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Rainfall field validation SOP

This SOP outlines the Horizons Regional Council procedures for field validation of a rainfall intensity gauge. This procedure is in accordance with the 'National Environmental Monitoring Standard – Rainfall Recording' document.

Validation

Validation of a rainfall intensity gauge is a reference check to establish whether a gauge is performing within the tolerances of its calibration. This check is carried out using a certified device, the Hydrological Services FCD (field calibration device), which has a known volume of water (653ml) and a documented number of theoretical tips that it should yield at a known delivery rate.

Another acceptable method is the burette method, where a measured volume of water is added to each bucket to determine how much water it takes to tip. While this is acceptable, it is generally unnecessary unless trying to quantify any noticeable Left-Right bias in a gauges bucket tips.

When to Validate

Validation shall be carried out:

- On newly purchased gauges
- Before deployment at a site
- Upon removal from a site
- Annually during regular site surveys
- Whenever an intensity gauge's total rainfall deviates from the primary reference gauge by more than 10%
- When received back from a service agent



The reason for validation on purchase and when received from a service agent is to determine if any damage or changes have occurred during transit and ensure that it still meets the tolerances of its calibration.

If validation is necessary and you do not have a validation device with you, you must return within **one month** to validate the gauge. In this instance, it is prudent to have a replacement gauge with you when you return in the event of a validation failure.

How to validate

NEMS states that validation should be carried out in accordance with the manufacturer's instructions – whatever device you use. Horizons uses the HS FCD, the procedures we use are:

- Clean the gauge and siphon (if present)
- Attach an external counter to the gauge *or* enable maintenance mode on the logger and reset totals
- Set up and place the stand for the FCD on the top of the rain gauge
- Fill the FCD with clean water (do not use water from your primary reference gauge)
- Attach the nozzle of a known rate (typically marked as 100mm/hr)

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- Place the device in its stand on top of the gauge and open the tap on top of the device to allow the water to drain freely
- Once the device is completely empty, remove it from the gauge and check the counter for the number of tips achieved.
- Record the number of tips, and the FCD serial number on the electronic field sheet or physical form (appendix 12.5 of the Operations Manual).

If the intensity gauge fails validation

In the case that an intensity gauge fails validation, it must be replaced with a calibrated, validated gauge within **one month**.

The failed gauge should be removed and returned to the office. A non-conformance must be filed against it, and then the gauge must be sent to a service agent for calibration.

Horizons Regional Council currently has two service agents for rain gauges – Metservice and NIWA. Both agencies calibrations meet the requirements of the NEMS – Rainfall Recording document.

Necessary admin

Validations can be recorded in the electronic field sheet that is filed for the inspection, from here the record of validation is created. If there is any missing information, the reporting staff member will be notified via email so it can be fixed and filed.

All validation forms must be completed and placed in the appropriate site folder with the correct naming convention (GaugeType_SerialNumber_Date), if a gauge has failed, (_fail) must be added to the end of the file name. This information is then added into Hilltop Asset.

Relocations must be filed in Hilltop Asset for any instrument movements and replacements.