To Go to Gordon.

GULF REGION STUDY

GILBERT RIVER EXPLORATORY DRILLING PROGRAMME

INTRODUCTION

Large areas of well-drained alluvial soil exist on the natural levees an minor flood plains of the Gilbert River. These potentially arable soils are more extensive in the reach from just up-stream of "Prestwood" station to below "Chadshunt" station. An area of approximately 577 ha is currently authorised to be irrigated in this area. In the early part of the season irrigation takes place from run-of-river flows. Surface flows usually reduce to less than 50 litres per second by June, and cease completely by August or September; (G.S.917001D at "Rockfields"). During the latter part of the year until the December storms, irrigation relies upon water drawn from the bed sands of the river using shallow interception galleries, sand-spears or gravel-packed bore-holes.

Recent applications for abstraction from this source total 22 000 ML, indicating that a significant demand exists for irrigation development in this area. In order to develop allocation policy to meet the water supply demand, with any degree of sustainability, an understanding of the catchment hydrology needs to be attained. This project attempts to quantify the water resource contained in the bed sands.

INVESTIGATION METHOD

Eight locations were selected, at more or less regular intervals, over the 55 km reach of the Gilbert River at which to construct a line of bore-holes across the river bed. The purpose of the exercise being to determine the depth and composition of the bed material and thereby assess its potential as a ground-water aquifer. The bore-line locations were selected more on the basis of ease of access rather than topographic or geological attributes.

The investigation work at each of the selected locations involved construction of a series of uncased exploration holes to the lower extent of any potential aquifer material. These holes penetrated to either rock, clay, silt or combinations thereof. Bore-holes were located generally within the active river channel. Where continuation of potential aquifer material beneath the high banks was indicated, (and access possible), additional holes were drilled in the high banks. Spacing of holes varied from 32 metres to 40 metres. One of these holes, (generally the deepest), was then selected as the site for a sample hole to establish the quality of the aquifer.

- Drill-holes were 152 mm diameter test holes which penetrated saturated, unconsolidated sediments to basement. Depths of the holes varied from 1 metre to 32 metres. A total of eighty-seven (87) test holes were constructed..
- A single 200 mm diameter bore-hole was constructed by percussion methods adjacent to one of the deeper test holes at five of the eight lines. Washed, but otherwise uncontaminated, strata samples were obtained at 1 metre intervals for the full depth, which ranged from 5 to 13 metres approximately.
- Slotted P.V.C. casing was inserted into the 200 mm sample holes to act as observation bores to allow water-table monitoring.
- Sieve analyses were carried out on every second sample obtained from the five sample percussion-drilled holes. Results have been plotted on a spread-sheet to allow mean values of Coefficient of Uniformity and Effective Grain Size to be determined, and thereby accurate assessment of porosity to be made.
- Each of the bore-hole lines was surveyed using a Total-Station and river bed profiles plotted. Standing water level elevations were added to the cross-section plots, as well as depth to lower extent of the clean sand/gravel. This allowed the mean cross-sectional area of saturated, clean sand/gravel aquifer to be determined. Mean values for aquifer storativity may be derived by integration of the porosity result and the available river bed cross-sectional area.

DRILLING PROGRAMME

Auger drilling investigation was carried out using a Bourne A25 continuous auger rig operated by Underground Drilling of Proserpine. Driller was Neil Heiniger, a licensed driller. Auger holes were constructed at regular intervals across the Gilbert River at each of the eight selected cross-sections. Spacing of holes varied between 35 and 40 metres.

Strata samples were obtained from holes constructed by a percussion or cable tool rig. A Hydromaster percussion plant, again operated by Underground Drilling, was used to push and drive 200 mm steel casing ahead of a 150 mm sand pump, (130 mm aperture). A positive head of water was maintained inside the casing to prevent outside material from entering the casing and contaminating the sample. Strata samples were obtained at intervals varying from 100 to 600mm, depending on rate of progress, and combined into one metre samples. A 2 kg sample considered representative of each metre was then bagged and labeled.

RESULTS OF DRILLING INVESTIGATIONS

"Prestwood" Line

Location: Approximately 1 km up-stream of the "Prestwood" homestead at about AMTD 321 km.

Description: The river at this location has a broad low-flow channel about 200 m wide. The right bank rises to a slightly elevated terrace at the toe, with further rises to a series of sand hills forming the right bank levee. The left bank rises about 1.5 m to the toe of a near-vertical high bank, the top of which is about 5 m above the toe. Total width of the river bed is approximately 325 m. Free water was evident at the lowest point of the river bed, in the vicinity of hole #8.

Auger-drill Investigation: Fourteen holes were drilled at approximate 40 m spacing, except for holes 12, 1 and 2 where spacing is 14 m and 20 m respectively. Total auger drill depth for this line was 208.7 metres. Clean sand and gravel was encountered in the bed section holes, (1-10), except for #11 at the toe of the left bank, which went straight into brown silt. Depth of clean sand and gravel ranged from 2 m in hole #1, at the toe of the right bank, to 6.6 m in hole #4 at the edge of a minor channel.

In all cases the clean material was underlain by clayed sand and gravel, generally increasing in fines with depth, to bottom-out in hard rock, (generally granite) at between 8.0 m and 25.3 m.

Percussion Drilling Investigation: No percussion drilling was carried out on this line. It was decided to exclude this line from the sampling investigations as the depth of aquifer material below the normal water table level is minimal. It was considered that better information would be available from the deeper sites.

"Riverview" Line

Location: Immediately up-stream of the "Riverview" access crossing at about AMTD 314 km, adjacent to the Bureau of Meteorology flood warning station.

Description: The river at this location has a broad, fairly uniform sandy bed with a narrow low-flow channel located centre-left. Both river banks rise rapidly to a well developed levee on the right bank, and to granite out-crops on the left. Total width of the river bed is approximately 325 m. No free water was evident at the lowest point of the river bed, but a pit excavated for drill water adjacent to hole #4 had a standing water level of about 2 m below natural surface.

Auger-drill Investigation: Twelve holes were drilled at approximate 36 m spacing. Holes #1 and 12 are located high on either river bank, 4 to 5 m above the bed. Total auger drill depth for this line was 197.3 metres. Clean sand and gravel was encountered in all holes except for #1 at the top of the left bank, which went straight into brown silt. Depth of clean sand and gravel ranged from 3.3 m in holes #10 and 11, near the right bank, to 13.5 m in hole #4 near the left bank of the minor channel. The clean sand and gravel strata was much thicker from the centre-line towards the left bank.

In all cases the clean material was underlain by clayed sand and gravel to about 15m, with a distinct ridge of dense clay in the centre of the channel, (hole # 7). Below this lightly clayed layer is a dense gravelly clay which persists for between 15.3 and 22.5 m.

