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PDR

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION VIII
1860 LINCOLN STREET
DENVER COLORADO 80295

MAY 11 1979

REF: 8AH-WM

Mr. Leland C. Rouse, Chief
Fuel Processing & Fabrication Branch
Division of Fuel Cycle & Material Safety
Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Mr. Rouse:

According to our responsibilities under Section 309 of the Clean Air Act, we are submitting the Environmental Protection Agency (EPA) review of the Draft Environmental Statement (DES), NVREG-0504. This review, related to the proposed operation of the Shootering Canyon Uranium Project, was managed by EPA's Region VIII Radiation Control Office.

While our comments cover many areas of concern, there is an overriding issue I want to place particular emphasis on.

We do not agree with the NRC staff's assessment that environmental costs would not decrease if the Shootering Project was rejected since its impacts would be shifted to other existing mill sites. This view does not consider the environmental benefits (no costs) of undisturbed wilderness areas, grazing land and one less tailings disposal site in the State of Utah. In addition, the costs for reclamation will be substantial in compliance with Utah's reclamation law. The savings from reclaiming one mill site instead of two was not considered in the staff's analysis of alternative mill sites. These factors need to be considered in the NRC's Final Environmental Statement particularly since the White Mesa uranium mill is adjacent to one of the two plateau resources ore buying stations in Utah.

In accordance with EPA procedures adopted to rate the adequacy of environmental impact statements, the DES for the proposed Shootering Canyon mill is being designated as ER, Category 2. This means that EPA has environmental reservations (ER) concerning the effects of

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certain aspects of the proposed action. EPA believes that further study of suggested alternatives is required. A Category 2 designation indicates EPA's belief that the DES does not contain sufficient information to assess fully the enviromental impact of the proposed project.

Sincerely yours,

Alan Merson
Regional Administrator

DRAFT

EPA REGION VIII
SPECIFIC COMMENTS ON
DRAFT ENVIRONMENTAL STATEMENT (DES)
(NUREG - 0504)
SHOOTERING CANYON URANIUM PROJECT

1. Page V, Paragraph b. It seems unlikely that a water sprinkler system would be effective in controlling airborne particulates for the entire tailings area - chemical stabilization of the dry areas is suggested as a more likely and effective alternative. What changes would this produce in the radon emission?

2. Page XVii, first paragraph. From the company developed ER, it is apparent that Plateau Resources is a wholly owned subsidiary of Consumers Power Co. This information should be so stated in the FES.

3. Page 1-3, Section 1.3. The DES references NRC's responsibility under the recently enacted "Uranium Mill Tailings Radiation Control Act of 1978." (PL95-604) What additional requirements must be stipulated to comply with this Act? What changes, if any, in tailings management will result?

4. Page 1-3, Section 1.4. This area of Utah (usually referred to as the Henry Mountains Region) has substantial wilderness values and may receive further study under BLM's Wilderness Study Program. According to the Interim Guidelines (Jan. 17, 1979) new mining activity can be permitted so long as any impacts it would cause are either substantially unnoticeable or can be rehabilitated within five years of congressional designation as wilderness. Clearly, such an extensive mining operation as this uranium project and new town cannot fit this exception clause. Therefore, we believe, no mining permits can be issued until this area has been studied for wilderness value.

5. Page 1-4, Section 1.5. We disagree with the conclusions presented on page 1-4 concerning the independent treatment of this licensing action in comparison to other similar licensing actions. Specifically, we believe the NRC staff has not adequately reviewed the cumulative environmental impacts of the Shootering Canyon mill proposal and the White Mesa mill currently being proposed 5 miles south of Blanding, Utah. These two proposals would result in a total loss of 520 acres of potential wilderness and grazing land. Land which would be contaminated from tailing impoundments. We believe that an expansion of uranium production (U_3O_8) at one of these proposed mills could eliminate the need for two proposed mills thus eliminating the amount of land impacted. Further, we question the transportation costs and accident potential for ore trucks. The White Mesa mill proposal would mean shipping 25% of the ore supply from

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Hanksville. Hanksville is located 48 miles north of the proposed Shootering Canyon mill and about 163 miles from the White Mesa mill. In addition some (about 10%) of the ore supply for the Shootering Canyon mill proposal is to be provided from a station in Blanding, Utah. Blanding, Utah is over 100 miles from this mill site and is only five miles north of the proposed White Mesa mill site. While it appears reasonable that the companies involved will arrange a mutual understanding to trade ore instead of hauling it, this cannot be guaranteed. Additionally, since the amounts proposed to be hauled between Blanding and Hanksville by the two companies are not equal, much of it will be hauled anyway. This does not appear to be in the best interest of local residents and travelers in the area.

