

POWER AND WATER AUTHORITY
REPORT NO 78/91D

Bore Completion Report
BORE 27298
KUMUNU OUTSTATION

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Darwin
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LIST OF ABBREVIATIONS

AMG	-	Australian Map Grid
°C	-	degree Celsius
ID	-	internal diameter
km	-	kilometre
L/s	-	litre per second
L/c/d	-	litre per capita per day
m	-	metre
mm	-	millimetre
m ³ /d	-	cubic metres per day
mg/L	-	milligram per litre
pH	-	acidity and alkalinity index
SWL	-	standing water level

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1. INTRODUCTION

Kumunu is a proposed Aboriginal outstation on the eastern edge of the Tanami Desert, and approximately 40km west of Banka Banka Homestead. Water Resources Division of the Power and Water Authority was approached by Aboriginal Essential Services to construct a potable groundwater supply for the outstation. The aim was to construct one bore with a minimum potable supply of 1 L/s. This would provide water for a population in excess of 40 people.

Access is via a rough formed road which strikes west from the Morphett Creek crossing on the Stuart Highway. At 20km beyond Kalampulpa Outstation, the route turns north-northwest and follows the line cleared for the proposed railway line for 31km. The region is covered by the 1:250,000 scale Topographic Map Helen Springs (AMG Grid Reference 356800 - 7924700).

The proposed site is on a sandstone/siltstone ridge which rises from sparsely vegetated sand plains. The sand is largely colluvial, but reworked by wind action. The climate is monsoonal with a wet season from December to March, but early storms and occasional winter rains occur. Mean annual rainfall is about 500mm with an average pan evaporation of 3800mm.

An initial desktop study was undertaken in April 1991. Bore sites were pegged and access checked in May 1991. Following sacred site clearance, drilling and pump testing were undertaken in June and July of the same year.

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2. HYDROGEOLOGY

The region is covered by the 1:250,000 scale Geological Series Map Helen Springs (Sheet SE53-10).

Kumunu is sited on an upstanding ridge of Carpentarian Tomkinson Creek Beds. These beds consist of medium to very fine grained quartz sandstone with mudcasts and occasional calcareous siltstone beds. They compose the basement for the Wiso Basin in this area and extend as a basement ridge into the central part of the basin. The sediments are intensely folded and faulted with a general north-northwest trend.

Aquifer potential of the Carpentarian sediments is poor and unsuccessful bores are common. However, aquifers occur where fracturing of sandstone beds through faulting, or leaching of carbonate rocks, has taken place. Bore 20816, beside Tomkinson Creek, encountered 2 L/s of potable water in fractured sandstone between 33 and 35m. Bore 26497, drilled in Tomkinson Creek Beds at Powell Creek (near Gleeson Springs) encountered 1 L/s of potable water between 26.5 and 28m in a leached calcareous siltstone bed within sandstones. Water from within the siltstones has commonly shown turbidity when pumped hard.

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3. RESULTS

Bore 27298 was drilled to a total depth of 52.1m and encountered 1.5 L/s of potable water in a leached calcareous siltstone bed between 40 and 46m. The siltstone was overlain by interbeds of sandstone and siltstone/mudstone that comprise the Tomkinson Creek Beds. The bore was constructed with steel casing slotted adjacent to the aquifer zone (see Attachments). Initial turbidity encountered in this bore declined during extensive development, but may occur temporarily on start-up.

Two investigation bores, RN 27296 and RN 27297, were drilled to 120m and 70m respectively. Seepage supply (conductivity 550 $\mu\text{S}/\text{cm}^2$) was obtained at 68m in RN 27296, but RN 27297 was dry. The two bores were considered unsuccessful and backfilled.

Water quality results from a sample taken during pump testing are included in Table 1. This bore yielded water with significant bicarbonate and sodium chloride content. The bicarbonate may be derived from the calcareous siltstone aquifer and sodium chloride indicates a moderate length flow path. The water is non-corrosive and within potable limits (AWRC and NHMRC, 1987).

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4. RECOMMENDATIONS

It is recommended that :

- a pump setting of 38m and a pumping rate not in excess of 1.5 L/s be adopted at RN 27298;
- a silt trap should be included in the reticulation;
- absorption trenches and septic tanks should not be constructed within 100m radius of the bore;
- further recommendations for bore equipping are included in the Test Report (see Attachments).

