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GROUNDWATER MONITORING SUMMARY REPORT

Piñon Ridge Project, Montrose County, Colorado

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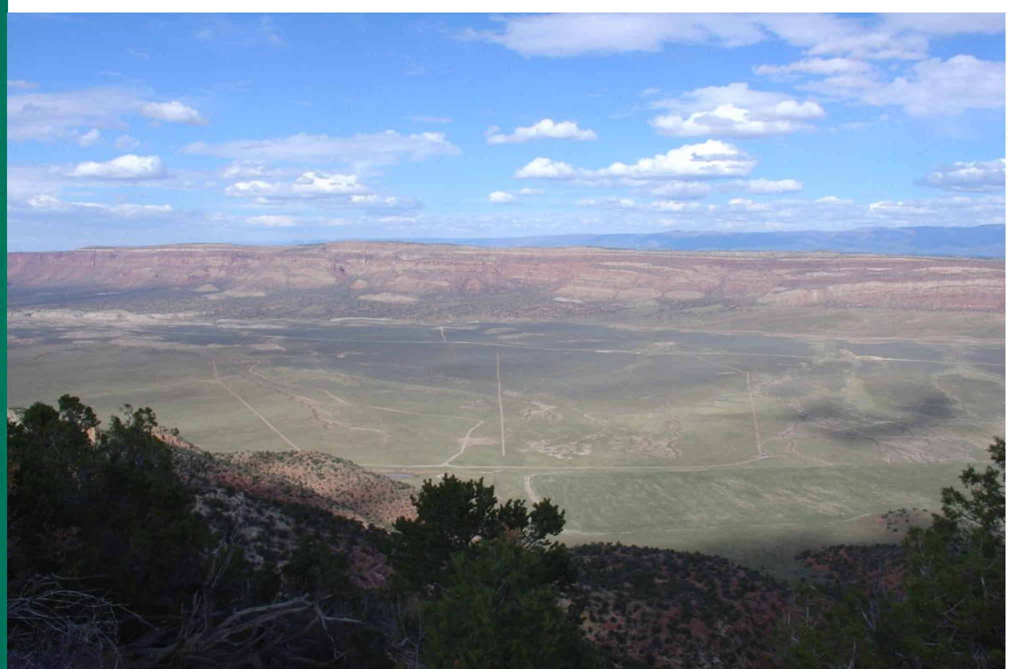

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EXECUTIVE SUMMARY

Energy Fuels Resources Corporation (EFRC) proposes to license, construct, and operate a conventional acid leach uranium and vanadium mill at the Piñon Ridge Mill site (Site) in western Montrose County, Colorado. As part of the licensing process, EFRC conducted eight quarters of groundwater monitoring at the Site, from the fourth quarter of 2007 through the third quarter of 2009. Groundwater monitoring provided data for hydrogeologic characterization of the site, as required for licensing through the Colorado Department of Public Health and Environment (CDPHE). This report summarizes the methods and results of groundwater quality monitoring at the Site.

Groundwater quality monitoring at the Site and within the vicinity of the Site has been conducted at 20 locations dispersed along a 10-mile stretch of Paradox Valley on the southwest side of the valley axis. Groundwater sampling locations included:

- Five monitoring wells (MW-5, MW-6, MW-7, MW-8B, and MW-9);
- Three groundwater production wells (PW-1, PW-2, PW-3);
- Seven exploratory holes (EX-5, EX-6, EX-7, EX-10, EX-12, EX-15, and EX-23);
- Four off-site wells, referred to by the last name of the well owner (Boren Well, BLM Well, Davis Well, and Hurdle Well); and
- One off-site spring.

Monitoring wells, production wells, and exploratory boreholes were drilled between September 2007 and July 2008. Monitoring wells were completed with polyvinyl chloride (PVC) casing, production wells were completed with steel casing, and exploratory boreholes were left as open holes with temporary casing for sampling and aquifer testing and were then abandoned. Monitoring and production wells were developed prior to sample collection, with the exception of monitoring wells MW-5 and MW-9, which could not be fully developed due to slow recharge. Wells MW-1 through MW-4 were not sampled or developed. Wells MW-1 and MW-4 were dry throughout the monitoring period and water in wells MW-2 and MW-3 was intermittent and limited when present, with a maximum recorded water column height of 3.4 feet in well MW-3.

