



U.S. Department of Energy

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APR 19 2002

Melvyn Leach, Chief
U.S. Nuclear Regulatory Commission
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety & Safeguards
Mail Stop T8A33
Washington, D.C. 20555-0001

Subject: Revised *Site Observational Work Plan for the Slick Rock, Colorado, UMTRA Project Site*, dated April 2002, for Review

Dear Mr. Leach:

We are sending your staff a copy of the revised *Site Observational Work Plan for the Slick Rock, Colorado, UMTRA Project Site*. This document was updated and revised based on comments received from the Colorado Department of Public Health and Environment (CDPHE). CDPHE comments dated December 7, 2001 and December 17, 2001, and a summary of the response to comments are attached.

If you have any questions, please contact me at 970/248-7612 or Sam Campbell at 970/248-6654.

Sincerely,

A handwritten signature in black ink, appearing to read "Donald R. Metzler".

Donald R. Metzler, P.Hg.
Project Manager

Enclosures

cc w/enclosures:
M. Fliegel, NRC
M. Layton, NCR
B. Von Till, NRC
File: GWSKR 1.1 (Sutton)

Comment Resolution for the *Site Observational Work Plan for the
Slick Rock, Colorado, UMTRA Project*

Following are the responses to Colorado Department of Public Health and Environment comments on the *Site Observational Work Plan for the Slick Rock, Colorado, UMTRA Project* (SOWP).

- 1) This term was replaced throughout the document.
- 2) Neither of the locations listed in the figure represent the USGS gaging station. One is a water quality sampling location, and the other is a river elevation measuring point on the bridge. The location of the USGS gaging station was added to this figure for clarification.
- 3) Wells with water levels and the site boundary were added to the cross section.
- 4) Contaminant concentrations in the Entrada Sandstone are attributed to drilling and installing a well through the contaminated alluvial aquifer; therefore, ground water flow and transport modeling of the Entrada was not required and was removed from the document. In lieu of a model, the Entrada wells on the floodplain will be monitored until contaminant concentrations are below the MCL. The potentiometric contour map of the Entrada was modified to be consistent with historical data.
- 5) Wells 310, 311, and 312 were installed across the river from the NC site to determine if contaminants from the NC site were being transported under the river between the two sites via a paleochannel. The uranium concentration in well 311 indicates possible transport from the NC site. The drill logs do not show evidence of a paleochannel; however, when comparing river elevations with elevations of the base of the aquifer, the base of the river appears to be above the base of the alluvial aquifer, so ground water flow beneath the river is possible. Therefore, the SOWP was amended to address the potential for transport under the river, and the discussion regarding anion concentrations as evidence of limited transport between the sites was removed. Ultimately, the paleochannel issue has been addressed because the ground water model accounts for flow between the sites and predicts uranium will flush within the 100-year time frame. Also, well 311 is scheduled for long-term monitoring to monitor plume migration from the NC site.
- 6) A new table (5-3) with the reference values was added, and additional discussion was added to the text of the SOWP to show the calculations and assumptions used to determine un-ionized ammonia as N. The numbers in Table 9 and Table 14 in Appendix I were modified to reflect un-ionized ammonia as N. The text on page I-23 was modified to exclude the discussion on ammonium, because the hazard quotient based on un-ionized ammonia as N is less than 1.
- 7) The value in the table (<0.01) is an error; the correct value is <0.00058 and was added.

- 8) Selenium was added.
- 9) This contradiction was corrected.
- 10) The modeling discussion of the Entrada was removed – refer to number 4
- 11) Refer to numbers 10 and 4.
- 12) Probability figures were included in Appendix H.
- 13) The IC boundary figure was modified to reflect reasonable boundaries surrounding the plumes.
- 14) This section was be rewritten to incorporate Jeff's comments and clear up the inaccuracies.

Additional Comments

The human health risk-based number is based on use of standard EPA exposure assumptions for a residential drinking water scenario and the use of the reference dose for selenium from IRIS (EPA's Integrated Risk Information System data base). EPA established the MCL at a lower level because that was the lowest level that public water systems could reasonably remove the contaminant given the technology and resources at the time.

Because the ACL is being used at a cleanup level (rather than an action level) for the natural flushing strategy, the terms POC and POE are not applicable and were removed from the text. The text was modified to indicate that the "POC" under the natural flushing strategy is every well on site, and the "POE" under the natural flushing strategy at the Slick Rock site is the Dolores River.

To address the agricultural standards, the text was modified to explain that the environmental covenant IC would prevent agricultural use of contaminated ground water until concentrations are below the standard even though agricultural use of ground water from the alluvial aquifer is unlikely.

