

STAFF REPORT

To: Chairman and Members, Engineering Services Committee

From: Rivers Asset Engineer, Philip Drummond

Reference: R600

Date: 21 March 2007

Subject: **TASMAN DISTRICT COUNCIL MAINTENANCE OF RIVER BEDS**

1 PURPOSE

The purpose of this report provides detail of a way forward with riverbed management and maintenance.

2 GENERAL

The Asset Engineer Rivers manages the Rivers Management and Maintenance programme. The Asset Engineer is assisted by MWH as consultants and Sicon as contractors carrying out the work in the field.

Two thirds of the operational \$1.1 million budget is used for the maintenance and control of the riparian margins, generally willow works.

The rest of the budget is spent on rock work and management of gravel within the channels.

The process begins with the Contractor mapping out a two year Rivers Annual Operating & Maintenance Program (AOMP). The work is prioritised. In conjunction with this, the Asset Engineer Rivers investigates a range of sites where channel geometrics are developing in an unsatisfactory manner. Generally this involves meanders that are developing into curves that are too tight and will require an uneconomic input of rock protection works to manage these features.

3 RIVER RATES

Investigation into river rating data shows that in recent years a significant imbalance has developed in use of the X, Y and Z rated income from rates. A December 2006 report tabled shows that about 30% of the income derived from the X areas is redirected into the Y areas. Generally this is the section of Y rated river bed adjacent to the X rated areas. The Z rated areas provide 50% of the total river rate as these ratepayers make use of the river areas for recreational and other purposes. Around 40% of the funding spent in Y areas is transferred from the Z income and some from the X areas. This is an area where some input by

corporate services may be required to ensure the rating burden is fairly apportioned.

4 THE GLOBAL CONSENT NN010109

River protection and maintenance works carried out in the river bed are permitted by the terms and conditions of the Global Consent NN010109. This essentially covers the active river bed to the extent of the annual flood. It does not permit us to work within the waterway with out further consultation with interested parties. It does not permit us to manage the river bed to develop an ever increasing capacity to pass floods.

The Rivers AOMP includes a schedule of work sites for gravel extraction and removal of overburden. However it is re-emphasised that this schedule is for beach clearance and fairway maintenance or improvement for river control purposes only. The total Rivers program and gravel schedule is formally reviewed and scrutinised by a range of interested parties including Iwi, Fish & Game and the Department of Conservation. The annual programme fits alongside the Council's other programmes of work starting in July each year.

5 GRAVEL MANAGEMENT

To control the meander development a process of removing gravel from strategic places within the channel has evolved. This aims to retain the basic single thread channel model instigated by the Catchment Board from about the 1960s. Usually this includes some gravel being removed from the river bed, and some gravel being left in a state, or position, that encourages gravel movement downstream in subsequent floods. A further portion is left insitu to control the desired meander shape. The quantity of each is a function of what appears to be most functional at each site.

Royalties are paid to Council for each cubic metre of gravel removed. The bulk of this payment is used in compliance costs and any surplus is transferred each year to the rivers account to help pay for the rock work undertaken that year. This recognises that there can be a link between removing gravel and having to armour banks in the vicinity. The link is often quite hard to prove.

If there is any cash balance left it is required to be surplused to the Crown, who own most of the classified river beds. Royalties from gravel cannot be harvested from river beds and sold to raise funds for other capital works projects.

The gradual increase in overall length of rock work is exacerbating the development of an entrenched channel at rocked bends. The tractive forces of a river are dissipated less when they have less gravel to move downstream. This leads to increased velocities around the curves with the gravel below the toe of the rock being mined, as this occurs it leads to the rock wall slumping. Theory appears to suggest that the need to place the rock is to a greater, or lesser, extent related to the on going extraction of gravel unless a program of feeding the meanders with gravel is also employed.

6 GRAVEL EXTRACTION

Contractors interested in obtaining gravel are given a copy of the Rivers AOMP Gravel Schedule. They can make time with the Asset Engineer Rivers to visit sites to inspect the work required to win the gravel. It is often necessary to remove vegetation and other debris from the gravel extraction area. The maintenance task scheduled at any site may extend over an area wider than that where the gravel will come from. This additional work needs to be factored into the contractors cost structure as the clearance work is part of a package at that site. This process has allowed considerable savings in the works programme to be made.

A recent assessment undertaken by the River Scientist has indicated that less gravel can be removed from the active river channels in a sustainable manner than may have been previously anticipated. This opinion has been followed up with supporting comments related to the Rivers AOMP Gravel Schedule that indicate that in many places it might be considered more sustainable to relocate the gravel within the river bed. This would add considerable costs to the river maintenance program (Est. \$200,000 pa). Considering that the Global Consent does not permit work within the wetted waterway we are unable to move immediately to this type of regime should we wish to.

It is widely recognised that the gravel present in river beds is not the only source of quality gravel for the range of community end uses. It is beyond the scope of the Asset Engineer Rivers role to comment on this. The report recommending a minimal quantity of gravel be removed from river beds to meet the sustainable requirements of the Resource Management Act 1991 was generated by the E & P Department. The Engineering Department is not in a position to require that the report be tabled for debate.

7 CROSS SECTION INFORMATION

A study of 5 typical Motueka River cross sections between Whakarewa Street and the crusher at the end of Parker Street for the period of 1990 -2005 shows that an increase in flood waterway has occurred. This has generally been through an increase in the wetted channel depth.

8 WILLOW MANAGEMENT

The inclusion of Crack Willow (*Salix fragilis*) on the New Zealand Unwanted Organism Register will have an impact on river management. Council has had an active programme involving riparian margins and crack willow replacement for the last two years. This was designed to remove crack willow from all places where we do not experience high erosion potentials. The program was approved by Council knowing that it would take up to ten years to deal with the worst of the willow stands, an increase in funding was approved for the work from 2005. The program includes replanting with appropriate other species which may include native plants.

This work will include the removal of a large amount of the taller trees growing in the lower Motueka River fairway.

The Unwanted Organisms Register inclusion requires us to eradicate all crack willow within ten years. TDC has joined eight other Regional & Unitary Authorities in applying for an exemption for up to twenty years with an offer to accept an audit at ten years to show that each Council has made substantial progress. We have also noted that success of the operation hinges on Government assistance in developing alternative species with equal or better rooting ability to the crack willow.

9 RECOMMENDATION

THAT this report be received.

Philip Drummond
Asset Engineer Rivers/Roads
March 2007