COMMUNITIES FOR CLEAN WATER AND
GILA RESOURCES INFORMATION PROJECT
PROPOSED REVISIONS TO 20.6.4 NMAC

20.6.4.6 NMA

D. A further purpose of these ~~These~~ surface water quality standards is~~serve~~ to address the inherent threats to water quality due to climate change.

20.6.4.7 NMAC

C.(4) "Climate change" refers to any significant change in the measures of climate lasting for an extended period of time, typically decades or longer, and includes major changes in temperature, precipitation, wind patterns or other weather-related effects. Climate change is due primarily to anthropogenic emissions of greenhouse gases into the atmosphere, in combination with ~~may be due to~~ natural processes ~~or human-caused changes of the atmosphere, or a combination of the two~~.

C.(7) "Emerging contaminants" ~~Contaminants of emerging concern" or "CECs" refer to water~~ means contaminants, including~~,~~ but not limited to pharmaceuticals and ingredients in personal care products, that may cause significant adverse ecological or human health effects at low concentrations. ~~CECs~~ Emerging contaminants are ~~generally~~ chemical compounds that, although suspected to potentially have ~~impacts~~adverse effects, may not have regulatory standards, and the concentrations to which ~~negative impacts~~adverse effects are observed may not have ~~not~~ been fully studied. An emerging contaminant may be a toxic pollutant if it falls within the definition of that term.
[Renumber as 20.6.4.7.E(3).]

S.(5) "Surface water~~(s)~~ of the state" (i) means all surface waters situated wholly or partly within or bordering upon the state, including ~~the following: (1)~~ lakes,~~[,]; (2)~~ rivers,~~[,]; (3)~~ streams (including intermittent and ephemeral streams),~~[,]; (4)~~ mudflats,~~[,]; (5)~~ sandflats,~~[,]; (6)~~ wetlands,~~[,]; (7)~~ sloughs,~~[,]; (8)~~ prairie potholes,~~[,]; (9)~~ wet meadows,~~[,]; (10)~~ playa lakes,~~[,]; (11)~~ reservoirs,~~[,];~~ and (12) natural ponds.

(ii) The term also means all tributaries of such waters, including adjacent wetlands, any manmade bodies of water that were originally created in surface waters of the state or resulted in the impoundment of surface waters of the state, and any "waters of the United States" as defined under the Clean Water Act that are not included in the preceding description.

(iii) The term does not include private waters that do not combine with other surface or subsurface water or any water under tribal regulatory jurisdiction pursuant to Section 518 of the Clean Water Act. Waste treatment systems, including treatment ponds or lagoons designed and actively used to meet requirements of the Clean Water Act (other than cooling ponds as defined in 40 CFR Part 423.11(m) that also meet the criteria of this definition), are not surface waters of the state, unless they were originally created in surface waters of the state or resulted in the impoundment of surface waters of the state.

T.(2) "Toxic pollutant" means those pollutants, or combination of pollutants, including disease-causing agents, that after discharge and upon exposure, ingestion, inhalation or assimilation into any organism,

CCW-GRIP EXHIBIT 1

either directly from the environment or indirectly by ingestion through food chains, will cause death, shortened life spans, disease, adverse behavioral changes, reproductive or physiological impairment or physical deformations in such organisms or their offspring. The term includes the toxic pollutants listed in the federal regulations at 40 CFR 401.15, and the groundwater quality regulations at 20.6.2.7.T(2) NMAC as those lists may be amended.

(7) "Emerging contaminants" ~~Contaminants of emerging concern" or "CECs" refer to water~~ means contaminants, including~~,~~ but not limited to, pharmaceuticals and personal care products, that may cause significant adverse ecological or human health effects at low concentrations. ~~CECs~~ Emerging contaminants are generally chemical compounds that, although suspected to potentially have ~~impacts~~adverse effects, may not have regulatory standards, and the concentrations to which ~~negative impacts~~adverse effects are observed have not been fully studied.

20.6.4.13 NMAC

F. Toxic pollutants: (1) Except as provided in 20.6.4.16 NMAC, surface waters of the state shall be free of toxic pollutants~~, including but not limited to contaminants of emerging concern and those toxic pollutants listed in 20.6.2 NMAC,~~ from other than natural causes in amounts, concentrations or combinations that affect the propagation of fish or that are toxic to humans, livestock or other animals, fish or other aquatic organisms, wildlife using aquatic environments for habitation or aquatic organisms for food, or that will or can reasonably be expected to bioaccumulate in tissues of fish, shellfish and other aquatic organisms to levels that will impair the health of aquatic organisms or wildlife or result in unacceptable tastes, odors or health risks to human consumers of aquatic organisms.

20.6.4.13 NMAC

F. An emerging contaminant shall be monitored if it may be present in effluent or receiving waters.

STATE OF NEW MEXICO NEW MEXICO
WATER QUALITY CONTROL COMMISSION

IN THE MATTER OF: PROPOSED AMENDMENTS TO STANDARDS FOR INTERSTATE AND INTRASTATE WATERS, SECTION 20.6.4 NMAC.	)))))	**Docket No. WQCC 20-51 (R)**

DIRECT REBUTTAL TESTIMONY OF ELDER KATHY WAN POVI SANCHEZ

Good day Madam Chair, members of the Commission, and Mr. Hearing Officer. My name is Elder Kathy Wan Povi Sanchez, and I am a life-long resident of the San Ildefonso Pueblo. I am a potter and a community organizer. I am the Sayain Project Coordinator and past Director of Tewa Women United, based in Española, New Mexico, which is a component organization of Communities for Clean Water. I am also a Commissioner on the New Mexico Mining Commission, and a Commissioner on the New Mexico Surface Mining Commission.

I have a Bachelor of Sciences degree in Education-Elementary, composite science: Chemistry and Biology, from the University of New Mexico in Albuquerque, New Mexico, awarded in 1978. I have a Master of Arts degree in Special Education from the University of New Mexico, Albuquerque New Mexico, awarded in 1984.

I am a fluent speaker of Tewa.

I come from a famous family of potters, being the fourth-generation who works with the traditional clay. I was mentored through a communal process to make pottery with family members of all ages. Many of San Ildefonso's ancestral homelands, which contain the pits where we used to gather clay, are on the property of Los Alamos National Laboratory (LANL) or in the neighboring Santa Fe National Forest. In collecting clays and other materials for my

CCW-GRIP EXHIBIT 2

pottery work, I have learned a deep appreciation for the land, the water, and the plants and wildlife on the Pajarito Plateau and the canyons that run through it.

As part of my work with Tewa Women United and Communities for Clean Water, I have participated in numerous technical meetings with representatives of LANL, the New Mexico Environment Department, EPA, and other members of Communities for Clean Water related to various LANL water permits, including two surface water quality permits – LANL's Wastewater Permit and LANL's Individual Stormwater Permit. Permit conditions for these permits are set based on the surface water quality standards that are the focus of this triennial review proceeding. I have participated in many public meetings on these permits and have given public comment during permit hearings.

My resume is **CCW-GRIP Exhibit 3**. It is accurate and up-to-date.

I am testifying today on behalf of Communities for Clean Water, in rebuttal of some of the proposals of Triad National Security LLC, one of the federal contractors that operates Los Alamos National Laboratory, and the United States Department of Energy, National Nuclear Security Administration.

Founded in 2006, Communities for Clean Water is a coalition of several diverse organizations that have a strong interest in protecting the precious water resources of Northern New Mexico, particularly from the threats posed by Los Alamos National Laboratory. Communities for Clean Water is made up of Amigos Bravos, Tewa Women United, Honor Our Pueblo Existence (HOPE), Concerned Citizens for Nuclear Safety, the New Mexico Acequia Association, and the Partnership for Earth Spirituality. Our mission is to ensure that community waters adversely affected by Los Alamos National Laboratory are kept safe for drinking, agriculture, sacred ceremonies, and a sustainable future.

