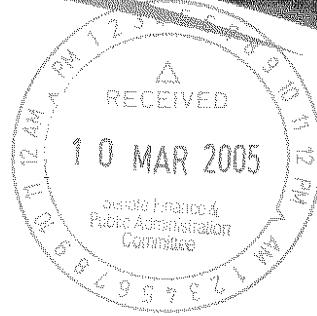


**WYONG SHIRE
COUNCIL**

building a better tomorrow!



**CENTRAL
COAST**



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JNF/Mr J Ferguson
F2004/06943

March 9 2005

Ms Lisa Fenn
Senior Research Officer
Finance & Public Administration Committee
Parliament House
ACT 2600

Dear Ms Fenn

**SENATE ENQUIRY INTO TUMBI CREEK DREDGING PROJECT
ADDITIONAL INFORMATION REQUESTED BY COMMITTEE AT
HEARING HELD ON 28 FEBRUARY 2005**

At the Committee hearing a number of items of correspondence and similar documents were requested by the Committee. Please find enclosed the following information:

1. Documents relating to flooding issues associated with Tumby Creek including a summary of documents by Council's Design Engineer, Mr Tom Wallace.
2. 8 bound colour copies of PowerPoint presentation by Mr D Cathers, Director of Engineering Services, to Council meeting of 24 November 2004, following storms of October 2004;
3. Bound copy of Review of Environmental Factors dated December 2004 detailing proposal to dispose of dredged spoil off site;
4. Copy of letter from Mr McBride to Council dated February 7 2005 advising that the State Government would still partly fund option to spread dredged spoil across the bed of Tuggerah Lake;
5. Copy of letters from Council to State Government, and from State Government regarding requests for funding for the dredging project: The release of correspondence written to Council has been approved by the relevant organisations

Correspondence from Grant McBride MP

- Fax - McBride to Council 5/3/04 (2 pages)
- Letter - McBride to Council 6/7/04 (2 pages)
- Letter - McBride to Council 7/4/04 (2 pages)

Correspondence from Wyong Shire Council

- Letter - Council to McBride 11/2/05 (1 page)
- Letter - Council to McBride 13/12/04 (1 page)
- Letter - Council to Knowles 19/8/04 (1 page)
- Letter - Council to Knowles 2/8/04 (1 page)
- Fax - Council to DIPNR 29/6/04 (3 pages)
- Fax - Council to DIPNR 25/6/04 (2 pages)
- Letter - Council to McBride 10/6/04 (2 pages)
- Letter - Council to DIPNR 24/3/04 (1 page)
- Letter - Council to Knowles 23/3/04 (1 page)
- Letter - Council to Knowles 4/2/04 (1 page)
- Letter - Council to Knowles 12/12/03 (2 pages)

Correspondence from Department of Infrastructure, Planning & Natural Resources includes Craig Knowles MP

- Letter - Knowles to Council 24/10/04 (1 page)
 - Fax - DIPNR to Council 30/6/04 (2 pages)
 - Letter Knowles to Council – 7/4/04 (1 page)
 - Letter – DIPNR to Council – 5/4/04 (1 page)
6. Details of dates and nature of discussions between council staff and Mr Graham Hallett (1 Page)
 7. Copy of second application to DOTARS for funding dated 25 June 2004;
 8. Estimate of costs for current dredging proposal (known as Option 1) for \$2M (1 page);
 9. Copy of letter dated 26 August 2004 from Ms De-Anne Kelly advising Council's first application for funds was successful;

Should further assistance be required please do not hesitate to contact me.

Yours faithfully



D G Cathers
Director
ENGINEERING SERVICES

Mr David Cathers,

I understand that for the Senate hearing on Tumbi Creek dredging you need to provide a copy of the "flood study" for that project.

The "flood study" was actually consultants' advice supplied in the form of correspondence which gave different predicted flood levels for various degrees of siltation in the creek mouth. I then added comments to say what properties were potentially affected by the differences.

The consultant was Mr KW (Bill) Paterson of Paterson Consultants (PC) from Grafton. His CV is attached.

The model which was being used was that produced by PC for Tumbi Creek flood study. Some associated analyses on a related model were carried out in 2000 by Webb McKeown & Associates (WMA).

WMA also produced a map referred to below which shows ground and floor levels taken from the 1995 survey of the Tuggerah Lakes perimeter. (The map is on the TRIM file as of 28/2/05).

Attached are copies from the hardcopy file W30/31800.

1. PC's email 21/1/01

It shows five computer files attached of which four were saved as noted on the file. One of the four was "comparis.wks" which has been converted to "comparis.xls" by me and is used below.

The 1% and 20% results using the Lake at 1.1m AHD are in "comparis.xls" of which a copy is attached. (Also attached are some property levels, some cross section profiles and a plan of those cross section locations.)

2. My memo 23/1/01.

A signed hardcopy from the file is attached.

It includes the spreadsheet "comparis.xls" but with the addition of two columns headed as being results dated 24/1 from PC using the lower level of 0.5 m AHD for the Lake.

This memo dated 23/1/01 points to a 490 mm effect of extended siltation at 0.2m AHD, and gives absolute flood values 1.209 – 1.699 m AHD at the confluence of the main branch and the Killarney branch of Tumbi Creek, using the results dated 24/1.

It refers to 16 properties including twelve with grounds below 1.5 m AHD, five with floors below 1.8 m and four with non-habitable floors near ground level.

It also refers to increased levels of 50 mm to 140 mm in the 450 m upstream of Adelaide Street, but this effect in the upstream areas was not mentioned in later dealings.

3. PC's fax 24/4/01

4. PC's fax 1/5/01 giving correction of a typographic error in Table 3 of 24/4/01

These two faxes, mainly in Table 3, again use the Lake at 0.5 m AHD. They show a smaller value for flood effect (only about 81 mm) by examining reduction in silt volumes rather than increases as had been the case in the January analysis.

This different approach is explained in PC's memo of 31/8/01.

5. PC's memo 31/8/01.

It is marked as a "draft". It confirms the accuracy of my fax of 22/8/01 which in turn implies that PC's results of 22/1/01 and 24/1/01 are correctly shown in "comparis.xls".

This memo also refers to PC's sets of calculations supplied in Jan 01 and May 01 as listed above and sets out the reasons for the different results. The reasons are that the January analysis examined what increase would happen if siltation increased in extent at a height of +0.2 m. and the May analysis looked at what decrease would happen if siltation was removed and the creek bed lowered to about -0.8 m.

Not attached is recent advice from me which concluded that the higher lake level was not unreasonable and **"Siltation of the creek bed over a range from -0.8m to +0.2 m would cause flood levels to increase by about 0.35 m from 1.4 m to 1.75 m AHD which is above the levels of the lowest floors and lands shown on the map."**

T R Wallace 1/3/05

CURRICULUM VITAE

NAME: K W PATERSON

CONTACT ADDRESSES: Paterson Consultants Pty Ltd
1/45 Prince Street, Grafton NSW 2460
Postal Address: P O Box 596, Grafton NSW 2460
Tel: 61 2 6643 1588
Fax: 61 2 6642 7566
E-mail: patcon@nor.com.au

PRESENT POSITION: Director, Paterson Consultants Pty Limited.

YEAR OF BIRTH: 1949.

CITIZENSHIP: Australian.

QUALIFICATIONS:

Bachelor of Civil Engineering, University of Sydney, 1971.
Diploma in Hydraulic Engineering, International School of Hydraulic Engineering, Delft, The Netherlands (1976).

PROFESSIONAL AFFILIATIONS: Fellow, Institution of Engineers, Australia.

FIELDS OF SPECIAL COMPETENCE: Floodplain and estuary management, hydraulic engineering including river and channel hydraulics, urban drainage and water quality investigation and design, catchment hydrology, flood mitigation investigation and design, computer applications.

LANGUAGES: English, Indonesian (basic).

EMPLOYMENT RECORD:

1988-Present: Director, Paterson Consultants Pty Limited.

1981-1988: Associate Director, Cameron McNamara Pty Ltd., Sydney.

1976-1981: Sinclair Knight and Partners Pty Ltd, Sydney.

1975-1976: Participation in International School of Hydraulic Engineering, Delft.

1975-1975: Engineering and Power Development Consultants, Den Haag, The Netherlands.

1973-1974: Pearson Bridge Pty Ltd.

1971-1973: Sinclair Knight and Partners Pty Ltd, Sydney.

EXPERIENCE:

FLOODPLAIN MANAGEMENT INVESTIGATION AND DESIGN

Mr Paterson has acted as project manager/engineer for the following floodplain management investigations:

2004: *Upper Bellinger River Flood Assessments*

The Upper Bellinger River has regular flooding. The principal impact is the isolation of about 900 people for long durations because of the flood susceptibility of access routes. The Flood Assessment deals with flood frequency, flood levels and access in a catchment featuring significant rainfall gradients.

2000 - 2003: *Gloucester Floodplain Management Study*

Gloucester is located near the confluence of three rivers in NSW (the Gloucester, the Avon, and the Barrington). The headwaters of the rivers are in high rainfall areas.

The floodplain management study undertook:

- identification of frequency of historical floods;
- definition of design floods, noting the PMF is 12 metres above the 1% AEP flood;
- development of planning and emergency management systems to deal with flood risk.

2000: *Walcha Flood Risk Assessment*

Walcha is protected by high levees but the risk and frequency of levee overtopping has not been examined over the past 30 years. The assessment involved:

- comparison of design techniques;
- assessment of flood damage potential;
- assessment of the risk to life if levee overtopping occurred.

1999: *South Grafton Floodplain Management Study*

South Grafton presents a number of difficult issues relating to floodplain management.

The area is protected by a levee to the 1% AEP flood level. However, the levee can overtop, creating ponding depths behind the levee of up to 6 metres. Further, runoff from a 42 sq kilometre local catchment can pond behind the levee, draining to the Clarence via floodgates. The Floodplain Management Study involved extensive joint flood probability investigations and floodgate operations before outlining appropriate building and development controls behind the levee system.

The recommended measures were incorporated into the Local Environmental Plan in 2002.

1997: *Marshalls Creek Floodplain Management Study*

Marshalls Creek is a tidally influenced estuary behind the coastal dune system near Brunswick Heads, Byron Bay. The area has considerable development pressure with vocal groups for and against development.

The Marshalls Creek Floodplain Management Study and Plan reached a compromise solution for the area, addressing development pressures, development control, environmental enhancement and environmental protection.

1996: *North Coffs Creek Floodplain Management Study*

North Coffs Creek is a steep urbanised creek on the escarpment behind Coffs Harbour. The study investigation concentrated on works, measures and strategies to reduce flooding risk. The adopted strategy was essentially application of building and development controls. Structural works were investigated, but found to be expensive and producing no significant benefits.

1994: *Moree Floodplain Management Study*

The Moree Plains Floodplain Management Study derived its flood information from the earlier Flood Study.

Moree presents particular floodplain management problems in that there is little flood-free land available, the town itself is separated from flood refuge areas by the Mehi River and there is general community perception that future development will occur north of Moree which is flood-labile (and mostly classed as High Hazard areas).

The study investigated a number of structural measures and non-structural measures to reduce flood damages.

1994: *Avoca and Cockrone Lagoons Floodplain Management Studies*

The Avoca and Cockrone Lagoon studies concentrated on the pockets of older-style development surrounding these coastal lagoons.

The flood levels within each lagoon are controlled by local rainfall, the break-out of the lagoon through the beach to sea and Council's current policy of opening the lagoons once a pre-determined level is reached.

There has been considerable concern that the policy of opening the lagoons is causing significant environmental damage to the lagoon's ecology.

The studies reviewed a variety of structural and non-structural options for each lagoon, ranging from levee works to flood warning and revised opening procedures. The best balance between the conflicting needs of reduction in flood damage and enhancement of lagoon ecology was a dune management regime which will not affect the level at which the lagoon is mechanically opened but will affect the speed of opening and thus reduce flood levels.

1988-1992: *South Grafton Levee Works*

This engagement covered the project management of the South Grafton Levee Program following the levee design, EIS and document preparation. The levee system includes:

- some 20 kilometres of earth levee;
- some 600 metres of reinforced concrete levee;
- major drainage structures at 4 locations with 2.1 x 2.1 m box culverts with up to 5 cells, some 50 metres long;
- establishment of extensive borrow area; and
- landscaping and rehabilitation works.

The South Grafton levee scheme provides protection for the urban areas of Grafton on the southern bank of the Clarence River.

The scheme was investigated using a quasi-two dimensional hydraulic model. After confirmation of the hydraulic performance of the scheme for events up to the PMP flood, an EIS was prepared. The scheme was designed in 1987 and has an estimated construction cost of \$15.0 million (1994).

1992: *Macleean Shire Floodplain Management Study*

This study reviewed options for floodplain management for Macleean Shire. The area is dominated by the Clarence River and has a flood-labile area of 330 square kilometres.

The study reviewed a mix of non-structural (principally land use planning) and structural measures (principally levee works) to reduce flood damages. The study was a pre-cursor for public debate for formulation of a floodplain management plan.

1991: *Green Point Creek, Pearl Beach*

This study concentrated on preparation of a floodplain management plan for Green Point Creek. Although the creek is small, it features significant flow velocities and erosion potential. The floodplain management planning concentrated on land use planning options such as fixing of floor levels, re-vegetation of flood-labile areas, community controls on inter allotment fencing and minor bridge works.

1982: *Moree Floodplain Management Investigation*

The work involved detailed investigations of a series of levees to protect Moree on the Gwydir River Valley. The adopted scheme involves seven kilometres of levee and is awaiting government funding.

URBAN DRAINAGE INVESTIGATIONS

Mr Paterson has acted as project manager/engineer for the following urban drainage and water quality investigations:

2002 - 2004: *Developer Submissions*

Numerous drainage and riverine investigations have been carried out for various developers and/or local government authorities. These include:

- Jacks Road Sub-division, Gloucester Shire Council;
- Trunk drainage investigation and design, Corindi, Pristine Waters Council;
- Trunk drainage, local drainage and water quality control, "Seagrove" and "Seadrift", high density housing, Byron Bay;
- Medium density housing adjacent to Coffs Creek, Coffs Harbour Council.

2002: *Parkes Development Site, Yamba*

Parkes Development propose filling and sub-division of the 7 ha site at Yamba. The site is low lying, flood liable and surrounded by a mix of newer development on fill and older development at original ground levels. The site needs filling to conform with Maclean Council's conditions. The principal issues addressed were options and preliminary design of the drainage network, both in the site and the surrounding area such that existing drainage behaviour could be maintained.

2000: *Yamba CBD Drainage Study*

The Yamba CBD catchment is small and characterised by steep slopes in the top half of the catchment and flat slopes in the bottom half. The study investigated the causes of flooding and remedial measures. DRAINS and MIKE-11 were used, as the bottom part of the catchment is under tidal influences.

1988-2002: *Developer Submissions, NSW*

Numerous drainage investigations have been carried out for various developers and/or local government authorities. These include:

- Moree Services Club Development, Moree;
- Warrell Creek, Scotts Head, Nambucca Council;
- Wyoming Medical Centre, Gosford Council;
- Dwelling Construction, Bowraville, Nambucca Council;
- Belongil Creek filling, Byron Shire Council;
- Corindi Drainage, Ulmarra Shire Council;
- Suffolk Park drainage, Byron Bay;
- Crayfish farm development, Byron Bay;
- Bensons Creek, Shellharbour Municipality; and
- Coffs Creek, Coffs Harbour City Council.

1994: *Treloar Development Site, Yamba*

The Treloar development involves mixed land use development at Yamba involving commercial, medium density uses and some 725 residential dwellings. Paterson Consultants were engaged to review the drainage proposals for the development which involved three (3) retention basins.

The investigation found that the works proposed were not effective and undertook optimisation of the design proposals to ensure reduction of downstream flows to pre-defined peak values. Paterson Consultants have since completed the detailed hydraulic design and preparation of works specifications to allow construction drawings to be prepared.

1992: *Darling Mills Creek, Multiple Basins Option*

The Upper Parramatta River Catchment Trust prepared an EIS to cover construction of a single flood mitigation dam on Darling Mills Creek to reduce design 1% AEP flows from 650 cu.m/sec to 150 cu.m/sec. The multiple basins study involved examination of an alternative system of 14 basins to ascertain if this alternative was as effective as and less environmentally sensitive than the single basin option.

1992: *Kolora Lake Section 94 Contributions Plan*

Kolora Lake area (West Yamba) is envisaged to be developed in the near future. The whole area will be filled to provide flood protection. The preparation of the Section 94 Contributions Plan involved investigation and preliminary design of drainage systems and associated water quality controls with costing to establish land developer's cost contributions.

1990: *Surveyors Creek, Penrith*

The investigations detailed existing flood conditions and improvements required to Surveyors Creek, Penrith. The work is required to enable urban development on currently undeveloped land west of the Penrith City area but east of the Nepean River. The area floods from either runoff from the local urban catchment or spillage from the Nepean River.

1989: *North Grafton Drainage Study*

Grafton drainage comprises of a pipe system to the Clarence River. However, during flood time, the pipe system cannot discharge to the river and drainage paths are totally altered. The study involved review of options to utilise ponding areas within the town to minimise local flooding.

1989: *Maclean Drainage Pumps Review*

Maclean is protected by a levee with pumps installed to remove water impounded by behind the levee. The 1988 and 1989 floods indicated the pumps and drainage system did not operate as intended. The review involved investigation and analysis to identify and quantify the deficiencies and to propose a series of remedial works.

1988: *Dual Use of Open Space Areas, WSROC*

This study reviewed the difficulties experienced with dual use of open space for drainage and open space uses in Western Sydney. The study reviewed current practice and produced a multi-disciplinary handbook on dual use areas to avoid the historically evident difficulties.

1986: *Rose Bay Catchment Study*

The investigation involved determining the causes of flooding in the Rose Bay commercial area in the November, 1984 storms and outlined a series of flood mitigation measures to alleviate flooding. Some 60 commercial properties (principally retail outlets) were flooded above floor level in the 1984 event. The study involved extensive data collection and development of computer models to determine the catchment's behaviour.

1985: *West Kensington Flood Study, Sydney*

This study involved data collection, development of computer models and proposal of flood mitigation measures for a 3.2 square kilometre catchment in suburban Sydney. The study was commissioned after severe storms in November, 1984 inundated some 30 homes and caused extensive damage.

1984: *Kensington Flood Study, Sydney*

This study into drainage of the Kensington area in south eastern Sydney was commissioned following extensive flooding in November, 1984, when over 100 houses were flooded above floor level and water entered another 200 properties. The study involved extensive data collection, establishment of computer models of the catchment and investigation and proposal of works and measures to alleviate flooding.

1984: *Australia's Wonderland, Blacktown, Western Sydney*

This investigation involved review of methods of drainage control for a 42 hectare site to be developed as a "fun fair". The recommendations involved a system of 11 retention basins which would also be used for irrigation water supply.

1983/84: *South Blacktown Release Areas, Western Sydney*

This study involved examination of potential trunk drainage strategies for development of the above release area. The recommended strategy involved retention of natural floodway, grassed channels and low flow pipes covering about 10 kilometres of trunk drainage. Two retention basins are incorporated.

1981: *Elderslie-Narellan Strategy Plan, Camden, Western Sydney*

This study identified an appropriate trunk drainage strategy for the development of the Elderslie-Narellan area. The plan incorporated a series of grassed channels, low flow pipes and retention basins.

1981: *Cook Islands Development Plan, Rarotonga, Cook Islands*

The Cook Islands Development Plan was a multi-disciplinary investigation of infrastructure development opportunities in the Cook Islands and was funded by the World Bank. The drainage works aimed to reduce flooding in the capital, Rarotonga, which is located in a depressed coastal lagoon area. The drainage scheme adopted involved a series of control channels and retention in swamp areas used for food production.

1979: Bow Bowling Creek, Campbelltown, Western Sydney

The study developed a drainage strategy for development of the upper part of Bow Bowling Creek being developed by the Macarthur Development Board. The scheme adopted involved a series of grass channels and retention basins. The retention basins were multi-level and intended for conjunctive use with sporting fields.

URBAN DRAINAGE DESIGN

Mr Paterson has acted as project manager/engineer for the following urban drainage designs:

2000: Design Improvements, Rural Drainage Schemes, Acid Sulphate Soils Program (ASSPRO)

Many NSW flood mitigation schemes were constructed with deep drainage. It is now appreciated that this has exposed acid sulphate soils, creating highly acidic "slugs" of water in the drains, with adverse impact on fisheries and agricultural production. The study examined ways and means to obtain better environmental outcomes for flood mitigation. A primary concept shift was proposed to allow more productivity from low lying back swamps.

1999: Mingara Wetland, Wyong

The project involved the detail design of 1.5 ha artificial wetland to improve water quality. The wetland featured major sediment traps on the inlet, variable water level control at the outlet and planting of a variety of wetland species.

1994: Mingara Trunk Drainage, Wyong

The Mingara Trunk Drainage Program involved construction of 1.6 kilometres of open grassed channel. Innovative cross-sections were developed to reduce the maintenance costs and visual impact of the works.

1992: Chittaway Road Levee and Culverts, Wyong

The project involved investigation and detailed design of one kilometre of levee plus upgrading and flapgating of a single cell 2.5 x 0.9 metre box culvert to a three cell 2.5 x 0.9 metre box culvert below Chittaway Road, Berkeley Vale Industrial Area, Wyong.

1989: Suffolk Park Drainage, Byron Bay

Detail design and construction of an earth channel to provide trunk drainage through an urban development at Suffolk Park. The constructed channel through sand and peat soils features a number of drops and pools and incorporates environmental control measures.

1990: Howard Street/Argyle Street Pump Stations - Maclean

Earlier pump review indicated that the drainage pump capacities installed at Maclean did not achieve the drainage times indicated in the EIS for Maclean levee. Consequently, two new pump stations were constructed at Argyle Street (capacity 130 l/s) and Howard Street (500 l/s).

Both stations use axial flow pumps locate in chambers below ground level (and below mean water levels). The project involved design, documentation and construction of the pump stations.

1990: *Enterprise Drive Trunk Drainage - Wyong*

Flood investigations for the Berkeley Vale Industrial area at Wyong indicated the existing drainage was inadequate to meet 1% AEP design standards. The project involved design and documentation for a new drain 1 200 m long, a 3 cell 2.1 x 2.1 m box culvert with floodgates and 500 m of earth levee. The works augment existing drainage to provide a full 1% AEP design standard.

1987: *Rose Bay Drainage. NSW*

The design works involved approximately 500 metres of 1,800 millimetre diameter pipe with associated pits and outfall structure. The foundation conditions are loose water charged sands which present particular design and construction problems in the heavily built-up areas.

1987: *Rainbow Pacific Development, NSW*

The design works involved a control weir to create an artificial three hectare lake as part of a residential development. Road crossing is incorporated as part of the outlet works.

1986: *South Blacktown and South East Plumpton Release Areas, Blacktown, Western Sydney*

The South Blacktown and South East Plumpton Release areas required approximately 10 kilometres of major trunk drainage works. The system adopted involved a series of formed grass channels, natural grass channels and low flow pipes. The design also incorporated two upstream retention basins to reduce flows following urban development.

