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January 23, 2018

Department of Environmental Quality – Land Quality Division  
District III Supervisor (via email)  
2100 West 5<sup>th</sup> Street  
Sheridan, WY 82801

Attn: Document Control Desk  
Director (via electronic submission)  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Attn: Deputy Director (via email)  
Division of Decommissioning, Uranium Recovery and Waste Programs  
U.S. Nuclear Regulatory Commission  
11545 Rockville Pike, Mail Stop T-8F5  
Rockville, MD 20852-2738

Re: Uranerz Energy Corporation Nichols Ranch ISR Project, WDEQ-LQD Permit to Mine No. 778 and NRC SUA-1597 Quarterly Report

Dear Mr. Rogaczewski and Mr. Dapas,

Pursuant to the Permit to Mine No. 778 and SUA-1597 License Condition 11.1, quarterly reporting is required. A comparison of quarterly reporting requirements between Wyoming Department of Environmental Quality – Land Quality Division (WDEQ-LQD) permit and the NRC License SUA-1597 shows similar reporting requirements. Uranerz has therefore combined the WDEQ-LQD quarterly report with the NRC License SUA-1597 quarterly report. It is worth noting that the report format more closely follows the WDEQ-LQD Chapter 11 Section 15 requirement list.

In accordance with correspondences with the WDEQ-LQD District III Supervisor and with NRC project Manager mid-January 2018, it was approved to submit, to both agencies, future reporting via electronic submission.

If you have any questions regarding the provided information, please contact me at 307-232-6680 or by email at [bbonifas@energyfuels.com](mailto:bbonifas@energyfuels.com).

Sincerely,

Bernard Bonifas  
Mine Manager  
Uranerz Energy Corporation (an Energy Fuels company)  
BB/bv



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Attachments

4th Quarter 2017 Report

cc: BJ Kristiansen, Assistant Supervisor, District III, WDEQ-LQD (via email)  
Ron Linton, Project Manager, NRC (via email)  
Bernadette Baca, Health Physicist, NRC (via email)



# **4<sup>th</sup> Quarter 2017 Report**

## **Nichols Ranch ISR Project**

### **WDEQ-LQD Permit to Mine No. 778**

#### **And**

### **NRC License SUA-1597**



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## 1.0 Introduction

Uranerz Energy Corporation (Uranerz) received its Wyoming Department of Environmental Quality – Land Quality Division (WDEQ-LQD) Permit to Mine No. 778 on December 29, 2010. The permit was amended to add the Jane Dough Unit, approved March 3, 2017. On July 19, 2011 Source Material License SUA-1597 was issued to Uranerz by the Nuclear Regulatory Commission (NRC). The license was amended to add the Jane Dough Unit, approved March 22, 2017. Quarterly reports are required by WDEQ-LQD Non-Coal Rules and Regulations Chapter 11, Section 15 and NRC License SUA-1597 Condition 11.1.

The following highlights Uranerz activities during the quarter:

### Nichols Ranch and Jane Dough Units

- Production continues in Production Area #1 (PA#1) in Header Houses 1 through 8.
- Production continues in Production Area #2 (PA#2) in Header House 9.
- No activities took place at the Jane Dough Unit during the quarter.

### Hank Unit

- No activities took place at the Hank Unit during the quarter.

## 2.0 Monitoring

### 2.1 Injection Fluid Characteristics

A typical lixiviant solution is provided in Table 3c of the WDEQ-LQD Mine Plan with representative concentration ranges that could be found in the lixiviant. If changes to the ranges occur, Uranerz has committed to updating the table during completion of the annual report. Additionally, WDEQ-LQD Chapter 11, Section 14(a)(ii)(A) Non Coal Rules and Regulations requires that the nature of the injection fluids be monitored at least monthly to yield representative data on the characteristics of the fluid and WDEQ-LQD Chapter 11, Section 15(b)(i) requires that it is reported in the Quarterly Reports.

Table 1, below, depicts the injection fluid composition for October, November and December 2017 based on a grab sample collected each month and submitted to a third-party laboratory for analysis. A comparison of the monthly composition results to values in Table 3c of the Mine Plan show that all analytical results were within or below the values presented in Table 3c.

