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May 31, 2023

Arturo Duran
Designated Agency Manager
Environmental Management
U.S. Department of Energy
Los Alamos Field Office
1200 Trinity Drive, Suite 400
Los Alamos, New Mexico 87544

Re: Notice of Disapproval
Chromium Interim Measures and Characterization Work Plan
Los Alamos National Laboratory
EPA ID#NM0890010515
HWB-LANL-22-076

Dear Mr. Duran,

The New Mexico Environment Department (NMED) received the United States Department of Energy's (DOE) *Chromium Interim Measures and Characterization Work Plan* (Work Plan) on September 29, 2022. The Work Plan is dated September 2022 and referenced by EM2022-0582. The Work Plan is subject to reporting and interim measure (IM) operational requirements provided in Paragraphs C and D of Section XV of the 2016 Compliance Order on Consent (Consent Order). Those Paragraphs reference Section XXIII of the Consent Order, which provides the process for NMED review and approval of these submittals. NMED issues this Notice of Disapproval in accordance with Paragraph F of Section XXIII of the Consent Order.

NMED and DOE held several pre-submittal meetings from June 2022 through August 2022 to discuss the Work Plan requirements. During those discussions, DOE determined that additional time was needed to fulfill multiple data requirements for the Work Plan. On September 8, 2022, NMED provided informal comments based on the review of DOE's draft version of the *Chromium Interim Measures and Characterization Work Plan*. DOE did not address multiple NMED informal comments.

NMED issues this Notice of Disapproval because DOE has not provided all the required contents, as discussed in the pre-submittal meetings. DOE must satisfactorily resolve all the disapproval comments provided herein and submit a revised Work Plan to NMED. The Revised Work Plan is due within 60 days of the date of this letter.

Should you have any questions regarding this correspondence, please contact Caitlin Martinez at (505) 690-4742.

Sincerely,

Rick Shean

Digitally signed by Rick Shean
Date: 2023.05.31 09:52:09 -06'00'

Rick Shean
Designated Agency Manager
Director, Resource Protection Division
New Mexico Environment Department

Cc with Attachment:

N. Dhawan, NMED HWB
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File: LANL 2023, NOD LANL Chromium Interim Measures and Characterization Work Plan, September 2022
HWB-LANL-22-076

ENCLOSURE
NMED COMMENTS ON THE CHROMIUM INTERIM MEASURES AND CHARACTERIZATION WORK PLAN, SEPTEMBER 2022
LOS ALAMOS NATIONAL LABORATORY, EPA ID #NM0890010515
LANL-22-076

General Comment No. 1

After the submission of the Interim Measures and Characterization Work Plan (Work Plan) on September 29, 2022, the NMED Hazardous Waste Bureau (HWB) directed DOE to not restart operations at CrEX-1, CrEX-2, CrEX-3, CrIN-1, CrIN-2, and CrIN-3, that had been offline due to electrical issues, until further notice via an email sent and received on November 21, 2022. Additionally, NMED Ground Water Quality Bureau (GWQB) directed DOE in a letter, *Corrective Action Plan Response and Further Action Required, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835*[1], to cease all injections authorized under Discharge Permit 1835 (DP-1835) by April 1, 2023. Due to this change in regulatory directive after the submission of the Work Plan, additional revisions to the Work Plan are required.

General Comment No. 2

Section 4.1, Objective 1: Provide Interim Measures to Prevent Migration of the Plume Beyond the Laboratory Boundary, of the Work Plan must be revised to include a discussion of alternative injection scenarios (i.e., shallow infiltration gallery, conversion of existing well outside the plume to an injection well, constructing a new injection well outside the plume boundary, etc.). The Work Plan must also be revised to include a proposal from DOE for an investigation activity that will achieve the regulatory requirement to implement an alternative injection well location for the treated water.

General Comment No. 3

The investigation activities and methods presented throughout Section 4 are necessary to fulfill the required data gap categories. However, the document must be revised throughout to include the prioritization of each investigation activity, including an estimated schedule for initiation or completion of each activity. Section XV.C, *Interim Measures/Emergency Interim Measures*, of the Compliance Order on Consent[2] (June 2016) requires that the Interim Measures Work Plan shall include estimated implementation schedules for completion of the interim measures. Specifically, the text must clarify which investigation activities will be conducted concurrently and the anticipated completion order for each of the activities presented.

