EMID-700740

N3B-Los Alamos
1200 Trinity Drive, Suite 150
Los Alamos, New Mexico 87544
(505) 661-5918

Environmental Management
Los Alamos Field Office
P.O. Box 1663, MS M984
Los Alamos, New Mexico 87545
(505) 257-7950/FAX (505) 606-2132

Date: JAN 29 2020
Refer To: N3B-20-0025

Steve Pullen
Program Manager
Groundwater Pollution Prevention Section
New Mexico Environment Department
P.O. Box 5469
1190 S. St. Francis Drive
Santa Fe, NM 87502

GROUND WATER
JAN 29 2020
BUREAU

Subject: Submittal of Discharge Permit 1793 Renewal Application

Dear Mr. Pullen:

On July 27, 2015, the New Mexico Environment Department (NMED) issued Discharge Permit (DP) 1793 to the U.S. Department of Energy (DOE) and Los Alamos National Security, LLC (LANS) for the discharge of treated groundwater. On April 30, 2018, operational responsibility of DP-1793 was transferred from LANS to Newport News Nuclear BWXT-Los Alamos, LLC. The term of DP-1793 is 5 years and will end on July 27, 2020. In order to continue operations under DP-1793, a renewal application is required to be submitted to NMED at least 180 days before the date DP-1793 expires.

The technical information supporting this application includes the information submitted for the 2015 permit, which is incorporated in this application by reference. The conditions included in DP-1793, as issued in 2015, are sufficient to ensure that applicable requirements are met. DOE/N3B are proposing to make minor modifications to Permit Condition #4 of the 2015 permit as indicated in Section III of the attached permit renewal application.

Enclosed are two hard copies and an electronic copy of a renewal discharge permit application for DP-1793. The enclosed renewal discharge permit application is intended to provide the foundation for the re-issuance of DP-1793 with additional details being provided to NMED in project-specific work plans. As such, the renewal of the discharge permit will provide umbrella coverage for a diversity of groundwater activities at Los Alamos National Laboratory.

If you have questions, please contact Christian Maupin at (505) 695-4281 (christian.maupin@em-la.doe.gov) or Cheryl Rodriguez at (505) 257-7941 (cheryl.rodriguez@em.doe.gov).

Sincerely,

Elizabeth Lowes
Program Manager
Environment, Safety and Health
N3B-Los Alamos

Sincerely,

David Nickless, Acting Director
Office of Quality and Regulatory Compliance
Environmental Management
Los Alamos Field Office

Enclosure:

1. Two original signature hard copies and one electronic copy – New Mexico Environment Department Ground Water Quality Bureau Groundwater Discharge Permit Application

cc (letter and enclosure emailed):
Arturo Duran, EM-LA
Douglas Hintze, EM-LA
Cheryl Rodriguez, EM-LA
Hai Shen, EM-LA
Ben Underwood, EM-LA
Emily Day, N3B
Erich Evered, N3B
Danny Katzman, N3B
Christian Maupin, N3B
Glenn Morgan, N3B
Joseph Legare, N3B
Dana Lindsay, N3B
Frazer Lockhart, N3B
Elizabeth Lowes, N3B
Bruce Robinson, N3B
Steve White, N3B
emla.docs@em.doe.gov
N3B Records
Public Reading Room (EPRR)
PRS Website

NEW MEXICO ENVIRONMENT DEPARTMENT
GROUND WATER QUALITY BUREAU

GROUND WATER DISCHARGE PERMIT APPLICATION

Instructions for completing the application are included in the form itself and in the Supplemental Instructions found at the back of the application. You may fill out the application manually, or a Microsoft Word version may be downloaded from www.env.nm.gov (Ground Water Quality) and filled out electronically. Timely processing of this application is contingent upon the technical completeness of the submission. Failure to provide all of the information pursuant to Section 20.6.2.3106 NMAC, following notice of technical deficiency, may result in denial of the application.

Send two complete paper copies AND one electronic copy of this application, with the filing fee to:

Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Introduction

Facility Name: Los Alamos National Laboratory

GWQB – Date of Receipt
(Department use only)

For Existing Discharge Permits:

DP Number: 1793
Expiration Date: 07/27/2020

Type of Discharge (*check one)*:

- ☐ Domestic
- ☒ Industrial
- ☐ Agricultural
- ☐ Mining

Type of Application (*check appropriate box*)

- ☐ New – new facility
- ☐ New – existing (unpermitted) facility
- ☒ Renewal only
- ☐ Modification only
  "modification" includes a change in the location of a discharge, and/or increase in the quantity of the discharge, and/or a change in the quality of the discharge.
- ☐ Renewal and Modification

If this application is to *modify* or *renew and modify* a Discharge Permit, what is the reason for modification of the Discharge Permit? Describe the proposed changes that would result in modification, meaning a change in the location of a discharge, and/or an increase in the quantity of the discharge, and/or a change in the quality of the discharge.

Not Applicable (NA). This discharge permit application renewal does not propose any modifications that would change the location, quantity, or quality of discharges.

Fees Included with Application

All applicants are required to submit a **$100 Application Filing Fee**. An additional fee will be assessed prior to permit issuance. Permit fees are listed in section 20.6.2.3114 NMAC. **Make checks payable to: NMED-Ground Water Quality Bureau**

Application Checklist

The following checklist has been provided to assist in ensuring that the application is complete prior to submission (*check all that apply*):

☒	Part I. Administrative Completeness ☒ $100 Application Filing Fee ☒ A. General Information ☒ B. Public Notice Information ☒ C. Public Notice Preparation
☒	Part II. Technical Completeness ☒ A. Discharge Volume and Description ☒ B. Identification and Physical Description of Facility ☒ C. Flow Metering ☒ D. Ground Water Monitoring ☒ E. Engineering and Surveying (electronic copies) ☒ F. Land Application Area
☒	Part III. Site-Specific Proposals
☒	Part IV. Electronic (PDF) format of Maps and Logs is required (additional paper copies of maps and logs are optional and may be requested by the Department if required for review) ☒ A. Surface Soil Survey and Vadose Zone Geology ☒ B. Location Map ☒ C. Flood Zone Map

Copies of Application

An applicant applying for a Discharge Permit shall submit **two paper copies of the signed application, and an electronic copy of the signed application including all supporting documentation**, to the address listed below.

☒ Two paper copies – completed and signed

☒ Electronic copy in portable document format (PDF) of the signed application and all supporting documentation (designs, maps, logs), on the following media *(choose one)*:

☒ Compact disc (CD)/DVD ☐ Flash drive

Send application and fees to the following address:
Program Manager
Ground Water Pollution Prevention Section
New Mexico Environment Department
P.O. Box 5469
Santa Fe, NM 87502

Applicant's Signature

Signature must be that of the person listed as the legally responsible party on this application (Part I, 2a).

I, the applicant, attest under penalty of law to the truth of the information and supporting documentation contained in this application for a Ground Water Discharge Permit.

Signature: [signature] Date: 1-28-20

Printed Name: DAVID J NICKLESS Title: Acting Director OQ&RC

Signature: [signature] Date: 1-23-2020

Printed Name: ELIZABETH LOWES Title: Environment, Safety & Health Program Manager

Part I. Administrative Completeness

General Information

1. Facility Information

See Supplemental Instructions to determine what constitutes a "facility." The physical address must be provided. If the facility does not have an address, the location can be described by road intersections, mile posts, or landmarks, as appropriate. See Supplemental Instructions for additional information.

Facility Name	Los Alamos National Laboratory (LANL or the Laboratory)
Discharge Permit #	1793
Physical Address	Los Alamos, New Mexico
County	Los Alamos
Type of Facility	U.S. Department of Energy (DOE) Facility
Driving Directions	All project sites will be located at LANL, Los Alamos, NM. Project-specific maps will be provided to the New Mexico Environment Department (NMED) in each work plan.

2. Contact Information

a) Applicant Information The applicant is the person or entity (e.g., corporation, partnership, organization, *municipality*, etc.) legally responsible for the discharge and for complying with the terms of the Discharge Permit. If the applicant is an entity, then the name and title of a contact person must be provided. This application must be signed by the applicant or contact person named here.

Applicant Name	U.S. Department of Energy[1] Newport News Nuclear BWXT-Los Alamos, LLC (N3B)[2]	Title	NA[1,2]	
Mailing Address	P.O. Box 1663, MS M984[1] 1200 Trinity Drive, Suite 150[2]			
	City: Los Alamos[1,2]	State: NM[1,2]	Zip: 87545[1,2]	
Contact Person	David Nickless[1] Elizabeth Lowes[2]	Title	Director, Office of Quality and Regulatory Compliance[1] Program Manager, N3B[2]	
Contact Information	Office Number: (505) 257-7933[1] (505) 257-7160[2]	Fax Number	NA	
	Cell Number: (505) 553-5441[1] (757) 810-7624[2]	E-mail	david.nickless@em.doe.gov[1] glenn.morgan@em-la.doe.gov[2]	

b) Facility Operator/Manager Information Provide the contact information for the facility operator or manager below. If the facility is required to have an operator certified by the State of New Mexico, please include the certification level of the operator named here.