As I mentioned, I am the past Director of Tewa Women United. Tewa Women United is an independent, women-centered and Native women run non-profit 501(c)(3) organization located within the Northern Pueblos of New Mexico. Tewa Women United is dedicated to a vision of making a healthy, safe and culturally enriched self, family and community a reality. Tewa Women United promotes and supports efforts and activities that nurture and care for the well-being of our Mother Earth, including work to keep the land, air, and water free from all chemical and radioactive contamination.

I have read the direct testimony of Mr. John Toll in this proceeding, who presented testimony on behalf of Triad National Security, LLC, and the U.S. Department of Energy, National Nuclear Security Administration. It is their Exhibit 7. As I understand his testimony, Triad and DOE are proposing to amend the State of New Mexico surface water regulations to limit the water analysis that Los Alamos National Laboratory is required to do. I understand that under this proposal, the State Environment Department could require LANL to conduct analysis *only* using analytical methods that have been approved by the Environmental Protection Agency under the federal regulations at 40 C.F.R. part 136. I understand that EPA has not approved an analytical method for detecting per- and poly-fluoroalkyl substances (PFAS) under these regulations. I also understand that EPA has not approved an analytical method for detecting polychlorinated biphenyls (PCBs) under these regulations at a low enough level to determine compliance with State surface water quality standards. I understand, therefore, that if these proposals are adopted, LANL would not be required to monitor for PFAS and that LANL would not be required to monitor for PCBs at levels low enough to determine compliance with State water quality standards. Finally, I also understand that these chemicals, which Triad and DOE want to ignore, are harmful to human life and to fish and wildlife.

As a spokeswoman for Communities for Clean Water, and for Tewa Women United, I find these proposals to be very, very disturbing. As Native people and as rural people, our rivers and streams are very important to us. Water is life. We – including the members of our organizations – rely on our waters for drinking, for irrigation, for livestock watering, for recreation, and for ceremonial purposes. Plants and fish and wild animals also need water for their sustenance, and they are part of our history and our culture. We want the water to be clean, and free of harmful chemical pollution.

These chemical pollutants discharged into our waters are harmful to the health and well-being of the people who live near LANL and rely on local rivers and streams. They are harmful to the plants and animals that also rely on that water. They are particularly harmful to the most vulnerable among us: to pregnant women, to children, to the sick, and to the elderly. And these chemical pollutants are particularly harmful to the many members of our communities who have spent, or who will spend, their entire lives here, as the effects of these pollutants are cumulative over time.

We have a right to know what chemical pollutants, and at what levels, LANL is discharging into canyon streams that flow along and near Pueblo lands into the Rio Grande. Our members and supporters are very interested in this sort of information. We need to know what pollutants are being discharged into our waters, at what level, during what times, and in what locations. We need this information so that we can avoid using waters that may be polluted, or so that we can take mitigating measures. For example, my family and I no longer eat fish taken from certain streams around LANL because of potential contamination with PCBs.

Many of our members and supporters use the LANL Reading Room, and the Intellus database for information on pollutants coming from LANL. The LANL Reading Room postings

go to more than 8,000 email addresses. Some 97 individuals have created accounts for the LANL Intellus database, onto which water quality data is posted.

It is important for the Commission to consider that most of the people who live near LANL are people of the land: Native Americans and Spanish Americans. The following statistics were taken directly from a DOE document, the *Final Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations*, dated August 2020. According to this document (Chapter 3), the total population living within the area potentially affected by LANL operations is 418,432 people. Of this population, 232,023 (56%) are Spanish American or Hispanic; 31,370 (8%) are Native American; 5,079 (1%) are Asian Americans; 5,019 (1%) are African Americans; 597 (0.1%) are Native Hawaiian or Pacific Islander; and 8,843 (2%) are of mixed ethnicity. The total minority population is 282,931 (68%). Further, 68,184 (16 percent) of the population are considered low-income.

And we believe that this DOE report significantly undercounted the number of Native people that live in the area.

The DOE document also noted that the Pueblos of San Ildefonso, Cochiti, Jemez, Sandia, Santa Clara, Ohkay Owingeh, San Felipe, Santo Domingo, Nambé, Picuris, Pojoaque, Taos, Tesuque, Zia, and part of the Jicarilla Apache Indian Reservation are within the area potentially affected by LANL operations.

A copy of the *Final Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Lo Alamos National Laboratory for Plutonium Operations* (DOE/EIS-0380-SA-06} (Aug. 2020) is **CCW-GRIP Exhibit 4**.

For these reasons, we strongly oppose the proposal of Triad and DOE to limit the analysis that the State can require of our waters. Respectfully, we urge this Commission to reject these proposals.

Thank you.

_____
Elder Kathy Wan Povi Sanchez
Communities for Clean Water

38 OTohNahPo
Santa Fe NM 87506
(505)-363-7100

Kathleen M. Sanchez

Employment

2011-2020 TEWA WOMEN UNITED (TWU), Program manager of the Environmental Health and Justice Program. Coordinator of Gathering for Mother Earth

2011-present TEWA WOMEN UNITED, Program coordinator of Circle of Grandmothers: Sayain language program

1993-2011 TEWA WOMEN UNITED, Northern Pueblos, New Mexico, Director of an Indigenous non-profit organization, working on community organizing, utilizing our collective women's voice for political, social and economic change for equity in Indian country, locally, nationally and internationally.

2011-present Coordinator ,Healing with Clay, Native Women Speaking HIV/AIDS retreats,

2010-2013 Pottery instructor ,Common Ground on the Hill, Maryland

2009-2011 Pottery instructor, Espanola Valley schools

1999-2006 V.O.I.C.E.S., TWU sexual assault victim advocate

2002 Instructor, Building Healthy Relationships Across Cultural Boundaries course, . EcoVersity; Instructor, Santa Fe, NM , self-actualization and capacity building

1998-2004 Crisis Center of Northern New Mexico, Espanola, NM, Community Coordinator, First Responder Coordinator, outreach community educator .

1997-03 American Indian/Alaska Native Community Suicide Prevention Center & Network, Northern Pueblos area, NM consultant

1997-03 Economic Literacy Collaborative, Women of Color Resource Center, Oakland, . Ca.,NM, co-founding member

1997-98 Lifeways and Community, San Ildefonso Pueblo, NM, co-founding coordinator and instructor; using our cultural perspectives, skills and logic to do the eco-systemic sustainability for community wellness of mind, heart and spirit;

1986-89 Elementary Teacher, Special Education program, resource room, San Juan Day School

1978-86 Elementary Teacher, San Ildefonso Day School, and acting principal

EDUCATION:

1984 University of New Mexico, Albuquerque, New Mexico
M.A. Special Education

1978 University of New Mexico, Albuquerque, New Mexico
B.S. Education-Elementary, composite science:
Biology & Chemistry

CCW-GRIP EXHIBIT 3

APPOINTMENTS, AWARDS, GRANTS, SPECIAL RECOGNITIONS:

2021 Re-appointment to the NM Surface Mining Commission
2021 Re-appointment to the NM Mining Commission
2019 Appointment to the NM Coal Surface Mining Commission
2019 Appointment to the NM Mining Commission
Spirit Aligned 2019 Leadership Program, Akwesasne, NY Apr. 2019, Three year Fellowship
National Council of Elders, Member, 2011to present
Resident NEA artist, 2012 Common Ground on the Hill, West minister, Maryland

Indigenous representative to the UN Commission on Sustainable Development, NY 2006

Indigenous Representative to the UN Non-Proliferation Treaty Prepcom. Geneva,2003

GUEST LECTURER:
1990-present Conducted workshops, trainings and lectures based on Native perspectives in education, environmental racism, spirituality, cross-cultural communications, community organizing, capacity building and Native American women's gender roles in the decision & policy making process to stop the violence against Native women and Mother Earth. Developed Trauma Rocks healing workshops and Two World Harmony Butterfly model for holistic management of holding and contrasting contradictory ways of being.