Specific Comments

1. **Section 1.1.1, Characterization Work Plans, pg.2.**

[1] NMED Ground Water Quality Bureau. (2022, December 12). Corrective Action Plan Response and Further Action Required, Los Alamos National Laboratory Underground Injection Control Wells, DP-1835. https://ext.em-la.doe.gov/GovFTPFiles/api/GetFiles/GetFile?fileName=EMID-702464.pdf

[2] State of New Mexico Environment Department. (2016, June). Compliance Order on Consent U.S. Department of Energy Los Alamos National Laboratory. https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/Permit/37925.pdf

DOE Statement: "Although results of the characterization activities were to be published in a CME report, results from activities conducted under the "Work Plan for Chromium Plume Center Characterization[3]" (LANL 2015, 600615) were documented in the "Compendium of Technical Reports Conducted Under the Work Plan for Chromium Plume Center Characterization[4]" (hereafter compendium) (LANL 2018, 602964). Results that are documented in the compendium include nine borehole dilution tracer tests; two push-pull tracer tests (R-42 and R-28); four long-term pumping test in which geochemical transients were observed (R-42, R-28, R-62 and R-43 screen 1); one push-drift test (R-42); one cross-hole tracer test with three different tracer injection locations (CrPZ-2a, CrPZ-2b, and R-28); and one well in which tracers appeared (CrEX-3, with tracers from CrPZ-2a). The "Work Plan for Chromium Plume Center Characterization" (LANL 2015, 600615) will be administratively closed with an EM-LA letter that documents where data have been published within the compendium."

NMED Comment: Revise the text to include a discussion regarding how the objectives from the documents listed in this section have been revised, or retained, as current Work Plan objectives. Additionally, the future submission of the letter to administratively close these documents must include an analysis of the initial objectives and must also discuss why any objectives have changed.

2. **Section 1.1.2, Interim Measures Work Plans, Page 3.**

DOE Statement: "*Unlike the previous work plans associated with interim measures, the plume control IM identified metrics for performance, including decreasing chromium concentrations at R-50 to the 50-ppb New Mexico groundwater standard or less over a period of approximately 3 yr.*"

NMED Comment: Revise the Work Plan to include specific discussions updating each of the anticipated responses in the plume boundary that were presented in *Interim Measures Work Plan for Chromium Plume Control*[5]. Specifically, the *Interim Measures Work Plan for Chromium Plume Control* stated that chromium concentrations were expected to decline at R-45 and stay the same or decline at R-44. Revise the text to include a discussion on the observed responses in concentration trends and a comparison to the projected responses for R-45 and R-44.

3. **Section 1.1.2, Interim Measures Work Plans, pg. 3.**

DOE Statement: "The 2018 performance monitoring work plan (LANL 2018, 603010) will be administratively closed with the documentation provided in this work plan."

NMED Comment: For the 2018 performance monitoring work plan to be administratively closed, revise the text to include the results for all tracer tests mentioned in the 2018 performance monitoring work plan. This

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[3] Los Alamos National Laboratory. (2015, July 28). Work Plan for Chromium Plume Center Characterization. https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2005/37208.pdf

[4] Los Alamos National Laboratory. (2018, March 28). Compendium of Technical Reports Conducted Under the Work Plan for Chromium Plume Center Characterization. https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2005/38414.pdf

[5] Los Alamos National Laboratory. (2015, May 26). Interim Measures Work Plan for Chromium Plume Control. https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2005/37125.pdf

discussion must provide key points, like travel time, recovered location, injection and recovery amounts and the aquifer parameters determined from testing. Specifically, one objective of the 2018 performance monitoring work plan was to utilize data from pressure responses and chromium transients to refine the understanding of aquifer properties (heterogeneity and hydraulic connections between pumping and observation wells). The text must directly state what data was used to refine the aquifer properties, state what the aquifer properties are currently assumed to be and must also include an evaluation of each objective from the 2018 performance monitoring work plan.

4. **Section 3.2, IM Operations, pg. 6.**

   NMED Comment: Revise the text to include a background discussion on the identification of the hexavalent chromium, the investigation phases, and the technical work conducted that identified the spatial location and depth for the extraction and injection wells.

