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WMUR:KBW
Docket No. 40-8786

Uranium Resources, Inc.
ATTN: Mr. Mark S. Pelizza
735 Promenade Bank Tower
Richardson, Texas 75080

Gentlemen:

We have completed a preliminary review of your application requesting a source material license for a research and development in-situ uranium recovery facility in Converse County, Wyoming, and have accepted it for further processing. Docket No. 40-8786 has been assigned to this case and should be referred to in all future correspondence.

Although the application has been accepted for further processing, a number of question areas have been detailed and additional information needs outlined. The questions need to be fully answered and all information requests met before any further review can be conducted. It is recommended that the individual numbered pages be corrected where necessary or additional pages of the same number be added with consecutive letters. This is to keep the application current and accurate. Any revised pages should contain the date of revision clearly printed on the page.

The section of the text on pump tests and Appendix II are continuing to be reviewed and additional requests for clarification will be forwarded as the review on this section continues. Also, the evaporation pond foundation and embankments are still in the process of being reviewed.

Specific questions and requests for additional information are attached. Please respond to these requests by no later than June 24, 1981. If you have questions on this transmittal, please call Kristin B. Westbrook of my staff at (301) 427-4601.

Sincerely,

Original Signed by:
J. J. Linehan

John J. Linehan, Section Leader
Operating Facilities Section I
Uranium Recovery Licensing Branch
Division of Waste Management

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Attachments
1. Questions
2. Requests for Additional Information - URI Solution Mining R&D Project

5/27/81 -- MAG II, Revision No. 1

OFFICE	WMUR	WMUR	WMUR				
SURNAME	KWestbrook:mb	JJLinehan	RAScarano				
DATE	5/27/81	5/27/81	5/ /81				

NRC FORM 318 (10-80) NRCM 0240 OFFICIAL RECORD COPY USGPO 1980—329-824

QUESTIONS

1. P. A-36 -- This states that in the event of a water sample reading showing chemical excursion levels a second sample will be taken within 24 hours and if the first was the result of improper sampling or faulty analysis then no further action will be taken. Why would it be logical to assume that the first one is in error and not the second? In such a situation a third sample is needed. Also, the NRC must receive the same information on excursions as the State of Wyoming.

2. P. B-32 -- This provides a description of the #1 clay. It is given as about 14', but P. B-48 gives it as 15'-20' thick and P. C-24 gives it as 12'-15' thick. Also, the geophysical logs show silty/sandy beds with presumably higher permeability. Please explain the differences in thickness and explain how we are assured that this variable material, both in terms of thickness and lithology, is a reliable aquiclude.

3. P. B-34 and P. D-10 and App. I -- These sections are on water quality chemical parameters tested for and to be used as restoration limits as well as excursion indicators. Throughout the sample analysis data the entry N.D. is very frequently found. This has been defined by M. Pelizza and your lab as "not detectable" as per the detection limit and not as "not determined". Please verify this in your written responses.

4. Fourteen wells were used in sampling for water quality on 7/14/80, 7/23/80, 8/80, 11/80 and 1/81. All fourteen of these wells are contained within a 400 ft. square area. A very high number of N.D. data readings are given for most of the chemical parameters. In general, there is more data above the detection limits for the later samples 11/80 and 1/81 than for the earlier samples which are most often given as N.D. The explanation might be that the water quality changed over time. However, certain chemicals such as Fe, Cl, Mg, F, K, Na and TDS show up at consistent levels throughout all five sample dates.

   Some chemicals we would expect to see at detectable limits almost everytime a sample is taken show unusual variations. On some sample dates a chemical parameter will show up way above the detection limit and then for the same date be shown in the nearby wells as N.D. Another way in which this type of anomaly occurs is that a chemical parameter will show up way above the detection limits on one date, while for the same well, the chemical is listed on the

previous sample date as N.D. Uranium (U) is an example. It's detection limit is .001 as per your lab. The following chart summarizes the data for U:

U
(all units in mg/ℓ)

Well #	7/14/80	7/23/80	8/80	11/80	1/81	Detection Limits
P-1	.028	.020	.014	no sample	.028	.001
I-1	ND	.005	.013	.008	.001	.001
I-2	ND	.004	.006	.008	.002	.001
I-3	ND	ND	ND	ND	.002	.001
I-4	ND	.004	.006	.004	.003	.001
MW-1	ND	.008	.007	.003	.045	.001
MW-2	ND	.005	.008	.014	.068	.001
MW-3	ND	ND	ND	.017	ND	.001
MW-4	ND	.008	.009	.026	.002	.001
MW-5	ND	.004	.002	.006	.003	.001
MW-6	ND	.005	.003	.006	.008	.001
MS-1	.024	ND	no sample	.004	ND	.001
MS-2	no sample	no sample	no sample	.001	ND	.001
DM-1	no sample	no sample	no sample	.006	ND	.001
M-3	dry					