ORGANIZATIONS AND AFFILIATIONS: PAST AND PRESENT
San Ildefonso Language Program: Board member, Tewa program
Communities for Clean Water,NM; Tewa Women United Representative
Organizational Planning Committee for Women Ban the Bomb, NYC 2017
National Council of Elders, member 2011 to present
Environmental Support Center, past Board member
Coalition to Stop Violence Against Native Women, past board member
National sexual violence resource center, past organizational member

Beloved Communities Initiative, steering committee member
American Friends Service Committee, SW regional committee member
Peace Making and Conflict Resolution, Steering Committee
Ghost Ranch Governance Board, Past Board member
Institute for Intercultural Community Leadership, SFCC, Facilitators Guild
New Mexico Women's Foundation, Founding Mothers Board member
Potters for Peace, past member,
U.S. Women Connect, former Co-Chair, Founding Mothers.
Nationwide Grassroots Alliance to End Poverty, steering member
Women's Economic Literacy Collaborative, Women of Color Resource Center, founding member

Summary of cultural qualifications

I am a fourth generation fluent Tewa speaker from San Ildefonso Tewa Pueblo. I come from the Maria and Julian Martinez pottery making lineage and have continuously lived in San Ildefonso Pueblo. I am dedicated to advancing the wellness of sovereign nation peoples and land based people with cultural integrity and water relational-tivity.

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References:

References available upon request

DOE/EIS-0380-SA-06

August 2020

Final Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations

National Nuclear Security Administration

CCW-GRIP EXHIBIT 4

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Executive Summary

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States Department of Energy (DOE), is responsible for meeting the national security requirements to maintain and enhance the safety, reliability, and performance of the United States nuclear weapons stockpile. NNSA has both programmatic and site-specific environmental impact statements covering pit production activities designed to provide NNSA the flexibility to adapt decisions as needed in response to national security requirements. In 2008, the *Complex Transformation Supplemental Programmatic Environmental Impact Statement* (Complex Transformation SPEIS) evaluated, among other things, alternatives for producing 10–200 pits per year at different site alternatives, including the Savannah River Site (SRS) in South Carolina and at Los Alamos National Laboratory (LANL) in New Mexico. The site-specific *Final Site-Wide Environmental Impact Statement for the Continued Operations of Los Alamos National Laboratory* (DOE/EIS-0380) (2008 LANL SWEIS) evaluated producing 80 pits per year at LANL.

The United States has recognized the need to eventually produce 80 pits per year. Federal law requires the Secretary of Energy to produce not less than 80 war reserve plutonium pits during 2030 (50 U.S. Code (USC) 2538a). On January 27, 2017, the President directed the Department of Defense to conduct an updated *Nuclear Posture Review* (NPR) to ensure a safe, secure, and effective nuclear deterrent that protects the homeland, assures allies, and above all, deters adversaries. The 2018 NPR echoed the need for pit production. The 2018 NPR also confirmed that the United States will pursue initiatives to ensure the necessary capability, capacity, and responsiveness of the nuclear weapons infrastructure and the needed skill of the workforce, including providing the enduring capability and capacity to produce plutonium pits at a rate of no fewer than 80 pits per year. In 2018, Congress enacted as formal policy of the United States that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet NPR and national policy (Public Law 115-232, Section 3120).

NNSA now must implement a strategy to provide the enduring capability and capacity to produce plutonium pits at a rate of not less than 80 pits per year during 2030. At a programmatic level, NNSA could adopt a Modified Distributed Centers of Excellence Alternative for plutonium operations from the Complex Transformation SPEIS. This would enable the production of a minimum of 50 pits per year at a repurposed Mixed-Oxide Fuel Fabrication Facility at SRS, and a production rate of a minimum of 30 pits per year at LANL, with additional surge capacity at each site, if needed. If this approach is adopted, it would meet the requirements of producing pits at a rate of not less than 80 pits per year during 2030 for the nuclear weapons stockpile. In early 2020, NNSA published a Supplement Analysis (SA) to the Complex Transformation SPEIS and determined that its proposed action at a programmatic level does not constitute a substantial change from actions analyzed previously and there were no significant new circumstances or information relevant to environmental concerns. However, in order to implement the proposed action as it relates to LANL, NNSA decided to prepare a site-specific SA to the 2008 LANL SWEIS (DOE/EIS-0380).

As a result, NNSA has prepared this SA to re-evaluate adopting elements of the Expanded Operations Alternative from the 2008 LANL SWEIS. NNSA's decision resulting from this SA would enable producing a minimum of 30 pits per year at LANL with additional surge capacity, if needed, to meet the programmatic requirements of producing pits at a rate of no fewer than 80 pits per year during 2030 for the nuclear weapons stockpile. In this SA, NNSA evaluates the potential environmental impacts of producing up to 80 pits per year at LANL. This approach provides a conservative analysis and affords NNSA the flexibility of adapting to shifting requirements. This Final SA considers all comments received during the public comment period and documents NNSA's determination that further National Environmental Policy Act documentation at a site-specific level for LANL is not required.

Statement Concerning CEQ's NEPA Implementing Procedures

On July 16, 2020, the Council on Environmental Quality (CEQ) issued its Final Rule, *Update to the Regulations Implementing the Procedural Provisions of the National Environmental Policy Act*. 85 Federal Register (FR) 43304 (2020 regulations). The Final Rule provides updates to the current CEQ implementing procedures at 10 CFR 1500, *et seq*. (1978 regulations). The effective date of the 2020 regulations is September 14, 2020, and the 2020 regulations apply to all agency National Environmental Policy Act (NEPA) processes commenced on or after the effective date. For NEPA reviews in process that agencies begin before the effective date, agencies may choose whether to apply the 2020 regulations or proceed under the 1978 regulations and their existing agency NEPA procedures. 85 FR 43340. An agency should clearly indicate to interested and affected parties which regulations and procedures it is applying. *Id*. For this Final SA, DOE/NNSA has followed the 1978 regulations and DOE's implementing procedures at 10 CFR 1021.

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Acronyms and Abbreviations

AoA	Analysis of Alternatives
AC/MC	Analytical chemistry and materials characterization
ASCE	American Society of Civil Engineers
BMP	Best Management Practice
CFR	Code of Federal Regulations
CGP	Construction General Permit
CMR	Chemistry and Metallurgy Research
CMRR	Chemistry and Metallurgy Research Replacement
CMRR-NF	Chemistry and Metallurgy Research Replacement Nuclear Facility
COVID-19	Coronavirus Disease 2019
DCE	Distribute Centers of Excellence
DNFSB	Defense Nuclear Facility Safety Board
DOE	Department of Energy
DSA	Documented safety analysis
EA	Environmental Assessment
EIS	Environmental Impact Statement
EMNRD	New Mexico Energy, Minerals and Natural Resources Department
EPA	Environmental Protection Agency
FTE	Full-time equivalent
HC	Hazard Category
IDA	Institute for Defense Analyses
IFGMP	Interim Facility Ground Water Monitoring Program
INL	Idaho National Laboratory
IRT	Integrated Review Tool
KCNSC	Kansas City National Security Campus
LANL	Los Alamos National Laboratory
LCF	Latent cancer fatality
LLNL	Lawrence Livermore National Laboratory
LLW	Low-level radioactive waste
MAR	Material-at-risk
MEI	Maximally exposed individual
MFFF	Mixed-Oxide Fuel Fabrication Facility

