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

EMLA-2021-0058-02-001 November 30, 2020

Mr. Kevin Pierard
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 2020 Annual Progress Report for the Corrective Measures Evaluation for Royal Demolition Explosive in Deep Groundwater

Dear Mr. Pierard:

Enclosed please find two hard copies with electronic files of the "2020 Annual Progress Report for the Corrective Measures Evaluation for Royal Demolition Explosive in Deep Groundwater." This report summarizes activities completed by Newport News Nuclear BWXT-Los Alamos, LLC, from October 1, 2019, through September 30, 2020, related to Royal Demolition Explosive in deep groundwater.

If you have any questions, please contact Patrick McGuire at (505) 709-7918 (patrick.mcguire@em-la.doe.gov) or Cheryl Rodriguez at (505) 257-7941 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Arturo Q. Duran

Digitally signed by Arturo Q. Duran
Date: 2020.11.24 15:48:34 -07'00'

Arturo Q. Duran
Compliance and Permitting Manager
Environmental Management
Los Alamos Field Office

Enclosure(s):
1. Two hard copies with electronic files – 2020 Annual Progress Report for the Corrective Measures Evaluation for Royal Demolition Explosive in Deep Groundwater (EM2020-0572)

CC (letter and enclosure[s] emailed):
Laurie King, EPA Region 6, Dallas, TX
Raymond Martinez, San Ildefonso Pueblo, NM
Dino Chavarria, Santa Clara Pueblo, NM
Chris Catechis, NMED-DOE-OB
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Felicia Aguilar, N3B
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Emily Day, N3B
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Pamela T. Maestas

From: Martinez, Cynthia, NMENV <cynthia.martinez1@state.nm.us>
Sent: Tuesday, December 1, 2020 8:41 AM
To: Pamela T. Maestas
Subject: RE: Submittal to NMED on 11/30/2020 of 2020 Progress Rpt for CME for RDX in Deep GW

Received.
Thank you

From: Pamela T. Maestas <pamela.maestas@em-la.doe.gov>
Sent: Monday, November 30, 2020 3:10 PM
To: Pierard, Kevin, NMENV <Kevin.Pierard@state.nm.us>
Cc: Dhawan, Neelam, NMENV <neelam.dhawan@state.nm.us>; Emily M. Day <Emily.Day@em-la.doe.gov>; Regulatory Documentation <RegDocs@EM-LA.DOE.GOV>; Martinez, Cynthia, NMENV <cynthia.martinez1@state.nm.us>; cheryl.rodriguez@em.doe.gov; Patrick McGuire <Patrick.McGuire@EM-LA.DOE.GOV>; Danny Katzman <danny.katzman@em-la.doe.gov>
Subject: [EXT] Submittal to NMED on 11/30/2020 of 2020 Progress Rpt for CME for RDX in Deep GW

Mr. Pierard,
Attached for submittal is a pdf of the following:

- Submittal of the 2020 Annual Progress Report for the Corrective Measures Evaluation for Royal Demolition Explosive in Deep Groundwater (EMLA-2021-0058-02-001, letter and enclosure)

Please acknowledge receipt of this submittal by responding to this email.
Let me know if you have any questions.
Thank you.

Pamela T. Maestas
Regulatory Documentation Manager
Newport News Nuclear BWXT-Los Alamos, LLC
c. 505-927-7882
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Los Alamos, NM 87544

November 2020
EM2020-0572

2020 Annual Progress Report for the Corrective Measures Evaluation for Royal Demolition Explosive in Deep Groundwater

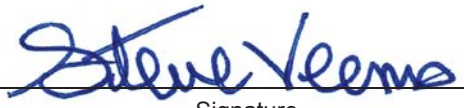
N3B Los Alamos

EM2020-0572

2020 Annual Progress Report for the Corrective Measures Evaluation for Royal Demolition Explosive in Deep Groundwater

November 2020

Responsible program director:

Steve Veenis		T2S Program Director	Water Program	11/18/20
Printed Name	Signature	Title	Organization	Date

Responsible N3B representative:

Kim Lebak		Program Manager	N3B Environmental Remediation Program	11/19/20
Printed Name	Signature	Title	Organization	Date

Responsible DOE EM-LA representative:

Arturo Q. Duran	Arturo Q. Duran Digitally signed by Arturo Q. Duran Date: 2020.11.24 15:49:43 -07'00'	Compliance and Permitting Manager	Office of Quality and Regulatory Compliance	
Printed Name	Signature	Title	Organization	Date

CONTENTS

Figure

1.0 INTRODUCTION

This report serves as the fifth annual progress report for the corrective measures evaluation (CME) of Royal Demolition Explosive (RDX) in deep groundwater. The report summarizes activities the U.S. Department of Energy (DOE) Environmental Management Los Alamos Field Office (EM-LA) and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) completed from October 2019 through September 2020 (fiscal year [FY] 2020) related to the RDX deep groundwater investigation for the Technical Area 16 (TA-16) 260 Outfall (Figure 1.0-1).

DOE and Los Alamos National Security, LLC (LANS) submitted the "Corrective Measures Evaluation Report, Intermediate and Regional Groundwater, Consolidated Unit 16-021(c)-99" (hereafter, the CME report) in August 2007 (LANL 2007, 098734). The New Mexico Environment Department (NMED) issued a notice of disapproval (NOD) in April 2008 (NMED 2008, 101311), requesting additional characterization to evaluate the feasibility of the remedial alternatives proposed in the groundwater CME report and to assess the extent of contamination in perched-intermediate groundwater and in the regional aquifer.

To address the data needs identified by NMED, Los Alamos National Laboratory (LANL or the Laboratory) and N3B have conducted additional characterization of perched-intermediate and regional groundwater in recent years, installing additional wells; conducting single- and multi-well aquifer tests and tracer tests; and conducting geochemical, bioremediation, and natural attenuation studies. The data obtained from these activities were summarized in the "Investigation Report for Royal Demolition Explosive in Deep Groundwater" (deep groundwater IR) (N3B 2019, 700561), which was submitted to NMED on August 29, 2019.

To address the uncertainties identified in the deep groundwater IR regarding potential risk to human health and to stay consistent with NMED risk assessment guidance (NMED 2019, 700550), the deep groundwater IR recommended that a risk assessment be developed for the RDX contamination in groundwater that would incorporate a fate and transport modeling analysis as input to the evaluation. The Fate and Transport Modeling and Risk Assessment Report (Risk Assessment Report) became 2020 Milestone #7 of Appendix B of the 2016 Compliance Order on Consent (Consent Order) and was submitted to NMED on May 29, 2020 (N3B 2020, 700925).

The deep groundwater investigation activities conducted during FY 2020 are discussed in this report.

2.0 DEEP GROUNDWATER INVESTIGATION ACTIVITIES

During the FY 2020 reporting period, the ongoing investigation of the nature and extent of RDX contamination in perched-intermediate groundwater and the regional aquifer included the following activities:

- revised and submitted the R-69 well completion report Revision 1, which NMED approved on December 2, 2019 (N3B 2019, 700657);
- sampled TA-16 260 monitoring group wells in accordance with the Interim Facility-Wide Groundwater Monitoring Plan (IFGMP);
- continued sampling to monitor tracer breakthrough in the perched-intermediate zones; and
- submitted the Risk Assessment Report (N3B 2020, 700925).

These activities are discussed below.

2.1 Monitoring Well R-69

A letter report documenting R-69 well completion and first sample collection was submitted to NMED on November 28, 2018 (DOE 2018, 700138). A well completion report was submitted to NMED in March 2019 (N3B 2019, 700346). On May 15, 2019, NMED provided comments to the well completion report (Andersen 2019, 701109). DOE provided responses to NMED comments on July 12, 2019 (McGuire 2019, 701107), and NMED replied on July 29, 2019 (Dhawan 2019, 701108) requesting additional information. DOE submitted the revised report to NMED on November 4, 2019 (N3B 2019, 700657). NMED approved the revised report on December 2, 2019 (NMED 2019, 700690).

2.2 IFGMP Sampling

Two groundwater sampling campaigns were conducted for the TA-16 260 monitoring group (Figure 1.0-1) during FY 2020 in accordance with the "Interim Facility-Wide Groundwater Monitoring Plan for the 2020 Monitoring Year, October 2019–September 2020" (N3B 2019, 700451). The IFGMP sampling campaigns were conducted December 3–13, 2019, and July 15–August 3, 2020. The analytical data from these sampling campaigns are available on the Intellus New Mexico website (https://www.intellusnm.com) and are presented in the annual periodic monitoring reports for the TA-16 260 monitoring group.