5. **Section 3.2, IM Operations, pg. 6.**

   DOE Statement: "*Figure 3.2-3, parts a and b, plots the cumulative quantities of fluid extracted and injected in the IM infrastructure wells for extraction wells CrEX-1, -2, -3, -4 and -5, and injection wells CrIN-1, -2, -3, -4, and -5, respectively.*"

   NMED Comment: As discussed in the pre-submittal meetings held between NMED and DOE, NMED requires that the Work Plan be revised to include a discussion of the observed plume responses regarding mass capture, using the mass removal estimates. Revise the text to include the estimated mass of chromium removed since initiation of the ion exchange treatment system and a discussion on any observed trends in mass removal. This discussion should also evaluate any deficiencies in the estimates, including the potential inaccuracy from using HACH test estimations.

6. **Section 3.2, IM Operations, pg. 6.**

   DOE Statement: "Because of the lack of deeper monitoring points in the centroid of the plume, the depth of groundwater capture is unknown."

   NMED Comment: Revise the statement to include that the lack of deeper monitoring points in the centroid of the plume is due to incomplete delineation in the centroid of the plume.

7. **Section 3.3.1, Chromium Concentration Trends Indicative of Meeting Primary IM Objectives, pg. 8.**

   DOE Statement: "These tracer data, along with the decreasing chromium concentrations at R-50, provide the basis for changes (retreat) in the plume edge (as defined by the 50-ug/L NMED groundwater standard) over time. These data, along with monitoring information indicating continued maintenance of low chromium concentrations in R-44 screen 1 and screen 2 (Figures 3.3-3 and 3.3-4, respectively); R-13 (Figure 3.3-5); and SIMR-2 (Figure 3.3-6); indicate that the IM has achieved its objective of maintaining the southern edge of the plume within the Laboratory boundary."

NMED Comment: Revise the text to include the NMED concerns with the data in the southern region of the plume. Specifically, the text must be revised to include specification that the plume is not adequately delineated in this region, therefore, describing the response as a retreat of the plume edge is speculative. Revise the Work Plan to include detail regarding the lack of delineation and the potential for dilution of the plume near R-50 via in situ mixing of clean injection water with the plume.

8. **Section 3.3.1, Chromium Concentration Trends Indicative of Meeting Primary IM Objectives, pg. 8.**

DOE Statement: "A residual uncertainty remains with respect to increasing chromium concentrations at well R-61 (Figure 3.3-7), which will be the subject of additional work proposed in this work plan."

NMED Comment: Revise the document to include a clear definition of the term residual or rephrase the language.

9. **Section 3.3.2, Conceptual Site Model Updates Since Initiation of IM Operations, pg. 9.**

DOE Statement: "In 2017, initial CrIN-6 concentrations of 250-300 ug/L indicated that the plume extended further east and was likely deeper than previously thought. In response to this finding, CrIM-6 and the surface infrastructure was then converted to extraction well CrEX-5. In mid-2019, samples collected from R-70 screen 1 and screen 2 showed that concentrations in excess of 200 ug/L extend significantly farther east than originally assumed, and those high concentrations were present at depths at least 90 ft below the water table (depth of the top of R-70 screen 2)."

NMED Comment: Revise the text to include details about the depth of the contamination at the locations discussed in this section. The text should include the depth of the sampled screened interval for CrIN-6 (before conversion to extraction well CrEX-5). It should also include a comment about how this information assisted in the development of the subsequent R-70 screen depths.

10. **Section 3.3.2, Conceptual Site Model Updates Since Initiation of IM Operations, pg. 9.**

DOE Statement: "Even though CrEX-5 is likely capturing chromium mass from this location, the current array of injection and extraction wells is screened at shallower depths and may not provide complete access to the depths required to fully control the plume in this area. However, there has been no indication of chromium contamination at wells R-35a (Figure 3.3-10) and R-35b (Figure 3.3-11), situated northeast of R-70 and serving as a sentinel well for municipal water supply well PM-3, either before or during the IM operational period. These concentrations remain at background with no upward trend."

NMED Comment: Revise the text to discuss a contingency plan if the plume migration results in increasing hexavalent chromium concentrations at R-35. Given the proximity of R-35a and R-35b to PM-3 and the inability of the IM system to mitigate plume migration in a reasonable time frame, it is important to briefly discuss and prepare a contingency plan that will prevent the contamination from reaching PM-3.

