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DEPARTMENT OF ENERGY
Environmental Management Los Alamos Field Office (EM-LA)
Los Alamos, New Mexico 87544

EMLA-2022-BF101-02-001

June 10, 2022

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NMED Hazardous Waste Bureau

Mr. Rick Shean
Bureau Chief
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505-6313

Subject: Submittal of the Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74, Revision 1, and Comment Response

Dear Mr. Shean:

Enclosed please find two hard copies with electronic files of the "Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74, Revision 1." Enclosure 1 includes an electronic copy of a redline strikeout version of the report that incorporates all changes made in response to the New Mexico Environment Department's review comments dated April 2022 (Enclosure 2).

If you have any questions, please contact Joseph Sena at (505) 551-2964 (joseph.sena@em-la.doe.gov) or Cheryl Rodriguez at (505) 414-0450 (cheryl.rodriguez@em.doe.gov).

Sincerely,

ARTURO DURAN

Digitally signed by ARTURO DURAN
Date: 2022.06.09 16:16:19 -06'00'

Arturo Q. Duran
Compliance and Permitting Manager
U.S. Department of Energy
Environmental Management
Los Alamos Field Office

Enclosure(s):

1. Two hard copies with electronic files (including a redline strikeout version) – Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74, Revision 1 (EM2022-0339)
2. U.S. Department of Energy Responses to New Mexico Environment Department Draft Comments on Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74, Dated April 2022 (EM2022-0276)

cc (letter and enclosure[s] emailed):
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Enclosure 1

Drilling Work Plan for RDX Groundwater Project
Regional Aquifer Monitoring Well R-74, Revision 1

Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74, Revision 1

Primary Objectives and Purpose	This work plan presents the objectives, drilling approach, and conceptual design for groundwater monitoring well R-74. The primary objective for R-74 is to characterize vertical extent of Royal Demolition Explosive (RDX [hexahydro-1,3,5-trinitro-1,3,5-triazine]) contamination in the regional aquifer, specifically in the R-69 area (Figure 1). Well R-69 is a two-screen well installed in 2018, and data through the period of record since its installation show RDX concentrations in the deeper of two screens (screen 2) above the New Mexico tap water screening level of 9.66 µg/L. Concentrations have ranged from a maximum of 39.4 µg/L on November 9, 2018, to the most recent concentration of 14.6 µg/L from a sample collected on December 17, 2021. A downward vertical gradient is represented by an approximate 10-ft difference in head measurements between the two screens in R-69. The primary objective of R-74 is to delineate vertical extent of RDX in the R-69 area and provide for long-term monitoring for RDX in an area known to have a downward vertical gradient that could play a role in the current and potential future distribution of RDX contamination in the regional aquifer. Another objective is to further quantify the vertical downward gradient in the RDX area. Well R-74 is, therefore, proposed as a two-screen well with a 20-ft upper screen set at a depth beneath the deeper screen at R-69, and a 10- to 20-ft lower screen set at a depth even deeper into the aquifer. A 10-ft lower screen is shown in Figures 2 and 3 for illustrative purposes. The separation between well screens is shown in Figures 2 and 3 at 50 ft, but the final well-screen positions will be determined based on lines of information obtained from the approaches described below. The proposed location for R-74 is sufficiently close to R-69 to provide confidence that the extent of RDX contamination observed in R-69 screen 2 is characterized (Figure 1). In addition to terrain and site-operational constraints in the Weapons Facility Operations area of Los Alamos National Laboratory (the Laboratory), other potential drilling locations further away from R-69 might result in deep characterization information that would misrepresent the vertical extent of RDX contamination observed in the R-69 area. Figure 2 shows two cross-sections of the approximated RDX distribution in the regional aquifer. The upper cross-section depicts the approximated plume profile using RDX concentrations that were measured in the wells at the time just before submittal of the "Investigation Report for Royal Demolition Explosive in Deep Groundwater" (N3B 2019, 700561). The lower cross-section shows the current concentrations of RDX in the R-69 area and also includes the proposed approximate location and design concept for the R-74 well screens. Figure 3 shows the conceptual design for R-74, with the understanding that a separate and more detailed design package that reflects characterization information obtained during and following drilling will be submitted to the New Mexico Environment Department (NMED) for review and approval.
Drilling Approach	The proposed drilling approach for R-74 will use fluid-assisted air-rotary with casing-advance methods. Telescoping casing sizes between 24 in. and 10 in. and dual-rotary methods will be used to advance the borehole to a depth within the upper 230 ft of the regional aquifer. This approach will produce a borehole that can accommodate an approximate 3-in. annular filter pack around the 5-in.-diameter well screen. Various techniques may be used by the drilling subcontractor to maintain borehole stability and for eventual placement of well screens. Specific techniques that may be used to manage conditions are not provided in this work plan. The U.S. Department of Energy and the selected drilling subcontractor will have the responsibility to use drilling and well-completion methods that are best suited for the conditions encountered. Well completion will follow New Mexico Office of the State Engineer regulations concerning well construction including, but not limited to (1) the hanging of the casing throughout well construction and (2) industry standard centralizers allowing for a minimum 2-in. annular space in a vertical well. Drilling subcontractors are required to have a New Mexico Well Driller's License.

