

FORM 1 GENERAL	U.S. ENVIRONMENTAL PROTECTION AGENCY GENERAL INFORMATION Consolidated Permits Program <i>(Read the "General Instructions" before starting.)</i>	I. EPA I.D. NUMBER <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <td style="width:5%;">S</td> <td style="width:85%;">NM0890010515</td> <td style="width:5%;">T/A</td> <td style="width:5%;">C</td> </tr> <tr> <td>F</td> <td></td> <td></td> <td>D</td> </tr> <tr> <td>1</td> <td>2</td> <td>13</td> <td>14</td> </tr> <tr> <td></td> <td></td> <td></td> <td>15</td> </tr> </table>	S	NM0890010515	T/A	C	F			D	1	2	13	14				15																																						
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LABEL ITEMS I. EPA I.D. NUMBER III. FACILITY NAME V. FACILITY MAILING ADDRESS VI. FACILITY LOCATION		PLEASE PLACE LABEL IN THIS SPACE																																																						
II. POLLUTANT CHARACTERISTICS INSTRUCTIONS: Complete A through J to determine whether you need to submit any permit application forms to the EPA. If you answer "yes" to any questions, you must submit this form and the supplemental form listed in the parenthesis following the question. Mark "X" in the box in the third column if the supplemental form is attached. If you answer "no" to each question, you need not submit any of these forms. You may answer "no" if your activity is excluded from permit requirements; see Section C of the instructions. See also, Section D of the instructions for definitions of bold-faced terms .																																																								
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VII. SIC CODES (4-digit, in order of priority)			
A. FIRST		B. SECOND	
C	7 9711 (specify) NATIONAL SECURITY	C	7 9661 (specify) SPACE RESEARCH AND TECHNOLOGY
15	16 - 19	15	16 - 19
C. THIRD		D. FOURTH	
C	7 9922 (specify) SCIENTIFIC RESEARCH	C	7 9611 (specify) ENERGY DEVELOPMENT
15	16 - 19	15	16 - 19

VIII. OPERATOR INFORMATION			
A. NAME			B. Is the name listed in Item VIII-A also the owner?
C	8 TRIAD NATIONAL SECURITY, LLC		<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
15	16	55	56

C. STATUS OF OPERATOR (Enter the appropriate letter into the answer box; if "Other," specify.)		D. PHONE (area code & no.)
F = FEDERAL S = STATE P = PRIVATE	M = PUBLIC (other than federal or state) O = OTHER (specify)	C A (505) 667-4218
	M (specify)	15 16 18 19 21 22 26
	56	

E. STREET OR P.O. BOX	
P.O. BOX 1663	
26	55


F. CITY OR TOWN		G. STATE	H. ZIP CODE	IX. INDIAN LAND
C	B LOS ALAMOS	NM	87544	Is the facility located on Indian lands?
15	16	40 41	42 47 51	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
				52

X. EXISTING ENVIRONMENTAL PERMITS			
A. NPDES (Discharges to Surface Water)		D. PSD (Air Emissions from Proposed Sources)	
C	T I	C	T I
9	N NM0028355	9	P P100R1
15	16 17 18	30	15 16 17 18
B. UIC (Underground Injection of Fluids)		E. OTHER (specify)	
C	T I	C	T I
9	U DP-1835	9	SEE APPENDIX A (specify)
15	16 17 18	30	15 16 17 18
C. RCRA (Hazardous Wastes)		E. OTHER (specify)	
C	T I	C	T I
9	R NM0890010515-1	9	(specify)
15	16 17 18	30	15 16 17 18

XI. MAP
Attach to this application a topographic map of the area extending to at least one mile beyond property boundaries. The map must show the outline of the facility, the location of each of its existing and proposed intake and discharge structures, each of its hazardous waste treatment, storage, or disposal facilities, and each well where it injects fluids underground. Include all springs, rivers, and other surface water bodies in the map area. See instructions for precise requirements.

XII. NATURE OF BUSINESS (provide a brief description)
The Los Alamos National Laboratory is a multidisciplinary/multiprogram laboratory. The Laboratory's central mission is to reduce the nuclear danger through evaluation and stockpile stewardship. It also provides significant programmatic support to many civilian efforts. Because of evolving technologies and changing national and international priorities, the Laboratory increasingly uses its multidisciplinary research and development capabilities to solve civilian problems in the areas of health, national infrastructure, energy, education, aeronautics, and the environment. Extensive basic research programs in physics, chemistry, metallurgy, mathematics and computers, earth sciences, and electronics support these efforts.

XIII. CERTIFICATION (see instructions)
I certify under penalty of law that I have personally examined and am familiar with the information submitted in this application and all attachments and that, based on my inquiry of those persons immediately responsible for obtaining the information contained in the application, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

A. NAME & OFFICIAL TITLE (type or print) William S. Goodrum, Manager Los Alamos Field Office	B. SIGNATURE 	C. DATE SIGNED 3-25-2019
---	--	-----------------------------

COMMENTS FOR OFFICIAL USE ONLY	
C	
15	16

VII. SIC CODES (4-digit, in order of priority)			
A. FIRST		B. SECOND	
C	7	(specify)	
15	16	19	
C. THIRD		D. FOURTH	
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			52

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C	9	N	
15	16	17	18
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EXTRA PAGE FOR SIGNATURE

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A. NAME & OFFICIAL TITLE (type or print)	B. SIGNATURE	C. DATE SIGNED
Michael W. Hazen, Associate Laboratory Director ESHQSS		3-20-19

COMMENTS FOR OFFICIAL USE ONLY	
C	
15	16

LOS ALAMOS NATIONAL LABORATORY

Industrial and Sanitary Outfalls 2019 NPDES Permit Re-Application Permit No. NM0028355

LA-UR-19-22215
March 2019

For:
Los Alamos National Laboratory
Los Alamos, NM

Submitted By:
U.S. Department of Energy – National Nuclear Security Administration,
Los Alamos Field Office and Triad National Security, LLC

Prepared By:
Los Alamos National Laboratory
Environmental Protection and Compliance Division
Compliance Programs Group

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VOLUME I

Section	Title
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13S	Outfall 13S – Form 2C, Fact Sheet and Attachments
03A027	Outfall 03A027 – Form 2C, Fact Sheet and Attachments
03A048	Outfall 03A048 – Form 2C, Fact Sheet and Attachments
03A113	Outfall 03A113 – Form 2C, Fact Sheet and Attachments
03A160	Outfall 03A160 – Form 2C, Fact Sheet and Attachments
03A181	Outfall 03A181 – Form 2C, Fact Sheet and Attachments
03A199	Outfall 03A199 – Form 2C, Fact Sheet and Attachments
04A022	Outfall 04A022 – Form 2C, Fact Sheet and Attachments
051	Outfall 051 – Form 2C, Fact Sheet and Attachments
05A055	Outfall 05A055 – Form 2C, Fact Sheet and Attachments