MLLW	Mixed low-level radioactive waste
NEPA	National Environmental Policy Act of 1969, as amended
NM	New Mexico
NMED	New Mexico Environment Department
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NPR	Nuclear Posture Review
NWSM	Nuclear Weapons Stockpile Memorandum
NWSP	Nuclear Weapons Stockpile Plan
Pantex	Pantex Plant
PEIS	Programmatic Environmental Impact Statement
PF	Plutonium Facility
PGA	Peak ground acceleration
PIDAS	Perimeter Intrusion, Detection, and Assessment System
PSHA	Probabilistic Seismic Hazards Assessment
RCRA	Resource Conservation and Recovery Act
RLWTF	Radioactive Liquid Waste Treatment Facility
ROI	Region of influence
RLUOB	Radiological Laboratory/Utility/Office Building
ROD	Record of Decision
SA	Supplement analysis
SEIS	Supplemental Environmental Impact Statement
SNM	Special nuclear material
SPD	Surplus Plutonium Disposition
SPEIS	Supplemental Programmatic Environmental Impact Statement
SRS	Savannah River Site
SSM PEIS	Stockpile Stewardship and Management Programmatic Environmental Impact Statement
SWEIS	Site-Wide Environmental Impact Statement
SWMU	Solid Waste Management Unit
TA	Technical Area
TCP	Traditional Cultural Property
TRU	Transuranic

U.S.	United States
USGS	U.S. Geological Survey
VTR	Versatile Test Reactor
WIPP	Waste Isolation Pilot Plant
Y-12	Y-12 National Security Complex

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1.0 INTRODUCTION

The National Nuclear Security Administration (NNSA), a semi-autonomous agency within the United States (U.S.) Department of Energy (DOE), is responsible for meeting the national security requirements established by Congress and the President. NNSA has a statutory mission to maintain and enhance the safety, reliability, and performance of the U.S. nuclear weapons stockpile including the ability to design, produce, and test, in order to meet national security requirements (50 USC 2401(b)). Plutonium pits are critical components of every nuclear weapon; nearly all current stockpile pits were produced from 1978 to 1989 (DOD 2018a p. 62). Today, the United States' capability to produce plutonium pits is limited.

As explained in the *Supplement Analysis of the Complex Transformation Supplemental Programmatic Environmental Impact Statement* (2019 Complex Transformation SPEIS SA) (DOE 2019a) and to meet federal law and national security requirements, NNSA is pursuing the two-prong (two-site) approach. This approach requires producing a minimum of 50 pits per year at Savannah River Site (SRS) in South Carolina and a minimum of 30 pits per year at Los Alamos National Laboratory (LANL) in New Mexico (NM), with additional surge capacity at each site, if needed. The two-site approach would meet the requirements of producing pits at a rate of not less than 80 pits per year during 2030 for the nuclear weapons stockpile. Furthermore, this approach would provide an effective, responsive, and resilient nuclear weapons infrastructure with the flexibility to adapt to shifting requirements.

NNSA prepared this *Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory for Plutonium Operations* (referred to hereafter as this SA) to evaluate the potential environmental impacts of producing a minimum of 30 pits per year at LANL and implementing surge efforts to exceed 30 pits per year to meet *Nuclear Posture Review* (NPR) and national policy. Under federal law, the Secretary of Energy is required to produce not less than 80 pits per year during 2030 (50 USC 2538a). It is the policy of the United States, as established by Congress and the President, that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet NPR and national policy (Public Law 115-232, Section 3120).

NNSA has multiple existing environmental impact statements (EISs) that are further defined in Section 1.4 and 1.5, which evaluate potential impacts of pit production at LANL with production levels between 10 and 200 pits per year. NNSA has undertaken this supplement analysis (SA) to evaluate whether those prior analyses remain adequate or whether NNSA would require further National Environmental Policy Act (NEPA) analysis prior to adopting the decision to produce a minimum of 30 pits per year for the national production mission and implement surge efforts to exceed 30 pits per year to meet NPR and national policy at LANL. In addition to this SA to the 2008 LANL Site-Wide Environmental Impact Statement (2008 LANL SWEIS) and the SA to the Complex Transformation Supplemental Programmatic Environmental Impact Statement (Complex Transformation SPEIS), NNSA is also preparing a separate site-specific analysis of implementing production activities at SRS.

1.1 PURPOSE AND NEED

The purpose and need for the continued operation of LANL is to provide support for NNSA's core missions as directed by Congress and the President (DOE 2008a, ch. 1 p. 11). Congress and the President have directed that during 2026 LANL will produce a minimum of 30 war reserve pits per year for the national pit production mission and implement surge efforts to exceed 30 pits per year to meet NPR and national policy (50 USC 2538a; Public Law 115-232).

As a result, to meet this direction, NNSA must consider implementing previously analyzed but unimplemented elements of the Expanded Operations Alternative from the 2008 LANL SWEIS as needed to produce a minimum of 30 pits per year for the national pit production mission and to implement surge efforts to exceed 30 pits per year to meet NPR and national policy.

The analysis in this SA will enable NNSA to decide whether a supplemental EIS, a new EIS, or no further NEPA documentation would be required prior to making site-specific decisions regarding pit production at LANL.

1.2 SCOPE

The scope of this SA is to identify (1) if there have been substantial changes related to pit production activities at LANL compared to those analyzed in the 2008 LANL SWEIS and (2) if there have been significant new circumstances or information relevant to environmental concerns bearing on the 2008 LANL SWEIS proposed action or its impacts (10 Code of Federal Regulations [CFR] 1021.314). While NNSA has taken efforts to identify pit production requirements at LANL, it is possible in the future that project needs or requirements could change or that additional elements of specific projects could be identified. If this happens, NNSA would evaluate those new project elements in accordance with NEPA as appropriate.

This SA is organized as follows:

- Section 1.0 contains the introduction;
- Section 2.0 describes the proposed action;
- Section 3.0 discusses the process/methodology utilized and contains the comparative environmental impact analyses;
- Section 4.0 presents potential cumulative impacts;
- Section 5.0 includes the conclusion and determination; and
- Section 6.0 identifies references used.

1.3 PROPOSED ACTION

NNSA's proposed action is to implement elements of the Expanded Operations Alternative as needed to produce a minimum of 30 war reserve pits per year during 2026 for the national pit production mission and to implement surge efforts to produce up to 80 pits per year to meet NPR and national policy. For purposes of estimating impacts in a conservative manner, potential surge efforts were defined and calculated at 80 pits per year. This also allows direct comparison

with analyses from the 2008 LANL SWEIS and the Complex Transformation SPEIS. Section 2.0 provides more detail about those activities that would be required to implement the proposal.

1.4 RELEVANT NEPA ANALYSES AND OTHER DOCUMENTS

1.4.1 Background on Programmatic and Site-Specific NEPA for LANL Pit Production

For over two decades, NNSA has fulfilled its obligations under NEPA with respect to operations involving Category I and Category II levels of special nuclear materials[1] (SNM) through a tiered NEPA approach. With a tiered approach, NNSA maintains a programmatic environmental impact statement (EIS) for the functional areas of plutonium, uranium, and weapons assembly/disassembly/high explosives that identifies and analyzes impacts at a national level to ensure an evaluation of, among other things, cumulative impacts and connected actions. Through site-specific NEPA analyses that tier off of the programmatic EIS, NNSA evaluates impacts at various sites throughout the country in a more detailed manner. DOE and NNSA have periodically re-evaluated, validated, and updated the programmatic EIS and site-specific NEPA analyses related to pit production. The first programmatic EIS in the post-Cold War era was the 1996 Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (SSM PEIS). The most current programmatic EIS for plutonium operations is the Complex Transformation SPEIS (DOE 2008b).

