June 10, 2009

Mr. Michael Thomas
Environmental, Safety, and Health Manager
Uranerz Energy Corporation
1701 East "E" Street
P.O. Box 50850
Casper, WY 82605-0850

SUBJECT: SUMMARY OF MAY 19, 2009 TELECONFERENCE - URANERZ ENERGY CORPORATION

Dear Mr. Thomas:

A summary of the teleconference between U. S. Nuclear Regulatory Commission (NRC) staff and representatives of Uranerz Energy Corporation on May 19, 2009, is enclosed.

If you have any questions regarding this letter or the enclosed meeting summary, please contact me at (301) 415-7777, or by email at ron.linton@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

/RA SJC for/

Ron C. Linton, Project Manager
Uranium Recovery Licensing Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 040-09067

Enclosure: Meeting Summary

cc: G. Mooney (WDEQ)
Uranerz Energy Corp Distribution List
Meeting Attendees

Mr. Michael Thomas
Environmental, Safety, and Health Manager
Uranerz Energy Corporation
1701 East "E" Street
P.O. Box 50850
Casper, WY 82605-0850

SUBJECT: SUMMARY OF MAY 19, 2009 TELECONFERENCE - URANERZ ENERGY CORPORATION

Dear Mr. Thomas:

A summary of the teleconference between U. S. Nuclear Regulatory Commission (NRC) staff and representatives of Uranerz Energy Corporation on May 19, 2009, is enclosed.

If you have any questions regarding this letter or the enclosed meeting summary, please contact me at (301) 415-7777, or by email at ron.linton@nrc.gov.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice for Domestic Licensing Proceedings and Issuance of Orders," a copy of this letter will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records component of NRC's Agencywide Documents Access and Management System (ADAMS). ADAMS is accessible from the NRC Web site at http://www.nrc.gov/reading-rm/adams.html.

Sincerely,

Ron C. Linton, Project Manager
Uranium Recovery Licensing Branch
Decommissioning and Uranium Recovery
Licensing Directorate
Division of Waste Management
and Environmental Protection
Office of Federal and State Materials
and Environmental Management Programs

Docket No.: 040-09067

Enclosure: Meeting Summary

cc: G. Mooney (WDEQ)
Meeting Attendees

DISTRIBUTION:
JWhitten/RIV KMcConnell DOrlando BvonTill IYu J.Webb E. Striz
T. Oxenberg T. Lancaster

ML091520597

Office	DWMEP	DWMEP	DWMEP	DWMEP
Name	RLinton	BGarrett	S Cohen	sjc for RLinton/
Date	06/10/09	06/04/09	0610/09	06/10/09

OFFICIAL RECORD COPY

MEETING REPORT

DATE: May 19, 2009

TIME: 1:00 p.m. – 4:00 p.m.

PLACE: U.S. Nuclear Regulatory Commission
Two White Flint North, Rockville, Maryland
Room T10C4

PURPOSE: Discuss Uranerz Energy Corporation's Nichols Ranch Project License Application and Uranerz' responses to NRC's request for additional information (RAI) dated September 1, 2008.

ATTENDEES: SEE ATTACHED ATTENDEE LIST

BACKGROUND:

The purpose of this meeting was for Uranerz Energy Corporation (Uranerz) and Nuclear Regulatory Commission (NRC) staff to discuss the Nichols Ranch *in-situ* recovery (ISR) facility license application and Uranerz' March 11, 2009 responses to NRC's RAI dated September 11, 2008.

DISCUSSION:

The meeting and teleconference started at 1:00 p.m. Eastern time in T10C4. An opening statement was presented by Ron Linton, NRC. Participants introduced themselves.

NRC staff indicated that the discussion topics were not a request for additional information, but a discussion of issues to which Uranerz could address or supplement the Technical Report (TR). Staff also indicated that Uranerz could choose to wait until the draft Safety Evaluation Report (SER) is written and address the identified open items, at that time. The discussion topics in this teleconference may or may not be open issues after the draft SER is written. It should also be noted that the draft SER is an internal document only.

The following topics were discussed in detail. The headings, letters, and numbers correspond to the RAI responses provided to the NRC by Uranerz dated March 11, 2009.

HYDROLOGY ISSUES

Section 2.6 Geology and Seismology

e. NRC requested an explanation of how a porosity of 0.05 was determined for the "A sand" and "F sand" at the Nichols Ranch and Hank Units. Uranerz stated, "An unconfined multi-well pump test in the F sand is being conducted to better define the specific yield for the F Sand" (RAI response page 3). It is not clear if Uranerz completed this test and when NRC staff will receive the information.