VOLUME II

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B	Hazardous Waste Management Facility Maps
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E	Map 3 – Location Map of Water Supply Wells, Monitoring Wells, Springs, and Other Surface Water Bodies
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G	Historical and Existing National Pollutant Discharge Elimination System (NPDES) Outfall Status Summary
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J	2017 Drinking Water Quality Data Report
K	Executive Summary of the Los Alamos National Laboratory's National Pollutant Discharge Elimination System (NPDES) Permit Re-Application Implementation Plan
L	Sampling and Analysis Plan for Los Alamos National Laboratory's National Pollutant Discharge Elimination System (NPDES) Permit Re-Application
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2	Generalized Cross-Section of the Los Alamos National Laboratory Area
3	Primary Watersheds at Los Alamos National Laboratory
4	Illustration of Geological and Hydrological Relationships on the Pajarito Plateau

LIST OF TABLES

No.	Title
1	Historical Summary of NPDES Permit NM0028355
2	Existing Permitted NPDES Outfalls
3	List of Outfalls Included in the Permit Re-Application Package

ACRONYMS/ABBREVIATIONS

CWA	Clean Water Act
DOE	U.S. Department of Energy
EA	Environmental Assessment
ENV-DO	Environmental Protection Division
EPA	Environmental Protection Agency
EPC-CP	Environmental Protection and Compliance – Compliance Programs
ESHQSS	Environment, Safety, Health & Quality, and Safeguards & Security
°F	Fahrenheit
ft	feet/foot
HEWTF	High Explosives Wastewater Treatment Facility
IPSP	Industrial Point Source Permit
IWD	Integrated Work Document
LANL	Los Alamos National Laboratory
LDCC	Laboratory Data Communications Center
NEPA	National Environmental Policy Act
NMAC	New Mexico Administrative Code
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NPDES	National Pollutant Discharge Elimination System
QA	quality assurance
RCRA	Resource Conservation and Recovery Act
RLWTF	Radioactive Liquid Waste Treatment Facility
SAP	Sampling and Analysis Plan
SMO	Sample Management Office
SWEIS	Site Wide Environmental Impact Statement
SWWS	Sanitary Waste Water System
TA	Technical Area
WAC	Waste Acceptance Criteria
WCATS	Waste Compliance and Tracking System
WSP	Waste Stream Profile

EXECUTIVE SUMMARY

The Los Alamos National Laboratory (Laboratory) must apply for renewal of the existing Industrial and Sanitary Point-Source National Pollutant Discharge Elimination System (NPDES) Permit No. NM0028355 issued by the U.S. Environmental Protection Agency (EPA) under the requirements specified in the Clean Water Act Section 402 and Code of Federal Regulations, Title 40, Section 122. The existing permit expires on September 30, 2019. The NPDES permit and regulations require the Laboratory to submit a re-application 180 days prior to the expiration of the existing permit, April 4, 2019. The attached document, forms, Appendices, and Attachments constitute the Laboratory's permit reapplication for the following eleven (11) outfalls:

- 001 - Power Plant
- 13S - Sanitary Waste Water System Facility
- 03A027 - Treated Cooling Water
- 03A048 - Treated Cooling Water
- 03A113 - Treated Cooling Water
- 03A160 - Treated Cooling Water
- 03A181 - Treated Cooling Water
- 03A199 - Treated Cooling Water
- 04A022 - Once Through Cooling Water and Roof Drains
- 051 - Radioactive Liquid Waste Treatment Facility Effluent
- 05A055 - High Explosives Wastewater Treatment Facility Effluent

The Laboratory is categorized as an industrial or commercial facility that is renewing an existing NPDES permit with no new outfalls. This categorization requires that the permit reapplication include an EPA Form 1 and EPA Form 2C. This 2019 Permit Re-Application includes a Form 1 that provides general information such as the nature of business, name, mailing address, location, and other existing permits that apply to Laboratory operations. It also includes a Form 2C and fact sheet for each outfall. The Form 2C, fact sheet, and the fact sheet attachments provide detailed information regarding the location of the outfall, sources of influent water, production levels, and the analytical data for potential contaminants in the effluent discharged from the outfall.

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LOS ALAMOS NATIONAL LABORATORY INDUSTRIAL AND SANITARY OUTFALLS 2019 NPDES PERMIT RE-APPLICATION

The current Los Alamos National Laboratory (LANL or Laboratory), National Pollutant Discharge Elimination System (NPDES) Industrial and Sanitary Discharge Permit No. NM0028355 will expire September 30, 2019. The NPDES permit and regulations require the Permittees to submit a re-application to the U.S. Environmental Protection Agency (EPA) 180 days prior to the expiration of the existing permit, April 4, 2019. This document serves as the 2019 NPDES Permit Re-Application package for the renewal of NPDES Permit No. NM0028355 submitted to the EPA by the U.S. Department of Energy (DOE) – National Nuclear Security Administration (NNSA) and the Triad National Security, LLC. The DOE/NNSA and Triad are hereinafter referred to as the “co-permittees or permittees.”

This 2019 NPDES Permit Re-Application package has been prepared and is submitted in accordance with the provisions of the Clean Water Act (CWA) (33 U.S.C. 1251 – 1387) and the NPDES Permit Program requirements provided in 40 CFR 122.21. It is the intent of the package to provide the EPA and permit writer, New Mexico Environment Department, and others with adequate background information concerning each outfall, the surrounding environmental conditions, and associated future activities at the Laboratory to promote review of the technical data and preparation of the permit. The Permittees would like to invite EPA and New Mexico Environment Department (NMED) representatives to visit the Laboratory during the review process to gain firsthand knowledge and understanding of the information provided, identify potential issues, and answer any questions regarding proposed changes to the permitted outfalls and NPDES facilities presented in this re-application package.

Due to the complex nature of the NPDES Permit Re-Application and potential need for supplemental information, the applicant requests that all previous applications, modifications, maps, data, and pertinent correspondence submitted in reference to NPDES Permit No. NM0028355 transmitted to the EPA up to the time the new permit is issued, be considered part of this re-application. The applicant will continue to provide copies of all such information to the EPA Permit Writer as new information becomes available.

1.0 NPDES PERMIT RE-APPLICATION

The 2019 NPDES Permit Re-Application requires that detailed information be provided for each point source outfall. The information required includes the location of each outfall; a detailed description of all sources and processes that contribute to each outfall discharge; the volume and frequency of the discharges; and analytical data for the discharges. The Laboratory is categorized as an industrial or commercial facility that is renewing an existing NPDES permit with no new outfalls. This categorization requires that the permit reapplication include an EPA Form 1 and EPA Form 2C. This application is organized into two volumes. Volume I includes an introduction and a set of alphabetically organized (A through L) appendices that provide the maps required by the Form 1 and other supplemental information to support the application. Volume II provides the Form 1 and an application package that consists of the Form 2C and fact sheet for each individual outfall.