Percussion Drilling Investigation: Percussion drilling was carried out adjacent to auger hole #4 for the purpose of obtaining strata samples of the sand/gravel and the underlying clayed material. Drilling proceeded satisfactorily at first, but slowed when a dense layers of quite large gravel was encountered through which the casing could not be pushed. The casing was then alternately pumped and driven to a final depth of 14 m, finishing in dense gravely clay.

"Blancourt" Line

Location: Approximately 6.5 km down-stream of the "Blancourt" homestead at about AMTD 302 km.

Description: The river at this location has a fairly narrow low-flow channel about 100 m wide adjacent to the right bank. The right bank rises steeply to the crest of the levee about 8 m above the bed level. The remaining 250 m bed section comprises undulating sand ridges. The left bank rises about 2.5 m to the toe of a near-vertical high bank, the top of which is about 6.5 m above the toe. Free water was evident at the lowest point of the river bed, in the vicinity of hole #2. A deeper hole exists nearby at the toe of the right bank. This provides near-permanent stock-water.

Auger-drill Investigation: Eleven holes were drilled at approximate 35 m spacing. Total auger drill depth for this line was 230.5 metres. Clean sand and gravel was encountered in all holes. Depth of clean sand and gravel ranged from 4.5 m in hole #5, to 6. m in hole #4. both towards the centre-right of the river bed.

In most cases the clean material was underlain by clayed sand and gravel, generally increasing in fines with depth, to bottom-out in dense cemented clayey gravel at between 15 0 and 25.0 m. Test holes #10 and 11 at the toe of the left bank exhibited similar upper strata but finished in green/brown silt at 12 and 7.5 m respectively.

Saturated sand and gravel appears to extend beneath both river banks beyond the limits of the section drilled as indicated in test-holes #1 and 11. No attempt was made to further define the limit of the deposit.

Percussion Drilling Investigation: A percussion drill hole was drilled on this line adjacent to test hole #4. This hole penetrated the clean sand/gravel strata, finishing in the clayed sand/gravel at 5.2 m.

"Forest Home" Line

Location: Approximately 1.8 km down-stream of the eastern boundary of "Forest Home" at about AMTD 294 km. The line is located at the property's river crossing. Three production bores are located at the toe of the right bank.

Description: The river at this location has a broad near level channel almost 300 m wide. The right bank rises sharply to a terrace about 3 m above the bed, before falling slightly to a minor side channel. The left bank rises about 6 m directly to the top of the river levee. Free water was evident at the lowest point of the river bed, in the vicinity of hole #1.

Auger-drill Investigation: Twelve holes were drilled at average 36 m spacing. Total auger drill depth for this line was 189.4 metres. Clean sand and gravel was encountered in all holes except for #10 at the top of the left bank, which went straight into brown silt. Depth of clean sand and gravel ranged from 1.3 m in hole #5, in the centre of the bed to 7.5 m in hole #6 immediately adjacent. An extra hole, #11, drilled between 5 and 6 verified the steep dip in the lower margin of the sand/gravel strata.

In all cases the clean material was underlain by clayed sand and gravel, generally increasing in fines with depth, to bottom-out in dense silt or clay at between 12.0 m and 22.5 m.

Evidence from test-hole #12 on the lower right bank suggests that saturated sand and gravel extends beneath the right bank beyond the limits of the section drilled. This is supported by the presence of a

production bore located 30 m north of test-hole #12 in an upper-level flood channel. No attempt was made to further define the limit of the deposit.

Percussion Drilling Investigation: A percussion drill hole was drilled on this line at test hole #2. This hole penetrated the clean sand/gravel strata, finishing in the clayed sand/gravel at 12.0 m.

"Rockyview" Line

Location: Approximately 1 km down-stream of the "Rockyview" boundary at about AMTD 284 km.

Description: The river at this location has a narrow main channel about 80 m wide and a series of upper level channels on the left side. The left bank rises in a series of terraces up to out-crops of fine-grained sand-stone or siltstone, (Langdon River Formation). The right bank rises steeply to the top of a near-vertical high bank, before flattening off to the crest of a broad natural levee. Total width of the section drilled is approximately 346 m. Free water was evident in a water-hole adjacent to the lowest point of the section in the vicinity of hole #3.

Auger-drill Investigation: Eight test-holes were drilled at approximate 38 m spacing from the toe of the right bank to the sandstone out-crops on the lower left bank. Total auger drill depth for this line was 29 metres. Clean sand and gravel was encountered in the lower bed section holes, (1-3), changing to clayed sand/gravel in hole #4 at the top of the first terrace. Depth of clean sand and gravel ranged from 1 m overlying the sandstone in holes 5 to 8 inclusive, to 6.9 m in hole #2 in the centre of the channel.

The clean material was underlain by clayed sand and gravel, to bottom-out in sandstone in all but hole #1 at between 1.0 m and 7.3 m.

Evidence from test-hole #1 suggests that saturated sand and gravel may extend beneath the right bank beyond the limits of the section drilled. No attempt was made to further define the limit of the deposit.

Percussion Drilling Investigation: No percussion drilling was carried out on this line. It was decided to exclude this line from the sampling investigations as the volume of aquifer material below the normal water table level is minimal.

Gilbert Bridge Line

Location: Approximately 30 metres up-stream of the Gulf Development Road bridge at about AMTD 276 km.

Description: The river at this location has a broad channel about 190 m wide, with a minor low-flow channel at the toe of the left bank. The left bank rises steeply for about 7 or 8 m to the top of the bank. The right bank rises through a series of exposed sandstone out-crops to the crest of the right bank levee. Total width of the river bed is approximately 192 m. Free water was evident in the low-flow channel in the vicinity of hole #1.

Auger-drill Investigation: Eight test holes were drilled at approximate 35 m spacing. Total auger drill depth for this line was 201.8 metres. Clean sand and gravel was encountered in the bed section holes, (1-6), underlain by clayed sand/gravel and cemented granite sands. Test-hole #7, on the right bank terrace encountered loose dry sand over sandstone at 1 m. Depth of clean sand and gravel ranged from 6 m in hole #3, to 12 m in hole #5 in the middle of the stream channel.

A thin lens of saturated fine sand identified in test hole #8 may extend beneath the left bank beyond the limits of the section drilled. No attempt was made to further define the limit of the deposit.

Percussion Drilling Investigation: A percussion drill hole was drilled on this line at test hole #5. This hole penetrated the clean sand/gravel strata, finishing in the clayed sand/gravel at 11.2.0 m.

"Neem Trees" Line

Location: At the "Neem Trees" plantation on the old road crossing at Gilbert River township at about AMTD 268 km.