Enclosure

Discussion

Uranerz indicated the pumping test had been completed at the Hank Unit and analyzed. The analysis provided a specific yield of 0.15 instead of 0.05, as reported for the Hank Unit "F sand" in the application. Uranerz assumed that specific yield is equal to effective porosity. The effective porosity of 0.05 for the Nichols Ranch unit has not been verified by any field test or core analysis.

Section 2.7.1. Surface Water Hydrology

m. NRC requested a discussion of how coal bed methane (CBM) produced water infiltrating from impoundments may impact the surficial aquifer water quality at Nichols or Hank. Uranerz indicated that according to Wyoming Department of Environmental Quality (WDEQ), groundwater quality in Wyoming has been adversely affected and class of use has changed at 16 of 109 permitted impoundments due to infiltration…… and class of use has typically changed due to increases in the concentrations of selenium, TDS or sulfate. (RAI response page 11). Methods to separate the impact of CBM produced water infiltration to the surficial aquifer from ISR surface operations (impoundment infiltration, surface spills, leaks in casing, etc.) at Nichols Ranch have not been proposed.

Discussion

Uranerz stated that as it compiles more information on the composition of the CBM produced water in and near the license areas, it will develop a database of CBM water quality. It will identify constituents that are significantly different in CBM water and ISR fluids and use them to monitor changes in groundwater quality in the surficial aquifers. Uranerz stated that no CBM water will be discharged at the Hank unit, as Anadarko will send all CBM produced water offsite to be injected into the Madison Formation.

At Nichols Ranch, all CBM produced water will be discharged into impoundments. Uranerz reported that a CBM impoundment is located upgradient on the east side of the Nichols Ranch permit area. Uranerz does not have a sample point in the surficial aquifer near this impoundment, but stated the WDEQ requires groundwater monitoring near the impoundment. Uranerz reported that the F sand and Cottonwood alluvium act as surficial aquifers at Nichols Ranch. The G sand may also act as a surficial aquifer, but Uranerz has yet to determine if it is saturated in the permit area. Uranerz is proposing two more wells in surficial aquifers at Hank and Nichols. NRC staff stressed the importance of characterizing the baseline water quality in all surficial aquifers. NRC staff questioned whether the number of monitoring wells at this point is sufficient to characterize surficial aquifer water quality, so that impacts from ISR or CBM operations can be distinguished from one another in the future.

o. NRC staff requested that Uranerz provide recent surface water samples from within the Nichols and Hank unit to provide baseline values.

It appears there are no surface water samples within either the Nichols or Hank Unit licensed boundaries. Additionally, only one set of three surface water samples for June 2008 are presented for both permit areas (RAI response page 12).

Discussion

Uranerz agreed there were no surface water samples taken within either of the permit areas. Uranerz stated there are no locations where they could practically collect samples within the permit boundaries, as all the drainages are ephemeral. At the Hank Unit, Uranerz collected one water sample at Dry Willow Creek from a location a few tens of feet down gradient of the southern boundary. Uranerz considers it representative of the site surface water. At Nichols Ranch, Uranerz collected water samples from a location 0.25 miles down gradient from the permit boundary and a few hundred feet up gradient of the boundary on Cottonwood Creek. Uranerz considers the down gradient sample to represent surface water drained from the Nichols Ranch permit area. Uranerz stated that samples were collected June 2008 and a few more were collected this spring. NRC staff requested that the sample results be provided in the application.

Section 2.7.2. Ground Water Hydrology

s. NRC requested an explanation of how future pumping tests will be designed for the "F sand" in the Hank Unit to provide adequate hydrogeologic characterization of the wellfields given the limited extent of drawdown developed by a pumping well in this unconfined aquifer. Uranerz stated, "Future multi-well pump tests in the F Sand at the Hank unit will be designed using the USGS WTAQ computer program for unconfined aquifers. The Hank wellfield pump test will require more multi-will tests than most wellfields due to its unconfined nature….. A minimum of 3 multi-well tests will likely be required for the first Hank mine unit multi-well pump test" (RAI response page 17).

The typical radial extent of a cone of depression for a single well operating at the maximum extraction rate in the unconfined F sand aquifer has not been provided, as the pumping tests provided in the application did not establish this distance through observation wells.

Uranerz stated in its response that to demonstrate communication across Hank Unit unconfined aquifer would require three pumping wells with observation wells 1000 ft distant. Uranerz has presented no basis for this design. Only one multi-well pumping test has been conducted in the F sand at Hank Unit to date. It showed no response in F sand observation wells located at greater than 1000 ft from the F sand pumping well after five days.

The cone of depression to be produced across the entire wellfield during operations in the unconfined aquifer at Hank Unit has not been demonstrated. Only a small portion of the wellfield was modeled. The ability to maintain a 3 percent bleed during operations without dewatering has not been shown. Uranerz has not indicated when these pumping tests will be completed and when the NRC will receive this information.