1.1 General Form 1

The Form 1 is used to present general information such as the nature of business, name, mailing address, location, and other existing permits that apply to Laboratory operations. This permit application includes a section that is labeled Form 1 in Volume I. This section provides the completed Form 1 with its associated footnotes and applicable certifications. The following Appendices (located in Volume II) provide details regarding the Laboratory’s existing environmental permits and the maps requested in Form 1 Section X and XI, respectively:

- Appendix A - A list of other environmental permits that are applicable to Laboratory Operations
- Appendix B - Topographic maps of each hazardous waste treatment, storage, and/or disposal unit.
- Appendix C - Topographic map of the LANL technical areas (TA) and Boundaries

- Appendix D - A Topographic map of all springs, rivers, and other surface water bodies
- Appendix E - A Topographic Map of the area extending to at least one mile beyond the property boundaries that shows the outline of the facility and the location of each outfall. Detailed location maps for each intake and discharge structures are provided with each outfall Form 2C and Fact Sheet.

1.2 Form 2C

The Form 2C is used to provide detailed information regarding the location of the outfall, sources of influent water, production levels, and the analytical data for potential contaminants in the effluent discharged from the outfall. The Form 2C for each outfall is provided in Volume I as a section that corresponds to the respective outfall ID number (e.g., 001, 03A048, 051). In addition to the Form 2C, each outfall section includes a fact sheet that is intended to demonstrate compliance with the Form 2C requirements. The fact sheets provide additional detail and the supporting documentation that is requested by form for each outfall. Supporting documentation includes location maps, process schematics, water balances, photographs, a Discharge Monitoring Report Summary, and chemical safety data sheets, as applicable to each outfall. This permit application provides a Form 2C and fact sheet for the following eleven (11) outfalls:

- 001 - Power Plant
- 13S - Sanitary Waste Water System (SWWS) Facility
- 03A027 - Treated Cooling Water
- 03A048 - Treated Cooling Water
- 03A113 - Treated Cooling Water
- 03A160 - Treated Cooling Water
- 03A181 - Treated Cooling Water
- 03A199 - Treated Cooling Water
- 04A022 - Once Through Cooling Water and Roof Drains
- 051 - Radioactive Liquid Waste Treatment Facility (RLWTF) Effluent
- 05A055 - High Explosives Wastewater Treatment Facility (HEWTF) Effluent

2.0 BACKGROUND

2.1 Laboratory Organization

The Laboratory is currently operated by Triad National Security, LLC on behalf of the U.S. Department of Energy (DOE) and thus is a co-permittee of the NPDES Permit. As co-permittee, Triad is responsible for Laboratory site compliance with the regulatory requirements of the NPDES permit and all other environmental permits granted to the Laboratory. The Environment, Safety, Health & Quality, and Safeguards & Security (ESHQSS) Directorate, Environmental Protection and Compliance (EPC-DO) provides environmental protection leadership, service, and support to meet the Laboratory's environmental protection obligations and public assurance needs. The Triad senior management has delegated the authority and responsibility to the Associate Laboratory Director of ESHQSS and/or Division Leader of the EPC-DO to act as the certifying official for environmental compliance permit applications. The Associate Laboratory Director of ESHQSS will be a signatory on the 2019 NPDES Permit Re-Application as designated by the letter provided in Appendix F.

2.2 Laboratory Research Activities

The Laboratory is a complex organization comprised of multiple disciplines and programs that include stockpile stewardship and extensive basic research in physics, chemistry, metallurgy, mathematics, computers, earth sciences, and electronics. Its current mission is to solve national security challenges through scientific excellence. The current goals of the Laboratory are to deliver national nuclear security and broader global security mission solutions and to foster excellence in science and engineering disciplines essential for national

security missions by attracting, inspiring, and developing world-class talent to ensure a vital future workplace and by enabling mission delivery through next-generation facilities, infrastructure, and operational excellence.

2.3 NPDES Permit NM0028355

The Laboratory has had an approved NPDES Permit since 1978. Table 1 summarizes the permit activities associated over the last 41 years. Appendix G provides a list of all historical and existing outfalls.

Table 1
Historical Summary of NPDES Permit NM0028355

Application		NPDES Permit		Outfalls Eliminated and/or Removed
Date	No. Outfalls	Effective Date	No. Outfalls	
Prior to 1990	141	NA	NA	<ul style="list-style-type: none"> 24 outfalls eliminated prior to the effective date of the first permit.
1990	117	9/1/2003	34	<ul style="list-style-type: none"> 83 outfalls were eliminated due to the completion of the Waste Stream Characterization and Corrections Project and the Outfall Reduction Project.
1998	35	2/1/2001	21	<ul style="list-style-type: none"> 14 outfalls were not permitted because the supply wells associated with them were transferred from U.S. Department of Energy to Los Alamos County before the permit was issued. Request made to EPA to delete 4 outfalls (03A024, 03A047, 03A049, and 05A097) in August of 2004 because they were no longer in use.
2004	17	8/1/2007	15	<ul style="list-style-type: none"> 03A158 was not permitted because the TA-21-209 cooling tower was decommissioned and the outfall eliminated before the permit was issued. 03A028 was not permitted because the TA-15-185 and TA-15-202 Phermex facilities were decommissioned before the permit was issued. 03A021 and 03A185 were tied to the Sanitary Waste Water System (SWWS) Plant in 2010 as part of the Outfall Reduction Project. Outfalls 02A129 (TA-21 Steam Plant) and 03A130 (TA-11 cooling tower) no longer discharge to the environment.
2012	11	10/1/2014	11	<ul style="list-style-type: none"> Permitted 11 outfalls.
2015	11	5/1/2015	11	<ul style="list-style-type: none"> Permit Modification to change the maximum and monthly average temperature limits. Revised the designation of outfall 03A022 to a 04A022.

The existing NPDES Industrial and Sanitary Discharge Permit No. NM0028355 became effective on October 1, 2014 with final modifications implemented May 2015 (LA-UR-15-23948). This permit includes 11 outfalls located at seven (7) Technical Areas (TAs) spread out over an approximately 36 square mile area within the Laboratory boundaries (Table 2).

Table 2
Existing Permitted NPDES Outfalls

Outfall Category	Number of Outfalls	Designation
Power Plant (001)	1	001
Sanitary Wastewater System Facility (13S)	1	13S
Radioactive Liquid Waste Treatment Facility (051)	1	051
Treated Cooling Water (03A)	6	03A027
		03A048
		03A113
		03A160
		03A181
		03A199
Non-Contact Cooling Water, Storm Water, and Roof Drain Water (04A)	1	04A022
High Explosive Wastewater Treatment Facility (05A)	1	05A055

The permit requires weekly, monthly, quarterly, yearly, and term sampling to demonstrate compliance with different outfall specific effluent quality limits. The existing permit requires the Permittees to give notice to the EPA of any planned physical alterations or additions that could significantly change the nature or increase the quantity and/or quality of pollutants discharged from any of its permitted outfalls. The existing permit includes 14 Notices of Changed Condition/Planned Change. Appendix H provides a copy of each Notice of Changed Condition/Planned Change that was submitted to the EPA from March 2012 through February 2019.