Description: The river at this location has a distinct low-flow channel about 80 m wide at the toe of the right bank, another slightly higher channel 25 m wide at the toe of the left bank and a third upper-level channel some 10 m wide beyond this. The intervening bed comprises undulating sand terraces and silted tea-tree islands. The right bank rises steeply to the crest of the levee about 8m above bed level. Beyond the upper-level flood channel the left bank rises a further 3 or 4 m to the crest of the levee. Total width of the river bed drilled is approximately 427 m. Free water was evident in a small channel at the lowest point of the river bed, in the vicinity of hole #3.

Auger-drill Investigation: Fourteen holes were drilled at approximate 40 m spacing, except for holes 12, 1 and 2 where spacing is 14 m and 20 m respectively. Total auger drill depth for this line was 208.7 metres. Clean sand and gravel was encountered in the bed section holes, (1-10), except for #11 at the toe of the left bank, which went straight into brown silt. Depth of clean sand and gravel ranged from 2 m in hole #1, at the toe of the right bank, to 6.6 m in hole #4 at the edge of a minor channel.

In all cases the clean material was underlain by clayed sand and gravel, generally increasing in fines with depth, to bottom-out in hard rock, (generally granite) at between 8.0 m and 25.3 m.

Evidence from test-hole #13 indicates that up to a 6m thickness of saturated sand and gravel may extend beneath the right bank beyond the limits of the section drilled. No attempt was made to further define the extent of the deposit.

Percussion Drilling Investigation: No percussion drilling was carried out on this line. It was decided to exclude this line from the sampling investigations as the depth of aquifer material below the normal water table level is minimal. It was considered that better information would be available from the deeper sites.

Godfrey's Line

Location: At the down-stream boundary of Lot 8 on ET16 owned by R. & D. Godfrey at about AMTD 261 km.

Description: The river at this location has a narrow low-flow channel about 45 m wide at the toe of the right bank and another slightly lower channel 150 m wide at the toe of the left bank. The intervening bed comprises undulating sand terraces and silted tea-tree islands. The right bank rises near vertically for about 9 or 10 m to the crest of the levee. The left bank also rises steeply to about the same elevation. Total width of the river bed drilled is approximately 336 m. Standing water level was approximately 0.8 m below the bed in the vicinity of test-hole #1.

Auger-drill Investigation: Nine test holes were drilled at approximately 36 m spacing. Total auger drill depth for this line was 55.1 metres. Clean sand and gravel was encountered in all test-holes except for #1 and #9 at the extremities of the section. These two holes exhibited clayed sand/gravel to 5 m and 3 m respectively, over dense mottled clay. Depth of clean sand and gravel ranged from 3.6 m in hole #8 to 7.0 m in hole #3 at the edge of the right bank channel.

In all cases the clean material was underlain by clayed sand and gravel, generally increasing in fines with depth, to bottom-out in sandstone at between 3.6 m and 7.3 m.

Percussion Drilling Investigation: A percussion drill hole was drilled on this line adjacent to test hole #2. This hole penetrated the clean sand/gravel strata, finishing in the clayed sand/gravel at 6.5 m.

RESULTS OF SEIVE ANALYSES

Particle size determinations, or sieve analyses, were carried out on alternate one metre samples of the clean sand and gravel obtained from the percussion holes. As the percussion drilled holes were constructed under saturated conditions most fine material, if present, was washed from the sample in the drilling process. Observation of the water emptied from the sand pump indicated that in general very little clay or silty fines were present in the aquifer material. No sieve analyses have been conducted on the clayed sand and gravel because the fine fraction would generally have been washed from the sample. The sieve analysis results and the aquifer parameters calculated therefrom refer only to the clean, upper sand and gravel strata.

The entire sample of approximately 2 kg was air dried before passing through a sieve set comprising 12 sieves ranging from 37.5 mm to 0.075 mm. The mass of material retained on each sieve was weighed and the percentage of the total sample weight calculated. A particle size distribution curve was then drawn showing the percentage of the sample retained on each sieve. The Effective Grain Size, D10, being the grain size at which 10 % of the sample is finer and D60, the size at which 60 % of the sample is finer were obtained from the distribution curve. The Coefficient of Uniformity, Cu, was then calculated for each sample.

Twenty-five samples were analysed in this manner. Effective Grain Size varies from 0.39 mm to 2.8 mm, with a mean of 0.66 mm. Coefficient of Uniformity values vary from 3.58 to 12.63, with a mean of 5.0 and median value of 6.02.

AREAL EXTENT OF THE AQUIFER

The bore-hole lines were surveyed to obtain natural surface elevation and location at each of the bore-holes. River bed profiles were plotted and strata information added to allow determination of the available cross-sectional area of the saturated aquifer. Cross-sectional area of the saturated material ranges from 386 m^2 at the "Rockyview" line to 2 420 m^2 at "Riverview", with a mean area of 1 151 m^2. Therefore the volume of saturated, clean sand and gravel contained within the 59 kilometre length investigated is estimated at 67 909 000 m^3.

It is recognised that as the drilling investigation did not extend to the outer limits of the aquifer, estimation of its areal extent will be conservative. It is considered that an extensive and detailed drilling programme would be needed to accurately locate the margins of the potential aquifer.

AQUIFER PARAMETERS and STORAGE

The mean and median Coefficient of Uniformity values of 5.0 and 6.02 respectively indicates that the aquifer material is a moderately poorly sorted, (or moderately well mixed) sand and gravel. As such it is expected that this material has a porosity of between 25 to 30 %. The volume of water contained within the river bed material in the area under investigation is therefore between 16 980 megalitres to 20 370 megalitres.

The bed slope of the Gilbert River in this vicinity is about 1 2 m per kilometre. It may be assumed that the average gradient of the aquifer is similar. The presence of several geological features however, is thought to result in local variations in the aquifer gradient. This is evidenced by the fact that surface flow, or semi-permanent water-holes appear at irregular intervals; presumably at the down-stream control points of sections of flatter grade. The effect of these "controls" is unknown, but it is reasonable to expect that they act as physical barriers to ground-water during the latter part of the year, causing the aquifer to be broken up into discrete "pools".

