

Report 00.475

23 June 2000

File: N/6/11/3

Report to the Landcare Committee
from Graeme Campbell, Project Manager, Flood Protection Group

Waikanae River Gravel Analysis

1. Purpose

The purpose of this report is to:

- Advise the Landcare Committee of the results of the 1999 cross-section survey on the Waikanae River.
- Outline the issues raised by the analysis.
- Advise on the proposed programme for a review of the gravel extraction policy.

2. Background

A monitoring requirement of the Waikanae Floodplain Management Plan is that the Regional Council will survey cross-sections, at approximately five yearly intervals, on the Waikanae River. The survey extends from the mouth to the water treatment plant weir, and its purpose is to monitor gravel bed changes. These cross-sections were initially surveyed in 1991, 1995 and most recently in 1999. The results of the 1995 survey were reported to this Committee in April 1996 (Report 96.145). The levels from the latest survey (1999) have now been analysed and are reported below. This report summarises the survey results, highlights the issues raised, and outlines the proposed actions.

3. Summary of Survey Results

A comparison of the 1991, 1995 and 1999 cross section surveys has been undertaken. Wellington Regional Council Report WRC/FPSA-T-00/21 contains the full analysis of the results. A copy of this report is available to Councillors through the Manager, Flood Protection (Strategy and Assets).

Attachment 1 to this report shows the gravel volume change between sections from the mouth to the water treatment weir. **Attachment 2** shows the general location of the cross-sections.

The results show a general trend of aggradation from the mouth to Jim Cooke Park (JCP) (section 300) and degradation above this point. The change from aggradation to degradation at section 300 coincides with a change of grade in the river. This is much the same trend as was observed after the 1995 survey, but it is now more accentuated, primarily a result of the two floods in October 1998.

The results show an overall net loss of gravel in the survey reach of 3,500m³ between 1991 and 1999. While there is a net loss there has been an increase of some 40,000m³ in the reach from the mouth to JCP. This is despite 11,000m³ being extracted at Greenaway Road for the construction of the Kauri Puriri stopbank.

Mean bed levels below JCP have increased by 200-300mm while mean bed levels above the State Highway 1 (SH1) bridge have lowered by between 200 and 1,200mm. The mean bed levels between JCP and the SH1 bridge varied significantly with increases of 500mm at some cross-sections and decreases of 500mm at others. This variation is most likely due to the amount of lateral erosion caused by the October 1998 floods.

4. **Issues Raised by the Survey Results**

Aggradation below JCP is causing concern to residents in that reach as the perceived flood capacity is reduced. A number of submissions to the Annual Plan process related specifically to this issue. However, previous work has shown that the increases in bed level do not significantly affect major flood levels as the sand bar at the mouth and much of the material stored in the channel upstream will blow out in floods greater than a 20 year return period (the October 1998 events were 28 year and 16 year return period respectively).

The aggradation will, however, affect the frequency at which the river starts to flow over the adjacent berms. The basement of one house is considered to be directly affected in these lower events, however, there are no practical structural measures that can reduce the impact of flooding. A 20 to 30 year event is required before the next group of houses are flooded. This second group of houses is therefore less affected by the aggradation in the channel as the mouth is likely to blow out before they are flooded. The outflows may also cause difficulties maintaining the river within the preferred channel alignment. The matter needs to be addressed with reasonable urgency to allay local residents' concerns.

Degradation above JCP was one of the major causes of erosion in the SH1 to Maple Lane reach and in the reaches above the SH1 bridge in the October 1998 events, as the existing protection works were undermined. The new SH1 to Maple Lane works include a grade control structure near the downstream end in an attempt to stabilise the bed levels. The Transit NZ grade control, just below the SH1 bridge, was strengthened following the October 1998 floods and KCDC protection work above the SH1 bridge also included grade control structures. Assuming a continuing degradation trend in the reach, more of these structures are likely to be required in the future.

A number of issues and concerns, over gravel and river management on the Waikanae River, arose during consultation on the Council's 2000 –2010 Long-term Financial Strategy. The residents of Otaihangā in particular raised a number of matters. The Flood Protection Group will arrange a meeting, to be held before the end of August, to work through the various issues.

5. The Current Policy

The Waikanae Floodplain Management Plan recommended that material be extracted from the river at approximately the same rate as it is increasing. This is in an attempt to maintain overall bed levels at the status quo. The outcome of the last survey (1995) was:

'That the sustainable rate of extraction from the Waikanae River is estimated to be 3,000m³/year and that this material should be extracted from selected locations below Greenaway Road. This figure will need to be re-evaluated after the next survey.'

Since that report was completed approximately 13,500m³ (equivalent to 3,500m³/year) of material has been extracted, primarily between El Rancho and Greenaway Road as part of the Kauri Puriri Stopbank construction.

The 1999 survey results show that despite this extraction, there are substantial increases in mean bed levels in the lower reaches of the Waikanae River and that the extraction policy needs to be reviewed. The policy must not only consider the overall balance from the Water Treatment Plant to the mouth, but also must specifically address the aggradation below JCP and the degradation above that point.

It was always acknowledged that material would need to be extracted from the lower reaches of the Waikanae River but it was felt that this was not likely to be required until 2005 to 2010. The two floods in October 1998 accelerated this aggradation process and brought forward the need to consider a more active extraction policy in the lower reaches.

6. The Proposed Actions

The actions proposed for the review of the policy are to assess:

1. The affect of the aggradation on flood levels and associated flood damage.
2. The practicality of extracting gravel in the lower reaches.
3. The commercial viability of gravel extraction in the lower reaches.

A draft policy will then be developed for consultation with those parties affected or with an interest in the river. It is likely that there will be two distinct groups with a strong interest in the river. The first will be concerned about the increased flood risk and the second concerned about environmental affects. Reaching a consensus between these two groups may be time consuming. In the first instance officers will ensure all parties are given relevant information and free and open lines of communication will be maintained.

Once the consultation is complete a final policy recommendation will be reported back to this Committee for adoption.

7. Programme

Work on the initial assessment of the effects on flood levels and the viability of extracting gravel will begin in July and is likely to take until mid August 2000 to complete. We will then develop a draft policy and begin consultation with the affected parties. An updating report, which details progress against programme, will be given to the 16 November Landcare Committee meeting. The final policy is programmed for completion by December 2000, and will be reported back to Landcare by February 2001.

8. Communication Opportunities

A press release will be prepared once we have completed our initial assessment of the results outlining:

1. Results of the gravel survey.
2. Issues that have arisen.
3. Programme for the extraction policy review.

9. Recommendation

That the Landcare Committee receive the report and note the contents.

Report prepared by:

Approved for submission:

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Attachment 1 : Summary of Bed Level and Volume Changes

Attachment 2 : Locality Plan of Cross-sections