
</table>

Notes:
1. Top of casing as constructed was 0.35 m above ground.
2. All depths are measured from natural ground level.
3. Test rates are not necessarily indicative of a sustainable yield for production pumping.

WARNING: MINIMUM INTERNAL BORE DIAMETER IS 154 mm.
MINIMUM INTERNAL BORE DIAMETER TO RECOMMENDED PUMP SETTING IS 190 mm.

********************************************************************************
COMMENTS:

1. The above recommendations are based on a constant rate test for 24 hours at 15 L/s and a step test up to 30 L/s and assume that hydrological conditions remain constant.
2. Provision to monitor water levels and obtain water samples while pumping should be incorporated when equipping this bore.
3. This bore will produce a small amount of fine sand at recommended rate which may dissipate with long term pumping.
4. Water quality analysis indicates a corrosive nature due to low pH and TDS which will affect pumping equipment and reticulation fittings of a ferrous composition.

********************************************************************************
WATER ANALYSIS: 95/96/0801
Prepared by: P.Rees
15.1.96
Checked by: B.Thatcher
6.02.96

Appendix 10
<table>
<thead>
<tr>
<th>DEPTH (m)</th>
<th>BORE CONSTRUCTION LOG</th>
<th>STRATA DESCRIPTION</th>
<th>AQUIFERS (WATER STRUCK)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>CEMENT</td>
<td>Very hard, red/brown BAUXITE.</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>25mm ID STEEL CASING</td>
<td>Soft, yellow, red, and white minor sandy CLAY. Sand is clear to opaque, fine to coarse grained and subangular.</td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>9.1mm ID ABS CASING</td>
<td>Soft white brown and minor purple sandy CLAY.</td>
<td></td>
</tr>
<tr>
<td>30</td>
<td>25mm ID STEEL CASING</td>
<td>Firm white and minor pink CLAY.</td>
<td></td>
</tr>
<tr>
<td>40</td>
<td>25mm ID STEEL CASING</td>
<td>White and purple sandy CLAY.</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>25mm ID STEEL CASING</td>
<td>Firm, white and minor pink plastic CLAY.</td>
<td></td>
</tr>
<tr>
<td>60</td>
<td>25mm ID STEEL CASING</td>
<td>Heavily layered white, pink, and minor yellow/brown CLAY, sandy CLAY and clayey SAND.</td>
<td></td>
</tr>
<tr>
<td>70</td>
<td>25mm CRUSHED STAINLESS STEEL CASING / SOIL SUBGRADE</td>
<td>White and pink, slightly clayey SAND</td>
<td></td>
</tr>
<tr>
<td>80</td>
<td>25mm CRUSHED STAINLESS STEEL CASING / SOIL SUBGRADE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90</td>
<td>25mm CRUSHED STAINLESS STEEL CASING / SOIL SUBGRADE</td>
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<td></td>
</tr>
<tr>
<td>100</td>
<td>25mm CRUSHED STAINLESS STEEL CASING / SOIL SUBGRADE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>110</td>
<td>25mm CRUSHED STAINLESS STEEL CASING / SOIL SUBGRADE</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

COMPOSITE LOG OF BORE 30257

Appendix 3
WATER RESOURCES.

WATER CHEMISTRY LABORATORY

Date Received in Lab: 13 - 12 - 95

Date Sampled: 05 - 01 - 95

Sampled:

Field Temp: 21.1

Field pH: 6.9

pH: 5.3

Electrical conductivity (mS/m at 25°C): 50

Total dissolved solids (mg L⁻¹, dried at 105°C): 65

Sodium, Na: 6

Chloride, Cl⁻: 11

Potassium, K: 1

Sulphate, SO₄²⁻: 2

Calcium, Ca: 1

Nitrate, NO₃⁻: <1

Magnesium, Mg²⁺: 1

Bicarbonate, HCO₃⁻: 6

Iron, (total) Fe: 0.2

Carbonate, CO₃²⁻: 0

Total Hardness (as CaCO₃) Calculation: 7

Hydroxide, OH⁻: 0

Total Hardness (as CaCO₃) Titratin: 5

Fluoride, F⁻: <0.1

Total Alkalinity (as CaCO₃): 12

Dissolved Oxygen: 18

Silica, SiO₂: 12

Dissolved Oxygen: 18

This report relates specifically to the “sample tested as received”.


Boxes marked thus indicate:

DENOTES UNSUITABLE FOR ANALYSIS

DENOTES INSUFFICIENT SAMPLE

DENOTES FILTRATE ANALYSIS

DENOTES TOTAL ANALYSIS

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