<b>Table 1: Injection Fluid Composition</b>				
<b>Parameter</b>	<b>Value Range</b>	<b>October 2017</b>	<b>November 2017</b>	<b>December 2017</b>
Calcium (mg/L)	20-500	201	218	213
Chloride (mg/L)	200-5000	86	87	85
Carbonate as CO <sub>3</sub> (mg/L)	1-2500	ND	ND	ND
Bicarbonate as HCO <sub>3</sub> (mg/L)	400-5000	1070	1100	1100
Potassium (mg/L)	15-300	12	12	13
Magnesium (mg/L)	3-100	22	23	24
Manganese (mg/L)	0.01-50	0.40	0.44	0.44
Sodium (mg/L)	400-6000	619	666	615
Sulfate (mg/L)	400-5000	923	978	986
TDS @ 180 (mg/L)	1500-12000	2150	2230	2320
U <sub>3</sub> O <sub>8</sub> (mg/L)	0.01-500	0.35	0.28	0.79
V <sub>2</sub> O <sub>5</sub> (mg/L)	0.01-100	0.40	0.47	0.45

## 2.2 Injection Pressure and Flow Volumes (Class III Wells)

According to WDEQ-LQD Chapter 11 Section 14(a)(ii)(B) the injection pressure and either flow rate or volume is to be monitored at least weekly. Chapter 11, Section 14(a)(ii)(C) allows monitoring to be performed at the header house manifold. Uranerz monitors injection pressure and flow rate by header house. At this time, operations are occurring in PA#1, Header Houses 1 through 8 and PA#2 Header House 9.

Table 2, below, is a tabulation of the weekly maximum injection pressures for the header houses in PA#1 and PA#2. The Uranerz system continuously records injection pressure via electronic instrumentation at the header houses. Per the NRC Source Material License SUA-1597, License Condition 11.1(C), the readings are kept on site and are available for inspection upon request. The maximum pressure for Nichols Ranch is 150 psi. As shown in Table 2 the 150 psi maximum injection pressure was exceeded in Header House 3. On November 14, 2017, Header House 3 injection manifold experienced an exceedance event of 160 psi lasting two seconds. On November 16, 2017, Header House 3 injection manifold experienced an exceedance event of 159 psi lasting two seconds. On November 17, 2017 Header House 3 injection manifold experienced two exceedance events. The first exceedance event was 159 psi lasting three seconds. The second exceedance event occurred minutes later and reached 162 psi for two seconds. In each of the four exceedance events that occurred that week, the header house programming functioned correctly and began the booster pump shut-down process immediately when the 145 psi maximum set-point was reached. Because the shutdown procedure is not an instantaneous process, the pressure continued to build for one to two



seconds causing the momentary pressure spikes. These pressure spikes did not exceed the operational ratings of the affected piping nor did they exceed the formation fracture pressure.

**Table 2: Weekly Maximum Injection Pressure**

Week Ending	Header House 1	Header House 2	Header House 3	Header House 4	Header House 5	Header House 6	Header House 7	Header House 8	Header House 9
October 08, 2017	108	72	56	127	131	137	128	121	113
October 15, 2017	94	98	87	134	112	131	132	112	116
October 22, 2017	118	48	51	133	110	135	132	115	122
October 29, 2017	116	51	52	124	107	132	122	112	130
November 05, 2017	112	60	60	128	105	130	121	112	113
November 12, 2017	122	69	136	124	109	130	126	116	109
November 19, 2017	100	59	*162	143	122	140	127	115	130
November 26, 2017	108	47	150	129	87	132	119	112	131
December 03, 2017	115	52	138	124	98	125	113	114	125
December 10, 2017	116	51	149	130	97	136	116	114	121
December 17, 2017	84	45	106	111	79	135	104	106	117
December 24, 2017	97	52	100	117	86	127	107	109	116
December 31, 2017	93	47	102	122	94	126	113	111	116
* Value exceeds maximum injection pressure									

Flow rates are also continuously recorded via electronic instrumentation at the header houses. Table 3, below, is a tabulation of the recovery (aka production) and injection flow volumes for the quarter in PA#1 and PA#2.

**Table 3: Wellfield Weekly Flow Volumes**

Week Ending	Recovery (gallons)	Injection (gallons)
October 08, 2017	21,533,400	21,385,665
October 15, 2017	20,994,300	20,856,964
October 22, 2017	22,650,000	22,496,556
October 29, 2017	22,686,700	22,545,597
November 05, 2017	22,514,800	22,355,431
November 12, 2017	22,465,900	22,305,303
November 19, 2017	22,824,100	22,664,384
November 26, 2017	22,880,500	22,728,506
December 03, 2017	22,886,800	22,727,607
December 10, 2017	22,640,250	22,482,806
December 17, 2017	22,627,900	22,463,972
December 24, 2017	22,772,700	22,609,726
December 31, 2017	23,025,100	22,861,103
<b>Totals</b>	<b>292,502,450</b>	<b>290,483,620</b>



## 2.3 Monitor Well Sampling Results

Monitor well sampling is performed during operations to detect and correct conditions leading to a potential excursion. Monitor well sampling and analysis is performed according to the WDEQ-LQD Mine Plan, Section 3.14.7.8.10 and the NRC License Condition 11.5. The monitor wells in producing wellfields are sampled twice a month, not less than 10 days between each sampling event, for water levels and the Upper Control Limit (UCL) parameters: chloride, conductivity, and alkalinity. All perimeter (ring), overlying and underlying monitor wells were sampled as required.