Since the White Mesa Uranium Project is a nominal 2000 ton per day proposal, it could handle the Shootering Canyon Project's 750 ton per day capacity with only minor modifications. While this alternative would increase the ore hauling questioned above, we believe the lessor long term environmental impact committment would be justifiable.

We question if the short term economic benefits derived from these proposed operations for far removed electrical power companys have been adequately evaluated with the best achievable milling proposals for minimizing long term environmental impacts of this area.

6. Page 2-5, Figure 2.1. In using a regional approach to address the uranium mining and milling impacts, Figure 2.1 should show the location of the Atlas Mill in Moab and the Rio Algom Mill in La Sal. This figure, showing the location of surrounding facilities is an improvement from previously developed DES's and should be continued.

7. Page 2-6, Section 2.4.2. In view of the very large population increase projected for Garfield and the counties, through the year 2000, socioeconomic and other projections should be made for longer than 21 years. This will only be about five years or so after shutdown (15 year operation) yet the impact is barely beginning at that time.

8. Page 2-14 ff, Tables 2.8 and 2.9. The variability in the radiological analyses is indicative of the necessity to obtain a good analytical contractor and to have a good quality assurance program. If the analytical results are placed in a common set of units (such as pCi/l) the differences become more apparent. Some discussion of the significance of the variability should be given. Presumably R-222 should be Rn-222.

9. Page 2-16, Section 2.6.2. Before placing too much significance on the selenium in water concentrations, the recent report by Dreesen et. al.,* should be reviewed.

*Contaminant Transport, Revegetation, and Trace Element Studies at Inactive Uranium Mill Tailings Piles by D. Dreesen et. al., Symposium on Uranium Mill Tailings Management, Fort Collins, CO, November 1978.

10. Page 3-1, Section 3.1.1. It is stated that the underground mining activity is expected to be a dry activity; encountering little or no groundwater. If substantial groundwater flow is encountered, the committment is made to use the water in the milling process. Considering the distances between the mill and the mine sites, we are skeptical that this would be implemented. Faced with the cost of conveying this water to the mill, we feel a shift in policy to thealternative of discharge to one of the normally dry canyon drainages, without chemical treatment to reduce radionuclide concentrations is likely. Therefore, we recommend that the company commit itself to dispose of mine dewatering effluent by treatment and discharge instead of use as mill process water. (Note: It is acknowledged that use as process water is the most environmentally acceptable. It is the practicality of such in the highly unlikely event that a problem occurs is being questioned.)

11. Page 3-3, Section 3.1.2. Despite the rather elegant and technical description of the disposal procedure -

"...The waste rock will assume its natural angle of repose as it is dumped. Appearance of the waste rock piles will be similar to the appearance of the numerous natural talus slopes now bordering the floor of Shootering Canyon and other canyons in the vicinity..."

The DES essentially proposes dumping the waste rock over the side and down the canyon walls.

Under some circumstances waste rock from uranium mining can be classified as a "hazardous waste" in the proposed Resource Conservation and Recovery Act (RCRA) regulations recently published in the Federal Register (Dec. 19, 1978). It is not clear whether the proposed regulations could be complied with, if the waste rock falls within the definition of hazardous waste. The FES should clarify this particular point. Acceptability of the proposed procedure, or lack thereof, with the requirements of the requirements of the State of Utah Mined Land Reclamation Act and the Solid Waste Disposal Regulations needs a full discussion in the FES.

12. Page 3-6, Section 3.2.2. Surprisingly, there doesn't appear to be any ore sampling or blending. Although this seems unlikely, there should be enough sampling and analysis to at least determine the average content of radionuclides in the tailings.