Samples were collected using a variety of methods. Samples from most of the exploratory boreholes and initial samples collected from production wells were obtained during pumping tests at those locations. Samples from the monitoring wells have been collected using polyethylene bailers, stainless-steel submersible pumps, or stainless-steel bladder pumps, depending on the location and the sampling event. Since the fourth quarter of 2008, quarterly sampling methods have been consistent, with samples from wells MW-7, MW-8B, PW-1, PW-2, and PW-3 collected with low-flow bladder pumps, samples from MW-5 collected with a dedicated bailer, and samples from MW-6 collected with a dedicated stainless-steel pump. Throughout purging and prior to sample collection, field parameters of temperature, pH, specific conductivity, dissolved oxygen, and oxidation/reduction potential were measured.

Based on the results of the sampling, the groundwater at the site and in the vicinity of the site has no dominant cation and sulfate-bicarbonate anions. The majority of the samples, with the exception of samples from wells MW-6 and MW-8B and borehole EX-23, have near-neutral pH values, generally ranging between 7 and 8, total dissolved solids concentrations ranging from approximately 600 to 1000 mg/L, and alkalinity in the range of approximately 150 to 260 mg/L as $CaCO_3$.

Sulfate concentrations vary widely in the area, with a low concentration of 90 mg/L from the Davis well, and a high concentration of 2,720 mg/L from borehole EX-23. The three production wells and monitoring wells MW-5 and MW-7 had sulfate concentrations between 360 and 480 mg/L. Monitoring wells MW-6 and MW-8B, which are located near the northern extent of the on-site aquifer, had higher sulfate concentrations, ranging from 1,070 to 1,810 mg/L. In addition to sulfate, wells MW-6 and MW-8B also showed relatively higher concentrations of total dissolved solids (approximately 2,400 to 3,000 mg/L), more negative oxidation/reduction values, low dissolved oxygen, and detectable concentrations of sulfide and ammonia. These results, in addition to a sulfur smell noted at the wells, suggest reducing conditions at these locations.

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1.0 INTRODUCTION

Energy Fuels Resources Corporation (EFRC) proposes to license, construct, and operate a conventional acid leach uranium and vanadium mill at the Piñon Ridge Mill site (Site) in western Montrose County, Colorado. A general location map of the Site is presented on Figure 1. As part of the licensing process, EFRC conducted eight quarters of groundwater monitoring at the Site, from the fourth quarter of 2007 through the third quarter of 2009. Groundwater monitoring provided data for hydrogeologic characterization of the Site, as required for licensing through the Colorado Department of Public Health and Environment (CDPHE). The purpose of this report is to summarize methods and results of groundwater quality monitoring at the Site. A more broadly-scoped discussion of groundwater at the Site can be found in the *Hydrogeologic Report, Piñon Ridge Project, Montrose County, Colorado* (Golder 2009).

The Site is located in eastern Paradox Valley, in the Dolores River basin. The prominent geologic feature of Paradox Valley is a northwest-trending salt dome comprised of the Hermosa formation. The only known occurrences of groundwater within the surface drainage area (Figure 1) are close to the contact between the Chinle and Moenkopi formations and close to the contact between the Moenkopi and Hermosa formations. Groundwater samples discussed in this report are primarily from the Chinle formation, near the contact with the underlying Moenkopi formation. Three samples (from wells MW-6, MW-8B, and exploratory borehole EX-23) are from groundwater close to the contact between the Moenkopi formation and the underlying Hermosa formation. In the vicinity of the Site, the Chinle and Moenkopi formations are present near Davis Mesa on the southwest side of the valley, and are truncated by the salt dome near the axis of the valley. Additional details regarding the hydrostratigraphy can be found in the Hydrogeologic Report (Golder 2009).

This report is organized into five sections including this introduction section. Section 2 presents a summary of the groundwater quality monitoring locations, which includes drilling, well construction, and well development information. Section 3 summarizes the monitoring frequency and parameters sampled during each monitoring event. Section 4 describes the sampling methods used at each location, and Section 5 discusses the water quality results and includes a brief analysis of the quality assurance program. Much of the information in this report has been previously presented in the quarterly monitoring reports prepared after each quarterly monitoring event. Quarterly reports from the fourth quarter of 2007 through the third quarter of 2008 were prepared by Kleinfelder (Kleinfelder 2008b, 2008c, 2008d, 2008e) and quarterly reports from the fourth quarter of 2008 through the third quarter of 2009 were prepared by EFRC (EFRC 2009a, 2009b, 2009c, 2009d).

