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Hawke's Bay Regional Council  
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Dear Dougall

## **Ruataniwha Plains rainfall recharge monitoring site installation**

### **1.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS**

GNS Science was contracted to provide advisory assistance to Hawke's Bay Regional Council (HBRC) during the installation of a rainfall recharge monitoring site in the Ruataniwha Plains (Contract Number: RM-13-24-4540). Abigail Lovett (Groundwater Scientist) attended the installation for a total of three days, including the 19<sup>th</sup>, 20<sup>th</sup> and 23<sup>rd</sup> September 2013. The installation was undertaken by HBRC according to standard procedure as detailed in Lovett and Cameron (2013), which is included with the contract.

On Day 1 (19.09.2013) lysimeter one and two were removed from the lysimeter pit and inverted so that the lysimeter bases could be prepared. A decision was made to use fibreglass wicking in the installation, due to the fine grained (silty/clay) material at the base of lysimeter one. The sediment at the bases was prepared so that it was level with the lysimeter lip. The sediment was then lined with a circular layer of shade cloth and a splayed fibreglass wick before the base plate was inserted and fixed with steel rods. Lysimeters one and two were inverted, cleaned and sealed with Sika 291 marine sealant.

On Day 2 (20.09.2013) petroleum jelly was heated and pumped into the gap between the soil column and lysimeter casing to seal lysimeters one and two. Lysimeter three was removed from the soil pit, inverted, the base was prepared (as above) and the lysimeter base plate attached, cleaned and sealed.

On Day 3 (23.09.2013) lysimeter three was sealed with petroleum jelly. The lysimeter pit was excavated to approximately 1350 mm below ground level to allow for re-instatement of the lysimeters. String lines were set to allow for accurate placement of the lysimeters. Timber platforms were placed and levelled in the base of the lysimeter pit. A 500 mm length of culvert pipe was cut to provide a platform for the lysimeter. Each lysimeter was lifted by

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the excavator and the pipe fittings were attached using thread tape and tightened with an adjustable spanner. During this process, a 450 mm length of 30 mm diameter alkathene riser pipe was attached to each lysimeter base to protect the fibreglass wick. Each lysimeter was then lowered onto the culvert pipe platform with particular care taken to ensure the soil surface within the lysimeter was installed at ground level (Figure 1). At this stage of the re-installation, the site visit by Abigail Lovett was completed.



Figure 1: Lysimeters re-installed into the lysimeter pit and set to ground level. Lysimeter three is located in the foreground of the photograph, lysimeter two in the middle and lysimeter one furthest away.

HBRC staff were advised to allow a 50 mm fall from lysimeter three to lysimeter one, and a 100 - 150 mm fall from lysimeter one to the instrument enclosure (Figure 1). In order to complete the monitoring site following the GNS Science visit, HBRC staff were required to: attach 15 mm diameter alkathene pipe from each lysimeter to the instrument enclosure, install an instrument enclosure, infill the lysimeter pit, and install rain gauges and telemetry equipment to complete the site. If you have any questions or comments, please do not hesitate to contact either myself or Stewart.

Yours sincerely

Abigail Lovett  
Groundwater Scientist

Stewart Cameron (Reviewer)  
Senior Groundwater Scientist