11. **Section 3.3.3, Upward Trends in Chromium Concentration, pg. 9.**

DOE Statement: "Trends in chromium at monitoring well R-61 (located to the southeast of the chromium investigation area) have also exhibited increases in chromium concentrations coincident with initiation of the IM (Figure 3.3-14). As indicated by the pressure responses in R-61 screens 1 and 2, primarily associated with extraction at CrEX-2 and injection at CrIN-5, the chromium concentration trend is likely associated with IM operations. This work plan proposes further investigation into the chromium trends and the relation to the IM."

NMED Comment: Revise the text to discuss potential reasons for an increased trend in hexavalent chromium concentration at monitoring well R-61. The text must include initial considerations with specific reference to which IM operations potentially caused the unfavorable response. The text must also be revised to include a discussion on how the increased concentration response can be used to evaluate the current IM system's ability to effectively control migration in a relatively predictable way.

12. **Section 3.4, Tracer Tests, pg. 10.**

DOE Statement: *"Several field tracer tests have been conducted to examine flow velocities, hydraulic connections, and natural attenuation capacity of the regional aquifer. This testing was documented in the compendium (Addendum 1), and was conducted from 2013 to 2017 (LANL 2018, 602964). The text below is an abbreviated description from the compendium."*

NMED Comment: Revise the text to include a table clearly listing the 17 tracer tests mentioned in the bullet points in Section 3.4 and the specific location within the compendium for the analysis conducted for each. This table should include a summary of each test and the specific location(s) within the compendium of the documented testing and all associated analysis for that test.

13. **Section 3.4.1, Tracer Testing in Injection Wells, pg.11.**

DOE Statement: *"The "Chromium Plume Control Interim Measure Performance Monitoring Work Plan[6]" (LANL 2018, 603010) described tracers that were to be redeployed in CrIN-3, CrIN-4, and CrIN-5, and first-time deployments into CrIN-1 and CrIN-2 once those injection wells were brought online."*

NMED Comment: Revise the text to include the location of any analytical results associated with these tracer test deployments. Although a brief discussion is provided, the Work Plan must provide specific reference to the location of analyses conducted. The Work Plan must also include a discussion of how the results of these deployments have altered assumptions for hydraulic parameters of the regional aquifer. Additionally, the discussion in the Work Plan only refers to the tracers injected into CrIN-4, CrIN-1, and CrIN-2. The discussion must be revised to include the responses to the redeployments of tracers for CrIN-3 and CrIN-5.

14. **Section 4.1, Objective 1: Provide Interim Measures to Prevent Migration of the Plume Beyond the Laboratory Boundary, pg. 12.**

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[6] Los Alamos National Laboratory. (2018, April 24). Chromium Plume Control Interim Measure Performance Monitoring Work Plan. https://hwbdocuments.env.nm.gov/Los%20Alamos%20National%20Labs/TA%2005/38423.pdf

DOE Statement: "Whereas a metric is a quantifiable measure used to track and assess the status of a specific process (e.g. decreasing chromium concentrations at R-50 to below 50 ppb within 3 yr), the activities described in this work plan (e.g. estimates of mass extracted through treatment) are measures that provide useful information and insight with respect to IM operations but do not have specific quantitative target value that denotes success."

NMED Comment: Although providing a specific quantitative target value can be difficult, the Work Plan must be revised to provide clarification denoting fulfillment of the required data gap. For instance, specific explanation should be provided for what data collected in the upcoming construction of monitoring wells will be used to define the vertical and horizontal extent. Additionally, the text must include what results from the sampling of the new wells presented in the Work Plan activities would suggest that the extent of contamination has adequately been defined. Revise the text throughout Section 4 to include what metrics will be used to determine if the data gap is fulfilled or if additional activities will be required.

15. **Section 4.1.1.1, Capture Zone Analysis, pg. 14.**

DOE Statement: "EPA encourages the use of groundwater models at complex sites to support the CSM and provide a technical basis for CZA. However, field monitoring is a critical component in evaluating the model predictions and assessing a capture zone effectiveness. The Finite Element Heat and Mass Transfer Code (FEHM) simulator can account for complexities associated with partially penetrating wells, aquifer heterogeneity, and complex boundary conditions. To this end, the FEHM-based model of the site will be calibrated to available field data (e.g., heads, hydraulic gradients, and chromium concentrations) to support the CZA."