### 2.3.1 Production Area #1

Monitor well sampling in PA#1 continued during the quarter. Sampling results for each well in PA#1 are enclosed in Appendix A. Monitor ring wells (MRN) located around the perimeter of PA#1 show fluctuations in water levels as would be expected in an active production area. These fluctuations are attributed to the balancing of water flow throughout the production area in order to maintain the required inward hydraulic gradient according to NRC License 1597 Condition 10.9 and the WDEQ-LQD Mine Plan Section 3.4.

The overlying monitor well MON-11 continued to show high conductivity values during the 4<sup>th</sup> quarter, 2017. Uranerz believes this to be a naturally occurring anomaly and continues to closely observe the conductivity levels through routine monitoring of the well.

MON-12 has shown a slight upward trend in conductivity since 2014 with conductivity values exceeding the UCL for the first time in the 3<sup>rd</sup> quarter, 2017, as previously reported. Conductivity values for the 4<sup>th</sup> quarter began above the UCL but have shown a steady decline. Because chloride and total alkalinity values show no corresponding trend, Uranerz believes this to be a naturally occurring anomaly similar to MON-11. Uranerz continues to closely observe the conductivity levels through routine monitoring of the well.

As previously reported, MRN-29 exhibited an upward trend in chloride and conductivity during the 3<sup>rd</sup> quarter 2017. Though all parameters were well below the UCL, Uranerz proactively took steps such as additional wellfield production balancing in the area to address this potential concern before it became an issue. As a result of Uranerz efforts, conductivity values fell to near baseline levels during the 4<sup>th</sup> quarter, 2017. Uranerz will continue to closely observe the conductivity and alkalinity levels through routine monitoring of the well.

### 2.3.2 Production Area #2

Monitor well sampling of PA#2, Header House 9, continued during the quarter as illustrated in Figure 3-19 of the Mine Plan (LQD Change No. 20). Phase 1 monitor ring wells (MRN) located around the operational area of PA#2 show fluctuations in water levels as would be expected in an active production area. These fluctuations are attributed to the balancing of water flow throughout





the production area in order to maintain the required inward hydraulic gradient according to NRC License 1597 Condition 10.9 and the WDEQ-LQD Mine Plan Section 3.4. Sampling results for each well currently monitored in PA#2 are enclosed in Appendix B.

### 2.3.3 Excursion Status

Based on the monitor well water quality reports and analysis, there were no excursions which required reporting during the quarter.

## 3.0 Mechanical Integrity Testing

The WDEQ-LQD Permit to Mine No. 778 requires mechanical integrity test (MIT) results for wells to be reported quarterly. NRC License Condition 11.1B requires a summary of MIT results semi-annually; however, the MIT information remains the same regardless of the reporting timeframe. Uranerz will therefore report the results quarterly to both agencies. The MIT procedure is followed pursuant to Section 3.6 of WDEQ-LQD Mine Plan, Volume XIV and NRC License Application Volume I, Section 3.4. Results of the MITs are maintained on site and include the signature of the individual responsible for conducting the test.

One (1) well was tested for mechanical integrity during the report period and the MIT results are attached in Appendix C. Wells tested with a pressure at or below 10% in a 10-minute timeframe have passed the MIT.

The format of column designations in Appendix C was established based on WDEQ-LQD criteria. The first column is a simple line designation for ease in review.

## 4.0 Defective Wells, Well Repair and Plugging

Per Chapter 11, Section 8(c), a well lacking mechanical integrity must be plugged if it cannot be repaired. Chapter 11, Section 15(b)(iii) requires the status of corrective action on defective wells be reported quarterly. As reported in the 3<sup>rd</sup> quarter 2017 report, two Class III wells, N1B-038 and N1B-082, failed MIT. Both wells were plugged in the 4<sup>th</sup> quarter 2017 according to a well abandonment procedure modification approved by WDEQ on October 3, 2017. The results are attached in Appendix D.

Although the plugging and abandonment of these two wells didn't occur within the 2017 annual reporting period, these activities were included in the 2017 Annual Report at the request of WDEQ staff in Sheridan.



## 5.0 Certification

Certification is required by WDEQ-LQD Non-Coal Rules and Regulations Chapter 11, Section 2(g). I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations.