Discussion

Uranerz stated a new pumping test was conducted on the "F sand" at the Hank Unit. The aquifer properties from this test are transmissivity = 667 gpd/ft; storage = .001; K_h 1.06 ft/day; K_v = 0.85 ; and Sy = 0.15. Uranerz stated the one observation well for the pumping test was located only 50 feet from the pumping well in order to measure adequate drawdown in the unconfined aquifer for analysis. NRC staff noted that the new transmissivity is an order of magnitude lower than the one reported in the TR and the Sy is

three times greater. This could mean that more pumping wells will be needed to demonstrate a connection to the MW ring. Based on these results, Uranerz agreed to reevaluate the number of pumping tests and spacing required in wellfield one to show communication with the MW ring.

u. NRC requested a description regarding presence of sufficient head in the "F sand" at Hank Unit to prevent substantial dewatering of the sand during production and restoration operations, especially during the groundwater sweep phase of restoration. Uranerz responded that there is 50+ feet of head and should be sufficient to allow operations and without substantial lowering of water table levels (RAI response page 18).

This response from Uranerz does not provide any basis for the assumption that the water table will not be substantially lowered. The maximum extraction rates that can be achieved at Hank Unit without dewatering the unconfined aquifer have not been provided. In addition, evidence has not been provided that extraction rates to recover an excursion in the unconfined aquifer at Hank Unit will not result in excessive dewatering. Methods to capture an excursion in the unconfined aquifer at Hank Unit which consider the limits on extraction rates and small areal extent of cones of depression have not been presented.

Discussion

NRC staff stated that generally in an unconfined aquifer, pumping could create a deep dewatered cone of limited areal extent around a pumping well. The depth and extent of the dewatering is dependent on the extraction rate and aquifer characteristics. The extraction rate is limited by the saturated thickness of the unconfined zone and the head required for the operation of the submersible pump.

NRC staff requested that Uranerz provide the maximum pumping rate for a single well that could be used without inducing unsustainable dewatering. Uranerz stated that it showed in the application it could capture an excursion on the edge of the wellfield by pumping several wells at a higher rate to reverse the gradient instead of a single well. Uranerz stated its strategy will be to pump several wells in specific well patterns to draw back excursions.

w. NRC requested a discussion of the implications to lixiviant composition and flow in the unconfined aquifer setting from "gas lock," a condition where dissolved oxygen in the lixiviant may evolve out of solution to create a gas and liquid phase in the ore body. This condition could lead to reduced permeability and preferential flow paths. Uranerz responded, "The injection of lixiviant into the F sand will not be in the upper portion of the aquifer or near the water table. A few tens of feet of water over the injection point should enable the added oxygen to stay in saturation. The head above the injection zone will be increased near injection wells; therefore, the injection of lixiviant into the unconfined aquifer should not create a problem (RAI response page 18-19).

The Uranerz response did not provide any basis to support the conclusion that oxygen will not evolve out of solution in the low head environment of the unconfined aquifer at the Hank Unit. For example, the potential for dissolved oxygen to evolve as a free gas and hydrogen peroxide to decompose to free oxygen and create "gas lock" conditions under the low head (unconfined) operating conditions at the Hank Unit was not sufficiently discussed. Furthermore, methods to identify "gas lock" and correct for it were not presented.

Additionally, Section 3.2.4.1 Underground Recovery of the Technical Report states, "Uranerz will use oxygen as the primary oxidant; however, hydrogen peroxide may be used if needed to increase the oxidation potential in the lixiviant." There was no discussion of the potential issue of using hydrogen peroxide lixiviant and additional oxygen being liberated with the possible reaction between hydrogen peroxide and pyrite.

Discussion

Uranerz stated it was aware of the issue of dissolved gas coming out of solution in the ore zone and "gas lock" from experience at an ISR in Texas, which exhibited a static water level of 80 feet above the ore creating an unconfined aquifer setting. Uranerz reported this ISR experienced the evolution of dissolved oxygen gas from solution in the ore zone that led to problems with gas/liquid slug flow in piping and cavitation in pumps. The problem was solved using monitoring to ensure that the dissolved oxygen concentration in the lixiviant did not exceed the solubility limit of the aquifer. Uranerz stated that as long as operational controls were managed, there was no problem with free gas. Uranerz stated that "gas lock" could be a problem in the unconfined aquifer at the Hank Unit, but it would be correctible.

Uranerz stated it was aware of the decomposition of hydrogen peroxide to free oxygen when pyrite is present in the ore zone. It stated the problem had also been experienced at the ISR Texas, and it was prepared to address it. NRC staff stated the application indicated Uranerz was planning on using hydrogen peroxide; however, Uranerz stated it was not planning on using hydrogen peroxide.