At a programmatic level, with respect to plutonium operations, the Complex Transformation SPEIS analyzed impacts associated with pit production at levels of 125 to 200 pits per year. In June 2019, NNSA announced its re-evaluation of programmatic and site-specific NEPA analyses and its strategy to fulfill national requirements for pit production (84 FR 26849). The original Distributed Centers of Excellence Alternative, in the Complex Transformation SPEIS, considers one large enduring consolidated pit production facility within the Complex[2], but current national security policy requires a more resilient enterprise. Therefore, through the 2019 Complex Transformation SPEIS SA, NNSA analyzed the impacts of a modified Distributed Centers of Excellence Alternative that includes two smaller capacity pit production facilities rather than a single facility. NNSA also included an analysis of actions across the Complex associated with transportation, waste management, and ancillary support (e.g., staging, testing, and utilities). Based on the analysis in the 2019 Complex Transformation SPEIS SA (DOE 2019a), NNSA determined that the proposed action of two smaller capacity production facilities did not constitute a substantial change from actions analyzed previously and that there were no significant new circumstances or information relevant to environmental concern. As a result,

[1] Special nuclear material—As defined in Section 11 of the Atomic Energy Act: "(1) plutonium, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the U.S. Nuclear Regulatory Commission determines to be special nuclear material, or (2) any material artificially enriched by any of the foregoing."
[2] Refers to the NNSA Nuclear Complex that supports plutonium pit production: SRS, Pantex, Kansas City National Security Campus, LANL, Nevada National Security Site, Y-12 National Security Complex, Sandia National Laboratories, and Lawrence Livermore National Laboratory.

NNSA determined no further NEPA documentation was required at a programmatic level and that NNSA may amend the existing Complex Transformation SPEIS Record of Decision (ROD). Prior to implementing specific actions, the 2019 Complex Transformation SPEIS SA states that NNSA will prepare site-specific documents. This SA to the 2008 LANL SWEIS is that site-specific documentation for LANL.

The 1999 *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico* (1999 LANL SWEIS) tiered from the SSM PEIS and evaluates an Expanded Operations Alternative with pit production levels of 80 pits per year at LANL. The No Action Alternative includes an evaluation of 14 pits per year. NNSA announced that it would not implement more than the 20 pits per year production level at LANL until completion of a future NPR.

The 2008 LANL SWEIS tiers from the 2008 Complex Transformation SPEIS and analyzes three alternatives: a Reduced Operations Alternative, a No Action Alternative (20 pits per year), and an Expanded Operations Alternative (80 pits per year). Under the Expanded Operations Alternative, NNSA analyzed existing space at LANL in the Plutonium Facility (PF) and other infrastructure to support production of up to 80 pits per year (DOE 2008a). Federal law and national policy now require that NNSA produce no fewer than 30 pits per year at LANL during 2026 and implement surge efforts to exceed 30 pits per year to meet NPR and national policy (Public Law 115-232, Section 3120); this is not fundamentally different from the Expanded Operations Alternative in the 2008 LANL SWEIS. However, NNSA previously identified a specific support facility (the Chemistry and Metallurgy Research Replacement Nuclear Facility or CMRR-NF)[3] at LANL as necessary to support pit production. The CMRR-NF was never envisioned to house pit production, but it was thought necessary to support analytical chemistry and materials characterization (AC/MC) capabilities for pit production. However, in the ensuing years, alternatives for AC/MC capabilities were identified which have separate and sufficient NEPA analysis, and the CMRR-NF was not required to support LANL pit production capabilities.

This SA, to the 2008 LANL SWEIS, analyzes reasonably foreseeable infrastructure and support needs required to implement the pit production mission. The analysis also includes an evaluation of the impacts previously analyzed in the 2008 LANL SWEIS Expanded Operations Alternative and other relevant NEPA documents for the pit production mission. The other relevant NEPA documents are discussed below. This SA considers whether new circumstances and relevant information constitute a significant change that would warrant additional NEPA analysis. It reanalyzes the impacts associated with pit production at LANL through an integrated and

[3] NNSA prepared the Supplemental Environmental Impact Statement for the Nuclear Facility Portion of the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR SEIS) (DOE 2011). The 2011 CMRR SEIS evaluated critical analytical chemistry and materials characterization capabilities and addressed changes to the proposed facility regarding seismic concerns identified in the 2008 LANL SWEIS and modification of the CMRR-NF design.

comprehensive review of existing NEPA analyses and other relevant documents. These documents are incorporated into this SA and are grouped below by programmatic documents, LANL-specific plutonium-related documents, and other relevant documents. For each document, a description is provided of how it is relevant to this SA and how it relates to pit production at LANL.

1.4.2 Programmatic NEPA Documents and Related Documents

1.4.2.1 *Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (SSM PEIS) (DOE 1996)*

The SSM PEIS evaluates alternatives for maintaining the safety and reliability of the United States nuclear weapons stockpile and preserving competencies in nuclear weapons after the post-Cold War era. The SSM PEIS evaluates how the United States would meet these requirements without the use of underground nuclear testing and without a large-scale pit production facility. The SSM PEIS evaluates pit production of 80 pits per year at LANL and SRS, which was significantly lower than historic production levels. Tiering from the SSM PEIS, the site-specific 1999 LANL SWEIS also analyzed pit production levels of 80 pits per year at LANL.

1.4.2.2 *Final Complex Transformation Supplemental Programmatic Environmental Impact Statement (Complex Transformation SPEIS) (DOE 2008b)*

In 2008, the Complex Transformation SPEIS supplemented the SSM PEIS and analyzed the environmental impacts of alternatives for transforming the nuclear weapons complex (Complex) into a smaller, more efficient enterprise that could respond to changing national security challenges and ensure the long-term safety, security, and reliability of the nuclear weapons stockpile. The Complex Transformation SPEIS considers how to configure facilities that hold Category I and Category II quantities of SNM across the Complex including the three functional areas of plutonium, uranium operations, and weapons assembly/disassembly/high explosives. These alternatives were categorized into the Distributed Centers of Excellence Alternative, the Consolidated Centers of Excellence Alternative, and the Capability-Based Alternative. The Complex Transformation SPEIS also analyzed the No Action Alternative.

Under the four alternatives, the Complex Transformation SPEIS evaluated: (1) constructing and operating a new Greenfield pit production facility to produce 125 pits per year at SRS, LANL, Y-12 National Security Complex (Y-12), Pantex (Pantex Plant), and/or Nevada National Security Site (NNSS); (2) constructing and operating pit production facilities that would use the Mixed-Oxide Fuel Fabrication Facility (MFFF) and Pit Disassembly and Conversion Facility infrastructure at SRS to produce 200 pits per year; and (3) upgrading two existing facilities at LANL (Los Alamos Upgrade Alternative), one to support production of 200 pits per year and one to support production of 50–80 pits per year (DOE 2008b, ch. 3 p. 20). In the 2008 Programmatic ROD (73 FR 77644), NNSA decided to implement its preferred programmatic

alternative, which was a combination of the Distributed Centers of Excellence Alternative and the Capability-Based Alternative and did not make any new decisions related to pit production.

1.4.2.3 *Final Supplement Analysis of the Complex Transformation Supplemental Programmatic Environmental Impact Statement (2019 Complex Transformation SPEIS SA) (DOE 2019a)*

The 2019 Complex Transformation SPEIS SA analyzed NNSA's proposed action to implement, with respect to plutonium operations, elements of the Modified Distributed Centers of Excellence Alternative. The elements implemented would enable NNSA to produce a minimum of 30 pits per year at LANL and a minimum of 50 pits per year at a repurposed MFFF at SRS, with additional surge capacity at each site, if needed. This would enable NNSA to meet the requirements of producing pits at a rate of no fewer than 80 pits per year during 2030 for the nuclear weapons stockpile. In addition, the 2019 Complex Transformation SPEIS SA analyzed pit production support activities across the Complex associated with transportation, waste management, and ancillary support (e.g., staging, testing, and utilities). Based on the analysis in the 2019 Complex Transformation SPEIS SA, NNSA determined that no further NEPA documentation was required at a programmatic level, and NNSA may amend the existing Complex Transformation SPEIS ROD. However, to date, NNSA has not issued an Amended ROD for the Complex Transformation SPEIS.