1985: *Kensington Drainage Program, Kensington, Sydney*

The Kensington Drainage Program was commenced after severe flooding in November 1984. The system designed included:

- * Changes to the outlet from Centennial Park to control flows to specified levels. The changes were based on a physical model test.
- * Five hundred metres of reinforced concrete channel through a heavily developed area, founded on water charged sands and utilising all of the existing easements.

1984: *Australia's Wonderland, Blacktown, Western Sydney*

The detail design phase involved design and documentation for all internal drainage, major water features and four major retention basins for the 42 hectare "fun fair" site. Each basin incorporated significant sediment pollutant control measures to reduce sedimentation downstream and to improve runoff quality.

1981: *Berowra Section, F3 Freeway, Sydney*

The detail drainage components of the extension of the freeway between Berowra and Mt. Ku-ring-gai involved extensive permanent sediment control structures, separate collection systems for pavement runoff as compared to across-road drainage. The culverts installed included substantial energy dissipation measures.

HYDROLOGIC AND HYDRAULIC MODELLING OF CATCHMENTS

Mr Paterson has acted as project manager/engineer on numerous investigations involving hydrologic and hydraulic modelling of catchments. The aim of the studies has generally been to define design one percent flood levels and to develop an understanding of flood behaviour. Each study has involved extensive data collection as well as computer modelling. Recent projects include:

2002: *Water Resource Allocation, Gwydir Valley*

The NSW Government is preparing water resource allocation plans for surface water and ground water for Gwydir Valley. The Gwydir Valley Irrigators funded Paterson Consultants to undertake a peer review of the background data, analysis and conclusions reached in the Plans. The review indicated significant discrepancies and the application of the plans is currently "on hold".

2001: *"Woondulla", Barwon / McIntyre River*

Irrigation development for cotton production on "Woondulla" comprises 1500 hectares. The development is partly on flood liable land affected by the Weir and Barwon Rivers. Flood models were developed for an area of some 100 sq kilometres surrounding the property to identify flood impacts. The hydraulic models used were MIKE-11 and RMA-2. The investigation illustrated substantial flaws in the topographical data base used prior to the study.

2000: *"Shartale", Gunnedah*

Irrigation development at "Shartale" involves 700 hectares of cotton on the Mooki River floodplain. Hydrologic and hydrodynamic models were established to confirm the development did not affect surrounding properties. The information was required to address local issues and licensing requirements. The models used were RORB and MIKE-11.

2000: *Boambee Flood Study, Coffs Harbour*

Boambee Creek has a catchment of 50 sq kilometres. The Flood Study was required to address the impact of large industrial development sited partly on flood liable land. The hydrologic model used was RORB, while a model covering some 6.5 kilometres of stream, including an erodable entrance to the sea, was developed using MIKE-11.

1999: *Water Demand, Bonville International Golf Course, Coffs Harbour*

Bonville International Golf Course proposes to expand its facilities. Hydrologic investigations using a daily water balance model were undertaken to address issues of catchment yield, operation of storages to meet demand, and drought sequences.

1995: *North Coffs Creek Flood Study*

North Coffs Creek is an urban catchment of 8 square kilometres at Coffs Harbour. The flood study established hydrologic and hydraulic models of the creek system. The study output was a series of design flood profiles and flood hazard maps for events up to the PMP level.

1994: *Tumbi Umbi Creek Flood Study*

The Tumbi Umbi Creek catchment covers 25 square kilometres on the New South Wales Central Coast. Previous investigations established a riverine hydraulic model using CELLS. The Flood Study Review established and re-calibrated the hydraulic models using MIKE-11 software and incorporated most recent river improvement works.

1994: *Freight Rail - Culvert Analysis System*

Freight Rail maintains thousands of culverts on the rail network. The capacity and deficiencies in this network are unknown.

Freight Rail North commissioned the development of a database system to simplify the hydrologic and hydraulic analysis. The system, developed in MS-ACCESS, was directed to 'user-friendliness' and potential for use by operators of limited training.

1993: *Avoca and Cockrone Lagoons Flood Studies*

Avoca and Cockrone Lagoons are two small coastal lagoons created behind the beach dune system. Lake water levels are elevated above normal tidal levels. Council has a policy of mechanically opening the dunes once water levels reach a pre-set level.

The flood studies established a model of the complex dune break-out process. The models were calibrated against recorded events and tested against dam break models and geomorphological models.

1991-1992: *Moree Flood Study*

This study involved prediction of design flood levels at Moree. The hydrology and river system is complicated at Moree by the Gwydir and Mehi river systems which distribute flood flows over a wide area. The study involved development of a MIKE-11 model covering an area some 80 kilometres long by 15 kilometres wide and comprising some 120 channel links. Calibration within 50 millimetres of recorded events was achieved.

1990: *Catamaran Drive Flood Study - Wyong*

This study examined an approximately 500 hectares part of the Ourimbah Creek floodplain designated for industrial development. The investigation established a large two-dimensional hydraulic model of the area, investigated a series of flood control options and led to a recommended plan of works to reduce flood liability to acceptable levels.

1989: *Ourimbah Creek - Creek 2JA Study, Wyong*

This study examined the interconnection during flood periods between Ourimbah Creek and Creek 2JA, which had been overlooked in earlier flood studies of both systems. The study

proposed works and a development control outline for the flood affected area. The flood affected area has been the subject of actions in the Land and Environment Court.

1986: *Bellinger Flood Study, NSW*

The study involved development of a flood model to predict flood behaviour in the lower reaches of the Bellinger River. A hydrologic model was established for the 800 square kilometre catchment and calibrated against recorded floods. A hydraulic model was established for the Bellinger River and its tributary, the Kalang, and covered approximately 50 kilometres of river. A quasi-two-dimensional hydraulic model was used.

1985: *Woronora River Flood Study, Sydney*

The study involved development of hydrologic and hydraulic models for the tidal sections of the Woronora River on the southern outskirts of Sydney. The hydraulic model involved a one-dimensional unsteady-state tidal model.

1985: *Bundeena Flood Mitigation Works, Sydney*

The study involved investigation of the causes of flooding and development of a series of works to reduce flooding in the township of Bundeena, which is located by a coastal lagoon. The catchment covers 290 hectares. The works recommended involve a series of channel works and a large retention basin.

1984: *Lower Narara Creek, Gosford, NSW Central Coast*

The study involved development of a model with a complex two-dimensional unsteady state hydraulic model of the floodplain.

1983: *Cooks River, Sydney, NSW*

The study involved development of a runoff routing model with a one-dimensional steady state hydraulic model for 13 kilometres of the Cooks River through suburban Sydney.

1983: *Singleton Floodplain Study, Hunter River, NSW*

This study involved investigation of levee works and required establishment of a two-dimensional hydraulic model of 10 kilometres of floodplain of the Hunter River around Singleton.

1982: *Tumbi Umbi Creek, NSW Central Coast*

The Tumbi Umbi Creek catchment covers about 25 square kilometres. The study involved establishment of a runoff routing model and a one-dimensional hydraulic model to determine the impact of urban development in the catchment and to propose mitigation measures.

1982: *Cut Rock Creek, NSW Central Coast*

The Cut Rock Creek catchment covers about 55 square kilometres. The study brief was similar to the Tumbi Umbi Catchment above.

RIVERINE INVESTIGATIONS

Mr Paterson has acted as project manager/engineer for the following investigations of localised riverine problems:

2003 - 2004: *Moree By-pass*

The previous investigations into the Moree By-pass involved one-dimensional modelling. The RTA commissioned a two dimensional model of the area to confirm the afflux predictions. The model was created using a finite element system covering some 25 sq kilometres and involved about 15,000 elements. The results were similar to the one-dimensional results.

2000 - 2003: *Highway Rehabilitation Programs, NSW*

The NSW RTA are undertaking extensive road rehabilitation. Paterson Consultants have provided flood impact assessments for the following works:

- Newell Highway, Gwydir River, 5 km of works;
- Gwydir Highway, Gwydir River, 15 km of works;
- Kamilaroi Highway, Namoi River, 10 km of works.

2002: *Blue Angle Creek Flood Study, Gerroa*

Blue Angle Creek is a tributary to Crooked River, which has a total catchment of some 32 sq kilometres. The floodplain is behind a coastal dune system, with ground levels at 2 metres above sea level. The entrance of Crooked River is intermittently open and closed due to coastal conditions. The flood study involved detailed modelling of the entrance breakout, together with coastal dynamics and hydrological response of the catchment.

2001: *Rail Underbridge, Gurley, NSW*

Following a 1:100 year ARI flood in 2001, State Rail sought to reduce washouts at rail underbridge by increasing opening size. The investigation at Gurley showed the principal issue related to downstream levels and that major track lifts, not simply increased openings, were required.

2001: *Sg Sebelak Padi Irrigation Scheme Feasibility Study, Sarawak*

The Malaysian government is pursuing a policy of increasing the rice production on a national scale.

Sg Sebelak Padi Scheme represents a 4000 ha system in coastal Sarawak. The specific issues addressed in the feasibility study were:

- availability of water for irrigation, assessed by daily rainfall models;
- daily water balance in padi field, allowing for crop usage, evaporation, rainfall and supplementary irrigation;
- saline intrusion into the irrigation off-take points, given a 5 metre tidal range at the off-takes;
- drainage and local pondage.

2000: *Moree Bypass, Moree*

The Moree Bypass crossed the floodplain of the Mehi River and had potential to cause major redistribution of flood flows. The investigation, using MIKE-11 recommended vertical profiles and waterway opening size and location to minimise any adverse impacts on flooding.

1998: *Shark Creek Deviation, Pacific Highway, Grafton*

As part of the Pacific Highway enhancement program, the RTA propose to raise the highway by 0.75 metres over a distance of 4 kilometres along the floodplains of the South Arm of the Clarence River and Shark Creek. Hydrodynamic modelling was undertaken using MIKE-11 to address the concerns of local cane growers. The model was calibrated against 1996 flood and received favourable comment from local residents.

1994: *Batang Rajang Bridge - Sarawak, Malaysia*

Batang Rajang is the largest river in Sarawak having a catchment of some 40 000 square kilometres. The Batang Rajang bridge will replace the existing ferry at Durin which is the last ferry on the First Trunk Road (between Kuching and Kota Kinabalu).

The bridge crossing is some 600 metres wide. The hydraulics investigation involved collection of original data and establishment of an hydrologic and hydraulic model to identify flood level recurrence intervals, flood discharges and velocities and to assess scour at the site. Likely scour at the site was assessed at 10 metres below normal bed depth.

1993: *Bangalow Bypass - Culvert Investigations*

A new by-pass for Bangalow is under construction and involves fill heights of 15 metres above 2.5 metre diameter corrugated steel culverts. Inspections prior to opening revealed the culverts had failed structurally. The investigation concentrated on the hydrology and hydraulics of the culvert system to provide recommendations for remedial works.

1993: *Proposed Upgrading of Pacific Highway, McIntyres Lane - Flood Impacts*

The RTA is increasing the road height of a low section of the Pacific Highway over a 1.5 kilometre section adjacent to the South Arm of the Clarence River. The investigation reviewed existing flood behaviour, changes to flood behaviour and likely changes to drainage of the surrounding agricultural enterprises (chiefly sugar cane farming).

1991-92: *Summerland Way Bridge Crossings, Myrtle and Deep Creeks*

Myrtle and Deep Creeks have catchments in excess of 50 square kilometres. These studies involved selection and siting of appropriate bridge openings for new highway crossings.

Both studies involved establishment of rainfall-runoff models and quasi-two-dimensional hydraulic models of the river systems. The areas modelled were some 8 kilometres long by 3 kilometres wide in each case.

1990: *Bridge Crossing - Bellinger River at Raleigh*

This investigation examined the impact of various routes and bridge opening configurations for the Bellinger and Kalang Rivers between Raleigh and Urunga. Local factors addressed included flow velocities, affluxes created, impacts on future and existing development.

1990: *Pacific Highway Road Works, Grafton to Maclean*

This investigation reviewed the local impacts of changes to the Pacific Highway over a 50 kilometre flood-labile section of highway between Grafton and Maclean. The impacts were identified between severe and negligible and compensatory works reviewed.

1989: *Macksville Education Centre, Access Road*

The Macksville Education Centre is located on high ground surrounded by a wide floodplain. The study examined the appropriate level for the access road being the optimum combination of road height, infrequency and duration of loss of access, detrimental impacts on flood behaviour and roadworks cost.

1989: *Pacific Highway Improvements, Coffs Harbour*

This investigation examined the hydraulic implications of raising some 500 metres of a low-lying section of the Pacific Highway through Coffs Harbour. The study proposed a series of works such that the flood liability of the upstream residential areas was not worsened.

1988: *Surveyors Creek, Penrith*

Surveyors Creek, Penrith, floods from the rainfall over its own catchment or overflow from the Nepean River system. The study investigated various ways the creek system could be improved to enable development of surrounding lands.

1987: *Coffs Creek Improvements, Coffs Harbour NSW*

The investigation collected all available flood data at the site, established and calibrated hydrological models of the catchment and hydraulic models of the bridge site and recommended appropriate bridge openings and configurations to provide an economical flood free route whilst reducing the afflux on upstream development.

1985: *Bridge Crossing of the Murray River at Howlong, Corowa and Robinvale*

These investigations examined existing flood behaviour and proposed new bridge crossing parameters based on local factors such as flood levels, flow velocities, geomorphology road alignment, existing and future development.

1985: *Bridge Crossing of the Williams River at Dungog, NSW*

This study had a similar brief to the Murray River Bridges above. A two-dimensional flow model of the floodplain was established to effectively determine bridge affluxes.

1984: *Bridge Crossing of The Wollombi Brook at Bulga*

This study investigated appropriate locations considering flood behaviour, route alignments and existing developments. Geomorphology was a major consideration given the historical substantial changes on the river's course.

1984: *Bellinger River. Geomorphology Study, NSW North Coast*

The study examined the lower 25 kilometres of the Bellinger and Kalang Rivers leading to production of the likely bank erosion in the next 100 years and preparation of erosion hazard maps for the area investigated.

1983: *Bridge Crossing of The Boyd River at Dalmorton, NSW North Coast*

The bridge is a low-level bridge. However, the river has historically been subjected to very high flow velocities, requiring particular investigation of the hydrology and bed movement.

SEDIMENTS, INVESTIGATION AND CONTROL

Mr Paterson has acted as project manager/engineer on a number of projects with significant components of sedimentation, geomorphology and sediment and pollution control measures. Recent projects include:

2000: *Design Improvements, Rural Drainage Schemes, Acid Sulphate Soils Program (ASSPRO)*

Many NSW flood mitigation schemes were constructed with deep drainage. It is now appreciated that this has exposed acid sulphate soils, creating highly acidic "slugs" of water in the drains, with adverse impact on fisheries and agricultural production. The study examined ways and means to obtain better environmental outcomes for flood mitigation. A primary concept shift was proposed to allow more productivity from low lying back swamps.

1998 - 2000: *Nutrient Management Plans, Tweed and Richmond Rivers*

Urban development, intensive agriculture and sewerage treatment plants were seen as major contributors to high nitrogen and phosphorus levels, leading to blue-green algae in the Tweed and Richmond Rivers. The Nutrient Management Plans addressed relative nutrient contributions by point and diffuse sources, outlined measures to reduce nutrients, and sought to quantify the reduction in nutrients from various strategies.

1998: *Beardy Waters Dredging EIS*

Beardy Waters is a small dam providing water supply to Glen Innes. The Glen Innes Council proposed dredging the storage to increase water supply security. The EIS involved detailed investigation of sedimentation changes over time, dredging and spoil disposal methods and environmental impacts. The EIS recommended the project not proceed, given the uncertainty that the project benefits could be achieved and commercial risk to Council.

1992: *Darling Mills Creek Bank Protection Works*

The Upper Parramatta River Catchment Trust prepared an EIS for a single flood mitigation structure on Darling Mills Creek.

As part of this program, bank protection works were investigated and a five year works and maintenance program prepared to reduce the possible impact on bank stability caused by the flood mitigation structure's construction.

1987: *Tumbi Umbi Creek, Bank Protection, NSW Central Coast*

Tumbi Umbi Creek has major bank erosion over about one kilometre of its length. The erosion is affecting neighbouring properties and gardens. Preliminary design of works was completed to prevent further bank erosion and reduce flood levels.

1987: *South Grafton Levee Scheme, Bank Protection*

A bank protection and management plan was prepared for the Clarence River at Grafton. This was based on site inspections, photogrammetric analysis of historical aerial photographs and calculations of river behaviour. The recommended plan involves components of rock protection, bank stabilisation and a regular monitoring process.

1987: *Bellinger Flood Study, NSW*

The lower five kilometres of the Bellinger River system are subject to significant scour. To enable accurate prediction of flood levels, Mr Paterson developed a scour prediction model parallel to the riverine hydraulic model. The scour model performance was confirmed against historical survey data.

1984: *Bellinger River, Geomorphology Study, NSW North Coast*

The study examined the lower 25 kilometres of the Bellinger and Kalang Rivers leading to production of the likely bank erosion in the next 100 years and preparation of erosion hazard maps for the area investigated.

1984: *Australia's Wonderland, Blacktown, Western Sydney*

The detail design phase involved design and documentation for all internal drainage, major water features and four major retention basins for the 42 hectare "fun fair" site. Each basin incorporated significant sediment pollutant control measures to reduce sedimentation downstream and to improve runoff quality.

RIVER BASIN STUDIES

Mr Paterson has been involved in a number of large multi-disciplinary river basin studies. His input has been in the area of floodplain management, flood mitigation works and river control and improvement. Recent projects include:

2001: *Sg Sebelak Padi Irrigation Scheme Feasibility Study, Sarawak*

The Malaysian government is pursuing a policy of increasing the rice production on a national scale.

Sg Sebelak Padi Scheme represents a 4000 ha system in coastal Sarawak. The specific issues addressed in the feasibility study were:

- availability of water for irrigation, assessed by daily rainfall models;
- daily water balance in padi field, allowing for crop usage, evaporation, rainfall and supplementary irrigation;
- saline intrusion into the irrigation off-take points, given a 5 metre tidal range at the off-takes;
- drainage and local pondage.

1998: *Sg Sarawak Environmental Study, Sarawak*

The Sg Sarawak study examined the environmental issues along the river length. Paterson Consultants addressed the flooding and drainage issues. The principal work was directed to the long term protection options for Kuching.

1985: *Murray River Flood Mitigation Study*

This study is a broad scale investigation of flooding along the Murray River with proposal and review of flood mitigation options.

1981: *Water Development, Hastings, Macleay and Bellinger Rivers, NSW North Coast*

This study involved investigation of existing and potential demand for water in the three valleys and methods of meeting such demand from existing and proposed developments of water resources.

1980: *Bah Bolon River, North Sumatra, Indonesia (an ADAB funded project)*

The project is a multi-disciplinary irrigation development project covering about 12,000 hectares of irrigated rice fields. Mr Paterson was responsible for the flood control and river improvement programs covering about 100 kilometres of river.

1977: *Serang River Project, Central Java, Indonesia (a World Bank funded project)*

The Serang River Project covers development of some 18,000 hectares of irrigated land and rehabilitation of about 60,000 hectares of highly productive rice fields at an estimated cost of U.S. \$200 million (1976).

Mr Paterson was responsible for:

- * Investigation of alternative flood control schemes of the Serang River including assessment of likely sedimentation and the effective life of such schemes.
- * Preliminary design of the recommended scheme.
- * Functional drainage design of 4,000 hectares of rice fields, the bulk of which lie below high tide level.

Wyong Shire Council - wscspd

From: Paterson Consultants P/L [patcon@nor.com.au]
Sent: Sunday, 21 January 2001 15:29
To: Wyong Shire Council - wscspd
Subject: For Tom Wallace



Compare.txt



Comparis.fm3



Comparis.wk3



Pwdxs.hec



ATT00398.txt

patcon deleted

Hello Tom

Further to your querie regarding the dredging of Tumbi Creek, downstream of the boat ramp.

I have undertaken a specific analysis as follows:-

- (a) I set up a new Tumbi model with a channel called "NAV-CHAN" downstream of the confluence of Killarney Vale
- (b) Cross-sections used were Sections Numbered 31,37,39 and 41 from your fax of 16 January 2001
- (c) Cross-sections were extended onto left and right overbanks using original PWD survey
- (d) Three models of the "Navigation Channel (NAV-CHAN) were set up :-
Model #1 with sections as surveyed and adjusted for overbank
Model #2 with sections 37, 39 and 41 silted to RL 0.0 m AHD
Model #3 with sections 37, 39 and 41 silted to RL 0.2 m AHD
- (e) Three models were run for design 1% AEP, 9 hour duration event and 20% AEP, 9 hour duration event
- (f) Results are tabulated in the attached Lotus 123 files for

Tumbi Creek from Wyong Road to Killarney Vale confluence
Killarney Vale trib from Wyong road to Tumbi confluence
Navigation channel from Tumbi/Killarney Vale tributary to a notional outlet
250 metres downstream from Section 41

The difference in flood levels are also quoted

Regards
Bill Paterson

PS I have also attached HEC format of PWD sections.
9B

file names have been retained and the files moved into H:\floodlay\models\tumbi (The Pwdxs.hec appear to be the same as provided 24/2/2000 - file ext is 84.kim and extxs88.kim) Comparis wk3 has also been saved a EXCEL file Comparis.xls

Results from Paterson Consultants 22/1/01 for effect of siltation of Tumbi Creek mouth.

COMPARISON OF SILTATION

Y006 RD

at Killarney

CHANNEL	DIST.	DESIGN FLOOD LEVELS 1% AEP 9HR			DIFFERENCE	
		WSC88 SURV	WSC TO 0.0	WSC TO 0.2	COL D - COLC	COL E - COLC
TUMBI	4.900	4.07	4.08	4.08	0.009	0.013
TUMBI	4.910	4.05	4.06	4.06	0.010	0.013
TUMBI	4.970	4.01	4.02	4.03	0.010	0.014
TUMBI	5.040	3.97	3.99	3.99	0.011	0.015
TUMBI	5.080	3.95	3.96	3.97	0.012	0.017
TUMBI	5.080	3.95	3.96	3.97	0.012	0.017
TUMBI	5.090	3.84	3.85	3.86	0.013	0.018
TUMBI	5.110	3.25	3.26	3.27	0.017	0.023
TUMBI	5.120	2.85	2.87	2.88	0.022	0.030
TUMBI	5.150	2.37	2.43	2.45	0.060	0.080
TUMBI	5.350	2.03	2.13	2.16	0.103	0.135
TUMBI	5.550	1.80	1.94	1.98	0.138	0.179
TUMBI	5.700	1.61	1.79	1.84	0.180	0.231
TUMBI	5.750	1.59	1.78	1.83	0.190	0.243
TUMBI	5.750	1.59	1.78	1.83	0.190	0.243
TUMBI	6.000	1.41	1.68	1.75	0.274	0.341
KILLARNEY	1.790	2.98	3.01	3.01	0.033	0.036
KILLARNEY	1.910	2.84	2.89	2.89	0.044	0.049
KILLARNEY	1.972	2.80	2.85	2.86	0.049	0.054
KILLARNEY	2.010	2.78	2.83	2.83	0.051	0.056
KILLARNEY	2.133	2.68	2.75	2.75	0.063	0.069
KILLARNEY	2.256	2.54	2.63	2.63	0.082	0.090
KILLARNEY	2.363	2.31	2.45	2.45	0.134	0.138
KILLARNEY	2.380	2.26	2.41	2.41	0.153	0.157
KILLARNEY	2.380	2.26	2.41	2.41	0.153	0.157
KILLARNEY	2.400	1.87	2.08	2.07	0.207	0.202
KILLARNEY	2.400	1.87	2.08	2.07	0.207	0.202
KILLARNEY	2.405	1.85	2.07	2.06	0.217	0.211
KILLARNEY	2.477	1.68	1.94	1.93	0.259	0.250
KILLARNEY	2.660	1.40	1.68	1.75	0.281	0.347
KILLARNEY	2.700	1.41	1.68	1.75	0.274	0.341
NAV-CHAN	0.025	1.41	1.68	1.75	0.274	0.341
NAV-CHAN	0.085	1.39	1.66	1.73	0.273	0.341
NAV-CHAN	0.175	1.32	1.59	1.66	0.275	0.344
NAV-CHAN	0.225	1.30	1.55	1.61	0.247	0.307
NAV-CHAN	0.280	1.29	1.51	1.57	0.226	0.279
NAV-CHAN	0.362	1.23	1.43	1.47	0.194	0.238
NAV-CHAN	0.443	1.17	1.30	1.32	0.130	0.149
NAV-CHAN	0.525	1.10	1.10	1.10	0.000	0.000

see table version 2/01

W30 / 1/200

Results from Paterson Consultants 22/1/01 for effect of siltation of Tumbi Creek mouth.