STATE OF COLORADO

Bill Owens, Governor
Jane E. Norton, Executive Director

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Colorado Department
of Public Health
and Environment

December 7, 2001

Mr. Donald Metzler
Technical Manager
UMTRA Groundwater Project
U.S. Department of Energy
P.O. Box 2567
Grand Junction, CO 81502

RE: CDPHE Comments on the Slick Rock Site Observation Work Plan (SOWP), Dated September 2001

Dear Don:

The Colorado Department of Public Health and Environment (CDPHE) has completed its review of the above referenced document; attached to this letter are our specific comments. The two most significant issues raised in the attached comments are: first, to provide results for the modeling of the Entrada formation at the UC site (comment numbers 10 & 11) and second to correct the discussion of Institutional Controls (comment numbers 13 & 14).

I thank you for the opportunity to provide our input to this effort. Please call if you have any questions.

Sincerely,

Wendy Naugle, P.E.
UMTRA Groundwater Project Hydrologist

cc: Paul Oliver, CDPHE-GJ
Bill Von Till, NRC
FILE (SRK-7-A)

Colorado Department of Public Health and Environment Comments on Slick Rock SOWP

- 1) Please replace the term “surficial groundwater” with “surficial aquifer” or “shallow groundwater” throughout the document.
- 2) Figure 4-11, page 4-37. The legend should indicate which of the surface water elevation stations is the USGS gage.
- 3) Figure 5-2 on page 5-5, is not a very good cross section for the site. A cross section should include more than one boring and should show the location of the site and the depth to water in the included wells.
- 4) If the alluvial aquifer and the Entrada act as one aquifer system, as discussed in the text, then the potentiometric surface map presented for the Entrada (figure 5-5, page 5-13) should be more similar to that presented for the alluvium (figure 5-4, page 5-9). As currently presented, groundwater flow directions are vastly different between the two formations, and thus, groundwater flow and transport modeling results need to be presented separately for each system. The contours on figure 5-5 are greatly influenced by the water table elevation in well 0326, which is outside of the area where the alluvium is present. If well 0325 and 0326 are contoured separately, would the potentiometric surface indicated by the remaining 2 wells be more similar to the alluvium? Note also that only the 2 wells in contact with the alluvium were used as calibration targets in the groundwater modeling effort.
- 5) Recall that the reason that stabilization on-site was rejected for the Slick Rock sites was that the DOE believed (at that time) that a significant paleochannel connected the two Slick Rock sites, which would impact groundwater compliance at the disposal cell. Therefore, the issue of transport via a paleochannel between the two sites should be addressed in detail in the SOWP. Given what DOE now knows about the alluvium/river interface, is it possible for contaminants to cross the river from the NC site? Do the drill logs indicate connection between the alluvium on either side of the river? Figure 5-4 on page 5-49 shows that one well in the 0312 to 0310 cross-section, (the center well – 0311) has a higher uranium concentration than the two adjacent wells. This may be indicative of transport from the NC site. The brief discussions on pages 5-22 and 5-45 are not very convincing in terms of showing that the groundwater across the river is not affected by the NC site. It is not surprising that the water in well 0310 would have a piper diagram indicative of a mixture between alluvial groundwater and the river, given the fact that this is the well closest to the river. The chloride and sulfate data that are mentioned as key to this argument should be presented in a table or a figure in this section to add emphasis to this point. Are the lower sulfate and chloride concentrations a result of the plume mixing with surface water as it moves downgradient? It may be beneficial to devote a section of the document to this subject.
- 6) On Page 5-22, it is stated that the UCL95 for ammonium, nitrate and manganese increase adjacent to and downstream of the UC site. It is then stated that the concentrations of these contaminants are well below applicable standards or risk-based concentrations. However, these reference values do not appear to be presented in the table or the text section. The reference values need to be added. However, since Table 5-2 is already so large, a separate table dealing with these three contaminants may be needed. Since surface water standards are usually for unionized ammonia, the text should also include a discussion of unionized ammonia concentrations at these sample locations. If DOE does not

have the data to support this discussion, additional data collection may be indicated. In reviewing the Ecological Risk Assessment (Appendix I), it appears that some of these issues are addressed. However, given that this is the first UMTRA mill site where actual measurable increases in surface water can be attributed to contaminated groundwater discharge, this should be addressed in more detail in the main text of the SOWP. In addition, the appendix (Table 9, page I-18) contains a conversion from unionized ammonia to ammonium. Since this conversion is dependent upon both pH and temperature, it is unclear what assumptions were used and whether or not these assumptions were conservative. Thus, a more detailed discussion of the potential ecological impacts from unionized ammonia in groundwater to the river, including the backup calculations showing how the conversions were conducted, needs to be added to the appendix, with a summary provided in the main text of the document.

