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Report 02.726

18 November 2002

File: B/09/02/02

Report 02.726.doc

Report to Utility Services Committee
From Murray Kennedy, Strategy and Asset Manager

Seismic Security Project Review

1. Purpose

To update the Committee on Seismic Security Projects undertaken over the last 10 years.

2. Introduction

A report titled “Lifelines in Earthquake – Wellington Case Study” was completed by the Centre for Advanced Engineering, University of Canterbury in 1991. As a result of this, Kingston Morrison (now Sinclair Knight Merz), consulting engineers, carried out a seismic security assessment on most of the Wholesale Water Supply facilities in 1993. The assessment excluded more modern structures known to have been designed to comply with current earthquake loadings. Assets assessed included:

- Tunnels
- Buried pipelines
- Bridges and stream crossings
- Fixing of plant and equipment

Kingston Morrison made a number of recommendations for detailed investigation work, assigned a priority, and an order of cost for possible remedial work.

3. Seismic Security Projects

Over the last nine years, a number of the projects identified by Kingston Morrison have been completed. A selection of these is included in Attachment 1.

A number of other projects, many of them expensive, are still being evaluated, see Attachment 2. One of the more expensive projects was a deviation near the Silverstream bridge. This was considered by the Committee at its last meeting (Report 02.628).

Because the Committee decided the benefits did not justify the projects costs, this project has now been taken off the future capital works project schedule.

Some structures for example, have only moderate seismic resistance and possibly will be replaced during the next 20 years. At that time, replacement structures would be designed to the latest seismic design code. In the meantime, only relatively minor upgrading is being undertaken.

4. Damage Assessments

The Kingston Morrison report considered components of the system that are likely to be damaged in a major seismic event. The report did not estimate the cost of repairs. Repair costs for the pipelines were estimated in an Opus International Consultants report (1996).

As part of the current insurance/self insurance review, three seismic damage assessment studies have recently been carried out, namely;

- Pipeline and tunnel performance (Opus International Consultants)
- Water treatment plants, pumping stations and reservoirs (Sinclair Knight Merz)
- The Stuart Macaskill Lakes (Sinclair Knight Merz)

The financial implications from three reports will be included in the insurance/self insurance report. Other aspects raised in the reports will be incorporated in the capital works programme.

5. Pipeline Materials

A number of pipelines will break during a major earthquake. To allow repairs to start immediately following an event requires spare materials (pipes, couplings and fittings) to be available. Materials valued at \$430,000 are currently stored at various localities. Additional materials can be sourced for the latter part of the recovery work as work gets underway.

As a result of the just completed damage assessment reports, the schedule of spare materials will be reviewed.

6. Recommendation

It is recommended the report is received and its contents noted.

Report prepared by:

Approval for submission:

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Attachments

1. Seismic Projects Completed or Projects with Improved Seismic Performance
2. Seismic Projects Under Evaluation or Not Completed