Drilling Fluids, Composition, and Use	Fluids and additives will be used to facilitate drilling and may include those previously authorized for use by NMED, including the following: • Potable water, municipal water supply, to aid in delivery of other drilling additives and to cool the drill bit, • QUIK-FOAM, a blend of alcohol ethoxy sulfates, used as a foaming agent to lift cuttings, and • AQF-2, an anionic surfactant, used as a foaming agent to lift cuttings. The goal is to stop use of drilling fluids and additives 100 ft above the regional aquifer, but use of additives may be necessary to advance drilling and maintain borehole integrity. Complete records will be maintained detailing the type, amount, and volume of fluid and additives used and the depth at which fluids or additives were added to the borehole.
Potential Groundwater Occurrence and Detection	Although perched-intermediate groundwater was not observed during drilling of R-69, perched-intermediate groundwater may be present in the vicinity of the proposed R-74 drilling location. Methods used to identify perched-intermediate groundwater during drilling will include driller's observations, water-level measurements, and borehole video, if appropriate. If perched-intermediate groundwater is encountered, measures will be taken to seal the zone before advancing drilling to ensure that the perched water does not follow the drilling downhole. The top of the regional aquifer is projected to occur at approximately 1300 ft below ground surface.
Geophysical Testing	Geophysical logging will be conducted through the saturated interval in the regional aquifer when the borehole has been drilled to total depth. Neutron and gamma logs will be run to refine estimates of the top of regional saturation, to identify geologic contacts, and to characterize the hydraulic properties of strata beneath the water table. The neutron log measures the amount of hydrogen in the formation in either a water- or air-filled borehole. The hydrogen content typically provides a good measure of moisture content in the unsaturated zone and porosity in the saturated zone. The gamma survey employs a scintillation detector to measure the gross gamma radiation activity of the formation. Naturally occurring gamma radiation comes from the decay of potassium-40 plus the uranium and thorium decay series. Typically, these elements occur in varying concentrations within different strata, and the gamma log can be used to estimate porosity and relative content of fine-grained material. The geophysical data will be used in conjunction with drill cuttings and driller's observations to identify intervals within the aquifer that are suitable for screen placement.
Cuttings Characterization	Cuttings will be collected from the length of the borehole. Cuttings collection and characterization methods will attempt to optimize representative retention of the fine-grained fraction, particularly within the regional aquifer. Split samples of all cuttings collected during drilling will be provided to NMED.

Well Development	The well filter pack may be developed by both mechanical and chemical means. Mechanical means include airlift swabbing, bailing, and pumping. Chemical means include the use of additives to remove clays and/or chlorination to kill bacteria that may be introduced during well completion. Filter pack development during placement will be considered complete when less than 1/10 ml/L of sand is passing through the well screen. After initial airlift swabbing and bailing during filter pack placement, a 6-in. submersible pump will be used to complete the development process following well completion. A 6-in. pump will be capable of removing significantly higher volumes of water than the 4-in. pump that will be part of the final sampling system. Sand production will be measured with a Rossum Sand Tester. Water-quality parameters will be measured in a flow-through cell. The parameters to be monitored are pH, specific conductance, dissolved oxygen, temperature, turbidity, oxidation-reduction potential, and total organic carbon (TOC). If water-quality parameters cannot be brought to within the target values specified below during well development, the use of chemical well development may be discussed with NMED. No chemicals will be added without NMED's approval. Chemical development methods that may be used include AQUA-CLEAR PFD or a similar product to remove clays, and/or chlorination with sodium hypochlorite.
	Well development will be considered complete when target water-quality parameters and sand production quantities are met and a volume of water equivalent to that which was introduced into the aquifer during drilling and construction is removed. The target water-quality parameters are turbidity <5 nephelometric turbidity units and TOC <2 ppm. The target sand production quantity is less than 1 mg/L.
Step-Drawdown Testing	Step-drawdown testing will be performed to investigate and record each well screen interval's performance under controlled discharge conditions. Initial specific capacity will be determined for each screen interval and the data will be used to help select a suitable permanent pump for the dedicated sampling system. Specific pumping rates for each step test will be determined in the field.