2.4 NEPA Considerations

A National Environmental Policy Act (NEPA) categorical exclusion for the Waste Stream Corrections Project was issued by DOE in January 1996 and an *Environmental Assessment (EA) for Effluent Reduction* was completed by the LANL in September 1996. This categorical exclusion and EA support the reduction/elimination of the discharges from all of the LANL outfalls except the following:

- Outfall 001, TA-3 Power Plant
- Outfall 05A055, TA-16 HEWTF
- Outfall 13S, TA-46 SWWS
- Outfall 051, TA-50 Radioactive Liquid Waste Treatment Facility
- Outfall 03A199, Laboratory Data Communications Center (LDCC) Cooling Tower

The TA-16 HEWTF (Outfall 05A055) was analyzed under a separate evaluation which provided a NEPA determination that the project was determined to be covered under an existing DOE-approved categorical exclusion for Safety and Environmental Improvements at LANL. The outfall reduction project for RLWTF (Outfall 051) was included as an option in the Final Site-Wide Environmental Impact Statement (SWEIS) for Continued Operation of Los Alamos National Laboratory (DOE 2008a). In September 2008, the National Nuclear Security Administration (NNSA) issued the first Record of Decision for the 2008 SWEIS (DOE 2008b). The NNSA chose to implement the No Action Alternative with the addition of some element of the Expanded Operations Alternative. Final design of a new RLWTF was a part of the Expanded Operations Alternative that were approved to move forward. Mitigation commitments associated with this project are included in the Mitigation Action Plan for the 2008 SWEIS.

In 2008, a Permit Requirements Identification request was submitted for the proposed actions reducing or eliminating discharges from the LDCC Cooling Tower (Outfall 03A199); TA-46 SWWS (13S); and the TA-3 Power Plant (Outfall 001). In August 2010, an EA for the Expansion of the Sanitary Effluent Recycling Facility and Environmental Restoration of Reach S-2 of Sandia Canyon at LANL and associated Finding of No Significant

Impacts was issued by the NNSA. The NNSA determined that by using adaptive management practices in the implementation of specific resource mitigation commitments, the potential for adverse environmental effects from the proposed actions would be minimal.

2.5 Other Environmental Permits

The Laboratory operations are regulated under various state and federal environmental regulations (e.g., Clean Air Act, CWA, etc.) through operating permits. These documents are designed by the regulatory agencies to allow Laboratory operations to be conducted while assuring that the public, air, land, soils, water, and biota are protected. Appendix A provides a detailed list of the environmental permits at LANL includes issuing dates, revision dates, expiration date, and the administering agency.

3.0 ENVIRONMENTAL SETTING

3.1 Location

The Laboratory and the associated residential and commercial areas of Los Alamos and White Rock are located in Los Alamos County, in north-central New Mexico, approximately 60 miles north-northeast of Albuquerque and 25 miles northwest of Santa Fe as shown on Figure 1. The Laboratory currently encompasses about 36 square miles and is situated on the Pajarito Plateau, a series of finger-like mesas and canyons at the eastern edge of the Jemez Mountains, bordered on the east by White Rock Canyon and the Rio Grande. Mesa tops range in elevation from approximately 7,800 feet (ft) on the flanks of the Jemez Mountains to about 6,200 ft at the edge of White Rock Canyon. Most Laboratory and community developments are confined to the mesa tops.

The land surrounding the Laboratory is largely undeveloped and large tracts of land north, west, and south of the Laboratory site are held by the Santa Fe National Forest, the U.S. Bureau of Land Management, Bandelier National Monument, the U.S. General Services Administration, and Los Alamos County. The Pueblo de San Ildefonso borders the Laboratory to the east. Santa Clara Pueblo is north of the Laboratory but does not share a border. The Laboratory is divided into 49 TAs, which are defined areas that may contain building sites, experimental areas, support facilities, roads, and utility rights-of-way (Appendix C).

3.2 Climate

The Los Alamos area has a semiarid mountain climate where more water is lost through evaporation and transpiration than is received as annual precipitation. Annual temperatures and amounts of precipitation vary across the site because of the 1,000-ft elevation change and the complex topography. Four distinct seasons occur in Los Alamos County. Winters are generally mild, with occasional winter storms. Spring is the windiest season. Summer is the rainy season, with frequent afternoon thunderstorms. Fall is typically dry, cool, and calm. Daily temperatures are highly variable. On average, winter temperatures range from 30°F to 50°F during the daytime and from 15 degrees Fahrenheit (°F) to 25°F during the nighttime. The Sangre de Cristo Mountains to the east of the Rio Grande act as a barrier to wintertime arctic air masses, making the occurrence of local subzero temperatures rare. On average, summer temperatures range from 70°F to 88°F during the daytime and from 50°F to 59°F during the night. From 1981 to 2010, the average annual precipitation (which includes both rain and the water equivalent of frozen precipitation) was 19 inches and the average annual snowfall amount was 59 inches. The rainy season begins in early July and ends in early September. Afternoon thunderstorms form as moist air from the Pacific Ocean and the Gulf of Mexico lifts over the Jemez Mountains. Thunderstorms yield short, heavy downpours and an abundance of lightning. Local lightning density, among the highest in the United States, is estimated at 15 strikes per square mile per year.