Section 2.7.2.4 Groundwater Quality

d. NRC requested a rationale for the number and location of wells selected for preoperational groundwater quality monitoring for both the Nichols Ranch and Hank units. Uranerz should propose an appropriate preoperational monitoring program for the Nichols Ranch and Hank units with these objectives and guidelines of Regulatory Guide 4.14, Revision 1 in mind (RAI response page 21-22). The Uranerz response did not provide any basis or rationale for the preoperational program employed by Uranerz.

Discussion

Uranerz stated it will address this issue.

Section 3.1 ISR Leaching and Process and Equipment

a. NRC requested information on the design, operation, and monitoring of the wellfield header houses. Uranerz provided the design in revisions to Section 3.4.3 (RAI responses, page 28). NRC staff also stated that it would like the physical description and operation of downhole gas spargers.

Discussion

Uranerz stated it will provide this information.

c. NRC requested the general locations for the underlying and overlying aquifer monitoring wells. Uranerz responded that the final locations of the vertical monitor wells will be submitted to the WDEQ/Land Quality Division in the Production Area Pump Test Document as described in Section 5.7.8 (RAI response page 29-30).

NRC expects that wellfield pump test, water quality data, and monitoring well locations (wellfield hydrologic package) will be submitted to NRC as reflected in Section 5.7.8.4 of the Technical Report and RAI response 5.7.8 c.

Discussion

Uranerz stated it will address this issue.

f. NRC requested an explanation for how the applicant will handle waste fluids should the disposal wells become inoperable short term or long term. Uranerz responded that it has three possible solutions to manage surge capacity. One option would be to rent large capacity bladder tanks with secondary confinement. A second option would be to haul the solution over to the other site (Nichols to Hank or Hank to Nichols), and a third option would be to reduce production to minimize the waste tank fill rate, thus minimizing the volume of solution needed to be sent down the deep disposal well (RAI response page 30-31).

While this presents three options for handling excess waste fluids in the short term, the response lacks specificity on how Uranerz would handle the loss of a deep disposal well during commercial operations or restoration of its wellfields and ensure bleed and hydraulic control of the production zone will be maintained.

Discussion

Uranerz stated it will address this comment.

Section 5.7.8 Groundwater and Surface Water Monitoring Programs

a. NRC requested an analysis that takes into consideration the unconfined conditions at Hank Unit to determine the location of monitoring wells in the production zone MW ring in the “F sand.” Uranerz responded that an analysis of the F sand MW ring did account for unconfined conditions by using specific yield value for the storage value (RAI response page 56).

The response appears to center around the fact that the MW rings were shown to be in communication with production zone and the distance from the production zone, not the spacing between the wells to ensure that an excursion is detected.

Discussion

Uranerz stated that a steep cone of depression will be created in the unconfined aquifer that enhances the monitoring and control of excursions. It also stated that 500-ft spacing has been working well for other ISRs in Powder River Basin. NRC staff explained that the cone of depression in the unconfined aquifer at Hank Unit might be limited in extent. For

example, it could be expressed by numerous small diameter dewatered cones of depression at each extraction well that are surrounded by mounding of groundwater at nearby injection wells. The cone of depression is therefore not physically expressed in the same way as it is in a confined aquifer setting. The actual physical drawdown at the MW ring might be small, as these dewatered cones might not extend 500 ft to the monitoring well ring at the Hank Unit. NRC staff requested that Uranerz consider these physical conditions to support its selection of the location and the spacing of the MW ring.

Section 6.1 Groundwater Restoration

a. NRC requested a statement that the applicant will return the groundwater quality to the standards listed in Criterion 5B(5) of 10 CFR Part 40, Appendix A. Uranerz responded that the restoration standards would be from NUREG-1569 (RAI responses, page 58). NRC has alerted industry and issued a Regulatory Issue Summary (RIS) 2009-05 dated April 29, 2009 stating that the standards for restoration are those found in Criterion 5B(5) and Criterion 5B(6) of 10 CFR Part 40, Appendix A.

