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CERTIFIED MAIL - RETURN RECEIPT REQUESTED

March 28, 2019

Doug Hintze, Manager
Environmental Management
Los Alamos Field Office
P.O. Box 1663 MS-M984
Los Alamos, NM 87545

**RE: APPROVAL
ANNUAL PROGRESS REPORT ON CHROMIUM PLUME CONTROL
INTERIM MEASURE PERFORMANCE
LOS ALAMOS NATIONAL LABORATORY
EPA ID #NM0890010515
HWB-LANL-18-047**

Dear Mr. Hintze:

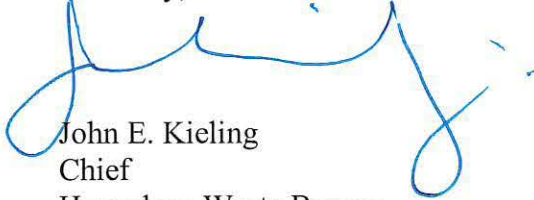
The New Mexico Environment Department (NMED) has received the United States Department of Energy's *Annual Progress Report on Chromium Plume Control Interim Measure Performance* (Report), dated September 2018 and referenced by EM2018-0028. The Report was received on September 26, 2018.

Pursuant to Section XXIII of the 2016 Compliance Order on Consent, a pre-submission review meeting was held with NMED and DOE on June 20, 2018 to discuss the content of the Report. After conducting a technical review of the Report, NMED sent draft review comments on the Report to DOE on February 1, 2019. NMED's draft comments were informally resolved through a teleconference held on February 12, 2019 and a meeting held on February 26, 2019. NMED hereby issues this approval for the Report with the understanding that DOE will address NMED's comments in future Semiannual Progress Reports on Chromium Plume Control Interim Measure Performance. NMED's comments are included as Attachment 1.

Mr. Hintze
March 28, 2019
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If you have any questions or comments regarding this correspondence, please contact Dane Andersen at 505-476-6056.

Sincerely,



John E. Kieling
Chief
Hazardous Waste Bureau

Attachment:

- 1.) NMED Draft Comments on the Annual Progress Report on Chromium Plume Control Interim Measure Performance (EM2018-0028), January 2019

cc: N. Dhawan, NMED HWB
D. Andersen, NMED HWB
M. Dale, NMED HWB
R. Murphy, NMED HWB
S. Yanicak, NMED DOE OB, MS M894
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File: Reading and LANL 2019, TA-05, Approval for Annual Progress Report for Chromium IM Performance, September 2018

NMED Draft Comments on the *Annual Progress Report on Chromium Plume Control Interim Measure Performance (EM2018-0028)*, January 2019

General Comments

- 1.) The Annual Progress Report on Chromium Plume Control Interim Measure Performance (Report) uses several lines of evidence (chromium concentration trends, water-level data, tracer test analysis) to assess the performance of the Interim Measure (IM) to achieve and maintain the 50-ppb chromium plume boundary. NMED agrees with this approach, as it is consistent with the United States Environmental Protection Agency's January 2008 guidance document entitled *Systematic Approach for Evaluation of Capture Zones at Pump and Treat Systems* (Guidance). The Guidance recommends using multiple, converging lines of evidence to assess capture zone performance at pump & treat sites. While the IM is not necessarily designed as a pump and treat system, many of the recommendations in the Guidance are applicable to the IM and should be used to assess its performance. Therefore, in addition to the primary lines of evidence included in the Report, the following additional lines of evidence should be used by DOE to assess IM performance.

Water-Table Maps – DOE has included water-table maps in the Report and has committed to including these in future IM performance reports. Baseline water-table maps should also be included in future reports to assess the aquifer response to the IM operation. A baseline water-table map should be produced from head data collected on May 1, 2018 @ 1500 hours, since this date and time represents pre-IM aquifer conditions.

The Guidance also recommends incorporating water-level data from piezometers installed near capture-zone wells in water-table and vertical head gradient maps. In lieu of piezometer data, the Guidance recommends using corrected water-level data from capture-zone wells to construct water-table maps. Corrected water-level data accounts for well inefficiencies and is an estimation of the water table elevation in the aquifer adjacent to the pumping/injection well (i.e. not the water-table elevation inside the pumping/injection well). Since the installation of piezometers near IM wells is not anticipated at this time, DOE should explore the use of water-table maps using corrected water-level data from injection and extraction wells. These maps may be produced for technical team discussion initially and may not be required for future IM performance reports. The determination to include these maps in future IM performance reports will be made through technical team discussion.

Vertical Head Gradients - An evaluation of vertical head gradients should be included in future reports to observe any potential changes in vertical head gradients resulting from IM operation. Water level data from dual screened wells R-50, R-61, R-44, R-45, and piezometers CrPZ-2a and CrPZ-2b should be used to interpret vertical pressure gradients. Any changes in vertical head gradients due to IM operation can provide valuable information on capture zone effectiveness, since vertical head gradients can potentially influence the direction of contaminant transport.

Capture Zone Analysis – the Guidance recommends performing capture zone analyses to delineate predicted capture zones. DOE should perform capture zone/flooding zone analyses for the IM operations and present the results in map format in future IM performance reports.

Use of Analytical and/or Numerical Groundwater Models – numerical groundwater modeling results can provide additional lines of evidence for capture zone evaluation. Numerical modeling could prove especially valuable considering the cost/difficulty of installing monitoring wells and/or piezometers. In future IM performance reports, DOE should include modeling results from the existing Finite Element Heat & Mass Transfer (FEHM) model to evaluate the IM performance. Modeling results should include a comparison between the results of ongoing tracer tests to model-predicted tracer test results.

- 2.) Because of the relatively flat hydraulic gradient throughout the chromium plume area, using 1-ft contour intervals for the groundwater elevation contours on the water-table maps would provide better resolution for the water-table maps. DOE should produce maps using a 1-ft groundwater elevation contour interval.
- 3.) The Guidance recommends comparing the *actual* capture zone (as determined by the multiple lines of evidence approach) against the *target* capture zone. The IM has not been operating long enough for DOE to make this comparison, but a comparison should be included in future IM performance reports once more definitive results can be observed.

Specific Comments

- 1.) **Section 2.1.2 Hydraulic Testing, page 2, 2nd paragraph** - will the results of the 10-day aquifer tests conducted at the CrIN wells be used to assess IM performance? If so, the results should be presented in a future IM performance report.
- 2.) **Table 2.1.1, pages 37 and 38** - specific to Table 2.1.1 in the Report, DOE must include dates and descriptions for all tracer deployments. All forthcoming IM performance reports must contain these insertions.
- 3.) **Section 2.1.3, 2017 Tracer Testing, page 3, first paragraph, last sentence** - as stated, deployments of additional tracers into the remaining injection wells will take place in conjunction with the second element of the IM system start-up. DOE must provide NMED written notification of the second element of the start-up phase. This notification must be submitted to NMED within three months prior to initiation of the second start-up phase. All planned tracer testing associated with the second start-up phase must be incorporated into a formal work plan to be submitted to NMED within three months prior to tracer deployment.