

Appendix C: Meteorological Data Files and Processing Procedures

- **15 Minute Average Meteorology Data (contained on compact disc only)**
- **Hourly Averaged Meteorology Data with Processing Macros (contained on compact disc only)**
- **Meteorology Processing Procedures**
- **AERMET Files (contained on compact disc only)**
- **Surface Parameter File (contained on compact disc only)**
- **Meteorology Data Approval Letter from APCD**

Meteorology Processing Procedures

**Procedures for Running the Averaging Macros on 15 Minute Met Data
Energy Fuels Piñon Ridge Mill
November 2, 2009**

The following procedures must be completed to ensure the calculations performed by AERMET are correct. If the procedures are followed, the 15 minute data values will be averaged by the hour according to the CDPHE document "Instructions for Interim Processing of Site-Specific Meteorological Data for AERMET version 06341", dated September 14, 2009. Certain units are specified by AERMET; therefore, if the data are not in these units, the data must be converted. Once the data is averaged according to the CDPHE instructions, then the data is formatted for AERMET input (columns right justified, etc).

The steps outlined in this document assume the raw data (data from data logger) has been formatted and EPA Air Quality System (AQS) data qualifiers have been added to the file to flag invalid/missing data. Procedures for formatting and adding EPA AQS data qualifiers to the raw data are not included.

1. Open an Excel workbook with one worksheet containing the 10 meter data, and another worksheet containing the 30 meter data.

2. Delete the following columns (this data is not needed for AERMET processing):

Note: the 30 meter tower will not have Precip_Tot or EvapLevel_Avg.

- a. RECORD
- b. FIFMIN_ARR_ID
- c. Year
- d. Day_of_Year
- e. VertWS_EPS_Avg
- f. VertWS_EPS_Std
- g. VertWS_CFT_Avg
- h. VertWS_CFT_Std
- i. Precip_Tot
- j. RHTemp_Avg
- k. EvapLevel_Avg
- l. BatteryV_Avg

3. The file headings should now be as follows:

Note: The headings shown are for the 10 meter tower. The 30 meter tower will have the same headings, just a 30 meter temperature rather than 10 meter temperature.

TIMESTAMP	HOUR	WSpd_m/s	WDir_Deg	ST	Temp2m_Avg	Temp10m_Avg	DeltaT_Avg	RH_Avg	BPinHg	SolarRad_Avg
TS		m/s	Deg	Deg	DegC	DegC			inHg	W/m ²
	Smp	WVc	WVc	WVc	Avg	Avg	Avg	Avg	Smp	Avg

4. Run Macro "MissingData". This Macro will replace the EPA Air Quality System data qualifier codes with AERMET/AERMOD recognized missing data codes (as outlined in Appendix B of the AERMET User's Guide).
5. Run Macro "WindThresh". This Macro will look for wind speed values lower than the instrument threshold of 0.4 m/s and replace those wind speed values with 0.2 m/s, or half the instrument threshold. The wind speed instrument is a RM Young Model 5305-5. Next, the Macro substitutes AERMET missing indicators (not zero) for wind direction (999) and standard deviation of horizontal wind speed (99) for the subhourly data periods when the wind speed was below the instrument threshold. Finally, the Macro converts barometric pressure from inches of mercury to milliBar *10, the units needed for AERMET processing.
6. Run Macro "InsertColumns". This Macro will insert an empty column after each column of data (except date/hour data) where the averaging calculations will take place.
7. Run Macro "Avg15data". Set variable alldata for the number of total hours that will be averaged (i.e. 15 minute data rows/ 4). (Use the following menus: Tools – Macro – Macros – Edit Macro). This Macro will first check that the date/hour columns are complete and contain four data values for every hour. If an error box appears with a date and time, then go to that cell to look for a value near that cell that may be missing. Manually fix the missing hour (i.e. add in missing data indicators for the entire row) and then hit the blue reset button in the visual basic editor and rerun the Avg15data Macro. The Macro will average the subhourly data and place the average in the zero hour row for each hour.
8. Run Macro "Delete Columns". This macro copies the column headers from the subhourly data to the hourly averaged data and then removes the subhourly data columns.
9. Run Macro "Delete Rows". This macro deletes the empty rows in the hourly averaged columns.
10. Insert worksheet titled "Merged". Copy 10 meter data (hourly averaged) on this worksheet.
11. Run Macro "MergeData". This macro merges the 10 meter and 30 meter data into one file and also adds a column for tower height.
12. Copy the merged data into a new worksheet. Close the worksheet with the macros.

13. Data in each column needs same amount of decimal places so it lines up correctly.
 - a. Find the number of decimal places that most of the data in a column have and use that number in the next step.
 - b. Type Excel function: `FIXED(cell no, decimal places, TRUE)`.
 - i. This function fixes the decimal places for each number. If the original number had fewer decimals, then it will add trailing zeros, if the number had more decimals, then it will round. In any case, significant digits are not being created.
 - c. Repeat for all columns.
14. Delete header rows.
15. Save the file as a space delimited text file called Merged.prn.
16. Open the text file in Ultra Edit. Edit the file to ensure the following:
 - a. All the columns are right justified.
 - b. The month, day, year, hour columns are all two digits and do not contain any “/ or :” symbols.
17. The file is now ready to run through AERMET.

Meteorology Data Approval Letter from APCD

STATE OF COLORADO

Bill Ritter, Jr., Governor
James B. Martin, Executive Director

Dedicated to protecting and improving the health and environment of the people of Colorado

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Colorado Department
of Public Health
and Environment

Zach Rogers
Environmental Engineer
Energy Fuels Resources Corporation
44 Union Boulevard, Suite 600
Lakewood, Colorado 80228

October 6, 2009

Dear Mr. Rogers,

I have received your letter of September 25, 2009, which responds to my letter of September 24, 2009. Thank you for providing the corrected Site 1 data for April 2008. This resolves all issues with the preconstruction meteorological monitoring data sets. Contact Emmett Malone (Emmett.Malone@state.co.us) to obtain a meteorological determination for use in preparing a regulatory impact analysis.

Sincerely,

Nancy D. Chick
Environmental Protection Specialist
Air Pollution Control Division

C:\Energy Fuels Naturita\EnergyFuelsMetDataFinalized.docx

Cc: R.K. Hancock, SSP Permit files
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