---

Bernard Bonifas  
Mine Manager  
Uranerz Energy Corporation (an Energy Fuels Company)

## **Appendix A**



## Appendix A

Production Area 1 Well ID MON-01		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

### Date

10/11/2017	6	565	143	8.5	4,641.2
10/24/2017	7	549	110	8.3	4,641.6
11/09/2017	7	557	118	8.4	4,641.9
11/22/2017	7	550	119	8.5	4,641.5
12/07/2017	8	537	117	8.5	4,643.2
12/20/2017	7	542	117	8.5	4,642.7

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-02		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/11/2017	6	568	122	8.6	4,644.9
10/25/2017	7	550	113	8.6	4,645.5
11/09/2017	7	558	117	8.5	4,646.0
11/22/2017	7	550	118	8.6	4,645.1
12/07/2017	7	538	116	8.5	4,646.7
12/20/2017	6	542	116	8.6	4,646.3

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-03		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/11/2017	6	570	123	8.4	4,648.2
10/26/2017	6	551	113	8.5	4,648.6
11/09/2017	7	554	118	8.4	4,649.6
11/27/2017	6	550	117	8.5	4,648.7
12/11/2017	7	541	118	8.6	4,650.8
12/27/2017	7	526	116	8.5	4,649.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-04		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/10/2017	5	517	*185	8.5	4,652.9
10/30/2017	6	524	130	8.8	4,652.7
11/09/2017	7	537	121	8.6	4,653.6
11/27/2017	7	529	117	8.6	4,653.6
12/11/2017	7	523	117	8.6	4,654.5
12/27/2017	7	508	115	8.6	4,653.6

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-05		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/11/2017	6	591	122	8.8	4,653.0
10/30/2017	7	574	116	8.9	4,653.8
11/13/2017	7	573	118	8.9	4,654.6
11/27/2017	7	574	117	8.9	4,654.7
12/11/2017	7	566	117	8.8	4,655.3
12/27/2017	7	547	116	8.9	4,654.7

\*Value Exceeds Upper Control Limit



Production Area 1 Well ID MON-06		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	6	582	123	8.6	4,655.4
10/30/2017	6	568	114	8.6	4,655.4
11/13/2017	7	566	119	8.5	4,656.2
11/27/2017	7	568	116	8.6	4,656.3
12/11/2017	7	558	116	8.5	4,657.1
12/28/2017	7	541	116	8.6	4,656.2

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-07		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/11/2017	6	576	*174	8.4	4,653.6
10/31/2017	6	567	126	8.6	4,653.2
11/13/2017	6	569	122	8.6	4,654.5
11/28/2017	7	562	119	8.5	4,654.3
12/11/2017	7	568	118	8.4	4,655.3
12/27/2017	7	546	115	8.6	4,654.6

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-08		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	6	590	122	8.5	4,658.9
10/31/2017	7	574	117	8.5	4,658.9
11/13/2017	6	572	117	8.5	4,659.7
11/28/2017	7	566	115	8.5	4,660.1
12/12/2017	7	545	115	8.4	4,660.5
12/28/2017	7	546	115	8.5	4,659.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-09		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	6	583	*146	8.4	4,660.6
10/31/2017	7	571	119	8.4	4,660.5
11/13/2017	6	570	119	8.5	4,661.0
11/28/2017	7	562	119	8.5	4,661.1
12/12/2017	6	539	117	8.3	4,661.4
12/28/2017	7	545	116	8.5	4,661.1

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-10		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4thQTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	6	595	120	8.4	4,662.8
10/31/2017	7	581	114	8.5	4,662.9
11/13/2017	6	580	115	8.4	4,663.3
11/28/2017	7	572	113	8.4	4,663.3
12/12/2017	6	548	113	8.3	4,663.8
12/28/2017	7	552	114	8.6	4,663.3

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-11		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	5	*918	109	8.3	4,662.6
10/31/2017	6	*900	104	8.2	4,663.9
11/14/2017	6	*894	104	8.2	4,664.2
11/28/2017	6	*878	104	8.2	4,664.3
12/12/2017	6	*844	103	8.2	4,664.9
12/28/2017	6	*842	104	8.2	4,664.5

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-12		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	6	*744	115	8.2	4,664.4
10/31/2017	6	728	110	8.3	4,664.5
11/14/2017	7	727	111	8.3	4,664.6
11/27/2017	6	721	111	8.3	4,664.6
12/12/2017	6	686	111	8.2	4,665.1
12/28/2017	7	686	111	8.3	4,664.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MON-13		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4thQTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	733	145		

Date

10/12/2017	6	615	120	8.3	4,664.8
10/26/2017	7	604	112	8.4	4,664.9
11/14/2017	6	603	115	8.4	4,665.2
11/28/2017	6	594	115	8.4	4,664.9
12/11/2017	7	589	115	8.3	4,659.9
12/28/2017	7	574	116	8.5	4,657.2

\*Value Exceeds Upper Control Limit



Production Area 1 Well ID MRN-01		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	5	523	117	8.6	4,596.2
10/16/2017	6	573	124	8.6	4,609.6
11/01/2017	7	557	118	8.6	4,613.3
11/15/2017	7	558	120	8.7	4,617.0
12/05/2017	7	555	120	8.7	4,624.4
12/18/2017	7	555	118	8.7	4,630.0