NMED Comment: The Work Plan does not mention the aquifer parameter characteristics or assumptions in the model that have changed since initiation of injection and extraction operations. The *Interim Measures Work Plan for Chromium Plume Control*[5] discussed utilizing the FEHM-based model to provide plume response predictions. To adequately address optimization, the Work Plan must be revised to include how key characteristics or assumptions in the model have changed since the application for use in the *Chromium Plume Control* document.

16. **Section 4.1.1.2, IM Mass Extraction, pg. 14.**

DOE Statement: "Influent and effluent water quality analysis will be performed to (1) determine concentration loadings to the treatment system, (2) estimate the mass removed from the regional aquifer, (3) ensure compliance with applicable discharge requirements, and (4) identify the need to adjust system components."

NMED Statement: In addition to the mass extraction analysis on influent and effluent water quality analysis, the approaches for determining total mass of chromium dissolved in the regional aquifer must be provided. This requires applying data-based and model-based approaches to determine total dissolved chromium mass estimates, including specification to the potential mass estimates on Pueblo de San Ildefonso property and the associated uncertainty bounds.

17. **Section 4.1.1.2, IM Mass Extraction, pg. 14.**

DOE Statement: "For measurements supporting mass removal, concentrations will be measured one time per week using Hach test kids, but duplicate samples will also be sent to a state-approved laboratory for analysis. The Hach data will continue to provide rapid results on chromium influent and effluent concentrations, whereas analytical laboratory results will be used in the mass removal calculations."

NMED Comment: The Work Plan must incorporate a discussion on a quantitative analysis of chromium mass removal, including calculations of mass removed to date for the IM operations. A clear estimation of the mass removed must be provided that specifically identifies mass removed from chromium treatment unit A (CTUA) and chromium treatment unit C (CTUC).

18. **Section 4.2, Objective 2: Perform Scientific Studies and Aquifer Testing to Obtain Data Necessary to Conduct a Corrective Measures Evaluation Including a Data Gap Analysis, pg. 15.**

DOE Statement: "The first activity, scientific studies, is to support identifying the nature and extent of chromium plume in the regional aquifer."

NMED Comment: The use of the term scientific studies is overly broad and implies that aquifer testing is not a scientific study. Revise the language.

19. **Section 4.2, Objective 2: Perform Scientific Studies and Aquifer Testing to Obtain Data Necessary to Conduct a Corrective Measures Evaluation Including a Data Gap Analysis, pg. 15.**

DOE Statement: "The second activity, aquifer testing, supports chromium mass flux characterization within the regional aquifer, a measure that combines two key features of the chromium plume: (1) the amount of chromium mass in the groundwater and (2) how fast the water is moving through any given cross-sectional area."

NMED Comment: Revise the text to clarify if the second activity is aquifer testing alone or if it will be combined with mass flux characterization.

20. **Section 4.2.1, Plume Horizontal and Vertical Extent, pg. 15.**

DOE Statement: "To evaluate the success of the IM system in maintaining chromium concentrations <50ppb beyond the Laboratory boundary, both the horizontal and vertical extents of the chromium plume need to be established."

NMED Comment: Revise the text to include specification that monitoring wells will be needed on Pueblo de San Ildefonso land to adequately determine the vertical and horizontal extents for the southern region.

21. **Section 4.2.1, Plume Horizontal and Vertical Extent, pg. 15.**

DOE Statement: "To assess the vertical extent of the plume to the south, fixed-laboratory geochemical sampling will be conducted at CrEX-1 screen 2. This screen initially showed <50 ppb as measured from Hach data, and characterizing the extent of contamination in this region of the plume will be an important new data point."

NMED Comment: Revise the text to include details regarding how this sampling will be accomplished. Currently, CrEX-1 has a permanent pump in the upper screen with a packer underneath. Clarification must be provided to state how the reconfiguration of the downhole pump and packer system will be conducted to sample screen 2. Additionally, revise the text to include the basis for using an extraction well for delineation.

22. **Section 4.2.1, Plume Horizontal and Vertical Extent, pg. 16.**

DOE Statement: "The exact locations of the monitoring wells will be stablished in collaboration with NMED and will be dependent on local topography, cultural site locations, and infrastructure constraints."

NMED Comment: Revise the text to include a statement that additional monitoring wells may be required after the completion of the Work Plan activities if the extent of contamination has not yet been defined.