1.4.2.4 *Waste Isolation Pilot Plant (WIPP) Disposal Phase Final Supplemental Environmental Impact Statement (WIPP SEIS-II) (DOE 1997)*

Potential environmental impacts associated with disposing of transuranic (TRU) waste at the Waste Isolation Pilot Plant (WIPP) were analyzed in the 1997 WIPP SEIS. DOE's proposed action and subsequent ROD were to dispose at WIPP up to 175,600 cubic meters of TRU waste generated from defense activities (63 FR 3624).

1.4.2.5 *Supplement Analysis for the Waste Isolation Pilot Plant Site-Wide Operations (2016 WIPP SA) (DOE 2016a)*

Following two accidents in February 2014 and the subsequent closure of WIPP, the 2016 WIPP SA evaluated the potential environmental impacts and safety and operational measures needed to resume waste operations at WIPP. DOE evaluated changes in conditions of environmental resource areas, assessed for potential impacts, and considered new NEPA guidance. Following this 2016 WIPP SA, DOE resumed WIPP operations in January 2017. NNSA determined that the analysis for TRU waste disposal in the WIPP SEIS-II remained valid and no further NEPA analysis was required for TRU waste disposal at WIPP.

1.4.3 LANL Site-Specific NEPA Documents

1.4.3.1 *Final Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (1999 LANL SWEIS) (DOE 1999a)*

The 1999 LANL SWEIS analyzes all capabilities at LANL that support DOE missions including plutonium operations and pit production. It served as a basis for the development of the 2008 LANL SWEIS. The 1999 LANL SWEIS analyzes four alternatives, including a No Action Alternative, an Expanded Operations Alternative (analyzing a pit production rate of 80 pits per year), a Reduced Operations Alternative, and a "Greener" Alternative. DOE decided to conduct pit production at a nominal rate of 20 pits per year. The elements of the Expanded Operations Alternative of the 1999 LANL SWEIS adopted by NNSA became the No Action Alternative for the 2008 LANL SWEIS.

1.4.3.2 *The Site-Wide Environmental Impact Statement for Continued Operation of Los Alamos National Laboratory, Los Alamos, New Mexico (2008 LANL SWEIS) (DOE 2008a)*

The 2008 LANL SWEIS evaluates the potential environmental impacts from ongoing LANL operations and new activities and analyzes three specific alternatives: (1) a Reduced Operations Alternative, (2) a No Action Alternative, and (3) an Expanded Operations Alternative. The Expanded Operations Alternative analyzed the use of existing space in the Plutonium Facility to produce up to 80 pits per year. The 2008 LANL SWEIS also evaluates the impacts of constructing and operating a consolidated plutonium center (as well as a consolidated nuclear production center of excellence) at LANL, which entailed consolidation of SNM storage and production of 125 pits with a potential surge capacity of 200 pits annually. The impacts of constructing and operating a consolidated nuclear production center at LANL were included in the cumulative impacts section of the 2008 LANL SWEIS, Section 5.13. In the associated ROD, NNSA reserved a decision on pit production until completion of a future NPR.

1.4.3.3 *2018 Supplement Analysis of the 2008 Site-Wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory (2018 SWEIS SA) (DOE 2018a)*

The 2018 LANL SWEIS SA evaluates projects and impacts of activities conducted since publication of the 2008 LANL SWEIS and projects being proposed from 2018 through 2022. NNSA determined that ongoing operations, new and modified projects, and modifications in site operations at LANL do not constitute a substantial change in the actions previously analyzed in the 2008 LANL SWEIS. The 2018 LANL SWEIS SA was completed in April 2018, before the announcement of national policy on pit production.

1.4.3.4 *Final Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR EIS) (DOE 2003a)*

DOE prepared the 2003 CMRR EIS to evaluate alternatives for replacing the AC/MC capabilities provided in the Chemistry and Metallurgy Research (CMR) Building. The CMRR project was to provide the physical means for conducting mission-critical CMR capabilities, to consolidate like activities for operational efficiency, and to potentially provide extra space for future modifications. The ROD (69 FR 6967) announced the decision for construction and operation of a two-building replacement for the CMR Building to be located in Technical Area (TA)-55. These buildings were to consist of (1) a Radiological Laboratory/Utility/Office Building (RLUOB) and (2) a nuclear facility (CMRR-NF) housing Hazard Category (HC)-2 nuclear operations.[4] After publication of the CMRR SEIS ROD, NNSA first announced a delay in construction of the CMRR-NF (DOE 2012) and then cancelled funding. The 2003 CMRR EIS analyzes construction of new administrative and support buildings that would support pit production at LANL.

1.4.3.5 *Final Supplemental Environmental Impact Statement for the Nuclear Facility Portion of the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR SEIS) (DOE 2011)*

NNSA prepared the 2011 CMRR SEIS for the CMRR-NF in 2011 to address changes to the proposed facility regarding seismic concerns and modification of the CMRR-NF design (DOE 2011). NNSA evaluated the potential environmental impacts from revised alternatives for constructing and operating the CMRR-NF and from ancillary projects that had been proposed since publication of the CMRR EIS. On October 18, 2011, in an amended ROD (76 FR 64344), NNSA selected the Modified CMRR-NF Alternative for constructing and operating the CMRR-NF portion of the CMRR project. The 2011 CMRR SEIS provided an analysis of construction areas for support facilities related to pit production. The analysis of construction areas at and adjacent to TA-55 are used in this SA.

[4] 10 CFR 830 assigns hazard categories to nuclear and radiological facilities in accordance with the potential consequences in the event of a radiological accident. PF-4 is an HC-2 nuclear facility. Facilities with smaller inventories of radioactive material would be HC-3 or below HC-3. The nuclear facilities at LANL are either HC-2 or HC-3 (DOE 2008a, ch. 1 p. 11). DOE has determined threshold quantities for individual radionuclides that define the lower boundaries for the hazard categories: a DOE HC-3 nuclear facility is 38.6 grams of plutonium-239 and an HC-2 nuclear facility is 2,610 grams of plutonium-239 (DOE 2014a Attachment 2, Table 1).

1.4.3.6 *Supplement Analysis for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR SA) (DOE 2015a)*

Following a DOE decision to cancel the CMRR-NF (DOE 2015b), NNSA issued the 2015 CMRR SA that addressed modifications to NNSA's approach for assuring AC/MC capabilities at LANL. This entailed performing AC/MC work in RLUOB and making space available at Plutonium Facility Building 4 (PF-4). Under those modifications, RLUOB would continue to operate as a radiological facility but with an increased allowable quantity of actinides such as plutonium-239. NNSA determined that no additional NEPA documentation was needed to implement this modified approach.

1.4.4 Other Relevant Documents

1.4.4.1 *Atomic Energy Defense Act (50 USC 2538a)*

The Secretary of Energy is charged with producing no less than 80 war reserve plutonium pits during 2030 and submitting an annual certification to Congress and the Secretary of Defense that the programs and budget of the Secretary of Energy will enable the nuclear security enterprise to meet those requirements.

1.4.4.2 *National Defense Authorization Act for Fiscal Year 2020 (Public Law 116-92)*

In Section 3116 of Public Law 116-92, Congress expressed the sense that "(1) rebuilding a robust plutonium pit production infrastructure with a capacity of up to 80 pits per year is critical to maintaining the viability of the nuclear weapons stockpile; (2) that effort will require cooperation from experts across the nuclear security enterprise; and (3) any further delay to achieving a plutonium sustainment capability to support the planned stockpile life extension programs will result in an unacceptable capability gap to our deterrent posture." Public Law 116-92 also amended the Atomic Energy Defense Act to require production of not less than 80 pits per year during 2030.