Name	Glenn Morgan, N3B	Title	Program Manager
Mailing Address	1200 Trinity Drive, Suite 150		
	City: Los Alamos	State: NM	Zip: 87544

	Office Number	(505) 257-7160	Fax Number	NA
Contact Information	Cell Number	(757) 810-7624	E-mail	glenn.morgan@em-la.doe.gov
	Cell Number	NA	E-mail	NA
Certification Level (if applicable)	NA			

c) Consultant's Information (if applicable) If the consultant is a company or organization, then the name and title of a contact person must be provided here.

Company Name (1)	NA					
Company Contact						
Mailing Address						
	City		State		Zip	
Contact Information	Office Number		Fax Number			
	Cell Number		E-mail			

Company Name (2)	NA					
Company Contact						
Mailing Address						
	City		State		Zip	
Contact Information	Office Number		Fax Number			
	Cell Number		E-mail			

d) Permit Contact Information (if applicable) If someone other than the contacts listed above is a primary contact for this application and/or facility, list here.

Name	Christian Maupin			Title	Environmental Professional	
Mailing Address	1200 Trinity Drive, Suite 150					
	City	Los Alamos	State	NM	Zip	87544
Contact Information	Office Number	(505) 257-7421	Fax Number	NA		
	Cell Number	(505) 695-4281	E-mail	christian.maupin@em-la.doe.gov		
Facility Affiliation	Regulatory Compliance					

3. Ownership and Real Property Agreements [20.6.2.7HH NMAC]

The applicant owns (check as appropriate):

- ☒ The facility
- ☐ All discharge sites
- ☐ Some discharge sites

If someone other than the applicant owns the facility or any of the discharge sites, provide ownership information below. For any portion of the facility where the applicant is not the owner of record, the applicant shall submit a copy of any lease agreement or other agreement which authorizes the use of the real property for the duration of the term of the requested permit (typically five years). Lease prices or other prices may be redacted.

- If more than one person has ownership interest, or a partnership exists, list all persons with an ownership interest.
- If a corporate entity holds an ownership interest, provide the name of the corporate entity and the entity's registered agent as filed with the New Mexico Public Regulation Commission.

Name	NA		Title	
Mailing Address				
	City		State	Zip
Contact Information	Office Number		Fax Number	
	Cell Number		E-mail	
Owns	☐ The facility		☐ A discharge site	
	☐ Attached – lease (or other authorized use) agreement			

Name	NA		Title	
Mailing Address				
	City		State	Zip
Contact Information	Office Number		Fax Number	
	Cell Number		E-mail	
Owns	☐ The facility		☐ A discharge site	
	☐ Attached – lease (or other authorized use) agreement			

4. Public Notice Information

a) Proposed Maximum Daily Discharge Volume: 350,000 gallons per day

Note: Use the information from Part II.A.2 following its completion.

b) Depth-to-Most-Shallow Ground Water: 850–1350 (regional aquifer), 5–50 (alluvial), 100–900 (intermediate-perched) feet

Note: Use the information from Part II.A.2 following its completion.

c) Pre-Discharge Total Dissolved Solids Concentration in Ground Water

[Subsection C of 20.6.2.3106 NMAC]

Provide the concentration of total dissolved solids (TDS) in ground water prior to discharging from the facility. *Note: This information is likely the same as that submitted in the first application for a Discharge Permit for this facility.*

- Pre-discharge TDS concentration in ground water: 95.7–201 mg/L (ppm)
  ☒ Attached – Copy of laboratory analysis report (if available)
- From what source was the sample collected (e.g., upgradient monitoring well, on-site supply well, nearest well within a one-mile radius of the facility)?
  Samples collected on 12/06/2019 from performance monitoring well R-45 screen 1 and on 08/08/2019 from performance monitoring well R-68. Laboratory analysis results available in Attachment A and Intellus New Mexico (www.intellusnm.com).

5. Facility Location

In the table below, describe the location for the entire facility by listing the Township, Range, and Section, and/or latitude and longitude for the locations of all components of the processing, treatment, storage, and/or disposal system. See Supplemental Instructions for additional information. [Paragraph (2) and (5) of Subsection C of 20.6.2.3106 NMAC]

Component[1] ID	Township	Range	Section(s)	Latitude	Longitude
Groundwater monitoring wells	See Att. B	See Att. B	See Att. B	Various (within LANL property)	Various (within LANL property)
Treatment and storage systems	See Att. B	See Att. B	See Att. B	Various (within LANL property)	Various (within LANL property)
Land application equipment	See Att. B	See Att. B	See Att. B	Various (within LANL property)	Various (within LANL property)

6. Processing, Treatment, Storage, and Disposal System

Briefly describe how wastewater, sludge, etc. is processed, treated, stored, and/or disposed of at your facility. Include each component listed in the table above.

[1] Components include: septic tanks, impoundments, treatment systems, irrigation sites, leachfields, monitoring wells, mine stockpiles, etc. Additional examples are listed in the Supplemental Instructions. Each component should have a unique ID, for example septic tank-1, monitoring well-3, etc.

See Attachment C for a generalized process flow diagram for the storage, treatment, and land application of groundwater for activities conducted under this discharge permit.

Groundwater pumped from a well will be discharged into a steel frac tank, a lined modular tank, and/or a synthetically lined impoundment near the well site. A feed pump will transfer the untreated groundwater to the treatment system to remove contaminants of concern to concentrations below regulatory limits. Treated groundwater from the treatment system will be discharged into a lined modular tank or a synthetically lined impoundment before land application. Specific components for the processing, treatment, storage, and/or land application will be provided in project-specific work plans. Monitoring of the treated groundwater will ensure that contaminant concentrations do not exceed the 20.6.2.3103 New Mexico Administrative Code (NMAC) standards or the tap water Table A-1 limits in the NMED Risk Assessment Guidance for 20.6.2.7.T(2) NMAC, Toxic Pollutants. At the conclusion of treatment activities, treatment solids will be managed in accordance with all applicable local, state, and federal regulations.

7. Public Notice Preparation [20.6.2.3108 NMAC]

Once NMED has determined that your application is administratively complete, you must complete the applicant's public notice requirements of Section 20.6.2.3108 NMAC. Language for notifications will be mailed to you with an administratively complete determination. Note: Guidance and instructions for completion of applicant's public notice can also be found at the following link: *https://www.env.nm.gov/gwb/NMED-GWQB-PublicNotice.htm*. The information requested below will be used by NMED to approve or reject the proposed public notice newspaper and signage posting locations in accordance with Subsection A of 20.6.2.3108 NMAC. Note: Other requirements of Section 20.6.2.3108 NMAC not listed here, such as certified mailings to nearby landowners, may also apply.

a) Public Notice Posting Locations

Select the type of application you are submitting and provide the requested information. Language to be used in the required notifications will be included in the administratively complete packet.

☒ Renewal Application

1. Following receipt of an administrative completeness determination from NMED, the applicant is required to provide public notice of this application by placing a 2 inch by 3 inch display ad (classified or legal sections are not acceptable) in a newspaper of general circulation in the location of the proposed discharge. Indicate the newspaper in which you intend to place the ad. [Subsection C of 20.6.2.3108 NMAC]

Newspaper: Los Alamos Daily Monitor and Santa Fe New Mexican

☐ New Application, Modification Application, or Renewal with Modification Application

1. Following receipt of an administrative completeness determination from NMED, the applicant is required to provide public notice of this application by placing a display ad (classified or legal sections are not acceptable) in a newspaper of general circulation in the location of the proposed discharge. Indicate the newspaper in which you intend to place the ad. [Paragraph (4) of Subsection B of 20.6.2.3108 NMAC]

Newspaper: _____

2. Following receipt of an administrative completeness determination from NMED, the applicant is required to post a sign(s) (2 feet x 3 feet in size) for 30 days in a location conspicuous to the public at or near the facility. One sign must be posted for each 640 contiguous acres or less. NMED may require additional postings for facilities of more than 640 acres or when the discharge site(s) is not

located on contiguous properties. Indicate the location(s) where you intend to display the sign(s). [Paragraph (1) of Subsection B of 20.6.2.3108 NMAC]

Note: Conspicuous location means a location where the sign is visible and legible to the public and the public has access (e.g., at facility entrance on public road).

- Is the entire facility (including all components and discharge sites) contained within **less than** 640 acres, and is the acreage contiguous?

  ☐ Yes - Indicate a sign location below.
  ☐ No – Indicate **two** sign locations below.

Sign Location(s): _____

3. Following receipt of an administrative completeness determination from NMED, the applicant is required to post an additional notice (a flyer 8.5" X 11" or larger) for 30 days at an off-site location conspicuous to the public (e.g., public library). Indicate the location where you intend to display the flyer. [Paragraph (1) of Subsection B of 20.6.2.3108 NMAC]

Note: The U.S. Postal Service no longer allows the posting of flyers in post offices.

Flyer Location: _____

b) Mailing Instructions

a) The administrative completeness determination letter, including public notice instructions, should be sent to:

☒ Applicant ☐ Consultant

Part II. Technical Completeness

1. Discharge Volume and Description

a. Date of Initial Discharge at the Facility [Subsections A and B of 20.6.2.3106 NMAC]

Date of Initial Discharge: 07/27/2015

b. Determination of Maximum Daily Discharge Volume [Subsection C of 20.6.2.3106 NMAC]

See Supplemental Instructions for more information.

1. **Proposed maximum daily discharge volume:** 350,000 gallons per day.

