

**PIÑON RIDGE MILL  
2009 ANNUAL REPORT OF THE  
MONITORING AND MITIGATION PROGRAM  
FOR PUMPING PRODUCTION WELLS**



**ENERGY FUELS RESOURCES CORPORATION**  
**31525 Highway 90**  
**Nucla, Colorado 81424**

**January 2010**

## Table of Contents

<u>Section</u>	<u>Page</u>
1.0 Introduction.....	1
2.0 Production Wells and Associated Piezometers.....	1
3.0 Off-Site Wells .....	1
4.0 Off-Site Spring.....	2

### Figures

Figure 1 Monitored Production Wells, Off-Site Wells and Springs

### Tables

Table 1 Production and Off-Site Well Water Levels  
Table 2A Analytical Data for Production Well Samples  
Table 2B Analytical Data for Off-Site Well and Spring Samples  
Table 3 Off-Site Well and Spring Productivity Testing

### Appendices

Appendix A Field Data Sheets  
Appendix B Laboratory Data Reports

## **1.0 Introduction**

The 2009 Annual Report is provided in accordance with the Monitoring and Mitigation Plan prepared by Golder Associates, Inc., dated June 29, 2008 and revised July 7, 2008. Energy Fuels is currently in the process of permitting the Piñon Ridge Mill with the Colorado Department of Public Health and Environment (CDPHE). Currently, the mill has not been built and the production wells currently installed (PW-1 through PW-3) do not have installed pumps and are not in operation. Until such a time that they are operating, the data collected for the monitoring and mitigation program will be used to establish baseline conditions.

The monitoring and mitigation plan requires groundwater monitoring at the following locations:

- Production wells and associated piezometers
- Five off-site wells
- One off-site spring

## **2.0 Production Wells and Associated Piezometers**

The Monitoring and Mitigation Plan requires water level monitoring at the piezometers and water sampling at the production wells during production well operation.

Three production wells identified as PW-1, PW-2 and PW-3 are currently located on and near the Piñon Ridge Mill site (Refer to Figure 1). Two piezometers were initially installed near each production well. The piezometers were temporary and have been abandoned. Permanent piezometers will be installed prior to operation of the production wells. To establish water level baseline measurements, Energy Fuels has been collecting water level measurements at the production wells on a quarterly basis and will continue to do so until the production wells are operated. Refer to Table 1 for water level measurements taken to date.

In addition, Energy Fuels has collected six groundwater samples from each production well to date. The results from these samples and from samples collected annually prior to production well operation will be used to establish baseline water quality at the production wells. Analytical results of production well samples collected to date are presented in Table 2 and the associated analytical reports are provided in Appendix B.

## **3.0 Off-Site Wells**

The Monitoring and Mitigation Plan requires pre-operational and operational monitoring of the off-site wells. The pre-operational monitoring includes water level measurements (if accessible) and productivity testing on a quarterly basis and water quality testing on an annual basis. The five off-site wells to be monitored are listed below.

- Hurdle Well, Well Permit No. 226684
- Davis Well, Well Permit No. 269575
- BLM Well, Well Permit No. 258704

- Herron Well, Well Permit No. 234134
- Boren Well, Well Permit No. 253522

Refer to Figure 1 for well locations.

Despite repeated attempts, Energy Fuels has been unable to obtain consent to monitor the Herron Well. Water level measurement and productivity testing of the remaining four off-site wells was performed in the Fourth Quarter 2009. Water level measurements are presented in Table 1 for the BLM Well and the Boren Well. Water levels could not be measured in the Hurdle Well and Davis Well due to well design that restricts the ability to lower a measurement probe into the well. Productivity testing was conducted in the four accessible off-site wells and results are provided in Table 3. Field data sheets for the productivity testing are provided in Appendix A. Initial water quality testing was performed at the four accessible off-site wells in 2008 and 2009 and the analytical data from those samples is presented in Table 2 and the associated analytical reports are provided in Appendix B.

#### **4.0 Off-Site Spring**

The Monitoring and Mitigation Plan requires pre-operational and operational monitoring of Stone Spring. The monitoring includes productivity testing and water quality sampling in the late spring and late fall. Stone Spring was tested and sampled on October 21, 2009. Field data sheets for the productivity testing are provided in Appendix A. The analytical data is summarized in Table 2 and the associated analytical reports are provided in Appendix B. Productivity testing data is provided in Table 3.