1.4.4.3 *John S. McCain National Defense Authorization Act for Fiscal Year 2019 (2019 National Defense Authorization Act (Public Law 115-232)*

In Section 3120 of Public Law 115-232, Congress enacted as formal policy of the United States that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet 2018 NPR and national policy (Public Law 115-232).

1.4.4.4 *Final Report for the Plutonium Pit Production Analysis of Alternatives (Pit Production AoA) (DOE 2017a)*

The purpose of the pit production analysis of alternatives (AoA) was to identify and assess alternatives across DOE sites that could deliver the infrastructure to meet the sustained plutonium pit requirements of no less than 80 pits per year during 2030. To achieve the required

annual pit production rate, the AoA report considered the construction of new facilities, and the refurbishment to existing facilities. The AoA report identifies SRS and LANL as the two preferred locations to accomplish this enduring mission (DOE 2017a).

1.4.4.5 *Fiscal Year 2020 Stockpile Stewardship and Management Plan, a Report to Congress (DOE 2019b)*

The Stockpile Stewardship and Management Plan describes NNSA plans to ensure the safety, security, and effectiveness of the United States nuclear weapons stockpile mission to carry out national security responsibilities by maintaining a safe, secure, and effective nuclear deterrent; preventing, countering, and responding to the threats of nuclear proliferation and terrorism worldwide; and providing naval nuclear propulsion.

1.4.4.6 *2018 Nuclear Posture Review (2018 NPR) (DOD 2018a)*

In February 2018, the Office of the Secretary of Defense issued the 2018 NPR report. This report assessed previous nuclear policies, strategy, and corresponding capabilities needed to protect the Nation in the deteriorating threat environment that confronts the United States, its allies, and partners. The 2018 NPR provided guidance for the nuclear force posture and policy requirements needed now and in the future.

1.4.4.7 *2018 Joint Department of Defense/NNSA Statement on the Recapitalization of Plutonium Pit Production (DOD 2018b)*

A Joint Statement on pit production was issued on May 10, 2018, by the Under Secretary of Defense for Acquisition and Sustainment and the NNSA Administrator. This Joint Statement announced the two-site approach to produce a minimum of 50 pits per year at SRS and a minimum of 30 pits per year at LANL.

1.4.4.8 *2009 Defense Nuclear Facility Safety Board Letter Report (DNFSB 2009)*

The DNFSB issued a letter report on October 26, 2009, to NNSA expressing concerns about potential consequences of seismic events to the PF-4 facility. The 2009 recommendation (2009-2 *Los Alamos National Laboratory Plutonium Facility Seismic Safety*) identified the need to execute both immediate and long-term actions to reduce risks posed by a seismic event at PF-4.

1.4.4.9 *2017 DNFSB Letter (DNFSB 2017)*

DNFSB issued a letter on January 3, 2017, to NNSA acknowledging the ongoing upgrades to the PF-4 facility that address concerns of potential seismic consequences, and DNFSB closed its recommendations in 2009-2 Los Alamos National Laboratory Plutonium Facility Seismic Safety.

1.4.4.10 *2019 DNFSB Letter Report (DNFSB 2019)*

DNFSB issued a letter report on November 15, 2019, to NNSA expressing its concerns on (1) delayed completion of upgrades to the PF-4 to mitigate potential seismic consequences, and (2) continued reliance on the PF-4 facility for pit production. DNFSB provided a report to NNSA

(*Safety Basis for the Plutonium Facility at Los Alamos National Laboratory*, issued on August 16, 2019) that outlined the DNFSB recommendations for documented safety analysis for the PF-4 facility. NNSA is in the process of reviewing the DNFSB recommendations.

1.4.4.11 *1995 DOE and State of Idaho Settlement Agreement (ID/DOE 1995)*

In October of 1995, the state of Idaho, U.S. Navy, and DOE reached agreement settling a lawsuit filed by the state to prevent shipment of spent nuclear fuel to Idaho National Laboratory (INL) for storage (the 1995 Settlement Agreement; ID/DOE 1995). As part of the 1995 Settlement Agreement, DOE committed that it would remove TRU waste from INL by a target date of Dec. 31, 2015, and no later than Dec. 31, 2018. In 1995, there was an estimated 65,000 cubic meters of TRU waste located in Idaho. Idaho estimated that 7,800 shipments of TRU material would leave the state under the 1995 Idaho Settlement Agreement.

1.4.4.12 *2019 Supplemental Agreement to the 1995 DOE and State of Idaho Settlement Agreement (ID/DOE 2019)*

In 2019, the state of Idaho and DOE finalized a supplemental agreement to the 1995 Settlement Agreement, setting out conditions concerning conditional waiver of sections D.2.e and K.1 of the 1995 Settlement Agreement under which INL may receive limited research quantities of used commercial fuel (2019 Supplemental Agreement; ID/DOE 2019). Under the 2019 Supplemental Agreement, DOE also committed to allocate and make at least 55 percent of all TRU waste shipments received at WIPP for INL, until the remaining TRU waste from the 1995 Agreement was removed from Idaho. In 2014, there was a halt in WIPP operations, and after WIPP's reopening in 2017, it was operating at limited throughput capacity pending completion of improvements in the ventilation system. Therefore, by the December 31, 2018 deadline under the 1995 Settlement Agreement, DOE had only shipped 38,089 cubic meters of TRU waste from Idaho. This allocation to INL allowed DOE to meet its TRU waste shipment commitments at other sites. In addition to allocating 55 percent of all TRU waste shipments received at WIPP for INL, DOE committed to giving INL "priority" for other shipments. Under the 2019 Supplemental Agreement, "priority" means "that if a shipment allotted to a generator site other than INL is not made, such shipment allotment will be made available to INL, subject to consideration of national security mission and nonproliferation matters, other DOE legal and site cleanup commitments, WIPP operational concerns, and safety and security operations."

1.4.4.13 *2005 Consent Order and the 2016 Consent Order Update (NMED 2016)*

On March 1, 2005, the New Mexico Environment Department (NMED), the New Mexico Attorney General, DOE, and the University of California entered into the final Consent Order. The Consent Order was issued in accordance with the New Mexico Hazardous Waste Act and the New Mexico Solid Waste Act. The Consent Order specified investigations, cleanup, and corrective measures to be conducted at LANL. Appendix I of the 2008 SWEIS (DOE 2008a) evaluated the environmental consequences of Consent Order actions through fiscal year 2016. Implementation of the Consent Order was part of the No Action Alternative. In June 2016, the

NMED, DOE, and LANL entered into the 2016 Consent Order, which superseded the 2005 Consent Order. The purpose of the 2016 Consent Order is to (1) provide a framework for current and future actions to implement regulatory requirements; (2) establish an effective structure for accomplishing work on a priority basis; (3) drive toward cost-effective work resulting in tangible, measurable environmental cleanup; (4) minimize the duplication of investigative and analytical work and documentation, and ensure the quality of data management; (5) set a structure for the establishment of additional cleanup campaigns and milestones as new information becomes available and campaigns are completed; (6) facilitate cooperation, enhance information, and ensure participation of the parties; (7) provide for effective public participation; and (8) define and clarify its relationship to other regulatory requirements. The 2016 Consent Order does not change the investigations, cleanup, and corrective measures to be conducted at LANL; therefore the impacts of the 2016 Consent order are not substantially different than those impacts of the 2005 Consent Order that was analyzed in the 2008 LANL SWEIS (DOE 2008a).

1.5 Relationship of NEPA Documents to Pit Production at LANL

As the description of NEPA analyses and supporting documents indicate, there have been extensive NEPA analyses conducted for pit production at LANL. This extensive series of NEPA analyses and supporting documents, and the relationships between them, provides the basis in this SA. These documents are used to evaluate pit production and the potential impacts at LANL.

