



Energy Fuels Resources

December 21, 2010

Mr. Edgar Ethington
Hazardous Materials & Waste Management Division
Colorado Department of Public Health and Environment
HMWM-HWC-B2
4300 Cherry Creek Drive South
Denver, Colorado 80246-1530

Re: 2010 Third Quarter Meteorological Monitoring Report

Dear Mr. Ethington,

Energy Fuels Resources Corporation (Energy Fuels) is pleased to submit two copies of the Third Quarter 2010 Meteorological Monitoring Report with data CDs prepared by Energy Fuels Resources and dated July 19, 2010. Note that this report only covers meteorological monitoring as total suspended particulate and PM-10 monitoring was suspended following the first quarter of 2010.

Please feel free to contact me at (303) 974-2151 if you need any additional information.

Sincerely,

Zach Rogers, EIT
Environmental Engineer

Attachment

Cc: Nancy Chick (CDPHE)
Phil Egidi (CDPHE), letter only
Kris Allen (Kleinfelder)
Frank Filas (Energy Fuels)

**THIRD QUARTER 2010 DATA REPORT
FOR METEOROLOGICAL MONITORING
ENERGY FUELS RESOURCES CORPORATION
URANIUM MILL LICENSING SUPPORT
PIÑON RIDGE MILL
MONTROSE COUNTY, COLORADO**

**December 21, 2010
Revision: 0**

Prepared By:



Energy Fuels Resources Corporation
44 Union Boulevard, Suite 600
Lakewood, Colorado 80228

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1.0 INTRODUCTION

This quarterly report provides meteorological data required for the assessment of air quality. The data collected during the Third Quarter 2010 augments the environmental baseline study at Energy Fuels Resources Corporation (EFR) proposed Piñon Ridge Mill (the "Site") located in Montrose County, Colorado. Twelve months of meteorological and air quality data were collected from the second quarter 2008 to the second quarter 2009 and was subsequently summarized in the Meteorology, Air Quality and Climatology Report, revision 1, dated October 9, 2009 and prepared by Kleinfelder West, Inc. (Kleinfelder). Meteorological and ambient air data were collected at five air monitoring stations (network) from the second quarter 2008 through the first quarter 2009, comprising 24 months of data which is twice the minimum required for permitting purposes. Ambient air monitoring was suspended at the end of the first quarter 2010 per the proposed changes to the monitoring program outlined in a letter to CDPHE dated March 12, 2010 and subsequently approved by CDPHE. In accordance with the approved monitoring program changes, meteorological monitoring will continue through the first quarter 2011. Ambient air and meteorological monitoring will resume prior to the start of mill construction.

The project is under the regulation of the Colorado Department of Public Health and Environment (CDPHE) and will require a mill license (radioactive material license) by CDPHE to construct and operate. Monitoring sites were chosen according to guidance outlined in Nuclear Regulatory Commission (NRC) Regulatory Guide (Reg. Guide) 3.63, Onsite Meteorological Measurement Program for Uranium Recovery Facilities – Data Acquisition and Reporting (NRC Reg. Guide 3.63); and Environmental Protection Agency (EPA) Meteorological Monitoring Guidance for Regulatory Modeling Applications (MMGRMA) (EPA-454/R-99-005).

The Site is located 14 miles northwest of Naturita at 16910 Highway 90, Montrose County, Colorado. The property consists of approximately 880 acres that include the Southwest $\frac{1}{4}$ of the Southeast $\frac{1}{4}$ of Section 5, all of Section 8, the North $\frac{1}{4}$ of Section 17, and the Southeast $\frac{1}{4}$ of the Northwest $\frac{1}{4}$ of Section 17, Township 46 North, Range 17 West, of the New Mexico Principal Meridian. See Figure 1 for the site layout.

2.0 MONITOR SITE DESCRIPTIONS

2.1 Selection of Monitoring Sites

Selection of meteorological monitoring station locations was based on the siting criteria set forth in NRC Reg. Guide 3.63. The monitoring locations were selected near the Site boundaries. Wind direction is predominantly from northwest and from the southeast depending on time of day due to the presence of a down-valley/up-valley flow through the area.