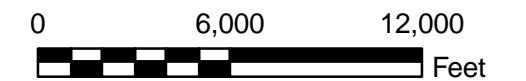
## **Figures**

**Figure 1      Monitored Production Wells, Off-Site Wells and Springs**



**LEGEND**

- Production Wells
- Off-Site Well
- Stone Spring
- Piñon Ridge Site Boundary
- Highway
- River



**MONITORED PRODUCTION WELLS,  
OFF-SITE WELLS AND SPRINGS**



**Energy Fuels  
Resources Corporation**

PROJECT	Piñon Ridge Mill	FIGURE	<b>1</b>
DRAWN	01/25/10		
DRAWN BY	ZTR		
CHECKED BY			

Fig1\_WellAndSpringLocations\_012510.mxd

## **Tables**

<b>Table 1</b>	<b>Production and Off-Site Well Water Levels</b>
<b>Table 2A</b>	<b>Analytical Data for Production Well Samples</b>
<b>Table 2B</b>	<b>Analytical Data for Off-Site Well and Spring Samples</b>
<b>Table 3</b>	<b>Off-Site Well and Spring Productivity Testing</b>

**TABLE 1  
PRODUCTION AND OFF-SITE WELL  
WATER LEVELS**

<b>Well ID</b>	<b>Date</b>	<b>Water level below TOC (ft)</b>
PW-1	8/2/08	280.70
	11/12/08	280.07
	2/16/09	280.13
	4/28/09	280.69
	7/27/09	280.21
	11/27/09	283.54
PW-2	8/2/08	331.22
	11/12/08	332.35
	2/16/09	331.98
	4/28/09	332.43
	7/27/09	332.13
	11/25/09	333.91
PW-3	8/2/08	256.65
	11/12/08	261.76
	2/16/09	263.13
	4/28/09	264.08
	7/27/09	263.93
	11/27/09	266.52
BLM Well	7/30/09	168.68
	10/22/09	168.69
Boren Well	8/2/09	28.06
	10/21/09	28.06

Notes:

TOC - Top of Casing

Hurdle and Davis Wells could not be measured due to well design

**TABLE 2A  
ANALYTICAL DATA FOR PRODUCTION WELL SAMPLES**

Analyte	PW-1						PW-2					
	8/12/08	8/13/08	11/14/08	2/24/09	4/30/09	7/30/09	8/8/08	8/11/08	11/13/08	2/24/09	4/29/09	7/31/09
<b>Dissolved Metals</b>												
Aluminum (mg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Arsenic (mg/L)	0.0169	0.0177	0.0009	0.0007	0.0009	0.0007	0.0034	0.0024	0.0007	<0.0005	0.0010	<0.0005
Barium (mg/L)	0.013	0.027	NA	NA	NA	NA	0.013	0.009	NA	NA	NA	NA
Boron (mg/L)	0.30	0.30	0.29	0.29	0.31	0.29	0.47	0.48	0.47	0.47	0.51	0.48
Cadmium (mg/L)	<0.0001	<0.0001	NA	NA	NA	NA	<0.0001	<0.0001	NA	NA	NA	NA
Calcium (mg/L)	69.1	66.7	68.9	68.4	71.4	66.6	91.4	90.3	88.4	82.5	91.6	83.5
Cesium (mg/L)	<0.0002	<0.0002	NA	NA	NA	NA	<0.0002	<0.0002	NA	NA	NA	NA
Chromium (mg/L)	<0.01	<0.01	NA	NA	NA	NA	<0.01	<0.01	NA	NA	NA	NA
Copper (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron (mg/L) <sup>(3)</sup>	0.02	0.02	2.88	3.42	4.04	2.39	0.12	0.12	4.15	21.20	16.30	24.30
Lead (mg/L)	0.0002	0.0001	<0.0001	<0.0001	<0.0001	<0.0001	0.0020	0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium (mg/L)	85.8	88.0	84.3	83.6	84.5	90.0	65.6	69.9	71.1	65.6	71.8	66.2
Manganese (mg/L) <sup>(3)</sup>	<0.005	<0.005	0.179	0.182	0.169	0.154	0.009	0.012	0.101	0.227	0.198	0.284
Mercury (mg/L)	<0.0002	<0.0002	NA	NA	NA	NA	<0.0002	<0.0002	NA	NA	NA	NA
Molybdenum (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	0.02	0.01	<0.01	<0.01	0.02	<0.01
Nickel (mg/L)	<0.01	0.01	NA	NA	NA	NA	<0.01	<0.01	NA	NA	NA	NA
Potassium (mg/L)	9.80	10.0	10.7	10.7	10.1	10.0	17.4	18.3	18.1	17.1	18.0	17.0
Selenium (mg/L)	0.0181	0.0168	0.0089	0.0078	0.0081	0.0079	0.0167	0.0171	0.0126	0.0024	0.0053	0.0008
Sodium (mg/L)	72.3	72.4	73.9	74.7	73.4	69.9	102	102	102	102	102	102
Uranium (mg/L)	0.1070	0.0963	0.0250	0.0198	0.0253	0.0295	0.0605	0.0638	0.0452	0.0078	0.0204	0.0033
Vanadium (mg/L)	0.035	0.041	<0.005	<0.005	<0.005	<0.005	0.010	0.007	<0.005	<0.005	<0.005	<0.005
Zinc (mg/L)	<0.01	<0.01	<0.01	<0.01	0.01	<0.01	0.06	0.02	<0.01	<0.01	<0.1	<0.01
<b>General Water Quality</b>												
Alkalinity as CaCO <sub>3</sub> (mg/L)	225	228	225	217	224	234	249	241	246	214	222	215
Carbonate as CaCO <sub>3</sub> (mg/L)	<2	5	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
Bicarbonate as CaCO <sub>3</sub> (mg/L)	225	223	225	217	224	234	249	241	246	214	222	215
Chloride (mg/L)	36	36	36	38	36	36	38	36	34	38	39	42
Fluoride (mg/L)	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.4	0.5	0.4	0.4
Ammonia as N (mg/L)	<0.05	31.2	0.3	0.16	0.19	0.09	<0.05	<0.3	0.05	<0.5	<0.05	<0.05
Nitrate/Nitrite as N(mg/L)	1.80	1.47	0.36	0.37	0.42	0.51	0.66	0.66	0.29	0.03	0.15	<0.02
Silica (mg/L)	19.2	19.4	10.2	11.1	11.5	12.9	16.7	15.2	12.8	11.2	11.8	9.7
Sulfate (mg/L)	380	360	380	380	410	380	430	430	440	430	450	440
Sulfide as S (mg/L)	<0.02	<0.02	<0.02	<0.2	<0.2	<0.2	<0.02	0.03	<0.02	0.11	<0.1	<0.2
Total Organic Carbon (mg/L)	10	9	NA	NA	NA	NA	8	11	NA	NA	NA	NA
Total Dissolved Solids (mg/L)	810	810	820	810	820	830	940	930	920	910	940	940
Total Suspended Solids (mg/L)	<5	<5	106	24	18	25	38	43	55	66	49	93
<b>Dissolved Radionuclides</b>												
Gross Alpha (pCi/L)	46	40	7.8	11	11	16	31	27	18	<3	21	2.4
Gross Beta (pCi/L)	26	23	15	11	13	16	29	25	21	18	21	8
Radium 226 (pCi/L)	<0.23	<0.25	<0.27	0.04	<0.25	0.11	<0.27	<0.16	<0.3	<0.19	<0.25	0.1
Radium 228 (pCi/L)	NA	NA	NA	NA	NA	0.96	NA	NA	NA	NA	NA	0.08