2.0 GROUNDWATER QUALITY MONITORING LOCATIONS

Groundwater quality monitoring at the Site and within the vicinity of the Site has been conducted at 20 locations dispersed along a 10-mile stretch of Paradox Valley on the southwest side of the valley axis. The sampling locations are presented on Figures 2 and 3. Groundwater sampling locations included:

- Five monitoring wells (MW-5, MW-6, MW-7, MW-8B, and MW-9);
- Three groundwater production wells (PW-1, PW-2, PW-3);
- Seven exploratory holes (EX-5, EX-6, EX-7, EX-10, EX-12, EX-15, and EX-23);
- Four off-site wells, referred to by the last name of the well owner (Boren Well, BLM Well, Davis Well, and Hurdle Well); and
- One off-site spring.

In addition to the above locations, quarterly monitoring has been conducted at four monitoring wells (MW-1, MW-2, MW-3, and MW-4). However, throughout the monitoring period, these wells have been dry or contained insufficient volumes of water for sample collection. The locations of these monitoring wells are shown on Figure 2.

2.1 Monitoring Wells

Nine monitoring wells have been installed at the Site: MW-1 through MW-9. A summary of their construction and development is presented in the sections below.

2.1.1 Monitoring Well Drilling and Construction

Boreholes for the wells were drilled using air rotary drilling methods. Wells MW-1 through MW-6 were drilled and completed in September or October of 2007. Well MW-7 was drilled in March 2008 and completed as a monitoring well in June 2008. Wells MW-8B and MW-9 were drilled and completed in July 2008. The wells were drilled to depths beyond their completion depths to provide additional geologic data for site characterization and, in some cases, such as at wells MW-1 through MW-5 and MW-7, to confirm the absence of groundwater at depths below the Chinle and Moenkopi formations. Borehole depths and well completion depths are presented in Table 1.

Monitoring wells were constructed with 4.5-inch outer diameter (O.D.) schedule 80 polyvinyl chloride (PVC) casing, with screened intervals consisting of 0.020-inch screen slots. The total completed depth and length of screen for each well is presented in Table 1. Coarse-grained silica sand was placed in the annular space around the screened interval and extended a minimum of approximately 3 feet above the screen. The coarse-grained sand was 10-20 grit size at wells MW-1 through MW-7 and 8-12 grit size at wells MW-8B and MW-9. Approximately 2 to 3 feet of finer-grained silica sand was placed in the annular space above the coarse-grained sand. The fine-grained sand was 20-40 grit size at wells MW-1 through MW-7 and 10-20 grit size at wells MW-8B and MW-9. A minimum of 2 feet of bentonite chips was placed in the annular space above the finer-grained sand. The remaining annular space was filled with bentonite chips, bentonite grout, or cement to the surface. Additional details of the depths of the sand, bentonite, and cement for each well are presented on the borehole logs in Appendix D of the Geologic Report (Kleinfelder 2009).

2.1.2 Monitoring Well Development

Following installation, monitoring wells MW-6 through MW-9 were developed to remove fine-grained sediments from the sand pack and formation surrounding the well. By removing the fines, groundwater can flow freely from the formation into the well and sample turbidity will likely be reduced.

Well development occurred through a combination of methods, including airlifting, bailing, and pumping with a submersible pump. Total volumes purged during development ranged from 122 gallons at MW-9 to 1,502 gallons at well MW-7. Table 2 summarizes the development methods and purged volumes from each well. As shown in the table, development at MW-9 has involved purging the well on six separate occasions, due to slow recovery in the well. On July 22, 2008, well MW-9 was purged dry with a submersible pump. A total of approximately 64 gallons were removed from the well; however, this purged volume is likely water used during drilling. The well was purged dry five additional times: on August 8, 2008; November 12, 2008; February 16, 2009; April 28, 2009, and July 27, 2009. On each of these five occasions, approximately 10 to 14 gallons were purged from the well using a bailer (see Table 2). After purging the well dry on August 5, 2008, the well required over one month to sufficiently recharge for sample collection on September 10, 2008. The well's very slow recharge suggests that the well is completed in an aquitard. As discussed in the Hydrogeologic Report (Golder 2009), the water present in the well is derived from interstitial moisture and is not representative of groundwater encountered in other boreholes and wells at the Site.

Wells MW-1 through MW-4 were not developed. Wells MW-1 and MW-4 were dry throughout the monitoring period and water in wells MW-2 and MW-3 was intermittent and limited when present, with a maximum recorded water column height of 3.4 feet at well MW-3. Due to the limited water available for groundwater sampling, development of these wells was both impractical and unnecessary.