Water-Quality Sampling	If perched-intermediate groundwater is encountered, attempts will be made to collect screening-level samples using air-lifting or bailing methods. Screening samples from perched-intermediate groundwater will be analyzed for metals, semivolatile organic compounds, and general inorganic compounds. Water-quality samples will be collected at 20-ft intervals during advancement through the regional aquifer. Borehole water will be air lifted to the surface while each new section of 20-ft drill casing is welded at the surface. Each sample will be collected from the air-lifted water just before continuing advancement of the casing string. To avoid drawing formation materials up the casing, this practice may not be conducted within strata that exhibit characteristics indicating a high degree of borehole instability. Screening-level samples will be analyzed for anions and metals with fast turnaround at the Laboratory's Geochemistry and Geomaterials Research Laboratory. After achieving total depth at approximately 230 ft into the regional aquifer, a series of "temporary wells" will be constructed in the 10-in. borehole. A well string with a 5-ft stainless-steel screened interval will be lowered into the drill casing to total depth, and the annular space around the well screen will be filled with 10/20 filter-grade silica sand (adjacent to screen slots) extending 1 ft to 2 ft above and below the screened interval and with 20/40 transition sand emplaced 5 ft above and below the primary filter pack interval. The 10-in. drill casing will then be retracted to expose the screen interval to the native formation. A 4-in. submersible pump will be deployed in the temporary well on stainless-steel drop pipe to purge and sample. The well construction and purging/sampling procedure will be repeated in 20-ft intervals up through the interval targeted for the upper screen, The purge volumes for each sampling interval will follow this approach: 20 casing volumes for 10-in. casing at a (nominal) length of 10 ft plus introduced water volume for the 20-ft drilling interval being sampled + 10%. [For example: 1 casing volume: (4.1 gal./ft)(10 ft) = 41 gal.; (41 gal.)(20) = 820 gal.; 820 gal. + introduced volume = X; (X)(1.1) = purge volume.] Samples from each of these intervals will be analyzed off-site for RDX with fast turnaround to support near real-time assessment of the distribution of RDX within the aquifer. Samples will also be made available to NMED upon request. These RDX data along with the geophysics data, and information from drill cuttings and driller's observations, will be used for the well-design package submitted to NMED for review and approval. The first groundwater samples from the completed well will be collected at the end of the step-drawdown testing conducted in each of the two screens. These samples will be analyzed for high explosives, metals, general inorganic chemicals (including nitrate, perchlorate, sulfate, etc.), semivolatile organic compounds, volatile organic compounds, and radionuclides (including low-level tritium). Subsequent samples will be collected from the dedicated sampling system described below.
Sampling System Installation	A two-screen Baski sampling system will be installed in the well. The system will use a typical 4-in. pump and motor to maintain sampling purge rates at or near 5 gal. per minute.

Investigation-Derived Waste Management	Investigation-derived waste will be managed in accordance with Standard Operating Procedure (SOP) N3B-EP-DIR-SOP 10021, "Characterization and Management of Environmental Program Waste." This SOP incorporates the requirements of applicable U.S. Environmental Protection Agency and NMED regulations, U.S. Department of Energy orders, and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) requirements. The primary waste streams will include drill cuttings, drilling water, drilling fluids and additives, development water, purge water generated during step-drawdown testing, decontamination water, and contact waste. Drill cuttings will be managed in accordance with the NMED-approved "Decision Tree for the Land Application of Drill Cuttings" (April 2016). Drilling, purge, and development waters will be managed in accordance with the NMED-approved "Decision Tree for Land Application of Drilling, Development, Rehabilitation, and Sampling Purge Water" (November 2016). Initially, drill cuttings and drilling fluids will be stored in a lined pit. Representative samples of the drill cuttings and drilling fluids will be collected and analyzed, and waste determinations will be made from validated data. If validated analytical data show these wastes cannot be land-applied, they will be removed from the pit, containerized, and placed in accumulation areas appropriate for the type of waste. Development and aquifer testing water that meets the requirements to be treated and land-applied will be managed under Discharge Permit 1793. Decontamination water will be containerized separately at the point of generation, placed in an accumulation area appropriate to the type of waste, and directly sampled. Contact waste will be containerized at the point of generation, placed in an appropriate accumulation area, and characterized using acceptable knowledge or the media with which it came in contact.
Schedule	Documentation of completion of R-74 is a proposed fiscal year 2023 Appendix B target.

REFERENCE

The following reference list includes documents cited in this plan. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID.ERIDs were assigned by Los Alamos National Laboratory's Associate Directorate for Environmental Management (IDs through 599999); ESHIDs were assigned by the Laboratory's Associate Directorate for Environment, Safety, and Health (IDs 600000 through 699999); and EMIDs are assigned by N3B (IDs 700000 and above).