Groundwater sampling at TA-16 typically entails four sampling campaigns in a fiscal year, one per quarter. However, only two campaigns were conducted in FY 2020 for two reasons:

- The FY 2020 Quarter 2 sampling event was canceled because groundwater field crews were unable to access Weapons Facilities Operations security areas pending approval of Form 1897 for authorization to use necessary controlled portable electronic devices on-site to complete sampling.
- The FY 2020 Quarter 3 sampling event was canceled due to a partial stop-work order issued by EM-LA in response to the COVID-19 pandemic. During this time, N3B's operations at LANL were limited to those considered essential mission critical activities starting on March 24, 2020. The samples scheduled to be collected in FY 2020 Quarter 3 were collected in FY 2020 Quarter 4, once phased resumption of operations began at LANL.

2.3 Tracer Test Update

Tracer deployments were conducted in October and November 2015. Tracer data available for FY 2020 were reviewed for breakthrough at downgradient wells. It was concluded that the tracers had not yet fully moved beyond the vicinity of the screens where they were deployed and no cross-well detections had occurred. However, long-term tracer breakthrough monitoring will continue, and the results of the tracer tests will be reported on an annual basis in future CME progress reports.

2.4 Risk Assessment Report

Submission of the Risk Assessment Report fulfilled the requirements of the Consent Order, FY 2020 Appendix B, Milestones and Targets. Appendix B, Milestone #7 (N3B 2020, 700925), required a report that presents a fate and transport evaluation and risk assessment for RDX in deep (perched-intermediate and regional) groundwater. The report incorporated a model analysis as part of the risk assessment approach. The report is currently under NMED review.

3.0 REGULATORY, PUBLIC, AND STAKEHOLDER INVOLVEMENT

In FY 2020, activities to characterize the perched-intermediate and regional groundwater continued to be performed. Communication with the NMED Hazardous Waste Bureau, the NMED DOE Oversight Bureau, and the U.S. Environmental Protection Agency (EPA) were held throughout the year to discuss the fate and transport modeling and the risk assessment. Technical meetings to discuss the fate and transport modeling and the risk assessment were held on December 3, 2019; January 28, 2020; March 31, 2020; and April 13, 2020. On July 15, 2020, a technical team meeting was held to review the RDX conceptual site model with recently hired staff from NMED and EPA.

In addition, N3B presented at the Environmental Management Cleanup Forum on February 19, 2020, in an effort to keep the public informed of DOE's activities regarding RDX in deep groundwater.

4.0 WORK PLANNED FOR FY 2021

In FY 2021, deep groundwater CME activities will include performance of IFGMP sampling and addressing NMED's comments to the deep groundwater IR (N3B 2019, 700561) and the Risk Assessment Report.

A summary of the FY 2021 activities will be reported in the sixth annual progress report and submitted to NMED by November 30, 2021.

5.0 REFERENCES AND MAP DATA SOURCES

5.1 References

The following reference list includes documents cited in this report. Parenthetical information following each reference provides the author(s), publication date, and ERID, ESHID, or EMID. This information is also included in text citations. ERIDs were assigned by the 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 Newport News Nuclear BWXT-Los Alamos, LLC (N3B) (IDs 700000 and above). IDs are used to locate documents in N3B's Records Management System and in the Master Reference Set. The NMED Hazardous Waste Bureau and N3B maintain copies of the Master Reference Set. The set ensures that NMED has the references to review documents. The set is updated when new references are cited in documents.