Well MW-5 was not fully developed, due to slow recharge to the well. The well was purged dry on October 16, 2007 and had no measurable recharge by the following day. On January 30, 2008, the well was purged of approximately 4.5 gallons using a cluster of disposable bailers. The water level was drawn down 9.2 feet from the bailing. The well was allowed to recharge overnight and the water level had risen 1.2 feet by the following morning. Due to the slow recharge, no additional development was conducted on this well.

2.2 Production Wells

During July 2008, three production wells (PW-1, PW-2, and PW-3) were drilled and completed at the Site. The locations of the production wells are shown on Figure 2. A summary of well construction and development is provided in the sections below.

2.2.1 Production Well Drilling and Construction

The production wells were drilled using air rotary methods, with a borehole diameter of 12 inches from the ground surface to approximately 24 to 27 feet below ground surface, depending on the well. Below that point, the remainder of the borehole was drilled with a diameter of 8.75 inches. The wells were completed with 9-5/8 inch O.D. steel casing, extending from the ground surface to the bottom of the 12-inch diameter borehole (approximately 24 to 27 feet below ground surface). A 6-5/8 inch O.D. steel casing was placed inside the larger steel casing and extends from approximately 2 feet above ground surface to the total depth of the well. Screened intervals in each well consisted of a combination of 1/16-and 1/8-inch slot sizes. The screen lengths and well depths of each well are summarized in Table 1. The wells were left as open-boreholes (no filter pack), with packers installed to isolate productive zones of the aquifer. Each well was completed with a packer at 40 feet below ground surface. Wells PW-1 and PW-2 have a second packer located 40 feet and 20 feet above the top of their screened intervals, respectively. PW-3 was completed with two screened intervals, from 240 to 280 feet below ground surface and 320 to 370 feet below ground surface, with a second packer at the bottom of the upper screened interval at 280 feet below ground surface. Additional details of the well construction can be found in Appendix D of the Geologic Report (Kleinfelder 2009).

2.2.2 Production Well Development

Because the production wells are open-borehole wells, removal of fines from the sand/filter pack was not an issue. However, the wells were developed to remove fines and loose material from the bedrock near the well screen. Development was conducted the same day as well completion using airlifting methods. Each well was purged for four hours at rates ranging from 12 gallons per minute (gpm) at PW-2 to 45 gpm at PW-1. A summary of the production well development is presented in Table 2.

2.3 Exploratory Boreholes

A total of 18 exploratory boreholes were drilled on, and in the vicinity of, the Site from February to June 2008 for the purpose of delineating groundwater and geologic lithologies. Of these 18 boreholes, groundwater samples were collected from seven of the boreholes. Boreholes were selected for sampling based on their location and their potential to enhance the spatial coverage of groundwater characterization. The exploratory boreholes from which groundwater samples were collected are EX-5, EX-6, EX-7, EX-10, EX-12, EX-15, and EX-23. The locations of the sampled exploratory boreholes are shown on Figure 2. Samples from exploratory boreholes EX-5, EX-6, EX-7, EX-10, EX-12, and EX-15 were collected during the short-term (approximately 4-hour) pumping tests conducted to evaluate the water supply potential. At the time of pumping and sampling, the boreholes were equipped with temporary casing. At exploratory borehole EX-23, a grab sample was collected from the open borehole, as discussed in Section 4.2.3.

2.4 Off-Site Wells

Four off-site wells in the vicinity of the Site have been sampled to provide additional hydrogeologic characterization and baseline water quality conditions. These four wells are referred to by the name of the owner: BLM; Boren; Davis; and Hurdle. The wells are permitted for domestic and stock purposes. The locations of the four off-site wells are shown on Figure 3. Available information on the wells is presented in Table 3. All four wells are known to be screened in the Chinle formation.

2.5 Off-Site Spring

One sample has been collected from an off-site spring, Stone Spring, located approximately 4.8 miles northwest of the Site. Stone Spring provides water to two households on the Boren property through a PVC pipe. Field investigations conducted in June 2009 indicate that the spring originates from the Chinle formation. Flow data collected in the field resulted in an estimated sustainable flow rate from Stone Spring of 10 gpm.

3.0 MONITORING SCHEDULE

The frequency of monitoring each location and the suite of parameters analyzed from each sampling event are described in the sections below.

3.1 Monitoring Frequency

Monitoring wells and production wells have been monitored quarterly since their construction. Water quality sampling of the monitoring wells commenced in October 2007 and has continued for seven additional quarterly sampling events through July 2009. During the first and second sampling events (fourth quarter 2007 and first quarter 2008), monitoring wells MW-1 through MW-6 had been installed. By the second quarter 2008, monitoring well MW-7 had been installed, and by the third quarter 2008, monitoring wells MW-8B and MW-9 had been installed. Throughout the monitoring period, wells MW-1 through MW-4 have been dry or contained insufficient volumes of water for sample collection. Additionally, well MW-9 has only been sampled once due to slow recharge in the well. Table 4 provides a summary of the wells sampled during each quarterly monitoring event.

