

APPENDIX J

Rain/Snow Gauge SOP

Standard Operating Procedure For a Met One Rain and Snow Gauge

1.0 INTRODUCTION

This procedure applies to the Met One model 385 rain and snow gauge. The rain and snow gauge will be used to monitor precipitation in the vicinity of the proposed Energy Fuels Resources Corporation (EFR) Uranium Mill. The selection and location of the site is described in the Energy Fuels Resources Corporation Uranium Mill Licensing Support Ambient Air Monitoring Plan for the Piñon Ridge Mill Site prepared by Kleinfelder West, Inc.

Precipitation data will be collected at the air monitoring site located on the northern boundary of the proposed Energy Fuels Piñon Ridge Uranium Mill site in order to obtain a representative set of data for the assessment. Data will be collected during construction and when the mill becomes operational.

2.0 INSTRUMENT INSTALLATION

2.1 Instrument Assembly

The rain and snow gauge will be assembled and prepared for operation with assistance from Inter-Mountain Laboratories (IML) according to the procedure in the manufacturer's operating manual. IML will also carry out the initial calibration of the instrument.

3.0 OPERATING PROCEDURE

Please enter date, time, technician name, name of any visitors, and purpose of visit in Site Notebook for any visit to the site.

3.1 Necessary Equipment

Meteorological Equipment Checklist
Timepiece
Site Notebook
Writing Instrument

3.2 Rain and Snow Gauge Operation

This heated rain gauge provides year round measurement of either rain or snow.

1. It is important to verify that the tipping bucket assembly moves freely and that with each tip the data logger registers 0.01 inches of precipitation.

Please note the date and time of any instrument checks, such as checking the movement of the tipping bucket, in the site notebook and on the daily/weekly, and/or monthly meteorological checklist.

The rain gauge works by collecting rainfall in the collecting funnel and metering the rain into the tipping bucket assembly. When 0.01 inches of precipitation are collected, the tipping bucket assembly tips and activates a switch. The data logger records the switch closure. When the bucket tips the water drains out the screened base of the gauge.

In the case of snowfall, snow is captured in the collecting funnel and melted by the heating element. After melting, the water is funneled into the tipping bucket assembly for measurement of the water equivalent.

2. If snowfall is anticipated, remove primary screen from funnel (Figure1). Replace primary screen after snowfall event.

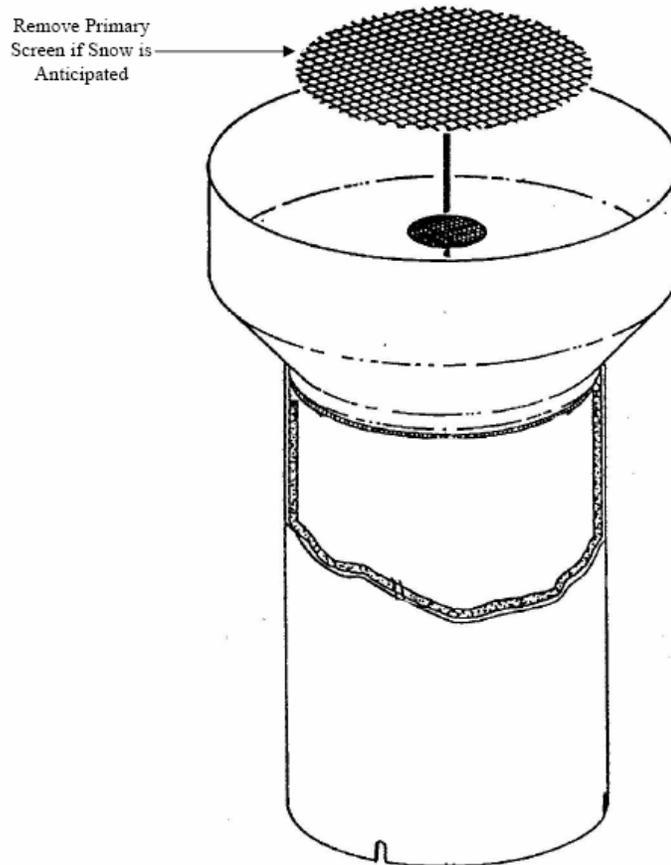


Figure 1: Primary screen removal for snowfall.

4.0 INSTRUMENT CHECKS

Routine Maintenance of rain and snow gauge is covered by following the daily, weekly, and monthly checks.

4.1 Daily Checks

4.1.1 Necessary Equipment

Timepiece
Meteorological Equipment Checklist
Site Notebook
Writing Instrument

4.1.2 Daily Check Procedure

1. Record all information requested on the Meteorological Equipment Checklist (Figure 2). Note start date and time and end date and time of all checks.
2. Perform a visual inspection of the rain and snow gauge, and note any damages that may affect sampler operation. If damage is noted please contact appropriate personnel for next steps.
3. Check the debris screens, and collection funnel for debris. Note in Site Notebook and on Meteorological Equipment Checklist.