CHANNEL	DIST.	DESIGN FLOOD LEVELS 20% AEP 9HR			DIFFERENCE	
		C	D	E	COL D - COL C	COL E - COL C
		WSC88 SURV	WSC TO 0.0	WSC TO 0.2		
<i>reg del</i> TUMBI	4.900	3.18	3.19	3.19	0.009	0.013
TUMBI	4.910	3.17	3.18	3.18	0.009	0.013
TUMBI	4.970	3.12	3.13	3.13	0.011	0.015
TUMBI	5.040	3.02	3.03	3.04	0.015	0.020
TUMBI	5.080	2.91	2.93	2.93	0.018	0.025
TUMBI	5.080	2.91	2.93	2.93	0.018	0.025
TUMBI	5.090	2.83	2.85	2.86	0.020	0.028
TUMBI	5.110	2.48	2.51	2.52	0.029	0.041
TUMBI	5.120	2.18	2.22	2.23	0.038	0.053
TUMBI	5.150	1.70	1.81	1.85	0.110	0.151
TUMBI	5.350	1.42	1.59	1.65	0.174	0.234
TUMBI	5.550	1.27	1.48	1.55	0.217	0.288
TUMBI	5.700	1.13	1.39	1.47	0.265	0.347
TUMBI	5.750	1.10	1.38	1.47	0.285	0.370
TUMBI	5.750	1.10	1.38	1.47	0.285	0.370
<i>flue</i> TUMBI	6.000	0.90	1.29	1.41	0.392	0.504
<i>reg M</i> KILLARNEY	1.790	2.43	2.43	2.45	0.001	0.018
KILLARNEY	1.910	2.31	2.32	2.34	0.007	0.026
KILLARNEY	1.972	2.28	2.29	2.31	0.010	0.029
KILLARNEY	2.010	2.25	2.27	2.28	0.012	0.031
KILLARNEY	2.133	2.16	2.18	2.20	0.018	0.044
KILLARNEY	2.256	2.01	2.04	2.07	0.033	0.065
KILLARNEY	2.363	1.75	1.81	1.87	0.066	0.118
KILLARNEY	2.380	1.68	1.76	1.82	0.079	0.137
KILLARNEY	2.380	1.68	1.76	1.82	0.079	0.137
KILLARNEY	2.400	1.56	1.67	1.73	0.113	0.171
KILLARNEY	2.400	1.56	1.67	1.73	0.113	0.171
KILLARNEY	2.405	1.55	1.67	1.73	0.114	0.173
KILLARNEY	2.477	1.42	1.56	1.64	0.136	0.222
KILLARNEY	2.660	0.91	1.30	1.41	0.389	0.500
<i>flue</i> KILLARNEY	2.700	0.90	1.29	1.41	0.392	0.504
<i>flue</i> NAV-CHAN	0.025	0.90	1.29	1.41	0.392	0.504
NAV-CHAN	0.085 <i>0.0837</i>	0.90	1.30	1.40	0.395	0.501
NAV-CHAN	0.175	0.84	1.23	1.34	0.392	0.506
NAV-CHAN	0.225 <i>37</i>	0.83	1.18	1.29	0.353	0.456
NAV-CHAN	0.280	0.81	1.14	1.24	0.332	0.431
NAV-CHAN	0.362 <i>39</i>	0.74	1.03	1.12	0.286	0.381
NAV-CHAN	0.443	0.65	0.84	0.93	0.187	0.277
<i>ke</i> NAV-CHAN	0.525 <i>41</i>	0.50	0.50	0.50 <i>rfwell</i>	0.000	0.000

STREET_NO	STREET	UNITS_ON_G	G_L_E_D	L_H_F
13	Yimbala St	1	2.63	3.45
14	Yimbala St	1	2.975	3.18
15	Yimbala St	1	2.5	3.08
16	Yimbala St	1	2.59	3.15
17	Yimbala St	1	2.18	2.41
18	Yimbala St	0	2.15	4.96
19	Yimbala St	1	2.04	2.62
20	Yimbala St	1	2.21	2.84
21	Yimbala St			
22	Yimbala St	1	1.93	3.16
23	Yimbala St	1	1.86	2.75
24	Yimbala St	1	1.74	2.05
25	Yimbala St	1	2.06	2.23
26	Yimbala St	1	1.68	2.73
27	Yimbala St	0	2.24	2.53
28	Yimbala St	1	1.71	2.3
29	Yimbala St	1	2.28	2.53
29	Yimbala St	1	2.52	2.94
30	Yimbala St	1	1.51	2.05
31	Yimbala St	0	2.66	5.91
32	Yimbala St	1	1.52	2.74
34	Yimbala St	1	1.6	2.74
36	Yimbala St	1	1.61	2.34
38	Yimbala St	1	1.67	2.21
40	Yimbala St	1	1.74	1.87
42	Yimbala St	1	1.76	2.31
44	Yimbala St	1	2.14	2.96
46	Yimbala St	1	1.99	3.05
48	Yimbala St	1	1.91	2.68
50	Yimbala St	1	1.93	3
54	Yimbala St	0	2.9	3.46
56	Yimbala St	1	2.53	3.07
4	Warratta Rd	1	2.51	3.17
6	Warratta Rd	1	2.42	2.54
7	Warratta Rd	1	2.61	3.24
8	Warratta Rd	1	2.28	2.78
9	Warratta Rd	1	2.53	3.1
10	Warratta Rd	1	2.23	2.93
11	Warratta Rd	1	2.42	2.81
12	Warratta Rd	1	2.39	2.96
13	Warratta Rd	1	2.33	2.89
14	Warratta Rd	1	2.01	2.37
15	Warratta Rd	1	2.45	3
16	Warratta Rd	1	2.02	2.62
17	Warratta Rd	1	2.28	2.61
18	Warratta Rd	1	2.17	2.67
19	Warratta Rd	1	2.04	2.6
20	Warratta Rd	1	2.18	3.02
21	Warratta Rd	1	1.96	2.76
22	Warratta Rd	1	2.13	2.55
23	Warratta Rd	1	1.94	2.5
24	Warratta Rd	1	1.95	2.26
25	Warratta Rd	1	2.05	2.55

*all
further storage*

effect

existing level

Sections of Tunkia Creek

Values typed off drawing 7635

All sections were done
& filed with survey section.

file w 30/31800.

31	15.000	0.960
	12.361	0.740
	10.526	0.182
	9.503	0.001
	3.242	1.191
	0.000	-0.177
	3.070	-1.563
	3.294	-1.505
	4.221	-1.221
	7.944	0.224
	8.822	1.157
	9.170	1.298
	14.023	1.298
	33	15.000
13.448		0.546
11.532		0.023
11.240		-0.020
8.333		-0.883
8.035		-0.966
7.036		-0.988
7.036		-0.949
0.000		-0.849
8.270		-0.731
8.425		-0.700
11.199		0.676
11.213		0.701
15.000		0.870
35	15.000	0.820
	12.384	0.785
	12.362	0.783
	9.194	0.137
	6.133	-1.170
	6.006	-1.215
	0.000	-1.096
	5.548	-1.000
	6.045	-0.977
	10.011	0.148
	11.144	0.740
	37	15.000
12.457		0.763
11.076		0.144
8.188		-0.576
5.554		-0.683
5.522		-0.729
0.000		-0.771
7.671		-0.767
8.314		-0.792
12.945		0.075
13.239		0.792
13.432		0.806
15.000		0.866
39		13.370
	12.483	0.147
	12.445	0.159
	10.524	-0.212
	4.717	-1.273
	0.000	-1.226
	1.617	-1.209

	4.689	-1.145
	9.697	-0.255
	11.622	0.100
	12.668	0.331
	14.640	0.766
	15.000	0.777
41	15.000	0.483
	12.021	0.121
	9.887	-0.312
	9.681	-0.343
	2.300	-0.599
	0.000	-0.579
	9.774	-1.008
	14.647	0.536
	15.000	0.546
42	15.000	0.035
	11.179	-0.378
	0.000	-0.377
	9.983	-0.376
	11.330	-0.423
	11.669	-0.315
	13.365	0.028
	15.000	0.235

STAFF MEMORANDUM

trw:trw
W30/31800
January 23 2001

Mr K Yates Director of Strategic Planning.
Mr D Cathers Director of Engineering Services

Re Tumbi Creek Siltation and Dredging. Preliminary Assessment of Flood Effects.

Attached is spreadsheet "comparis.xls" which shows significant effects resulting from the present siltation of Tumbi Creek mouth compared to the 1987-89 survey (other surveys were similar)

The results are given for:-

1. Tumbi Creek main branch from Wyong Rd downstream to the confluence
2. Killarney Branch from Wyong Rd downstream to the confluence
3. Tumbi Creek from the confluence downstream to about 250m beyond the shore of Tuggerah Lake. This section is labelled "NAV-CHAN".

The results (absolute values and differences) are given for :-

- a. 1% event with lake at 1.1m and silt to 0.0m in the NAV-CHAN
- b. 1% event with lake at 1.1m and silt to 0.2m (present lake level is 0.24)
- c. 1% event with lake at 0.5m and silt to 0.0m
- d. 1% event with lake at 0.5m and silt to 0.2m
- e. 20% event with lake at 0.5m and silt to 0.0m
- f. 20% event with lake at 0.5m and silt to 0.2m

The significance is indicated by case d. where the difference between the 1% base case and silt to 0.2m is 0.49m at the confluence (100 – 200m upstream of the footbridge and boatramp). The absolute values increase from 1.209 to 1.699m.

There are at least nine properties in the area of The peninsula and Lakedge Ave with ground below 1.5m, four with floors below 1.8m and three with non-habitable floors near ground level.

The changes in 1% level in the Warratta Rd area vary between 140mm and 50mm over the 450m upstream of Adelaide St culverts.

Submitted for yor information.


T R Wallace

DESIGN ENGINEER (FLOODING)

Pls file


Results from Paterson Consultants 22/1 and 24/1 for effect of siltation of Tumbi Creek mouth.

COMPARISON OF SILTATION (Note tailwater for 1% case is high)							Results 24/01/01 with lower 1% tail		
CHANNEL	DIST.	DESIGN FLOOD LEVELS 1% AEP			DIFFERENCES		DESIGN FLOOD LEVELS 1% AEP 9HR		
		Col C	Col D	Col E	(m)		Silt to 0.2m		
		WSC88 SURV	Silt to 0.00	Silt to 0.2	COL D - COLC	COL E - COLC	NAVCH 0.5	NAVSL 0.5	Difference (m)
TUMBI	4.900	4.07	4.08	4.08	0.009	0.013	4.065	4.079	0.014
TUMBI	4.910	4.05	4.06	4.06	0.010	0.013	4.041	4.056	0.015
TUMBI	4.970	4.01	4.02	4.03	0.010	0.014	4.008	4.023	0.015
TUMBI	5.040	3.97	3.99	3.99	0.011	0.015	3.97	3.986	0.016
TUMBI	5.080	3.95	3.96	3.97	0.012	0.017	3.943	3.962	0.019
TUMBI	5.080	3.95	3.96	3.97	0.012	0.017	3.943	3.962	0.019
TUMBI	5.090	3.84	3.85	3.86	0.013	0.018	3.835	3.855	0.02
TUMBI	5.110	3.25	3.26	3.27	0.017	0.023	3.241	3.265	0.024
TUMBI	5.120	2.85	2.87	2.88	0.022	0.030	2.843	2.875	0.032
TUMBI	5.150	2.37	2.43	2.45	0.060	0.080	2.353	2.438	0.085
TUMBI	5.350	2.03	2.13	2.16	0.103	0.135	1.987	2.135	0.148
TUMBI	5.550	1.80	1.94	1.98	0.138	0.179	1.751	1.951	0.2
TUMBI	5.700	1.61	1.79	1.84	0.180	0.231	1.53	1.798	0.268
TUMBI	5.750	1.59	1.78	1.83	0.190	0.243	1.503	1.788	0.285
TUMBI	5.750	1.59	1.78	1.83	0.190	0.243	1.503	1.788	0.285
TUMBI	6.000	1.41	1.68	1.75	0.274	0.341	1.209	1.699	0.49
KILLARNEY	1.790	2.98	3.01	3.01	0.033	0.036	2.975	3.009	0.034
KILLARNEY	1.910	2.84	2.89	2.89	0.044	0.049	2.843	2.889	0.046
KILLARNEY	1.972	2.80	2.85	2.86	0.049	0.054	2.801	2.852	0.051
KILLARNEY	2.010	2.78	2.83	2.83	0.051	0.056	2.776	2.83	0.054
KILLARNEY	2.133	2.68	2.75	2.75	0.063	0.069	2.683	2.748	0.065
KILLARNEY	2.256	2.54	2.63	2.63	0.082	0.090	2.541	2.627	0.086
KILLARNEY	2.363	2.31	2.45	2.45	0.134	0.138	2.31	2.449	0.139
KILLARNEY	2.380	2.26	2.41	2.41	0.153	0.157	2.254	2.413	0.159
KILLARNEY	2.380	2.26	2.41	2.41	0.153	0.157	2.254	2.413	0.159
KILLARNEY	2.400	1.87	2.08	2.07	0.207	0.202	1.867	2.077	0.21
KILLARNEY	2.400	1.87	2.08	2.07	0.207	0.202	1.867	2.077	0.21
KILLARNEY	2.405	1.85	2.07	2.06	0.217	0.211	1.848	2.068	0.22
KILLARNEY	2.477	1.68	1.94	1.93	0.259	0.250	1.585	1.934	0.349
KILLARNEY	2.660	1.40	1.68	1.75	0.281	0.347	1.213	1.699	0.486
KILLARNEY	2.700	1.41	1.68	1.75	0.274	0.341	1.209	1.699	0.49
NAV-CHAN	0.025	1.41	1.68	1.75	0.274	0.341	1.209	1.699	0.49
NAV-CHAN	0.085	1.39	1.66	1.73	0.273	0.341	1.202	1.674	0.472
NAV-CHAN	0.175	1.32	1.59	1.66	0.275	0.344	1.09	1.598	0.508
NAV-CHAN	0.225	1.30	1.55	1.61	0.247	0.307	1.055	1.526	0.471
NAV-CHAN	0.280	1.29	1.51	1.57	0.226	0.279	1.031	1.465	0.434
NAV-CHAN	0.362	1.23	1.43	1.47	0.194	0.238	0.913	1.311	0.398
NAV-CHAN	0.443	1.17	1.30	1.32	0.130	0.149	0.725	1.089	0.364
NAV-CHAN	0.525	1.10	1.10	1.10	0.000	0.000	0.5	0.5	0

Results from Paterson Consultants 22/1 and 24/1 for effect of siltation of Tumbi Creek mouth.

CHANNEL	DIST.	DESIGN FLOOD LEVELS 20% AEF DIFFERENCE				
		Col C	Col D	Col E		
		WSC88 SURV	WSC TO 0.0	WSC TO 0.2	COL D - COL C	COL E - COL C
TUMBI	4.900	3.18	3.19	3.19	0.009	
TUMBI	4.910	3.17	3.18	3.18	0.009	
TUMBI	4.970	3.12	3.13	3.13	0.011	
TUMBI	5.040	3.02	3.03	3.04	0.015	
TUMBI	5.080	2.91	2.93	2.93	0.018	
TUMBI	5.080	2.91	2.93	2.93	0.018	
TUMBI	5.090	2.83	2.85	2.86	0.020	
TUMBI	5.110	2.48	2.51	2.52	0.029	
TUMBI	5.120	2.18	2.22	2.23	0.038	
TUMBI	5.150	1.70	1.81	1.85	0.110	
TUMBI	5.350	1.42	1.59	1.65	0.174	
TUMBI	5.550	1.27	1.48	1.55	0.217	
TUMBI	5.700	1.13	1.39	1.47	0.265	
TUMBI	5.750	1.10	1.38	1.47	0.285	
TUMBI	5.750	1.10	1.38	1.47	0.285	
TUMBI	6.000	0.90	1.29	1.41	0.392	
KILLARNEY	1.790	2.43	2.43	2.45	0.001	
KILLARNEY	1.910	2.31	2.32	2.34	0.007	
KILLARNEY	1.972	2.28	2.29	2.31	0.010	
KILLARNEY	2.010	2.25	2.27	2.28	0.012	
KILLARNEY	2.133	2.16	2.18	2.20	0.018	
KILLARNEY	2.256	2.01	2.04	2.07	0.033	
KILLARNEY	2.363	1.75	1.81	1.87	0.066	
KILLARNEY	2.380	1.68	1.76	1.82	0.079	
KILLARNEY	2.380	1.68	1.76	1.82	0.079	
KILLARNEY	2.400	1.56	1.67	1.73	0.113	
KILLARNEY	2.400	1.56	1.67	1.73	0.113	
KILLARNEY	2.405	1.55	1.67	1.73	0.114	
KILLARNEY	2.477	1.42	1.56	1.64	0.136	
KILLARNEY	2.660	0.91	1.30	1.41	0.389	
KILLARNEY	2.700	0.90	1.29	1.41	0.392	
NAV-CHAN	0.025	0.90	1.29	1.41	0.392	
NAV-CHAN	0.085	0.90	1.30	1.40	0.395	
NAV-CHAN	0.175	0.84	1.23	1.34	0.392	
NAV-CHAN	0.225	0.83	1.18	1.29	0.353	
NAV-CHAN	0.280	0.81	1.14	1.24	0.332	
NAV-CHAN	0.362	0.74	1.03	1.12	0.286	
NAV-CHAN	0.443	0.65	0.84	0.93	0.187	
NAV-CHAN	0.525	0.50	0.50	0.50	0.000	

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File with D. CATERS
File
Attach

24 April 2001
Our Ref: 01-012

The General Manager
Wyong Shire Council
P O Box 20
Wyong NSW 2259

Attention: Mr T Wallace

Dear Sir

Re: Tumbi Creek
Dredging of Navigation Channel

WYONG SHIRE COUNCIL			
Doc. No.		439297	
REC'D 27 APR 2001			
ACT	INFO	DEPT	FILE No.
	✓	TRW	W 30/31800

We are writing in response to your "fax" of 30 March 2001 regarding the possible dredging of the outflow point of Tumbi Creek into Tuggerah Lake.

We have modelled the possible dredging by alteration of the Tumbi Flood Study model. The alterations included:

- inclusion of survey cross-sections downstream of the confluence of Tumbi Creek and the Killarney Vale Tributary. This change was made in January 2001 and used Wyong Shire Council survey dated 1988 - 1989 (WSC Drawing 7635).
- inclusion of a newer cross-sections downstream of the Boat Ramp using cross-sections derived from the Chase & Harvey Survey (April 2000). A separate channel titled "DREDGE" was established for these sections.

The channel identifications adopted and cross-sections used in the various separate models of Tumbi Creek are given in Tables 1 and 2 below.

*Noted. Confirms fax 10/4/01.
Memos written April ~ 1/5/01.
Attach to file
22/1/01.*

.../2

Table 1
Comparison of Flood Models

Purpose	Channel Links	Cross-sections
Flood Study	Tumbi 5.08 to Tumbi 6.0 Tumbi 6.0 to Tumbi 6.5	TUMBI 5.04, 5.08, 5.09, 5.11, 5.12, 5.15, 5.35, 5.55 TUMBI 5.7, 6.0 and 6.25
Siltation Review (January 2001)	Tumbi 5.08 to Tumbi 6.0 NAV_CH 0.025 to NAV_CH 0.525	As for Flood Study NAV_CH 0.0, 0.085, 0.175, 0.225, 0.280
Dredging Review	Tumbi 5.08 to Tumbi 6.0 NAV_CH 0.025 to NAV_CH 0.235 DREDGE 0.0 to DREDGE 0.24	As for Flood Study NAV_CH 0.0, 0.085, 0.175, 0.225, 0.28 DREDGE 0.0, 0.020, 0.040, 0.060, 0.080, 0.100, 0.120, 1.140, 0.160, 0.18, 0.20, 0.22, 0.24

Table 2
Topographical Points

Location	Appropriate Point
Tumbi Creek, Wyong Road Bridge	TUMBI 4.9
Tumbi Creek - Killarney Tributary Confluence	TUMBI 6.0
Boat Ramp	NAV_CH 0.235 DREDGE 0.0

With respect to the cross-sections used within the model, it should be noted that:

- the original Flood Study cross-sections (Tumbi Creek) included overbank areas;
- the Wyong Shire Council sections (1988 - 1989) were extended to include floodplain areas using the original Flood Study cross-sections for the channel "NAV_CH";
- the channel cross-sections were confined between the existing banks and extent of survey for the April 2000 survey for the channel "DREDGE".

.../3

Wyong Shire Council 24 April 2001

Page 3

We have undertaken the analysis of the dredging for:

- four sets of dredge channel configurations;
- 1% AEP and 20% AEP storms as per the Tumby Flood Study.

The run results appear in Table 3 attached.

The four sets of channel configurations tested were:

- "NOW" - based on April 2000 survey;
- "ZER4" - channel dredged to -0.4 metres AHD;
- "ZER6" - channel dredged to -0.6 metres AHD;
- "ZER8" - channel dredged to -0.8 metres AHD.

The April 2000 survey shows the bed level of Tuggerah Lake at -0.84 metres AHD and -0.98 metres AHD at the starboard and port channel markers respectively. Thus, the "ZER8" model is seen as a reasonable representation of system behaviour prior to any siltation.

The dredge channel parameters adopted were:

- base width: 16 metres
- side slopes in Tuggerah Lake: 1:24 vertical to horizontal
- side slopes in Tumby Creek: 1:4 vertical to horizontal

Table 3 also indicates:

- the equivalent flood levels using the Wyong Shire Council 1988 survey for comparative purposes; *see the ... some tailwater? seen, not.*
- the model time step and print timing for the sake of completeness.

We trust the range of cross-sections tested will provide an indication of the impacts of dredging to various configurations and conversely, the effect of gradual siltation up to current levels. We would happy to answer any queries you may have.