(*Note: Use this volume to complete Part I.4.a (Public Notice).*

- Describe the methods and calculations used to determine this volume. Acceptable methods are described in the Supplemental Instructions. If you are relying on metered flows, attach a two-year record of meter readings.

Maximum daily discharge volume under this discharge permit application is 350,000 gallons per day. Under circumstances where multiple projects are overlapping, cumulative maximum discharge volume is limited to 350,000 gallons per day.

- Describe what generates the wastewater, sludge, or other discharges processed and/or disposed of at your facility. Identify all sources (e.g., RV spaces, mobile homes, shower facilities, laundromat, restaurant, backwash systems, septage haulers, contaminated media, etc.). See Supplemental Instructions.

Activities at LANL may produce groundwater that requires treatment prior to land application. Groundwater that requires treatment contains contaminants that exceed the 20.6.2.3103 NMAC groundwater standards or 20.6.2.T(2) NMAC toxic pollutants that exceed the NMED Risk Assessment Guidance soil screening levels for tap water.The activities the may produce groundwater that requires treatment include (1) pumping tests and aquifer tests to characterize groundwater quality and aquifer properties, (2) well development during construction of new monitoring and injection/extraction wells or the rehabilitation of existing wells that are no longer providing representative data, (3) purging of groundwater monitoring wells, and (4) tracer studies to characterize hydraulic, geochemical, and transport properties of the subsurface flow medium. These activities are described in additional detail as follows.

1. Aquifer Tests and Pumping Tests. Aquifer tests and pumping tests are typically conducted to evaluate an aquifer by "stimulating" the aquifer through constant pumping and observing the aquifer's "response" in observation wells. Developing conceptual models on the nature and extent of groundwater contamination at LANL may require aquifer testing to better define aquifer parameters and variations in contaminant concentrations during pumping. Aquifer testing produces groundwater requiring management and disposal. In addition, new wells may be constructed that may be candidates for aquifer testing. Groundwater produced during an aquifer test is eligible for discharge by land application if it meets the conditions of this discharge permit application.

2. Well Development and Well Rehabilitation. Concerns about the reliability or representativeness of groundwater quality data obtained from a well may necessitate well rehabilitation. Well rehabilitation may produce groundwater requiring management and disposal. In addition, new wells may be constructed that would require development before completion. Groundwater produced during well development and rehabilitation is eligible for discharge by land application if it meets the conditions of this discharge permit application.

3. Groundwater Monitoring Purge Water. Groundwater produced during purging of groundwater monitoring wells is eligible for discharge by land application if it meets the conditions of this discharge permit application.

4. Tracer Studies. Tracers may be deployed in conjunction with a pumping or aquifer test or as a standalone study. Injection in the regional aquifer or intermediate-perched aquifers is done to

characterize hydraulic, geochemical, and transport properties of the subsurface flow medium. Groundwater containing recovered tracers is eligible for discharge by land application if it meets the conditions of this discharge permit application.

2. **Identify other wastewater or stormwater discharges at the facility** not described in this application and indicate what other permits apply to them. Examples include discharges from small septic systems covered by Liquid Waste Permits, discharges to surface waters under a NPDES permit, a discharge covered by a separate Discharge Permit, etc. Be sure these other discharge locations are identified on the site map required in item Part II.B.1.

Other Discharges	Permit Number
See Attachment D	See Attachment D

2. Identification and Physical Description of Facility

[Subsection C of 20.6.2.3106 NMAC]

a. Scaled Map

Provide a clear and legible scaled electronic map of the components of your proposed system and relevant surrounding features, indicating the location of all the following features present at the site:

- overall facility layout
- treatment units
- lagoons
- tanks
- sumps
- land application fields
- domestic wastewater re-use areas
- pits
- stockpiles
- leachfields
- sludge drying beds
- fences
- roads
- buildings
- supply wells
- monitoring wells
- extraction/injection wells
- arroyos
- nearby water bodies such as ponds or canals
- property boundaries
- other permitted discharges
- required setbacks
- north arrow

b. Description of Components

Provide descriptive details of all components of your processing, treatment, storage, and/or disposal system. Include all components listed in the table of Part I.5.

Component	Status[1]	Date of installation or construction (mm/dd/yyyy)	Description (construction material, liner type, irrigation method, capacity, dimensions, area, model number, etc.)
See Attachment E	Various	Various	See Attachments E and F

[1] Status = **proposed**; **existing in use**; **existing not in use**, but proposed for use; **abandoned** without closure, not proposed for use; or **closed**

3. Flow Metering

Describe the facility's flow metering system. See Supplemental Instructions for more information.

Meter ID[1]	Proposed or Existing?	Influent or Effluent?	Location Description	Flow Type[2]	Meter Type[3]	Supporting Documents Attached
Various	Various	Various	See Attachment G	Various	Various	Various

[1] Meter ID means the numbering or labeling system used to individually identify each meter (e.g., Meter-1, Irrigation Meter-1, etc.).
[2] Flow type - **gravity** flow or pressurized (**pumped**) flow
[3] Meter type - **open channel** such as a weir or flume, or a **closed-pipe** velocity meter such as an electromagnetic meter

4. Discharge Quality

Indicate the expected quality of the discharge (wastewater, leachate, sludge, etc.) that is generated, stored, treated, processed and/or discharged at your facility.

Note: Not all facilities need to characterize influent quality. See Supplemental Instructions for additional guidance.

Contaminants	**Contaminants**	
	Incoming (Influent)	Final (Effluent)
Nitrate as Nitrogen (NO_3-N, mg/L)[1]	See Attachment H	See Attachment H
Total Kjeldahl Nitrogen (TKN, mg/L)[1]	See Attachment H	See Attachment H
Total Dissolved Solids (TDS, mg/L)[1]	See Attachment H	See Attachment H
Chloride (Cl, mg/L)[1]	See Attachment H	See Attachment H
Total Suspended Solids (TSS, mg/L)[2]	See Attachment H	See Attachment H
Biochemical Oxygen Demand (BOD, mg/L)[2]	See Attachment H	See Attachment H
Fecal Coliform Bacteria (CFU/100 mL)[2]	See Attachment H	See Attachment H
pH[3]	See Attachment H	See Attachment H
Metals (attach list)[3]	See Attachment H	See Attachment H
Organic Compounds (attach list)[3]	See Attachment H	See Attachment H

1. Include for all domestic systems.
2. Include for domestic systems that use an advanced treatment process.
3. Include for industrial or mining systems if these are contaminants of concern. If metals or organic compounds are present in the discharge, attach a list of influent and effluent concentrations for each metal/organic compound.

5. Ground Water Monitoring

Discharge Permits typically require that ground water samples be collected quarterly from properly constructed monitoring wells located downgradient from discharge locations. The samples must be analyzed for contaminants of concern. For most domestic and agricultural Discharge Permits, the typical contaminants of concern are total Kjeldahl nitrogen (TKN), nitrate-nitrogen (NO_3-N), total dissolved solids (TDS), and chloride (Cl). For most industrial Discharge Permits, typical contaminants of concern are volatile and semi-volatile organic compounds (VOC's), polynuclear aromatic hydrocarbons (PAH's), polychlorinated biphenyls (PCB's), metals, and radionuclides. See Supplemental Instructions for additional information.

a. Depth-to-Most-Shallow Ground Water [Subsection C of 20.6.2.3106 NMAC]

1. Facilities *with* on-site monitoring wells

Provide the depth-to-most-shallow ground water from the most recent ground water levels obtained from monitoring wells at the facility. Depth-to-ground water shall be measured to the nearest 0.01 feet using standard methods and techniques [Subsection B of 20.6.2.3107 NMAC].

Depth-to-ground water is: 850–1350 (regional aquifer), 5–50 (alluvial), 100–900 (intermediate-perched) feet

Note: Use this depth to complete Part I.4.b (Public Notice).

2. **Facilities *without* on-site monitoring wells**

If a facility does not have a monitoring well intersecting most-shallow ground water, provide depth-to-most-shallow ground water for all wells on file located within one mile of the boundary of the facility. This information can be obtained from the Office of the State Engineer (http://www.ose.state.nm.us).

Depth-to-ground water is: _____ feet
Note: Use the range of depths from these records to complete Part I.4.b (Public Notice).

☐ Attached – Records from the Office of the State Engineer, including the following:
- location of each well by latitude/longitude and township, range, and section
- use of each well
- depth to ground water in each well
- total depth of each well

b. Ground Water Flow Direction [Subsection C of 20.6.2.3106 NMAC]

1. **Facilities with *three or more* on-site monitoring wells**

Provide ground water flow direction beneath the facility on a ground water elevation contour map. The ground water elevation contour map shall be developed based upon the most recent ground water levels and survey data obtained from on-site monitoring wells.

Flow Direction See Attachment I

☒ Included – Ground water contour map from on-site monitoring wells

☒ Included – Monitoring well survey

☐ No survey has been conducted

☐ Survey previously submitted on _____ (date)

2. **Facilities with *less than three* on-site monitoring wells**

If a facility does not have at least three monitoring wells intersecting most-shallow ground water, provide ground water flow direction based upon either the most recent regional water level data or published hydrogeologic information. Attach the sources of information used to determine ground water flow direction. *Select all that apply.*

☐ Ground water flow direction of the most-shallow ground water beneath the facility based upon the *most recent regional water level data* is _____.
-- Reference: _____ (attach relevant portions)

☐ Attached - Survey data from nearby monitoring wells and a *ground water elevation contour map* indicating the direction of ground water flow.