13. Page 3-11, Section 3.2.3.3. Any materials which will be disposed of as non-radioactive wastes should first be monitored to assure that appropriate standards are met.

14. Page 3-11, Section 3.2.4.1. Surely the test drilling program to define the ore body resulted in the penetration of aquifers within and above the ore body. Any resulting water level and water quality data should be provided in the FES.

15. Page 3-18, paragraph 3 & 4. The tailings drainage system will tend to increase the size of exposed surfaces and speed the drying of surface materials. This will increase the potential for wind erosion emissions. The addition of tailings liquids to all exposed drying areas will have to be done on an almost continuous basis to be effective. The use of dust stabilizing chemicals on exposed tailings beach areas should be considered as a more permanent and effective method for reducing wind blown emissions from the dry tailings areas until the point in time these are permanently stabilized.

16. Page 3-18, paragraph 6. What are the heavy metals and radionuclides that won't be mobilized?

17. Page 3-21, Section 3.3.2.1. The proposed plan does not provide for revegetation by seeding and soil additives, but the establishment of vegetation by natural secondary succession. This does not meet State requirements for revegetation. Furthermore, it is inconsistent with the reclamation requirements for other "new" uranium mills. It is recommended that the reclamation plan be revised to provide for fertilization and seeding with native species.

The proposed plan provides for the "ponding" of basin runoff over the protective tailings cap to establish conditions conducive to natural establishment of a vegetative cover. Also, the NRC staff in approving this concept indicates the advantage of improving the integrity of the clay cap by preventing dessication and, therefore, limiting the development of shrinkage cracks. Since the policy to date has required grading and diversion structures to prevent ponding on reclaimed tailings areas, the apparent policy change should be noted specifically. Although the concept appears on paper to have few disadvantages, without a more detailed description we are reluctant to conclude that diverting runoff from the drainage basin wouldn't be more desirable in a long term basis.

18. Page 4-3, Section 4.1.2. Dust suppression methods for ore stockpiles and haul roads should be a permit condition?

19. Page 4-4, Section 4.2.1.2. The loss of rangeland due to inability of vegetation to become reestablished is probably a minor impact compared to the erosion potential treated. Long term tailings pile stability is a crucial issue considering the erosion potential of native soils and the position of the tailings in an ephemeral stream channel. No stability analysis is presented for the period after the pile is active. Despite the comments on p. 10-12 (para. 4), the potential for erosion of the pile is believed to be significant.

20. Page 4-5, Section 4.3.1. Better drawings of the post-reclamation spillways and diversion ditches should be shown . Some of the statements on page 4-5 seem inconsistent with statements on page 3-21. If overland runoff can pond on the tailings cap and deposit sediment, why would the runoff go into the spillways instead of over the dike. If it can go over the dike it will cause erosion. Also if water is allowed to pond on the tailings cap we would expect some seepage to continue, possibly through the tailings cap, since it is not 100 percent impervious (see EPA publications. ORP/LV-78-5 and ORP/LV-78-8). If seepage does occur, what measures will be taken to handle it, since presumably the drainage system will still be intact. The applicant may be creating a seepage spring containing various radioactive and non-radioactive pollutants. It is not obvious why it is considered unlikely that surface waters will be contaminated by seepage from the impoundment. On the whole, the use of the stream to deposit sediments in the short term but not erode the pile over the long term infers great knowledge of and reliance on stream processes. The disposal scheme, for this reason, is bold and innovative but without precedent. Much more extensive discussion of adverse effects of the tailings on surface water and groundwater resources (and vice versa) is needed to elevate this approach from an idea to a practical, safe reality.21.
Page 4-6, Section 4.3.1. How will the liner be tested to show that it meets the required permeability? There is no mention of what will be done if water contamination does occur or if new seeps occur.

22. Page 4-5, Section 4.3.2. This Section indicates that the mill will utilize 538 acre ft/year of water from the Navajo Sandstone. This does not include the water that will be required by the mill town which will be constructed to house workers. This impact should be discussed in detail. The statement does not discuss any potential water rights problems that might develop from taking in excess of 1000 acre ft/year that eventually would become surface water. It would be worth raising this as a potential regional issue that the applicant might have to address if they have not already done so.