Sampling of the production wells began during the pumping tests conducted in August 2008. Two samples were collected from each production well during the pumping tests, one collected each day of the test. Following the pumping tests, the production wells were sampled four additional times during the quarterly monitoring events (November 2008 through July 2009).

Groundwater sampling at temporary exploratory boreholes occurred as one-time events. With the exception of EX-23, sampling at exploratory boreholes was conducted during the short-term pumping tests conducted in April and May of 2008. Additional details regarding these pumping tests can be found in Preliminary Water Supply Evaluation reports (Golder 2008a, 2008b). EX-23 was drilled in June 2008, and sampled in July 2008. All exploratory boreholes have been abandoned since the time of sampling, except EX-5, which was completed as monitoring well MW-7 in June 2008.

At the time of this report, groundwater sampling has occurred one time at the BLM, Boren, Davis, and Hurdle wells, and one time at Stone Spring. The Hurdle well was sampled in April 2008, and the BLM, Boren, and Davis wells were sampled in late July 2009. Stone spring was sampled in early August 2009.

3.2 Sampling Suite

During the initial sampling event at each location, samples were analyzed for the full suite of parameters, shown in Table 5, which includes dissolved metals, general water quality parameters, dissolved radionuclides, and field measurements. Typically, the suite of parameters was reduced following the first sampling event by removing barium, cadmium, cesium, chromium, nickel, mercury, and total organic carbon (TOC).

4.0 SAMPLING METHODS

Groundwater sampling procedures involved water-level measurement, purging of groundwater from the well, measurement of field parameters, sample collection, and shipping the samples to the analytical laboratory. In addition to groundwater samples, quality assurance samples were collected during the sample events and shipped to the analytical laboratory with the groundwater samples. Quality assurance sample types collected in the field included duplicates and equipment rinsate samples. The procedures for groundwater sampling and quality assurance sample collection are described in more detail below.

4.1 Water Level Measurement

Prior to purging and sampling, the water levels in the wells were measured using a decontaminated electronic water level indicator. Water levels were recorded on field forms, which are provided in Appendix A. Table 6 presents a summary of water level data from the eight quarters of monitoring.

4.2 Purging

The methods used for purging the wells and boreholes varied from location to location. The different purge methods are summarized in the sections below and in Table 7.

4.2.1 Monitoring Wells

Monitoring well MW-5 was purged using disposable polyethylene bailers in the initial sampling event. Following that event, purging was conducted using a dedicated polyethylene bailer. Because the well recharges slowly, three casing volumes were not removed prior to sample collection. Typically, the well has been purged to near dry conditions, allowed to recharge overnight and sampled the next day. During the second quarter 2008 sampling event, groundwater samples were collected the first and second days following purging due to insufficient volume for complete sample collection the first day after purging.

For each quarterly sampling event, well MW-6 was purged of three casing volumes prior to sample collection. The initial sampling event was conducted with a stainless steel submersible pump. During the following quarterly sampling event, the well was equipped with a dedicated pump (Grundfos, stainless steel, 5 gpm, 1.5 horsepower 5SQE 450). The dedicated pump has been used for purging during subsequent sampling events.

Wells MW-7 and MW-8B have been sampled using dedicated low-flow bladder pumps since the fourth quarter of 2008. Prior to installation of these dedicated pumps, MW-7 was sampled twice (second quarter and third quarter 2008) and MW-8B was sampled once (third quarter 2008) using a submersible pump. With the submersible pump, a minimum of three casing volumes were removed prior to sample collection. Low-flow sampling techniques involve purging water from the well at rates typically below 0.5 gpm, which will allow for collection of representative groundwater samples with minimal purging.

Purging at well MW-9 has been conducted with a dedicated polyethylene bailer. As discussed in Section 2.1.2, Monitoring Well Development, well MW-9 recharges very slowly. After purging the well dry in August 2008, the well required 33 days to sufficiently recharge for sample collection.

4.2.2 Production Wells

The initial two water quality samples from the production wells were collected during the August 2008 pumping tests. One sample was collected toward the beginning of the pumping test after purging had occurred (i.e., generally after an hour of pumping), and a second sample was collected towards the end of the 48-hour tests. Wells PW-1 and PW-3 were purged using a Goulds 65L10, stainless-steel submersible pump. A smaller pump was used at PW-2, a Goulds 33GS50.

