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## **Report 01.508**

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Report to Environment Committee  
from Tim Porteous, Biodiversity Co-ordinator and John Sherriff, Manager Resource  
Investigations

### **Waiwhetu Stream Sediment Investigation**

#### **1. Purpose**

To inform the Committee of the results of investigations of contaminated sediments in the Waiwhetu Stream.

#### **2. Background**

The Waiwhetu Stream has a reputation as being the most contaminated water body within the Wellington Region. This is a consequence of it being used to dispose of trade wastes from the surrounding industrial area from 1900 to 1978.

Numerous studies have shown heavy metal contamination of sediments and water in the Waiwhetu Stream. In 1979 the Wellington Regional Water Board considered dredging sediments in the lower section of the stream, however, because at that time the costs of dredging outweighed the perceived benefits, the contaminated sediment was left in place. This decision assumed that the contaminants were bound up in the sediment, were not being leached unless physically disturbed and that a layer of uncontaminated fine sediment was burying these contaminated sediments.

A study by the Wellington Regional Council in 1998 showed that these assumptions were incorrect and that contaminants were being re-suspended by stream and tidal flows adversely affecting the quality of the stream water.

With the establishment of the Waiwhetu Stream Working Group in July 2000 it was decided to re-visit the sediment contamination issues with a view to cleaning up the stream.

The starting point in this exercise was to undertake a screening investigation of the stream sediments to identify the degree and extent of contamination. This task was

contracted to Dr Doug Sheppard, *Geochemical Solutions Ltd.* and Dr James Goff, *GeoEnvironmental Consultants*. The overall objective of the project was to ascertain what contaminants are present and where they are located so that the total quantity of contaminated sediments could be calculated. Once this was known remediation options could be identified and assessed for efficiency and cost effectiveness.

The Waiwhetu Stream Working Group budget originally provided \$9,000 for this work. An additional \$20,000 was approved to provide a more comprehensive assessment of contamination.

### 3. Methodology

Twenty four sediment core samples were taken from six transects across the lower Waiwhetu Stream. These transects were located at the following sites:

- Mudflats just west of Seaview Road Bridge
- Adjacent to footbridge opposite the Hutt Park Raceway Grandstand
- South of the Hutt Park Road Bridge
- South of the Rail Bridge
- South of the Bell Road Bridge
- Opposite "E" Block at the Industrial Research Limited (IRL) site.



Figure 1: Waiwhetu Stream Study area – DSIR Transect to Urupa Transect. Base map provided by Hutt City Council includes major storm drain outlets.

Sediment cores were taken by pushing a 50mm diameter PVC pipe into the sediment and then extracting the pipe with the sediment intact. Cores were taken at low tide and, in general, one core was taken from each exposed side of the stream bed and two from either side of the main channel.

The core samples were scanned using a XRF (x-ray fluorescence) technique to detect the presence of four metals (iron, copper, lead and zinc). Where the scan indicated high levels of contamination, sub-samples were taken and fully analysed. Sub-samples were also analysed to detect total petroleum hydrocarbons.

The core samples have been preserved to allow further analyses if this is deemed to be necessary.

#### 4. **Results**

Analyses of sediment cores from the lower Waiwhetu Stream indicates the presence of a range of heavy metal contaminants. Most notably lead and zinc, but also including chromium, nickel, copper and barium. These are contaminants typical of the industries operating in the Seaview area over the past 100 years.

The worst contamination is confined to the stretch of the stream lying between the Raceway and Hutt Park Bridge. This is the area into which the Hutt Park Drain discharges. In this area maximum concentrations of lead reached 8790 mg/kg and zinc 11,710 mg/kg. These results are well above guidelines for maintaining aquatic ecosystems.

High concentrations of total petroleum hydrocarbons (TPH) were also found around the Hutt Park Raceway area.

Based on current results the volume of contaminated sediment is estimated to be 29,000 m<sup>3</sup>.

#### 5. **Where to from Here?**

Additional investigations will be undertaken to further quantify the degree and extent of sediment contamination. This would involve sampling at four additional transects and analysing existing core samples for mercury and cadmium.

More detailed analysis for specific organic compounds will be undertaken where TPH concentrations were high.

Remediation of the contaminated sediments is likely to be an expensive exercise. It is therefore critical that the extent and degree of contamination is fully quantified before proceeding to this stage.

There is provision for further investigative works of this nature in the current budget.

**6. Communication**

The results of this investigation will be presented to the Waiwhetu Stream Working Group and to the Hutt City Council.

A press release will be issued to relay these findings to the general public.

**7. Recommendation**

*That the report be received and its contents noted.*

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