23. Page 4-8, Section 4.6.2. It is assumed that the word, "an" (underlined), in the below quoted sentence is a typographical error and should be "no".

"...Localized increases in erosion and turbidity expected to have an effect on aquatic biota in Lake Powell; therefore, no unacceptable impact to aquatic biota is predicted."

If not, a more detailed explanation is needed.

24. Page 4-9, Figure 4.1. The wildlife to human exposure pathway (such as deer) is not included in the figure.

25. Page 4-12, Table 4.7. The NRC regulation (10 CFR 20) applicable dose limit for the bronchial epithelium is reported in working levels (WL) in this table, but was reported in cumulative working level months (CWLM) in Table 4.6 of the Moab DES. This inconsistency is confusing to the reader and make comparisons difficult. The estimated radiation doses to the bronchial epithelium as reported in mrem/yr in this table appears to be low.

26. Page 4-13 ff, Section 4.8. Socioeconomic and other impacts seem to be limited to less than 25 years. The hazardous nature of tailings will persist for many millenia.

27. Page 4-13 ff, Section 4.8. The limited information in this section indicates that successful development of the Ticaboo Subdivision is risky. Further, it appears that Plateau Resource's obligation is minimal and that the costs borne by the private developer will be recovered rapidly. Long term responsibilities (such as schools and maintanance) will be borne by the county and the subdivision could well become a resource draining liability when milling activities are terminated. As this is a major impact, more detailed accounts of company, developer, and county responsibilities are necessary in the FES.

28. Page 5-3, Section 5.1.3.1. The figure of 1.9×10^4 kg implies that no more than about one truckload of yellowcake will ever be on site at any one time. This seems inconsistent with practice at other mills.

29. Page 5-5, Section 5.1.3.2. Whether or not tailings reach a watercourse, should a tailings pile containment system fail, is largely a function of whether the pile is in a stream channel to begin with. It is hard to conceive of failure at Shootering Canyon without the introduction of tailings to the channel. Therefore, reference to other failure instances involving tailings piles positioned away from drainage channels is inappropriate.

30. Page 5-6, Paragraph 2. Are these statements based on an engineering analysis or on supposition.

31. Page 5-7, Section 5.3.1. The major toxicity of yellow cake appears to be heavy metal poisoning to the kidney, not radiation damage. A chemical toxicity evaluation of accidental dispersal to the public should be made, particularly in the case of juvinial ingestion of uranium.

32. Page 5-8, Section 5.3.1. Yellow cake shipments in congested urban areas appear to be neglected in the accident models. A population density of 160 people per square miles is not an accurate representation of an urban area, where larger traffic volumes and busy intersections increase the likelihood of an accident with a higher population dose potential. An accident model, utilizing specific data for a metropolitan area such as Denver, would be useful in evaluating the most severe accident consequences.

33. Page 5-9, Section 5.3.3. Truck shipments of amines and sulfuric acid should be discussed.

34. Page 6-1, Section 6.2.2. The staff states their reservations concerning the applicant's planned reclamation procedures. We agree with the staff and have additional comments to offer on such procedures based on our experiences with reclamation in New Mexico. We believe soil testing should be done to measure the soil toxicity and nutrient content. Application of fertilizers will most likely be necessary and by requiring soil testing the absent nutrients and elements can be accurately supplemented in the topsoil. We note that the staff (p. 3-22) has recommended that the majority of seeds should be native species, which we would also like to emphasize. In an arid region like Shootering Canyon (7" rainfall/yr), species such as wheatgrass and alfalfa will require significant irrigation. Even native species adapted to the area will require irrigation for at least a year or more. The EIS should discuss these water requirements and methods of irrigation for reclamation. We suggest that the first seeding might include grasses and a legume (sweet clover, alfalfa, or wheatgrass as was suggested in the draft EIS). Straw or some kind of mulch would help to retain the topsoil and moisture content of the soil. After these initial species have been established, ploughing these species into the soil would provide some organic matter in the soil. Native species could then be applied in the area with some degree of success.

35. Page 6-2, Section 6.3.2.1. Th applicant does not indicate in this section that the company will monitor water levels in their wells. Water levels should be measured in all wells when quality samples are taken.