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), August 2019. "Investigation Report for Royal Demolition Explosive in Deep Groundwater," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2019-0235, Los Alamos, New Mexico. (N3B 2019, 700561)

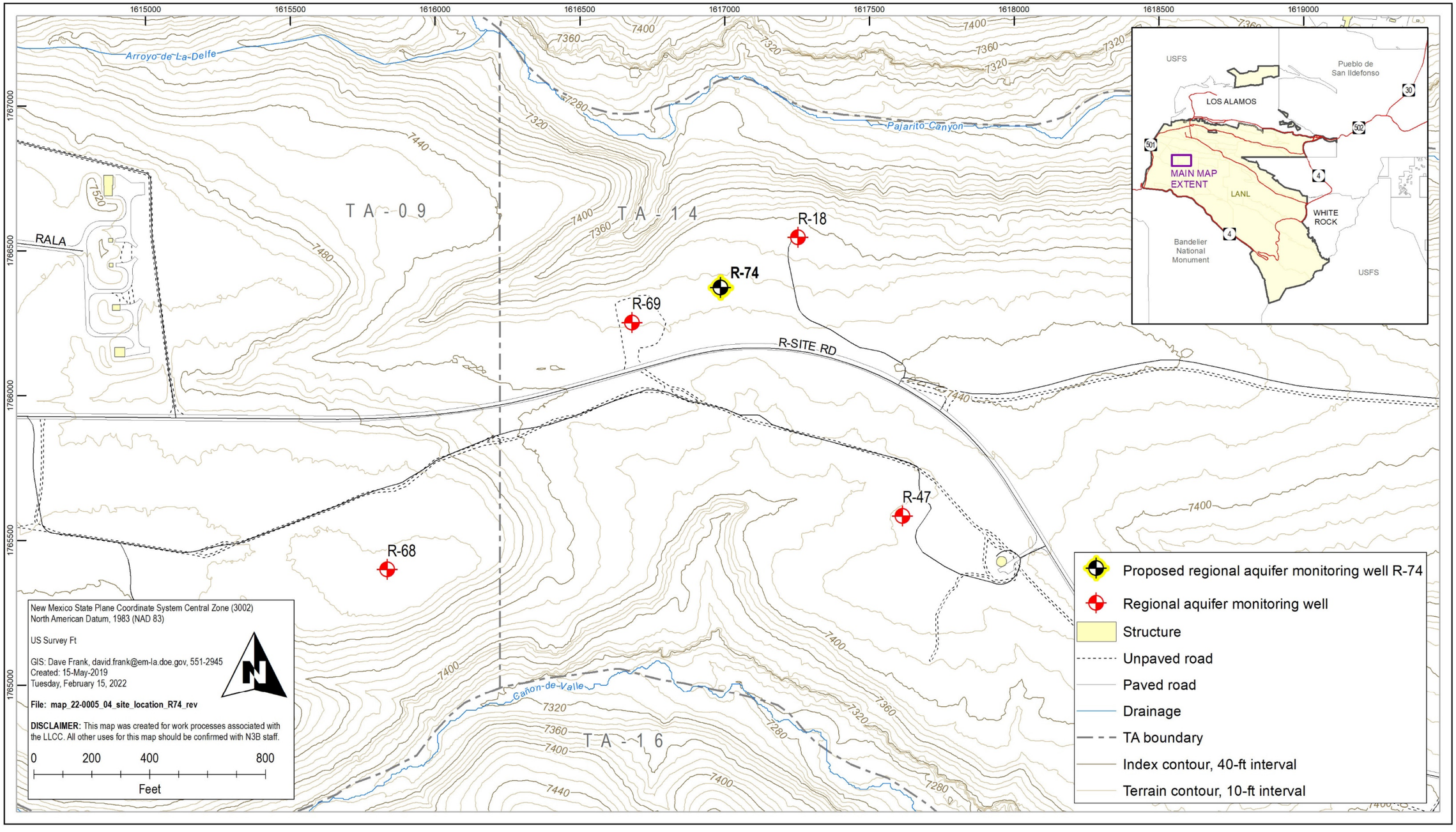


Figure 1 Proposed location for R-74

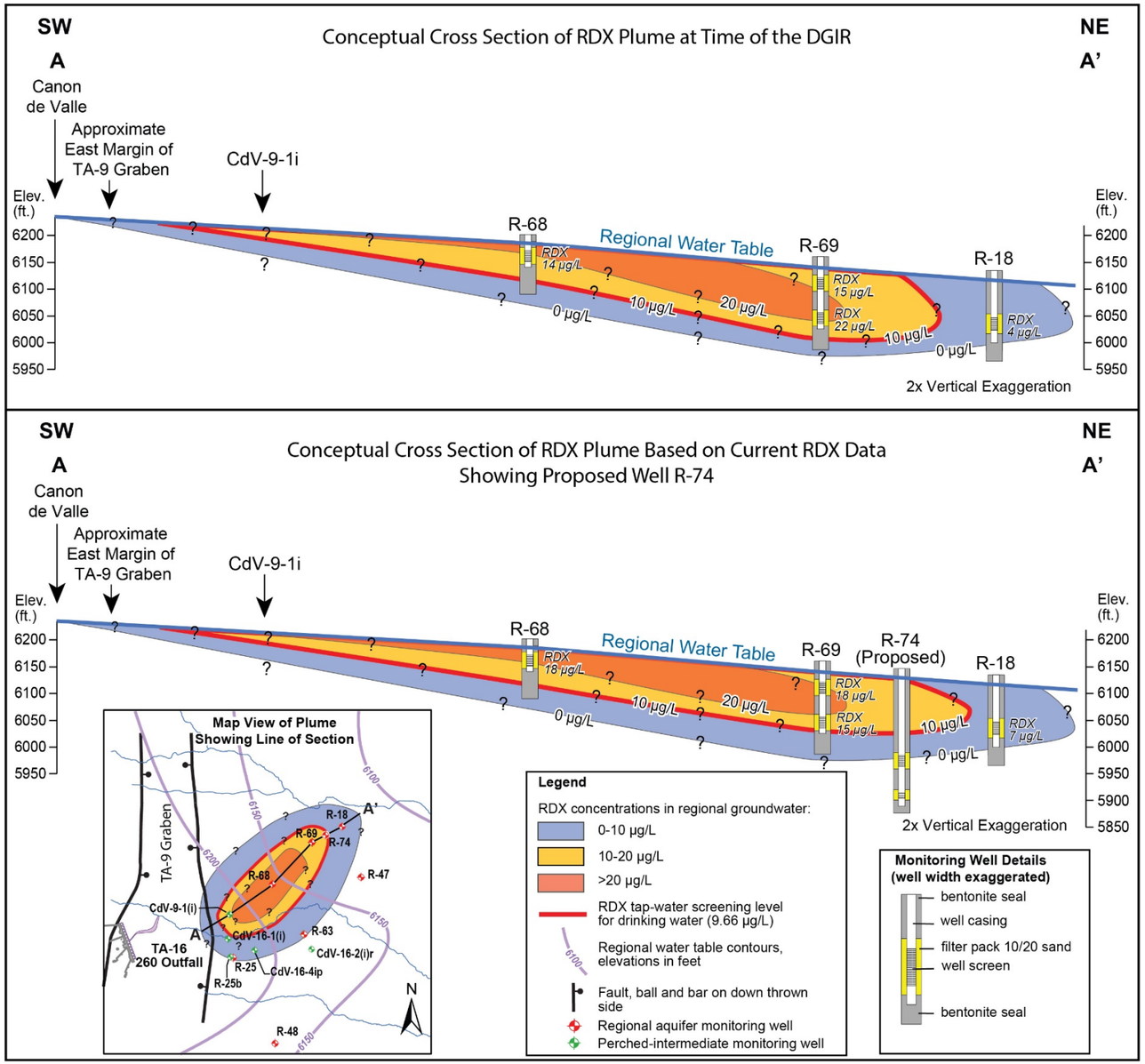
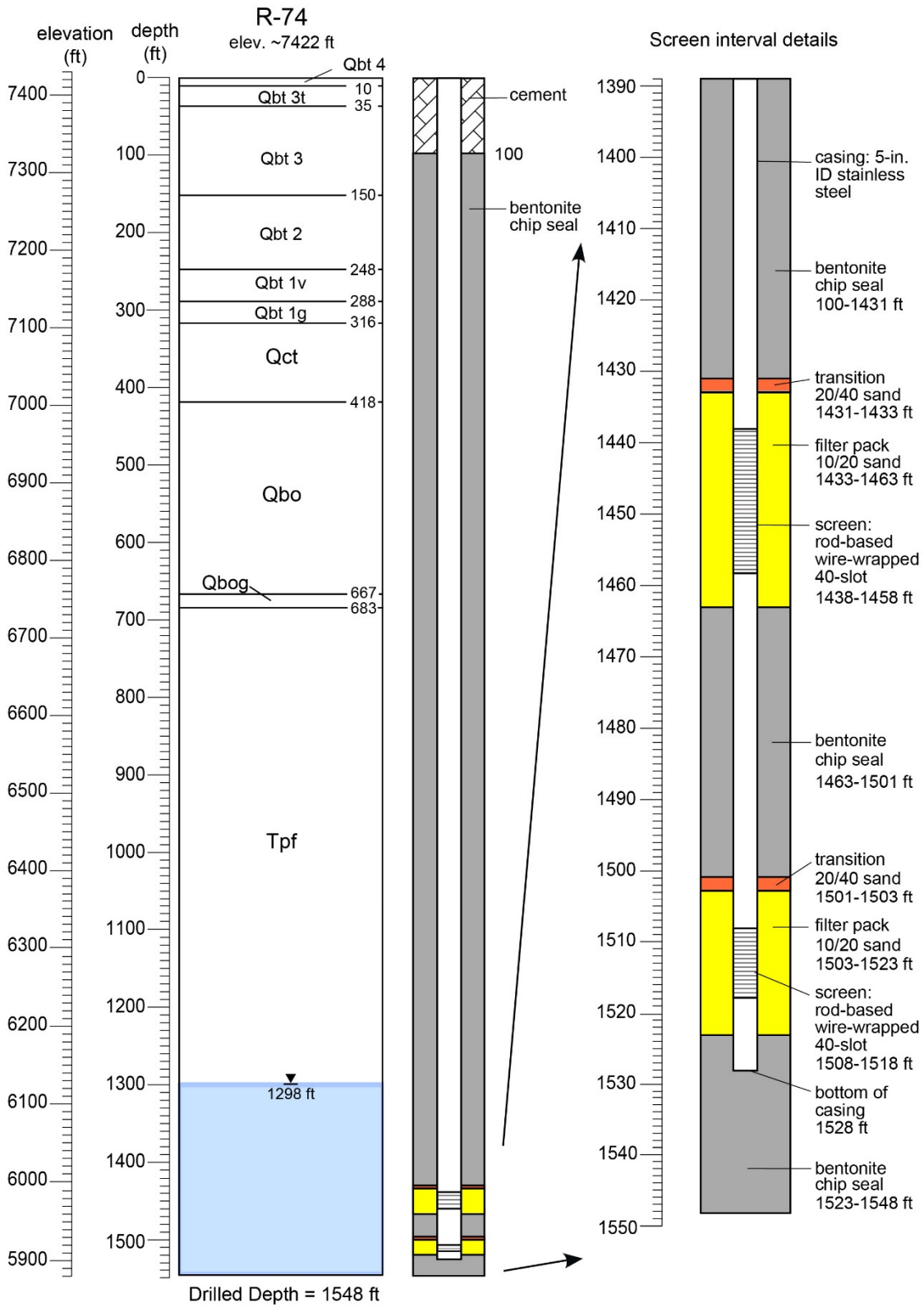