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-02-2		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	570	117	8.7	4,592.0
10/16/2017	6	593	144	8.6	4,606.4
11/01/2017	7	574	119	8.6	4,607.0
11/15/2017	7	575	119	8.6	4,613.6
12/05/2017	7	572	117	8.6	4,620.0
12/18/2017	7	569	117	8.7	4,619.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-03-2		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	578	115	8.6	4,590.8
10/16/2017	6	601	122	8.6	4,606.4
11/01/2017	7	582	116	8.6	4,604.4
11/15/2017	7	582	117	8.6	4,611.0
12/05/2017	7	579	116	8.6	4,618.3
12/18/2017	7	575	114	8.6	4,614.3

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-04		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	581	115	8.6	4,601.9
10/16/2017	6	603	122	8.6	4,612.9
11/01/2017	7	584	116	8.6	4,608.0
11/15/2017	7	584	118	8.6	4,614.1
12/05/2017	7	582	117	8.6	4,617.7
12/18/2017	7	577	114	8.6	4,610.6

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-05		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	575	111	8.7	4,604.5
10/17/2017	7	591	119	8.7	4,610.0
11/02/2017	8	582	117	8.7	4,603.8
11/15/2017	7	584	114	8.7	4,608.5
12/05/2017	7	581	114	8.2	4,604.8
12/18/2017	8	578	113	8.7	4,597.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-06		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	589	111	8.7	4,609.6
10/17/2017	7	602	117	8.7	4,610.3
11/01/2017	7	591	113	8.7	4,610.0
11/15/2017	8	590	113	8.7	4,608.8
12/05/2017	8	587	111	8.7	4,596.8
12/18/2017	7	585	109	8.7	4,594.7

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-07		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	7	583	107	8.5	4,623.1
10/17/2017	7	599	112	8.6	4,624.9
11/01/2017	8	592	106	8.6	4,629.8
11/15/2017	8	592	107	8.6	4,622.7
12/05/2017	8	590	106	8.5	4,605.0
12/18/2017	8	587	109	8.6	4,603.6

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-08		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	593	115	8.5	4,616.1
10/17/2017	6	600	119	8.6	4,619.5
11/06/2017	7	594	114	8.7	4,639.0
11/20/2017	7	594	112	8.5	4,611.6
12/05/2017	7	592	115	8.4	4,602.9
12/18/2017	7	592	114	8.5	4,608.7

\*Value Exceeds Upper Control Limit



Production Area 1 Well ID MRN-09		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/03/2017	7	593	133	8.6	4,621.5
10/17/2017	6	602	123	8.6	4,622.6
11/06/2017	7	594	117	8.6	4,638.3
11/20/2017	7	595	119	8.5	4,620.2
12/05/2017	7	592	117	8.4	4,612.8
12/18/2017	7	589	116	8.5	4,618.1

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-10		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	8	576	109	8.4	4,635.8
10/17/2017	7	593	129	8.5	4,636.2
11/06/2017	8	592	110	8.6	4,647.0
11/20/2017	8	585	110	8.5	4,632.3
12/05/2017	8	585	108	8.4	4,627.5
12/18/2017	8	579	106	8.5	4,628.6

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-11		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	8	580	108	8.5	4,642.7
10/18/2017	8	587	104	8.6	4,638.2
11/06/2017	8	589	107	8.6	4,645.1
11/20/2017	8	589	106	8.5	4,634.8
12/05/2017	8	588	107	8.5	4,633.3
12/18/2017	8	585	105	8.6	4,629.1

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-12		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	7	583	117	8.5	4,644.1
10/17/2017	6	599	122	8.5	4,641.4
11/06/2017	7	592	118	8.5	4,643.0
11/20/2017	7	593	118	8.5	4,635.5
12/05/2017	7	591	118	8.4	4,638.1
12/18/2017	7	587	118	8.5	4,629.5

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-13		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	7	583	117	8.5	4,645.4
10/18/2017	7	592	116	8.5	4,638.6
11/07/2017	7	470	117	8.6	4,643.6
11/20/2017	7	595	117	8.5	4,638.5
12/05/2017	7	592	117	8.4	4,646.7
12/18/2017	7	586	118	8.5	4,640.9

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-14		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	6	585	120	8.5	4,647.0
10/18/2017	6	597	120	8.5	4,637.6
11/07/2017	7	473	124	8.7	4,644.8
11/20/2017	6	598	123	8.5	4,640.7
12/06/2017	7	583	121	8.6	4,650.2
12/18/2017	7	592	119	8.6	4,651.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-15		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	7	572	121	8.4	4,649.2
10/18/2017	6	587	122	8.5	4,635.4
11/06/2017	6	574	125	8.4	4,643.2
11/20/2017	6	589	126	8.5	4,643.6
12/06/2017	7	574	125	8.5	4,655.2
12/18/2017	6	582	122	8.5	4,666.3