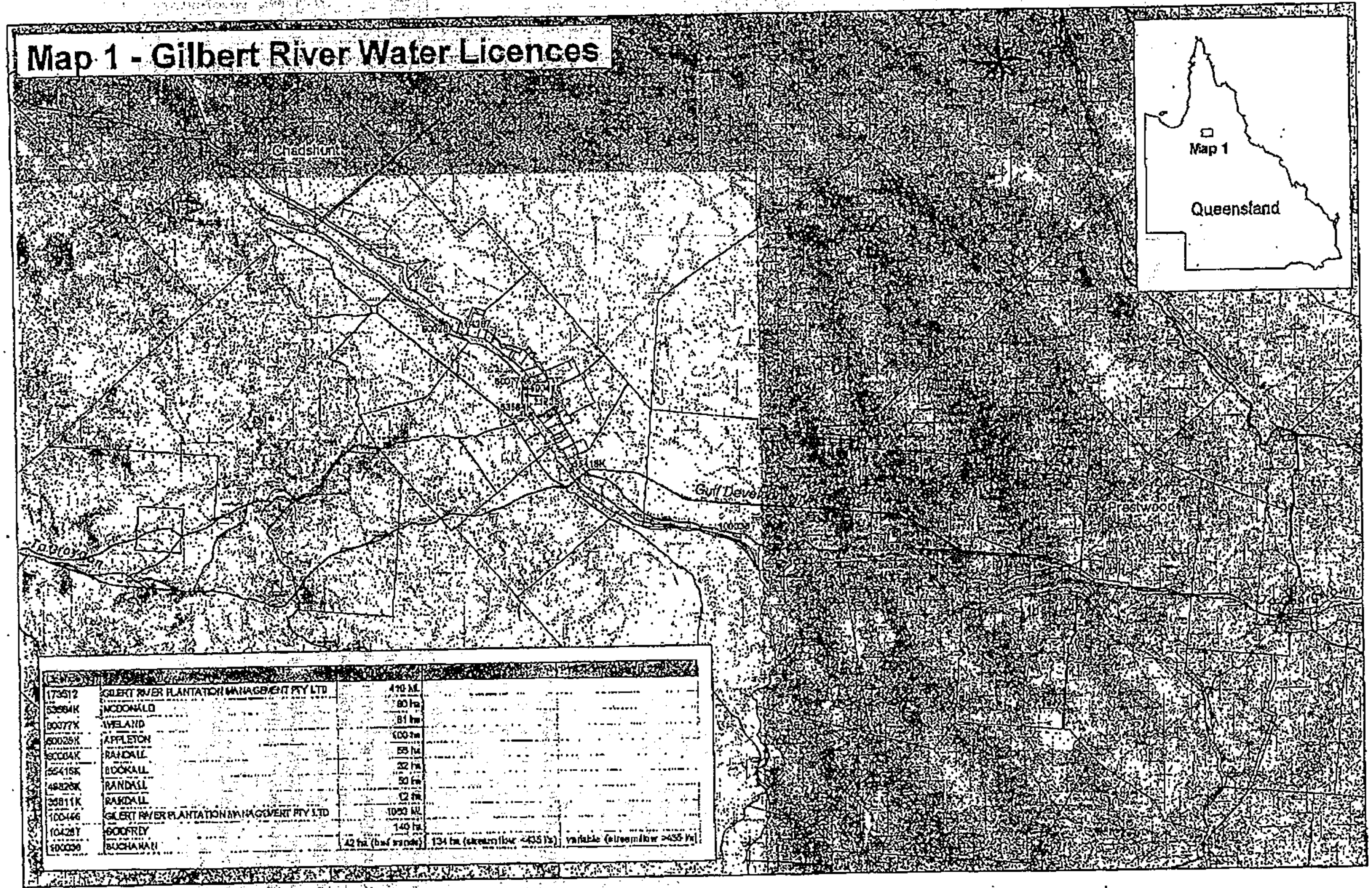
RECOMMENDATIONS FOR WATER RESOURCE DEVELOPMENT

It is considered that water resource allocations for irrigation should be based on a storage volume of 18 000 megalitres being available in the bed sands when surface flow ceases.

It should be noted that, in the author's opinion:

- The total amount, abstraction rate actually achievable and reliability of supply will be governed as much by the location of the abstraction point in respect to the shallow rock "controls", as by the characteristics of the aquifer at that particular location.
- Additional information is required as to the location and depth of the various geological features that may impact upon the system.
- Additional information is required as to the contribution made by the unmapped portions of the aquifer underlying the river banks.
- Hydrologic modeling of the entire catchment will be necessary to accurately determine the maximum sustainable, allocatable yield from both run-of-river and bed sand abstraction.

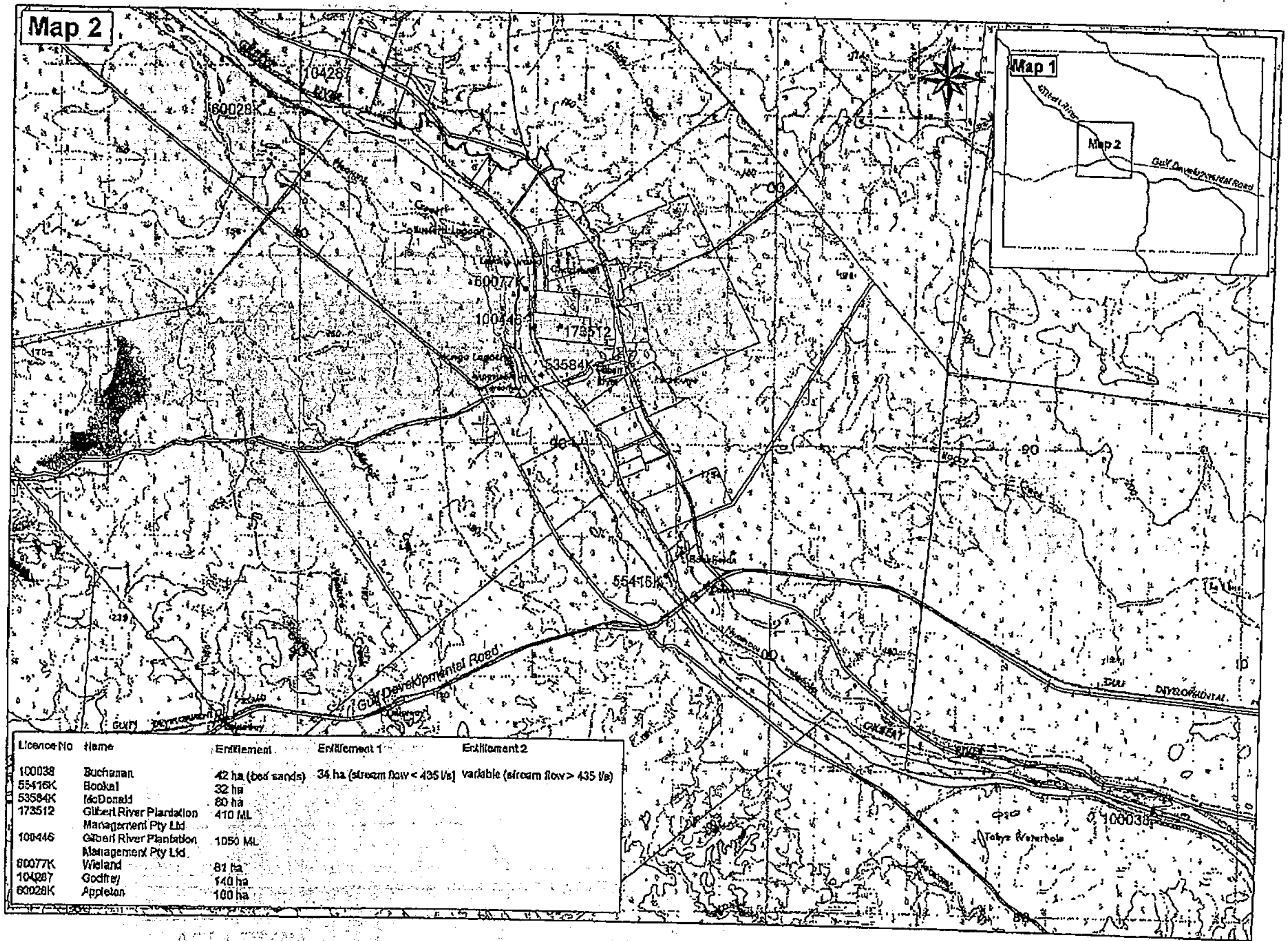
In 2000 Hydrologic Modeling was Done.