Discussion

Uranerz indicated that it will review the RIS. NRC staff discussed briefly the RIS and that the standards in 10 CFR 40, Appendix A, Criterion 5(B) will now apply. Uranerz asked what the other facilities had in their licenses. NRC staff explained that other existing licenses either have or will be amended to remove the class of use restoration standard. Uranerz asked if it could use the preservation of water resources as part of the justification for an alternative standard. NRC staff indicated that it could use that and any discussion containing any other relevant information and justification. Uranerz was directed to 10 CFR 40, Appendix A, Criterion 5(B)6 for regulatory discussion on alternate concentration limits.

b. NRC requested a technical basis demonstrating the applicant's ability to meet the standards in Criterion 5B(5) of 10 CFR Part 40, Appendix A. Uranerz responded that several of the facilities that have successfully restored the groundwater are the Bison Basin ISR operation located in the Great Divide Basin of Wyoming, COGEMA Christiansen Ranch and Irigaray ISR operations, Smith Ranch/Highlands Uranium Project, Collins Draw R&D Facility, Ruth R&D Facility, and the Reno Creek R&D Facility. These last six operations are all located in the Powder River Basin within 35 miles or less of Nichols Ranch (RAI responses, page 59-60). Uranerz provides no detailed discussion of how these examples are relevant to this facility.

The discussion should include details regarding:

(i) A comparison of hydrogeological setting of Nichols Ranch and example sites;

(ii) Details of the groundwater monitoring and restoration used in the example sites and how/why they are relevant to Nichols Ranch site

(iii) Why the Reno Creek R&D Facility should be considered as an appropriate analog for the Hanks Unit site for successful groundwater restoration of an unconfined aquifer.

Discussion

Uranerz asked if it needed to get the public information that NRC had collected. It stated that an analog was done for Ruth and was acceptable for North Butte. NRC staff indicated that Uranerz only suggested analog sites located in the Powder River Basin, but didn't expand the discussion to compare specifics of each site (porosity, unit thickness, confined/unconfined, geochemistry, etc.)

d. NRC requested a justification for the method to estimate wellfield pore volume and the assumed 30 percent flare in the surety estimate. Uranerz responded that the number of pore volumes needed to restore a production area can vary from operation to operation or from wellfield to wellfield and used COGEMA, SR-HUP, HRI as examples (RAI responses, page 60-61).

Uranerz provided no basis for the 7 pore volumes proposed for the Nichols Ranch or Hank units. NRC staff has noted that pore volume calculations are based on production and injection well completed thickness and not the entire aquifer (RAI responses, page 60-61).

Discussion

Uranerz stated that flare value was increased to 1.45 based on COGEMA restoration field data. It stated that the COGEMA ISR had similar aquifer properties and formations. Uranerz also stated that vertical hydraulic conductivity governs the amount of water depth to which pumping effects are felt. NRC staff noted that the pumping test results produced similar vertical and horizontal conductivity at Hank Unit. Uranerz did not agree that they will flare to 100 feet of saturated thickness with 10 feet of completed thickness in the unconfined aquifer at the Hank Unit. Uranerz indicated it has completed some analyses along these lines that may clear up this issue. Uranerz stated it will review this issue and provide a response.

Technical Report, page TR-250, TR Section 6.2.8 (follow-up question)

Uranerz stated in the TR, "Based on these operations and the restoration techniques that will be used by Uranerz Energy Corporation, the number of pore volumes that Uranerz estimates that will be needed to restore the partial operating Production Area 1 in the first year of operation at the Nichols Ranch Unit has been modified to seven pore volumes, one pore volume groundwater sweep and six pore volumes circulated through an RO unit." Uranerz does not define "partial operating Production Area 1."

Discussion

Uranerz indicated that seven pore volumes are not for the entire restoration, only for the first year. NRC staff indicated that the surety is based on what a third party contractor would need to restore groundwater and decommission the site if Uranerz was unable to perform those duties. Uranerz needs to clarify the number of years of operation so that NRC knows the total number of pore volumes that needs restoration. This also should be clearly stated in Section 6.0 of the TR. Uranerz stated it will review this issue.

f. NRC requested an explanation of how the restoration methods proposed for Hank Unit that have only been applied to confined aquifers, will be successful in an unconfined aquifer like the "F sand" production zone. Uranerz responded that restoration was successful at Reno Creek, which was in an unconfined aquifer. The restoration methods

for confined aquifers should be functional for an unconfined aquifer with possibly some minor changes. The unconfined aquifer may require some adjustment in the approach of the groundwater sweep. Some recycling of the groundwater sweep water after removal of uranium may be necessary to keep the bleed rate to a reasonable percentage, such as 15 percent (RAI responses, page 61-62).

Uranerz has not provided a basis that will ensure contact and sweep of all parts of the extracted region, including dewatered zones in the unconfined aquifer. Methods to restore the aquifer at the Hank Unit when dewatering and mounding in the unconfined aquifer will interfere with complete sweep of all portions of the aquifer was not presented. Uranerz has also not demonstrated the ability to maintain a 15 percent bleed during restoration groundwater sweep in the unconfined aquifer at Hank Unit.

