

Report to the Environment Committee
from Mike Harkness, Resource Scientist

Hydrology of the Wainuiomata Catchment

1. Purpose

To inform the Committee of the completion of a technical report updating the results of surface water resource monitoring in the Wainuiomata Catchment.

2. Background

In 1993 the Council published the *Wainuiomata Water Resource Statement*. This report contained information about the surface water and groundwater hydrology of the catchment, as well as water use, physical characteristics, biological resources, land use, population and tangata whenua interests. The information was used in the resource consent issuing process and in the formation of the Proposed Regional Freshwater Plan for the Wellington Region, and also by various interest groups.

The report *Hydrology of the Wainuiomata Catchment* updates the 1993 report, incorporating five years of additional hydrological data.

The revision of this report is timely as the Strategy and Assets Group, Utility Services Division, Wellington Regional Council, is about to embark on the process of renewing the resource consent to take water from the Wainuiomata and Orongorongo catchments for the metropolitan water supply of Wellington, Porirua, Lower Hutt and Upper Hutt cities.

3. Report Summary

The physiography, geology, soils, erosion, vegetation, land use and climate of the Wainuiomata Catchment are detailed.

Rainfall records from a number of rainfall stations throughout the catchment are analysed to determine mean annual rainfall, long-term rainfall trends, minimum moving average rainfalls and Southern Oscillation impacts on rainfall. Frequency analyses of rainfall extremes (i.e., droughts and high intensity rainfall) are also

provided.

Flow records from three flow recorders on the Wainuiomata River are analysed to determine flow statistics, flow duration and recession characteristics. Frequency analyses of flood flows and low flows are also presented.

An assessment of how the minimum flow levels set for the Wainuiomata River in the Proposed Regional Freshwater Plan relate to the current flow regime is made.

4. **Implications**

Following the analysis of the extra five years of record, the low flow characteristics of the Wainuiomata River, which are important in terms of availability for public water supply, have been refined. In comparison with the 1993 findings, the river flow anticipated during a very moderate drought (i.e., two year return period) is slightly less, while in more severe drought conditions (i.e., five to 100 year return period) the flow is greater.

The major implication of this finding is that during drought conditions (five year return period and greater) there will be more water than was previously estimated.

The analysis of the flow regime in the Wainuiomata River shows that during late summer and autumn the step down and minimum flow levels at Leonard Wood Park, as set out in the Proposed Regional Freshwater Plan, are likely to be reached. Flow in the Wainuiomata River frequently reaches the restriction levels naturally (i.e., before any abstractions occur).

5. **Technical Recommendations**

The following recommendations made in the report will improve the knowledge and management of the water resource of the Wainuiomata Catchment:

- The flow recorder site on the Wainuiomata River at Leonard Wood Park should be telemetered so that minimum flow and stepdown levels outlined in the Proposed Regional Freshwater Plan can be effectively enforced.
- The relationship between the Southern Oscillation Index and rainfall in the Wainuiomata Catchment should be investigated. This will supplement the work already undertaken on Southern Oscillation Index and river flows.
- A mid-catchment rain gauge should be installed. There are currently only two intensity rain gauges within the catchment and both of these are located in the upper reaches. The new rain gauge would provide a representation of rainfall in the mid to lower catchment area

These recommendations will be included for consideration in the Council's next strategic planning exercise.

6. Recommendation

That the report be received and its contents noted.

Report prepared by:

Approved for submission:

MIKE HARKNESS
Resource Scientist

JOHN SHERRIFF
Manager, Resource Investigations

JANE BRADBURY
Divisional Manager, Environment