Figure 2 **The map view in the lower left portion of the figure is an estimation of the RDX plume in the regional aquifer as depicted in the "Investigation Report for Royal Demolition Explosive in Deep Groundwater." The upper cross-section derives from the map view and shows the approximated vertical distribution of RDX in the R-69 area using data from R-68, R-69, and R-18 in 2020. The lower cross-section shows the approximated present-day vertical distribution of RDX in those same wells and also the proposed location and well-screen positions for R-74.**



Note: Geologic contacts based WC18 Geologic Framework Model

Figure 3 Conceptual well design for R-74

Enclosure 2

U.S. Department of Energy Responses to New Mexico Environment Department Draft Comments on "Drilling Work Plan for RDX Groundwater Regional Aquifer Monitoring Well R-74," Dated April 2022

U.S. Department of Energy Responses to New Mexico Environment Department Draft Comments on "Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74" Dated April 2022

INTRODUCTION

To facilitate review of this response, the New Mexico Environment Department's (NMED's) comments are included verbatim. The U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office responses follow each NMED comment.

SPECIFIC COMMENTS

NMED Comment

1. Primary Objectives and Purpose, Page 1.

a. ***DOE Statement:*** *"An additional objective of the well is to further characterize and monitor for RDX near the water table between R-69 and R-18. The proposed location of R-74 would be expected to further refine the downgradient extent of RDX observed in screen 1 at R-69 and also help resolve RDX concentrations near the water table."*

NMED Comment: *NMED does not concur with the stated additional objective. NMED provided the rationale for the need for an additional well to define the vertical extent of the RDX during the FY2021 and FY2022 Annual Planning Process discussions to update Appendix B of the 2016 Order on Consent (CO). RDX is 1.8 times denser than fresh water and is unlikely to migrate predominantly along the water table. More importantly, the substantial vertical downward movement of groundwater documented at R-69 suggests the RDX plume may be present much deeper than the water table at the proposed R-74 drilling location. Considering that the purpose for R-74 is to provide for vertical delineation of the RDX plume near its center, a water table screen is inappropriate for R-74. If DOE feels the need for another water table monitoring well, it must propose a new monitoring well during the next update to the Appendix B of the CO.*

For R-74, DOE must plan two deeper well screens by calculating prevailing groundwater flow paths based on the horizontal and vertical hydraulic gradients from the RDX source area to the proposed R-74 location. The calculation must consist of mathematically defensible analyses such as a groundwater model and/or a cross-sectional flow net that are both based on actual synoptic head data from surrounding wells. This analysis shall be discussed with NMED in the April Technical Team meeting to come to a mutual agreement for the screen placements. The results of the analysis must be included in a revision to the Drilling Work Plan for RDX Groundwater Project Regional Aquifer Monitoring Well R-74 (Workplan) for submittal and approval by NMED. In addition, consider NMED specific comments nos. 1b, 8 and 9 when revising the Workplan.

b. ***DOE Statement:*** *"Well R-74 is, therefore, proposed as a two-screen well with a 20-ft upper screen set at a depth approximately 15 ft below the water table and a 10- to 20-ft lower screen set at a depth of approximately 50 ft below the bottom of R-69 screen 2. A 10-ft lower screen is shown in Figures 2 and 3 for illustrative purposes. The net separation between well screens at R-74 will be approximately 107 ft."*