173512	GILBERT RIVER PLANTATION MANAGEMENT PTY LTD	410 ML		
53564K	MCDONALD	80 ha		
60077K	WIELAND	81 ha		
60025K	APPLETON	100 ha		
60004K	RANDALL	55 ha		
55415K	BOOKALL	32 ha		
49826K	RANDALL	50 ha		
35811K	RANDALL	12 ha		
100446	GILBERT RIVER PLANTATION MANAGEMENT PTY LTD	1050 ML		
104281	GODFREY	140 ha		
100030	BUCHANAN	42 ha (bed sands)	134 ha (streamflow <435 l/s)	variable (streamflow >435 l/s)

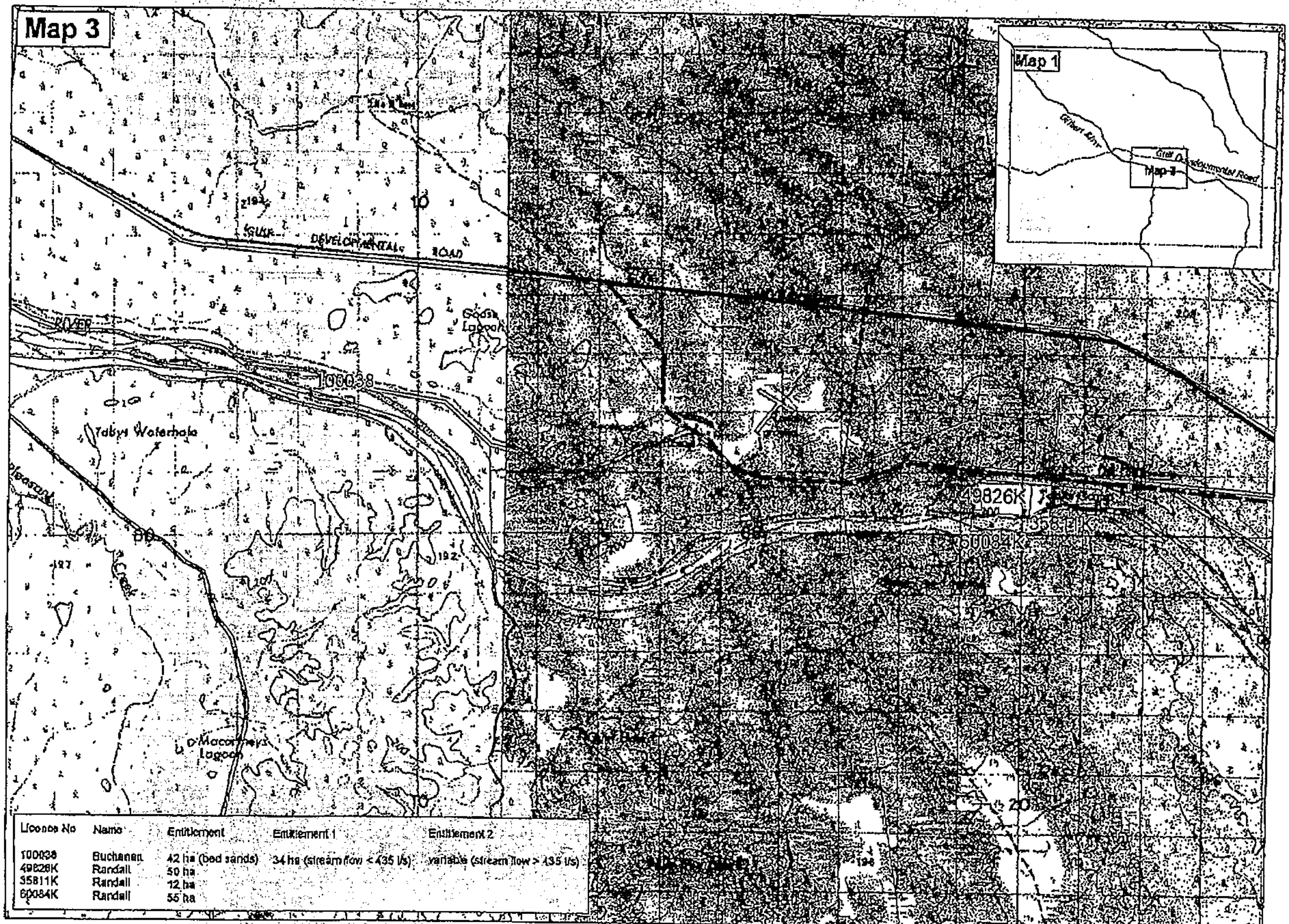
Details of Gilbert R. Water Licences
Map 1 - Prestwood to Chadshunt

Licence Number	Name	Entitlement
60028K	APPLETON	100 ha
104287	GODFREY	140 ha
60077K	WIELAND	81 ha
100446	GILBERT RIVER PLANTATION MANAGEMENT PTY LTD	1050 ML
173512	GILBERT RIVER PLANTATION MANAGEMENT PTY LTD	410 ML
53584K	MCDONALD	80 ha
55416K	BOOKALL	32 ha
100038	BUCHANAN	42 ha (bed sands) 134 ha (stream flow <435 l/s) Variable (stream flow >435 l/s)
60084K	RANDALL	55 ha
49826K	RANDALL	50 ha
35811K	RANDALL	12 ha