Yours faithfully



K W Paterson
Director

Encl

Table 3

Design Flood Levels, Dredging Options

Location	Wyong Road	Adelaide Street	Confluence	Boat Ramp	Outlet	Lake
Run	Tumbi 4.9 (m AHD)	Killarney 2.4 (m AHD)	Tumbi 6.0 (m AHD)	Dredge 0.0 (m AHD)	Dredge 0.1 (m AHD)	Dredge 0.16 (m AHD)
NOW-1%-9H	4.710 ^{4.071}	1.878	1.109	0.868	0.522	0.500
ZER4-1%-9H	4.070	1.878	1.091	0.829	0.523	0.500
ZER6-1%-9H	4.070	1.878	1.062	0.753	0.512	0.503
ZER8-1%-9H	4.069	1.878	1.028	0.656	0.508	0.500
WSCXS 88	4.065	1.867	1.209	1.055	0.913	
Note: delta T = 0.5 secs Print @ 5 mins						
NOW-20%-9H	3.158	1.563	0.773	0.651	0.500	0.500
ZER4-20%-9H	3.158	1.563	0.753	0.621	0.501	0.500
ZER6-20%-9H	3.157	1.563	0.721	0.570	0.501	0.501
ZER8-20%-9H	3.157	1.563	0.692	0.518	0.502	0.501
WSCXS 88	3.180	1.550	0.900	0.830	0.740	
Note: delta T = 0.5 secs Print @ 5 mins						

empirical LOC 439784

Type corrected in succession with PCs. amended table received 1/19/01 - 006 440727

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1 May 2001
Our Ref: 01-012

The General Manager
Wyong Shire Council
P O Box 20
Wyong NSW 2259

Attention: Mr T Wallace

Dear Sir

Re: Tumbi Creek
Dredging of Navigational Channel

WYONG SHIRE COUNCIL			
Doc. No.		440727	
REC'D		4 MAY 2001	
ACT	INFO	DEPT	FILE No.
	✓	TRW	W30/31800

We are writing further to our letter of 24 April 2001.

Your Mr Wallace has indicated a typographical error in Table 3 of our earlier letter. We have attached a revised Table 3 for your records.

Yours faithfully



K W Paterson
Director

Encl

File with	D. Cathers
Date
Please Attach	

L/MAY01/01012.01M

Table 3

Design Flood Levels, Dredging Options
(revised 1/5/2001)

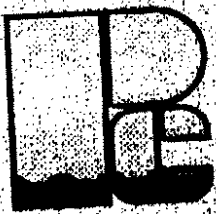
Location	Wyong Road	Adelaide Street	Confluence	Boat Ramp	Outlet	Lake
Run	Tumbi 4.9 (m AHD)	Killarney 2.4 (m AHD)	Tumbi 6.0 (m AHD)	Dredge 0.0 (m AHD)	Dredge 0.1 (m AHD)	Dredge 0.16 (m AHD)
NOW-1%-9H	4.071	1.878	1.109	0.868	0.522	0.500
ZER4-1%-9H	4.070	1.878	1.091	0.829	0.523	0.500
ZER6-1%-9H	4.070	1.878	1.062	0.753	0.512	0.503
ZER8-1%-9H	4.069	1.878	1.028	0.656	0.508	0.500
WSCXS 88	4.065	1.867	1.209	1.055	0.913	
Note: delta T = 0.5 secs Print @ 5 mins						
NOW-20%-9H	3.158	1.563	0.773	0.651	0.500	0.500
ZER4-20%-9H	3.158	1.563	0.753	0.621	0.501	0.500
ZER6-20%-9H	3.157	1.563	0.721	0.570	0.501	0.501
ZER8-20%-9H	3.157	1.563	0.692	0.518	0.502	0.501
WSCXS 88	3.180	1.550	0.900	0.830	0.740	
Note: delta T = 0.5 secs Print @ 5 mins						

register on file 1030/31800
already replied 20/8

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FACSIMILE TRANSMISSION



Paterson
Consultants
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TO: Tom Wallace
FROM: Murray Shire Council
REF: 627 4351 1096
BY: Bill Paterson

DATE: 31/8/2000 OUR REF: 01-012 YOUR REF: PAGE: 1 of 3

MESSAGE: re Tambi Umbi Navigation Channel

1. I have attached a "Memorandum" outlining the response to your queries of and covering the badger information collected to answer the queries

2. Whilst I have extracted the survey information, it is not easy to present in a simple form. your suggestion of water bed levels on an aerial photograph is probably the best given the evidence. Can you provide a decent aerial photograph of this area

Regards Bill Paterson

DRAFT

Memorandum

to: Tom Wallace
 from: Bill Paterson
 re: Tumbi Navigation Channel Analysis

Date: 31 August 2001

Our Ref: 01-012

This memorandum addresses issues raised by Tom Wallace regarding tabulated values of calculated flood levels at the confluence of Tumbi Umbi Creek and the Killarney Vale tributary.

2. Two sets of calculations are referenced by Tom Wallace, which were supplied by Paterson Consultants on 22 January 2001 (updated on 24 January 2001) and 24 April 2001 (corrected on 1 May 2001).

3. The calculations were based on the MIKE-11 model of Tumbi Umbi Creek and includes Killarney Vale tributary. The model extends into Tuggerah Lake by some 250 metres. Thus, the model assumes the outlet is some 500 metres downstream of the Tumbi/Killarney tributary. This was done to ensure some exit loss from the creek into the lake was included in the analysis.

There are several sets of cross-sections available:

- The cross-section undertaken for the original flood work in about 1984 and includes one cross-section downstream of the confluence;

- Survey by Wyong Shire Council in 1988 with 11 sections downstream of the confluence. Wyong Shire Council supplied five of these sections for analysis.

Topographic survey is available for the area from the Boat Ramp to a point 250 metres downstream (to the navigation channel marker) by Clase, Burke and Harvey (dated April 2000).

The April 2000 survey shows bed levels at the outlet of about -0.20 m AHD (See Survey Plan xx, Ch 100.0). Mr Wallace has advised that the current levels (April 2001) were about 0.0 m AHD to 0.2 m AHD).

4. The analysis in January and April 2001 addressed slightly different issues as follows:

January 2001

The January 2001 analysis used the cross-sections from the WSC 1988 survey (refer WSC Job 7635) downstream of the confluence and sought to answer the question "*How will flood levels be affected if siltation is continuing to occur?*". The answer leads to the question "*Are flood level increases sufficient to justify dredging?*"

This objective is indicated by Council's fax of 16 January 2001.

The model assumptions are detailed in our E-mail of 21/01/2001.

The model essentially allowed siltation from upstream of the footbridge (WSC 1988 Survey XS 37, Adopted Change 0.175) to RL 0.0 and RL 0.2 m AHD.

The assumptions of cross-sections means that the model extends some 200 metres into Tuggerah Lake with a top width of 30 metres.

April 2001

The April 2001 analysis addressed the questions of "*Given dredging is proposed, how much material should be removed*" and "*What should be the 'Base Case' as a no siltation situation*".

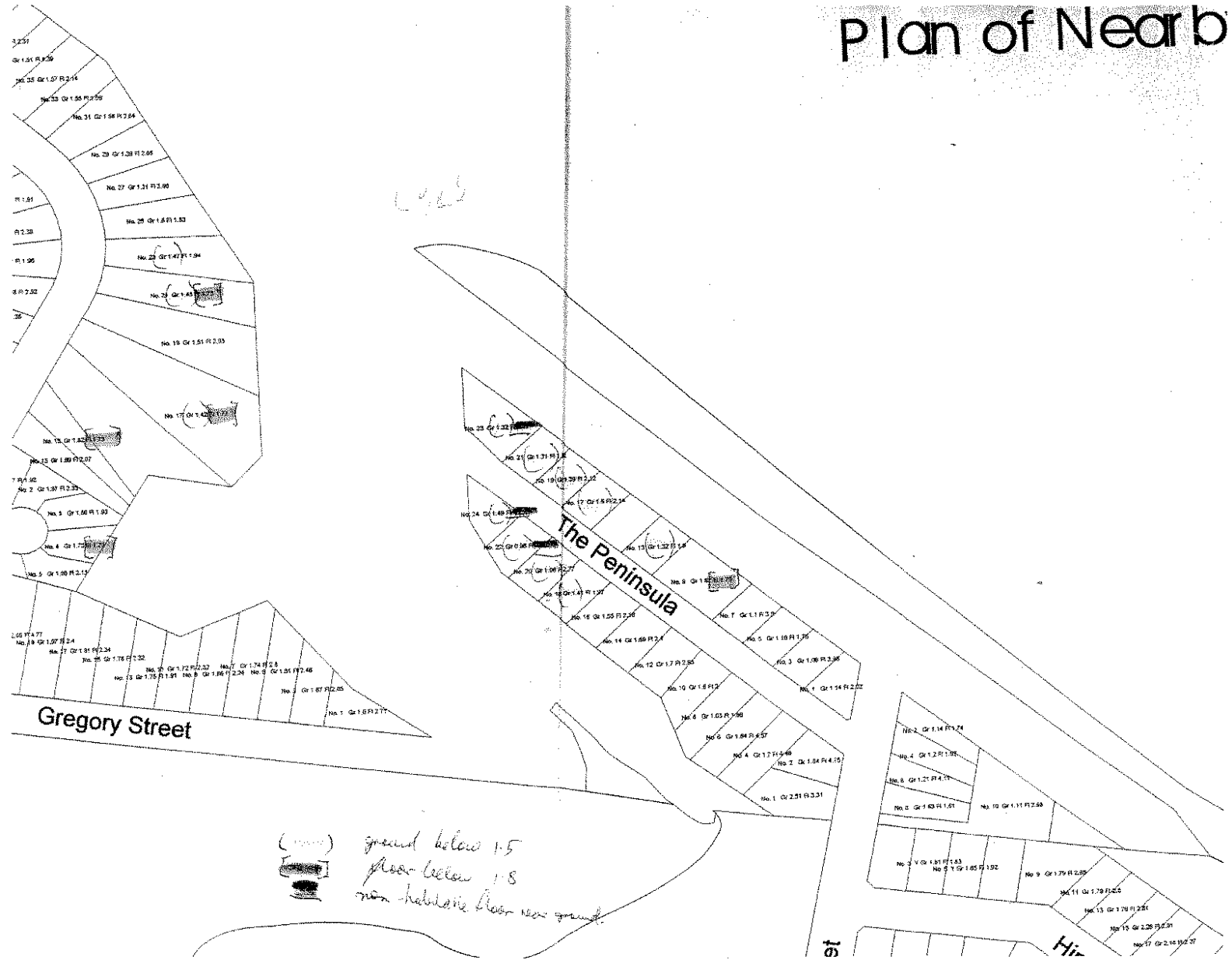
The model was modified by using cross-sections derived from the April 2000 survey downstream of the boat ramp.

Although our report of May 2001 uses the term "Now" in Table 3, the model results reflect the situation of April 2000 and thus do not include siltation that has occurred since April 2000. The model also assumes expansion of flow downstream of the shore line.

Thus, the overall width at WSC 1988 XS 41 is about 30 metres but expands up to 100 metres at the navigation channel markers.

K W Paterson
Director

Plan of Neighb



() ground below 1.5
■ floor below 1.8
■ non-habitable floor near ground



Grant McBride MP

Member for The Entrance



PARLIAMENT
OF NSW
LEGISLATIVE
ASSEMBLY

Postal Address: PO Box 401
The Entrance NSW 2261

Monday, 7 February 2005

Councillor Brenton Pavier
Mayor
Wyong Shire Council
PO Box 20
WYONG NSW 2259

PavierB-Inf050207-1239.Doc

Dear Brenton,

Following the recent rainfall events, which have resulted in flows that have partially cleared Tumbi Creek, I respectfully suggest that Council reconsider its original proposal to dredge Tumbi Creek.

I am pleased to advise that following further representations to the Minister for Infrastructure and Planning, the Hon C Knowles, the State Government has re-committed to fund in an equal partnership with Council the dredging of Tumbi Creek in accordance with Council's original proposal, for which a licence had previously been issued by the Department of Lands.

As I have previously stated, the Federal funds committed to this project would be better expended on catchment management issues upstream rather than just treating the symptoms of poor catchment management over and over again.

Further I believe the three levels of Government now have an opportunity to work together for the good of the community and stop this cycle.

Please find attached a copy of Minister Knowles correspondence for your information.

I await your advice in due course.

Yours sincerely

Grant McBride MP
Member for The Entrance
Minister for Gaming and Racing
Minister for Central Coast



NEW SOUTH WALES

MINISTER FOR INFRASTRUCTURE AND PLANNING
MINISTER FOR NATURAL RESOURCES

Y04/3986

The Hon. Grant McBride
Minster for Gaming and Racing
24 The Entrance Road
The Entrance NSW 2261

7 FEB 2005

27 JAN 2005

Dear Mr McBride

As a result of your representations, I am pleased to advise that the Government will re-commit to fund in an equal partnership with Wyong Shire Council the dredging of Tumbi Creek in accordance with Council's original proposal, for which a licence had previously been issued by the Department of Lands.

I note that the State Government had already contributed \$141,000 to this project, before Council chose to abandon it for a more expensive option.

I understand that the recent rainfall events resulted in flows that have partially cleared Tumbi Creek, allowing some boating access and water quality improvements.

To take advantage of this offer, Council should now resubmit a fully costed proposal to the Department of Lands for future management of this project under the State Government's Waterways program.

To ensure appropriate assessment and compliance with NSW environmental legislation contact should be made with the Department of Lands, Department of Environment and Conservation and Department of Primary Industry to obtain necessary approvals.

Yours sincerely



Craig Knowles
Minister for Infrastructure and Planning
Minister for Natural Resources

WYONG

Doc No 679125

EC

(14)

✓ KY w30/31800



PARLIAMENT OF NEW SOUTH WALES
LEGISLATIVE ASSEMBLY

GRANT MCBRIDE, MP

MEMBER FOR THE ENTRANCE

Electorate Office:
24 The Entrance Road
The Entrance NSW 2261

Postal Address:
PO Box 401
The Entrance NSW 2261

Phone: 02 4334 1012
Fax: 02 4334 3840

Facsimile Transmission

To: Kerry Yates

From: Dianne Anderson

Fax: 4351 1507

Pages: 2

Phone:

Date: 5/03/2004

Re: Tumbi Creek

CC:

Comments:

Kerry

Please find attached a copy of Minister Knowles response to Senator Campbell, concerning the offer of Federal funds for the proposed dredging of Tumbi Creek.

Regard

Dianne

Noted by GM. Copy provided
to Mayor & David Cathers,

Rueygn 5/3/04

Senator the Hon Ian Campbell
Minister for Local Government Territories and Roads
The Senate
Parliament House
CANBERRA ACT 2600

D03/5948

18 FEB 2004

Dear Senator Campbell

I refer to your letter offering \$340,000 of funding to Wyong Shire Council under the Regional Flood Mitigation Program (RFMP) towards the removal and off-site treatment of dredge spoil from Tumbi Creek. This funding would be contingent on the adoption of this management option rather than Council's current proposal to discharge the dredge spoil in a thin veneer over the bed of Tuggerah Lake.

I do not support the redirection of RFMP funds to this project ahead of effectively four prioritised floodplain management projects elsewhere in the State which were nominated in my submission to the Commonwealth.

To redirect these funds would devalue the well managed and transparent process under which floodplain management projects are prioritised in conjunction with the Floodplain Management Authorities of NSW.

The current proposal, the result of three years of co-ordination between Council and the State Government, involves the development of stringent guidelines for procedures and monitoring of the works. The methodology has a State wide significance and the results of the dredging will be properly evaluated and the efficiency of the work assessed for future projects. I commend Council for its co-operation and patience in this process.

Yours sincerely,

SIGNED

Craig Knowles MP
Minister for Infrastructure & Planning
Minister for Natural Resources



Grant McBride MP

Member for The Entrance



Postal Address: PO Box 401
The Entrance NSW 2261

Tuesday, 6 July 2004

Mr David Cathers
Director Engineering Services
Wyong Shire Council
PO Box 20
WYONG NSW 2259

Cathers D-Inf040706-1231.Doc

Dear David,

Dredging of Tumbi Creek
Your Ref: DGC:MDL W30/31800

I refer to your letter of 10 June 2004 requesting additional financial assistance for the proposed dredging of Tumbi Creek.

The Minister for Infrastructure and Planning, the Hon Craig Knowles, has now responded to my representations on your behalf and I enclose a copy for your information.

I sincerely hope Council responds positively to the issues raised by the Minister and takes up his invitation to submit an application for funding for the investigation and approval stage of the proposal.

If I can be of further assistance please do not hesitate to contact me.

Yours sincerely

Grant McBride MP
Member for The Entrance
Minister for Gaming and Racing



NEW SOUTH WALES

MINISTER FOR INFRASTRUCTURE AND PLANNING
MINISTER FOR NATURAL RESOURCES

D04/4078

The Hon G McBride MP
Member for The Entrance
Minister for Gaming and Racing
PO Box 401
THE ENTRANCE NSW 2261

Dear Mr McBride

I refer to your letter concerning Wyong Shire Council's request for financial assistance for their proposal to dredge Tumbi Creek.

The report from Wyong Shire Council's Manager of Engineering Services outlines in brief terms its preferred option but it fails to provide any specific details of what level of investigation needs to be carried out and its proposed schedule of works.

Committing to equally share funding for investigations and works estimated at \$2 Million without fully examining the alternatives, without having regard to other state-wide priorities and without having any input into the recommended option is not exercising due diligence with regard to the expenditure of public monies. I am also concerned that the council would consider the expenditure of over \$2 million on a remedial action that may need to be repeated in a few years and at more than one location.

The state government has clearly demonstrated its financial commitment to the management of the Lakes having already committed \$170,000 towards expenditure to date on this issue. I invite council to submit an application for funding for the investigation and approval stage of the proposal after further examination of the options and discussions with departmental representatives.

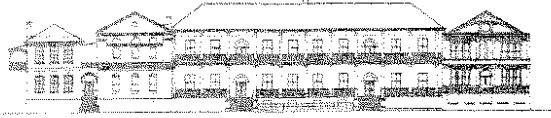
The protocol is for Council to develop such a proposal through the Estuary Committee Technical Sub-committee (and ultimately the full Coast and Estuary Committee). The technical committee would develop the proposed options for Council consideration and request for funds from the Department of Infrastructure, Planning and Natural Resources. In the first instance, it would be appropriate for Council to apply for investigation and documentation funds and give consideration to obtaining appropriate consents.

If you require further information please contact Mr Brian Gardoll, Acting Regional Director Hunter at the Department's Newcastle Office on telephone 49299801.

Yours sincerely,



Craig Knowles MP
Minister for Infrastructure and Planning
Minister for Natural Resources



GRANT McBRIDE MP
MEMBER FOR THE ENTRANCE

Postal Address: PO Box 401
THE ENTRANCE NSW 2261

Wednesday, 7 April 2004

Mr Kerry Yates
General Manager
Wyong Shire Council
PO Box 20
WYONG NSW 2259

Doc No		685486	
RECD		8 APR 2004	
AG	TE	NO	15
✓	KY	W30/31800	

File with ... Broader
 Date
 Please Attach

Dear Mr Yates

As you would be aware, the State Government has co-operated fully with Council regarding the Council's decision to dredge Tumby Creek.

Following Council's decision to undertake a dredging program, the State Government has assisted with funding and has ensured through the licence conditions and processes that the proposed method would be environmentally sound.

Following the recent rescission of Council's decision to undertake the dredging works, and the election of a new Council, I write to ask that Council prepare documentation for alternative proposals to resolve the issue of siltation of Tumby Creek, and restore the health of the system.

The creek in its current state remains a risk to the health of locals and the environment, and presents a flood risk.

Any proposals should include full costings, and cover such items as road rehabilitation, etc. The full cost of any work, equipment and research already undertaken as a result of Council's earlier decisions should also be incorporated into the costings.

You would be aware of the Federal Government's public commitment, through the Federal Member for Dobell, to a tri-partite equal funding partnership to finding a solution to the Tumby Creek issue.

Once the Council has prepared proposals, the State Government would be pleased to consider these on the basis of the Federal Member's public commitment to an equal third share with Council and the State Government.

Noted JH 16/4 → Mike Long

Page 2

As the local member I remain committed to working with Council to ensure a healthy lakes system.

Yours sincerely

A handwritten signature in cursive script that reads "Grant McBride".

Grant McBride MP
Member for The Entrance
Minister for Gaming and Racing

December 12 2003

The Honourable Craig Knowles
Minister for Infrastructure and Planning
Minister for Natural Resources
GPO Box 5341
SYDNEY NSW 2001

Dear Minister

Dredging of Tumbi Creek

As you would be aware the dredging of Tumbi Creek and disposal of the excavated material as a thin veneer across the bed of Tuggerah Lake has been extensively investigated, and Council has received a conditional dredging licence from your Department for this project. All required pre-dredging documentation has been submitted, and we are currently awaiting a further response from your Department prior to proceeding with the dredging. Based on verbal advice it appears that this response is only one to two weeks away.

You might also be aware that this project has generated considerable public concern, mainly related to the proposed method of disposal of the dredged material. While Council is very much aware of the negative public perceptions associated with dispersing material across the bed of Tuggerah Lake, the estimated costs of possible alternative disposal methods are considerably higher than the adopted disposal option.

At its meeting of 10 December 2003, Council was addressed by Mr Ken Ticehurst MP, Federal Member for Dobell. At the meeting Mr Ticehurst was critical of the planned disposal method, and advocated removal of the material to a land-based disposal area. He acknowledged that although the Federal Government had no jurisdiction over the lakes, he was seeking an alternative disposal method.

Mr Ticehurst advised Council that the Federal Government had \$340,000 currently unallocated from regional flood mitigation schemes that would be made available for this project on the condition that the material was taken off site, and the project costs were shared equally between the Federal Government, State Government and Council. He also indicated that these funds were being provided towards the cost of the project, and indicated that he would be seeking additional funds as any alternative proposal was likely to cost in excess of one million dollars. Mr Ticehurst could not guarantee, however, that further funds would be forthcoming from his Government.

Attached are copies of publicity material that Mr Ticehurst released detailing his offer.

Following considerable discussion on this new funding proposal, Council resolved as follows:

"That having regard to the Federal Government's recent offer of \$340,000 part funding towards off site disposal of spoil for the restoration of Tumbi Creek, Council not commence dredging of Tumbi Creek before January 12 2004 in order to seek the State Government's advice in respect of the proposed method of disposal of dredged spoil and funding thereof."

Page 2

In view of this resolution I am writing to urgently seek your comments as to whether the State Government, as the responsible authority for the Tuggerah Lakes, would be agreeable to funding an acceptable alternative option equally with the Federal Government and Council.

I would note that at this time Council has made no commitment to the provision of additional funds, and no funds have been identified for any alternate method. Council staff are proceeding with the currently approved option that involves relocating the dredged material onto the bed of Tuggerah Lake.

The possible cost of an acceptable alternative is likely to be at least \$1.3 - \$1.5M based on present estimates. I have attached a copy of an information report to Council dated 10 September 2003 that details the most likely alternate options and provides estimates of costs. To these costs should be added the possible need to treat the excavated material at the landfill site to address acid sulphate issues. This may add a further \$300,000 to \$500,000 to each of these options.