The two meteorological monitoring locations are discussed below:

Air Monitoring Site #1: This location is also referred to as Met Site 1 and is located near the northern boundary of the Site. This location includes the 10 meter (10m) meteorological tower.

Air Monitoring Site #2: This location is also referred to as Met Site 2 and is located near the eastern boundary of the Site. This location includes the 30 meter (30m) meteorological tower.

2.2 Locations

The Site is located at 16910 Highway 90, Montrose County, Colorado. See Table 1 and Figure 1 for locations of the meteorological monitoring sites.

Table 1
Meteorological Site Locations

Site ID	UTM Zone 12 (NAD83)	
	Easting	Northing
Met Site 1 (North Site) – 10m Tower	695211.43	4237487.24
Met Site 2 (East Site) – 30m Tower	695930.42	4235452.56

3.0 DATA COLLECTION AND COMPLETENESS

According to the Prevention of Significant Deterioration (PSD) regulations, the data recovery goal for meteorological data is 90 percent data recovery per quarter so as to meet a 90 percent data recovery requirement for a year.

Meteorological data were collected continuously at Met Sites 1 and 2 from July 1 to September 30, 2010 and are reported in Appendix A. EPA Air Quality System (AQS) data qualifiers were used to flag invalid data. Data qualifiers used for meteorological data this quarter include: BA – Maintenance/Routine Repairs, AQ – Collection Error and AT – Calibration.

Weekly and monthly checks were performed on meteorological equipment at each met site according to standard operating procedures (SOPs) presented in the Energy Fuels Resources Corporation Uranium Mill Licensing Support Ambient Air Monitoring Plan Piñon Ridge Mill Site, 2008.

Met Site 1 includes the 10m tower and the following parameters are measured based on EPA MMGRMA guidance:

- wind speed, wind direction, and sigma theta
- vertical wind speed,
- temperature,
- relative humidity,
- delta temperature,
- barometric pressure,
- solar radiation,
- precipitation, and
- evaporation.

At the 10m level, wind speed, wind direction, sigma theta, vertical wind speed, and delta temperature are measured. At the 2m level, temperature, relative humidity, delta temperature, barometric pressure, and solar radiation are measured. At the ground level, precipitation and evaporation are measured.

Met Site 2 includes the 30m tower and the following parameters are measured based on EPA MMGRMA guidance:

- wind speed, wind direction, and sigma theta,
- vertical wind speed,
- temperature,
- relative humidity,
- delta temperature,
- barometric pressure, and
- solar radiation.

At the 30m level, wind speed, wind direction, sigma theta, vertical wind speed, and delta temperature are measured. At the 2m level, temperature, relative humidity, delta temperature, barometric pressure, and solar radiation are measured.

Sigma theta values for both met sites are calculated from wind monitor readings. Wind gusts are measured at both of the met sites. The measurement indicates the speed of the gust based on a 3-second average of the wind speed, along with the gust direction and time of the gust.

Data recovery was calculated for each parameter at both of the meteorological sites. As shown in Table 2, data completeness at Met Site 1 was between 95.8 and 99.9 percent for all parameters. Data recovery at Met Site 2, also shown in Table 2, was 98.6 percent for all parameters except temperature (2-meter and 30-meter), delta temperature, and solar radiation.

Data recovery for the Met Site 2 2-meter temperature, 30-meter temperature and delta temperature was at 87.8 percent for the quarter. Data recovery was low due to an extended power outage. All the meteorological instruments ran on battery power for approximately ten days. However, the fans that vent ambient air across the temperature sensors are not powered by the battery back-up system during a power outage. As a result the temperature data was qualified for the entire period that line power was not operational at Met Site 2. The data recovery for these parameters does not meet the data recovery *goal* of 90 percent. However, the data recovery for these parameters over the past four quarters does exceed the 90 percent data recovery *requirement* at 96.8 percent for the year.

Data recovery for the Met Site 2 solar radiation was at 63.3 percent for the quarter. The low data recovery for solar radiation was due to a sensor malfunction that was not discovered until the following meteorological equipment quality assurance audit and is described further in Section 5.3. The data recovery for these parameters does not meet the data recovery *goal* of 90 percent for the quarter. However, the solar radiation data recovery for the past four quarters does exceed the 90 percent data recovery *requirement* at 90.7 percent for the year. In addition, this data is duplicative of solar radiation measured on-site at Met Site 1, which could be used as substitute data.