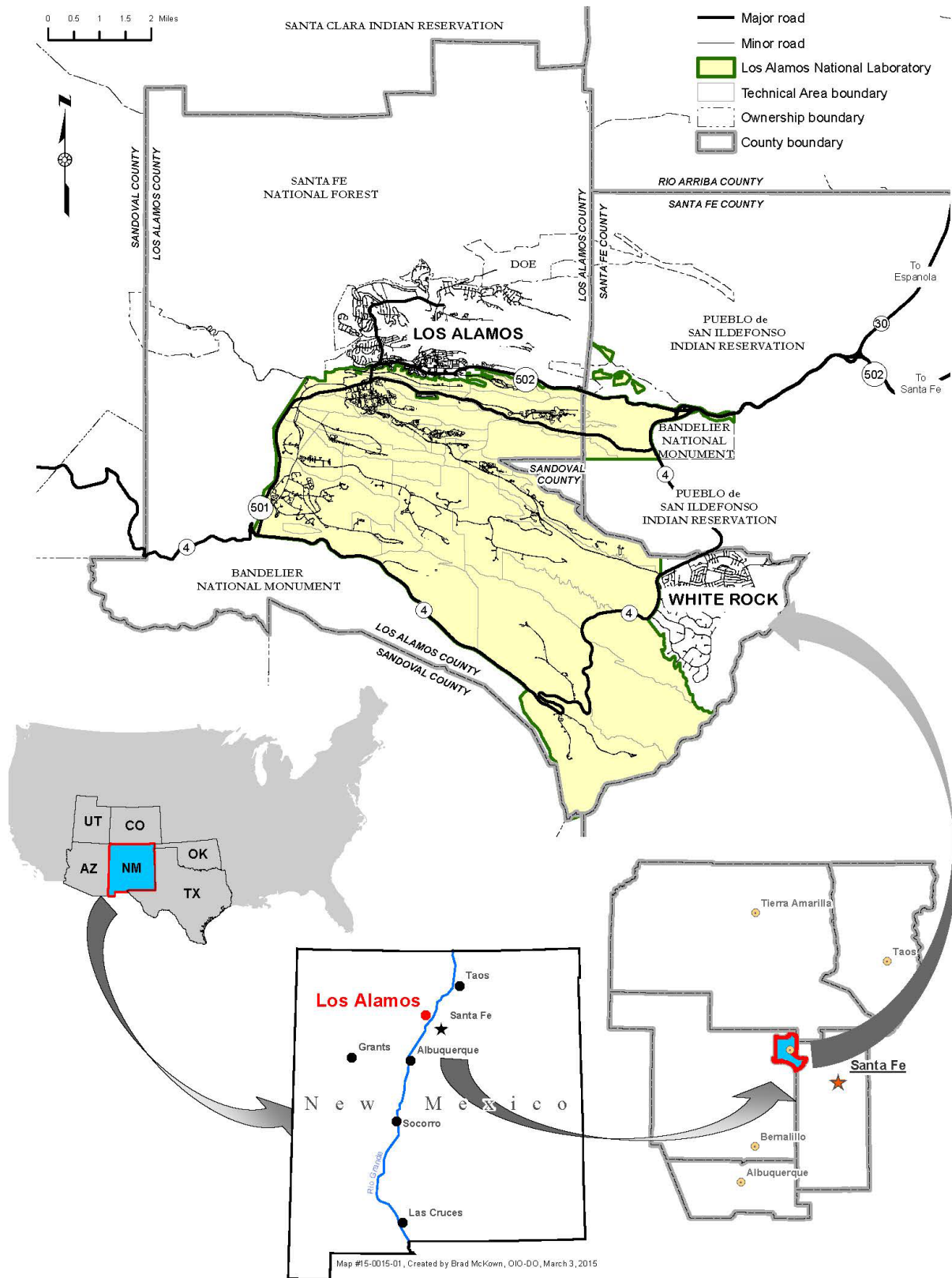


Figure 1 - Location of Los Alamos National Laboratory

3.3 Geology

The Laboratory is located in Northern New Mexico on the Pajarito Plateau (Figure 2). The Pajarito Plateau extends from the Rio Grande in the east to the Sierra de los Valles range of Jemez Mountains in the west. Rocks that compose Bandelier Tuff cap the Pajarito Plateau. The tuff was formed from ash and other volcanic materials that erupted from the Jemez Mountains volcanic center approximately 1.2 to 1.6 million years ago. The tuff is more than 1,000 ft thick in the western part of the plateau and thins to about 260 ft next to the Rio Grande.

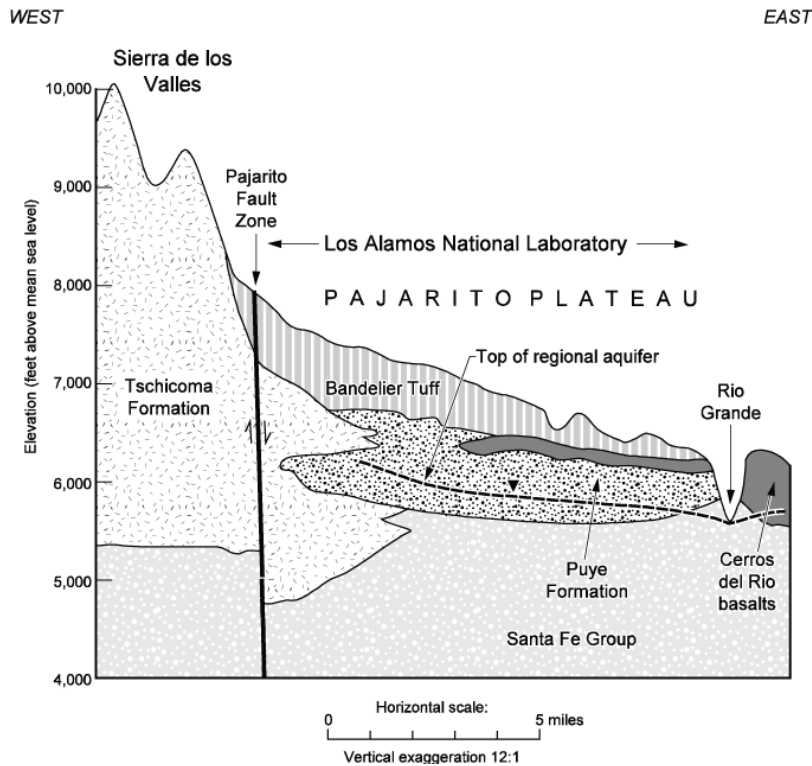


Figure 2 - Generalized Cross-Section of the Los Alamos National Laboratory Area

On the western part of the Pajarito Plateau, the Bandelier Tuff overlaps the Tschicoma Formation, which consists of older volcanic deposits. The Puye Formation, a largely unconsolidated sedimentary conglomerate, underlies the tuff beneath the central and eastern portion of the plateau. The Cerros del Rio basalt flows, which originated mostly from a volcanic center east of the Rio Grande, extend into the Puye Formation beneath the Laboratory. These formations all overlie the sediments of the Santa Fe Group, which cross the Rio Grande valley and are more than 3300 ft thick.

3.4 Hydrology

3.4.1 Surface Water

The Laboratory property contains all or parts of seven primary watersheds that drain directly into the Rio Grande. Listed from north to south, the major canyons for these watersheds are Los Alamos, Sandia, Mortandad, Pajarito, Water, Ancho, and Chaquehui as shown on Figure 3. Each of these watersheds includes tributary canyons of various sizes. Los Alamos, Pajarito, and Water Canyons have their headwaters west of the Laboratory in the eastern Jemez Mountains, mostly within the Santa Fe National Forest. The remainder the primary watersheds have their headwaters on the Pajarito Plateau. Only the Ancho Canyon watershed is entirely located on Laboratory land.