During the subsequent quarterly events, additional samples were collected from production wells PW-1, PW-2, and PW-3 using a bladder pump and low-flow techniques in which the purge rates were less than 0.5 gpm.

4.2.3 Exploratory Boreholes

Exploratory boreholes EX-5, EX-6, EX-7, EX-10, EX-12, and EX-15 were sampled during the short-term pumping tests, after a minimum of one hour of pumping. At holes EX-5, EX-6, EX-7, and EX-10, pumping was conducted using a Goulds stainless-steel, 25-gpm pump. At holes EX-12 and EX-15, a larger pump was used, a Goulds stainless-steel, 33-gpm pump. Based on the duration of the pumping test prior to sampling and the pumping rates at each borehole, a minimum of 1,200 gallons were purged prior to sample collection. Field forms for samples obtained from these boreholes are presented in the Preliminary Water Supply Evaluation reports (Golder 2008a, 2008b).

Exploratory borehole EX-23 was not sampled during a pumping test. The hole was drilled dry and therefore did not merit additional testing for water-supply potential. Groundwater accumulated in the borehole following drilling and a grab sample (no purging) was obtained with a bailer on July 21, 2008, after the borehole had been blown dry on July 7, 2008.

4.2.4 Off-Site Wells and Spring

Groundwater samples collected from four off-site wells (BLM, Boren, Davis, and Hurdle wells) were collected using pumps that were already installed in the wells. Prior to sample collection, the BLM well was purged of 682 gallons at a rate of 7.5 gpm, the Boren well was purged of 3,051 gallons at a rate of 12 gpm, the Davis well was purged of 512 gallons at a rate of 6.5 gpm, and the Hurdle well was purged of 80 gallons at a rate of 8 gpm.

At Stone Spring, approximately 1,149 gallons were allowed to pass through the gravity-fed PVC pipe prior to collection of a sample. The 1.25-inch diameter PVC pipe extends approximately 1,000 feet from the spring to the well house, where the sample was collected.

4.3 Measurement of Field Parameters

Field parameters of temperature, pH, specific conductivity, dissolved oxygen (DO) and oxidation reduction potential (ORP) were measured during purging and prior to sample collection. When possible, a flow-through cell was connected to the pump discharge tubing to measure field parameters with minimal influence from atmospheric conditions. For wells with adequate recharge rates and sufficient volumes of water for sample collection, purging continued until field measurements stabilized. In accordance with the groundwater sampling work plan (Kleinfelder 2008a), field parameters were considered stable when three consecutive readings varied by less than 10%. For sampling with low-flow bladder pumps, the criteria for stabilization were tightened: specific conductivity and temperature varied by less than 3%; pH varied by +/- 0.01 pH units; DO varied by less than 10%; and ORP varied by +/- 10 mV.

4.4 Sample Collection and Shipment to Laboratory

Samples were collected from the wells using the same methods for purging the well. Samples were collected in laboratory-prepared bottles. For samples collected from the BLM, Boren, and Davis wells, sampling and filtration were conducted directly from the well spigots using an adapter. Samples from the Hurdle well were collected in clean gallon jugs from an outdoor faucet via a garden hose. Laboratory-prepared bottles were then filled from the jugs. Samples requiring filtration were filtered in the field using a 0.45 micron disposable filter. When possible, filters were connected directly to the discharge tubing. If filtering directly from the discharge line was not possible, a subsample was collected and passed through a filter using a peristaltic pump.

Samples were labeled and placed in ice-filled coolers. Appropriate Chain-of-Custody procedures were followed and the sample coolers were shipped, typically the next day, to the analytical laboratory. Following the first sampling event, the samples collected from well MW-6 were shipped overnight to Energy Labs, Inc. in Casper, Wyoming. For the remaining quarterly sampling events, samples were shipped overnight to ACZ Laboratories, Inc. in Steamboat Springs, Colorado.

4.5 Quality Assurance Sample Collection

Quality assurance samples collected in the field consisted of duplicate samples and equipment rinsates. Equipment rinsates involved rinsing the sampling equipment with de-ionized water, either by pouring the water over or through the pump, tubing, and/or bailer, and collecting the rinsate water in sample bottles. Equipment rinsate samples were collected during the fourth quarter 2007 and third quarter 2008 sampling events. The equipment rinsate sample collected during the third quarter 2008 was analyzed for dissolved metals and the equipment rinsate sample collected during the fourth quarter 2007 was analyzed for dissolved radionuclides. Eleven duplicate samples have been collected and were analyzed for dissolved metals and radionuclides. The results of the quality assurance samples are discussed in Section 5.1.

