Rainfall SOP Overview

This SOP summarizes the information in the '*National Environmental Monitoring Standard - Rainfall Intensity Recording*' document

In order to be useful from a user perspective an archive of rainfall data must be collected, processed, and archived in a manner that is consistent over time.

Some key items considered essential in the rainfall standard are:

- Stationarity of record
- Resolution of recorded rainfall depth
- Resolution of time
- Corrections to the recorded data
- Filling of any missing record
- Comments on the quality of the data
- Quality codes
- Calibration
- Preservation of record
- Field Procedures

Generally, a rain gauge should not be re-located from its current position to accommodate this standard. Replacement instruments must be located at the same x,y,z location If a replacement gauge is installed at a standard height a minimum of two year's overlapping record **with at least 8 inspections** should be collected to allow the two recording locations to be correlated. The current 0.5mm and 0.2mm tipping buckets, typically deployed by Horizons, provide adequate resolution for most purposes.

The recording of bucket tips as a time stamped event is now the most common form of rainfall intensity measurement.

Rainfall data at the Council is adjusted to the primary reference gauge, validation of equipment is undertaken on an annual basis, and when there is greater than 10% difference between the primary reference gauge and the intensity gauge.

Approved Sensors

Currently deployed (as at 07-09-2023) TB3 and OTA rain gauges with 0.5mm tips are considered to meet our standard and NEMS

All new purchases will be 0.2 mm or better resolution rain gauges with a reported accuracy of +/- 10% or better. The following instruments are approved for purchase:

- TB3 0.2mm tipping bucket rain gauge
- OTA 0.2mm tipping bucket rain gauge

The purchase and deployment of different gauge types such as piezoelectric, photoelectric, or weighing gauges is acceptable with approval from your regional supervisor providing it meets the accuracy requirements in this document and is fit for purpose.

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Installation

When installing a new rain gauge site, it is important to consider and mitigate any aspects of the location and /or layout that may impact the gauges ability to record consistent and accurate data. Specific guidance on these characteristics is given in appendix 12.2 of the Operations Manual or the 'NEMS – Rainfall Recording' document.

Intensity Gauges

Tipping bucket rain gauges are the standard intensity gauge deployed by HRC. Intensity gauges should be installed with the orifice between **285 mm** and **600 mm** above ground level or at ground level where an anti-splash grid is installed unless site characteristics such as snow depth require a higher setting. For specific guidance on intensity gauge installation see appendix 12.2 of the Operations Manual or the 'NEMS – Rainfall Recording' document.

Primary Reference Gauges

For guidance on installation of Primary reference gauges, see appendix 12.2 of the Operations Manual or the 'NEMS – Rainfall Recording' document.
All Intensity data collected by HRC is adjusted to the rainfall totals in the Primary reference gauge. It is a rainfall collector gauge that provides a stable, long-term reference for rainfall comparisons. Primary reference gauge orifice heights and positions shall remain static for the life of the site.

Site Inspections

Site inspections should be completed at a maximum of every three months, and preferably monthly, to ensure that the gauges are in working condition.

The procedure for site inspections can be found in appendix 12.3 of the Operations Manual.

Validation

Validation of the intensity gauge at a rainfall site must be carried out annually **and** at any time the intensity gauge deviates from the primary reference gauge by more than 10% (or 5mm where less than 50mm of rain has been collected).
The procedure for intensity gauge validation can be found in appendix 12.4 of the Operations Manual

Data Processing

For all rainfall data processing please refer to appendix 12.10 of the operations manual.

Four data streams are maintained – raw, raw with manual tips removed, adjusted, and primary reference gauge