**Table 2
Data Recovery for Meteorological Parameters**

Meteorological Parameter	Data Recovery Met Site 1	Data Recovery Met Site 2
Wind Speed	99.9%	98.6%
Wind Direction	99.9%	98.6%
Sigma Theta Wind	99.9%	98.6%
Vertical Wind Speed EPS Avg	99.9%	98.6%
Vertical Wind Speed EPS Std	99.9%	98.6%
Vertical Wind Speed CFT Avg	99.9%	98.6%
Vertical Wind Speed CFT Std	99.9%	98.6%
2m Temperature	99.9%	87.8%
10m Temperature	99.9%	N/A
30m Temperature	N/A	87.8%
DeltaT Avg	99.9%	87.8%
Precipitation Total	99.8%	N/A
Relative Humidity Avg	99.9%	98.6%
RH Temperature Avg	99.9%	98.6%
Barometric Pressure	99.9%	98.6%
Solar Radiation Avg	99.9%	63.3%
Evaporation Level Avg	95.8%	N/A
Gust Speed	99.9%	98.6%
Gust Direction	99.9%	98.6%
Gust Time	99.9%	98.6%

N/A – Not Applicable. Sensors for 10-meter Temperatures, Evaporation, and Precipitation were not installed at Met Site 2. Sensors for 30-meter Temperature were not installed at Met Site 1.

4.0 DATA ANALYSIS

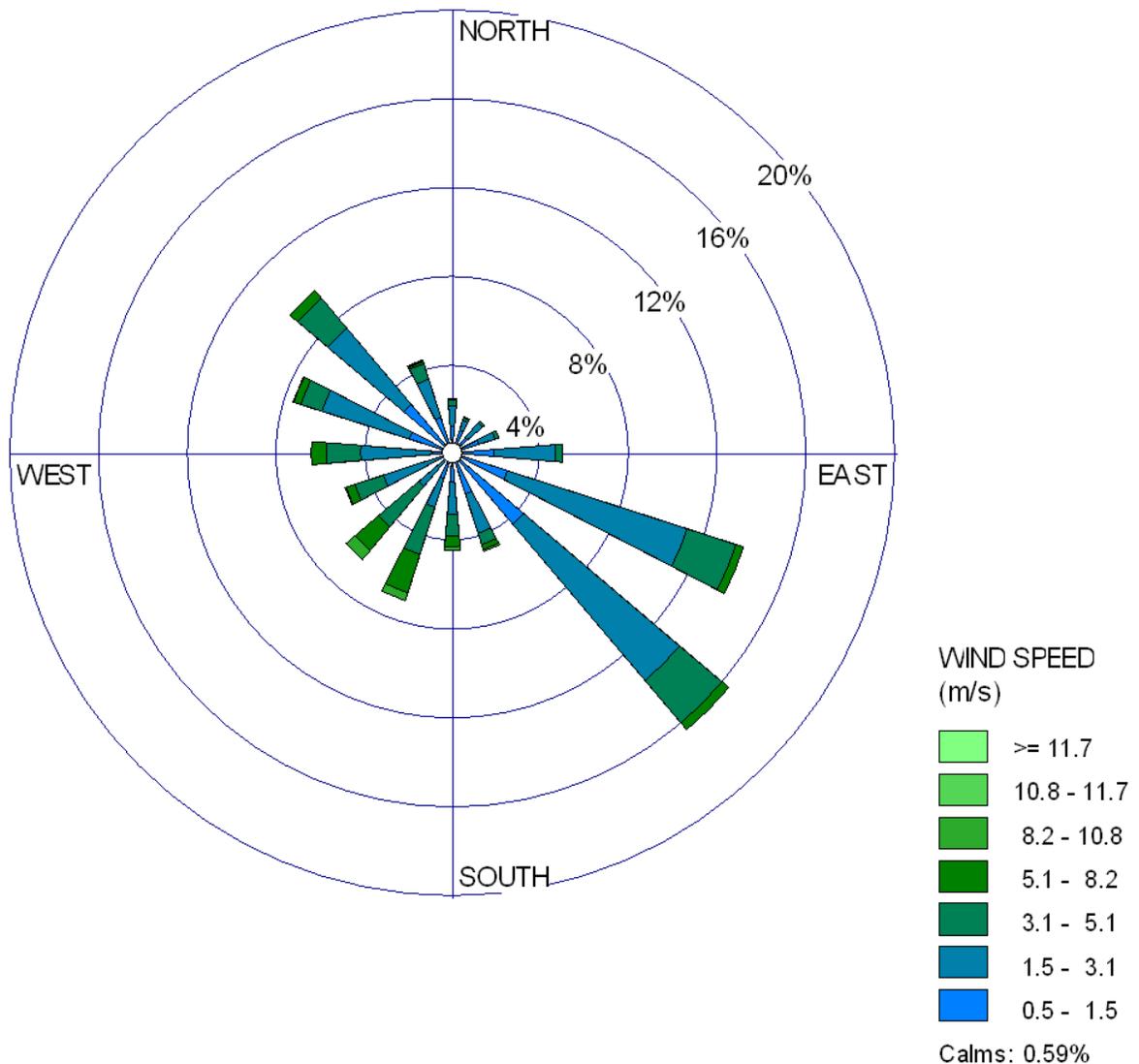
The monthly averages of meteorological parameters are summarized in Table 3.