Map 2
Map 1
Map 2
Gulf Developmental Road
Gulf Developmental Road
10428
60028K
60077K
100446
173512
53584K
55416K
100038
Tabys Waterhole
Licence No Name Entitlement Entitlement 1 Entitlement 2
100038 Buchanan 42 ha (bed sands) 34 ha (stream flow < 435 l/s) variable (stream flow > 435 l/s)
55416K Bookal 32 ha
53584K McDonald 80 ha
173512 Gilbert River Plantation Management Pty Ltd 410 ML
100446 Gilbert River Plantation Management Pty Ltd 1050 ML
60077K Wieland 81 ha
104287 Godfrey 140 ha
60028K Appleton 100 ha

Details of Gilbert R. Water Licences
Map 2 - Chadshunt

Licence Number	Name	Entitlement
60028K	APPLETON	100 ha
104287	GODFREY	140 ha
60077K	WIELAND	81 ha
100446	GILBERT RIVER PLANTATION MANAGEMENT PTY LTD	1050 ML
173512	GILBERT RIVER PLANTATION MANAGEMENT PTY LTD	410 ML
53584K	MCDONALD	80 ha
55416K	BOOKALL	32 ha
100038	BUCHANAN	42 ha (bed sands) 134 ha (stream flow <435 l/s) Variable (stream flow >435 l/s)


Map 3
Map 1
Gilbert River
Gulf Developmental Road
Map 3
GULF DEVELOPMENTAL ROAD
RIVER
100038
Goose Lagoon
Tabys Waterhole
Macartneys Lagoon
49826K
35811K
60084K
Licence No | Name | Entitlement | Entitlement 1 | Entitlement 2
100038 | Buchanan | 42 ha (bed sands) | 34 ha (stream flow < 435 l/s) | variable (stream flow > 435 l/s)
49826K | Randall | 50 ha
35811K | Randall | 12 ha
60084K | Randall | 55 ha

Details of Gilbert R. Water Licences
Map 3 - Forest Home

Licence Number	Name	Entitlement
100038	BUCHANAN	42 ha (bed sands) 134 ha (stream flow <435 l/s) Variable (stream flow >435 l/s)
60084K	RANDALL	55 ha
49826K	RANDALL	50 ha
35811K	RANDALL	12 ha

Licence to Take Water

Licence to Take Water

Conversion is 12mg/Ha.

A Flow @ Gauging stn - 10 and 50 megs/Day.

A well will be granted.

New water licence applications for Gilbert R. Prestwood to Chadshunt

Type of Licence	Name	Entitlement applied for	Lot/plan of activity
Licence to Take Water	GODFREY	127 ha	8/ET16
Licence to Take Water	GODFREY and RINGROK	1548 ML	8/ET16
Licence to Take Water	GODFREY and RINGROK	70 ha	7/ET16
Licence to Take Water	RANDALL	85 ha	2/ET4
Licence to Take Water	MCFARLANE	300 ha	10/ET15
Licence to Take Water	HENRY	100 ha	1/LG8

Development permits for Dam/Piping Tank.

Find out about existing licence where it stands.

Find out about licence's Pending ie Above applications.

Tranfer of licence on sale.

ETHERIDGE SHIRE COUNCIL

ABN 576 652 388 57

St George Street, Georgetown QLD 4871, Australia

Phone: (07) 4062 1233 Fax: (07) 4062 1285 Email: info@etheridge.qld.gov.au

. . . a part of the GULF SAVANNAH REGION

Address all correspondence to:
The Chief Executive Officer
PO Box 12
GEORGETOWN QLD 4871

Our ref: ECD/03/009
Your ref:

22 August 2007

«First_Name» «Surname»
«address_1»
«address_2»

Dear «Greeting»

Planning for the Allocation of Water Entitlements and Three Phase Power Supply to the Farming Properties on the Gilbert River

Meeting 14 September 2007 - Georgetown

Etheridge Shire Council is undertaking planning to prepare for the anticipated increase of water allocations for the agricultural properties within the Gilbert River irrigable area.

The planning will also seek to explore the supply of 3-phase power to interested properties. Council will consider capital funding options for the cost of 3-phase electricity supply to ensure the infrastructure is in place when the additional water is eventually allocated.

Attending the meeting will be the Mayor of Etheridge Shire Council and member of the Advisory Panel for the Gulf Water Resource Plan Cr John Smith, Council staff, Mr Nigel Kelly, Regional Manager, Water Services, and Ms Michelle Wood, A/Manager, Water Services (Planning) North Region, Department of Natural Resources and Water, Mr. Geoff Bowes, Regional Manager of ERGON Energy, Mr Peter Elliott – Regional Manager of the Department of Primary Industry & Fisheries, and Gilbert River property landholders.

The discussions will provide Council with an accurate indication of landholder's intentions and how Council can best support the aspirations of the landholders in the development of the power and water needs on their properties.

The meeting will be held in the Georgetown Community Hall Supper Room on Friday 14 September 2007 commencing at 8:30 am and should conclude by 11:30 am.

The provision of water entitlements and the power supply will be the major topic of a meeting with Senator Bill Heffernan's Northern Australia Land & Water Taskforce when they visit the Gilbert River area on **Tuesday 25 September 2007**. Senator Heffernan and his team will visit a couple of properties on the Gilbert River in the afternoon of that day and will talk to landholders at a shed meeting.

The times and locations of the visits and the meeting with Senator Heffernan's team will be worked out at the September 14 meeting. Please RSVP to Emma Corradi on 4062 1233 no later than Thursday 13 September 2007.

Yours faithfully

Warren Olsen
Chief Executive Officer

Distribution List:

First Name	Surname	address 1	address 2	Greeting
Greg	Ryan	Greenhills Station	GEORGETOWN QLD 4871	Greg
Russell	Ryan	Rockdale Station	GEORGETOWN QLD 4871	Russell
Maurice	Marnane	Prestwood Station	GEORGETOWN QLD 4871	Maurice
Glen	Connolly	Blanncourt Station	GEORGETOWN QLD 4871	Glen
Ken	Fry	Forest Home Station	GEORGETOWN QLD 4871	Ken
Grant	Randall	Tonk's Camp	GEORGETOWN QLD 4871	Grant
Robert	McFarlane	Rockyview Station	GEORGETOWN QLD 4871	Robert
Ron	Henry	Riverview Station	GEORGETOWN QLD 4871	Ron
Glynn	Bookall	Rockfields	GEORGETOWN QLD 4871	Glynn
The Manager,	Plantations Australia	Gilbert River	GEORGETOWN QLD 4871	Sir
The Manager,	Mango Plantation	Gilbert River	GEORGETOWN QLD 4871	Darren
Bevan	Wieland	Avoca Glen	GEORGETOWN QLD 4871	Bev
Warren	Bethel	Feral View	GEORGETOWN QLD 4871	Warren
Richard	Godfrey	Gilbert River	GEORGETOWN QLD 4871	Richard
Alan	Bethel	Chadshunt Station	GEORGETOWN QLD 4871	Alan
Terry	Bethel	Lake Carlo Station	GEORGETOWN QLD 4871	Terry
Scott	Harris	Strathmore Station	GEORGETOWN QLD 4871	Scott
Noeline	Gross	NGRMG	GEORGETOWN QLD 4871	Noeline