Discussion

Uranerz questioned what NRC staff meant by dewatering in the unconfined aquifer at the Hank Unit. NRC staff explained that in an unconfined aquifer setting extraction wells create small dewatered cones of depression and injection wells create groundwater mounds. NRC staff stated that in the unconfined aquifer setting, Uranerz may need to resaturate all dewatered zones to ensure restoration of all areas. Uranerz stated it understood the issue and will provide the information.

NRC staff requested that more evidence be provided for successful restoration in an unconfined aquifer. The example of Reno Creek, a test ISR which was only operated for ten weeks and restored with one month of groundwater sweep, is not considered to be a sufficient analog.

s. NRC requested a justification for the selection of a six-month stability monitoring time period to determine restoration success and also provide the criteria that will be used to establish that the water quality in the restored zone is stable. Uranerz responded that the six month stability monitoring period is specified in WDEQ-LQD Guideline 4. The criteria to establish restoration stability will be based on wellfield averages for water quality (RAI responses, page 65). Uranerz has not discussed criteria or methodology that will be used to determine the wellfield averaging, and especially how to evaluate hot spots in the data where wellfield averaging is used.

Discussion

NRC staff discussed the appropriateness of the three quarterly samples required by WDEQ. NRC staff stated its concern that if statistical averaging across the wellfield is used to show that a wellfield is restored, Uranerz should be able to also show that adjacent aquifers will not be endangered before restoration will be deemed complete, including areas where higher concentrations may be statistically significant.

t. NRC requested an estimate, with supporting analysis, of how much waste water would be produced during restoration and the ability of the disposal wells to handle the rates and volumes. Uranerz responded that an estimated 50 gpm of waste water could be sent to the deep disposal well during restoration at the Nichols Ranch Unit and at least 22 gpm at the Hank Unit (RAI responses, page 66).

Uranerz has not addressed the issue of capacity and if a well cannot be used for an extended period of time and how will Uranerz handle excess water and protect adjacent aquifers. The Uranerz RAI responses do not match the flow rates given in the revised TR 3.2.6, which are 90 gpm for both units during restoration. The remaining deep disposal well capacity balances (8 gpm for both units) are not likely to sustain operations for an extended period of time.

Discussion

Uranerz stated it will address this issue, which is similar to previous discussion on waste water disposal (see RAI 3.1-f). Uranerz also stated that estimates listed in TR Section 3.2.6 (pages TR-153 & TR-154) does not mean it actually will use those pumping rates. Uranerz should clarify whether the pumping rates listed in this section are actual or maximum pumping rates and the technical report should state clearly that the pumping rates that will be used will be below a maximum limit to have a "margin of safety."

Health Physic Issues:

Section 2.9 Background Radiological Characteristics

a. The NRC requested a demonstration that air particulate sampling is not needed while meeting the regulatory objectives of Regulatory Guide 4.14, Revision 1. Uranerz provided information to support its rationale for the absence of uranium air particulates, but none for radon progeny. Uranerz has committed to installing particulate air samplers at 4 locations at the Nichols Ranch and to collect in the first and second quarters in 2009 (RAI response pages 23-25).

The proposed sampling period does not meet the requirement for one-year of pre-operational sampling. Atmospheric radon originates from the decay of radium in surface soils. Radon decays into solid particulate radioactive progeny that can attach to dust particulates in air. The objective of sampling is to collect a portion of material that is representative of the conditions being tested. Baseline data are important to establish clean-up criteria. Baseline data are also used to measure the effectiveness of effluent control procedures and systems during normal operations and to assess the impacts of unusual releases, such as spills or accidents. For these reasons, Regulatory Guide 4.14 recommends that the radon and air particulate samplers be co-located and that the air particulate samples be analyzed for natural uranium, thorium-230, radium-226, and lead-210. Uranerz has not provided sufficient justification to be relieved from the requirement of 10 CFR 40, Appendix A, Criterion 7.

Discussion

Uranerz has proposed to use two quarters of data from Uranerz site and compare it to the COGEMA and Moore Ranch sites. If data collected compares to what has been measured at other sites, Uranerz feels this is sufficient. NRC staff is looking for four quarters of background before Uranerz operates, not necessarily prior to licensing. Uranerz understands NRC position that four quarters of sampling is needed prior to operational status and NRC is looking for a commitment from Uranerz to provide this information. NRC staff and Uranerz had a discussion on RG 4.14 updating.

Section 4.7.1 Effluent Control Techniques

a.ii. NRC staff requested a description of the acceptable monitoring criteria and flow rates for the work area ventilation system. The applicant responded that it is not practical to monitor the ventilation system, but that the work area will be monitored as described in the TR Section 5.7.3 and further stated that the environmental monitoring described in the TR Section 7.7.7 will provide an assessment of radioactivity released from the ventilation system (RAI response page 36)..