**Table 3
Monthly Average Meteorological Parameters**

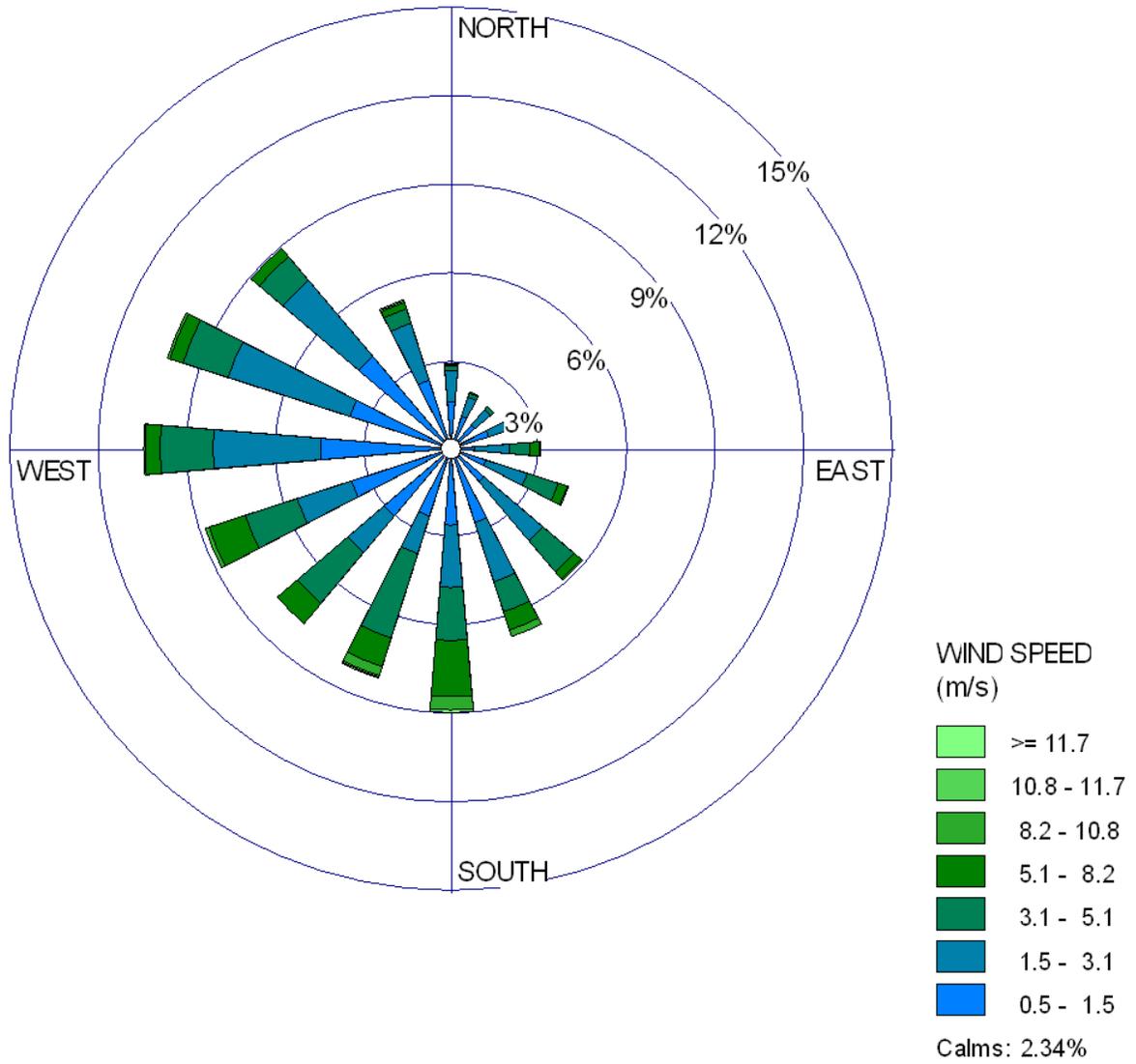
Meteorological Parameter	July		August		September	
	Met Site 1	Met Site 2	Met Site 1	Met Site 2	Met Site 1	Met Site 2
Wind Speed (m/s)	2.89	2.85	2.68	2.57	2.59	2.49
Wind Direction (deg)	157.17	238.43	169.17	228.78	187.05	246.54
Sigma Theta Wind	30.58	31.69	29.41	32.00	29.04	29.58
Vertical Wind Speed EPS (cm/s)	3.00	8.16	2.31	4.86	1.75	5.59
Vertical Wind Speed EPS Std	19.90	34.05	18.35	35.62	17.07	34.45
Vertical Wind Speed CFT (cm/s)	6.62	14.38	8.73	12.11	7.57	13.44
Vertical Wind Speed CFT Std	22.11	37.61	19.91	38.52	18.96	35.90
2m Temperature (°C)	23.94	24.17	21.45	21.48	18.86	19.13
10m Temperature (°C)	24.25	N/A	21.82	N/A	19.72	N/A
30m Temperature (°C)	N/A	24.58	N/A	22.24	N/A	20.44
DeltaT (°C)	0.31	0.41	0.37	0.76	0.87	1.32
Relative Humidity (%)	38.09	36.63	49.25	47.79	31.76	28.52
RH Temperature (°F)	75.56	76.29	71.18	71.56	66.66	68.00
Barometric Pressure (in. Hg)	24.64	24.58	24.67	24.60	24.66	24.59
Solar Radiation (W/m ²)	288.39	286.93	263.37	255.57	253.56	N/A ⁽¹⁾
Gust Speed (m/s)	6.27	6.42	5.76	5.93	5.50	5.61
Gust Direction (deg)	149.66	246.96	168.21	228.57	190.26	249.14
Total Precipitation (in.)	3.11	N/A	2.83	N/A	0.78	N/A
Total Evaporation (in.)	6.42	N/A	6.69	N/A	5.68	N/A
Average Daily Evaporation (in.)	0.21	N/A	0.22	N/A	0.19	N/A

(1) Solar radiation sensor at Met Site 2 malfunctioned for the entire month of September

The wind roses for Met Sites 1 and 2 are shown below. As can be seen in the wind rose below, the wind direction at the 10m tower site (Met Site 1) is predominantly from the southeast, with less frequent, yet still prominent northwest and southwest components. The southeast/northwest wind directions depict the down-valley/up-valley flow through the area. The wind direction at the 30m tower site (Met Site 2 wind rose, below) is distributed predominantly from the west with a significant south component.



Met Site 1: 10m Wind Rose



Met Site 2: 30m Wind Rose

5.0 QUALITY ASSURANCE PROGRAM

5.1 Calibrations

Calibrations of meteorological instruments were performed on July 27, 2010 by IML personnel. A copy of the IML Calibration Report is provided in Appendix B.

5.2 Independent Audit Program

Audits of meteorological instruments are performed semi-annually and were not performed in the Third Quarter 2010. Audits of meteorological instruments were performed on April 26, 2010 by IML personnel. A copy of the IML Quality Assurance Audit Report was provided in the Second Quarter 2010 Meteorological Monitoring Report.