23. **Section 4.2.3, Mass Flux Distribution Characterization, pg. 16.**

DOE Statement: "Two direct methods will be used to characterize chromium mass flux within the regional aquifer, including the transect method (concentration and flow data measured at individual monitoring points) and aquifer testing (groundwater is extracted and total flow and mass discharge are measured). The former method will make use of an electromagnetic borehole flow meter (EBF), coupled with grab sampling, to conduct high-resolution stratified mass flux characterization at short (~5ft) intervals in existing long-screen (>40ft) wells (e.g., R-70 screen 1, CrEX-1, CrEX-2, CrEX-3, CrEX-4, CrEX-5)."

NMED Comment: Revise the text to include a discussion of how the effects of intraborehole flow will be prevented or how an assessment will be conducted to ensure that the results will accurately reflect distribution with depth in the aquifer.

24. **Section 4.2.3.1, Local Scale Mass Flux, pg. 17.**

DOE Statement: "Two surveys will be performed in each well, one under ambient flow conditions (IM off) and another under pumping conditions (IM on). This will help determine zones of relatively high mass flux conditions that may be created by the IM and provide information for the design of the final remedy."

NMED Comment: Revise the text to discuss how the data gap activity can be accomplished without a survey being conducted under pumping conditions (IM on). If previously collected data can be used, clarify which data and any existing constraints in applying the data to fulfill the data gap requirement.

25. **Section 4.2.3.2, Aquifer Testing: Plume-Scale Hydraulic Properties and Mass Flux, pg. 18.**

DOE Statement: "The test duration for each screen will be dependent on individual test conditions but is anticipated to be approximately 7 days long to (1) increase the probability of capturing the hydraulic response that occurs after delay yield effects dissipate and to (2) enhance the response in observation (monitoring) wells."

NMED Comment: NMED does not concur with the anticipated test duration of 7 days and the text must be revised to clarify that the anticipated test duration will be 24 hours.

26. Section 4.2.3.2, Aquifer Testing: Plume-Scale Hydraulic Properties and Mass Flux, pg. 18.

DOE Statement: "Water produced from testing will be treated to remove hexavalent chromium and injected into injection wells. The use of different injection locations can be used to evaluate pressure responses in nearby monitoring wells associated with each injection event."

NMED Comment: Revise the text. NMED does not support injection occurring in the same aquifer the pumping is being conducted during the aquifer testing and will not approve of an aquifer test work plan following that procedure. Provide specification that the portions of the aquifer testing requiring the injection of treated water into the injection wells will not be completed until NMED has revised the regulatory directive to cease injection.

27. Section 4.2.3.2, Aquifer Testing: Plume-Scale Hydraulic Properties and Mass Flux, pg. 18.

DOE Statement: "The use of different injection locations can be used to evaluate pressure responses in nearby monitoring wells associated with each injection event. To the extent possible, injection of extracted water will begin when test pumping begins and at the same flow rate. Water-level monitoring at surrounding wells will enable observation of system responses to both the pumping and the injection events."

NMED Comment: Revise the text to discuss what pumping analyses will be used to account for extraction and injection influences and to account for the overlapping, interfering influences. Provide specification that the portions of the aquifer testing requiring the injection of treated water into the injection wells will not be completed until NMED has revised the regulatory directive to cease injection.

28. Section 4.2.3.2, Aquifer Testing: Plume-Scale Hydraulic Properties and Mass Flux, pg. 19.

DOE Statement: "It is important to remove the effects of barometric pressure changes on the water levels measured at the site. Therefore, in addition to the pressure transducers installed to monitor pressures, barometric pressure will be monitored throughout the testing process."

NMED Comment: Provide clarification if background water levels will also be measured and corrected for.

29. Section 4.3, Potential Tracer Testing, pg. 19.

DOE Statement: "Although tracer testing is not proposed in this work plan, tracer tests may be required to establish a baseline of information needed to transition to the CME. If additional information is needed to

estimate mass flux, additional tracer tests may be considered. Tracer tests may also be used to identify chromium source locations."

NMED Comment: Revise the text to include a statement discussing the requirement for NMED involvement in the planning of future tracer testing. Additionally, clarify what criteria will trigger implementation of tracer tests. When additional tracer tests are deployed, the quarterly monitoring reports must discuss the details, specifically mentioning key points like travel time, recovered location, injection and recovery amounts and the aquifer parameters determined from the testing.