36. Page 6-2, Section 6.3.2.2. Monitoring wells should be constructed so that a pumped sample can be taken. A grab sample can often be non-representative of the actual formation quality unless the well can be totally bailed several times before taking the samples.

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37. Page 6-3, Figure 6.1. The three monitoring wells that are located down gradient of the tailings ponds as shown in Figure 6.1 seem to be close together. There should be consideration given to having them placed further apart.

38. Page 6-5, Section 6.6.1. To provide a useful perspective, the preoperational monitoring program should have been complete before the DES was published for review.

39. Page 6-7 ff, Table 6.1. The preoperational monitoring program needs to be expanded and include:

(a) Air, particulates

The analytical protocol should be expanded to include suspended particulates (weight) and polonium-210.

(b) Surface soil

A fraction of the samples (10 to 20%) also should be analyzed for polonium-210 (to obtain total characterization of all the potentially significant radionuclides).

(c) Stream bottom sediment

At least one of the two sample sets also should be analyzed for polonium-210.

(d) Groundwater

Groundwater samples should be analyzed for chemical constituents (metals, sulfate, etc.) which are expected to be of significant concern in the tailings liquor if leaching or seepage takes place in the future.

40. Page 6-9 ff, Table 6.2. The following additions to the operational monitoring program are recommended:

(a) Air, particulates

(i) Considering the several sources of airborne, radioactive particulates - tailing impoundment, ore storage piles, ore haulage, etc. - it seems probable that more than three sampling stations will be required to monitor on-site air quality.

(ii) Weekly inspection of the tailings impoundment to monitor the effectiveness of interim stabilization procedures should be supplemental with air particulate monitoring stations located on the periphery of the

impoundment (fence-line). These stations should be located in the downwind sector. Routine analysis of these samples be for gross alpha; a fraction of the filters (10 to 20%) or those showing unusually high gross alpha results should be analyzed for radium-226, thorium 230, uranium 238-234. Compositing schedule for analysis should be monthly.

(iii) Except for the sampling stations discussed in (ii), quarterly composite filter samples should be analyzed for suspended material (weight) and polonium-210 in addition to the listed parameters.

(b) Air, radon gas

Identical comment as (a)(i) above.

(c) Water, groundwater

The wells downgradient from the tailings impoundment are to be completed to the top of the Carmel Formation. Although this Formation should prevent contamination of the Navajo Sandstone aquifer (the source of mill process water), it is advisable to complete a downgradient well in the Navajo Formation to generate the data to document that this is indeed the case.

(d) Surface Water

(i) Surface water sampling should include the several seeps along Shootering Creek and any surface seeps that develop as the result of the tailings impoundment.

(ii) Seepage samples should be analyzed for chemical as well as radiological parameters.

(iii) To have interpretative meaning, radionuclide analysis of surface water samples (particularly after precipitation events) should be for the total and dissolved fractions; not limited to total concentrations.

(e) Stream bottom sediment

Bottom sediment sampling should be continued in the operational monitoring phase with the same procedures as those for the preoperational monitoring phase.

(f) Soil

As stated, soil samples should be collected at the air particulate sampling locations. However, instead of only five locations, the number of locations should be increased as stated in (3)(a) above. Radionuclide analysis of the soil samples should be the same as that for the corresponding air particulate samples.41. Page 10-12, paragraph 3 & 4. Is the coarse gravel and rock cover mentioned in paragraph 3, the same as the coarse rock and boulders mentioned in paragraph 4? A more complete engineering description is needed.

42. Page 10-17, Section 10.3.3. What is the basis for the statement that the costs far outweight the benefits that might accrue? Similarly, what is the basis for the statement that the proposed tailings disposal scheme is "...the most environmentally sound, reliable, and reasonable method..." (emphasis added).

43. Page 10-18, Item 1. We are unaware of the referenced milling operation by Hydrojet Services, Inc., in the early 1970's. Exactly where was this performed and was an EIS or environmental assessment prepared?

44. Page 10-18, Item 3. If the White Mesa mill will be only 1.5 miles from the applicant's ore buying station, it seems neither cost nor energy effective to haul from the ore buying station to Shootering Canyon.