5.0 RESULTS AND DISCUSSION

Results of the water quality sampling and quality assurance sampling are presented in Tables 8 through 11. Monitoring well sample data are presented in Table 8, production well sample data are presented in Table 9, exploratory borehole and off-site wells and spring data are presented in Table 10, and quality assurance sample data are presented in Table 11. Results are discussed in the sections below.

5.1 QA/QC Results and Discussion

In addition to the quality assurance samples collected in the field, the laboratory also conducted their own internal quality assurance/quality control (QA/QC) program. Their program consisted of analysis of preparation blanks, duplicates, laboratory control samples, spikes, internal calibration blanks, and additional laboratory analyses. Laboratory QA/QC results were generally within acceptable ranges. Where control limits were exceeded, the laboratory provided narratives in the laboratory reports to indicate or resolve discrepancies. Laboratory reports, which were included in the quarterly monitoring reports previously submitted to CDPHE (Kleinfelder 2008b, 2008c, 2008d, 2008e; EFRC 2009a, 2009b, 2009c, 2009d), are provided in Appendices B through I, respectively.

Laboratory analyses were conducted within hold times, except for the following analyses:

- Sulfide and mercury analyses for the MW-5 sample collected on January 31, 2008;
- Sulfate and sulfide analyses for the MW-6 sample collected on January 29, 2008;
- Total suspended solids (TSS) analysis for the EX-7 sample collected on April 24, 2008;
- Total dissolved solids (TDS) analysis for the Hurdle Well sample collected on April 22, 2008;
- TDS analysis for the EX-5 sample collected on April 22, 2008;
- Sulfide analysis for the PW-1 sample collected on August 13, 2008; and
- Total suspended solids analysis for MW-5 and PW-1 samples collected on April 30, 2009.

Sample anion-cation charge balances were within acceptable ranges, except for the MW-6 sample from April 2008 (charge balance of 7.8%), PW-1 sample from August 2008 (charge balance of 10.2%), Hurdle Well sample from April 2008 (charge balance of 11.2%), and Davis Well sample from July 2009 (charge balance of 7.9%).

Results of the equipment rinsate sampling in July 2008 suggest that contamination of field equipment was not an issue during the sampling event, with undetectable concentrations of most parameters. For parameters that were detected in the equipment rinsate sample, concentrations are low relative to the concentrations reported for other groundwater samples. Results of the equipment rinsate sampling in October 2007 sampling also suggest that field equipment contamination was not an issue during the sampling event; however, the rinsate sample was only analyzed for dissolved radionuclides.

Dissolved metal results for duplicate samples typically compared favorably to the parent sample. Relative percent differences (RPDs) between the duplicate and parent samples are generally low, with the following exceptions:

- Results for samples collected from MW-5 on February 19, 2009, particularly for aluminum, iron, lead, and manganese;
- Manganese results for samples collected from MW-9 on September 10, 2008;
- Molybdenum results for samples collected from MW-6 on April 29, 2008 and from MW-8B on July 21, 2008; and
- Selenium results for samples from MW-8B on July 29, 2009.

Higher differences between parent and duplicate samples are reasonable for well MW-5 and MW-9 because these wells require more time for sample collection due to their slow recharge. Differences between duplicate and parent samples for dissolved radionuclide results were generally higher than the differences observed for the dissolved metals. RPDs for the dissolved radionuclides were frequently above 25% between the duplicate and parent samples.

Based on the results of the field and laboratory quality control programs, Golder considers the dataset suitable and representative for the purposes of site characterization. If the data are to be used for other purposes, such as to calculate concentration limits for compliance purposes, a formal validation of the laboratory results is recommended.

5.2 Discussion of Water Quality

Water quality, in terms of major-ion chemistry, is similar for most samples collected at the Site and in the vicinity of the Site. Generally, the water has no dominant cation and sulfate-bicarbonate anions. The majority of the samples have near-neutral pH values, generally ranging between 7 and 8, total dissolved solids concentrations ranging from approximately 600 to 1000 mg/L, and alkalinity in the range of approximately 150 to 260 mg/L as $CaCO_3$. As discussed in more detail below, water quality of samples from wells MW-6 and MW-8B and borehole EX-23 differ from the majority of the groundwater samples.