30. Section 4.3, Potential Tracer Testing, pg. 19.

DOE Statement: "However, the potential to disturb the viability of the monitoring well will need to be considered if tracer testing is desired."

NMED Comment: Revise the text to clarify how the viability of a monitoring well will be disturbed from tracer testing.

31. Section 5.1, Quarterly Monitoring Reports, pg. 22-23.

DOE Statement: "Evaluation of the IM influence on the water table configuration, hydraulic gradients, and chromium plume response using: Graphical and tabular presentations of water level data at each performance monitoring well; synoptic potentiometric surface maps using dates collaboratively identified with NMED, generated for three depths, if possible, based on the availability of data; chromium and other concentration data needed to support the analysis."

NMED Comment: Revise the text to include a discussion on the effectiveness of the current injection well network to control migration. Specifically, evaluate if the data shows evidence of mound or reversal of the hydraulic gradient.

32. Section 5.1, Quarterly Monitoring Reports, pg. 23.

DOE Statement: "Synoptic potentiometric surface maps using dates collaboratively identified with NMED, generated for three depths, if possible, based on the availability of data."

NMED Comment: Revise the Work Plan to include the most recent synoptic potentiometric surface maps from a NMED approved document for at a minimum of two depths. Then continue to update the quarterly reporting requirements for three depths, if possible.

33. Section 5.1, Quarterly Monitoring Reports, pg. 23.

DOE Statement: "Documentation of extraction and recovery rates for wells impacted by aquifer testing, providing data both graphically and in tabular form."

NMED Comment: NMED requires that extraction and recovery rates are provided for each extraction well, not just for the wells impacted by aquifer testing. Specifically, the recovery rates for each well and the system overall should be presented as plots in the future Quarterly Monitoring Reports.

34. Section 5.2, Annual Monitoring Reports, pg. 23.

DOE Statement: "Time-series plots that include data for chromium, perchlorate, nitrate, and tritium and trend analysis as appropriate (e.g., Mann-Kendall)"

NMED Comment: Revise the text to add that solute ratio plots shall be constructed and evaluated. NMED requested that chromium/sulfate, chromium/nitrate, and chromium/chloride plots be constructed and evaluated in the Annual Monitoring Reports.

35. Figure 3.2-2, Schematic of infrastructure well screen locations, pg. 32.

NMED Comment: Revise the figure to include all infrastructure well screen locations for the chromium plume monitoring well network. Additionally, revise the figure to accurately represent the dual screen configuration of CrEX-1 and CrEX-5.

36. Figure 3.3-1 through Figure 3.3-14, pg. 34-40.

NMED Comment: Revise the figures to update to current data that includes the reduced pumping conditions from October 2022 to March 2023.

37. Figure 3.3-14, Chromium concentrations over time at R-61, pg. 40.

NMED Comment: This figure is a duplicate of Figure 3.3-7. Revise Figure 3.3-14 to reflect concentration data for R-61 screen 2.

38. Figure 3.3-16, Present-day plume depiction, along with symbols depicting the level of chromium concentration (<50 or <50 ug/L) at sampling locations, pg. 42.

NMED Comment: The boundary lines are currently showing the approximate extent of 50 ppb Cr at depths >50ft below water table and the approximate extent of 50 ppb Cr at a depth <50ft below water table. For consistency throughout the document, the boundary location provided should represent the position of the 50 ppb extent of contamination. If including a visual representation of the deeper portions of contamination within the regional aquifer, the reference point should include linear depth and depth below water table. Additionally, revisions must be made for the assumptions between known data points representing the approximate extent of 50 ppb Cr at depts >50 ft below water table. For instance, Figure 3.3-16 shows that the approximate extent excludes CrIN-2, CrEX-1, CrEX-2, CrPZ-1 and CrPZ-4 despite the lack of data points in those regions that would allow for exclusion. In regions where data gaps exist and not enough information has been established to determine the approximate extent boundary line, Figure 3.3-16 should err on the side of caution and include it in the potential contamination boundary until enough data has been collected to

exclude. Figure 3.3-16 does not accurately represent the injection wells that showed contamination above 50 ppb in the initial sampling, and it should be revised to reflect the concentration above regulatory standards.