Environmental monitoring is not the same as effluent monitoring. Although environmental monitoring may indicate deposition of radioactive material from an airborne release, it is not measuring the effluent from the release point (e.g. ventilation system outlet).

Discussion

Uranerz asked if this was a question of "stack sampling." NRC staff indicated Uranerz lacked a discussion or commitment of how to address the differences between effluent monitoring and environmental monitoring. Uranerz will revisit.

b.ii. NRC staff requested the applicant to demonstrate why sampling the effluent was not necessary. Uranerz stated it was not practicable to monitor the effluent. Instead of monitoring the effluents, Uranerz provided a description of the vacuum dryer and the emission controls in place, as well as sections from NUREG-1508, NUREG/CR-6733, and NUREG-1569 that state the vacuum dryer technology results in zero emissions and no need for ventilation to the atmosphere (RAI response pages 38-39).

Uranerz does not propose to perform surveys in the workplace and monitoring the effluent sufficiently to demonstrate compliance with the requirements of 10 CFR 20.1302, which states that licensees shall survey radioactive materials in effluents released to unrestricted and controlled areas to demonstrate compliance with 10 CFR 1301. Regulatory Guide 8.37, ALARA Levels for Effluents from Materials Facilities, states airborne radioactive effluents should be from monitored release points (e.g., monitored stacks, discharges, vents) to ensure the licensee meets established ALARA goals. The regulatory guide also states that the licensee should estimate unmonitored effluents if monitoring is not practicable and that unmonitored effluents should not exceed 30 percent of the total estimated effluent releases. The applicant is proposing 100 percent of the estimated effluents will be unmonitored.

Discussion

Uranerz will address.

Section 5.7.1 Effluent Control Techniques

a. NRC staff requested that the applicant demonstrate that the dryer system will not release any particulate emissions. Uranerz stated that the response provided to the NRC's question in Section 4.1 b.ii is applicable and provides a description of the dryer room, possible sites that yellowcake could be released from the equipment, and the ventilation system. Uranerz states that the dryer would not be expected to create significant airborne material due to the high moisture content of the yellowcake (RAI response page 43).

Uranerz does not provide any definition of “significant release” nor provide any methods of monitoring the air in the dryer room or the ventilation system to verify that any airborne particulates will not exceed the ALARA goals or 10 CFR 1301 and 1302.

Discussion

Uranerz indicated it thought it discussed filters and removal of particulates by discussing air that moves into the condenser circuit. A tiny amount might escape the vacuum; however, the condenser will capture 99.99 percent. NRC staff inquired into what that small amount is, and why is this not an issue. Ceramic filters were discussed and that pulse jets of air contain and keep dust from building up on surfaces.

Section 6.2, Surface Reclamation and Decommissioning

a. NRC staff requested that the applicant provide a description of the procedures for conducting surveys to meet the clean-up criteria in 10 CFR 40, Appendix A, Criterion 6(6). Uranerz committed to preparing a clean-up plan at least 12 months before the reclamation of a well field or licensed area begins. The plan will include a description of the areas to be reclaimed, the planned reclamation activities, methods to be used to ensure protection of workers and the environment against radiation hazards, the planned final radiation survey, including cleanup criteria for uranium in soil, and a respective cost estimated (RAI response page 66).

Uranerz did not provide a survey methodology or a commitment to using the MARSSIM, or similar, methodology. Uranerz has not provided enough information for the NRC staff to evaluate if the methodology meets the criteria required in NUREG-1569 or 10 CFR 40, Appendix A, Criterion 6(6).

Discussion

NRC staff indicated that a general description of survey methodology should be supplied.

d. NRC staff requested that Uranerz provide assurance that the survey method for verification of soil cleanup is designed to provide 95 percent confidence that the survey units meet the cleanup guidelines. Uranerz stated the issue will be addressed in the planned final survey for soil that was included in the response to Section 6.2.a (RAI response page 67).

Uranerz does not provide a survey methodology. The applicant has not provided enough information for the NRC staff to evaluate if the methodology meets the criteria required in NUREG-1569 or 10 CFR 40, Appendix A, Criterion 6(6).

Discussion

Staff and Uranerz had a discussion about closing out wellfields using MARSSIM technology. Uranerz asked if a close out survey showed hot spots and averaging is allowed, is MARSSIM technology used in that way ok for release? NRC staff indicated it could be used that way.

e. NRC staff requested that the applicant provide additional discussion of the soil cleanup program, to include areas to be surveyed, on-site transportation routes, historical spill areas, and areas near deep disposal wells. Additionally, details of the pre-reclamation survey with specifics on how it and the baseline survey would be used to identify potential contamination areas and details of the final status of the site were requested. Uranerz stated the issue would be addressed in the planned final radiation survey within the response to TR Section 6.2.a (RAI response page 67).