Notes:  
NA - Not Analyzed

**TABLE 2A  
ANALYTICAL DATA FOR PRODUCTION WELL SAMPLES**

Analyte	PW-3					
	8/6/08	8/7/08	11/13/08	3/3/09	4/30/09	7/31/09
<b>Dissolved Metals</b>						
Aluminum (mg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Arsenic (mg/L)	0.0135	0.0138	0.0118	0.0120	0.0118	0.0078
Barium (mg/L)	0.032	0.032	NA	NA	NA	NA
Boron (mg/L)	0.39	0.37	0.42	0.43	0.43	0.41
Cadmium (mg/L)	0.0001	<0.0001	NA	NA	NA	NA
Calcium (mg/L)	67.0	66.9	72.7	73.7	76.3	74.0
Cesium (mg/L)	<0.0002	<0.0002	NA	NA	NA	NA
Chromium (mg/L)	<0.01	<0.01	NA	NA	NA	NA
Copper (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Iron (mg/L) <sup>(3)</sup>	0.02	0.02	0.06	<0.02	0.04	0.25
Lead (mg/L)	0.0002	<0.0001	<0.0001	<0.0001	0.0010	<0.0001
Magnesium (mg/L)	80.6	82.4	70.0	71.7	72.7	72.2
Manganese (mg/L) <sup>(3)</sup>	<0.005	<0.005	0.008	<0.005	<0.005	0.021
Mercury (mg/L)	<0.0002	<0.0002	NA	NA	NA	NA
Molybdenum (mg/L)	<0.01	<0.01	0.01	<0.01	0.02	<0.01
Nickel (mg/L)	<0.01	<0.01	NA	NA	NA	NA
Potassium (mg/L)	12.7	12.3	14.3	14.3	14.3	14.6
Selenium (mg/L)	0.0208	0.0203	0.0215	0.0209	0.0196	0.0176
Sodium (mg/L)	100	98.9	102	101	101	102
Uranium (mg/L)	0.0826	0.0837	0.0797	0.0731	0.0771	0.0665
Vanadium (mg/L)	0.014	0.021	0.020	0.024	0.019	0.014
Zinc (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
<b>General Water Quality</b>						
Alkalinity as CaCO <sub>3</sub> (mg/L)	243	241	252	242	252	262
Carbonate as CaCO <sub>3</sub> (mg/L)	3	<2	<2	<2	<2	<2
Bicarbonate as CaCO <sub>3</sub> (mg/L)	240	241	252	242	252	262
Chloride (mg/L)	35	35	35	37	36	35
Fluoride (mg/L)	0.5	0.4	0.5	0.5	0.5	0.4
Ammonia as N (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate/Nitrite as N(mg/L)	0.98	1.04	1.14	0.77	0.68	0.67
Silica (mg/L)	18.7	18.9	15.2	15.6	15.3	15.6
Sulfate (mg/L)	380	380	380	390	390	380
Sulfide as S (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	<0.02
Total Organic Carbon (mg/L)	7	7	NA	NA	NA	NA
Total Dissolved Solids (mg/L)	830	840	860	850	860	870
Total Suspended Solids (mg/L)	<5	<5	10	<5	<5	14
<b>Dissolved Radionuclides</b>						
Gross Alpha (pCi/L)	40	35	32	33	23	25
Gross Beta (pCi/L)	27	26	29	19	20	27
Radium 226 (pCi/L)	0.26	<0.20	<0.35	0.23	0.48	0.25
Radium 228 (pCi/L)	NA	NA	NA	NA	NA	1.4