5.3 Internal Quality Control Procedures

In the event of any operational errors a corrective action procedure is implemented. The quality assurance manager for the site will investigate the cause and effect of the incident, take corrective action, and prepare a letter to the CDPHE Air Pollution Control Division (APCD) and the Radiation Management Unit (RMU), as necessary.

One equipment failure occurred in the Third Quarter 2010. During the audit performed on October 27, 2010, it was discovered that the solar radiation sensor at Met Site 2 was not within audit specifications. The sensor was found to be reading lower than the reference sensor. The sensor was replaced and verified as being within audit specifications on October 27. The malfunction in the sensor was not discovered during semi-weekly checks because the sensor was still reporting values within the normal range of measurement. Comparison of the solar radiation data with data from Met Site 1 indicated that the sensor began malfunctioning on August 27, 2010. The Met Site 2 solar radiation data from August 27 through the end of the quarter was qualified.

One extended power outage also occurred in the Third Quarter 2010 at Met Site 2. The power outage was initially discovered on September 1, 2010 with an observation that the ground level temperature sensor fan was not running. However, the data logger was still running on back-up battery power. The circuit breaker for the met site was reset at that time in an effort to correct the issue. During a subsequent check on September 7 it was noted that there was still no power to the met site but the data logger was still running on battery power. On September 8, it was discovered that the data logger had also stopped running. The local power provider was notified and an off-site transformer fuse was found to be blown and was replaced on September 8, restoring power to Met Site 2. Analysis of the battery voltage readings indicated that the power went out on August 28, 2010. The only meteorological equipment that requires power at Met Site 2 is the 2-meter and 30-meter temperature sensor fans. Although the 2-meter temperature at Met Site 2 tracked well against the 2-meter temperature at Met Site 1 for the duration of the power outage, the temperature data (2-meter, 30-meter and delta temperature) were qualified for the entire period of power loss since the fans were not operating.

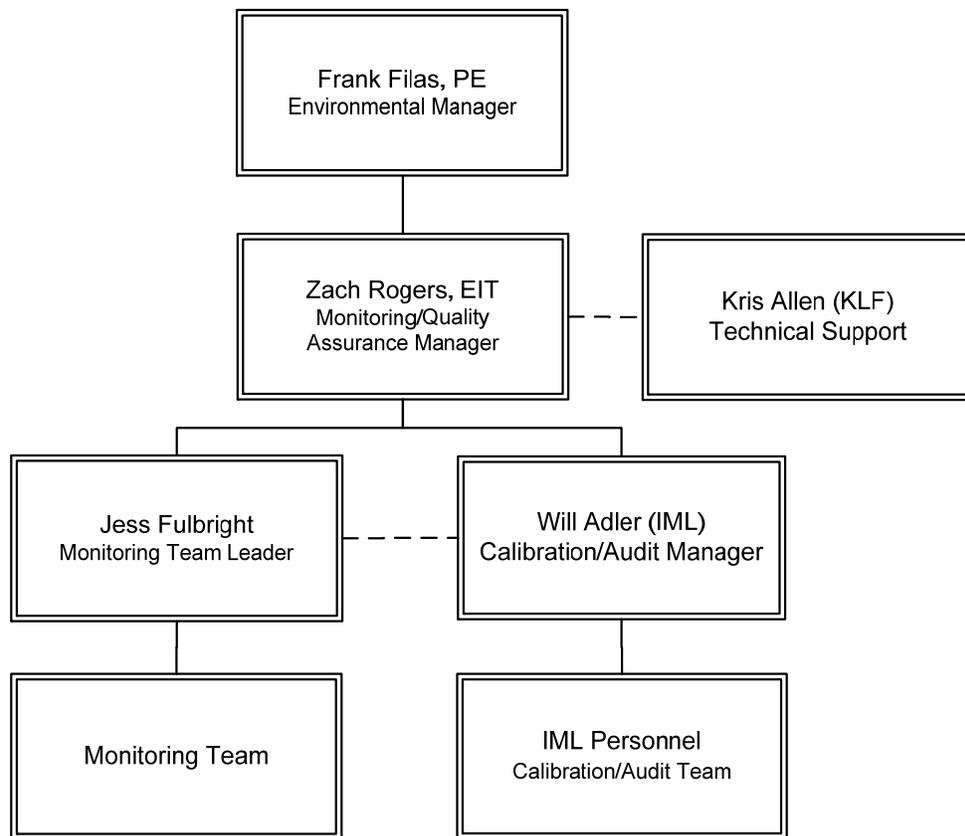
It was determined that current practices in place, including regular checks of equipment and semi-annual calibrations and quality assurance audits, and duplicate instruments are adequate to prevent significant data loss due to equipment failure. Modifications were made to the monitoring program to more quickly recognize and correct power failures at the met sites. These modifications include taking more care to recognize that there is a power outage, confirming that corrective actions (such as resetting the circuit breaker) resolve the issue, and understanding the impacts of a power loss to the data completeness for the project.