A further option that has also been investigated involves pumping the dredged material into large geotextile bags placed in narrow ponds along the lake foreshore. This option has been estimated to cost approximately two million dollars.

To date Council has expended or committed funds of approximately \$340,600, with the current budget for the project being \$450,000. The additional testing and monitoring costs required as part of the licence conditions are likely to see further increases in this budget.

I appreciate that there are many demands on your time, but in view of the imminent commencement of dredging works Council would greatly appreciate your advice on this matter as a matter of some urgency.

Yours faithfully



D G Cathers
Acting General Manager

Attch

Cc The Hon Mr Grant McBride MP, Minister for Gaming and Racing

Mayor G Best, Deputy Mayor R Graham, Councillor K Forster, Councillor F Brennan, Councillor D Cawthorne, Councillor B Pavier, Councillor D Eaton, Councillor R Stewart, Councillor N Rose, Councillor W Thompson

W30/31800

4 February 2004

The Honourable Craig Knowles
Minister for Infrastructure and Planning
Minister for Natural Resources
GPO Box 5341
SYDNEY NSW 2001

Dear Minister

Dredging of Tumbi Creek – Additional Funding Assistance

As you would be aware Council has received a conditional dredging licence from the Department of Lands for the dredging of Tumbi Creek and the disposal of the dredged material across the bed of Tuggerah Lake. The conditions imposed by this licence have to date seen the original estimated cost for this project increase from \$300,000 to \$450,000. Council and the Department are jointly funding this work, and currently approval has been received for State Government funding up to an amount of \$225,000. Council has agreed to match these funds.

The project budget has now been further revised due to the costs of project delays and additional studies that have been required. The current estimate for this project is \$600,000, and Council is seeking approval for Government funding for 50% of this cost, or \$300,000. Attached is a breakdown of the costs already incurred on the project, together with estimates of the costs to complete the work.

I would, however, like to draw your attention to the fact that there are many vagaries associated with work of this nature that are likely to impact upon the final costs. The work will have to be undertaken in an exposed marine environment that is subject to sometimes extreme weather changes. The dredging licence contains strict conditions that will require close monitoring and control on every aspect of the project to ensure the work fully complies with the licence. These factors make it difficult to provide a total project estimate that encompasses all unknown costs.

Accordingly, I am respectfully seeking a commitment from the State Government to share equally the final costs of this work with Council, given the many variables as outlined above that will affect the dredging. This project has special significance for the local community, and Council would appreciate your commitment to assist with its funding.

I look forward to your reply.

Yours faithfully

D G Cathers
Director

JBL/LOB
File No W30/31800

679307

March 23 2004

The Hon Craig Knowles MP
Minister for Infrastructure, Planning
And Natural Resources
Level 33 Governor Macquarie Tower
1 Farrer Pl
SYDNEY NSW 2000

Dear Minister

Tumbi Creek Dredging

At a recent meeting of Council , Council considered a Notice of Rescission regarding the dredging of Tumbi Creek.

In light of the strong community concerns over the proposed dredging of Tumbi Creek, Council resolved that I write to you advising that Council is not prepared to continue with the programmed dumping of siltation from Tumbi Creek into the Tuggerah Lakes.

Council is currently investigating the financial constraints in respect to the removal of material from Tumbi Creek and the feasibility of a staged sludge removal program and disposal to land fill.

The Tuggerah Lakes system is owned by the State Government and has been identified by the Federal Government as being of national significance. Accordingly, Council is seeking the State and Federal Government to match the \$3 million funding that Council provides for the lakes system in the Shire.

This funding would ensure that the dredging of the creek would proceed and also allow Council to implement a program to dispose of the sludge to land fill.

This correspondence has also been forwarded to the Federal Minister for the Environment and Heritage, The Hon Dr David Kemp MP.

Your assistance regarding this matter would be appreciated.

Yours faithfully



K Yates
GENERAL MANAGER

File: W30/31800
Mike Long

March 24 2004

Ms Cathy Cole
Regional Director, Hunter Region
Department of Infrastructure Planning and Natural Resources
PO Box 2213
DANGAR NSW 2309

Dear Ms Cole

TUMBI CREEK DREDGING AND SPOIL DISPOSAL IN TUGGERAH LAKE
Your Reference: Y02/0692

Council at its meeting of March 10 2004 resolved to rescind its resolution of December 11 2002 in respect of the dredging of Tumbi Creek and disposal of spoil in Tuggerah Lake and further resolved as follows:

- “1 That having regard to strong community concerns over the proposed remediation/dredging of Tumbi Creek, Council advise the State Government that it is not prepared to continue with the programmed dumping of siltation into the lake and that the staff bring back a report as to options and likely funding requirements to remediate the creek with the spoil being taken off site.*
- 2 That having regard to the current financial constraints facing Council with respect to the removal of material from Tumbi Creek, staff report on the feasibility of a staged sludge removal program and disposal to land fill.*
- 3 That the report cover volumes, the effects on flood mitigation/liabilities, environmental flows and recreational boating access.*
- 4 That, as the Tuggerah Lakes system is owned by the State Government and has been identified by the Federal Government as being of national significance, Council calls on both State and Federal Governments to match Council’s \$3M lakes funding.”*

You are advised that in response to Council’s resolution the dredging as was proposed under Section 34 of the Crown Lands Act 1989, Licence number LI342374 will not now proceed.

A further detailed submission will be made to the Department in respect of State Government funding for lakes works.

Yours faithfully



Mike Long
Manager Open Space and Recreation

10 June 2004

Mr Grant McBride MP
Member for The Entrance
PO Box 401
THE ENTRANCE NSW 2261

Dear Grant

Dredging of Tumbi Creek

I refer to your letter dated 7 April 2004 and the summit meeting on this matter held in the Mayor's office on 21 May 2004. Council is now seeking your support for additional financial assistance with this project as discussed below.

At its meeting of 9 June 2004 Council considered a further report (copy attached) on possible options to open Tumbi Creek and remove the excavated material away from the site. Council resolved to seek financial support from State and Federal Governments as detailed in parts 2 and 3 of the following resolution.

- 1 *That Council formally moves to support option one of using a small dredge to on shore separation then removal to Buttonderry Waste Depot and that Council commits to one third of the estimated cost of \$2M.*
- 2 *That Council make immediate application to the Commonwealth Department of Transport and Regional Services for funding under the Regional Partnerships Program and similar application be made for funding to the State Government Department of Infrastructure, Planning and Natural Resources via the office of the State Member for The Entrance.*
- 3 *That the Federal Member for Dobell and the State Member for The Entrance be requested to commit financial assistance to this project on behalf of their Governments by June 30 2004.*
- 4 *That if financial assistance is not forthcoming from the Federal and State Governments by June 30, that Council reconsider the project at its meeting to be held on July 14 2004.*

Council now seeks your support in obtaining State Government agreement to equally sharing with Council and the Federal Government the costs of investigating and implementing the proposed option to use a dredge, onshore separation plant and truck disposal of the material to landfill. The estimated cost of this option is \$2M as identified in the report. Council has committed to funding one third of this project cost, and confirmation is being sought from the Federal Government for its equal share.

Once Council has these agreements it will proceed to undertake final investigations and estimates, and obtain necessary approvals to undertake the work.

Your past assistance with this project has been appreciated by Council. Please contact me on 4350 5494 should you wish to discuss any matter in more detail.

Yours faithfully

D G Cathers
Director
ENGINEERING SERVICES

Attch



WYONG SHIRE
COUNCIL

building a better tomorrow!



CENTRAL
COAST

Wyong Shire Council ABN 47 054 613 735
DX 7306, PO Box 20, Wyong NSW Australia 2259
Phone: (02) 4350 5555 Fax: (02) 4351 2098
Email: wsc@wyong.nsw.gov.au
Web: www.wyongsc.nsw.gov.au

MDL:LT/M Long
F2004/06943

June 25 2004

Mr Ross Cooke
Department of Infrastructure, Planning and Natural Resources
Po Box 2213
DANGAR NSW 2310

Fax: 49296364

FAXED
25.6.04

Dear Ross

Tumbi Creek Dredging

As you would be aware Council has sought State Government funding assistance for a revised dredging proposal that involves removing the material from this site in trucks to the Buttonderry Landfill.

A media story on 25 June 2004 on this subject had Mr Grant McBride, MP for The Entrance, indicating that information was still required from Council in support of this new proposal (see attached). Council is unaware of any request for additional data or information from your Department, and is seeking your urgent advice as to what additional information might be required as part of its application for funding assistance.

It is noted that Council's proposal is largely based on the previous dredging application that has already gained approval. The significant difference with the current proposal is that it would involve pumping the material to shore, where a small cyclone and associated tanks and equipment would allow further separation.

I look forward to your earliest advice on this matter.


Mike Long
Manager
OPEN SPACE AND RECREATION

Attch



STATION	Gosford 2GO
PROGRAM	Radio News
DATE	25 June 2004
TIME	8.00am
PRODUCER	Caroline Perryman 02 4324 1323
SUMMARY	There are still environmental questions over the two million dollar proposal to dredge Tumbi Creek according to the member for The Entrance. Interview with NSW Member for The Entrance Grant McBride.
REHAME CONTACT	Daniel Bringans 02 9310 7999

NEWSREADER:

There are still serious environmental questions over the two million dollar proposal to dredge Tumbi Creek according to the member for The Entrance. Grant McBride says the current plan doesn't touch on issues like the destruction and removal of vegetation from the foreshore and the impact of truck movements.

GRANT McBRIDE – NSW MEMBER FOR THE ENTRANCE:

We need to do the investigation phase first and determine whether this is a workable solution before commitment of funds for completion of the work in its entirety.

END OF SEGMENT

REF: S236582



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Rehame 1300 651 111
www.rehame.com

2



WYONG SHIRE COUNCIL

FAXED
29.6.04

DX 7306 WYONG PO BOX 20, WYONG NSW 2259 Telephone: 0243 505 322 Fax: 0243 505 558
www.wyongsc.nsw.gov.au wsc@wyong.nsw.gov.au

Open Space & Recreation FACSIMILE TRANSMISSION

No. of pages sent including this one: 3

TO: NEIL KELLEHER

OF: DIRNR FAX NO: 43 233 960

FROM: MIKE LONG DATE: 29 JUNE 2004

Tumbi Creek - Final Certificate of Expenditure

Please find attached Final Certificate for works completed to date. This excludes earlier grant of \$20,000 - I believe \$5,000 is still owing on this grant? (Original will be posted).

Regards.

M. D. Long

Manager
Open Space and
Recreation

DEPARTMENT OF LAND AND WATER CONSERVATION
**CERTIFICATE OF EXPENDITURE FOR FINANCIAL ASSISTANCE TO
 WYONG SHIRE COUNCIL**

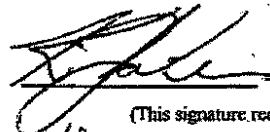
Program:	New South Wales Government's Waterways Program	Funding Ratio: 50% (Maximum amount \$150,000)
Financial Year:	2003/2004	
Date of Offer:	22nd of June, 2004	Progress Cert. No: Final Interim-Final Certificate Final Certificate (delete as appropriate)
Project:	029537A - Tumbi Creek Dredging 2	
Amount of Government Financial Assistance		119,306.13
Amount of Council/Other Contribution		119,306.13
Total		238,612.25
Total Expenditure to date (A)		238,612.25
Less GST input credits claimable (B)		0.00
GST exclusive cost (A) - (B)		238,612.25
Council share to date (GST exclusive)		119,306.13
Government share to date (GST exclusive)		119,306.13
Less Progress Payment made to date		112,500.00
Request Progress Payment		6,806.13

1. The amounts stated above are correct, and the sum of \$119,306.13 from funds made available by the Government, and the sum of \$119,306.13 from Wyong Shire Council's own funds have been actually and properly expended/committed to the project approved by the Department and are in accordance with the Conditions of Financial Assistance dated the 22nd of June, 2004.

2. ~~* All requested information/drawings have been furnished.~~

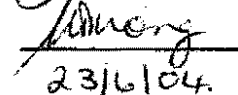
3. * Work as Executed information, as furnished, accurately represents the works as undertaken.

(* delete as appropriate)



General Manager

(This signature required on final certificate only)


23/6/04

Authorised Project Officer

Date

DETAILS OF EXPENDITURE

Item No.	Description of item	Amount Allocated (DIPNR + Council)	Expenditure (DIPNR + Council) The sum of these items must correspond with the total expenditure to date on the front page.
1.	Buoy & data Logger supply - Yeo-Kal Electronics Pty Ltd	\$62,387	\$62,387
2.	Survey - Chase Burke & Harvey Pty Ltd	\$7,921	\$7,921
3.	Lake bed Sediment disturbance analysis - University of Newcastle	\$1,909	\$1,909
4.	Geotechnical Reporting - Douglas Partners Pty Ltd	\$31,402	\$31,402
5.	Antenna installation - Karera Communications Pty Ltd	\$553	\$553
6.	Additional Dredge Flexible Pipes specifically for job - NEH Australia	\$6,450	\$6,450
7.	Additional Pipe Floats specifically for job - Holaustr Pty Ltd	\$3,960	\$3,960
8.	Beacons with warning mark - Solar Technology Australia Pty Ltd	\$3,190	\$3,190
9.	Silt Curtain - Geofabrics Australasia Pty Ltd	\$20,429	\$20,429
10.	Analysis of Siltation Effects - Patterson Consultants Pty Ltd	\$2,767	\$2,767
11.	Fish Sampling - NSW Fisheries	\$20,000	\$20,000
12.	Research Aquatic Flora - University of Sydney	\$31,344	\$31,344
13.	Environmental Advice and Ecological Study - Bio Analysis	\$6,165	\$6,165
14.	Geotube Trial - Crs Industrial Water Treatment Systems	\$850	\$850
15.	Works Inspection Geotube travel - Wyong Plaza Travel	\$1,265	\$1,265
16.	Project Management and labour costs directly associated with project	\$38,020	\$38,020
A	Total Cost/Expenditure	\$238,612	\$238,612
B	Less GST inputs claimable by Council	\$0	\$0
A-B	GST exclusive costs/expenditure	\$238,612	\$238,612

A copy of this Certificate was forwarded to the DIPNR office at (time) on (date).

MDL:LT / D Cathers
F2004/06943
D00028716

August 2 2004

The Honourable Craig Knowles
Minister for Infrastructure and Planning
Minister for Natural Resources
GPO Box 5341
SYDNEY NSW 2001

Dear Minister

Dredging of Tumbi Creek

I refer to your letter to Council dated 7 April 2004 and to Mr Grant McBride, MP, of July 2004 in relation to financial assistance for the above project. Thank you for your advice on this matter.

Alternative options for the off-site disposal of dredged spoil will be considered at the next meeting of the Tuggerah Lakes Estuary Committee on 5 August 2004.

Yours faithfully

D G Cathers
Director
ENGINEERING SERVICES

Per:

Cc Cathy Cole
Regional Director
Hunter
DIPNR

JBL/RGP
F2004/06943
D00032990

August 19 2004

The Honourable Craig Knowles
Minister for Infrastructure and Planning
Minister for Natural Resources
GPO Box 5341
SYDNEY NSW 2001

Dear Minister

Funding and Approval for Proposed Dredging of Tumbi Creek

At its recent meeting, Council considered a report concerning the alternative dredging proposals for Tumbi Creek.

At that meeting Council resolved that I write to you requesting urgent project approval for the dredging of Tumbi Creek due to the risk of flooding and the past history of the extensive delays associated with the project.

Mr Ken Ticehurst, Federal Member for Dobell also addressed Council and announced that he has secured funding of \$680,000 excluding GST for the project. This funding represents the Federal Governments one third share towards the project.

Having regard to the above, Council further resolved to again seek funds from the State Government to represent its one third share of the project to ensure the dredging can commence.

Your assistance with the above matters would be appreciated.

Yours faithfully

K Yates
GENERAL MANAGER

December 13 2004

Mr Grant McBride MP
Member for The Entrance
PO Box 401
THE ENTRANCE NSW 2261

Dear Mr McBride

Tumbi Creek

At its meeting held on November 24 2004, Council considered a Notice of Motion concerning Tumbi Creek.

At that meeting Council resolved the following:

- "1 That Council reaffirms its commitment to the dredging of Tumbi Creek to achieve its original objectives.*
- 2 That Council write to Grant McBride MP, Member for The Entrance and Minister for Gaming and Racing, seeking his representation to Minister Knowles for approval to the dredging of Tumbi Creek.*
- 3 That Council approach the Department of Transport and Regional Services and Ken Ticehurst MP, Member for Dobell, to seek their views on further funding applications for any dredging process and upstream works in Tumbi Creek, should item 1 be achieved under expected budget.*
- 4 Further to item 3, that the Department of Transport and Regional Services and the Department of Infrastructure Planning and Natural Resources be advised that the estuary management study is shortly to be costed and priorities identified which will require significant funding, and these two Government Departments be requested to identify funding programmes to which applications can be made to achieve these outcomes.*
- 5 That Ken Ticehurst MP, Member for Dobell, and Grant McBride MP, Member for The Entrance and Minister for Gaming and Racing, be advised of Council's resolution on this Notice of Motion."*

Having regard to No 2 above, Council seeks your assistance in making representation to The Hon Craig Knowles, Minister for Planning, Infrastructure and Natural Resources to urge the State Government to approve the dredging of Tumbi Creek.

Your assistance regarding this matter would be greatly appreciated.

Yours faithfully

K Yates
GENERAL MANAGER

D00126268
F2004/06943

February 11 2005

The Honourable Grant McBride
Member for The Entrance
PO Box 401
THE ENTRANCE NSW 2261

Dear Mr McBride

Thank you for your letter of February 7 2005 and the suggestion that Council reconsider its original proposal to dredge Tumbi Creek.

I have asked that your letter be reported to Council's next Ordinary meeting which will be held on Wednesday, February 23 2005 and I will again contact you following consideration of this report.

Yours faithfully

Brenton Pavier
MAYOR



Department of
Infrastructure, Planning and Natural Resources

Our ref: RD04/14
Your ref: W30/31800

Mr Kerry Yates
General Manager
Wyong Shire Council
PO Box 20
WYONG NSW 2259

WYONG		COUNCIL	
Doc No: 685216		REC'D - 7 APR 2004	
ACT	RD	FILE No. 15	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	DCC W30/31800	

copy
K. YATES
M. LONG

5 April 2004

Dear Mr Yates

I refer to Council's letter to the Hon Craig Knowles MP, Minister for Infrastructure and Planning and Minister for Natural Resources, dated 4 February 2004, seeking additional funding assistance for the dredging of Tumbi Creek, which has been forwarded to me for reply. Mr Cathers' letter to the Minister has been superseded by a subsequent letter from Mr Mike Long dated 24 March 2004, advising me of Council's decision not to proceed with dredging Tumbi Creek and disposing of the spoil in Tuggerah Lake.

Wyong Shire Council received 1:1 financial assistance for the studies and environmental assessments for the previously proposed dredging works under the NSW Government's Waterways Program. The grant conditions require Council to submit a Final Certificate of Expenditure to reconcile the amount expended by Council and the funds paid to Council by DIPNR. A detailed cost breakdown of all monies spent on the proposal should now be submitted with the Final Certificate. Could you please arrange for this to occur.

I understand that Council proposes to investigate alternative options to remediate Tumbi Creek, such as offsite disposal and staging of the works. These studies and works may be eligible for financial assistance from the NSW Government. A new application would need to be submitted for any alternative proposal. As you are aware, applications are assessed on a statewide priority basis.

I note that Council is currently formulating an estuary management plan for Tuggerah Lakes. Management of tributary creeks is an issue that should be investigated and prioritised within the context of this plan, and I encourage Council to complete this plan. The implementation of management actions contained in these plans attracts a higher statewide priority for funding than ad hoc applications for financial assistance.

If you require further information please contact Mr Neil Kelleher, Senior Natural Resource Officer, at the Department's Gosford office on telephone 4337 1207.

Yours sincerely

Cathy Cole

Cathy Cole
Regional Director
Hunter

File with <u>C. BRONHOFF</u>
Date <u>2/4/04</u>
Please Attach

c.c. Mr Mike Long
Manager Open Space and Recreation, WSC



NEW SOUTH WALES

MINISTER FOR INFRASTRUCTURE AND PLANNING
MINISTER FOR NATURAL RESOURCES

Mr David Cathers
Acting General Manager
Wyong Shire Council
PO Box 20
WYONG NSW 2259

D04/92

- 7 APR 2004

Dear Mr Cathers

I refer to your letter concerning dredging of Tumbi Creek and Wyong Shire Council's request for consideration of funding for an alternative disposal option.

I am aware that Senator the Hon Ian Campbell, Federal Minister for Local Government, Territories and Roads, recently offered \$340,000 to Wyong Shire Council under the Regional Flood Mitigation Program (RFMP) towards the removal and off-site treatment of the dredge spoil from Tumbi Creek. The funding was contingent on utilising an off-site disposal method rather than Council's current proposal to discharge the dredge spoil in a thin veneer over the bed of Tuggerah Lake. I note that the funding offer falls well short of one-third of Council's estimate of the cost of alternative options.

I understand the offer was conditional upon the NSW Government agreeing to the Tumbi Creek project having priority for RFMP funding. Since there is no significant flooding problem at Tumbi Creek, I do not support the redirection of RFMP funds to this project ahead of previously identified NSW priorities. Such action would be contrary to the region's process under which floodplain management projects are prioritised in conjunction with the Floodplain Management Authorities of NSW.

I note that Council has made no commitment to the provision of additional funds to pursue alternative disposal methods. The Department of Infrastructure, Planning and Natural Resources Waterways Program has a heavy demand for funding which prevents a substantial increase in contributions for dredging Tumbi Creek.

Accordingly, Council should consider continuing with the project under the current agreed funding arrangements.

If you require further information please contact Mr Neil Kelleher, Senior Natural Resource Officer, at the Department's Gosford office on telephone 4337 1207.

Yours sincerely



Craig Knowles MP
Minister for Infrastructure and Planning
Minister for Natural Resources

Department of Infrastructure, Planning and Natural Resources

FAX

To: MIKE LONG

From: ROSS COOKE

Fax No: 4350 5558
Phone:

Fax No: 02-49296364
Phone:

Date: 20/6/04
Pages (following cover sheet): 1

Time:



Department of Infrastructure,
Planning and Natural
Resources

Hunter Region, PO Box 2213 Dangar NSW 2309

Routine

Urgent

Confidential

Subject:

Tumbi Cr

[U:\Forma\FAX DIPNR.doc]

This message is intended for the addressee named and may contain confidential/privileged information. If you are not the intended recipient, please destroy it and notify the sender. Views expressed in this message are those of the individual sender, and are not necessarily the views of the Department of Infrastructure, Planning and Natural Resources.



Department of
Infrastructure, Planning and Natural Resources

Contact: Ross Cooke
Phone: (02) 4929 9825
Fax: (02) 49296364
Email: ross.cooke@dipnr.nsw.gov.au

File 406

Mr Mike Long
Manager
Open Space and Recreation
Pop Box 20
WYONG NSW 2259

Dear Mike

Re: Tumby Creek dredging
Your letter of 25 June 2004 re additional data requirements from this department.