4a. Generally it appears that there are less N.D. readings given for U in the last two sample intervals (11/80 and 1/81) than the first two sample intervals (7/14/80 and 7/23/80). This holds true for Cr, Mn, Ag, Pb, Ba, and Cu. All of these show up above detection limits suddenly in the 11/80 samples in many different wells. None of these six different chemicals ever showed up above detection limits in any of these same wells during the previous three separate sample set intervals.

4b. Zn is another example of the anomalies. Zn doesn't show up for any well in the 7/14/80 sample set, but Zn shows up in every single one of these same wells in the 1/81 sample set. The same fourteen wells were involved in all sample sets. Readings occur in these same wells on other dates, and compared to the detection limits the readings are often 1 to 3 orders of magnitude greater. The following chart summarizes the data for Zn:

Zn
(all units in mg/ℓ)

Well #	7/14/80	7/23/80	8/80	11/80	1/81	Detection Limits
P-1	ND	ND	.06	no sample	1.60	.005
I-1	ND	ND	.03	.19	.16	.005
I-2	ND	ND	ND	.01	.14	.005
I-3	ND	ND	ND	ND	.1	.005
I-4	ND	ND	ND	ND	.11	.005
MW-1	ND	ND	ND	ND	.06	.005
MW-2	ND	ND	ND	ND	.06	.005
MW-3	ND	ND	ND	.01	.03	.005
MW-4	ND	ND	.09	.12	.06	.005

Zn
(all units in mg/ℓ)

Well #	7/14/80	7/23/80	8/80	11/80	1/81	Detection Limits
MW-5	ND	ND	.03	.15	.03	.005
MW-6	ND	ND	.03	ND	.07	.005
MS-1	ND	.1	no sample	.16	.16	.005
MS-2	no sample	no sample	no sample	.02	.03	.005
DM-1	no sample	no sample	no sample	.24	.03	.005
MS-3	dry					

4c. Some chemicals which we would expect to find detectable levels for in at least a few cases, based on our prior experience in the uranium bearing formations of Converse County, Wyoming, are missing numerical data readings and are listed simply as N.D. Out of a total of 62 separate tests involving the same 14 wells, which are tested repeatedly for Cd, Hg, V, B, Co, Se, Mo, and Ni, all results for these parameters are given as N.D. The following chart gives the detection limits:

Chemical Parameter	Detection Limits mg/ℓ
Cd	.005
Hg	.001
V	.05
B	1.0
Co	.05
Se	.01
Mo	.1
Ni	.04

Please verify that 62 tests for each of these chemicals were performed and were always below the detection limits shown on the above chart.

4d. The indications of anomalies which are detailed in this document have resulted in concerns about the quality assurance for the water sampling and analysis program. Please provide these quality assurance programs. Also, please provide letters from the laboratory used verifying that they used the limits specified above. If they did not use these limits, the limits used should be provided.

4e. Based on the above comments, we request that you review all of your groundwater quality data and provide us a detailed explanation for the extremely high number of N.D. readings and large variation in levels of specific chemicals in some nearby wells on the same dates and for the same well over the 7 month sampling period.

5. P. C-4 -- This mentions pore volumes. Give the pore volume calculation.

6. P. C-5 -- It is stated on this page that water restoration activities will be conducted in a geologic interval 575-600 ft. deep. However, C-24 gives 530 ft. as the production zone and B-27 gives it as 610 to 620 ft. deep. Please explain these differences.

7. P. C-24 -- Our independent calculation of the figures at the bottom of the page shows that the numerical solution given for the equation is wrong. Please check your calculations.

8. P. C-24 -- This states that total drilling depth calculations are made by the use of existing exploration geophysical logs. Wouldn't the depths be a known fact during drilling operations? What were the survey controls on elevations at the tops of all the holes?

9. P. C-36 -- This states that a continuous water level recorder will be placed on a production zone monitor well and on a non-production zone monitor well. Please provide these well numbers as soon as they have been determined and include the figures you propose to use for water level readings which will signal an impending excursion situation.