The NRC staff does recognize that the White Mesa mill could be an alternative to Shootering Canyon. However, we do not agree with the staff's assessment that environmental costs would not decrease if the Shootering project was rejected since its impacts would be shifted to other existing mill sites. This view does not consider the environmental benefits (no costs) of undisturbed wilderness areas, grazing land and one less tailings disposal site in the State of Utah.

In addition, the costs for reclamation will be substantial if the applicants are to comply with the Utah reclamation law. The savings from reclaiming one mill site instead of two have not been considered in the staff's analysis of alternative mill sites. We believe the NRC should discuss in detail the environmental costs and benefits of alternative sites.

45. Page 10-14, Section 10.5.2. The NRC should be aware that if the development of soft technologies is accelerated by both the public and private sectors, other energy sources could contribute

significantly to the Nation's energy needs by the year 2000. The Council on Environmental Quality has concluded that solar energy alone could contribute as much as 25% of the Nation's energy demands by the year 2000.*

*Solar Energy - Progress and Promise.
Council on Env. Quality, April 1978.

46. Page 10-26, Section 10.6. This Section states (as in previous DES's) that the uranium production is needed to fuel reactors that produce electric power to U.S. consumers. If this is an important consideration in NRC licensing action, and we feel it should be, it deserves further evaluation. We are becoming increasingly aware offoreign sale of yellow cake that the NRC stated was destined for U.S. energy needs. Since much criticism is being generated by the general public concerning the hazards associated with nuclear power and the unpopular radioactive waste disposal issues (including tailings), misstatements on yellow cake useage will further erode public confidence in Federal actions related to nuclear energy.

47. Page B-6. We were not aware that 23 mills were operating in 1977. Our understanding is that less than 20 mills were operating in 1977. If the 1981 requirement is 17,500 MT and the 1977 output was 12,000 MT, there are at least 2 or 3 additional mills now on line to make up the difference. Page 10-26 also indicates that an additional 3,400 to 5,900 metric tons per year may be available from phosphoric acid extraction and copper dump leaching. These above sources appear to make up the difference without adding contributions from other new mills such as Pitch, White Mesa and Gas Hills or from old mill expansions. In light of these facts, is Shootering Canyon mill really needed?

48. Page D-4, Section D.1. What mitigating action was assumed that would reduce dust losses by 80%?

49. Page D-9, Section D.4. This section is much too abbreviated for proper evaluation and needs to be expanded.

50. Page D-9, Section D.4.1. The NRC modified version of the Argonne National Laboratory UDAD computer code is as of this date unpublished and not available for review, which raises a number of questions and uncertain ties for example:

Table D.3 does not appear to provide an accurate description of the factors used for inhalation dose calculations. Table D.5 should describe the YWD class and equivalent AMAD clarification. Has the reference ICRP Task Group Lung Model been updated by ICRP 19?

Since a WLM is based on 170 hours exposure, it should be explained how continuous exposure to 1 WL is equal to 25 WLM per year. We feel that the bronchial epithelium dose conversion factor of 0.625 mrem/yr is not appropriate. A more conservative estimate between this value and the 4 mrem/yr per pci/m^3 estimate in EPA -520/1-76-001 would be more appropriate for NRC licensing action. Does this DES again assume that indoor radon daughter concentration would be 50% of the ambient radon concentration? Any such assumptions should be listed and technically justified.

51. Appendix D. There seems to be essentially no background radiological data available on which to base conclusions.

52. Page F-3, Section F.1. A more detailed account should be given as to why the staff has changed its policy regarding the more conservative radon flux estimation by Schiager previously used by the NRC in its assessments.

53. No specific page. We are increasingly aware of reports of stolen quantities of uranium yellow cake. One such report describes 7,000 lbs. of yellow cake valued at $280,000 which was stolen from a New Mexico mill. Previously it was felt that 55 gallon drums weighing 800 lbs. and valued at $8/lb. (but for which there were no unauthorized buyers) would not be readily stolen. However, in light of the dramatic rise in the price of uranium and availability of further processing plants around the world, it is time to consider increased plant security measures.