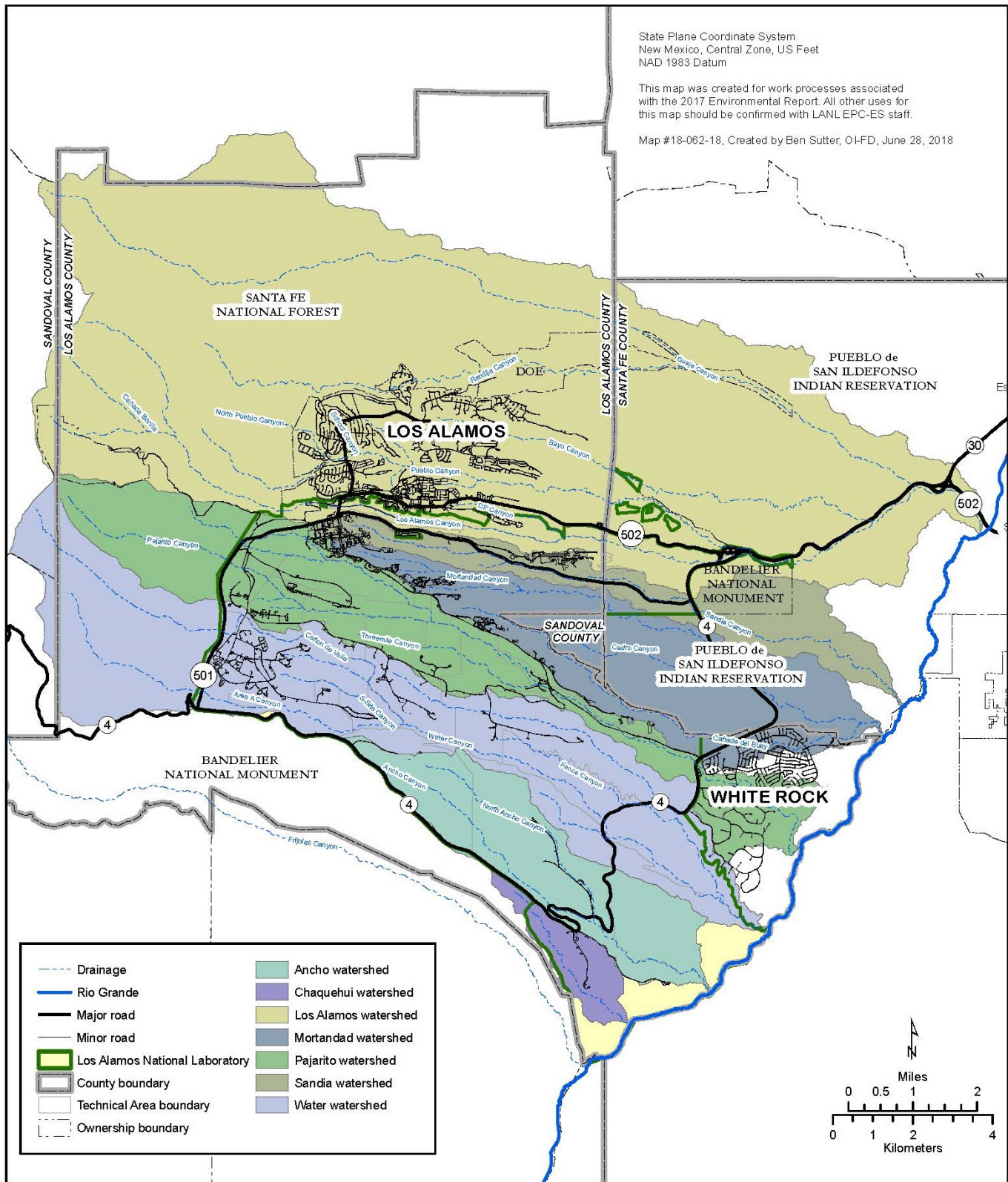


Figure 3 - Primary Watersheds at Los Alamos National Laboratory

Surface water in the Los Alamos region occurs primarily as ephemeral flow, which is associated with individual storms and lasting only a few hours to days, or intermittent flow, which is associated with events like snow melt and lasts only a few days to weeks. Springs on the edge of the Jemez Mountains that flow year-round do supply continuous water into western sections of some canyons on Laboratory property, but the amount of water is not enough to maintain surface flows to the eastern Laboratory boundary.

Except during major runoff events, the cumulative flow of wastewater discharges do not reach the Rio Grande. The intermittent runoff leaving Laboratory property is measured at gage stations located in each watershed. These flow measurements are periodically published in the Watershed Periodic Monitoring Reports or in reports for a given water year. Appendix I provides the most recent Surface Water Data report for Water Year 2014. Appendix E provides a scaled full size map showing the location of the springs/base flow associated with each watershed and the locations of the outfalls associated with this re-application document.

3.4.2 Groundwater

The Laboratory is located on top of a thick zone of mainly unsaturated rock and sediments, with the primary aquifer found 600 - 1,200 ft below the ground surface. Groundwater occurs beneath the Pajarito Plateau in three modes: (1) perched alluvial groundwater in canyon bottoms; (2) zones of intermediate-depth perched groundwater whose location is controlled by availability of recharge and by subsurface changes in permeability; and (3) the regional aquifer beneath the Pajarito Plateau as shown on Figure 4.