10. P. C-36 -- This states that all monitoring wells will have water level readings <u>every two weeks</u> except the two with continuous recorders. P. C-38 -- Says all monitoring wells will have <u>weekly</u> water level readings. How often will the levels be taken?

11. P. D-4 -- This states that measurements will be taken frequently at the effluent of the anion exchange column and cation column during restoration. How frequently will this be done?

12. App. I, P. 1 -- This gives the depth to all well screens as approximately 430'. Provide the elevations of the top and bottom of the screen, the total number of ft. open and in what aquifer it is open. If it is only open to part of an aquifer specify upper, middle, or lower part.

13. App. I, P. 7 -- This states in a data sheet comment that "Well P-1 produced large amounts of very fine grey sand and a strong smelling white foamy residue. Notice should be taken of this since this is your production well." Is the strong smell and foam a result of hydrogen sulfide which seems probable in view of the high organic content (Ref. P. E-3)? Is this comment a warning which indicates serious problems with the efficiency of your production well which is producing large amounts of fines after development was completed?

14. App. I, P. 7 to P. 18 -- This section mentions foamy turbid water in Wells I-1, I-2, MW-2, and MW-5. Well I-3 has foamy residue after five casing volumes and produces gas. Well MW-3 is very turbid with a lot of fine sand. Well MS-4 is extremely turbid with air and gas. This section contains data on the flow rates from the same wells used in the pump tests. The flow rates shown from 7/12/80 to 1/17/81 vary considerably between the closely spaced wells and the same wells often show significant variation. The comments indicate the occurrence of drawdown problems repeatedly. Also, there is a "usual large increase in conductivity with the second and third casing volumes pumped." Could this be caused by perched high gas pockets, the perches being formed by the clay lenses mentioned in the text (Ref. P. B-32)? Provide an analysis of all the explanations which could be possible causes of these occurrences and explain why a particular explanation is thought by U.R.I. to be the most probable.

15. P. B-48 -- This describes the area of pump tests with reference to a map which is not in the report. Copies should be provided.

16. P. B-48 -- Based on the geophysical logs provided in the application we disagree with the term "massive 270' clay". This should be amended to include the existence, elevation, and thickness of the sand units within this clay which are relatively thick and laterally continuous.

17. P. B-39 -- This page is not in the report.

18. Since the main purpose of this project is to demonstrate ground water restoration feasibility and the absence of excursions beyond the injection well pattern, and not the feasibility of mining, how can we be certain that contamination and restoration would be typical of actual mining operations if the wellfield area is not completely mined out?

ADDITIONAL INFORMATION NEEDED

1. Approximately 65 exploratory borings are shown in Figure C-4a. It is necessary to number these holes on the diagram and to indicate which is a core sample hole, a geophysical hole or both.

2. Copies of all lithologic core sample logs for the exploratory holes in the circled area from Figure C-4-4a should be provided. For these core logs the following information is needed: (1) The hole # from the location map; (2) Observations made during drilling; (3) Thickness of the overburden; (4) Elevation top of rock and bottom of the holes; (5) Total footage of rock drilled; (6) Casing through the overburden, details of how it's set and elevations; (7) Total length of core material actually recovered and the diameter; (8) Total core loss (these locations should be marked on the logs); (9) A scale with detail such as 1" = 10' to 1" = 1'; (10) Date started and finished; (11) Lithologic symbols; (12) Log or horizontal and vertical fractures; (13) Lithologic description corresponding to the log of vertical and horizontal fractures; (14) It is expected as is common practice that this information will shown on adjacent columns of the same log sheet.

3. A map showing the ore body in the permit area should be provided.

4. Regional joint patterns and references as to the sources should be provided.

5. Earthquake history should be provided.

6. Regional potentiometric contour map for the production aquifer should be provided.

7. A production schedule in number of months should be provided.

8. A restoration schedule in number of months should be provided along with a separate restoration circuit flow sheet.

9. The monitoring and injection well development details need to be fully explained. The total number of ft. open and the aquifer or part of an aquifer in which the screen openings occur is needed. The development details should be provided including: Gravel pack material for the screen including height of the gravel pack thickness, method of installation, and quality assurance on the gravel pack. Give the development date for each individual well number.

Laboratory Analysis

10. The percentages of mineral constituents for a specified # of representative samples should be given for the 1, 2, 3, and 4 sand and clay units. A minimum of two samples for each unit is requested.

11. The % effective porosity to the lixiviant of a specified # of representative samples (not less than a minimum of two) from the 2 production sand should be provided.