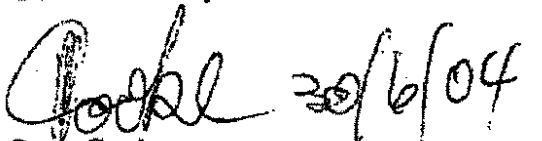
I am aware that the Member for The Entrance, Mr Grant McBride MP, has written to the Minister regarding a representation from the Director of Technical Services at Wyong Council relating to Council's revised approach to the dredging of Tumby Creek. I understand that the Minister will be responding to Mr McBride's enquiry in due course.

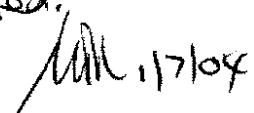
With regard to the reported comments by Mr McBride that the investigation phase must be undertaken first before the commitment of funds, I can only support such a statement. The protocol is for Council to develop such a proposal through the Coast and Estuary Committee Technical Sub-committee (and ultimately the full Coast and Estuary Committee), and Mr Neil Kelleher of this department would be a representative on both of those committee's. The technical committee would develop the proposed options for Council consideration and request for funds from the department. It would be at such a committee meeting that any additional data requirements could be discussed and agreed upon. At this time, the department does not have any specific requests.

With the recent restructure of the department, the Crown Land matters are now handled by the Department of Lands at Maitland.

Should you require any further information please contact me on 4929 9825 or Neil Kelleher on 4337 1277.

Yours faithfully


Ross Cooke
A/Local Government Programs Manager
Hunter Region

Noted.
 11/7/04

cc: Neil Kelleher, Gosford



NEW SOUTH WALES

MINISTER FOR INFRASTRUCTURE AND PLANNING
MINISTER FOR NATURAL RESOURCES

Mr Kerry Yates
General Manager
Wyong Shire Council
PO Box 20
WYONG NSW 2259

D04/5489

24 OCT 2004

Dear Mr Yates

I refer to your letter concerning a request for funding and approval for the proposed dredging of Tumbi Creek.

I am advised that the NSW Government funding is no longer required for this project as the Commonwealth Government has announced that it will provide two thirds of the estimated \$2m to dredge Tumbi Creek and remove the spoil for offsite treatment and disposal. I understand that Council is to provide the remaining one third of the funding toward the project.

Council is still required to comply with NSW state environmental legislation. The Department of Lands, the Department of Environment and Conservation and the Department of Primary Industries should be contacted with a view to obtaining any required approvals.

If you require further information please contact Mr Brian Gardoll, A/Regional Director, Hunter Region, at the Department's Newcastle office on telephone 4929 9801.

Yours sincerely



Craig Knowles MP
Minister for Infrastructure and Planning
Minister for Natural Resources

**TUMBI CREEK DREDGING
SENATE HEARING
24 February 2005
NOTES ON TELEPHONE CONVERSATIONS WITH MR GRAEME
HALLETT REGARDING REGIONAL PARTNERSHIP FUNDING**

- These notes are based upon the recollections of Mr Mike Long (formerly Manager Open Space & Recreation Wyong Shire Council) and Mr David Cathers (Director Engineering Services Wyong Shire Council) in relation to discussions in 2004 with Mr Graham Hallett regarding Regional Partnership Funding. It is understood Mr Hallett was working from Mr Ticehurst and/or Mr Lloyd's office at the time of these discussions.
- Unless otherwise stated, dates shown are from brief notes. Abbreviations used are: MDL = Mike Long, DGC = David Cathers.
- On Thursday 3 June 2004 DGC rang MDL and asked him to download information from the Internet relating to possible funding under the Federal Government's Regional Partnerships Programme. This was viewed as a potential funding source for the project to dredge Tumbi Creek should Council resolve to proceed with any option beyond already identified funding sources. (Note – this matter was to be considered at the Council meeting of June 9 2004). MDL recalls that he had to contact Mr Graham Hallett, in Mr Ticehurst's office, on 0419.688.440, to discuss such a programme. MDL's conversation with Mr Hallett was very brief, and MDL recalls he (Mr Hallett) only provided advice that the application should be sent directly to DOTARS.
- DGC also gave MDL the name of Mr Ian Geary of the Federal Department of Transport (02 62 748 143) as a further contact.
- DGC recalls that he had several telephone conversations with Mr Hallett on this matter prior to contacting MDL.
- MDL also has a folder note regarding contact with Mr Hallett on Friday 10 September 04 seeking an update on progress of grant monies, at the request of DGC. Mr Hallett advised MDL to contact Alex Petrovsky at DOTARS in Newcastle, who advised that it would take up to one month to draw up the funding contract and send it to Council. However, before funds are released Council would have to have all State Govt approvals in place.



WYONG SHIRE
COUNCIL

building a better tomorrow!



CENTRAL
COAST

Wyong Shire Council ABN 47 054 613 7
DX 7306, PO Box 20, Wyong NSW Australia 22
Phone: (02) 4350 5555 Fax: (02) 4351 20
Email: wsc@wyong.nsw.gov
Web: www.wyongsa.nsw.gov

FAXED
25.6.04

MDL:AR/M Long
F2004/06943

June 25 2004

Mr Ian Geary
Department of Transport & Regional
Services
GPO Box 594
CANBERRA ACT 2601

D 00020348

Fax: (02) 6274 8100

Dear Mr Geary

Regional Partnerships - Tumby Creek Dredging

Please find attached Council's revised application for Regional Partnerships regarding the Tumby Creek Dredging proposal. Council is now seeking financial support from the Federal Government for two-thirds of the estimated cost of the project (\$1.36M), with Council contributing the remaining one-third of the cost (\$0.68M), on the basis that the NSW Government has made no provision for funding of this work.

Should you require any further information or clarification please contact the undersigned on telephone 43 505 418.

Yours faithfully

Mike Long
Manager
OPEN SPACE AND RECREATION

*Please scan,
then discard.*

Tks

25/6/04

Attch.



Regional PARTNERSHIPS

APPLICATION FORM

Table of Contents

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b) Partnerships and support.....	12
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BEFORE YOU BEGIN

Before completing this application you should have:

Read **Regional Partnerships** guidelines: www.regionalpartnerships.gov.au

Completed the eligibility check : www.regionalpartnerships.gov.au

Consulted with your Area Consultative Committee (ACC) www.acc.gov.au

Your ACC is a primary source of information and assistance in the development of applications. Your ACC can:

- provide you with advice on obtaining and providing evidence of broad community or business support for the project;
- assist with identifying other project partners; and
- ensure your application form is completed in sufficient detail.

Your ACC plays a major role in providing the Department of Transport and Regional Services (the Department or DOTARS) with advice, in the form of comments and a recommendation on all applications. Involving your ACC early in the project and application development phase will reduce the assessment time with the Department.

Read *information you should know* in the application form (see p15).

APPLICANT/ SPONSOR INFORMATION

You are not eligible to apply for Regional Partnerships funding if you are one of the following:

- an Area Consultative Committee;
- a Commonwealth or State government department;
- an individual;
- a private enterprise or a co-operative, that is considered a commercial enterprise, requesting funding for planning, studies or research; or
- a third party seeking funds on behalf of others.

Please note that an asterisk (*) next to a question means that the information is mandatory.

1. Applicant or sponsoring organisation's information.

* Do you have a sponsor for this application?

A sponsor is an organisation that will administer the grant on your behalf. You will need a sponsor if your organisation is not registered under State or Commonwealth legislation eg Corporations Act 2001. The sponsor will sign the funding agreement if your application is successful.

Yes - complete the sponsoring organisation's details here.

No - complete your organisation's details here.

* Legal name of organisation: **WYONG SHIRE COUNCIL**

* Short Name or Trading Name: **WYONG SHIRE COUNCIL**

* Type of organisation:	<input type="checkbox"/> Private Enterprise or for-profit entity	<input checked="" type="checkbox"/> Local Government
	<input type="checkbox"/> Non-profit entity, including registered charities	<input type="checkbox"/> Community Council (Indigenous Council)
	<input type="checkbox"/> Association	<input type="checkbox"/> State Government funded agency
* Organisation Address:	Street/Unit/Lot No	16
	Street Name	HELY ST
	Town/Suburb	WYONG.
	City	
	State/Territory	NSW
	Postcode	2259

Internet Details:	Website	www.wyongsc.nsw.gov.au
	Email address	wsc@wyong.nsw.gov.au

Postal Address (if different from above):	PO Box	20
	Town/Suburb	WYONG.
	City	
	State/Territory	NSW
	Postcode	2259

2. Registration, ABN/ACN and GST.

a) Attach a copy of your organisation's (or sponsoring organisation, where applicable) registration certificate eg Certificate of Incorporation.

b)

Australian Business Number (ABN):

47 054 613 735

Australian Company Number (ACN):

--- --- ---

ABN / ACN Application Pending? (Evidence of the ABN/ACN registration will be required if the application for funding is successful.)

Yes No

* c) Is the applicant (or sponsoring organisation, where applicable) GST registered?

Yes - provide date of registration: ___/___/___ JULY 2000

No

* d) State the Purpose/ Objective/ Mission Statement of the Applicant Organisation (not the sponsor) (75 word limit)

To make Wyong Shire a great place to live, work and play.

3. Contact Details

* Primary Contact Please ensure that this person is well acquainted with the details of the application and project	* Title (Miss, Ms, Mr, Dr, Mrs, Rev)	MR
	* First Name	MICHAEL
	* Last Name	LONG
	* Position	MANAGER, OPEN SPACE & RECREATION
	* Organisation	WYONG SHIRE COUNCIL
	* Phone 1	43 505 418
	Phone 2	43 505 322
	Facsimile	43 512 098
Email address		Long M@wyong.nsw.gov.au
* Secondary Contact: Please identify a person that can be contacted about the project and application if the nominated contact is not available	* Title (Miss, Ms, Mr, Dr, Mrs, Rev)	MR
	* First Name	DAVID
	* Last Name	CATHERS
	* Position	DIRECTOR, ENGINEERING SERVICES
	* Organisation	WYONG SHIRE COUNCIL
	* Phone 1	43 505 494
	Phone 2	43 505 205
	Facsimile	43 512 098
Email address		CATHERSD@wyong.nsw.gov.au
Sponsor Contact: (If you have a sponsor for this application)	* Title (Miss, Ms, Mr, Dr, Mrs, Rev)	
	* First Name	
	* Last Name	
	* Position	
	* Organisation	
	* Phone 1	
	Phone 2	
	Facsimile	
Email address		

PROJECT INFORMATION

4. * Project name (short title): TUMBI CREEK DREDGING

We will use this name in general correspondence and communication

5. a) Anticipated project start date: ESTIMATED DECEMBER 2004

b) Anticipated project end date: ESTIMATED NOVEMBER 2005

6. Project location.

Only answer this question if the project is not located at the applicant's location address.

Street/Unit/Lot No.	NORTHERN END
Street/Property Name	THE PENINSULA
* Nearest Town/Suburb	KILLARNEY VALE
City	
* State/Territory	NSW
* Postcode	2261

7. Describe the broader geographic area that will benefit from your project, if applicable.

RESIDENTS LIVING IN SOUTHEAN PART OF WYONG SHIRE, PARTICULARLY FROM LONG JETTY, BATEAU BAY, KILLARNEY VALE, BERKELEY VALE, GLENNING VALLEY AND CHITAWAY WILL HAVE ACCESS TO BOAT RAMP IN TUMBI CREEK FOR BOATING. LOCAL CHILDREN WILL AGAIN BE ABLE TO SAFELY SWIM IN TUMBI CREEK.

8. Please list referees who can confirm the capability and experience of your organisation. (minimum 2).

Referee 1 Contact Details			
Organisation:	GOSFORD CITY COUNCL		
* Title (Miss, Ms, Mr, Dr, Mrs, Rev):	MR	* First Name:	STEPHEN
* Last Name:	GLEN	Position:	DIRECTOR, ENGINEERING OPERATIONS
* Phone 1:	4325-8280	Phone 2:	4325 8222
Facsimile:	4323-2477	Email address:	stephen.glen@gosford.nsw.gov.au

Referee 2 Contact Details			
Organisation:			
* Title (Miss, Ms, Mr, Dr, Mrs, Rev):		* First Name:	
* Last Name:		Position:	
* Phone 1:		Phone 2:	
Facsimile:		Email address:	

Referee 3 Contact Details			
Organisation:			
* Title (Miss, Ms, Mr, Dr, Mrs, Rev):		* First Name:	
* Last Name:		Position:	
* Phone 1:		Phone 2:	
Facsimile:		Email address:	

9. Tell us about your project partners

Please complete the tables below, making copies where necessary

a) Project Partners' Organisation Details

* Legal Name of Organisation		WYONG SHIRE COUNCIL	
* Type of Organisation		<input type="checkbox"/> Individual <input type="checkbox"/> Commonwealth Government <input type="checkbox"/> State Government <input checked="" type="checkbox"/> Local Government <input type="checkbox"/> Community Council (Indigenous Council)	<input type="checkbox"/> Community/not-for-profit <input type="checkbox"/> Private Enterprise, or for-profit entity <input type="checkbox"/> Association <input type="checkbox"/> Co-operative
* Address of Partner Organisation			
* Street/ Unit/ Lot No:		* Street Name:	
Town/ Suburb:		City:	
PO Box:		* State/ Territory:	
		* Postcode:	
* Details of contact person for Partner Organisation			
* Title (Miss, Ms, Mr, Dr, Mrs, Rev):		* First Name:	
* Last Name:		* Position:	
* Phone 1:		Phone 2:	
Email:		Facsimile:	

b) Funding Details

- (i) How much funding are you seeking from Regional Partnerships (GST exclusive)? \$680,000 or 1/3 of project cost
- (ii) Copy the table below for your organisation and each of your partners and complete the details about contributions of funding to the project.

Your organisation/ Project Partner's organisation:	WYONG SHIRE COUNCIL				
Name of funding programme: (if applicable)					
* Amount (\$):	<table border="1"> <tr> <td>Cash</td> <td>\$680,000 or 1/3 project cost</td> </tr> <tr> <td>In-kind</td> <td>\$</td> </tr> </table>	Cash	\$680,000 or 1/3 project cost	In-kind	\$
Cash	\$680,000 or 1/3 project cost				
In-kind	\$				
If an in-kind contribution, how did you calculate the \$ value?	eg 10 hours x \$15				
Describe any conditions on the contribution:	SUBJECT TO BALANCE OF FUNDS FROM FEDERAL GOVERNMENT, AND MEETING PROJECT REQUIREMENTS FROM STATE GOVERNMENT AGENCIES eg. NSW FISHERIES, LANDS DEPT, DPI&NR				
* Status:	<input type="checkbox"/> Application submitted/contribution requested <input type="checkbox"/> Contribution committed and yet to be received <input checked="" type="checkbox"/> Own contribution <input type="checkbox"/> In negotiation <input type="checkbox"/> Contribution received				

If after submitting this application form the details of this schedule change please advise the relevant DOTARS Regional Office as soon as possible. Confirmation of above details may be requested.

9. Tell us about your project partners

Please complete the tables below, making copies where necessary

a) Project Partners' Organisation Details

* Legal Name of Organisation		COMMONWEALTH GOVERNMENT	
* Type of Organisation		<input type="checkbox"/> Individual <input checked="" type="checkbox"/> Commonwealth Government <input type="checkbox"/> State Government <input type="checkbox"/> Local Government <input type="checkbox"/> Community Council (Indigenous Council)	<input type="checkbox"/> Community/not-for-profit <input type="checkbox"/> Private Enterprise, or for-profit entity <input type="checkbox"/> Association <input type="checkbox"/> Co-operative
* Address of Partner Organisation			
* Street/ Unit/ Lot No:		* Street Name:	
Town/ Suburb:		City:	
PO Box:		* State/ Territory:	
		* Postcode:	
* Details of contact person for Partner Organisation			
* Title (Miss, Ms, Mr, Dr, Mrs, Rev):		* First Name:	
* Last Name:		* Position:	
* Phone 1:		Phone 2:	
Email:		Facsimile:	

b) Funding Details

- (i) How much funding are you seeking from Regional Partnerships (GST exclusive)? \$1.360M or 2/3 of project cost
- (ii) Copy the table below for your organisation and each of your partners and complete the details about contributions of funding to the project.

Your organisation/ Project Partner's organisation:	COMMONWEALTH GOVERNMENT				
Name of funding programme: (if applicable)	REGIONAL PARTNERSHIPS				
* Amount (\$):	<table border="1"> <tr> <td>Cash</td> <td>\$1.360M or 2/3 of project cost</td> </tr> <tr> <td>In-kind</td> <td>\$</td> </tr> </table>	Cash	\$1.360M or 2/3 of project cost	In-kind	\$
Cash	\$1.360M or 2/3 of project cost				
In-kind	\$				
If an in-kind contribution, how did you calculate the \$ value?	eg 10 hours x \$15				
Describe any conditions on the contribution:					

* Status:	<input checked="" type="checkbox"/> Application submitted/contribution requested <input type="checkbox"/> Contribution committed and yet to be received <input type="checkbox"/> Own contribution	<input type="checkbox"/> In negotiation <input type="checkbox"/> Contribution received
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If after submitting this application form the details of this schedule change please advise the relevant DOTARS Regional Office as soon as possible. Confirmation of above details may be requested.

10. * Have you applied for Commonwealth, State or Local Government funding for any other project in the last 5 years?

- No - continue to the next question.
 Yes - complete the table below.

Source of funds eg Department Name	Name of funding programme (if applicable)	Status of funding	Amount provided or requested (\$)	Please provide brief details about the project	Source contact details	
		Indicate which: • Contribution received, or • Under negotiation, or • Unsuccessful.			Title (Miss, Ms, Mr, Dr, Mrs, Rev) First name Last name	Phone number (include STD code)
	COUNCIL FUNDING	HAS MADE ASSISTANCE	NUMEROUS	APPLICATIONS FOR		
	PLEASE REGIONAL	REFER TO PARTNERSHIPS	RECENT FUNDING	W.S.C. APPLICATION FOR FOR ROADS PROJECTS. ("C.A.R.E.S" FACILITY)		
	W.S.C.	CONTACT OFFICER WAS		MS KIRSTY TAYLOR, PH 43 505232..		
	ALSO	SEE ATTACHED		SHEET FOR ADDITIONAL INFORMATION.		

1. * Have you applied for Commonwealth, State or Local Government funding for any other project in the last 5 years?

No - continue to the next question.

Yes - complete the table below. Please see appendix 3

Source of funds eg Department Name	Name of funding programme (if applicable)	Status of funding	Amount provided or requested (\$)	Please provide brief details about the project	Source contact details	
		indicate which: • Contribution received, or • Under negotiation, or • Unsuccessful.			Title (Miss, Ms, Mr, Dr, Mrs, Rev) First name Last name	Phone number (include STD code)
Department of Transport and Regional Services	Roads to Recovery	Contribution received	From 2001 to 2004 we have received a total of \$3,019,174	Federal Government Roads to Recovery Programme	Mr Adrian Pitcher	(02) 4350 5451
Department of Transport and Regional Services		Contribution received	\$40,000			

11. Project Budget.

REFER COUNCIL REPORT OF 9 JUNE 2004

* Provide a breakdown of the various project cost items. Attach evidence of these costs separately (eg quotes, market comparisons, valuations).

Cost Item	Estimated Cost (\$ GST Exclusive)	Funds sought from Regional Partnerships (\$ GST exclusive)	Other Partner / Applicant Contributions		
			\$ (GST exclusive)	Type (cash/in-kind)	Name of Partner / applicant
Wages, salary and superannuation	\$	\$	\$		
Labour on-costs	\$	\$	\$		
Consultant/Contractors	\$1,470,000	\$	\$		
Travel	\$	\$	\$		
Materials	\$	\$	\$		
Equipment Hire/Lease	\$	\$	\$		
Audit	\$	\$	\$		
Evaluation	\$	\$	\$		
LANDFILL FEES \$150K Other Costs 2000SS \$30K	\$570,000	\$	\$		
TOTAL (\$)	\$2,040,000	\$1,360,000	\$1,360,000	CASH	COMMONWEALTH GOVERNMENT (2/3)
			\$680,000	CASH	WYONG SHIRE COUNCIL (1/3)

INSERT OR DELETE ROWS AS REQUIRED.

12. Project Timetable

* Please break down your project into key milestones and the required payments. Regional Partnerships payments are linked to the achievement of milestones.

Milestone number	Milestone description	Month Due	Estimated cost \$ (GST exclusive)	Cost items associated with milestone	Payment required from Regional Partnerships programme (\$ GST exclusive)
1-9	Monthly progress. Payments to dredging contractor	End of month	Approx \$280,000 per month	Dredging and removal of spoil to landfill. Contractor will require monthly payments over estimated 6 month duration of project.	Monthly progress payments of approx. \$200,000 per month
Total			\$2,040,000		\$1,360,000

Insert or delete rows as required.



ASSESSMENT CRITERIA

A) OUTCOMES

13. Tell us about your project.

a) *Tell us what your project is about. If relevant, tell us what phase Regional Partnerships funding will be used for. (250 word limit)

If your project involves appointing a consultant, attach a copy of the consultant's brief or job description you will be using to engage the consultant for the project.

THIS PROJECT INVOLVES DREDGING TO REMOVE 15,000 M3 OF MATERIAL TO LANDFILL. THIS MATERIAL IS BLOCKING THE MOUTH OF TUMBI CREEK INTO TUGGERAH LAKE. IT IS PREVENTING THE USE OF THE CREEK FOR RECREATIONAL BOATING, SWIMMING AND CAUSING WATER QUALITY PROBLEMS AND FLOODING CONCERNS.

b) *Tell us why your project is needed (ie the rationale). (250 word limit)

Please provide evidence of your project's rationale eg alignment to the region's identified priorities, including those identified by your ACC in its Strategic Regional Plan (include attachments if needed).

- TO RETURN A VALUABLE RECREATION ASSET TO FORMER FUNCTIONALITY BY RE-OPENING THE CREEK CHANNEL FOR BOATS
- TO PROVIDE IMPROVED CREEK FLUSHING AND WATER QUALITY, ALLOWING SWIMMING IN THE CREEK
- TO REDUCE POTENTIAL FOR FLOODING OF NEARBY HOUSES.

c) *Provide a description of how the project will be implemented (ie the methodology). (250 word limit)

The project should demonstrate clear pathways to sustainability.

Attach relevant documents that support the methodology eg project plan, feasibility study etc.

- FINAL APPROVALS WILL BE SOUGHT TO ADOPTED DREDGING METHOD [COUNCIL WILL ARRANGE THROUGH STATE GOVT. AUTHORITIES].
- TENDERS WILL BE CALLED AND MANAGED BY COUNCIL.
- WORK WILL BE UNDERTAKEN BY EXPERIENCED DREDGING CONTRACTOR.

d) *Provide a description of your project's expected outcome(s). (250 word limit)

- OPEN CHANNEL ALLOWING RECREATIONAL BOATS TO AGAIN ACCESS THE LAKE FROM THE BOATRAMP IN TUMBI CREEK.
- IMPROVED WATER QUALITY - MORE SWIMMING
- IMPROVED FISHING FROM MORE FISH MOVEMENTS FROM LAKE INTO CREEK.

14. *Tell us how you will measure your project's outcomes? (250 word limit)

Please complete the table below. List anticipated outcomes eg X jobs created; improved access to services etc, and include information about timeframes, how outcomes will be measured and by who, and how they will be reported on.