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-16		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/04/2017	6	562	123	8.4	4,656.1
10/18/2017	6	576	123	8.4	4,644.2
11/06/2017	6	576	124	8.4	4,650.8
11/21/2017	6	575	124	8.4	4,651.5
12/06/2017	7	562	124	8.2	4,648.6
12/18/2017	6	571	123	8.5	4,677.5

\*Value Exceeds Upper Control Limit



Production Area 1 Well ID MRN-17		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	529	122	8.3	4,657.5
10/18/2017	7	559	123	8.4	4,649.2
11/06/2017	6	559	125	8.4	4,656.0
11/21/2017	7	559	125	8.4	4,651.7
12/06/2017	6	544	125	8.5	4,643.6
12/18/2017	6	557	122	8.4	4,669.4

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-18-1		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	544	122	8.4	4,653.9
10/18/2017	6	555	122	8.5	4,645.1
11/06/2017	7	556	125	8.4	4,647.0
11/21/2017	6	556	124	8.4	4,646.5
12/06/2017	7	544	123	8.0	4,642.3
12/18/2017	6	555	122	8.3	4,661.2

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-20-1		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	541	123	8.4	4,654.0
10/19/2017	7	548	120	8.5	4,652.5
11/02/2017	7	549	126	8.5	4,650.2
11/16/2017	6	550	123	8.6	4,642.0
12/06/2017	7	541	122	8.4	4,653.8
12/18/2017	7	552	123	8.5	4,654.0

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-21		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	543	122	8.4	4,654.1
10/19/2017	6	548	125	8.5	4,644.3
11/02/2017	7	549	123	8.5	4,649.0
11/16/2017	6	547	124	8.6	4,642.7
12/06/2017	7	540	123	8.4	4,650.0
12/18/2017	7	545	120	8.3	4,647.0

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-22		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	544	118	8.4	4,654.3
10/19/2017	6	547	116	8.5	4,642.6
11/02/2017	7	548	118	8.5	4,648.6
11/16/2017	6	547	118	8.6	4,642.8
12/06/2017	7	537	117	8.5	4,645.4
12/18/2017	7	545	116	8.4	4,635.9

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-23		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	538	122	8.4	4,653.1
10/19/2017	6	547	116	8.5	4,638.6
11/06/2017	6	553	126	8.6	4,648.9
11/21/2017	7	553	125	8.5	4,637.4
12/07/2017	7	543	122	8.6	4,644.5
12/18/2017	6	551	123	8.3	4,632.3

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-24		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	542	121	8.4	4,646.0
10/19/2017	6	548	122	8.5	4,636.4
11/02/2017	7	553	123	8.5	4,645.4
11/16/2017	6	548	123	8.6	4,639.5
12/06/2017	6	539	124	8.4	4,636.0
12/18/2017	7	547	121	8.4	4,631.0

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-25		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/05/2017	6	541	120	8.4	4,631.9
10/19/2017	6	553	120	8.5	4,626.6
11/07/2017	6	560	122	8.4	4,636.3
11/22/2017	6	552	121	8.5	4,620.0
12/07/2017	7	540	119	8.6	4,623.5
12/19/2017	7	547	118	8.5	4,621.2

\*Value Exceeds Upper Control Limit



Production Area 1 Well ID MRN-26		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/10/2017	6	552	129	8.5	4,622.9
10/23/2017	7	546	120	8.6	4,617.4
11/06/2017	7	545	125	8.6	4,621.5
11/21/2017	7	544	122	8.7	4,610.9
12/06/2017	7	532	122	8.5	4,610.9
12/19/2017	7	542	120	8.6	4,608.7

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-27		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/10/2017	6	554	129	8.5	4,618.8
10/23/2017	6	548	120	8.5	4,613.6
11/07/2017	7	446	122	8.6	4,613.6
11/21/2017	6	547	122	8.6	4,606.7
12/06/2017	6	534	123	8.4	4,605.5
12/19/2017	6	545	119	8.5	4,602.4

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-28		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/10/2017	6	556	128	8.6	4,627.2
10/23/2017	6	550	120	8.6	4,616.7
11/07/2017	7	557	122	8.6	4,610.8
11/22/2017	7	547	122	8.5	4,611.9
12/06/2017	7	535	121	8.4	4,606.2
12/19/2017	6	546	120	8.6	4,605.4

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-29		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/10/2017	12	585	130	8.5	4,628.7
10/23/2017	12	571	121	8.6	4,629.2
11/07/2017	13	591	125	8.6	4,605.4
11/22/2017	12	576	123	8.6	4,612.3
12/06/2017	10	549	122	8.5	4,606.2
12/19/2017	10	559	119	8.5	4,608.5