REFERENCES

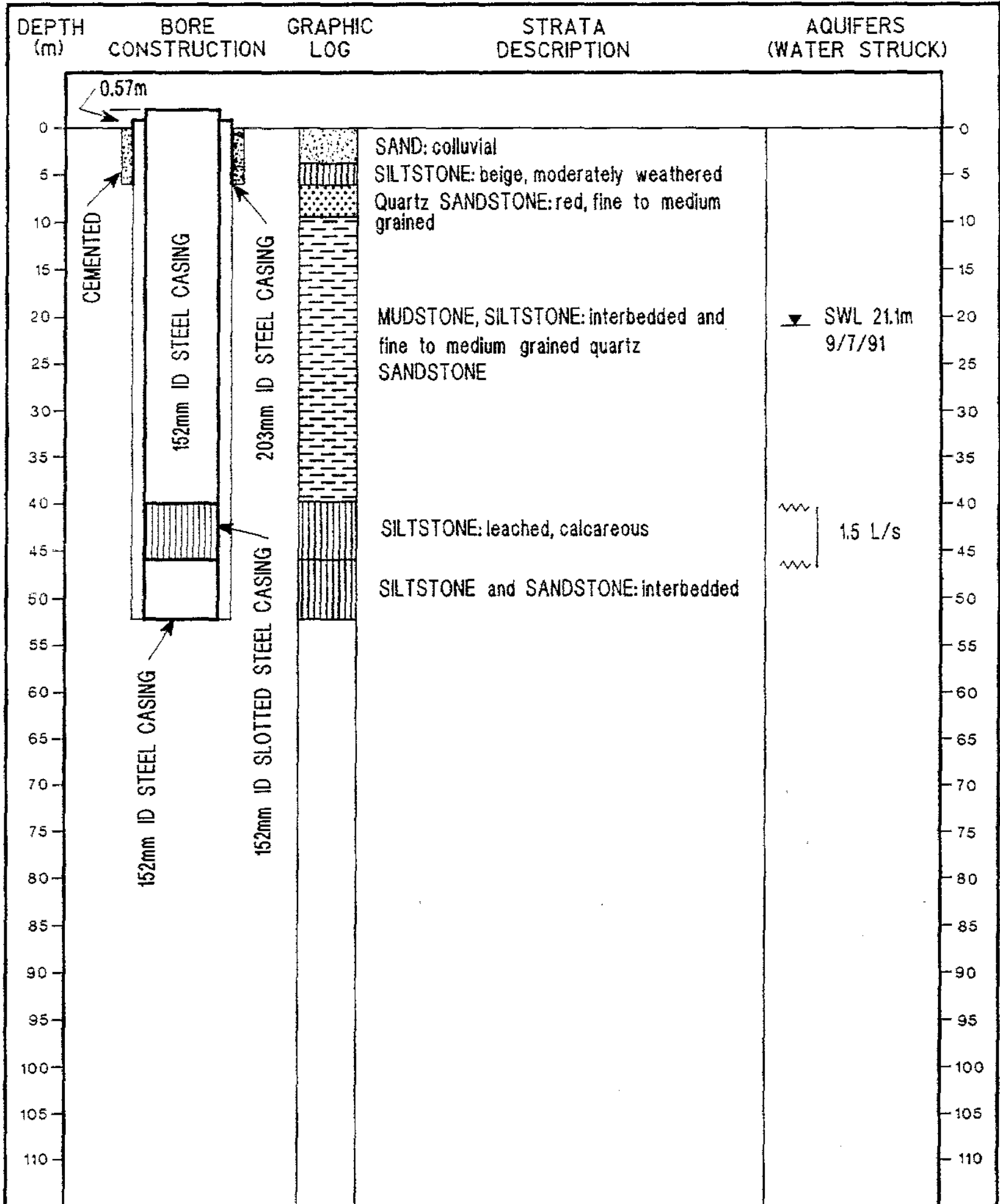
1. KENNEWELL, P.J., HULEATT, M.B., : 1980 - Geology of the Wiso Basin, Northern Territory. Bureau of Mineral Resources Bulletin 205.
2. RANDAL, M.A., BROWN, M.C. (compilers) : 1969 - Helen Springs, N.T. 1:250,000 Sheet SE 53-10 Geological Series - Explanatory Notes. Bureau of Mineral Resources, Australia.
3. AUSTRALIAN WATER RESOURCES COUNCIL/NATIONAL HEALTH AND MEDICAL RESEARCH COUNCIL : 1987 - Guidelines for Drinking Water in Australia. Australian Government Publishing Services, Canberra.