Uranerz does not provide a survey methodology. The applicant has not provided enough information for the NRC to evaluate if the methodology meets the criteria required in NUREG-1569 or 10 CFR 40, Appendix A, Criterion 6(6).

Discussion

This is similar to above and Uranerz will address.

Other Regulatory Issues:

Section 5.7.9, Quality Assurance

There were no RAIs associated with Section 5.7.9, Quality Assurance (QA). Uranerz has committed to a QA program in their license application, however, has offered no specifics or provided an established program as discussed in NUREG-1569, section 5.7.9.3. NUREG-1569, section 5.7.9.3 states the proposed QA program should be consistent with guidance provided in Regulatory Guide 4.14, Section 3 and 6 and Regulatory Guide 4.15.

Uranerz states in TR section 5.7.9.8, Review of Quality Assurance Program, "The quality assurance program will be implemented consistent with NRC Regulatory Guide 4.15 'Quality Assurance for Radiological Monitoring Programs (Normal Operations) – Effluent Streams and the Environment,' Revision 1, 1979." NRC staff notes that Regulatory Guide 4.15, Revision 2 has been updated as of July 2007.

NRC staff would like Uranerz to discuss when the QA program will be developed.

Discussion

This issue was discussed briefly before the meeting ended, but there was no substantive discussion due to time constraints.

Section 5.7, Accidents

Based on a recent accident at PRI, plans to contain only the volume of the largest tank may not be sufficient. What are the contingency plans for a failure of two or more tanks? Uranerz should provide historical performance of the ISR industry as information supporting the accident analysis.

Uranerz should demonstrate that sump capacity is sufficient to contain the volume of the largest hazardous material source. Consideration should be given to larger volume accidents.

Discussion

These issues were discussed briefly before the meeting ended, but there was no substantive discussion due to time constraints.

Action Items:

NRC will provide a detailed meeting summary of the issues discussed within 30 days.

The meeting and teleconference ended at approximately 3:50 p.m. eastern time.

ATTACHMENTS: Meeting Agenda - Attachment 1
Attendee List - Attachment 2

MEETING AGENDA
Uranerz Energy Corp.
May 19, 2009

MEETING PURPOSE: Teleconference to Discuss Uranerz Energy Corporation's Source Material License Application and its responses to NRC staff's request for additional information.

MEETING PROCESS:

Time	Topic	Lead
1:00 p.m.	Introductions	All
	Discussion of Hydrology RAI responses	All
	Discussion of Health Physics RAI responses	All
	Discussion of Additional items	All
	Summary of Action Items	Moderator
	Public Comment/Questions	Moderator
4:00 p.m.	Adjourn	

Attachment 1

MEETING ATTENDEES

Date: May 19, 2009

Topic: Discuss Uranerz Energy Corp's Response to NRC RAI's

NAME	AFFILIATION	PHONE NUMBER	E-MAIL
Glen Catchpole	Uranerz Energy Corp.	307-265-8900	gcatchpole@uranerz.com
George Hartman	Uranerz Energy Corp.	307-265-8900	ghartman@uranerz.com
Mike Thomas	Uranerz Energy Corp.	307-265-8900	mthomas@uranerz.com
Kurt Brown	Uranerz Energy Corp.	307-265-8900	kbrown@uranerz.com
Glenda Thomas	Uranerz Energy Corp.	307-265-8900	gthomas@uranerz.com
George Hoffman	Uranerz consulting hydrologist	307-266-6597	hydro@alluretech.net
Craig Holmes	Uranerz consultant	512-731-9082	pommelhouse@sbcglobal.net
James Webb	NRC	301-415-6272	james.webb@nrc.gov
Elise A. Striz	NRC	301-415-0708	elise.striz@nrc.gov
Steve Cohen	NRC	301-415-7182	stephen.cohen@nrc.gov
Tanya Oxenberg	NRC	301-415-6142	tanya.oxenberg@nrc.gov
Ron Linton	NRC	301-415-7777	ron.linton@nrc.gov
Tom Lancaster	NRC	301-415-6563	thomas.lancaster@nrc.gov
Jim Durham	CNWRA staff	210- 522-6934	jsdurham@cnwra.swri.edu
Alexander Sun	CNWRA staff	210- 522-6800	asun@cnwra.swri.edu
Chandrika Manapally	CNWRA staff	210-522-5182	cmanepally@cnwra.swri.edu
Robert Lenhard	CNWRA staff	210-522-6418	rlenhard@cnwra.swri.edu
Wayne Heili	Ur-Energy		
John Cash	Ur-Energy	307-265-2373	John.Cash@ur-energyusa.com

Attachment 2