- 7) Table 5-8 shows the concentration of uranium in well 0325 as "<0.1". Is this the detection limit for uranium? It seems high, or is there another explanation?
- 8) On page 5-62 the statement "With the exception of a sample from well 0556 (0.016 mg/l), samples collected from . . .". Please add that the constituent that had the concentration referenced is selenium.
- 9) Table 5-10 and the text on page 5-70 contradict each other. This is very confusing and should be corrected. The second bullet states that after 100 years, the maximum predicted manganese concentration is 3.86 mg/l. However, the table shows that the standard for manganese is met at 60 years. In addition, the text refers to a maximum selenium value of 0.262 mg/l, while the maximum value in the table is listed as 0.166 mg/l. The Table should be changed to include the actual maximums, consistent with the text, and then those two "extraneous" values can be foot-noted as only occurring in a limited areal extent.
- 10) Section 5.3, page 5-69. The modeling summary in the main document does not clearly indicate whether or not the Entrada was modeled as a separate layer with different hydraulic properties. Please summarize how the Entrada was modeled and briefly summarize the results for the Entrada. Will standards be met in the Entrada?
- 11) Appendix H, Groundwater Modeling, Section 5.3, page H-29. Model results are only presented for Layer 1, since the highest contaminant concentrations are contained within this layer. However, since the hydraulic properties of the bedrock (layer 2) are very different from the alluvium, the results for layer 2, while not showing the same high concentrations, may actually take a significantly longer time to reach the standards. Thus, results for layer 2 should also be presented to show that layer 2 also achieves the standards in the 100-year timeframe.
- 12) Appendix H, Groundwater Modeling, Section 6.2. For consistency with other sites, please include a figure showing the probability of exceeding the standard for selenium at 100 years, especially since the 14% probability of exceeding the standards at 100 years is mentioned in the text.

- 13) Figure 7-3, page 7-11. The IC boundary appears to be quite a bit larger than the plumes and includes property north of the river. Why? Does this boundary correspond to what UMETCO owns? Can the IC boundary be drawn to only include the areas of current and projected contaminant migration? The map needs to indicate the UMETCO property boundary as well as the proposed IC boundary.
- 14) Section 7.3.1, page 7-9, Institutional Controls. (The following comments were provided by Jeff Deckler. Jeff has also provided draft language for a covenant between the State, DOE and UMETCO. The draft covenant is currently being reviewed by our attorney, and we will forward it to DOE as soon as possible. Once DOE has completed its legal review, the draft covenant can be sent to UMETCO.):

The SOWP first discusses deed restrictions that DOE is negotiating with UMETCO, and goes on to say that these restrictions fulfill the requirements for permanence and enforceability by government entities. While the restrictions may be permanent (since they run with the land), they are not enforceable by anyone not in the chain of title. In this case, that is only UMETCO. The reason deed restrictions are enforceable at other UMTRA sites is that the state owned the land and thus, is in the chain of title. The deed restrictions DOE is negotiating are not enforceable ICs and frankly, they shouldn't bother.

The reason they shouldn't bother is that enforceable ICs are required under SB 01-145. However the SOWP writeup regarding the statute is inaccurate. The law doesn't require us to monitor the covenants, it just requires us to keep a list. In addition, the law doesn't require us to enter into agreements with local governments to oversee and monitor the covenants. It requires overlapping notifications between the property owner, the state and the local government when any activity that could affect the IC is proposed (i.e. a building permit is pulled). In addition, it allows the state and local governments to sign agreements enacting local ordinances in lieu of requiring a covenant from the landowner.

So, on the last paragraph of page 7-10:

- 1) Delete the first sentence.
- 2) Following the declaration, delete line 6 ... "This law compels"... through line 12 ... "owners of the property".
- 3) Replace lines 6-12 with: This law applies to property where a cleanup decision is reached that does not allow for unrestricted use. On these properties, the owner is required to enter into a covenant with the state that details the nature of the restriction, the owners commitment to abide by that restriction, and the circumstances under which state approval can be given to modify or remove the restriction. These covenants are recorded with the deed and run with the land.

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Colorado Department
of Public Health
and Environment

December 17, 2001

Mr. Donald Metzler
Technical Manager
UMTRA Groundwater Project
U.S. Department of Energy
P.O. Box 2567
Grand Junction, CO 81502

RE: Additional CDPHE Comments on the Slick Rock Site Observation Work Plan (SOWP),
Dated September 2001

Dear Don:

After further review of the Slick Rock Site Observational Work Plan (SOWP), the Colorado Department of Public Health and Environment offers the following additional comments. With respect to the proposed Alternate Concentration Limit (ACL) for selenium, please explain why the human health risk based number (0.18 mg/l) is significantly higher than the Maximum Concentration Limit (MCL) for drinking water (0.05 mg/l). In addition, it is unclear how the ACL will be applied with respect to the Point of Compliance and the Point of Exposure.

Since there is the potential for agricultural use of groundwater at the site to irrigate hay, etc. and/or graze livestock, it is unclear how the ecological risk assessment addresses this issue. Through simple comparison with agricultural standards, especially for selenium, it appears that risks to livestock for either grazing or water supply would be unacceptable. The SOWP needs to clearly state that agricultural use of the groundwater needs to be restricted through implementation of Institutional Controls because of these risks. In addition, since these risks are present at the site, it is unclear how the ACL can be set at a level higher than that protective of agricultural use.

Sincerely,

Wendy Naugle, P.E.
UMTRA Groundwater Project Hydrologist

cc: Paul Oliver, CDPHE-GJ
Bill Von Till, NRC
FILE (SRK-7-A)