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BORE REGISTERED NUMBER	27298	11/7/91	DATE OF SAMPLING	1280	SPECIFIC CONDUCTANCE ($\mu\text{s/cm}$ AT 25°C)	725	TOTAL DISSOLVED SOLIDS (mg/L BY EVAP. AT 180°C)	6.9	PH	176	SODIUM, Na	25	POTASSIUM, K	37	CALCIUM, Ca	35	MAGNESIUM, Mg	237	TOTAL HARDNESS (AS CaCO ₃)	233	TOTAL ALKALINITY (AS CaCO ₃)	0.3	IRON (TOTAL), Fe	25	SILICA, SiO ₂	213	CHLORIDE, Cl	93	SULPHATE, SO ₄	16	NITRATE, NO ₃	284	BICARBONATE, HCO ₃	1.1	FLUORIDE, F	351	NaCl (CALC FROM CHLORIDE)	COMMENTS	pumped sample
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Analysis in milligrams per litre - mg/L (unless otherwise stated)

WATER QUALITY DATA



COMPOSITE LOG OF BORE 27298



WATER RESOURCES DIVISION

TEST REPORT — BORE RN. 27298

Bore Location: KUMUNU

Client: AES.
Reference:
Purpose: COMMUNITY WATER SUPPLY.

Map: HELEN SPRINGS 1:250,000 Sheet SE 53-10
Grid Reference: 680 - 247

RECOMMENDATION

Pumping Rate: 1.5 l/s. Pump Setting 38m below Ground Level.
General recommendations are given on the reverse side. The aquifer and bore cannot sustain higher pumping rates with deeper pump settings or for short periods in favourable seasons. Further advice can be obtained from:

Water Resources

(In all correspondence please refer to bores RN number) SASCO House, DARWIN NT.

BORE DATA

Finished depth: 52.1m. Completion Date: 2/7/91 Test Date : 10/7/91.
Standing Water Level: 21.1 m. on 9/7/91 Test Rates : 1.01 L/s.
Construction details: Test Duration : 13 hrs.

Interval	Description
0 - 6.1m	203mm ID. steel casing.
0 - 39.9m	152mm ID. steel casing.
39.9 - 46.0m	152mm ID. slotted steel casing.
46.0 - 52.1m	152mm ID. steel casing.

- Notes:
1. Top of casing as constructed was 0.57 m above ground.
 2. All depths are measured from natural ground level.
 3. Test rates are not indicative of safe long term pumping rates.

WARNING: MINIMUM INTERNAL BORE DIAMETER IS 152 mm Nominal Size.

COMMENTS

1. The above recommendations are based on a constant rate test at 1.01 L/s for 13 hrs and assume hydrological conditions remain constant.
2. Provision to obtain water samples and monitor water levels should be incorporated when equipping this bore.
3. It is recommended that this bore is not pumped at rates above 1.5 L/s due to the induction of sands and clays into the pump.

WATER QUALITY. See water laboratory report. Analysis No. 91/92/0072.

