

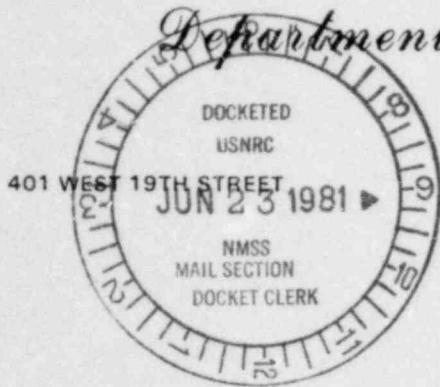


Docket 40-8786

PDR ED HERSCHLER GOVERNOR

Returns  
D. Cramer  
396-35

Department of Environmental Quality



LAND QUALITY DIVISION

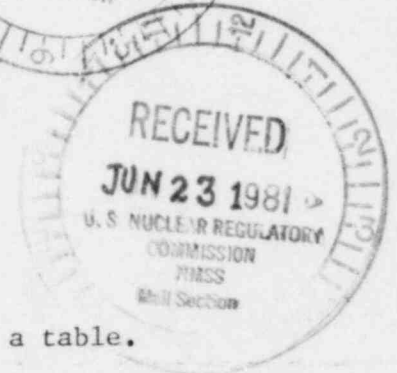
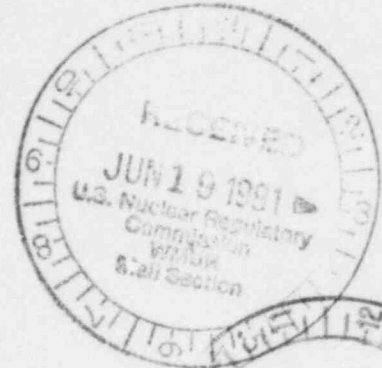
TELEPHONE 307-777-7756

CHEYENNE, WYOMING 82002

June 10, 1981

MEMORANDUM

TO FILE: Uranium Resources, Inc., North Platte  
PROJECT: TFN 1 4/225, Converse County, Wyoming  
FROM: Jim Brinkman J.B.  
SUBJECT: Initial Hydrologic Review



I. Baseline

1. Re: Figure B-5-1
  - a. Contour elevations should be marked.
  - b. Measuring points for wells should be listed on a table.
  - c. The hydrogeologic unit represented by the potentiometric surface should be mentioned in the title or legend.
2. A regional potentiometric surface map should be provided for the production zone.
3. Re: Figures B-4-2, B-5-1, B-5-2, B-5-3, B-5-4. An explanation should be given for the unmarked lines.
4. Re: Page B-41 - Upper control limits.
  - a. The discussion of upper control limits should be presented or referenced in the mine plan.
  - b. The applicant's choice of control limits is unacceptable. The mean value plus three standard deviations will provide a 99.49% confidence, assuming a normal distribution. The high value plus three standard deviations has no statistical significance. The applicant should use an acceptable criterion for the determination of upper control limits.

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Add'l Info

- c. Specific values for upper control limits should be given.
- 5. Re: Page B-45 - Restoration parameters.
  - a. This discussion should be included or referenced in the Reclamation Plan.
  - b. The applicant's determination of restoration parameters is unacceptable. The goal of restoration should be to baseline range on a parameter-by-parameter basis with outliers excluded.
  - c. See Comment #1 in the Reclamation Plan section for further discussion.

- 6. Re: Page B-32

The fourth sentence in the second complete paragraph is unclear and should be corrected.

- 7. Re: Figure B-5-2a

In two of the volumes supplied to DEQ, Land Quality Division, Figure B-5-2 is inserted in the place of Figure B-5-2a. In the third volume Figure B-5-2a is mislabeled. This should be corrected.

- 8. Re: Page B-47

The second paragraph should be corrected.

- 9. Re: Page B-68

An explanation should be given on the method of clay permeability estimation.

- 10. Re: Overlying and underlying aquifers.

Water levels should be given for wells in the overlying and underlying aquifers, and the head relationship between aquifers should be discussed.

- 11. Re: Ground water analyses (pg. B-34a)

Results of the Spring 1981 sampling should be submitted.

- 12. Re: Ground water classification (pg. B-41)

The ground water classification will be made by DEQ/Water Quality Division.

13. Re: Vertical travel times (pg. B-66)

The estimation of vertical travel times assumes an injection rate of 7.5 gpm per well. Page C-15 of the Mine Plan states that injection rates are expected to be 20 - 100 gpm for the field. The travel time calculations should be redone to reflect a worse case.

14. Re: Surface water description.

- a. A topographic map should be included which outlines the drainage basin in which the license area lies. Stream names should be given, and adjudicated water rights within  $\frac{1}{2}$  mile of the license area should be shown.
- b. A short discussion should be included demonstrating that the operation is designed to affect surface waters to the minimum extent necessary.