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-33		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/10/2017	6	542	126	8.7	4,616.7
10/24/2017	6	508	119	8.7	4,629.4
11/08/2017	7	544	122	8.7	4,628.8
11/20/2017	7	535	123	8.6	4,636.4
12/07/2017	7	523	120	8.7	4,631.5
12/19/2017	7	529	118	8.7	4,627.2

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MRN-34-2		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	731	152		

Date

10/10/2017	6	552	134	8.6	4,608.6
10/24/2017	6	520	122	8.5	4,620.0
11/08/2017	8	552	122	8.6	4,620.2
11/20/2017	6	547	121	8.6	4,628.4
12/07/2017	7	534	121	8.7	4,625.6
12/19/2017	7	545	119	8.8	4,622.6

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-01-1		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/11/2017	5	405	210	8.7	4,626.0
10/24/2017	5	378	201	8.7	4,626.0
11/09/2017	5	401	204	8.7	4,625.5
11/22/2017	5	403	208	8.8	4,624.9
12/07/2017	5	392	200	8.7	4,627.0
12/20/2017	5	391	202	8.7	4,625.4

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-02		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/11/2017	4	415	216	8.8	4,626.2
10/25/2017	5	403	202	8.7	4,626.2
11/09/2017	5	411	209	8.8	4,625.8
11/22/2017	5	397	203	8.8	4,624.9
12/07/2017	5	396	208	8.8	4,626.3
12/20/2017	5	396	205	8.8	4,625.2

\*Value Exceeds Upper Control Limit



Production Area 1 Well ID MUN-03		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/11/2017	5	407	209	8.6	4,624.8
10/26/2017	5	393	198	8.7	4,624.4
11/09/2017	6	398	202	8.7	4,624.6
11/27/2017	5	394	202	8.6	4,623.5
12/11/2017	5	396	199	8.8	4,625.4
12/27/2017	6	385	199	8.6	4,624.1

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-04		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/11/2017	4	444	234	8.5	4,624.8
10/30/2017	4	430	219	8.7	4,624.3
11/09/2017	5	433	227	8.6	4,625.2
11/27/2017	4	431	223	8.6	4,624.5
12/11/2017	5	429	228	8.6	4,625.3
12/27/2017	5	415	223	8.5	4,624.0

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-05-1		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/11/2017	4	402	209	8.6	4,625.9
10/30/2017	5	391	197	8.7	4,624.8
11/13/2017	5	391	201	8.7	4,625.4
11/27/2017	5	391	202	8.7	4,625.0
12/11/2017	6	390	201	8.6	4,625.4
12/27/2017	5	382	199	8.7	4,624.2

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-06		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/12/2017	4	398	208	8.7	4,623.6
10/31/2017	5	391	200	8.8	4,623.0
11/13/2017	5	392	203	8.6	4,623.3
11/27/2017	5	391	200	8.7	4,623.0
12/11/2017	5	388	199	8.7	4,623.7
12/27/2017	6	380	199	8.7	4,622.3

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-07		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/12/2017	5	390	189	8.8	4,623.6
10/30/2017	5	381	178	8.8	4,623.3
11/13/2017	5	381	184	8.7	4,623.8
11/28/2017	5	375	180	8.8	4,622.8
12/11/2017	6	386	178	8.6	4,623.0
12/27/2017	5	370	181	8.8	4,622.8

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-08		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/12/2017	5	378	192	8.9	4,625.6
10/31/2017	5	371	184	8.8	4,624.3
11/13/2017	5	372	184	8.7	4,624.5
11/28/2017	5	365	183	8.9	4,624.3
12/12/2017	5	351	178	8.8	4,624.2
12/28/2017	6	365	179	8.9	4,623.0

\*Value Exceeds Upper Control Limit

Production Area 1 Well ID MUN-09		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	20	490	274		

Date

10/12/2017	5	408	198	8.7	4,626.1
10/31/2017	6	399	190	8.8	4,625.4
11/13/2017	6	399	193	8.8	4,625.5
11/28/2017	6	392	188	8.8	4,624.8
12/12/2017	5	379	188	8.7	4,625.1
12/28/2017	6	388	189	8.8	4,624.0

\*Value Exceeds Upper Control Limit

## **Appendix B**





## Appendix B

Production Area 2 Well ID MON-14		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	725	148		

### Date

10/12/2017	6	549	125	8.8	4,638.1
10/26/2017	6	534	116	8.7	4,638.6
11/09/2017	7	542	120	8.7	4,639.2
11/22/2017	7	533	119	8.8	4,639.6
12/11/2017	7	528	118	8.7	4,639.6
12/28/2017	7	512	118	8.7	4,639.6

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MON-15		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	725	148		

Date

10/12/2017	6	587	123	9.0	4,634.3
10/26/2017	7	574	116	9.0	4,634.6
11/08/2017	7	581	119	8.9	4,635.3
11/27/2017	7	572	120	9.3	4,635.3
12/11/2017	7	564	118	8.8	4,635.5
12/28/2017	7	549	117	9.2	4,635.4

