

March 11, 2014

Mr. Thomas E. Gieck,  
Umetco Minerals Corporation  
2754 Compass Drive, Suite 280  
Grand Junction, CO 81506

SUBJECT: U.S. NUCLEAR REGULATORY COMMISSION STAFF REVIEW OF  
UMETCO'S JUNE 2013 GROUNDWATER SAMPLING RESULTS AND  
EVALUATION AND AMENDMENT TO LICENSE SUA-648 TO REFLECT  
UMETCO'S NEW ADDRESS AND TO CORRECT A TYPOGRAPHICAL ERROR  
(Docket 040-0299)

Dear Mr. Gieck:

I am writing in response to three letters from Umetco Minerals Corporation (Umetco) regarding Umetco's Gas Hills East, Wyoming, site. The first letter, dated March 7, 2013, provides information related to the additional ground water sampling at the Gas Hills East site that was requested by the U.S. Nuclear Regulatory Commission (NRC) staff in September 2012 (Agencywide Document Access and Management System (ADAMS) Accession Number ML13070A088). The second letter, dated September 18, 2013, provides a report entitled "June 2013 Groundwater Sampling Results and Evaluation," (ML13263A017). The third letter, dated January 13, 2014, provides Umetco's new mailing address and a request to amend License SUA-648 to reflect the address change (ML14016A163).

Regarding the March 7, 2013, and September 18, 2013, letters and report, the NRC staff has reviewed the information provided in the letters and report and has concluded that Umetco's conclusion that the plumes are migrating as expected is not supported by the information presented in the letter or report. Our rationale for this conclusion is summarized below.

The alternate concentration limits (ACLs) for the Umetco site constituents were approved by the NRC on the basis that geochemical conditions would result in attenuation of constituent concentrations to background levels before reaching the Point of Exposure (POE). The attenuation mechanisms necessary for removal of radium are dependent on co-precipitation with gypsum and ion exchange based on the geochemical model. The background groundwater concentration for radium 226+radium228 ( $^{226+228}\text{Ra}$ ) in the Western Flow Regime (WFR) was determined to be 69.5 picocuries per liter (pCi/l) in the ACL application. The POE value predicted by the geochemical and groundwater flow models used in support of the ACL application estimated that the  $^{226+228}\text{Ra}$  concentration would have a peak concentration of 69.5 pCi/l and reduce to less than 21 pCi/l over the 1,000-year model simulation, based on an initial model input concentration of 250 pCi/l.

Figure 5 of the September 2013 report shows that  $^{226+228}\text{Ra}$  concentrations have increased in monitoring well (MW) 28 and decreased in MW164 since about 2002. Umetco believes this indicates that the plume is moving across the site, as MW28 is hydrogeologically down gradient from MW164. However, there does not appear to be any attenuation of constituent concentrations as described in the ACL application.

While the sampling data confirms that constituent concentrations remain well below the approved ACLs, the increasing <sup>226+228</sup>Ra concentrations measured at monitoring well MW28 do not support the conclusions stated in the hazard assessment performed for approval of the ACL amendment request, i.e., that the constituent concentrations will be attenuated as the plume moves across the site towards the POE. The apparent lack of attenuation taking place between MW164 and MW28 may indicate that future constituent concentrations have the potential to be in excess of the background concentration of 69.5 pCi/l at the POE in the WFR.

The ACL application provides concentration profiles for each constituent along the flow path at the 1,000-year model simulated time-period and POE concentrations as a function of time for both the WFR and the South Western Flow Regime (SWFR). However, constituent concentration profiles were not provided in the ACL application for incremental time periods during transport, nor were model simulated results of concentrations as a function of time for wells downgradient of the POC other than the designated POE well (MW77) provided. It would be helpful if Umetco provided incremental time-period concentration profiles along the flow paths leading up to 1,000-years and model simulated concentrations as a function of time for each of the wells downgradient of the POC in the WFR and the SWFR. In addition, Umetco should begin sampling for all ACL constituents at each of the wells listed in Table M-1 of Appendix M to the ACL application. The additional information will allow NRC staff to better compare the model predicted concentrations along the flow paths to actual concentrations measured during annual sampling.

An additional monitoring well or wells located downgradient of MW28 would also allow NRC staff to determine the constituent concentrations and the degree of attenuation taking place prior to MW77. Without the additional well or wells, transfer of the license to the Department of Energy may be delayed to allow confirmation of attenuation mechanisms by analysis of constituent concentration trends at MW77.

Groundwater concentrations of milling-related constituents were historically shown to decline rapidly with depth and are restricted to the upper 50 to 100 feet of the WFR beneath the Above Grade Tailings Impoundment. As such, MW 71B is questionable as a suitable long-term monitoring well, since it is screened in the lower portion of the WFR. While MW71B does provide useful data to evaluate vertical migration of the constituents, it is not useful in identifying constituents migrating downgradient to the POE. Umetco should determine if installing an additional monitoring well in the upper portion of the Lower Wind River Formation will provide valid information about constituent concentrations in the vicinity of MW71B.

Umetco should evaluate if the additional monitoring wells discussed above would provide pertinent information for the purpose of long-term groundwater monitoring. If Umetco's agrees with the recommendations of the NRC staff, Umetco should so inform NRC and begin installation of the monitoring wells as soon as practical. However, if Umetco disagrees with the staff's recommendations, Umetco should similarly communicate this disagreement to the staff.

Regarding the January 13, 2014 letter, enclosed is Amendment Number 70 to source materials license SUA-648 reflecting Umetco's new address. An environmental assessment was not performed for this action as it is categorically excluded pursuant to 10 CFR 51.22(c)(10)(iii).

During its review of Umetco's licensing document, the NRC staff noted that when License Amendment No. 69 was issued, a typographical error resulted in the amendment reference for License Condition 63 being changed from Amendment No. 64 to Amendment No. 69. The staff is correcting this error with this license amendment. Pursuant to 10 CFR 51.22(c)(10)(v), this action is categorically excluded from the requirement of an environmental review.

In accordance with 10 CFR 2.390 of the NRC's "Agency Rules of Practice and Procedure" 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 ADAMS. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html>.

If you have any questions concerning the NRC staff comments, please contact me at 301-415-6749 or by email at [Dominick.Orlando@nrc.gov](mailto:Dominick.Orlando@nrc.gov).

Sincerely,

**R/A**

Dominick A. Orlando, Senior Project Manager  
Materials Decommissioning 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.: 040-00299  
License Number: SUA-648

Enclosure: Amendment 70 to SUA-648

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Dominick A. Orlando, Senior Project Manager  
Materials Decommissioning Branch  
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Division of Waste Management  
and Environmental Protection  
Office of Federal and State Materials  
and Environmental Management Programs

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**ML14037A215**

<b>OFC</b>	DWMEP	DWMEP	OGC	DWMEP	DWMEP
<b>NAME</b>	NOrlando	CHolston	PMoulding	MNorato	NOrlando
<b>DATE</b>	2/10/14	2/11/14	3/3/14	3/5/14	3/11/14

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