environmental
properties management, LLC

July 3, 2015

Mr. Ken Kalman
Project Manager
U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Mr. Paul Davis
Oklahoma Department of Environmental Quality
707 N. Robinson
Oklahoma City, OK 73101

Re: Docket No. 70-925; License No. SNM-928
Sampling Groundwater for Plutonium Analysis

Dear Mr. Kalman:

In a sidebar to the June 10, 2015 meeting to discuss groundwater remediation at Cimarron, EPM was asked if groundwater downgradient from the former mixed oxide fuel fabrication (MOFF) facility had been evaluated for the presence of plutonium, and if there is a monitor well located directly downgradient from the MOFF facility. The decommissioning of the MOFF facility was completed in 1989 and the NRC license for MOFF (SNM-1174) was terminated in 1993.

The following documents were reviewed to evaluate the degree to which impact to groundwater had been addressed prior to the termination of license SNM-1174:

- 1989 Decontamination and Decommissioning of the Kerr-McGee Cimarron Plutonium Fuel Plant
- 1989 Site Investigation Report
- 1994 Radiological Characterization Report
- 1998 Decommissioning Plan Groundwater Evaluation Report
- 2001 Surface and Groundwater Summary – 1989 – Present

Observations based on the review of these documents are:

1. Several leaks in underground piping leading from the MOFF facility to a 10,000-gallon above-ground storage tank as well as to an impoundment were identified during the decommissioning of the MOFF facility. Soil was cleaned up to less than 25 pCi/g plutonium, averaged over a 10 meter grid.
2. Residual sludge in the bottom of the Plutonium Emergency Pond and the Plutonium Evaporation Pond contained low concentrations of plutonium after these two impoundments were drained. After removal of the sludge, the liner was surveyed for surface contamination and found to be releasable for unrestricted use.
3. Analysis of groundwater and/or surface water samples for plutonium has not been performed since 1990.

9400 Ward Parkway • Kansas City, MO 64114
Tel: 405-642-5152 • jlux@envpm.com

4. The highest plutonium concentrations in groundwater samples collected prior to 1990 were in Monitor Wells 1314 and 1320 (0.027 and 0.023 pCi/l, respectively). Monitor Well 1314 is located upgradient from Burial Area #1, and Monitor Well 1320 is located upgradient from Uranium Pond #2.
5. The highest concentration of plutonium in surface water (0.021 pCi/L) was recorded at location 1204 (the pond west of Highway 74). During that same sampling event, location 1202, the Cimarron River downstream sample location, yielded 0.011 pCi/L plutonium.
6. Monitor Well 1331 was installed prior to 1990, and is located approximately 150 – 200 feet northeast of the MOFF facility. Because this well is located between the MOFF facility and the 1206 drainage, this appears to be a downgradient location based on surface topography. The highest plutonium concentration recorded in a groundwater sample from Monitor Well 1331 was 0.002 pCi/L.
7. **It should be noted that the tables in these reports do not identify the minimum detectable activity (MDA) for plutonium in aqueous samples. In June 2015, GEL Laboratory advised EPM that for current isotopic analysis, the detection limit is 1 pCi/L. Consequently, all the results listed in items 4 – 6 above would have been qualified as "not detected (ND)".**
8. During the 2014 Design Investigation, Monitor Well 1377 was installed approximately 200 feet directly north of the northeastern corner of the MOFF facility. Either Monitor Well 1331 or Monitor Well 1377 would most likely be located directly downgradient of the MOFF facility.

Conclusions

- There is documentation of the release of liquid plutonium from pipelines under the MOFF facility. The pipelines were removed during decommissioning, but no assessment of impact to groundwater related to these leaks was performed.
- There are over a thousand analytical results for plutonium in groundwater and surface water, and none show evidence of impact. All samples results are likely "ND".
- Monitor Well 1331 was the only monitor well apparently located downgradient from the MOFF facility prior to 2015. If groundwater in Sandstone A is moving in a more northerly direction than toward Monitor Well 1331, newly installed Monitor Well 1377 is likely more directly downgradient.
- It is highly unlikely that groundwater is impacted by a release of plutonium from the MOFF facility, but current, high-quality data documenting the impact (or lack thereof) does not exist.

EPM does not believe that groundwater at the Cimarron site is quantifiably impacted by plutonium from releases from the MOFF facility of from impoundments. However, if NRC desires to have current, high-quality data demonstrating this, EPM proposes to prepare an activity plan to provide for the sampling and analysis of groundwater from Monitor Wells 1331 and 1377.

Groundwater samples will be collected and shipped to GEL Laboratory to be analyzed only for isotopic plutonium (Pu-239/239 is the isotopic analysis of interest). GEL has informed EPM that the quantification limit for plutonium activity is 1 pCi/L. If the analytical results are less than 1 pCi/L, EPM will request closure on the "plutonium in groundwater" issue.

EPM estimates the cost for the collection, shipping, and analysis of samples to be between $1,500.00 and $2,000.00. Costs will be charged to Task 6, "Unanticipated Work" under the 2015 budget, and funded from the Federal Environmental Cost Account. Groundwater samples can be collected within one month of agency approval.

EPM requests approval by NRC and DEQ approval of this proposal.

Sincerely,

Jeff Lux, P.E.
Project Manager

cc: Gerald Schlapper, US NRC Region IV

Attachment