☐ Ground water flow direction of the most-shallow ground water beneath the facility based upon *published hydrogeologic information* is _____.

-- Reference: _____ (attach relevant portions)

c. Monitoring Well Construction and Identification [Subsection C of 20.6.2.3106 NMAC; Subsection A of 20.6.2.3107 NMAC]

1. **For existing monitoring wells**
   Submit construction logs for all existing, on-site monitoring wells, which indicate the date of installation and well driller.

   ☒ Included - Construction logs for each existing monitoring well.

   ☐ Previously Submitted
   Date _____

2. **For all monitoring wells -** Identify proposed and existing monitoring well (MW) locations.

MW ID[1]	Proposed or Existing?	Location Description[2] AND Latitude and Longitude	Screen Interval (ft)	Depth to Water
See Att. J	See Att.JI	See Attachment J	See Att. J	See Att. J

[1] MW ID (Monitoring Well ID) is the numbering or labeling system used to identify a MW (e.g., MW-1, MW-2, etc.).
[2] Example: 60 feet south of the top inside edge of the berm of Wastewater Impoundment-1

d. Past Ground Water Monitoring Results

This item applies only to existing facilities seeking renewal and/or modification of a Discharge Permit that required ground water monitoring. See Supplemental Instructions for additional information.

1. **Attach a graph or table showing all analytical results from ground water monitoring**.

e. Engineering and Surveying

Proposed New Structures or Improvements to Existing Structures

Include electronic plans and specifications for any *proposed* new structures or improvements to existing structures. All final plans and specifications must bear the stamp of a New Mexico licensed Professional Engineer.

- Proposed plans and specifications included (*Select all that apply)*

  ☐ Included for new structure(s)

  ☐ Included for improvements to an existing structure

  ☒ No proposals for new or improved structures

f. Land Application Area Information

For facilities proposing to apply reclaimed or treated wastewater to a land application area, provide calculations showing that nitrogen loading does not exceed 200 lbs/acre/year or that the amount of total nitrogen in the combined application of wastewater and fertilizer does not exceed by more than 25% the amount reasonably expected to be taken up by the crop(s) and removed by harvesting in any 12-month period. Forms to assist in these calculations can be found at: https://www.env.nm.gov/gwb/FORMS/NewMexicoEnvironmentDepartment-GroundWaterQualityBureau-Forms.htm.

☐ Attached – Nitrogen loading calculations

Part III. Additional Proposals and Conditions (if applicable)

In the space provided, propose revisions or additions to the standard Discharge Permit requirements. If you propose any revisions or additions, also provide the rational for your proposal.

1) This renewal discharge permit application for Discharge Permit 1793 is an "umbrella" discharge permit application for activities at LANL that may produce groundwater requiring a permit before land application on LANL property, not subject to other discharge permits or NPDES permits, including (1) pumping tests and aquifer tests to characterize groundwater quality and aquifer properties, (2) well development during construction of new monitoring and injection/extraction wells or the rehabilitation of existing wells that are no longer providing representative data, (3) purging of groundwater monitoring wells, and (4) tracer studies to characterize hydraulic, geochemical, and transport properties of the subsurface flow medium. As such DOE/N3B propose to submit a project-specific work plan 60 days before the commencement of any of the activities described in this discharge permit application for NMED review and approval. Each work plan will contain the following information, as applicable to the project:

a. A detailed description of the proposed activity, including a statement of purpose.
b. A description of water conservation and reuse options considered.
c. A topographic map showing the proposed land application sites and the location of all monitoring wells, site monitoring areas, National Pollutant Discharge Elimination System outfalls, solid waste management units/areas of concern identified in the 2016 NMED Compliance Order on Consent, drinking water wells, surface impoundments, and surface drainage features in the vicinity. The topographic map will include all other applicable items described in Parts II.2.a and IV.2 of this discharge permit application.
d. Depth to most shallow groundwater per Parts I.4.b and II.5.a of this discharge permit application.
e. Existing data showing the depth to and general groundwater quality at the proposed discharge location including concentrations of contaminants exceeding regulatory standards.
f. A graph or table showing all applicable analytical results from groundwater monitoring per Part II.5.d of this discharge permit application.
g. Groundwater contour map per Part II.5.b of this discharge permit application.
h. Schematic and detailed description of the on-site treatment system to remove contaminants of concern per Part II.2.b of this discharge permit application.
i. Flow metering system information per Part II.3 of this discharge permit application.
j. Monitoring well construction and identification information per Part II.5.c of this discharge permit application.
k. Lithologic logs for all existing on-site monitoring wells per Part IV.1 of this discharge permit application.
l. Soil survey map and associated descriptions identifying surface soil type(s) per Part IV.1 of this discharge permit application.
m. Most recent flood zone map per Part IV.3 of this discharge permit application.
n. A detailed description of the storage/containment systems associated with the treatment.
o. Maximum daily discharge volume.
p. Total estimated volume of proposed discharge.
q. Proposed sampling plan to demonstrate treatment efficiency and compliance with regulatory standards.
r. Proposed method(s) of land application, application rates, and area of application.
s. Project schedule including the date the discharge is to commence and anticipated duration.

2) An annual report will be submitted to NMED by the 1st of March each year summarizing all discharges conducted under this discharge permit application during the prior calendar year. Included will be quantity, source, and date of each individual discharge; water quality tables listing analytical results from samples collected under the water quality sampling plan; a map(s) depicting discharge locations; and copies of analytical reports.

3) All activities covered under this discharge permit application will be supervised daily by operators qualified to perform system maintenance.

4) The land application of treated groundwater will be conducted in accordance with, but not limited to, the following:

a. Land application sites are prohibited at the following locations:
- Watercourses
- Water bodies
- Wetlands
- Areas of concern
- Solid waste management units

b. Land application cannot result in water flow from an approved land application site.
c. Land application cannot create ponds, pools, or standing water.
d. Land application must be conducted in a manner that maximizes infiltration and evaporation.
e. Land application must be restricted to daylight hours.
f. Land application must be supervised.
g. Land application cannot extend off LANL property.
h. Land application will be terminated if leaks in the application system are detected.
i Land application is prohibited while precipitation is occuring or when the ground is frozen.

5) The technical information supporting this application includes the information submitted for the 2015 permit, which is incorporated in this application by reference. The conditions included in Discharge Permit 1793, as issued in 2015, are sufficient to ensure that applicable requirements are met. DOE/N3B is proposing to make minor modifications to Permit Condition #4 of the 2015 permit as follows:

a. Changing Permit Condition #4.1 which states “Land application is prohibited at the following locations:”
i. Revising the language of the forth bullet to read “Areas of Concern.”
ii. Deleting the sixth bullet which states “Slopes greater than 2% if the site is poorly vegetated (<50% ground cover).
iii. Deleting the seventh bullet which states “Slopes greater than 5% if the site is well vegetated (>50% ground cover).
b. Changing Permit Condition #4.5 to read “Land application is restricted to daylight hours.”
c. Changing Permit Condition #4.7 to read “Land application cannot occur off LANL property.”
d. Changing Permit Condition #4.9 to read “Land application is prohibited while precipitation is occurring or when the ground is frozen.”

The above proposed changes provide equivalent protection while allowing necessary operational flexibility. Land application activities will still be performed such that ponding, pooling, or standing water will not be generated and run-off will not occur from approved land application sites. Additionally, the proposed change to Condition #4.7 conforms to the intent of maintaining land

application within the boundaries of LANL. This is consistent with DOE/N3B's understanding of the 2015 Permit.

Part IV. Maps and Logs to be Attached

1. Surface Soil Survey and Vadose Zone Geology

[Subsection C of 20.6.2.3106 NMAC]

☒ Attached - Most recent regional soil survey map and associated descriptions identifying surface soil type(s).

☒ Attached - Lithologic logs for all existing on-site monitoring wells (if available).

2. Topographic Map [Subsection C of 20.6.2.3106 NMAC]

☒ Attached - Location map with topographic surface contours identifying all of the following features located within a one-mile radius of the facility:

- watercourses
- lakebeds
- sinkholes
- playa lakes
- springs (springs used to provide water for human consumption shall be so denoted)
- wells supplying water for a public water system
- private domestic water wells
- irrigation supply wells
- ditch irrigation systems
- acequias
- irrigation canals
- drains

3. Flood Zone Map [Subsection C of 20.6.2.3106 NMAC]

☒ Attached - Most recent 100-year flood zone map developed by the federal emergency management administration (FEMA) documenting flood potential for the facility.

Describe any engineered measures used for flood protection.

Any engineered measures used for flood protection will be provided in a project-specific work plan.

4. Additional Information

Describe any additional relevant information.

No components will be sited within a watercourse. However, some activities may be conducted within the floodplain of a watercourse because of the necessity of siting components in close proximity to the groundwater wells they are serving.

Supplemental Instructions

Please note: Discharge Permits are required for a wide range of facilities that process, treat, store and/or dispose of wastewater, sludge, septage, leachate, contaminated soils, mine tailings, industrial waste, mine ore, waste rock, or other similar materials. For the purposes of this application form, the term "discharge" applies to any of these materials whether they are actually discharged or whether they represent only a potential discharge that could occur due to factors such as poor maintenance, improper installation, equipment failure or accidents.