If debris was removed note the date and time of removal and the type of debris that was removed.

4.2 Monthly Instrument Checks

4.2.1 Necessary Equipment

Timepiece
Bubble Level
Site Notebook
Meteorological Equipment Checklist
Writing Instrument

4.2.2 Monthly Check Procedure

1. Record all information requested on the Monthly Checklist for Meteorological Equipment (Figure 2).
2. Perform Daily (4.1) Check procedures.
3. Clean the collection funnel.
4. Use a bubble level to check that the sensor is level.

Meteorological Equipment Checklist

Daily Instrument Checks

Date											
Time											
Technician Name											
Visible damage to any meteorological instrument(s)?	Yes	No									
If Yes, list instrument(s) with damage in the notes section along with the date and type of damage.											
Will damage affect operation?	Yes	No									
If Yes, damage will affect operation, contact appropriate personnel, see contact list.											
Check Rain Gauge debris screens and collection funnel for debris											
Was debris removed?	Yes	No									
If Yes, debris was removed, list the date, time and type of debris removed in the notes section.											
Check Evaporation Pan for debris											
Was debris removed?	Yes	No									
If Yes, debris was removed, list the date, time and type of debris removed in the notes section.											
Observe movement of wind vane											
Observe movement of wind speed propeller											
Observe movement of vertical wind speed propellers											
Listen for air movement through ground level temperature shields											
Notes:											

Weekly Instrument Checks

Date:	Time:	Technician Name:								
Add or Remove water to bring water level in Evaporation Pan to designated level	Add	Remove	Initial Water Level (in):							
Time water addition/removal started:	Time water addition/removal completed:	Final Water Level (in):								
Check radiation shields of ground level temperature sensors for debris										
Was debris removed?	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
If Yes, debris was removed, list the date, time and type of debris removed in the notes section.										
Notes:										

Monthly Instrument Checks

Date:	Time:	Technician Name:								
Clean Rain Gauge collection funnel		Check drain hole on Solar Radiation Sensor for debris								
Check that the Rain Gauge is level		Inspect and Clean Solar Radiation Sensor								
Check Evaporation Pan for sediment and algae		Verify that Solar Radiation Sensor is level								
Clean the Evaporation Pan if sediment or algae are present		Visually inspect cable connection on the Barometric Pressure Sensor to ensure it is clean & dry								
Check Evaporation Pan & Pipe for leaks		Visually inspect the Barometric Pressure Sensor for damage								
Note any leaks and call appropriate personnel for next steps		Check the pneumatic connection and pipe on the Barometric Pressure Sensor								
Information to be filled in if Evaporation Pan is Emptied.										
Start Time for Emptying Pan:			Evaporation Gauge Calibration Start Time:							
Reason for Emptying Pan:			Evaporation Gauge Calibration End Time:							
End Time for Refilling Pan:			Final Water Level (in):							
Notes:										

Figure 2: Example Meteorological Checklist

5.0 CALIBRATION PROCEDURE

5.1 Necessary Equipment

Timepiece
Site Notebook
Writing instrument

5.2 Calibration Procedure

The Rain and Snow Gauge will be calibrated every six months and on an as needed basis by qualified personnel.

Write the date and time of calibration in the Site Notebook.

Calibration of the gauge is required upon the initial installation of the gauge and whenever damage has occurred or the adjustment screws have loosened.

Proper calibration of the gauge is critical to the accuracy of the data and the correct operation of the gauge.

The following procedure can be used to check the calibration of the rain and snow gauge. Record the date and time of the calibration test in the Site Notebook.

1. Check to be sure that the sensor is level.
2. Wet the mechanism and tipping bucket assembly. Using a graduated cylinder or burette, slowly pour the measured quantity of water through the inner funnel to the tipping bucket, which should cause a tip.

Repeat for alternate bucket.

If both buckets tip when filled with the measured quantity of water, the sensor is properly calibrated.

If either of the buckets does not tip when filled, the sensor must be calibrated. Contact appropriate personnel for next steps.

6.0 AUDIT PROCEDURE

Independent auditing will be performed on a semi-annual basis by VSI Environmental Monitoring Service. A plan outlining audit procedures and instruments to be used for auditing is provided in the appendices of the Energy Fuels Resources Corporation Uranium Mill Licensing Support Ambient Air Monitoring Plan for the Piñon Ridge Mill Site.

References:

1. Model 385C/387C Electric Rain/Snow Sensor Operation Manual, Met One Instruments, Inc. DocNo 385C-9800, 2005
2. Energy Fuels Resources Corporation Uranium Mill Licensing Support Ambient Air Monitoring Plan for the Piñon Ridge Mill Site, 2008