OUTCOME	PERFORMANCE MEASURE
IMPROVED ACCESS BY BOATS	N° OF BOATS USING CHANNEL WILL BE MONITORED.
IMPROVED WATER QUALITY	WATER QUALITY TESTING WILL BE DONE & FISH STOCKS CHECKED

You should consider the resources required in monitoring and gathering the performance information. The resources required to measure the performance information are related to the size and complexity of your project and its outcomes. Your ACC can assist you in this part of your project's planning.

15. *Tell us how your project will impact on other businesses or groups in your region. (250 word limit)

This question relates to whether there will be duplication of or competition with existing businesses/organisations or whether this project will complement or enhance existing operations. Tell us about how your project will:

- meet an unsatisfied demand for the product/service,
- present the product/service in a new or different way, and/or
- enhance or diminish the product or service of other businesses or groups in your region.

RE-OPENED CREEK CHANNEL WILL ALLOW RECREATIONAL BOATING TO RESUME FROM THIS LOCATION. NO ADVERSE IMPACTS ON LOCAL BUSINESSES.

B) PARTNERSHIPS AND SUPPORT

16. * If necessary, does your project have commitment from local government to:

- provide formal statutory approvals, or
- meet the ongoing maintenance costs?

Yes – attach evidence

No

Not applicable REQUIRES STATE GOVERNMENT APPROVALS eg NSW FISHERIES, LANDS DEPARTMENT.

17. * Who supports your project? (250 word limit)

Establishing community support for the project is critical to the long term success and ownership of the project. The support should come from those that will benefit from and/or contribute to your project's outcomes.

Attach evidence of this support (eg letters of support, outcomes of consultations etc)

PROJECT HAS WIDESPREAD COMMUNITY SUPPORT TO RE-OPEN CHANNEL AND TAKE DREDGE SPILL AWAY.

C) PROJECT AND APPLICANT VIABILITY

18. * What experience and resources does your organisation have, or have access to, that will help you with managing the project? (250 word limit)

For example, tell us about numbers of volunteers, your staff, special expertise, office facilities, equipment etc that will be used in this project.

You should also include the relevant experience of individuals in your organisation.

COUNCIL HAS A LONG HISTORY OF SUCCESSFULLY MANAGING PROJECTS OF A TECHNICAL NATURE.
COUNCIL HAS ITS OWN DREDGE AND AQUATIC WEED HARVESTER, AND HAS BEEN DREDGING IN THE TUGGERAH LAKES FOR MANY YEARS.
THE ENGINEERING DEPARTMENT HAS OVER 500 STAFF.

19. * Tell us how the project and its outcomes will be self-sustaining at the end of Regional Partnerships funding. (250 word limit)

THE RE-OPENING OF THIS CHANNEL TO IMPROVE RECREATIONAL OPPORTUNITIES, REDUCE FLOODING POTENTIAL AND IMPROVE WATER QUALITY IS REQUIRED ABOUT ONCE OR TWICE A DECADE FROM HISTORICAL RECORDS.
COUNCIL WILL CONTINUE TO MONITOR THE DREDGED CHANNEL TO MANAGE IT FOR MAINTAINING ITS FUNCTIONALITY.

20. Additional considerations

- i) If your project includes a survey (funded by the Commonwealth) directed to 50 or more businesses, the survey is subject to clearance by the Australian Bureau of Statistics Statistical Clearing House www.sch.abs.gov.au/ Please contact your ACC for more information.
- ii) If you are successful in receiving funding through Regional Partnerships, a more detailed schedule of project outcomes will form part of the Funding Agreement. This information will be used for evaluation purposes.
- iii) As part of the assessment process, DOTARS may arrange for an independent risk assessment of the applicant or the project or both.
- iv) All applications will need to comply with DOTARS' probity and viability requirements. Additional information may need to be provided to support your application.

Are you:

- from the private sector and/or for-profit entity?
- seeking more than \$250,000 from Regional Partnerships and / or
- applying for funding for a project that will operate in a commercial environment?

NO - Go to the next page.

YES - Please attach the following information:

- An outline of the organisation's/sponsor's ownership and management structure, including details of partners and/or directors. Include their full name, date of birth, current residential address and where possible, driver's licence number.
- The business plan for the project including, where applicable:
 - feasibility study
 - industry data/research
 - cash flow projection for the project period + 3 years. Include assumption used and key/sensitive factors in the projections. It could include investment analysis details such as rates of return, liquidity and debt analysis assumptions.
 - marketing strategy and assumptions
 - SWOT analysis
- A list of pecuniary interests relevant to the project.

PLEASE REFER TO W.S.C.
PREVIOUS APPLICATION PREPARED
BY KIRSTY TAYLOR, ph43505232.

Note: Further information may be sought later.

This may include audited profit and loss and balance sheet statements, an authorised statement of financial position and tax returns for the last 3 financial years

DECLARATION

I declare that I have been authorised to make this application by WYONG SHIRE COUNCIL.

I declare that the information I have given on this form is complete and correct and that the group/organisation that I represent (and the sponsoring organisation, if nominated) supports the project. My organisation or I will inform the appropriate Regional Office of the Department of Transport and Regional Services promptly of any changes to this information.

I understand and agree with the conditions in the Guidelines and application form.


I understand that this application and other information provided to the Department of Transport and Regional Services may be provided to other agencies, as appropriate, to determine compliance with the **Regional Partnerships** assessment criteria.

I agree that

- my application may be used in future evaluation and performance management of **Regional Partnerships**.
- the Department can arrange for the project to be evaluated at any time during or after the term of the Funding Agreement.
- if my application is successful, information about my organisation's project in the application form may be reproduced in **Regional Partnerships** promotional and media material.
- individuals or organisations mentioned in my application may be contacted as part of the assessment of this application and I permit the Commonwealth to disclose to those individuals and organisations any information in the application it considers in order to verify any matter in the application.

I have read and understood the Funding Agreement and, if this application is approved for funding by the Commonwealth, am willing to enter into an Agreement with the Commonwealth in the same terms as the Funding Agreement should the Commonwealth request this.

Representative:

First Name	<u>DAVID</u>	Last Name	<u>CATHERS</u>
Position	<u>DIRECTOR, ENGINEERING SERVICES</u>	Phone	<u>(02)4350 5494</u>
Organisation	<u>WYONG SHIRE COUNCIL</u>		
Signature		Date	<u>25 JUNE 2004</u>

By submitting an application for funding electronically, you warrant that you are duly authorised to submit an application on behalf of the applicant. Further you acknowledge the absence of a handwritten signature in the application for funding does not invalidate your electronic submission.

FOR STATISTICAL PURPOSES

For private sector organisations employing fewer than twenty employees please provide an estimate of the time taken to complete this application form.

Include the time spent reading the instructions, working on the question, and obtaining the information to complete the question.

Hours: Minutes:

WYONG SHIRE COUNCIL

June 9 2004
To the Ordinary Meeting of Council

Director's Report
Engineering Services
Department

258**Alternative Dredging Proposals for Tumbl Creek****F2004/06943 MDL:AA**

SUMMARY

This report examines alternative methods of dredging Tumbl Creek and disposing of the dredge spoil away from the site and Tuggerah Lake. Estimated costs are provided based upon preliminary assessments of possible options and current knowledge of the requirements of other approval authorities.

RECOMMENDATION

Submitted for Council's consideration.

BACKGROUND

At its meeting of March 10 2004 Council passed the following rescission motion:

- *1 That having regard to strong community concerns over the proposed remediation/dredging of Tumbl Creek, Council advise the State Government that it is not prepared to continue with the programmed dumping of siltation into the lake and that the staff bring back a report as to options and likely funding requirements to remediate the creek with the spoil being taken off site.*
- 2 That having regard to the current financial constraints facing Council with respect to the removal of material from Tumbl Creek, staff report on the feasibility of a staged sludge removal programme and disposal to land fill.*
- 3 That the report cover volumes, the effects on flood mitigation/liabilities, environmental flows and recreational boating access.*
- 4 That, as the Tuggerah Lakes system is owned by the state Government and has been identified as being of national significance, Council calls on both State and Federal Governments to match Council's \$3M lakes funding."*

This rescission motion overturned Council's earlier resolution of December 11 2002 to proceed with the dredging and spreading of the dredge spoil in a thin veneer over the bed of Tuggerah Lake. This report provides information in response to Items 1, 2 and 3 of the above resolution.

Alternative Dredging Proposals for Tumbi Creek (contd)

2 CURRENT SITUATION

The channel mouth remains blocked and issues of potentially increased flood levels on local properties, recreational boating access to Tuggerah Lake and environmental flows within Tumbi Creek have not changed.

Approximately \$360,000 has been expended to date on investigations, consultancies, purchase of equipment and external/internal resources for the initial dredging option that involved placement of dredge spoils on the bed of the Lake.

Separate to this work Council has been addressing the erosion issues in Tumbi Creek with rock work and revegetation of banks. Approximately \$160,000 has been spent by Council on these works to date. Additional works are also being programmed. These are likely to cost up to \$140,000.

3 OPTIONS FOR OFF-SITE DISPOSAL

3.1 Introduction

A number of possible options to remove and dispose of material blocking the channel from Tumbi Creek to Tuggerah Lake have been initially investigated. These are discussed in Section 3.2 and summarised in Table 1 in Attachment 1. These options are based on providing a widened and slightly realigned channel from Tumbi Creek into the Lake, as shown in Attachment 2.

Further options have also been considered based upon re-opening the previous channel sufficiently to alleviate the current problems in the Creek, but noting that more frequent removal of sediments would be required by adopting this approach. These Options are discussed in Section 3.3 and are summarised in Table 1. The position of the previous channel is shown in Attachment 2. A plan showing the travel route from Tumbi Creek to the Butlanderry Landfill site is shown in Attachment 3.

A Summation of Key Issues and Outcomes is included in Attachment 4, and a table showing the various options and a ranking of relevant issues is included in Attachment 5.

Alternative Dredging Proposals for Tumby Creek (contd)

3.2 Dredge New Channel

A Review of Environmental Factors (REF) for the dredging of Tumby Creek, prepared in 2002, provided for the dredging and removal of approximately 30,000 cubic metres of material to provide a realigned channel from Tumby Creek into Tuggerah Lake. The Conditions of Licence for the dredging subsequently issued by the Department of Lands authorised the removal of 15,000 cubic metres of material in lieu of the proposed 30,000 cubic metres. This would still allow relief from the flooding risk within Tumby Creek arising from the siltation. However, the reduced volume of the approved channel was expected to result in more frequent dredging being required than for the proposed larger channel over the longer term.

The 2002 REF also considered a number of options for excavation and disposal of material away from the site as possible alternatives to dredging and disposal of the material across the bed of the Lake. These options are outlined below, together with one additional option and estimates of costs and possible timeframes.

The costs for the options provided within the REF have been adjusted to reflect the reduction of volume from 30,000 cubic metres to 15,000 cubic metres, and the option costings have been updated. They do not include the project expenditure to date as identified in Section 2. Timeframes have been estimated based on reasonable productivity rates for the various construction methods.

It should be noted that these options are still based on preliminary data, and would require further investigation to allow revision of the costs and timeframes of a selected option as much as possible. Any selected option would therefore:

- require further investigations of the site examining the possible spoil removal, temporary storage areas and disposal methods;
- be subject to a full environmental assessment (this would use as much information as possible from previous investigations and studies);
- require referral to the various approving authorities prior to gaining consent to proceed. These Authorities would include the EPA, Department of Lands, Department of Infrastructure, Planning and Natural Resources, NPWS, Waterways Authority and Fisheries Department.

Alternative Dredging Proposals for Tumbi Creek (contd)

With full investigation, and any imposed conditions by approving authorities, the final costs may vary by up to at least 25%. A range of costs is therefore shown for each option. For all options an allowance of \$75,000 has been included to allow for any additional studies or equipment required as a result of the need to gain approvals. This allowance is shown in Table 1.

All of the options considered include the estimated costs of haulage to Buttonderry Tip (\$225,000) and Tip disposal fees (\$248,000), based on moving and disposing of 15,000 cubic metres of material. A separate allowance has also been made for any damage to the local road system from the lake foreshore to Buttonderry Tip. This cost had been included in Table 1 in Attachment 1. A map showing possible roads to be used is included in Attachment 2.

No allowance has been included in the costings for treatment of any potentially acid sulphate soils at the landfill site. It is considered that further treatment is not required as the leachate collected at the landfill is already alkaline, and any acid leachate from the dredged material would not be of sufficient volume or concentration to noticeably change the acidity of the leachate. This matter may require further resolution with the EPA who regulates landfill operations.

Any option involving either the construction of ponds on the foreshore and/or the off-site transport of materials will result in difficulties dealing with potential odours, noise and general disruption to the adjoining residential areas. These issues would be addressed through the environmental assessment process, and where possible, methods to minimise their impact would be developed.

Possible options to remove 15,000 cubic metres of material from a new channel are as follows:

Option 1 Use of Small Dredge Pumping to On-Shore Separation and Disposal

This option involves the use of a small dredge that would remove the material to an on-shore separation plant and "cyclone" that would separate out the heavier materials. The material would then be transferred by trucks to an approved disposal site (Buttonderry Landfill). This option would require a temporary haulage road to be built along the foreshore. The estimated costs of excavation and handling excavated material are \$1.3-1.6M, including a temporary haulage road and Landfill fees. With an allowance for any local road repair costs of \$0.32M (see Section 3.3) and approval costs, the estimated total costs of this option may range from \$1.7M to \$2M.

Alternative Dredging Proposals for Tumbi Creek (contd)

Based upon information from a dredge contractor who operates such a system, this small operation would have a production rate of approximately 100m³/day, and would require a minimum of 150 working days (6-9 months) to remove the material from the proposed channel. It is estimated that at least 1,000 truck trips would be required to transport the material to the Landfill site.

Depending upon the equipment used and configuration of any holding ponds and temporary road, this option may be impacted by salt marsh plants on the foreshore as discussed further in Section 4.

Option 2 Dredge to Temporary Holding Ponds Prior to Disposal

This option was discussed in the 2002 REF, however, because of the very significant site constraints such as proximity to houses, odour, space restrictions and noise problems, it was not costed in detail. If temporary ponds were able to be constructed as a series of long narrow ponds along the Lake foreshore to the east of Tumbi Creek, the estimated costs of this option would vary from \$1.2M-\$1.5M, including haulage and Landfill fees. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated total cost of this option is \$1.6M - \$1.9M.

Removal of material would need to be done in stages as the small holding ponds filled up and were allowed to settle and progressively emptied. At least 1,000 truck trips would again be required to the Landfill site. Depending upon how much time was required to settle out the dredged material in these small ponds, this operation could possibly take 12 -18 months to complete.

The construction of holding ponds under this option may also be impacted by salt marsh plants on the foreshore as discussed further in Section 4.

Option 3 Floating Excavator and Barges

This option would require a specialised barge-mounted excavator, loading into barge-mounted skips which would then be transported to shore and loaded into trucks for disposal at the Bullonderry landfill. It is envisaged that this method would be most effective if the barges were used in Tumbi Creek, with the excavator working from the Creek towards Tuggerah Lake.

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Alternative Dredging Proposals for Tumbi Creek (contd)

Based on assumptions for cycle times and excavation rates, the estimated minimum cost for this option to bring material to the boatramp at the end of The Peninsula is \$1M, including haulage and Landfill fees. However, there will be large quantities of water included with the excavated material, and dealing with this will be difficult. This also makes estimating the final costs difficult as the material to be transported will contain a large percentage of water. This could increase costs by perhaps 50-100%. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated total cost of this option could range from \$1.4M to \$2.4M.

This option may require between 1,000 and 2,000 truck tips, depending on how wet the excavated material is when it is loaded into trucks. Sealed truck bodies would be required, and possibly the trucks would have to be underloaded to minimise loss of material. The work is estimated to take approximately 3-4 months to complete.

Option 4 Temporary Road Over Channel

This option involves the use of rock fill to construct a temporary road over the location of the proposed channel. Excavators and trucks would be used to place the rock fill, excavate the channel and then remove the temporary road. This option would also require construction of a temporary haul road to the site along the foreshore from Adelaide Street. The estimate cost for this option is \$1.4M, including haulage and Landfill fees.

However, while this estimate includes an allowance of \$250,000 for rock ballast to be used to provide a firm base for the temporary road across the channel, the actual costs may increase substantially if additional ballast is found to be necessary to provide a reasonable footing. This method may also produce a "wave" effect, with the material in the creek pushing out and around the rock used under the temporary road and adding to the final cost of the work. With an allowance for any road damage repair costs of \$0.2M, the estimate minimum total cost of this option is \$1.6M.

This option will require a considerable number of truck trips to import and export temporary road materials as well as the material from the new channel. At least 2,000 truck trips would possibly be required, with a total construction period 304 months to complete the work.

The need to construct and remove a temporary haul road along the foreshore may be impacted by salt marsh plants growing in the foreshore as discussed further in Section 4.

Alternative Dredging Proposals for Tumbi Creek (contd)

Option 5 Geofabric Bags

This option involves the use of large geofabric bags as temporary holding structures for the dredged material. Each bag would be approximately 15m long, and placed within bunded areas on the foreshore approximately 300m long and 20m wide. Dredged material would be pumped into them and the water allowed to drain from the bags. This process would be repeated until the bags were full. Special flocculating agents would be added to the dredged material to help the material settle so the water could be removed more quickly.

Once the bags were full they would be allowed to drain over approximately 2-3 months, when the bags could then be cut open and the drained material loaded into trucks and taken to landfill.

Preliminary investigations and costings have been made of this option that hasn't been widely used for dredging applications in Australia. Some of the difficulties with using these bags in this area include the susceptibility to vandalism of the bags (slicing of the bags leading to spillages), the need to secure and isolate a large section of the foreshore for many months while the water continues to drain from the bags, the need for special flocculants that will not adversely affect the receiving waters, and the estimated cost. Initial estimates for this option using a 20% contingency allowance, show that it is likely to cost from \$1.7M - \$2M to handle 15,000 cubic metres of material. This includes haulage and Landfill fees. With an allowance for any road damage repair costs of \$0.32M, and approval costs, the estimated minimum total costs of this option could range from \$2.1M - \$2.4M.

It is estimated that approximately 1,000 truck trips would be required, and this option would probably require in excess of six months to complete due to the need to allow the material in the bags to fully drain. Depending upon space this process may have to be repeated to handle the volumes of material involved, and this increases the time required for the work.

3.3 Additional Road Damage Costs

All of the options considered in this report require the transport of spoil to the Butlanderry Landfill Site by trucks. This will potentially involve at least 1,000 return truck trips along local streets from the Lake or Creek to Wyong Road; and then along the Freeway, Sparks Road and Hue Hue Road to the landfill site.

Where trucks are referred to in this report they mean a truck and dog (or trailer), with a capacity of approximately 15 cubic metres or approximately 22 tonnes. Each trip to Landfill means a journey to the Landfill and return to the site.

While the condition of the road network from Wyong Road to the landfill site is considered to be suitable for these extra loads, the impact of running many heavy trucks on the local streets at Tumbi will be significant because they are only built to a local road standard.

Alternative Dredging Proposals for Tumbi Creek (contd)

Condition assessments have been made of The Peninsula, Adelaide Street, Warratta Road and Cornish Avenue as these are all possible travel routes to Wyong Road. These indicate that the road pavements are currently only just performing adequately for the current conditions and traffic volumes on these low trafficked local roads.

Although a slightly longer route, to minimise the impact on residents it is proposed that trucks would travel along The Peninsula and Adelaide Street to Wyong Road, where they would turn left and travel east to the roundabout at Cornish Avenue before travelling west back to the landfill site. This route will involve approximately 1,100 m of local roads.

Based on condition assessments of these roads it is estimated that the cost of stabilising the full length of The Peninsula and Adelaide Street to repair damage caused by the trucks would be \$320,000. This estimate includes a 30% contingency factor, and is based upon the roads requiring some repairs while running the trucks, followed by reshaping, stabilising with lime and a two-coat seal.

For options that involve moving less material (i.e. re-dredging old channel) it is likely that road damage will still occur due to the standard and condition of these local roads. An allowance of \$320,000 has therefore also been included for these options.

These costs have been added to each option as shown in Table 1.

3.4 Re-dredge Previous Channel

Options 1 to 5 in Section 3.2 are based on the removal of approximately 15,000 cubic metres of material from an amended channel position slightly west of the old dredged channel. A further five options have been developed based upon removing considerably less material from the old channel, but sufficient to address the three issues of flooding, access and water quality.

Some of the advantages of re-opening the previous channel include:

- Re-dredging the previous channel will enable the main issues of potential flooding, access and water quality to be more quickly addressed. The approval process may be easier because the previous channel is being re-opened and material not spread over the lake bed.
- There will be reduced initial costs for dredging a minimum channel size, although there will be more frequent maintenance costs with this option.

Alternative Dredging Proposals for Tumbi Creek (contd)

There would also be a need for more frequent removal of material from the previous channel because of its smaller capacity and location. This may be possible in the future by using a long-reach excavator working from the foreshore, but should the material be deposited further out in the channel the other dredging methods will be required. This more frequent clearing will cause more disturbances to residents than periodic dredging of a larger channel.

The estimated costs of the respective options for re-opening of the previous channel have been calculated below on the basis of removing approximately 5,000 cubic metres of material. This should provide a minimum channel similar in size to the channel that was last dredged in 1995.

All options include the estimated costs of haulage to Buttoderry Landfill (\$75,000) and Landfill disposal fees (\$83,000), based on moving and disposing of 5,000 cubic metres of material. An allowance has also been made in Table 1, Attachment 1 for potential road repair costs as discussed in Section 3.3.

Option 1a Use of Small Dredge Pumping to On-Shore Separation and Disposal

This option is similar to Option 1, and is estimated to cost from \$0.5M - \$0.7M. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated costs for this option range from \$0.9M to \$1.1M.

This is the estimated initial cost of this option. The smaller channel may be expected to require some further clearing work at intervals of up to four years, depending upon conditions and rain events bringing more material from the creek. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$100,000 per year.

Due to the reduced volume of material to be removed it is estimated that there would be approximately 350 return trucks associated with this option. With the smaller volume of material the work is estimated to require approximately 50 working days (2-3 months).

Option 2a Dredge to Temporary Holding Ponds Prior to Disposal

This option is similar to Option 2, and is estimated to cost \$0.45M. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated costs for this option range from \$0.85M to \$1.05M.

Alternative Dredging Proposals for Tumbi Creek (contd)

This is the estimated initial cost of this option. The smaller channel may be expected to require some further clearing work at intervals of up to four years, depending upon conditions and rain events bringing more material from the creek. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$100,000 per year.

It is estimated that this option would involve at least 350 truck trips, and take approximately 4-6 months to complete due to the need to settle the material.

Option 3a Floating Excavator and Barges

This option is similar to Option 3, and is estimated to cost \$0.3M to \$0.6M. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated costs for this option range from \$0.7M to \$1M.

This is the estimated initial cost of this option. The smaller channel may be expected to require some further clearing work at intervals of up to four years, depending upon conditions and rain events bringing more material from the creek. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$100,000 per year.

It is estimated that this option would involve at least 350-700 truck trips, and take approximately 2-3 months to complete.