Andersen, D., May 15, 2019. NMED Draft Comments on the R-69 WCR. E-mail message to M. Everett (N3B) and P. McGuire (N3B) from D. Andersen (NMED), Santa Fe, New Mexico. (Andersen 2019, 701109)

Dhawan, N., July 29, 2019. RE: [EXT] R-69 Completion Report: Response to NMED Draft Comments on the R-69 WCR. E-mail message to P. McGuire (N3B) from N. Dhawan (NMED), Santa Fe, New Mexico. (Dhawan 2019, 701108)

DOE (U.S. Department of Energy), November 28, 2018. "Letter Report: Well R-69 Field Completion and Groundwater Sample Collection," U.S. Department of Energy letter (EM-LA-40AD-00354) to J. Kieling (NMED-HWB) from A. Duran (EM-LA), Los Alamos, New Mexico. (DOE 2018, 700138)

LANL (Los Alamos National Laboratory), August 2007. "Corrective Measures Evaluation Report, Intermediate and Regional Groundwater, Consolidated Unit 16-021(c)-99," Los Alamos National Laboratory document LA-UR-07-5426, Los Alamos, New Mexico. (LANL 2007, 098734)

McGuire, P., July 12, 2019. R-69 Completion Report: Response to NMED Draft Comments on the R-69 WCR. E-mail message to N. Dhawan (NMED) from P. McGuire (N3B), Los Alamos, New Mexico. (McGuire 2019, 701107)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), March 2019. "Completion Report for Regional Aquifer Well R-69," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2019-0053, Los Alamos, New Mexico. (N3B 2019, 700346)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), May 2019. "Interim Facility-Wide Groundwater Monitoring Plan for the 2020 Monitoring Year, October 2019–September 2020," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2019-0156, Los Alamos, New Mexico. (N3B 2019, 700451)

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)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), October 2019. "Completion Report for Regional Aquifer Well R-69, Revision 1," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2019-0335, Los Alamos, New Mexico. (N3B 2019, 700657)

N3B (Newport News Nuclear BWXT-Los Alamos, LLC), May 2020. "Fate and Transport Modeling and Risk Assessment Report for RDX Contamination in Deep Groundwater," Newport News Nuclear BWXT-Los Alamos, LLC, document EM2020-0135, Los Alamos, New Mexico. (N3B 2020, 700925)

NMED (New Mexico Environment Department), April 22, 2008. "Notice of Disapproval Corrective Measures Evaluation Report, Intermediate and Regional Groundwater Consolidated Unit 16-021(c)-99," New Mexico Environment Department letter to D. Gregory (DOE-LASO) and D. McInroy (LANL) from J.P. Bearzi (NMED-HWB), Santa Fe, New Mexico. (NMED 2008, 101311)

NMED (New Mexico Environment Department), June 19, 2019. "Risk Assessment Guidance for Site Investigations and Remediation, Volume 1, Soil Screening Guidance for Human Health Risk Assessments," February 2019 (Revision 2, 6/19/19), Hazardous Waste Bureau and Ground Water Quality Bureau, Santa Fe, New Mexico. (NMED 2019, 700550)

NMED (New Mexico Environment Department), December 2, 2019. "Completion Report for Regional Aquifer Well R-69, Revision 1," New Mexico Environment Department letter to D. Hintze (EM-LA) from N. Dhawan (NMED-HWB), Santa Fe, New Mexico. (NMED 2019, 700690)

5.2 Map Data Sources

Hillshade; Los Alamos National Laboratory, ER-ES, As published; \\slip\gis\Data\HYP\LiDAR\2014Bare_Earth\BareEarth_DEM_Mosiac.gdb; 2014.

Structures; Los Alamos National Laboratory, KSL Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Unpaved road; Los Alamos National Laboratory, ER-ES, As published, GIS projects folder; \\slip\GIS\Projects\14-Projects\14-0062\project_data.gdb; digitized_site_features; digitized_road; 2017.

Paved Road Arcs; Los Alamos National Laboratory, FWO Site Support Services, Planning, Locating and Mapping Section; 06 January 2004; as published 29 November 2010.

Drainage Channel; Los Alamos National Laboratory, ER-ES, As published, GIS projects folder; \\slip\GIS\Projects\11-Projects\11-0108\\gdb\gdb_11-0108_generic.mdb; drainage; 2017.