12. The laboratory data on the 1, 2, 3, and 4 sand and clay units should have an analysis which will provide the % of clay, silt, fine and course sands. This should be provided for a specified # of representative samples not less than a minimum of two. In addition to this data, an analysis of the various interpretations and possible significance of each should be made. This is needed to independently determine the rock type classification.

13. The laboratory performing the water quality analysis should provide signed laboratory tests sheets for all tests on a few representative chemical parameters. This is to allow for independent confirmation that all calculations were correct and that all the figures were transcribed without error. We are requesting all the tests sheets for Zn, U, V, and Se.

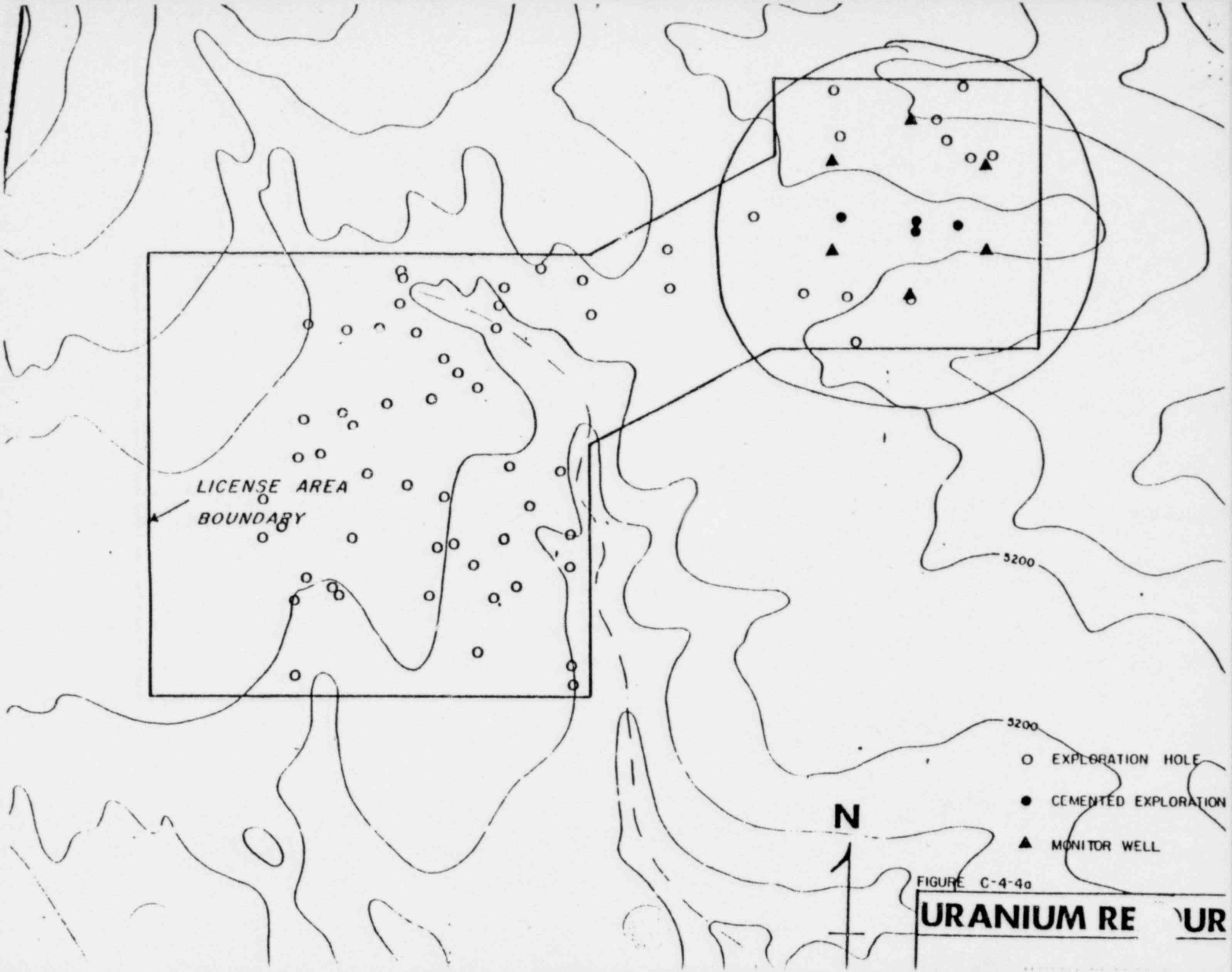

FIGURE C-4-4a

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