Part I.1 Facility Information and Type of Facility

The "Facility" may be identified as:

- a treatment facility, such as a municipal wastewater treatment plant;
- the source of the discharge, such as a subdivision, or waste rock pile;
- a disposal facility or operation, such as for sludge or septage;
- the discharge location or end user of reclaimed wastewater, such as a golf course or cement plant;
- a storage and/or processing facility with off-site disposal;
- a collection of facilities, such as numerous comfort stations at a state park; or
- a project or operation, such as a construction project or a system to distribute reclaimed wastewater throughout a city.

Examples of a variety of facility types are categorized below. Please note, "Domestic" waste contains human excreta or originates from typical residential plumbing fixtures.

Industrial Waste

- Manufacturing
- Power plant
- Military installation
- Vehicle/equipment wash
- Mortuary
- Hydrocarbon landfarm
- Ground water remediation
- Ethanol plant
- Asphalt plant
- Remediation Systems

Mining Waste

- tailing impoundment
- mine dewatering
- waste rock pile
- smelter slag
- in-situ leach
- leach piles
- pipelines
- collection ponds
- concentrator – other beneficiation

Domestic Waste

- Municipal wastewater treatment plant
- Septage disposal
- Sludge disposal
- Mobile home/RV park
- Campground/park
- School/educational facility
- Restaurant
- Subdivision/apartment complex
- Unincorporated community
- Lodging/resort/spa
- Residential facility
- Commercial/shopping complex
- Laundromat
- Facility using reclaimed domestic wastewater

Agricultural Waste

- Dairy
- Food processing
- Slaughter facility
- Nursery/greenhouse
- Manufacture/processing of agricultural chemicals
- Feedlot
- Livestock truck washout

This listing is only a guide, as there can be crossover between categories. For example, a golf course might use treated industrial wastewater for irrigation. The type of facility in that case is "golf course" and the type of waste is "industrial." A mining operation may need a permit for its restroom and shower facilities. In that case, the type of facility is a "mining operation" and the type of discharge is "domestic waste."

Part I.5: Facility Location

The following are examples of treatment, storage, and disposal components of a wastewater system that should be included in this part.

Treatment Methods

- Septic tank
- Grease interceptor
- Oil/water separator
- Manure separator
- Wetlands
- Lagoon (indicate whether aerated and type of liner)
- Trickling filter
- Activated sludge (extended air, SBR, etc.)
- Sand filter
- Membranes
- Sludge drying bed
- Disinfection (specify type)
  - chlorination

Disposal Methods

- Leachfield
- Infiltration gallery
- Evaporation lagoon (indicate type of liner)
- Evaporation tank
- Impoundment
- Discharge to waters of the US (NPDES permit required)
- Ongoing land application (specify type)
  - subsurface irrigation
  - sprinkler irrigation
  - flood irrigation
  - drip irrigation
  - surface spreading (solids)
  - surface injection (solids)

- UV/ozone
- Water treatment plant
- Injection Wells
- Temporary uses of reclaimed wastewater
- Ongoing use of reclaimed wastewater for:
  - Manufacturing construction or dust control

Storage Methods

- Above/below ground tank
- Storage lagoon (indicate type of liner)
- Holding tank
- Pit toilet
- Stockpile
- Tailing impoundment

Part II.1 Proposed Maximum Daily Discharge Volume

Your Discharge Permit will allow for the treatment, processing and/or discharge of up to a specified volume, generally, a maximum number of gallons per day. The flow at your facility on any given day must not exceed this "maximum discharge volume." It is determined based on the expected contributions from the sources you identified Part II, 1, b, 1.

NMED will carefully review the basis of the maximum discharge volume you propose. Show all your calculations and assumptions.

Animal feeding operations must provide calculations based on the number of animals and water conservation practices in place.

Landfarms, disposal facilities, processing facilities typically identify the expected number of loads to be delivered.

For septic systems and wastewater treatment plants, the maximum discharge volume is also referred to as the "design flow." It includes a peaking or safety factor to guard against back-ups and overflows.

Municipal wastewater treatment facilities should identify the population served, growth assumptions, and expected per capita usage considering any contributing industries.

On-site domestic wastewater treatment facilities should rely on published design flows such as those provided in the NMED Liquid Waste Regulations (20.7.3 NMAC), the Uniform Plumbing Code or the USEPA On-site Wastewater Treatment Systems Manual.

For existing facilities, the maximum discharge volume may be based on a record of measured flows if no changes are anticipated. At least two years of flow data must be submitted, and the highest monthly discharge volume must be multiplied by a peaking factor of 1.5.
NMED will verify that your proposed or existing facility can handle maximum discharge volume you propose.

Be specific in describing all sources. Consider the following examples:

- Municipalities – identify particular industries or specialized facilities contributing wastewater.
- RV Parks – identify showers, dump stations, laundromat, etc.

- Subdivisions – identify homes, apartments, commercial developments, water softener backwash, etc.
- Landfarms or disposal facilities – specify type of materials accepted, e.g., residential septage, car wash grit trap waste, contaminated soils/water, treated municipal sludge, etc.
- Dairies – identify milking parlors, type of washdown used, sources of stormwater runoff, etc.
- Schools – identify cafeteria, gym, showers, etc.
- Truck stops – identify restaurant, showers, car wash, etc.
- Facilities receiving reclaimed wastewater – identify the treatment facility providing the reclaimed wastewater.
- Food processing and industrial facilities – describe the processes which produce the waste stream and chemicals used.
- Mines – identify processes including beneficiation, tailing, waste rock, leach facilities, pipelines, ponds, catchments, booster stations, in-situ leach facilities.

You do not need to include solid wastes, hazardous wastes or discharges being managed under other permits; however, these must be listed under Item C-7 in Part C of the application.

Part II.3: Flow Metering

You must provide a method for measuring the discharge volume (Section 20.6.2.3109.H.1 NMAC). At facilities with treatment or storage lagoons, it is necessary to measure both the volume entering the treatment system as well as the volume ultimately discharged.

If you land apply wastewater to more than one discharge location, you must be able to track the volume to each location.

If your facility is small and relies on gravity to carry wastewater to the treatment and disposal system, it may be acceptable to estimate the wastewater flow. This can be done by metering water usage and deducting the volume of water used for fresh-water irrigation, swimming pools, evaporative cooling, livestock watering or other uses that do not result in wastewater flowing to the treatment system.

Part II.4: Discharge Quality

Untreated wastewater entering a treatment facility (also referred to as “influent”) must be characterized so that the treatment process can be evaluated. It is not necessary to provide influent quality for systems providing minimal treatment prior to discharge or disposal, such as systems relying on crop uptake for treatment (e.g., dairies), septic tank – leachfield systems, storage/processing facilities or evaporative systems. The final quality of the waste or wastewater disposed of or discharged must be characterized for all facilities.

For most agricultural and domestic facilities, the contaminants of concern include nitrate as nitrogen (NO_3-N), total Kjeldahl nitrogen (TKN), total dissolved solids (TDS), and chloride (Cl). For domestic facilities with advanced treatment, additional contaminants include total suspended solids (TSS), biochemical oxygen demand (BOD_5), and fecal coliform bacteria. Contaminants of concern at industrial and mining sites include pH, metals, and organic compounds. List all that apply.

Part II.E: Ground Water Monitoring

The depth to ground water beneath your facility and/or discharge site must be provided. This is true even if your facility or operation is intended to have no discharge. Discharge Permits are required for "no-discharge" lagoons, storage tanks, etc. because of the potential for a discharge to occur due to factors such as improper installation, poor maintenance, equipment failure or accidents.

The best way to determine the depth to water is to measure it in an on-site or nearby monitoring well. If a monitoring well is not available, the measurement may be from a water supply well. If there is a well but it is not possible to access it for a measurement, you could refer to the well log for that well and/or others in the vicinity. Well log information is available on the website of the State Engineer's office:

http://www.ose.state.nm.us/.

Be aware that water levels have dropped in many areas of the state, so more recent well logs in those areas are more reliable.

There may be a significant discrepancy in the depth to water in different wells, even when falling water levels is not a factor. One reason for this is that a water supply well may rely on a deep aquifer rather than water in the "first" or most shallow aquifer. Discharge Permits are intended to protect all ground water, so it is important to report the shallowest depth in the vicinity of your site.

The total dissolved solids (TDS) concentration of the ground water prior to discharge must be provided. As explained for the depth to water, this is true even if your facility or operation is intended to have no discharge. The TDS value provides a general indication of the quality of the ground water that could be affected by your operation.

The best way to obtain a pre-discharge TDS concentration is to sample an on-site or nearby well before your facility begins operating. It is better to sample a shallow rather than a deep well, if possible. It may be that a neighboring facility has existing analytical data for its Discharge Permit. (If so, be sure to obtain data from a non-impacted well.)

If there are no wells in your vicinity or it is not possible to sample them, you may find general TDS concentrations in reports available from sources such as a university, the State Engineer's Office (http://www.ose.state.nm.us/) or the US Geological Survey (http://nm.water.usgs.gov/).
If you are renewing or modifying your Discharge Permit, you may refer to the TDS concentration previously determined if there was a sound basis for it. Monitoring data or other information obtained since the permit was issued, however, may warrant listing a different value.