ETHERIDGE SHIRE COUNCIL

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. . . a part of the GULF SAVANNAH REGION

Address all correspondence to:
The Chief Executive Officer
PO Box 12
GEORGETOWN QLD 4871

Our ref: 09/001
Your ref:

28 October 2005

Ergon Energy
PO Box 358
CAIRNS QLD 4870

ATTENTION: **Chris Souter**

Dear Chris

Upgrade of power supply to Gilbert River Agricultural Properties

We anticipate imminently an increase in water allocations to agricultural properties in the vicinity of the Gilbert River.

Presently the property holders use diesel-powered pumping systems to meet their irrigation needs. However, we anticipate that electric pumps would have considerably reduced operating costs, if three-phase power was available.

If water allocations increase both in size and number, we anticipate there would be interest by property holders to "buy in" to a project to upgrade the line to make three-phase power available.

To encourage this development, Council may wish to finance the project and recover the capital cost by some kind of special charge or levy on the properties.

Could you please advise what would be the contribution sought from the Council and/or property owners toward a project to upgrade the supply line to three-phase as far as, say, the Gilbert River Mango Farm (Lot 20 on ET1 & lots 1-2 on ET14, Parish of Bumba).

Yours faithfully

Warren Olsen
Chief Executive Officer

From: BOWES Geoff (FN) <Geoff.BOWES@ergon.com.au>
To: Dorretti deGraaff <ceo@etheridge.qld.gov.au>
Received: 14 Jan 2008 19:52:28 SUBJECT RE: Three phase power to the Gilbert River agricultural precinct

Hello Doretti,

My apologies that this has stalled a little since my visit to Georgetown a few months ago.

Our Area Manager Charlie Casa was assisting me with the progress of this work, and he has been on leave for a couple of weeks and is expected back early February.

I will endeavour to seek out the preliminary work that was done previously and see if we can get some progress. Your offer of assistance is greatly appreciated and we will certainly make use of your local contacts to determine who might be interested in 3 phase supply.

My Regards.

Geoff Bowes
Acting General Manager Operations Northern
ERGON ENERGY
Ph 07 4080 4992
Fax 07 4080 4704
E-Mail geoff.bowes@ergon.com.au

From: Dorretti deGraaff [mailto:ceo@etheridge.qld.gov.au]
Sent: Sunday, 13 January 2008 3:23 PM
To: BOWES Geoff (FN)
Subject: Three phase power to the Gilbert River agricultural precinct

ECD/03/009

Greetings Geoff

Our Mayor, John Smith, has asked me to contact you to determine the status of the project which aims to bring 3 phase power to the Gilbert River area. Are you able to give an update?

John also mentioned that you were looking to do a survey of local landholders to determine potential usage and market. I would be glad to help with this if that is the case.

Looking forward to hearing from you.

Regards, Dorretti

Dorretti deGraaff
Acting Chief Executive Officer
Etheridge Shire Council

Ph 07 4062 1233 Fax 07 4062 1285

PO Box 12 Georgetown Qld 4871

Proposed Federal Government Initiatives

- Take control of the Gilbert River catchment, irrigation water and tree clearing within areas which may have potential for development into Queensland's Ord River Scheme
    - Current state regulations allow for no clearing whatsoever and the total amount of new water being released (15,000 ML) is not sufficient to irrigate all available land
- Build one or several weirs / dams within the river to make this similar to an Ord River Scheme
    - One ideal site has already been located approximately 50 km up river from the majority of available irrigateable land at Green Hills. As of 2 years ago, the weir / dam site was estimated to cost approximately $60,000,000 and hold approximately 375,000 ML
    - This will allow water to be slowly released through the Bed Sands negating the need for Ring Tanks
    - It is also the most environmentally and developmentally sustainable option, due to the later months in the year when the river is dry.
        - 1st the natural biota in the river sands, will be maintained even though irrigation water will be pumped from the bed sands, as the bed sand levels can be topped up from the dam
        - 2nd this approach nullifies the need for costly and impractical ring tanks required to be built in areas where the soil is to pores in nature, and construction will be required to far from pumping locations
        - 3rd will minimise the amount of evaporation and essentially waste, our most valuable resource. Current estimates put evaporation rates at approximately 2.5 meters per annum which makes the development of ring tanks extremely costly, due to the increased depths needed to compensate for evaporation rates
        - 4th makes it much easier for individual farms to slowly scale up production, as they add the necessary irrigation equipment. This scenario nullifies outlaying cash for unnecessary equipment and costs, associated with ring tanks and diesel powered ring tank pumping. Investment can be directly injected into lifting irrigation capacity from stored bed sand water and will go a long way to removing farming pressure from down south ie. Murray River much faster. Much more development would occur within the region, if this was the case
    - Gives the area a more beneficial economy of scales factor allowing for production costs to come down over time. For eg. Fertilizer spreading services, ariel spray unit based in Georgetown, transportation depots, local suppliers of necessary packaging materials, more stable work force and accommodation including a reason to stop in the local community etc. It is unlikely that many of these factors will be recognised due to the limited allocation proposed by Queensland's Department of Natural resources 15000 ML
        - A large storage dam will also inject valuable tourism dollars into the local economy
- Assistance in transportation upgrades including double lane bitumen roads, rail system and connecting 3 phase power
- Long term low interest loans, would encourage more growth in the industry
- Telecommunications upgrades
    - Some areas currently using solar powered digital phone lines have no telephone service after 2 or 3 consecutive overcast days. Furthermore there is no mobile service over the areas, which would be supporting future industry growth, which severely hampers running of these enterprises

Considerations

- To be part of the Coalitions plan to develop and farm this area and other regions in the Gulf, (The Northern Food Bowl) we as primary producers will need help from both the Federal and State Governments including a willingness to co-operate between the two and work with the primary producers, council and local community
- Forest Home and many other primarily grazing cattle properties can continue to farm profitably as we have been already doing, without having to spend the cash on infrastructure, therefore if it is an increase in small crop production, that is wanted to make the difference from crops usually produced along the Murray River the Government may need to offer some form of financial assistance
    - Possibly in the form of Grants or Long term low interest loans
- Due to the Queensland Labour Government and the Department of Natural Resources reluctance to allow further expansion, tree clearing and development in the agricultural sector in Queensland, many primary producers feel it would take a change of state government or extreme change in the current policies. Failing this control may need to taken at the Federal level