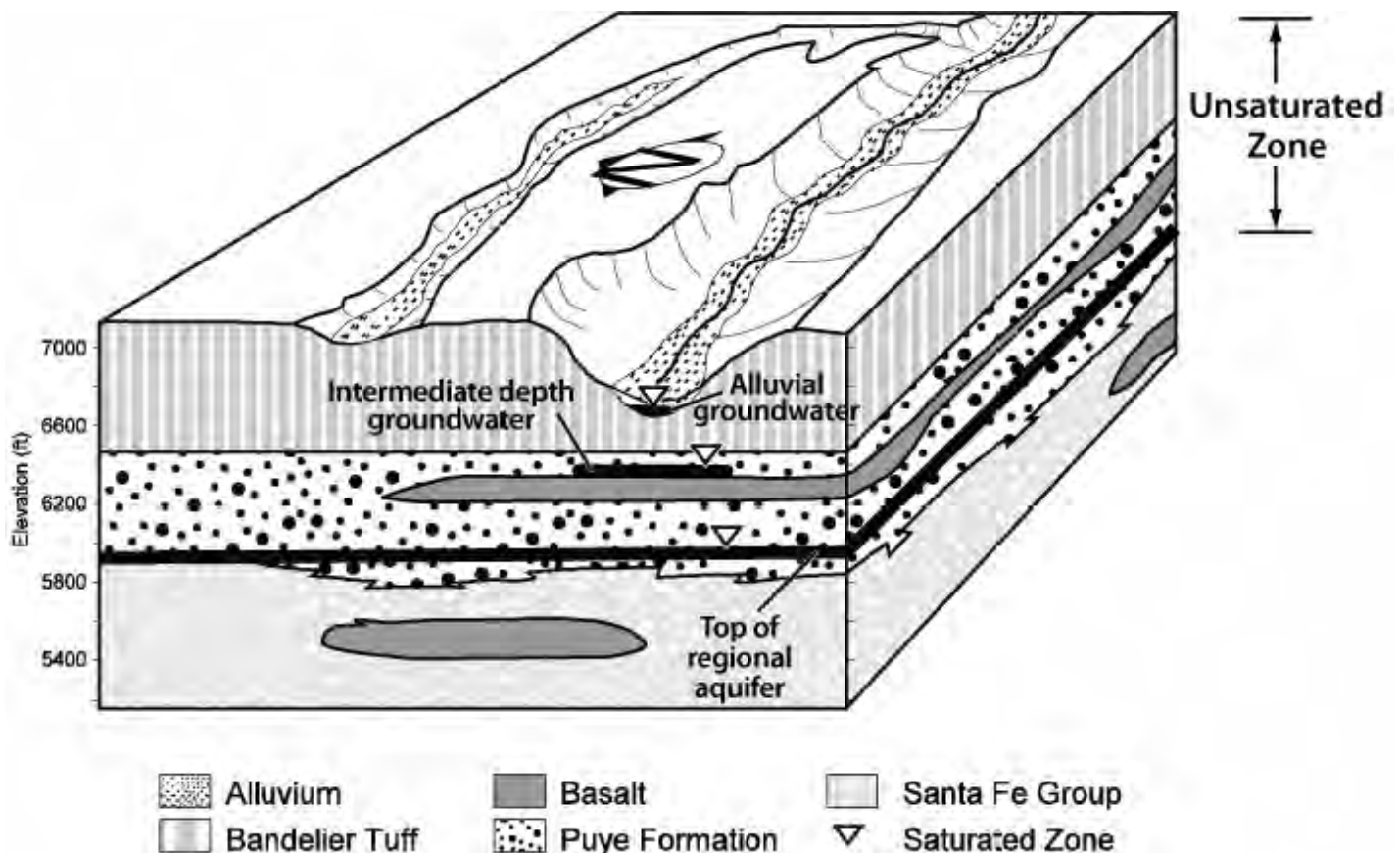


Figure 4 – Illustration of Geological and Hydrological Relationships on the Pajarito Plateau

Perched alluvial groundwater is a limited area of saturated rocks and sediments directly below canyon bottoms. Surface water percolates through the alluvium until downward flow is disrupted by less permeable layers of rock, resulting in shallow perched bodies of groundwater. Most of the canyons on the Pajarito Plateau have infrequent surface water flow and, therefore, little or no alluvial groundwater. A few canyons have saturated alluvium in their western ends supported by runoff from the Jemez Mountains. In some locations, surface water is supplemented or maintained by discharges from Laboratory outfalls. As alluvial groundwater moves down a canyon, it either evaporates, is used by plants, or percolates into underlying rock.

Perched-intermediate groundwater occurs within the lower part of the Bandelier Tuff and the underlying Puye Formation and Cerros del Rio basalt underneath some canyons (Figure 4). These intermediate-depth groundwater bodies are formed in part by water moving downward from alluvial groundwater until the water reaches a layer of relatively impermeable rock. Depths of the perched-intermediate groundwater zones vary. For example, the depth to perched-intermediate groundwater is approximately 120 ft beneath Pueblo Canyon, 450 ft beneath Sandia Canyon, and 500 to 750 ft beneath Mortandad Canyon.

The uppermost level of water in the regional aquifer (known as the water table) occurs at a depth of approximately 1,200 ft below ground surface along the western edge of the plateau and 600 ft below ground surface along the eastern edge. Studies indicate that water from the Sierra de los Valles is the main source of recharge for the regional aquifer (LANL 2005). Groundwater in the regional aquifer generally flows east or southeast. The speed of groundwater flow varies but is typically around 30 ft per year. The regional aquifer is separated from alluvial and perched-intermediate groundwater by layers of unsaturated tuff, basalt, and sediment with generally low moisture content (<10 percent). The limited extent of the alluvial and intermediate groundwater bodies, along with unsaturated rock that underlies them, restricts their contribution to recharging the regional aquifer, although locally they are important parts of the complete pathway to the regional aquifer.

The Laboratory uses groundwater for its potable water supply to laboratory facilities, sanitary facilities, and operations support facilities (cooling towers, power plant etc.). This groundwater contains various levels of natural elements that are dissolved as the water passes through the sub-surface geology. Appendix J provides the sampling results for well water as collected by the Los Alamos County Safe Drinking Water Act Sampling Program for 2017.

3.5 Soil Conditions

Most of the Laboratory facilities are located on mesa tops, where the soils are generally well-drained and thin. The parent materials are approximately 95% Bandelier Tuff, volcanic rocks of the Tschicoma and Puye Formations, and the Cerros de Rio Basalts of the Chino Mesa, and the remnants of the El Cajete pumice. The remaining 5% was formed from colluviums, alluvium, andesitic rocks of the Paliza Canyon Formation, Cerro Rubio Quartz Latites, and tuffs associated with the sediments of the Cerro Toledo Rhyolite. The textures of the these soils range from very fine sandy loams and clay loams to gravelly, sandy loams and stony, silty clay loams.

4.0 OUTFALL DESCRIPTIONS AND CLASSIFICATIONS

This 2019 NPDES Permit Application Package includes documentation for 11 industrial and sanitary outfalls as shown in Table 3 and the map provided as Appendix D. These outfalls discharge into 4 of the watersheds in the LANL region, with the amount of discharge varying from year to year. Detailed treatment descriptions and future proposed changes to NPDES permitted facilities and outfalls are found in the EPA Form 2C Applications and Fact Sheets for each outfall.

Table 3
List of Outfalls Included in the Permit Application Package

Outfall ID No.	Location	Receiving Stream ^a	Watershed
001	TA-3	Perennial Reach of Sandia Canyon, Water Quality Segment 20.6.4.126 NMAC	Sandia
13S	TA-46	Canada del Buey, Water Quality Segment 20.6.4.128 NMAC	Canada del Buey ^b
03A027	TA-3	Perennial Reach of Sandia Canyon, Water Quality Segment 20.6.4.126 NMAC	Sandia
03A048	TA-53	Ephemeral Tributary to Los Alamos Canyon, Water Quality Segment Number 20.6.4.128 NMAC	Los Alamos
03A113	TA-53	Ephemeral Reach of Sandia Canyon, Water Quality Segment 20.6.4.126 NMAC	Sandia
03A160	TA-35	Ten Site Canyon, Tributary to Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC	Mortandad
03A181	TA-55	Effluent Canyon, Ephemeral Reach of Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC	Mortandad
03A199	TA-3	Ephemeral Tributary to Upper Sandia Canyon Water Quality Segment 20.6.4.126 NMAC	Sandia
04A022	TA-3	Ephemeral Reach of Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC	Mortandad
051	TA-50	Effluent Canyon, Ephemeral Reach of Mortandad Canyon, Water Quality Segment Number 20.6.4.128 NMAC	Mortandad
05A055	TA-16	Ephemeral Tributary to Canon De Valle, Water Quality Segment Number 20.6.4.128 NMAC	Water/CdV

a. See Appendix M for a map showing the New Mexico Water Quality Stream Segments.

b. Treated effluent from Outfall 13S is pumped to the TA-3 Re-Use tank and discharged to Outfall 001. To date, the TA-46 SWWS Plant has never discharged into Canada del Buey. Canada del Buey is a tributary to Mortandad Canyon.