prepared by: P.REES. TO.1

boredata2

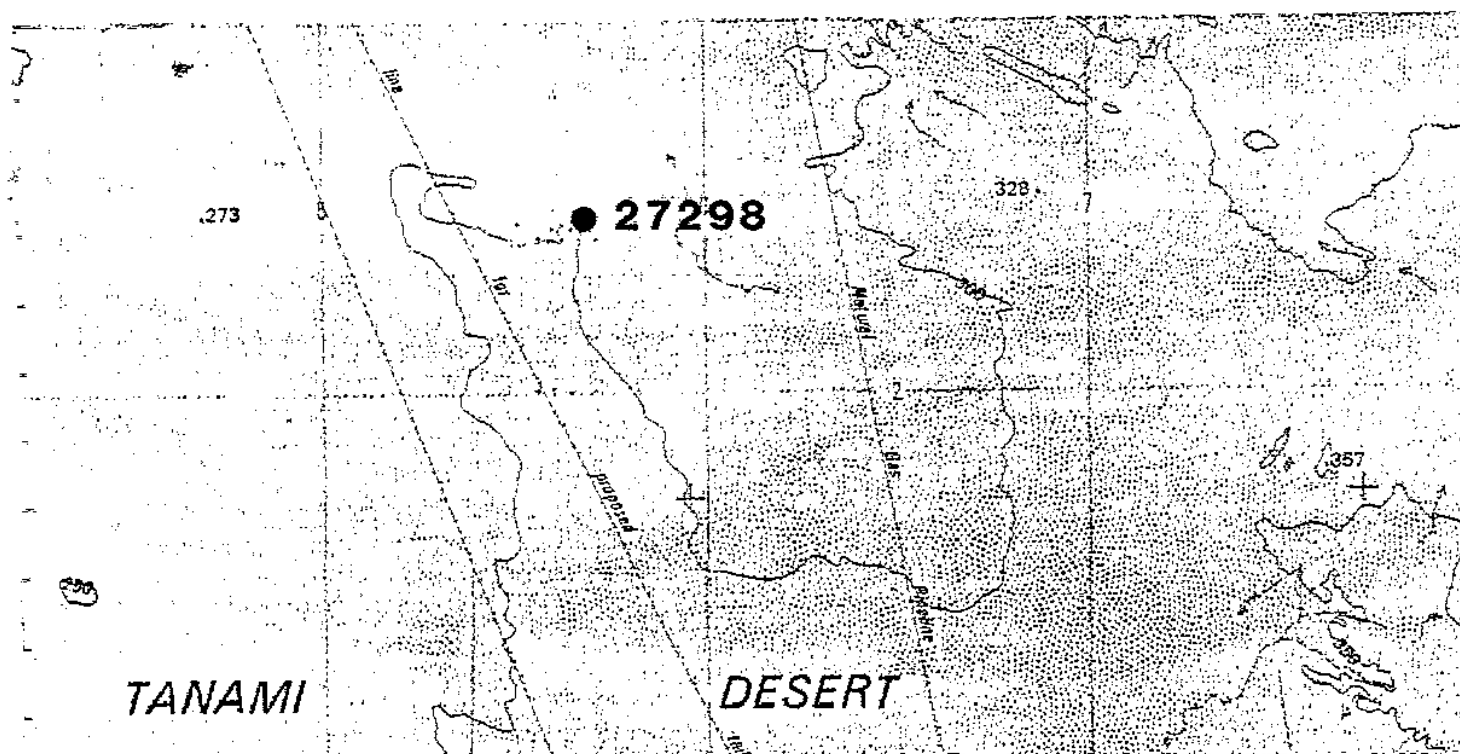
**RECOMMENDATIONS FOR FINISHING, OPERATING AND
PROTECTING GROUNDWATER BORES**

Attention to the following points will ensure a long and safe life for the bore supply and help prevent pollution of the groundwater resource.

1. Construct a concrete apron around the bore head to prevent surface flow, seepage and waste from entering the bore.
2. Seal the space between the casing and pump equipment to prevent entry of vermin: dirt and pollutants.
3. Maintain pumping equipment in good order to prevent pollution. Prevent spillage of fuel and oil on the ground around the bore. Store fertilizer and other chemicals at least 50 m away.
4. Keep stock away from the bore head. Discourage domestic activity at the bore. The first tap on the pipeline should not be less than 5 m from the bore head.
5. Pumping the bore at higher than recommended rates may fork the bore leading to instability of pump maintenance problems. Seek the professional advice of an hydrogeologist or groundwater engineer.
6. If the bore is no longer required, the casing is to be removed or securely capped and the bore backfilled with clayey material. A cement plug may be required in some instances.

IN ADDITION, please ensure that the BORE IDENTIFICATION TAG is retained securely at all times. The registered bore number is Water Resources Division's only reference to the scientific and engineering data on this bore, and hence important to WRD's further advice to bore owners.

BORE LOCATION MAP



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