6.0 PERSONNEL

Project staff and their respective roles are detailed in Table 4. The overall project organization is shown schematically in the Project Organization Chart below.

Program administration, management, and quality assurance is performed by Energy Fuels Resources personnel. The Monitoring Team Leader will provide onsite oversight and will assist the field team with technical, operational, or other project-related issues. Meteorological equipment calibrations and audits and ambient air monitoring audits are performed by IML Air Science. Technical support is provided by Kleinfelder (KLF).

Project Organization Chart



**Table 4
Roles and Responsibilities**

Name	Project Role	Responsibilities	Experience
Frank Filas, PE	Environmental Manager	Program Management	Engineering, Licensing, Operations Management
Zach Rogers, EIT	Monitoring/Quality Assurance Manager	Project Management, Quality Assurance, Report Preparation	Project Management, Field Operations, Air Quality, Quality Control, Meteorology
Jess Fulbright	Monitoring Team Leader/ Health & Safety Officer	Field Operations Management, Sampling, Health & Safety Compliance	Field Operations, Health & Safety Compliance
EFR Personnel	Monitoring Team	Sampling	Field Operations
Will Adler (IML)	Calibration/Audit Project Manager	Project Management, Field Work/Calibration/Audit	Project Management, Meteorology, Air Quality, Ambient Air Quality Modeling
IML Personnel	Calibration/Audit Team	Field Calibrations and Audits	Meteorology, Air Quality, Ambient Air Quality Modeling
Kris Allen, EIT (KLF)	Technical Support	Field Management, Air Quality Project Management	Air Quality, Field Management, Meteorology

7.0 STANDARDS AND REFERENCES

Colorado Department of Public Health and Environment (CDPHE), 2001. Ambient Air Monitoring Requirements for the Air Pollution Control Division of the Colorado Department of Public Health and Environment, Technical Services Program Air Pollution Control Division, April.

Energy Fuels Resources Corporation, 2008. Work Plan for Ambient Air Monitoring, Piñon Ridge Mill Site, July 18.

Environmental Protection Agency (EPA), 2000. Meteorological Monitoring Guidance for Regulatory Modeling Applications (MMGRMA) (EPA-454/R-99-005).

EPA, 1995. Quality Assurance Handbook for Air Pollution Measurement Systems. Vol. V, Meteorological Measurements. EPA/600/R-94/038d, U.S. Environmental Protection Agency, Research Triangle Park, NC.

EPA, 2008. Quality Assurance Handbook for Air Pollution Measurement Systems. Volume IV: Meteorological Measurements Version 2.0 (Final). EPA-454/B-08-002, U.S. Environmental Protection Agency, Research Triangle Park, NC.

Kleinfelder West, Inc., 2009. Meteorology, Air Quality and Climatology Report, revision 1. October 9.

U.S. Nuclear Regulatory Commission Regulatory Guide, Office of Standards Development, Regulatory Guide 3.8 – Preparation of Environmental Reports for Uranium Mills, Revision 2, October 1982.

U.S. Nuclear Regulatory Commission Regulatory Guide, Office of Nuclear Regulatory Research, Regulatory Guide 3.63 – Onsite Meteorological Measurement Program For Uranium Recovery Facilities – Data Acquisition and Reporting, March 1988.

FIGURES

Figure 1 – Site Layout