NMAC = New Mexico Administrative Code

5.0 WASTE ACCEPTANCE, CHARACTERIZATION, AND CERTIFICATION

The Laboratory's waste management requirements are consistent with the applicable DOE orders, and state and federal regulations. All waste generators at the Laboratory are required to properly identify and document the characterization of any solid, hazardous, radioactive, or mixed waste pursuant to P409, *Waste Management* and the waste acceptance criteria (WAC) provided in P409-1, LANL Waste Acceptance Criteria and PA-AP-01039, *Waste Acceptance Criteria for Transuranic Radioactive Liquid Waste*. The WAC for the wastewater treatment facilities that may discharge to an NPDES permitted outfall are based on the NPDES effluent limits, New Mexico Water Quality Standards, Resource Conservation and Recovery Act Universal Treatment Standards, and/or other federal and state requirements. The treatment processes and capacities of these facilities are also considered during the development of the WAC.

The Laboratory utilizes the waste stream profile (WSP) to provide a complete and concise description of each waste stream including the details of the generating process. The WSP process provides generators with guidance to help make the determination of the physical, chemical, and radiological characteristics of the waste with sufficient accuracy to permit proper segregation, treatment, and disposal appropriate facility WAC. A WSP is required for all waste streams to be discharged or transported to the SWWS, RLWTF, and/or the HEWTF. The WSPs are typically prepared by the generator with the assistance of a Waste Management Coordinator who then enters the information into the Waste Compliance and Tracking System (WCATS). The WCATS system automatically routes the WSP for approval by the appropriate organizations/personnel and allows for the generator to attach characterization data, acceptable knowledge data and other information necessary to properly document the waste stream.

6.0 2019 NPDES RE-APPLICATION PROJECT

The data and information used to prepare this 2019 NPDES Permit Re-Application document was prepared by a project team that consisted of representatives from DOE, Environmental Protection and Compliance Division's Compliance Program (ECP-CP) Group, Outfall owners, and Facility Operations Directors/Managers. The project team responsibilities and activities were outlined in a project Implementation Plan (Appendix K). The following sections provide a brief discussion of the work activities and the procedures and processes that were utilized by personnel to ensure that the information provided in this re-application document is complete and accurate.

6.1 Outfall Survey

The outfall survey was to accumulate records, logs, operating procedures, sampling data, compliance inspection reports, topography maps, chemical inventories, WSPs, Safety Data Sheets, Notice of Change/Plans to Change, and previous Laboratory discharge non-compliance records and reports to support completion of the Form 2C for each outfall. The outfall survey included site visits to each of the 11 outfalls and their associated treatment facilities to take photographs, provide confirmation of the sources and processes, verify the outfall location, and collect documentation.

6.2 Outfall Effluent Sampling and Analysis

The Permittees prepared a project specific Sampling and Analysis Plan (SAP) (Appendix L) to ensure that representative samples were collected, preserved, and managed in accordance with the EPA application Form 2C. All samples were collected in accordance with the project specific SAP; EPC-CP-QP-005, *Sampling at NPDES Permitted Point-Source Outfalls*; and EPC-CP-IWD-005, *IWD Part 1, NPDES Outfall Sampling*. The samples were shipped by the Sample Management Office (SMO) to a LANL approved analytical laboratory required to use EPA approved methods and follow DOE contract requirements.

All analytical data, upon receipt from the laboratory, was formally validated. After the data was validated it was forwarded to ECP-CP from the SMO and hand entered onto the Form 2C. The accuracy of the hand entered data was independently verified and the review documented, forwarded to the appropriate record series, and a hard copy sent to ECP-CP.

6.3 Document Control/Records Management

Effective document control, record keeping, and data management was conducted in accordance with ADESH-AP-007, *Document Control*; ADESH-AP-006, *Records Management*; and EPC-CP-QAPP-NPDES, *Quality Assurance Project Plan for the NPDES Industrial Point Source Permit (IPSP) Self-Monitoring Program*.

6.4 Quality Assurance

The quality assurance (QA) for the project was performed in accordance with SD330, *Los Alamos National Laboratory Quality Assurance Program*, ADESH-QAP-001, *Quality Assurance Plan*, and EPC-CP-QAPP-NPDES IPSP, *Quality Assurance Project Plan for the NPDES Industrial Point Source Permit (IPSP) Self-Monitoring Program*. Quality assurance reviews for data accuracy were conducted throughout the project to ensure that data collected from the outfall surveys, site visits, and sampling activities were reasonable and adequately documented. These QA reviews were initially be conducted by project personnel as the data was collected and/or received. Questionable or undocumented data initiated additional investigations with outfall owners/operators. To ensure accuracy, all collected or compiled data was compared and evaluated against existing data obtained from other internal and external entities.

Formal reviews were also conducted by subject matter experts, the outfall owners; and EPC-CP personnel. These included formal comment review and response to ensure that all changes were documented.

7.0 REFERENCES

ADESH-AP-006: Records Management.

ADESH-AP-007: Document Control.

ADESH-QAP-001: Quality Assurance Plan.

DOE 2008a: "Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico," U.S. Department of Energy report DOE/EIS-0380 (May 16, 2008).

DOE 2008b: "Record of Decision: Final Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory in the State of New Mexico," Federal Register, Volume 73, p. 55833. Washington, D.C. (September 26, 2008).

EPC-CP-IWD-005: IWD Part 1, NPDES Outfall Sampling.

EPC-CP-QAPP-NPDES IPSP: Quality Assurance Project Plan for the NPDES Industrial Point Source Permit (IPSP) Self-Monitoring Program.

EPC-CP-QP-005: Sampling at NPDES Permitted Point-Source Outfalls.

LANL 2005: "Los Alamos National Laboratory's Hydrogeologic Studies of the Pajarito Plateau: A Synthesis of Hydrogeologic Work Plan Activities (1998–2004)," Los Alamos National Laboratory document LA-14263-MS (December 2005).

LA-UR-15-23948: NPDES Permit No. NM0028355.

NMWQCC 2013: "State of New Mexico Standards for Interstate and Intrastate Surface Waters," New Mexico Water Quality Control Commission, 20.6.4 New Mexico Administrative Code.

P409: Los Alamos National Laboratory Waste Management.

P-409-1: Los Alamos National Laboratory Waste Acceptance Criteria.

PA-AP-01039: Waste Acceptance Criteria for Transuranic Radioactive Liquid Waste.

SD330: Los Alamos National Laboratory Quality Assurance Program.