15. Re: Pages B-32, B-48 and C-24

The thickness of the #1 clay is given as 14 feet, 15-20 feet and 12-15 feet on these three pages. This discrepancy should be corrected.

16. Re: Pages B-34 and E-10 and Appendix I

Anomalous ground water quality data

- a. Explain the variation of uranium concentrations both among wells for a given sample date and for a given well for various samples.
- b. Explain the variation of zinc concentration for wells through time.
- c. Explain the non-detectability of Cr, Mn, Ag, Pb, Ba, Cu in early ground water samples.
- d. Explain the non-detectability of Cd, Hg, V, B, Co, Se, Mo and Ni.
- e. Laboratory test sheets for all tests for Zn, U, V and Se should be supplied.

17. Re: Pages B-27, C-5 and C-24

The production zone depth is identified as 610-620 feet, 575-600 feet and 530 feet on these three pages. This discrepancy should be corrected.

18. Re: Appendix I, Page 1

The following information on well completion and development should be included:

- a. Elevations at the top and bottom of screened, perforated or open intervals.
- b. The hydrogeologic unit and portion of unit being tested.
- c. Well development details.
  - i. Drill methods.
  - ii. Packing or completing methods.
- d. Type and size of screen or perforations used.

19. Re: Figure C-4-4a

The information requested by the NRC for the lithologic core sample logs for the exploratory holes in the circled area should be included in the hydrology or geology section of the permit document.

20. Regional joint patterns should be referenced and discussed.

21. Particle size and mineralogical analyses should be performed on at least two representative samples from each of the 1, 2, 3 and 4 sand and clay units.

22. Re: Appendix I, Pages 7-18

Explanations should be given for the production of fines, foamy turbid water, excessive drawdowns and strong smells during sampling procedures.

II. Mine Plan

1. Re: Figure C-5-1

The localized cone of impression should be above the normal potentiometric surface.

2. Re: Page C-4-1

Monitoring for excursion parameters should continue until the excursion is controlled.

3. Re: Page C-30

Any pressure drop during the packer testing should be considered suspect. Packer test results should be approved by DEQ, Land Quality Division before injection of leach solution.

4. The permit to construct the pond should be included in this application.

5. The shallow hydrogeologic system in the pond area should be described.

6. Re: Production zone (Page C-23)

It is recommended that the 2c sand be included in the production zone.

7. Re: Exploration holes (Page C-25)

All exploration holes within the license area should be sealed.

8. Re: Injection pressures

Anticipated and maximum injection pressures should be given.

9. Re: Excursion monitoring (Page C-38)

a. All monitor wells should be sampled for excursion parameters bi-weekly (every two (2) weeks).

b. LQD Rules and Regulations require excursion notification within 24 hours.

10. Re: Fluid flow paths

A diagram should be submitted showing anticipated fluid flow paths in plan view.

11. Re: Page C-24 - Equation on the bottom of the page.
  - a. The dimensions do not match on the left and right side of the equation. This equation should be corrected.
  - b. A reference and more detailed geologic reasoning should be given for using 1 psi/ft for the fracture pressure.
12. A map showing the extent of the ore body within the permit area should be included.

### III. Reclamation Plan

1. Re: Ground water restoration (Pages D-9 and D-10)
  - a. Once all restoration parameter values fall within the minimum restoration range, a stabilization period of at least six months should begin. During this period, monthly ground water samples should be collected. After the six month period, these data should be sent to DEQ, Land Quality Division for analysis. DEQ will determine if the applicant has no further obligation for subsurface restoration. The reclamation plan should be corrected to include a commitment to this procedure.
  - b. Minimum restoration should be to the pre-mining highest potential use on a parameter-by-parameter basis. Specific minimum restoration criteria should be listed in the application.
  - c. The success of restoration should be based on all Guideline 8 parameters.
  - d. Samples taken during the restoration process should be also analyzed for U, V, Ra-226 and Se.
  - e. Ground water quality of the monitor wells should also be analyzed during the stabilization period.
  - f. The effects of adding H<sub>2</sub>S or SO<sub>2</sub> to the restoration fluid should be carefully analyzed, i.e., formulation of H<sub>2</sub>SO<sub>4</sub> or gypsum.



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Page Seven

2. Re: Page D-12

All contaminated material in the pond area, including the pond liner and contaminated earth, should be removed to a licensed L.S.A. disposal site. The pond site can then be reclaimed with overburden, topsoil and vegetation. The reclamation plan should be altered to include this procedure.

3. Re: Page D-11 - Hole abandonment

The drilling mud used for hole abandonment should meet the specifications of Chapter XV of the Rules and Regulations.

4. Re: Page D-4

A schedule for sampling of the effluent of the anion and cation exchange columns during reclamation should be presented.

JB:klr

cc: Margery Hulbert  
Phil Ogle  
Becky Mathisen  
Toni Mancini-WQD  
✓ Kristin Westbrook-NRC