Option 4a Temporary Road Over Channel

This option is similar to Option 4, and is estimated to cost \$0.5M. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated costs for this option range from \$0.8M to \$1.1M.

This is the estimated initial cost of this option. The smaller channel may be expected to require some further clearing work at intervals of up to four years, depending upon conditions and rain events bringing more material from the creek. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$100,000 per year.

It is estimated that this option would involve at least 700 truck trips, and take approximately 2-3 months to complete.

Alternative Dredging Proposals for Tumbi Creek (contd)

Option 5a Geofabric Bags

This option is similar to Option 2, and is estimated to cost \$0.6M. With an allowance for any road damage repair costs of \$0.32M and approval costs, the estimated costs for this option range from \$1M to \$1.2M.

This is the estimated initial cost of this option. The smaller channel may be expected to require some further clearing work at intervals of up to four years, depending upon conditions and rain events bringing more material from the creek. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$100,000 per year.

It is estimated that this option would involve at least 350 truck trips, and take approximately 3-4 months to complete to allow for drainage to take place from the bags.

3.5 Staged Sludge Removal Programme

It would be possible to undertake the opening of the channel as a staged process, removing material over a period of several years to provide the ultimate channel size required. However, there would be some disadvantages with this approach that include:

- A long period of disruption to the foreshore if temporary ponds or a haulage road were to be constructed along the edge of the lake. Community reaction to such disruption could be expected.
- Increased total project costs from several establishment and dis-establishment activities for stage of the work.

For these reasons a staged approach is not preferred.

Alternative Dredging Proposals for Tumbi Creek (contd)

4 ISSUES TO BE ADDRESSED

Two issues that need to be addressed in more detail (depending upon the chosen option) will be the treatment of the acid sulphate soils at Buttonderry Tip, and the effects on salt marshes on the foreshore east from Tumbi Creek.

The first issue as discussed in Section 3.2 is not expected to be a significant constraint, but will require the concurrence of the EPA. If the material has to be treated, this cost could be in the order of \$20-\$40/cu.m (potentially up to \$600,000 for 15,000 cubic metres of material).

The second issue may be a problem for any option that requires works to be carried out on the foreshore east from the Creek mouth. It is understood that legislation may be enacted shortly that protects salt marsh plants as threatened species. Options that use the foreshore east of Tumbi Creek (Options 1, 2, 4, 5, 1a, 2a, 4a and 5a) may have some impacts. This will require closer examination of any selected option to determine how any adverse impacts may be avoided.

The following table provides an assessment of some further issues that will impact on all options to varying degrees. A ranking process has been undertaken based upon the issues considered in this table. This indicates that Options 1 and 1a would be in the overall preferred options for the larger channel or previous channel respectively.

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Alternative Dredging Proposals for Tumbi Creek (contd)

OPTION	DESCRIPTION OF OPTION	WEIGHTING OF RELEVANT ISSUES					TOTAL WEIGHTED	RANKING
		LEACHATE MANAGEMENT	SOCIAL IMPACTS	ENVIRONMENTAL IMPACTS	INITIAL COST IMPACTS	ROAD DAMAGE		
	Opening New Channel							
1	Small dredge & onshore separation plant	2	3	2	4	5	16	3
2	Dredge into narrow ponds on foreshore	5	4	4	4	5	22	9
3	Floating excavator loading into barges	2	4	2	4	5	17	4
4	Construct temporary road over channel	3	4	4	4	5	20	7
5	Geofabric bags	5	5	4	5	5	24	10
	Re-Opening Previous Channel							
1a	Small dredge & onshore separation plant	1	3	2	2	5	13	1
2a	Dredge into narrow ponds on foreshore	4	4	4	2	5	19	6
3a	Floating excavator loading into barges	1	4	2	2	5	14	2
4a	Construct temporary road over channel	2	4	4	2	5	17	4
5a	Geofabric bags	4	5	4	3	5	21	8

Alternative Dredging Proposals for Tumbi Creek (contd)

Notes:

1 Weighting factors for Leachate Management, Social Impacts and Environmental Impacts when comparing options are as follows:

1	Small impact
2	Some impact
3	Moderately substantial impact
4	Substantial impact
5	Very substantial impact

2 Weighting factors for Cost Impacts are as follows for the average estimated cost of each option:

1	Less than \$0.5M
2	\$0.51M to \$1.0M
3	\$1.01M to \$1.5M
4	\$1.51M to \$2.0M
5	More than \$2.01M

3 Road damage for all options has been assessed as most likely requiring the stabilising and resealing of all haul roads from the site to Wyong Road. A maximum weighting of 5 has therefore been given to all options for this issue due to the likely damage and disruption to be caused.

5 CONCLUSION

A number of options have been presented in this report to remove the current blockage at the mouth of Tumbi Creek, and transport the material to the Buttonderry Landfill site.

Five options have been costed to remove approximately 15,000 cubic metres to create a larger channel in a new position to the west of the previous channel. A further five options have been presented to excavate only approximately 5,000 cubic metres and re-open the previous channel.

Table 1 in Attachment 1 summarises the ten options considered.

While estimates have been provided for all of the options, the nature of the work and types of equipment that may be used mean that the final costs for the work cannot be given with greater accuracy to clearly define the most economical method. The options considered to have the least adverse environment impacts and greatest advantages are Option 1, 2 and 3 (or 1a, 2a and 3a for re-dredging previous channel).

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Department

Alternative Dredging Proposals for Tumbi Creek (contd)

A possible way to economically carry out the work would involve calling for competitive tenders to remove, transport and dispose of the excavated material, but leaving the choice of method to the contracting industry. Floating excavators and barges, or dredges could be allowed alternatives, with conditions imposed on where and how material could be collected, protection of sensitive areas, travel routes and other conditions as appropriate.

It should be noted that no funds have been specifically identified for this project in the 2004/05 Management Plan.

Attachment 1
Attachment 2
Attachment 3
Attachment 4

Summary of estimated costs of dredging options (1 page)
Position of channels (1 page)
Map showing route to landfill site (1 page)
Summation of key issues and outcomes (2 pages)

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To the Ordinary Meeting of Council

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Alternative Dredging Proposals for Tumbi Creek (Attachment 1)

Table 1 Summary of Estimated Costs of Dredging Options

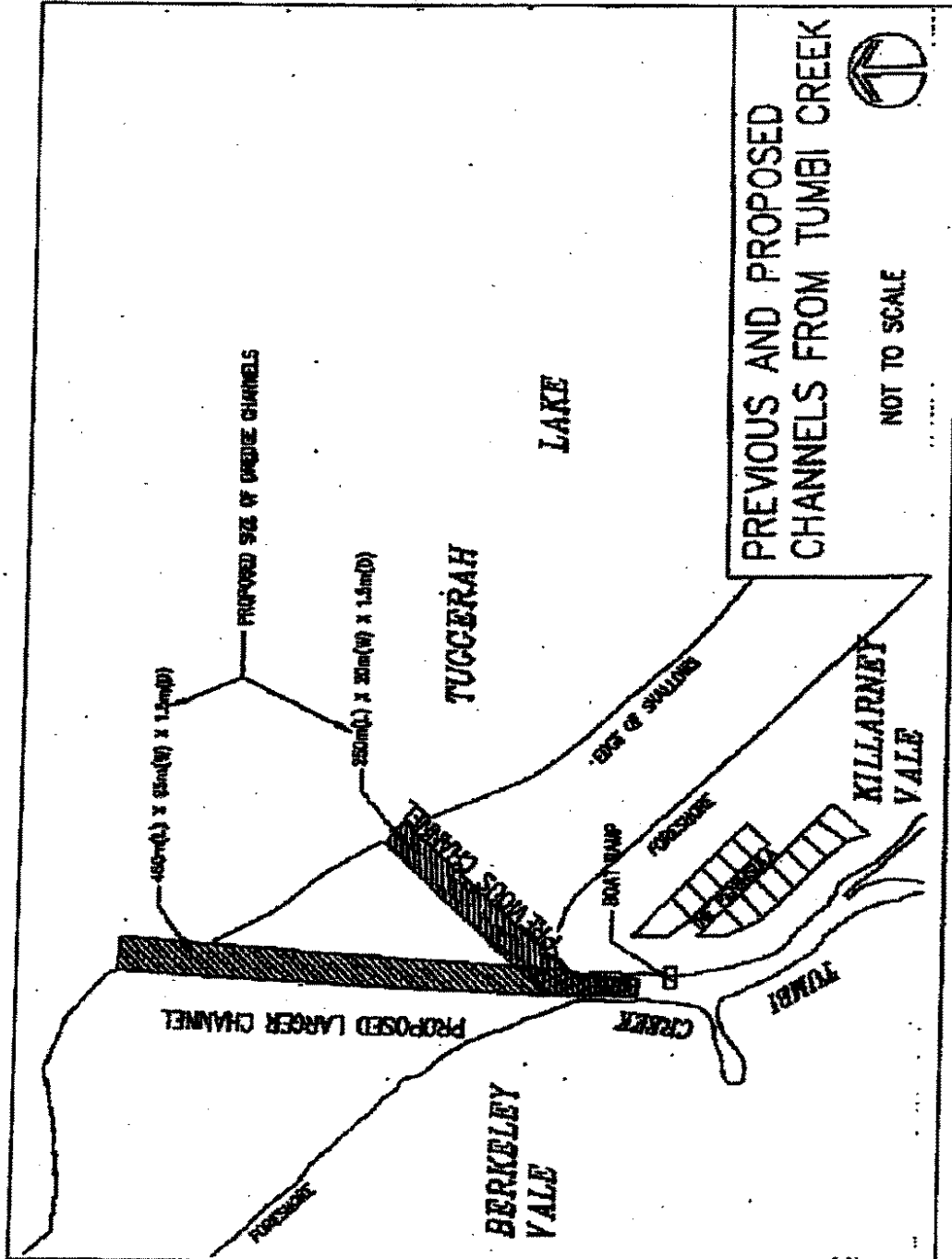
Option	Description	Estimated Dredging Costs	Allowance for Further Approvals	Potential Road Repair Costs	Potential Total Costs
	Opening Channel New				
1	Small dredge and onshore separation plant	\$1.3M - \$1.6M	\$0.075M	\$0.32M	\$1.7M - \$2M
2	Dredge into narrow ponds on foreshore	\$1.2M - \$1.5M	\$0.075M	\$0.32M	\$1.6M - \$1.9M
3	Floating excavator loading into barges	\$1.0M - \$2.0M	\$0.075M	\$0.32M	\$1.4 - \$2.4M
4	Construct temporary road over channel	\$1.4M - \$1.8M	\$0.075M	\$0.32M	\$1.8M - \$2.2M
5	Geofabric bags	\$1.7M - \$2M	\$0.075M	\$0.32M	\$2.1M - \$2.4M
	Re-Opening Previous Channel				
1a	Small dredge and onshore separation plant	\$0.5M - \$0.7M	\$0.075M	\$0.32M	\$0.9M - \$1.1M
2a	Dredge into narrow ponds on foreshore	\$0.45M - \$0.65M	\$0.075M	\$0.32M	\$0.85M - \$1.05M
3a	Floating excavator loading into barges	\$0.3M - \$0.6M	\$0.075M	\$0.32M	\$0.7M - \$1M
4a	Construct temporary road over channel	\$0.5M - \$0.7M	\$0.075M	\$0.32M	\$0.9M - \$1.1M
5a	Geofabric bags	\$0.6M - \$0.8M	\$0.075M	\$0.32M	\$1M - \$1.2M

Notes:

- 1 The expenditure to date on this project of approximately \$380,000 has not been included in the above costs.
- 2 "Estimated Dredging Costs" includes all costs to excavate and transport the material to landfill, including landfill disposal fees but not including the potential costs for road repairs from the site to Wyong Road.
- 3 Options 1a - 5a would involve more frequent removal over time of smaller quantities of material to keep the smaller channel open.
- 4 No allowance has been included in any option for treatment of acid sulphate soils at the Buttenderry Landfill.

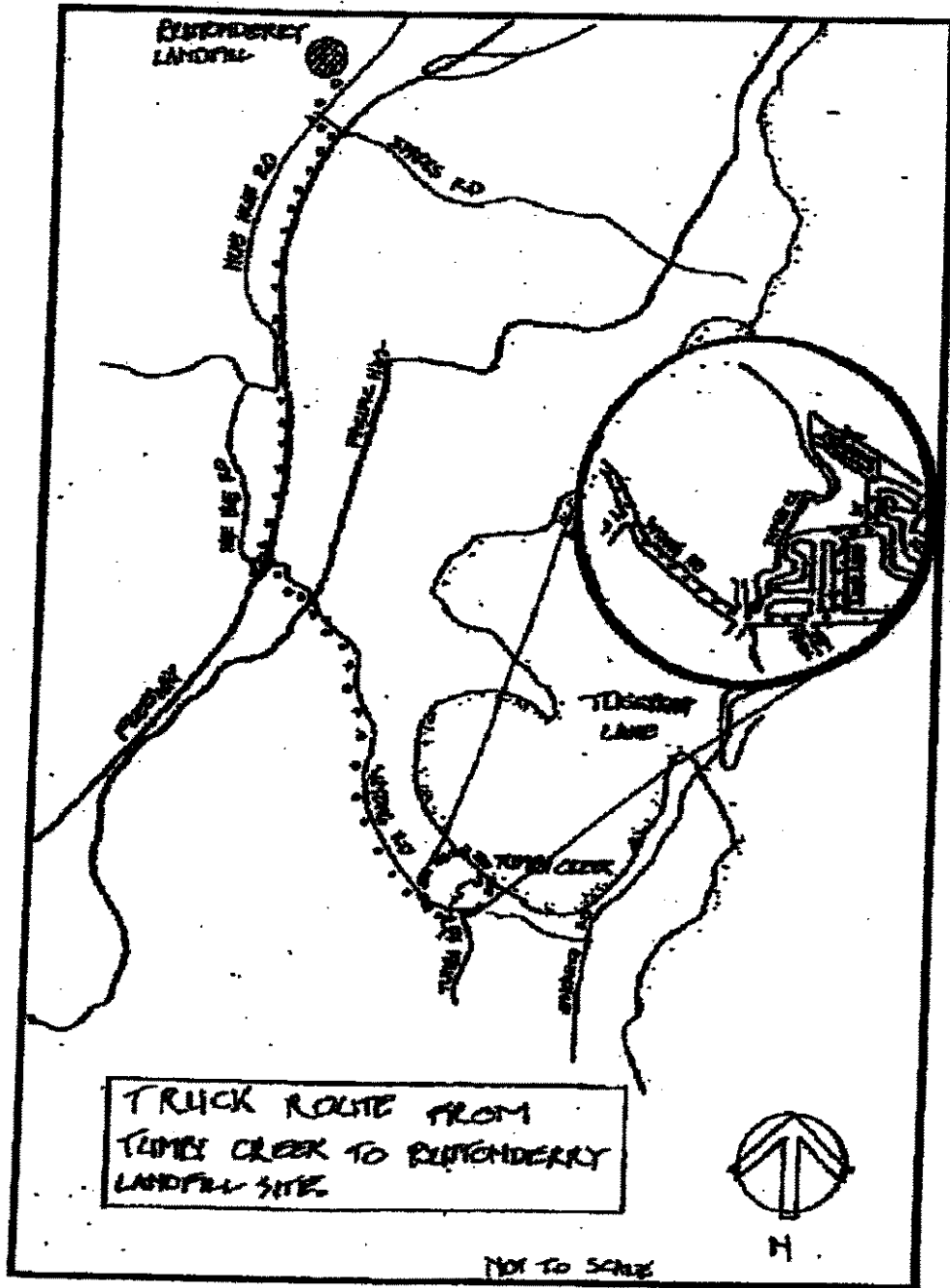
Alternative Dredging Proposals for Tumbi Creek (Attachment 2)

Position of Channels



Alternative Dredging Proposals for Tumbi Creek (Attachment 3)

Map Showing Route to Landfill Site



Alternative Dredging Proposals for Tumbi Creek (Attachment 4)

SUMMATION OF KEY ISSUES AND OUTCOMES

ISSUES

Key issues that are discussed in this report include:

- The need to reduce the potential for additional flooding of surrounding properties; water quality issues in Tumbi Creek; and access for boats.
- How much spoil needs be dredged and from where.
- Off-site disposal of the spoil in landfill.
- Road damage to surrounding local roads caused by extensive truck movements.
- The need to minimise impacts on the local environment.
- Potential impacts on the foreshore areas of Tuggerah Lakes.
- Potential costs for the project.

OPTIONS

Two possible channel configurations are discussed. One involves the re-dredging of the pre-existing channel, which is estimated to require approximately 5,000 cubic metres of spoil to be removed. The other involves cutting a new, wider and longer channel that is estimated to require the removal of approximately 15,000 cubic metres of spoil.

Five options were examined for excavating each channel. All options ultimately dispose of material at the Buttonderry Landfill. (A further option to take no action has not been considered in this report).

The five options are essentially the same for either channel, and only vary in the quantity of material to be removed. The options would involve:

- Dredging material into a separation plant and small holding tanks on the Lake foreshore (Option 1), or into settling ponds (Option 2) where water can be separated prior to placement into trucks and disposal of the spoil off the site.
- Using a barge-mounted excavator and transporting material back to shore in barge-mounted bins ready for removal in trucks (Option 3).
- Building a temporary road over the area of the required channel, and using excavating equipment to dig out the spoil from the channel and also the temporary road before removing it to landfill in trucks (Option 4).
- Pumping dredged spoil into large geofabric sausage-shaped bags for temporary storage inside bunded areas along the foreshore so that water can drain out before the material and bags are removed to landfill in trucks (Option 5).

Alternative Dredging Proposals for Tumbi Creek (Attachment 4) (contd)

COMPLETION TIMES

The time required for completion of each option will vary depending upon the methods employed to excavate and dewater the spoil. It is estimated that re-dredging the previous channel could require up to six months, while the larger channel could require up to 18 months for Option 2. The estimated costs of the various options are summarised in Table 1 in Attachment 1. It should be noted that these costs are preliminary, and based upon current information. Further detailed investigations will be required for any selected option to obtain more accurate costings.

FURTHER DREDGING REQUIREMENTS

- A significant difference between the proposal to re-dredge the previous channel or dredge the larger new channel is the expected time required before further work would be required to again clean out siltation in the channel. The smaller channel may be expected to require some further clearing work at intervals of up to four years, depending upon conditions and rain events bringing more material from the creek. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$100,000 per year.
- The larger channel may be expected to provide a much longer time between dredgings of up to say fifteen years. Assuming that dredging would then be required to remove say half of the volume of the original channel material, it is estimated that this could equate to an equivalent average cost per year of approximately \$60,000 per year.

**TUMBI CREEK DREDGING PROJECT
ESTIMATE FOR OPTION 1
DREDGING PLUS DISPOSAL OF MATERIAL OFF-SITE TO BUTTONDERRY TIP**

<<All rates and prices exclude GST>>

1. Dredging of 15,000 cu. m. for new channel using small dredge and on-shore cyclone and de-watering.

Dredge, de-water, transfer to trucks
 $15,000 \text{ cu m.} \times \$50.00/\text{cu.m.} = \$750,000.00$

<Source - rate based on verbal quotation from dredging contractor using small dredge and on-site dewatering equipment.>

2. Haulage of material to Buttonderry Waste Management Facility

$15,000 \text{ cu.m.} \times 1.5 \text{ tonne/cu.m.} \times \$10/\text{tonne} = \$225,000$

<Source - based on rates of \$110/hr for 27 tonne capacity truck and dog; assumes round trip to landfill and load/unload/weighbridge times of approx. 2 1/2 hrs per load; unit weight of 1.5 tonne/cu.m.>

3. Disposal costs at Buttonderry Waste Management Facility site

Strip the final capping daily in Area 3 to expose the waste layer; use capping material to construct bund wall around the perimeter to contain leachate; place and spread dredged materials daily; cover waste at end of each day using capping materials or artificial cover.

Allow for minimum one excavator to be permanently on site to move and shape material. Additional excavator or traxcavator to assist as required. Allow for contract to run for 6 days per week for minimum 30 weeks.

$15,000 \text{ cu. m.} \times \$1.5 \text{ tonne/cu. m.} = 22,500 \text{ tonnes} \times \$11.00/\text{tonne} = \$248,000$
say \$250,000.

<Source - \$11.00/tonne is minimum calculated costs for earthworks/materials handling undertaken at Landfill using soil and involving waste materials.>

4. Temporary haulage road along foreshore to truck out material

Place roadbase on geotextile, install drainage, compact, remove all materials on completion, restore disturbed areas.

Temporary road: $300 \text{ m} \times 4\text{m} \times \$40/\text{m}^2 = \$48,000$
Restoration/returf roadway: $300\text{m} \times 4\text{m} \times \$2.50/\text{m}^2 = \$3,000$
Total = \$51,000

<Source - roadworks construction cost of \$30/m² for basic gravel road, 4m wide, plus geofabric plus drainage and remove all materials - allow \$40/m² and returfing at \$2.50/m²>

5. Repair local roads during/after contract works.

Running repairs plus rebuild of local roads as result of 1,000+ truck trips

$$2000 \text{ lin.m} \times 8\text{m} \times \$20/\text{m}^2 = \$320,000$$

<Source - based upon actual testing of local roads Adelaide Street and Warrata Road, which showed roads would not handle these loads. Also unit rates for reconstruction of minor roads and new seal coat for 8m wide road of \$40/m²>

6. Additional studies required for off-site disposal

Assessment of seahorse and saltmarsh issues, provision of revised Acid Sulphate Soils Management Plan

Item \$50,000

Sub-total	\$1,646,000
20% contingency	\$ 329,000
Total	\$1,975,000
say	<u>\$2,000,000</u>

Note

- Not included in above estimate are 4 continuously-recording monitoring buoys required and previously purchased (value approx. \$70,000).
- Also not included above are pre-construction costs for Council staff investigation/administration time, or Council contract supervision costs.

D0051812



The Hon De-Anne Kelly BE MP
Parliamentary Secretary to

The Hon John Anderson MP
Deputy Prime Minister
Minister for Transport and Regional Services
Leader of the Nationals

The Hon Mark Vaile MP
Minister for Trade
Deputy Leader of the Nationals

Mr Michael Long
Manager, Open Space & Recreation
Wyong Shire Council
PO Box 20
WYONG NSW 2259

26 AUG 2004

Dear Mr Long

I am pleased to advise you that I have approved funding under *Regional Partnerships* of \$748,000 (GST inclusive) to the Wyong Shire Council for its Tumbi Creek Dredging project.

The funding has been approved subject to all relevant approvals being obtained. The Prime Minister, the Hon John Howard MP, announced funding for the project today.

An officer from my Department will be contacting you shortly to discuss contractual arrangements for the grant. You will need to sign a formal Funding Agreement which sets out the terms and conditions of the grant, including performance indicators, and return this document prior to making any specific commitments and before the grant can be paid.

Regional Partnerships is a popular source of grants and there are many projects competing for funding. It would be appreciated if contractual arrangements were finalised with my Department within 14 days of receiving a draft contract. Please notify my Department if you are unable to meet this timeline.

I would like to take this opportunity to congratulate your organisation on its successful submission and wish you and your organisation every success with the project.

Yours sincerely

A handwritten signature in black ink that reads "De-Anne Kelly". A horizontal line is drawn below the signature.

De-Anne Kelly