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MPN-16		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	681	161		

Date

10/10/2017	6	544	131	9.1	4,621.9
10/23/2017	6	536	122	9.1	4,616.3
11/07/2017	7	543	126	9.1	4,611.1
11/22/2017	6	531	123	9.1	4,614.7
12/07/2017	7	520	121	9.0	4,614.0
12/19/2017	7	527	121	9.0	4,616.0

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MRN-35		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	681	161		

Date

10/10/2017	6	531	128	8.7	4,615.1
10/24/2017	7	497	119	8.6	4,621.9
11/08/2017	7	530	123	8.8	4,619.0
11/20/2017	7	523	122	8.6	4,627.6
12/07/2017	7	512	120	8.7	4,625.6
12/19/2017	6	522	119	8.7	4,624.3

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MRN-36		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	681	161		

Date

10/10/2017	6	513	127	8.9	4,611.7
10/24/2017	6	506	125	8.7	4,612.4
11/08/2017	6	510	122	8.8	4,598.1
11/20/2017	7	506	123	8.7	4,622.0
12/07/2017	7	494	121	8.7	4,620.2
12/19/2017	6	504	120	8.8	4,620.1

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MRN-37		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	681	161		

Date

10/10/2017	6	511	130	8.7	4,611.8
10/24/2017	6	503	145	8.7	4,609.6
11/07/2017	7	503	125	8.7	4,602.1
11/20/2017	6	505	126	8.7	4,616.8
12/07/2017	6	493	123	8.8	4,616.4
12/19/2017	6	499	123	8.7	4,614.9

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MRN-38		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	681	161		

Date

10/10/2017	6	503	132	8.7	4,614.2
10/24/2017	6	493	*191	8.7	4,611.6
11/07/2017	6	494	126	8.7	4,606.1
11/20/2017	6	497	127	8.7	4,614.8
12/06/2017	7	488	125	8.6	4,614.8
12/19/2017	6	493	124	8.7	4,613.5

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MRN-58		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	21	681	161		

Date

10/10/2017	6	551	128	8.5	4,625.9
10/23/2017	6	542	119	8.6	4,618.0
11/08/2017	7	542	122	8.6	4,612.2
11/20/2017	7	542	121	8.6	4,616.6
12/06/2017	7	529	120	8.6	4,611.3
12/19/2017	7	537	119	8.6	4,612.0

\*Value Exceeds Upper Control Limit



Production Area 2 Well ID MUN-14		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	19	468	249		

Date

10/12/2017	4	406	213	8.8	4,624.4
10/26/2017	4	397	201	8.7	4,624.9
11/09/2017	5	401	207	8.7	4,625.4
11/22/2017	5	397	205	8.9	4,625.5
12/11/2017	5	405	204	8.6	4,625.1
12/28/2017	5	392	202	8.9	4,624.4

\*Value Exceeds Upper Control Limit

Production Area 2 Well ID MUN-15		<b>Uranerz Energy Corporation Nichols Ranch PERIMETER, OVER AND UNDER MONITOR WELLS</b>		Quarterly Report 4th QTR 2017	
Water Quality Parameters	Chloride	Specific Conductance	Total Alkalinity	pH	Piezometric Elevation
Units	mg/l	u mho/cm	mg/l as CaCo3		msl @ surface
Upper Control Limits	19	468	249		

Date

10/12/2017	4	405	240	9.2	4,622.7
10/26/2017	4	396	198	9.0	4,621.5
11/08/2017	5	402	202	9.0	4,623.2
11/27/2017	5	396	201	9.3	4,623.0
12/11/2017	5	390	201	9.0	4,622.7
12/28/2017	5	385	201	9.2	4,621.9

\*Value Exceeds Upper Control Limit

## **Appendix C**



**WDEQ - Quarterly Report/4th QTR 2017  
MITs for Nichols Ranch Production**

**Appendix C**

#	Well Name	Date Tested	Casing Type	Bottom Casing (top of completion ft)	Lower Packer Depth (feet)	Initial Pressure (psi)	Final Pressure (psi)	Pressure Loss (net)	Next Test Date	Pass-Fail
1	MRN-29	10/04/2017	PVC	558	540	190	179	11		PASS

## **Appendix D**



**Nichols Ranch ISR Project**  
**4th Quarter 2017**  
**Defective Well Status Report**

**Appendix D**

#	Well Name	Date Tested	Well Status	Plugging/Repair Date	Well Depth (Feet)	Well Diameter (Inches)	Casing Volume (Gallons)	Sealant Material Volume (Gallons)
1	N1B-038	8/9/2017	Abandoned	11/1/2017	669	5	656	748
2	N1B-082	8/16/2017	Abandoned	11/1/2017	659	5	646	695