NMED Comment: *In the revision, correct the length and setting below the water table of the upper screen to one appropriate for a non-water table setting. The specifications DOE provided for the lower screen at R-74 appear to be more suitable for the upper screen for R-74. However, the flow path analysis and encountered hydrogeology and water quality obtained during drilling will provide additional information for proper placement of both screens (see NMED specific comments nos. 1a, 8 and 9). Also, delete the suggested net separation distance between the well screens from the revision. Refer to NMED specific comment no. 1a to revise these statements.*

c. ***DOE Statement:*** *"Characterization methods may be implemented during drilling to increase confidence of identifying the vertical extent of RDX contamination."*

NMED Comment: *This statement is too ambiguous for a workplan. Provide definitive characterization methods that DOE intends to use including a detailed description of the(se) selected method(s) with a justification for the selected method(s) over other characterization methods. Revise the Workplan accordingly.*

c. ***DOE Statement****: "The lower cross-section shows the current concentrations of RDX in the R-69 area and also includes the proposed approximate location and design concept for the R-74 well screens. Figure 3 shows the conceptual design for R-74, with the understanding that a separate and more detailed design package that reflects characterization information obtained during and following drilling will be submitted to the New Mexico Environment Department (NMED) for review and approval."*

NMED Comment*: Formulating the proposed location and design concept for R-74 on the current understanding of the RDX distribution in the regional aquifer is inadequate because the actual thickness of the plume is unknown. This statement makes it appear that DOE has assumed the current understanding of the RDX distribution is sufficient to design R-74, specifically the proposed placement of the lower screen. See NMED specific comments nos. 1a, 1b, 8 and 9 for a more scientific approach to designing the well and adjust the revision accordingly.*

DOE Response

1. a. The document has been revised to indicate that the 2 screens will be placed deeper than proposed in Revision 0.

1. b. The figures have been changed to reflect the revised screen depths.

1. c. The work plan has been revised to include additional specificity.

1. d. The revised preliminary design of the well has been included in the revised work plan.

NMED Comment

2. Drilling Approach, Page 1.

DOE Statement: *"The proposed drilling approach for R-74 will use fluid-assisted air-rotary with casing-advance methods. Telescoping casing sizes between 24 in. and 10 in. and dual-rotary methods will be used to advance the borehole to a depth within the upper 100 ft of the regional aquifer. This approach will produce a borehole that can accommodate an approximate 3-in. annular filter pack around the 5-in.-diameter well screen."*

NMED Comment: *Revise the Workplan to include a description on how DOE plans to address the potential for encountering flowing sands that have occurred during past deeper drilling operations at the Los Alamos National Laboratory (LANL). In the Workplan revision, also provide the centralizer specifications that will be used to ensure a sufficient annulus that complies with the State engineer's specifications and whether the driller will "hang" the well to aid in well plumbness to further ensure that a 3-inch annulus develops for emplacement of filter pack, bentonite seal and cement grout. This is crucial to ensure that an adequate seal is installed between the two well screens for subsequent vertical hydraulic gradient and geochemical profiling evaluations. Lastly, revise the "100 ft of the regional aquifer" to a depth based on the analysis DOE will conduct to respond to NMED comments nos. 1a, 1b, 8 and 9. The stated 100 feet is insufficient for a vertical extent monitoring well, and should be more like the 185-foot or 170-foot drill depths DOE proposed for monitoring wells R-76 and R-77, respectively, for vertical delineation of the chromium plume.*

DOE Response

2. Additional detail has been added describing potential techniques and options for drilling and completing in the Tcar. The final well design will conform with applicable New Mexico Office of the State Engineer requirements, as noted.

NMED Comment

3. Potential Groundwater Occurrence and Detection, Page 2.

DOE Statement: *"Although perched-intermediate groundwater was not observed during drilling of R-69, perched-intermediate groundwater is known to be present in the vicinity of the proposed R-74 drilling location. Methods used to identify perched-intermediate groundwater during drilling will include driller's observations, water-level measurements, and borehole video, if appropriate. If perched-intermediate groundwater is encountered, measures will be taken to seal the zone before advancing drilling to ensure that the perched water does not follow the drilling downhole."*

NMED Comment: *In the revision, clarify this statement because it contradicts itself i.e., justify how perched-intermediate groundwater can be 'known to be present' in the vicinity of proposed monitoring well R-74 when it was not encountered during the drilling of nearby R-69 (or R-18). If perched-intermediate groundwater is found to be present with a sufficient quantity and yield (i.e., 250 milliliter per minute or more at three well volumes) while drilling R-74, NMED will require that a separate perched-intermediate aquifer monitoring well be installed at the R-74 pad.*

DOE Response

3. The text has been changed to "Although perched-intermediate groundwater was not observed during drilling of nearby well R-69, perched-intermediate groundwater may be present in the vicinity of the proposed location for R-74."

NMED Comment

4. Geophysical Testing, Page 2.

DOE Statement: *"Geophysical logging will be conducted through the saturated interval in the regional aquifer when the borehole has been drilled to total depth. Logging data will be used to refine*

estimates of the top of regional saturation and to characterize the hydraulic properties of strata beneath the water table."