Notes:  
NA - Not Analyzed

**TABLE 2B  
ANALYTICAL DATA FOR OFF-SITE WELL AND SPRING SAMPLES**

Analyte	Hurdle Well	Davis Well	BLM Well	Boren Well	Stone Spring	
	4/22/08	7/29/09	7/30/09	7/31/09	8/2/09	10/21/09
<b>Dissolved Metals</b>						
Aluminum (mg/L)	<0.03	<0.03	<0.03	<0.03	<0.03	<0.03
Arsenic (mg/L)	0.0032	0.0056	0.0029	0.0112	0.0089	0.0083
Barium (mg/L)	0.015	0.032	0.017	0.059	0.028	0.027
Boron (mg/L)	0.15	0.83	0.22	0.39	0.37	0.33
Cadmium (mg/L)	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001	<0.0001
Calcium (mg/L)	82.6	40.0	112	64.1	52.8	51.4
Cesium (mg/L)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Chromium (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Copper (mg/L)	0.02	<0.01	<0.01	<0.01	<0.01	<0.01
Iron (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	0.04
Lead (mg/L)	0.0006	0.0002	<0.0001	<0.0001	<0.0001	<0.0001
Magnesium (mg/L)	85.2	45.2	91.1	112	58.5	56.3
Manganese (mg/L)	<0.005	<0.005	<0.005	<0.005	<0.005	<0.005
Mercury (mg/L)	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002	<0.0002
Molybdenum (mg/L)	0.01	0.03	<0.01	<0.01	0.02	0.02
Nickel (mg/L)	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Potassium (mg/L)	11.2	26.2	13.8	18.0	16.1	15.7
Selenium (mg/L)	0.0484	0.0474	0.0561	0.0181	0.0218	0.0223
Sodium (mg/L)	66.9	58.4	66.9	72.4	79.7	15.2
Uranium (mg/L)	0.0256	0.0352	0.0389	0.0416	0.0510	0.0527
Vanadium (mg/L)	<0.005	0.007	0.010	0.020	0.018	<0.005
Zinc (mg/L)	0.03	<0.01	<0.01	<0.01	<0.01	<0.01
<b>General Water Quality</b>						
Alkalinity as CaCO <sub>3</sub> (mg/L)	198	264	235	422	271	274
Carbonate as CaCO <sub>3</sub> (mg/L)	<2	5	<2	<2	<2	nd
Bicarbonate as CaCO <sub>3</sub> (mg/L)	198	258	235	422	271	274
Chloride (mg/L)	35	16	21	87	59	62
Fluoride (mg/L)	0.5	0.5	0.5	0.4	0.4	0.4
Ammonia as N (mg/L)	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Nitrate/Nitrite as N(mg/L)	15.4	18.2	17.2	7.58	1.71	2.22
Silica (mg/L)	16.0	12.0	15.4	16.1	14.3	15.2
Sulfate (mg/L)	310	90	440	220	200	210
Sulfide as S (mg/L)	<0.02	<0.02	<0.02	<0.02	<0.02	0.05
Total Organic Carbon (mg/L)	3	4	3	6	4	17
Total Dissolved Solids (mg/L)	810	530	1020	910	630	640
Total Suspended Solids (mg/L)	<5	<5	<5	<5	<5	<5
<b>Dissolved Radionuclides</b>						
Gross Alpha (pCi/L)	17	15	16	16	17	18
Gross Beta (pCi/L)	19	30	21	25	25	26
Radium 226 (pCi/L)	0.08	0.33	0.47	0.13	0.07	0.2
Radium 228 (pCi/L)	NA	1.6	0.98	2	0.54	1.6
Lead-210 (pCi/L)	NA	4.3	-0.73	2.5	0.84	3.5
Thorium-230 (pCi/L)	NA	-0.3	0.06	-0.43	-0.2	0.0

Notes:

NA - Not Analyzed

**TABLE 3  
OFF-SITE WELL AND SPRING PRODUCTIVITY TESTING**

Well/Spring ID	Date	Sampled (Yes/No)	Maintained Flow Rate (gpm)	Duration of Flow (min)	Field Parameters				
					Temperature (deg. C)	pH (s.u.)	Specific Conductance (µS/cm)	Dissolved Oxygen (mg/L)	Oxidation- Reduction Potential (mV)
Hurdle Well	4/22/09 <sup>(1)</sup>	Yes	~8	10	21	7.9	1240	6.90	108
	12/23/09 <sup>(2)</sup>	No	15.8	42	16.4	7.64	1217	7.23	NM
Davis Well	7/29/09 <sup>(1)</sup>	Yes	6.5	60	16.3	7.65	885	0.72	76
	11/4/09	No	8.6	93	16.2	7.48	832	2.07	114
BLM Well	7/30/09 <sup>(1)</sup>	Yes	7.5	20	17.2	7.36	1444	2.54	-68
	10/22/09	No	10.3	39	16.7	7.32	1343	2.60	-39
Boren Well	8/2/09 <sup>(1)</sup>	Yes	12.0	253	18.9	7.44	1441	4.82	152
	10/21/09	No	11.5	57	19.4	7.37	1441	3.80	139
Stone Spring	8/2/09 <sup>(1)</sup>	Yes	4.7	240	21.1	7.59	1093	4.52	146
	10/21/09	Yes	5.3	160	18.7	7.44	1082	3.92	136

**Notes:**

- (1) Sample events conducted prior to October 2009 were not performed as productivity tests and may not reflect full flow of the well/spring
- (2) Oxidation-reduction potential was out of order during 12/23/09 sampling event

deg. C - degrees Celsius  
gpm - gallons per minute  
NM - Not Measured  
min - minutes  
mg/L - milligrams per Liter  
mV - milliVolt  
s.u. - standard unit  
µS/cm - microSiemens per centimeter