

The University of New South Wales Research Design

Smith Street Porous Pavement

A gauging station inclusive of a pluviometer will be installed to monitor runoff from Smith Street itself and the immediately adjoining catchment. Included in this gauging station will be an automatic grab sampler capable of collecting 24 discrete samples during an individual storm event. Associated with this gauging station also will be a multi-level piezometer for monitoring of groundwater levels and the groundwater quality at different levels through the underlying aquifer.

A total of five (5) storm events will be monitored over a 12 month period. This twelve month period is expected to commence at the beginning of March 2002. During this period groundwater samples will be collected at the conclusion of an event. Should a sampled event not occur within a thirty (30) day period, then a sample will be collected anyway. In this manner, twelve groundwater sampling periods are expected to occur.

Chemical analysis of both the surface water and the groundwater samples will comprise:

- Physical characteristics such as pH, EC, suspended solids, volatile suspended solids and the particle sizes of the non-volatile particulate matter; and
- Chemical characteristics such as the nutrient levels expressed as total phosphorous and particulate phosphorous, trace metals (Pb, Zn, Cr, Cu, Mn, Fe), and iron composition.

While not part of the regular monitoring, some samples will be analysed for their biological contamination. The standard measures for biological contamination are Faecal Coliforms; this indicator, however, fails to distinguish between human pathogens and those pathogenic to other mammals. Due to the need for a risk assessment of the Atlantis System discussed below, it is proposed that these samples will be analysed for stenols which can be sourced only from human activities.

The schedule for this component of the project is:

- Installation of gauging station and associated equipment – April 2002
- Completion of monitoring – April 2003
- Completion of reporting – June 2003

North Steyne Atlantis System

The monitoring initially proposed for the North Steyne site where the Atlantis System will be installed is not longer appropriate and hence an alternative monitoring process has been developed for this site. This alternative monitoring will include the use of a gauging station inclusive of a pluviometer to collect data on rainfall in the immediate area. Included in this gauging station will be an automatic grab sampler capable of collecting 24 discrete samples during an individual storm event. Associated with this gauging station will also be a pressure sensor for monitoring continuously the depth of treated water in the reuse tanks. Collection of samples from the reuse tanks will be intensive initially with the sample frequency expected to decrease as more information on potential health risks becomes available.

For the surface monitoring of runoff prior to the Atlantis System, a total of five (5) storm events will be monitored over a twelve month period. This twelve month period is expected to commence at the beginning of April 2002.

Chemical Analysis of the surface water will comprise:

- Physical characteristics such as pH, EC, suspended solids, volatile suspended solids and the particle sizes of the non-volatile particulate matter;
- Chemical characteristics such as the nutrient levels expressed as total phosphorous and particulate phosphorous, and trace metals (Pb, Zn, Cr, Cu, Mn, Fe); and
- Biological characteristics pertinent to the assessment of the health risk. Of particular concern is the presence of human pathogenic bacteria and viruses and hence screening of the samples for their presence will be undertaken. Not all samples will be screened in this manner, but rather sufficient samples will be screened to enable definition of potential risks.

The analysis of the samples collected from the reuse tanks will focus on those parameters pertinent to ascertaining the risk associated with spray irrigation. As with the surface water samples, these samples will be screened to ascertain the presence or otherwise of human pathogens. Correlations with more easily monitored parameters will be sought to facilitate overall operation of the reuse facility.

This information will then be used to confirm (or disprove) the initial risk assessment of the reuse facility which was conveyed to Council in August last year. While this assessment suggested that there were minimal health risks (below those adopted for sewage reuse schemes), the data on which this assessment was based were limited and needed confirmation through the monitoring program.