NMED Comment: *Provide in the revision to the Workplan the specific geophysical logs that DOE will run, and the information DOE expects to obtain from each log to achieve the stated hydrogeological characterization.*

DOE Response

4. Additional detail has been provided on the specific logs (gamma and neutron) and their purpose.

NMED Comment

5. Cuttings Characterization, Page 2

DOE Statement: *"Cuttings will be collected from the length of the borehole."*

NMED Comment: *Revise the Workplan to include that DOE will provide NMED with split samples of all cuttings collected during the drilling of R-74.*

DOE Response

5. The work plan has been revised to include a statement to that effect.

NMED Comment

6. Hydraulic Testing, Page 3.

DOE Statement: *"Both screened intervals will be hydraulically tested following development."*

NMED Comment: *Hydraulic testing must be removed from the Workplan revision. Appendix C, Appendix E Section II and Appendix F Section I.B.6.c of the CO provides the appropriate investigations, standards, and reports where hydraulic testing should be conducted and presented. NMED requires a specific workplan for all aquifer and well hydraulic tests that are in accordance with the CO and provides the rationale for the test including the purpose, goals, objectives, needs, methods, and the intended use for the acquired data including the proposed hydraulic test at R-74. If NMED concurs with the need, DOE shall provide a separate workplan prepared in accordance with NMED HWB's Aquifer Testing Guidance Document (pending) and is conducted as part of an RCRA Facility Investigation (RFI) or Interim Measure (IM) in accordance with the CO and subject to NMED review, comment, and approval. NMED stresses the value in a singular, large-scale, long-term, multi-well aquifer performance test at the RDX plume over the individual limited tests typically performed by DOE at LANL. NMED will not accept any data derived from, or report that contains the hydraulic testing methodology, rationale and analyses used at monitoring well R-70.*

DOE Response

6. The hydraulic testing section has been replaced by a section on step-drawdown testing for the purpose of sizing the pump in the dedicated sampling system and for determining the specific capacity of the well.

NMED Comment

7. Water-Quality Sampling, Page 3.

DOE Statement: *"If perched-intermediate groundwater is encountered, attempts will be made to collect screening-level samples using air-lifting or bailing methods. Screening samples from perched intermediate groundwater will be analyzed for high explosives, metals, semivolatile organic compounds, and general inorganic compounds.*

The first groundwater samples from the completed well will be collected at the end of the hydraulic test in each of the two screens."

NMED Comment: *Include in the revision to the Workplan that screening-level samples will also be collected from the regional aquifer and that split screening samples will be provided to NMED under NMED chain of custody protocol or that DOE will make the drill site safe and accessible for two NMED personnel at a time to collect their own screening-level groundwater samples during active drilling operations. If groundwater is not encountered in the perched intermediate aquifer, NMED will not request to be on site until regional aquifer groundwater is encountered. All groundwater quality data collected by DOE must be provided to NMED upon receipt from the laboratory.*

See NMED specific comment no. 6 regarding hydraulic testing. Refrain from referring to DOE's post development extended purging and collection of "first samples" as a hydraulic test as it does not conform to standard hydraulic well testing methods that are accepted and understood worldwide.

DOE Response

7. A description of the sampling to be conducted has been added to the document, along with a statement affirming NMED's access to split samples. References to "hydraulic tests" have been removed throughout the document.

NMED Comment

8. Figure 1, Proposed location for R-74, Page 5.

NMED Comment: *NMED notes that the projected RDX concentration at downgradient monitoring well R-18 will exceed the screening limit either before or during 2026. An exceedance at R-18 will require a new monitoring well to be installed further downgradient and north of R-18 across Pajarito Canyon on Two Mile Mesa to delineate the plume edge in the direction of groundwater flow. In addition, this monitoring well may also potentially serve as a sentinel well between the RDX plume flow path and the downgradient production wells. Scheduling for this well should be part of the annual planning process for proposed work for updating Appendix B of the CO. Conversely, placement of R-74 to this downgradient location may also be considered. This may be discussed during the April technical team meeting.*

DOE Response

8. No change to the R-74 drilling work plan is required for this comment.

NMED Comment

9. Figure 2, …cross-section shows the approximated present-day vertical distribution of RDX in those same wells and also the proposed location and well-screen positions for R-74, Page 6.

NMED Comment: *The vertical distribution of RDX is not known. The purpose of R-74 screen placement is to provide the vertical distribution of the RDX near the plume center. The vertical spacing of the two well screens in proposed monitoring well R-74 should reflect deeper groundwater flow pathways from the source to the proposed R-74 drill location and consider the vertical component to groundwater movement in the area. A flow net, groundwater model, or other appropriate mathematical calculation of the three dimensional groundwater flow field that dominates the flow regime and likely affect plume migration must be considered for screen placement. See NMED specific comment nos. 1a, 1b and 1c, and revise Figure 2 in the Workplan revision accordingly.*

DOE Response

9. The figures have been revised to reflect the new preliminary well design.