Part II.E.4: Past Ground Water Monitoring Results

A complete list of ground water standards can be found in Section 20.6.2.3103 NMAC. The standards for contaminants most frequently monitored under Discharge Permits are as follows:

Nitrate-nitrogen (NO_3-N).....10 mg/L
Chloride ..... 250 mg/L
Total dissolved solids (TDS)… 1000 mg/L
Sulfate (SO_4).....600 mg/L
pH ..... between 6 and 9

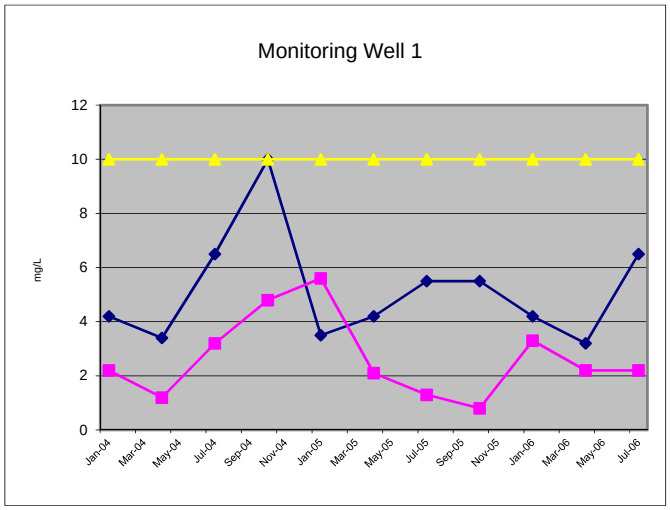
There is no ground water standard for total Kjeldahl nitrogen (TKN). Because TKN converts readily to nitrate as it moves through the vadose zone, however, concentrations approaching or exceeding 10 mg/L are of concern.

Additional parameters typically apply at mining or industrial facilities.

Some ground waters in the state have TDS or chloride concentrations that naturally exceed these standards. In that case, the standard is the naturally occurring level. You must provide documentation of such elevated natural conditions, such as analytical results from a non-impacted well.

An example table and graph follow:

	Monitoring Well 1	
Date	NO3-N	TKN
Jan-04	4.2	2.2
Apr-04	3.4	1.2
Jul-04	6.5	3.2
Oct-04	10	4.8
Jan-05	3.5	5.6
Apr-05	4.2	2.1
Jul-05	5.5	1.3
Oct-05	5.5	0.8
Jan-06	4.2	3.3
Apr-06	3.2	2.2
Jul-06	6.5	2.2



ATTACHMENT A
Laboratory Analysis Reports for Total Dissolved Solids

Product: Solids, Total Dissolved
Analytical Method: EPA 160.1
Analytical Procedure: GL-GC-E-001 REV# 15
Analytical Batch: 1906257

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
487313002	CAWA-19-183876
487313005	CAWA-19-183989
1204354957	Method Blank (MB)
1204354958	Laboratory Control Sample (LCS)
1204354959	487209007(TRR-28-19-171272) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Duplicate Relative Percent Difference (RPD) Statement
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Total Dissolved Solids	1204354959 (TRR-28-19-171272DUP)	6.21* (0%-5%)

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 9, 2019

Company :	N3B-Los Alamos
Address :	Bldg. 271, Embudo Rd Los Alamos National Laboratory Los Alamos, New Mexico 87544
Contact:	Mr. Sean Sandborgh
Project:	N3B

Client Sample ID:	CAWA-19-183876	Project:	N3BL00119
Sample ID:	487313002	Client ID:	N3BL001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 300.0	
3	EPA 350.1	
4	EPA 353.2	
5	EPA 365.4	
6	EPA 160.1	
7	EPA 310.1	
8	EPA 120.1	
9	EPA 150.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: September 9, 2019

Company :	N3B-Los Alamos
Address :	Bldg. 271, Embudo Rd Los Alamos National Laboratory Los Alamos, New Mexico 87544
Contact:	Mr. Sean Sandborgh
Project:	N3B

Client Sample ID:	CAWA-19-183989	Project:	N3BL00119
Sample ID:	487313005	Client ID:	N3BL001

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst Date	Time	Batch	Method

The following Analytical Methods were performed:

Method	Description	Analyst Comments
1	EPA 300.0	
2	EPA 350.1	
3	EPA 353.2	
4	EPA 365.4	
5	EPA 160.1	
6	EPA 310.1	
7	EPA 120.1	
8	EPA 150.1	

Notes:

Column headers are defined as follows:

DF: Dilution Factor	Lc/LC: Critical Level
DL: Detection Limit	PF: Prep Factor
MDA: Minimum Detectable Activity	RL: Reporting Limit
MDC: Minimum Detectable Concentration	SQL: Sample Quantitation Limit

TDS/TS/VS LogBook

Batch: 1906257
Analyst: KLP1

Procedure Code BALDSEP_L
Procedure Description EPA 160.1 Solids, Dissolved
Lab Sop GL-GC-E-001

Sample Type	Sample Id	Lot Id	Nc(mg/L)	Recovery(%)
LCS	1204354958	2921268	300	101.905

Sample Type	Sample Id	Rpd(%)
DUP	1204354959	6.2111801242236
DUP	1204354960	2.9146203417326

Sample Id	Sample Type	Original Hsn	Instrument	Run Date	Crucible ID	Aliquot (L)	Crucible Wt(g)	Final Wt Event 1	Final Wt Event 2	Final Wt Event 3	Final Wt Event 4	Result	Units
1204354957	MB		BAL216	12-AUG-2019 14:55	131	0.07	100.4138	100.4136	100.4137			-1.42857	mg/L
1204354958	LCS		BAL216	12-AUG-2019 14:55	H	0.07	71.0176	71.0386	71.039			305.71429	mg/L
487155002	SAMPLE		BAL216	12-AUG-2019 14:55	12	0.07	71.6124	71.6209	71.6209			121.42857	mg/L
487155005	SAMPLE		BAL216	12-AUG-2019 14:55	10	0.07	77.402	77.4147	77.4151			187.14286	mg/L
487155008	SAMPLE		BAL216	12-AUG-2019 14:55	2	0.07	69.9094	69.9213	69.9212			168.57143	mg/L
487155010	SAMPLE		BAL216	12-AUG-2019 14:55	21	0.07	69.6559	69.6649	69.6652			132.85714	mg/L
487166001	SAMPLE		BAL216	12-AUG-2019 14:55	4	0.07	75.9304	81.6214	81.6218			81305.71429	mg/L
1204354960	DUP	487166001	BAL216	12-AUG-2019 14:55	IXI	0.07	86.2965	91.8241	91.8244			78970	mg/L
487166002	SAMPLE		BAL216	12-AUG-2019 14:55	D	0.07	103.6184	111.7776	111.7771			1.17E+05	mg/L
487166003	SAMPLE		BAL216	12-AUG-2019 14:55	UP	0.07	97.4415	102.692	102.6919			75005.71429	mg/L
487166004	SAMPLE		BAL216	12-AUG-2019 14:55	9	0.07	69.4647	75.3558	75.3561			84162.85714	mg/L
487166005	SAMPLE		BAL216	12-AUG-2019 14:55	EE	0.07	91.2852	92.4043	92.4042			15985.71429	mg/L
487209005	SAMPLE		BAL216	12-AUG-2019 14:55	ICC	0.07	82.1433	82.1682	82.168			352.85714	mg/L
487209006	SAMPLE		BAL216	12-AUG-2019 14:55	ET	0.07	83.0106	83.0353	83.0348			345.71429	mg/L
487209007	SAMPLE		BAL216	12-AUG-2019 14:55	19	0.07	69.6896	69.7149	69.7145			355.71429	mg/L
1204354959	DUP	487209007	BAL216	12-AUG-2019 14:55	S	0.07	97.7213	97.7442	97.7447			334.28571	mg/L
487209008	SAMPLE		BAL216	12-AUG-2019 14:55	A7	0.07	103.4433	103.4643	103.4643			300	mg/L
487213001	SAMPLE		BAL216	12-AUG-2019 14:55	GI	0.07	104.1001	104.2345	104.2349			1925.71429	mg/L
487217001	SAMPLE		BAL216	12-AUG-2019 14:55	18	0.07	71.9339	71.9397	71.9402			90	mg/L
487218001	SAMPLE		BAL216	12-AUG-2019 14:55	A	0.07	73.6739	73.6889	73.6891			217.14286	mg/L
487219001	SAMPLE		BAL216	12-AUG-2019 14:55	OL	0.07	72.6384	72.8625	72.8625			3201.42857	mg/L
487313002	SAMPLE		BAL216	12-AUG-2019 14:55	411	0.07	74.9459	74.9577	74.958			172.85714	mg/L
487313005	SAMPLE		BAL216	12-AUG-2019 14:55	13	0.07	71.5967	71.6034	71.6034			95.71429	mg/L

Comments: **All Weights are in Grams**

A) Result = (Final - Crucible)/Aliquot * 1000

B) Prep Factor = 0.5 / Aliquot

In Oven Date/Time: 13-AUG-2019 09:00:00
In Oven Temperature (178-182C): 180 C
Temperature within limits (Y/N)?: Y
Out Oven Date/Time: 13-AUG-2019 10:00:00
Out Oven Temperature (178-182C): 180 C
Temperature within limits (Y/N)?: Y
In Oven Date/Time: 13-AUG-2019 13:00:00
In Oven Temperature (178-182C): 180 C
Temperature within limits (Y/N)?: Y
Out Oven Date/Time: 13-AUG-2019 14:00:00
Out Oven Temperature (178-182C): 180 C
Temperature within limits (Y/N)?: Y
Filter Lot Number: 950068

Product: Solids, Total Dissolved
Analytical Method: EPA 160.1
Analytical Procedure: GL-GC-E-001 REV# 16
Analytical Batch: 1949668

The following samples were analyzed using the above methods and analytical procedure(s).