Constraints

Mission Critical

- Many of the larger and indeed some of the smaller properties, will need better forms of land tenure to help offer security to their enterprise. This may further encourage growth of horticulture in the region

- 3 Phase power
    - Not feasible to further develop irrigation due to diesel costs, expansion of small crop production and intensive production techniques
    - Current information from ERGON ENERGY puts the cost of setting up 3 Phase power between 6 and 7.5 million dollars
        - This may prove to be too expensive for the number of users on the power lines to install

- Low interest development loans required for
    - Equipment; Due to locational restraints many **pioneer** producers will not have access to contractors and equipment as seen in coastal and southern areas in Queensland and Australia. Many southern producers may choose to come here after this initial hard work and costs has been completed
    - Development costs associated with water harvesting
        - It is simply just not feasible for many properties to develop ring tanks due to the pores nature of soil associated with the better farming areas. Under current regulations the only option may be to line ring tanks, which will not be economical (This may stop much of the hoped future development before is commences)

- Infrastructure including irrigation setup, workers quarters, sheds (packing, grading and processing, hay, other), coldrooms, silos, etc.

Queensland Government and the Department of Natural Resources

- Tree Clearing
  - Current tree clearing regimes in Queensland essentially allow for nil clearing and will not be a feasible policy if this area is to become a supposed Far North / Gulf Food Bowl
    - Many primary producers in Northern Queensland, feel that we are paying the price for the broad acre tree clearing seen in Southern Queensland, and particularly NSW and Victoria
      - Perhaps the answer to this problem is to reforest areas where there is little water or agriculture potential to allow for additional clearing, in developing and more sustainably irrigated areas?
    - At any case for the development of sustainable horticulture practices some selective tree clearing will be necessary, as long as it can be demonstrated that the clearing is for a sustainable enterprise and not just for broad scale clearing purposes
      - For example the clearing of land for a ring tank or of greater significance for irrigation purposes ie. Clearing of pivot circles and lateral irrigation land

Water Allocation System and Operational Procedures

- The total amount of new water to be allocated from the Gilbert River is 15,000 ML, which is not enough to fully irrigate the total amount of cleared land, estimated to be already available (6,000 hecatare) and is largely just a token amount with more than 4,800,000 ML running down the river, on average each year. Furthermore we still do not know how much Bed Sand water flow occurs. Current estimates require the additional allocation of approximately 60,000 ML to cover land which is already cleared or available for clearing.
  - Note that the initial estimates of land available and ML's required, are likely underestimated and as yet a more reliable total is not available
- The current amount of 15,000 ML of new water might not be reviewed again for 10 years making it quite clear that the area will not be allowed to fully develop under current guidelines
- The current level of water allocated, strictly adheres to the precautionary principle (1.5% for agricultural use and a further 0.5% reserved for state significant enterprise) however in the Gulf regions it is questionable that this is an advisable course. We may need to investigate the precautionary principles used by other states in their river systems
  - This principle obviously is designed to protect the environment, however we already have several rivers flowing into the Gulf of Carpentaria have been classified as Wild Rivers, which are totally protected (Other than the water reserved for State Significance, which includes mining)
  - As we already have fully protected rivers with similar ecosystems, is it not feasible to turn at least one other river system into one based on agricultural production?
- Further investigation of River Bed Sand ecology needs to be performed to determine if any organisms of significance reside their (Besides copious amounts of bacteria)
  - This is seen as an extremely important step, due to the severe limitations of Ring Tanks in the region as many irrigators will not be able to economically build ring tanks. Additionally allocation from Bed Sand water reserves will prove much more economical for horticulture and furthermore

nullify any water loss due to evaporation which is estimated at approximately 2.5 meters per annum
- Expansion of allocation from Bed Sand reserves, will greatly increase horticulture potential in the region

- Ring Tanks
  - As afore mentioned due to the extremely pores nature of the good farming soils found in the area the construction and pumping cost for water harvest is likely not to be feasible for many primary producers as most water will be lost due to leakage and evaporation. Furthermore ring tanks may need to be located further from pumping areas than current practices observed, in other irrigation areas
    - Pumping from Bed Sands may be the only economically sustainable solution, for many primary producers in the area

Other

- Labour Force
  - Community bus from Georgetown?
  - Accommodation for farm hands / field workers
  - Overseas workers?
  - Indigenous people from Gulf communities

- Transportation
  - Road; Need a fully developed double lane bitumen roads between farms, markets and suppliers
  - Rail; With the possibility of increased intensive livestock applications allowed, due to the farming potential of the area it is imperative that cattle can be sent by train to slaughter houses, furthermore this is also applicable for supplies required for horticulture and transport of product
    - It would be highly advantageous for a rail line to extend along the Gulf Developmental Road, to at least the Gilbert River Bridge

- Better telecommunications as in some areas solar powered phone lines go down after 2 or 3 days of overcast weather. Furthermore there is no mobile coverage in the area which severely hampers the running of local business, particularly horticulture business

Opportunities

- Initial estimates have identified 6000 hectares of cleared, or to be cleared land, as available for horticulture in our area and will require up to 60,000 ML to be fully utilised. Therefore in order to fully utilise this area in a sustainable manner, we will need to at the least construct one dam at the proposed Green Hills site
  - Note that the initial estimates of land available and ML's required are likely underestimated and as yet a more reliable total is not available
  - One primary consideration is that little will need to be spent in way of water delivery to primary producers, as the river can be used as a natural channel system
- Develop new markets due to location in Queensland we may find many of the different crops will be ready for market outside of present growth patterns and times
- Economic Considerations
  - Gives the area a more beneficial economy of scales factor, allowing for production costs to come down over time. For eg. Fertilizer spreading services, ariel spray unit based in Georgetown, transportation depots, local suppliers of necessary packaging materials, more stable work force and accommodation, including a reason to stop in the local community etc. It is unlikely that many of these factors will be recognised, due to the limited allocation proposed by Queensland's Department of Natural resources 15000 ML
  - Creation of numerous full time and part time jobs; larger number of seasonal workers required
    - Increase in community size and associated infrastructure improvements within town environments ie. Larger number of students at school, addition housing etc.
  - Increase in business productivity in Georgetown
  - Additional income for Etheridge Shire
- Boutique slaughter house / yard for locally produced Feed Lot stock
- Can send road trains directly from farms, (3 trailers) which is not feasible in coastal farming areas

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