TA-16 260 Outfall, As Published, GIS project folder: Q:\14-Projects\14-0080\project_data.gdb\ polygon\outfall_260

M Wall-PRB, As Published, GIS project folder: Q:\14-Projects\14-0080\project_data.gdb\line\wall_PRB

Connector piping, As Published, GIS project folder: Q:\14-Projects\14-0080\project_ data.gdb\line\connector_piping

Tech areas; Los Alamos National Laboratory, Database Connections\GIS.PUB.PRD1.sde\PUB.Boundaries\PUB.tecareas

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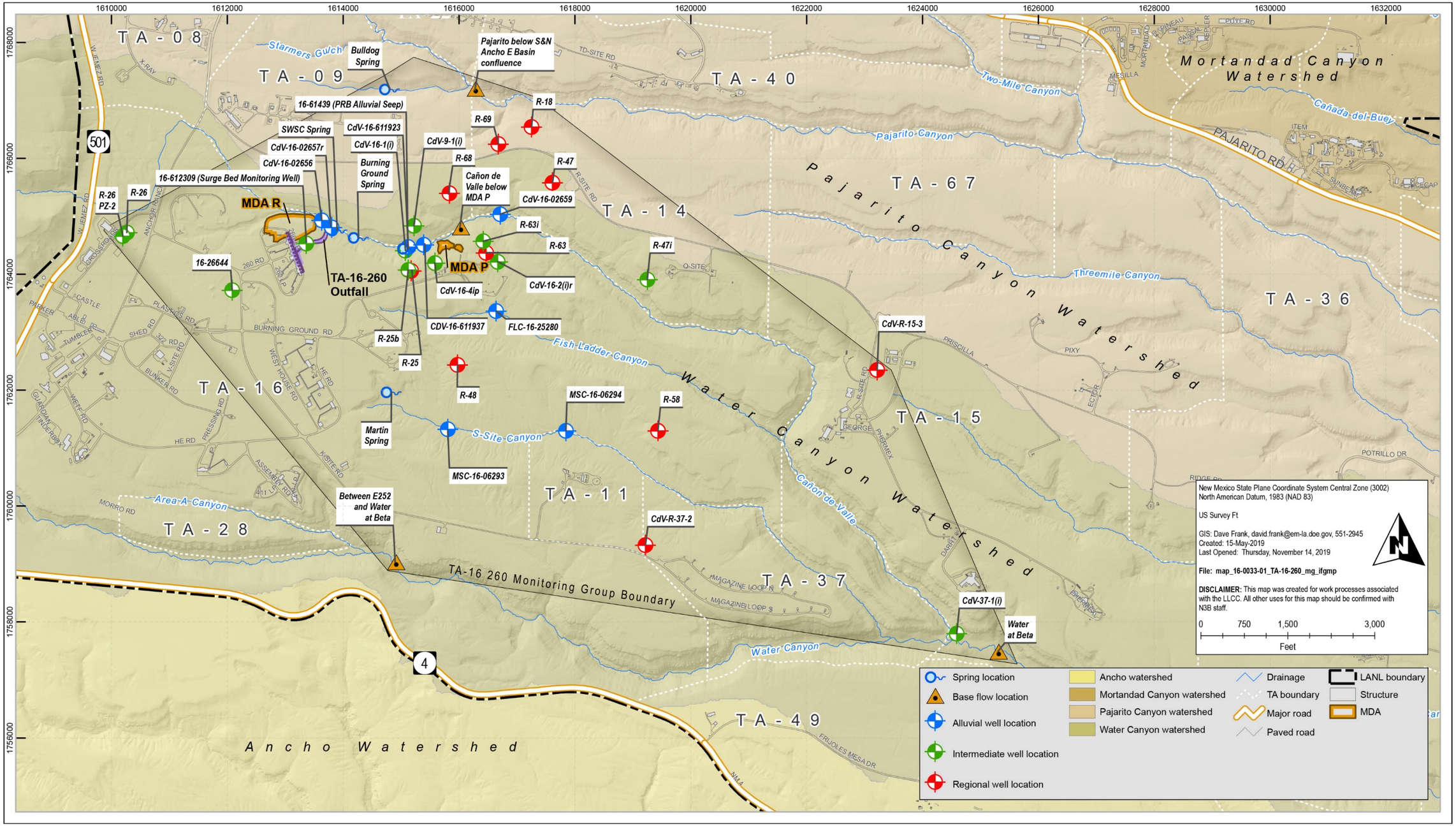

Figure 1.0-1 TA-16 260 monitoring group locations and 260 Outfall