GEL Sample ID#	Client Sample Identification
498567002	CAMO-20-190669
498567005	CAMO-20-190675
1204454112	Method Blank (MB)
1204454113	Laboratory Control Sample (LCS)
1204454116	498423006(CAAN-20-190542) Sample Duplicate (DUP)

The samples in this SDG were analyzed on an "as received" basis.

Data Summary:

All sample data provided in this report met the acceptance criteria specified in the analytical methods and procedures for initial calibration, continuing calibration, instrument controls and process controls where applicable, with the following exceptions.

Quality Control (QC) Information

Duplicate Relative Percent Difference (RPD) Statement
The Relative Percent Difference (RPD) between the sample and duplicate falls outside of the established acceptance limits because of the heterogeneous matrix of the sample:

Analyte	Sample	Value
Total Dissolved Solids	1204454116 (CAAN-20-190542DUP)	11.2* (0%-5%)

GEL LABORATORIES LLC
2040 Savage Road Charleston SC 29407 - (843) 556-8171 - www.gel.com

Certificate of Analysis

Report Date: December 20, 2019

Company :	N3B-Los Alamos
Address :	Bldg. 271, Embudo Rd Los Alamos National Laboratory Los Alamos, New Mexico 87544
Contact:	Mr. Sean Sandborgh
Project:	N3B

Client Sample ID:	CAMO-20-190669	Project:	N3BL00119
Sample ID:	498567002	Client ID:	N3BL001
Matrix:	W		
Collect Date:	06-DEC-19 12:07		
Receive Date:	10-DEC-19		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.068	0.067	0.200	mg/L		1	JLD1	12/10/19	1432	1947474	1
Chloride		4.88	0.067	0.200	mg/L		1					
Fluoride		0.349	0.033	0.100	mg/L		1					
Sulfate		6.98	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	J	0.0214	0.017	0.050	mg/L	1.00	1	KLP1	12/12/19	1252	1949528	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		2.47	0.170	0.500	mg/L		10	AXH3	12/16/19	0535	1948910	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0238	0.020	0.050	mg/L	1.00	1	KLP1	12/16/19	1638	1950182	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		201	3.40	14.3	mg/L			KLP1	12/12/19	1537	1949668	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity +CO3 "As Received"												
Alkalinity, Total as CaCO3		64.8	1.45	4.00	mg/L			RXB5	12/12/19	1725	1946273	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		152	1.00	1.00	umhos/cm		1	HXC1	12/13/19	1543	1949024	7
PH "As Received"												
pH at Temp 15.1C	H	7.97	0.010	0.100	SU		1	RXB5	12/12/19	1723	1946281	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	12/12/19	0735	1949527
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	12/16/19	1430	1950181

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Certificate of Analysis

Report Date: December 20, 2019

Company :	N3B-Los Alamos
Address :	Bldg. 271, Embudo Rd Los Alamos National Laboratory Los Alamos, New Mexico 87544
Contact:	Mr. Sean Sandborgh
Project:	N3B

Client Sample ID:	CAMO-20-190675	Project:	N3BL00119
Sample ID:	498567005	Client ID:	N3BL001
Matrix:	W		
Collect Date:	06-DEC-19 14:17		
Receive Date:	10-DEC-19		
Collector:	Client		

Parameter	Qualifier	Result	DL	RL	Units	PF	DF	Analyst	Date	Time	Batch	Method
Ion Chromatography												
WSP-ANIONS "As Received"												
Bromide	J	0.0872	0.067	0.200	mg/L		1	JLD1	12/10/19	1533	1947474	1
Chloride		5.08	0.067	0.200	mg/L		1					
Fluoride		0.329	0.033	0.100	mg/L		1					
Sulfate		6.08	0.133	0.400	mg/L		1					
Nutrient Analysis												
NH3 "As Received"												
Nitrogen, Ammonia	U	ND	0.017	0.050	mg/L	1.00	1	KLP1	12/12/19	1255	1949528	2
NO3NO2 "As Received"												
Nitrogen, Nitrate/Nitrite		0.985	0.085	0.250	mg/L		5	AXH3	12/16/19	0538	1948910	3
PO4 "As Received"												
Phosphorus, Total as P	J	0.0353	0.020	0.050	mg/L	1.00	1	KLP1	12/16/19	1638	1950182	4
Solids Analysis												
TDS "As Received"												
Total Dissolved Solids		197	3.40	14.3	mg/L			KLP1	12/12/19	1537	1949668	5
Titration and Ion Analysis												
EPA 310.1 Total Alkalinity +CO3 "As Received"												
Alkalinity, Total as CaCO3		73.5	1.45	4.00	mg/L			RXB5	12/12/19	1726	1946273	6
Carbonate alkalinity (CaCO3)	U	ND	1.45	4.00	mg/L							
EPA120.1 Specific Conductivity "As Received"												
Conductivity		154	1.00	1.00	umhos/cm		1	HXC1	12/13/19	1543	1949024	7
PH "As Received"												
pH at Temp 16.0C	H	8.14	0.010	0.100	SU		1	RXB5	12/12/19	1725	1946281	8

The following Prep Methods were performed:

Method	Description	Analyst	Date	Time	Prep Batch
EPA 350.1 Prep	EPA 350.1 Ammonia Nitrogen Prep	AXH3	12/12/19	0735	1949527
EPA 365.4 Prep	EPA 365.4 Phosphorus, Total in liquid PR	KLP1	12/16/19	1430	1950181

QC Summary

Workorder: 498567

Parmname	NOM		Sample	Qual	QC	Units	RPD%	REC%	Range	Anlst	Date Time
Nutrient Analysis											
Batch 1950182											
QC1204455066 498581002 MS											
Phosphorus, Total as P	1.00	U	ND		1.01	mg/L		99.2	(70%-136%)	KLP1	12/16/19 16:41
Batch 1950191											
QC1204455114 498581002 DUP											
Nitrogen, Total Kjeldahl		U	ND	U	ND	mg/L	N/A			KLP1	12/16/19 15:07
QC1204455113 LCS											
Nitrogen, Total Kjeldahl	1.00				0.997	mg/L		99.7	(90%-110%)		12/16/19 15:01
QC1204455112 MB											
Nitrogen, Total Kjeldahl				J	0.0339	mg/L					12/16/19 15:00
QC1204455117 498581002 MS											
Nitrogen, Total Kjeldahl	1.00	U	ND		0.977	mg/L		97.7	(90%-110%)		12/16/19 15:08
Solids Analysis											
Batch 1949668											
QC1204454116 498423006 DUP											
Total Dissolved Solids			169		189	mg/L	11.2*		(0%-5%)	KLP1	12/12/19 15:37
QC1204454113 LCS											
Total Dissolved Solids	300				300	mg/L		100	(95%-105%)		12/12/19 15:37
QC1204454112 MB											
Total Dissolved Solids				U	ND	mg/L					12/12/19 15:37
Titration and Ion Analysis											
Batch 1946273											
QC1204449343 498037002 DUP											
Alkalinity, Total as CaCO3			63.6		64.0	mg/L	0.623		(0%-20%)	RXB5	12/12/19 16:44
Carbonate alkalinity (CaCO3)		U	ND	U	ND	mg/L	N/A				