Figure 4 presents a Piper diagram for a representative sample from each sampled location. Results are included in the figure for the sample collected from well MW-9; however, as previously noted, the water present in well MW-9 is derived from interstitial moisture and is not representative of groundwater encountered in other boreholes and wells at the Site. As shown in the figure, the largest differences in major ion chemistry are due to differences in sulfate concentrations. Sulfate concentrations range from a low concentration of 90 mg/L at the Davis well, to a high concentration of 2,720 mg/L at borehole EX-23. Additionally, samples from wells MW-6 and MW-8B have higher sulfate concentrations than samples from the production wells and monitoring wells MW-5 and MW-7. Monitoring wells MW-6 and MW-8B, which are located near the northern extent of the on-site aquifer, had sulfate concentrations ranging from 1,070 to 1,810 mg/L, compared to sulfate concentrations between 360 and 480 mg/L at the production wells and monitoring wells MW-5 and MW-7. As discussed in the Hydrogeologic Report (Golder 2009), differences in sulfate concentrations, and water chemistry in general, are related to contact with the Hermosa formation.

In addition to differences in major-ion chemistry discussed above, several noteworthy observations were made based on general water chemistry parameters, dissolved metal concentrations, and field measurements. These observations are summarized below:

- Groundwater from wells MW-6 and MW-8B has a sulfur smell, which suggests reducing conditions. The field observations are supported by water quality data, which indicate negative ORP values, low DO, and detectable concentrations of sulfide and ammonia at these two wells and borehole EX-23.
- TDS concentrations at wells MW-6 and MW-8B are approximately two to three times higher than the TDS concentrations at the other wells and boreholes, except borehole EX-23. TDS concentrations average 2,504 mg/L at MW-6 and 2,790 mg/L at MW-8B. At borehole EX-23, the TDS concentration from July 2008 is 4,290 mg/L.
- At production wells PW-1 and PW-2, dissolved iron and manganese concentrations have been consistently above their water supply standards of 0.3 mg/L and 0.05 mg/L, respectively, beginning in the fourth quarter (November) 2008 sampling event. Iron concentrations at wells PW-1 and PW-2 from November 2008 through third quarter (July) 2009 range from 2.4 mg/L at PW-1 (during July 2009) to 24 mg/L at PW-2 (during July 2009). Manganese concentrations at wells PW-1 and PW-2 from November 2008 through July 2009 range from 0.10 mg/L at PW-2 (during November 2008) to 0.28 mg/L at PW-2 (during July 2009). The relatively high iron and manganese concentrations are likely related to the steel casing used for construction of the production wells. Concentrations were not as high prior to November 2008, likely due to the large purge volumes from the August 2008 sampling event, which was conducted during the pumping tests.
- The available data suggest that water quality is consistent through time during the period of record. For example, concentrations of chloride, generally considered a conservative constituent, vary in MW-6 from 142 to 170 mg/L over eight quarters of sampling with no apparent trends.

6.0 USE OF THIS REPORT

This report has been prepared exclusively for the use of Energy Fuels Resources Corporation (EFRC) for specific application to the Piñon Ridge Project. The analyses reported herein were performed in accordance with accepted practices. No third-party engineer or consultant shall be entitled to rely on any of the information, conclusions, or opinions contained in this report without the written approval of Golder and EFRC.

The site investigation reported herein was performed in general accordance with generally accepted Standard of Care practices for this level of investigation. It should be noted that special risks occur whenever engineering or related disciplines are applied to identify subsurface conditions. Even a comprehensive sampling and testing program implemented in accordance with a professional Standard of Care may fail to detect certain subsurface conditions. As a result, variability in subsurface conditions should be anticipated and it is recommended that a contingency for unanticipated conditions be included in budgets and schedules.

Golder sincerely appreciates the opportunity to support EFRC on the Piñon Ridge Project. Please contact the undersigned with any questions or comments on the information contained in this report.

Respectfully submitted,

GOLDER ASSOCIATES INC.

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TABLES

FIGURES

APPENDIX A

FIELD SAMPLING SHEETS

APPENDIX B

FOURTH QUARTER 2007 LABORATORY RESULTS

APPENDIX C

FIRST QUARTER 2008 LABORATORY RESULTS

APPENDIX D

SECOND QUARTER 2008 LABORATORY RESULTS

APPENDIX E

THIRD QUARTER 2008 LABORATORY RESULTS

APPENDIX F

FOURTH QUARTER 2008 LABORATORY RESULTS

APPENDIX G

FIRST QUARTER 2009 LABORATORY RESULTS

APPENDIX H

SECOND QUARTER 2009 LABORATORY RESULTS

APPENDIX I

THIRD QUARTER 2009 LABORATORY RESULTS