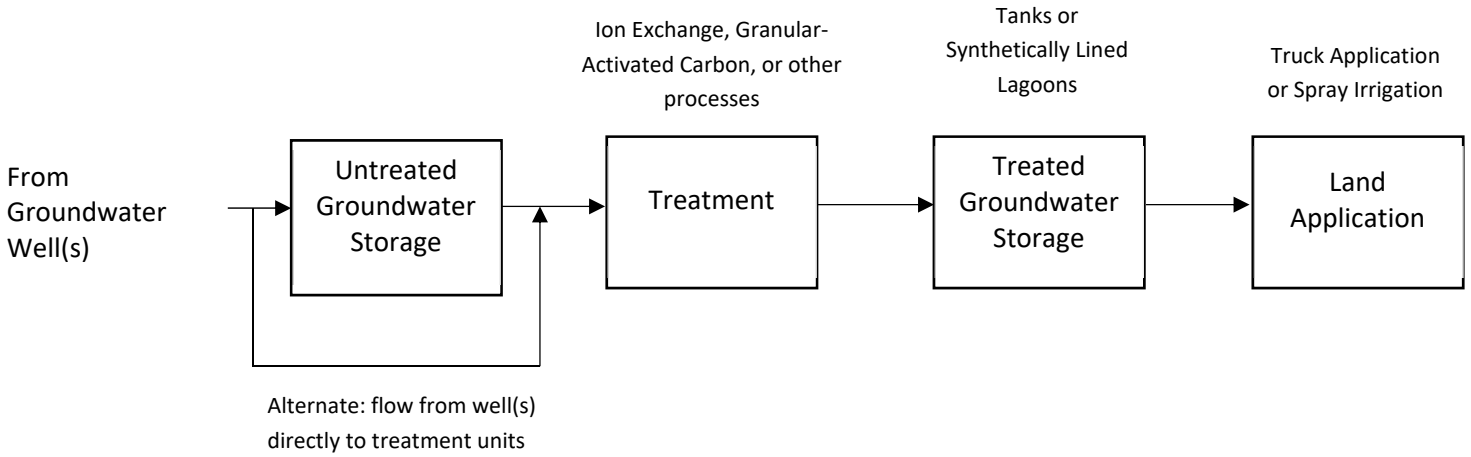
ATTACHMENT B
Facility Location

Item Number	Range	Township	Section(s)
1	R05E	T19N	S25
2	R05E	T19N	S36
3	R06E	Y18N	S1
4	R06E	T18N	S2
5	R06E	T18N	S3
6	R06E	T18N	S4
7	R06E	T18N	S10
8	R06E	T18N	S11
9	R06E	T18N	S12
10	R06E	T18N	S13
11	R06E	T18N	S14
12	R06E	T18N	S24
13	R06E	T18N	S25
14	R06E	T19N	S13
15	R06E	T19N	S14
16	R06E	T19N	S15
17	R06E	T19N	S16
18	R06E	T19N	S17
19	R06E	T19N	S18
20	R06E	T19N	S19
21	R06E	T19N	S20
22	R06E	T19N	S21
23	R06E	T19N	S22
24	R06E	T19N	S23
25	R06E	T19N	S24
26	R06E	T19N	S25
27	R06E	T19N	S26
28	R06E	T19N	S27
29	R06E	T19N	S28
30	R06E	T19N	S29
31	R06E	T19N	S30
32	R06E	T19N	S31
33	R06E	T19N	S32
34	R06E	T19N	S33
35	R06E	T19N	S34
36	R06E	T19N	S35
37	R06E	T19N	S36
38	R07E	T18N	S5
39	R07E	T18N	S6
40	R07E	T18N	S7
41	R07E	T18N	S8
42	R07E	T18N	S16
43	R07E	T18N	S17
44	R07E	T18N	S18
45	R07E	T18N	S19
46	R07E	T18N	S20
47	R07E	T18N	S21
48	R07E	T18N	S29
49	R07E	T18N	S30
50	R07E	T19N	S17
51	R07E	T19N	S18
52	R07E	T19N	S19
53	R07E	T19N	S20
54	R07E	T19N	S31
55	R07E	T19N	S32

The U.S. Department of Energy (DOE) and Newport News Nuclear BWXT-Los Alamos, LLC (N3B) acknowledge that activities covered by this discharge permit application may potentially be conducted anywhere within the 36 square-mile Los Alamos National Laboratory site. DOE/N3B propose to include all 55 sections in the table above as possible locations where components for the processing, treatment, storage, and/or land application may need to be located. Specific component identification information will be provided in a project-specific work plan provided to the New Mexico Environment Department (NMED). Project-specific work plans will be provided to NMED for review and approval at least 60 days before the commencement of any of the activities described in the work plan.

ATTACHMENT C
Processing, Treatment, Storage, and Disposal System

Below is a generalized process flow diagram for the storage, treatment, and land application of groundwater for activities conducted under this discharge permit application.



ATTACHMENT D
Identify Other Wastewater or Storm Water Discharges at the Facility

Discharge Type*	Permit Identification
Individual Storm Water Permit	National Pollutant Discharge Elimination System (NPDES) Permit No. NM0030759
Construction Storm Water Permits	Each construction project disturbing more than 1 acre
Technical Area 54 (TA-54) Maintenance Facility West Multi-Sector General Permit (MSGP)	NPDES Permit No. NMR050011
TA-54 Areas G and L MSGP	NPDES Permit No. NMR050012

* Only storm water discharges for Newport News Nuclear BWXT-Los Alamos, LLC (N3B), activities are identified.N3B does not manage any wastewater discharges.

ATTACHMENT E
Description of Components

Component*	Description (construction material, liner type, irrigation method, capacity, dimensions, area, model number, etc.)
Influent (untreated groundwater) storage tank	Steel frac tank. See Attachment F.
Influent (untreated groundwater) storage tank	Lined modular tank. See Attachment F.
Influent (untreated groundwater) storage lagoon	Synthetically lined lagoon. See Attachment F.
Treatment system feed pump	Delivers untreated groundwater from tank or lagoon to treatment unit.
Treatment unit	Treatment unit to remove contaminants > groundwater standards (e.g., ion exchange, granular-activated carbon)
Effluent (treated groundwater) storage tank	Steel frac tank. See Attachment F.
Effluent (treated groundwater) storage tank	Lined modular tank. See Attachment F.
Effluent (treated groundwater) storage lagoon	Synthetically lined lagoon. See Attachment F.
Effluent (treated groundwater) transfer pump	Transfers treated groundwater to water truck or spay irrigation.
Water truck	Water truck with sprayers for land application
Spray irrigation system	Pump, valves, piping, and spray nozzles for land application

* Components are listed singularly. Specific component identification and configuration information will be provided in a project-specific work plan to the New Mexico Environment Department.

ATTACHMENT F
Design Criteria for Storage Systems (Lagoons, Lined Modular Tanks, and Steel Tanks)

Design requirements for lining of the aquifer test storage systems are as follows:

Lagoons:

1. Suitable liner materials are identified in the Natural Resources Conservation Service (NRCS) Conservation Practice Standard No. Code 521A – Pond Sealing or Lining – Flexible Membrane.
2. Influent liner material shall be 36 mil flexible reinforced polypropylene geomembrane such as supplied by Colorado Lining International.
3. Effluent liner material shall be 24 mil (minimum) reinforced polyethylene geomembrane (pond liner) such as supplied by Colorado Lining International.
4. Lagoons shall have a design life of 5 years.
5. Subgrade shall consist of native silty sand alluvial soils essentially free of angular stones over 3/8 inch and prepared by smoothing.
6. Maximum lagoon slope: 1.5 horizontal to 1 vertical, and one slope per lagoon shall be no steeper than 3 horizontal to 1 vertical for access/egress.
7. The minimum berm width shall be 5 feet.
8. Lagoons will be monitored for water loss.
9. Each lagoon may have a maximum capacity of 200,000 gallons.
10. Lagoons will be fenced to prevent animal intrusion.
11. No penetrations of the liner shall be allowed.
12. No vehicles shall be used on the top-slopes of the berms.
13. Liners shall be installed per manufacturer's requirements.
14. Lagoons shall be sized such that field seaming is not required.
15. Entry into the lagoons shall be allowed only for maintenance, sampling, and operational activities.
16. Anchor trench shall be designed to support the entire weight of the side-slope liner.
17. A 2-foot freeboard shall be maintained.

Lined Modular Influent Tanks (such as provided by Modutank):

1. Field erected, abovegrade, lined modular tanks (e.g., Modutank, see link below) may be used for influent and effluent storage, possibly in combination with other storage types. An 8-ounce geotextile will be placed under the line as a ground cover. https://modutank.com/modutank/
2. Influent liner material shall be 36 mil flexible polypropylene geomembrane such as supplied by Colorado Lining International.
3. Effluent liner material shall be 24 mil (minimum) polyethylene geomembrane (pond liner) such as supplied by Colorado Lining International.
4. Tanks will be monitored for water losses.

Steel Frac Tanks

1. Steel frac tanks may be used for influent raw water storage, possibly in combination with other storage types.
2. Steel frac tanks are fully enclosed tanks (i.e., closed) with a capacity of approximately 21,000 gallons.

ATTACHMENT G
Flow Metering

Specific flow metering system information for measuring the volume entering the treatment system and the discharge volume will be provided in a project-specific work plan provided to the New Mexico Environment Department.

ATTACHMENT H
Discharge Quality

Contaminants	Contaminants	
	Incoming (Influent)	Final (Effluent)
>20.6.2.3103 New Mexico Administrative Code (NMAC) groundwater standards	Untreated groundwater quality information will be provided in project-specific work plans, if required. In accordance with Part II.4 of the discharge permit application, not all facilities need to characterize influent quality.	<90% of 20.6.2.3103 NMAC groundwater standards
20.6.2.7.T(2) NMAC Toxic Pollutants >Table A-1, New Mexico Environment Department (NMED) Risk Assessment Guidance Soil Screening Levels (SSLs) for Tap Water	Untreated groundwater quality information will be provided in project-specific work plans, if required. In accordance with Part II.4 of the discharge permit application, not all facilities need to characterize influent quality.	<90% of Table A-1, NMED Risk Assessment Guidance SSLs for Tap Water

ATTACHMENT I
Groundwater Flow Direction

The general groundwater flow direction at Los Alamos National Laboratory is to the southeast. Specific groundwater contour maps from on-site monitoring wells, when available, will be provided in a project-specific work plan provided to the New Mexico Environment Department.

ATTACHMENT J
Monitoring Well Construction and Identification

Construction logs and location information for all applicable project-specific on-site monitoring wells including the date of installation and well drilling will be provided in a project-specific work plan to the New Mexico Environment Department.