Pit production, at a level of 80 pits per year at LANL, was first analyzed in the SSM PEIS (DOE 1996). The SSM PEIS "high case" analysis for pits was 100 pits per year. The 80 pits per year production level at LANL was reanalyzed in the 1999 LANL SWEIS (DOE 1999a), and DOE selected a pit production rate of 20 pits per year. Part of the basis for the selected alternative relates to the legacy CMR building at TA-03 of LANL. In 2003, DOE issued the CMRR EIS that analyzed two replacement facilities that would house AC/MC operations and allow for decommissioning of the CMR facility (DOE 2003a). The 2008 LANL SWEIS tiers from the 1999 LANL SWEIS and the Complex Transformation SPEIS, as appropriate, and incorporates information from those documents by reference (DOE 2008a, ch. 1 p. 2). The 2008 LANL SWEIS also incorporates NEPA analyses conducted since the issuance of the 1999 LANL SWEIS that include the 2003 CMRR EIS (DOE 2008a, ch. 1 p. 28–30).

The CMRR-NF was analyzed in the 2011 CMRR SEIS (DOE 2011), and NNSA selected the Modified CMRR-NF Alternative. After the CMRR-NF portion of the CMRR project was cancelled in 2014, NNSA prepared the SA to the 2003 CMRR EIS (2015 CMRR SA) analyzing AC/MC operations within existing space at RLUOB and PF-4 (DOE 2015a, p. 2). The 2015 CMRR SA found that the potential impacts of conducting AC/MC operations in RLUOB and PF-4 was less than the impacts analyzed in the 2003 CMRR EIS. Pit production relies on AC/MC operations, but these operations do not specifically require the CMRR-NF (DOE 2015a, p. 49).

In 2018, NNSA issued the SA to the 2008 LANL SWEIS that evaluated current operations and changed environmental conditions since issuance of the 2008 LANL SWEIS (DOE 2018a). The 2018 LANL SA, to the 2008 LANL SWEIS, noted that DOE evaluated the production of 80 pits per year in the Expanded Operations Alternative in the 2008 LANL SWEIS and may issue a new ROD in the future for an increase in pit production. No specific decisions on pit production were analyzed in the 2018 LANL SA, but support facilities such as office buildings and parking garages were analyzed.

In summary, the 2008 LANL SWEIS and the 2011 CMRR SEIS, in addition to the programmatic NEPA analyses, provide the primary underlying NEPA analysis for pit production and related support activities at LANL. The 2008 LANL SWEIS tiers from previous documents and incorporates related NEPA analyses (i.e., 1999 LANL SWEIS and 2003 CMRR EIS) (DOE 2008a, ch. 1 p. 33–34). The 2008 LANL SWEIS, support documents, and subsequent analyses (i.e., 2011 CMRR SEIS and 2015 CMRR SA) are referenced in this SA to define when and where pit production for LANL has been previously analyzed and if those analyses remain valid.

1.6 PUBLIC PROCESS

On June 10, 2019, DOE issued a Notice of Intent (NOI) in the Federal Register providing information regarding DOE's overall NEPA strategy related to fulfilling national requirements for pit production. The NOI described that NNSA would be conducting a programmatic NEPA review and two site-specific analyses including one at LANL. This SA is the LANL site-specific review.

Although it is not required, NNSA made this SA available for public review and comment on the NNSA NEPA reading room (https://www.energy.gov/nnsa/nnsa-nepa-reading-room). NNSA issued a notice on March 10, 2020, to the GovDelivery mailing lists for persons who requested notification of activities related to LANL to provide notice of the availability of the draft version of this SA (Draft SA) for review.

During the comment period, NNSA accepted comments from all interested agencies (Federal, State, and local), Native American Tribes, public interest groups, businesses, and members of the public. Due to the SARS-CoV-2 pandemic in 2019 (COVID-19), the comment period was extended to May 9, 2020, for a total of a 60-day comment period.

NNSA received 148 total comment documents, and all comment documents were considered, including 14 comment documents that were received after the May 9, 2020 deadline. Seven comments were either blank or sent to the email box in error and thus considered irrelevant. The 141 comments relevant to this SA, as well as NNSA's corresponding responses to those comments, are presented in Appendix A of this SA. All comment documents received in response to the GovDelivery announcement for the Draft SA are included in the Administrative Record for this SA.

SA comments were organized into the following topic areas:

- Validity of the SA determination
- Purpose and need for NNSA's proposal
- Requests for an extension to the comment period
- New information or changed circumstances
- Questions about the technical aspects of the impact analyses
- General opposition to, or support for, the proposal
- Comments about nuclear weapon policies or new weapon designs
- Miscellaneous comments

NNSA considered all comments, including late comments, during the preparation of this Final SA and determination. In response to questions related to the programmatic need for pits and non-proliferation, NNSA has modified Section 1.0, Introduction; Section 1.1, Purpose and Need; and made other revisions throughout this SA. NNSA has made other modifications in response to public comments as appropriate. The Final SA and determination are available to the public on the NNSA NEPA Reading Room website (https://www.energy.gov/nnsa/nnsa-nepa-readingroom).

2.0 PROPOSED ACTION

NNSA's proposed action is to implement elements of the 2008 LANL SWEIS Expanded Operations Alternative as needed to produce a minimum of 30 war reserve pits per year during 2026 for the national pit production mission and to implement surge efforts to exceed 30 pits per year to meet NPR and national policy. This SA refers to these actions as pit production. Pit production includes resources needed for operations, such as supporting infrastructure (e.g., office buildings, parking, and training facilities), increased work force, waste management facilities, ancillary support (e.g., staging, testing, and utilities), and transportation.

Pit production has fundamentally remained the same since the end of the Cold War and its impacts are well understood. NNSA has analyzed and reanalyzed the impacts associated with pit production at LANL over many decades and has made such information available to the public.NNSA will meet federal law and national policy by implementing elements of the Expanded Operations Alternative. Through this SA, NNSA is evaluating these changes under NEPA to determine whether the changes are substantial and is further evaluating whether there are new circumstances or information relevant to environmental concerns bearing on the proposed action or its impacts that are significant within the meaning of NEPA. The analysis in this SA will enable NNSA to decide whether a supplemental EIS, a new EIS, or no further NEPA documentation is required prior to making site-specific decisions regarding pit production at LANL.

2.1 PIT PRODUCTION AT LANL

Pit production at LANL is concentrated at TA-55 (Figure 2-1), which houses the primary operations facility for pit production in PF-4, a Security Category 1 and an HC-2 nuclear facility (Figure 2-2) (DOE 2008a, ch. 2 p. 60). Pit production operations include shipping, receiving, staging, packaging, and moving nuclear materials and components; performing nondestructive analysis; purifying metal and managing related residues; foundry operations; machining; inspecting; assembling and post-assembly testing; waste management; and chemical/materials analyses. These operations are described in both the 1999 LANL SWEIS and the 2008 LANL SWEIS (DOE 1999a, ch. 2 p. 28–33; DOE 2008a, ch. 3 p. 56–59).

The NNSA pit production mission at LANL is operating below the level of 20 pits per year that was identified in previous NNSA decisions. Actions to support the production of 20 pits per year would include the hiring of additional staff (approximately 1,500); 24-hour operations; the construction of office space, personnel training, and parking facilities; waste management facilities; ancillary support (e.g., staging, testing, and utilities); transportation; and equipment removal and installation at PF-4. These supporting pit production actions were not analyzed in this SA because NNSA has already decided to operate at this level (64 FR 50797, 73 FR 55833), and those support actions were previously analyzed in the 2008 LANL SWEIS and other NEPA analyses (DOE 1999a, 2003a, 2008a, 2011, 2015a).

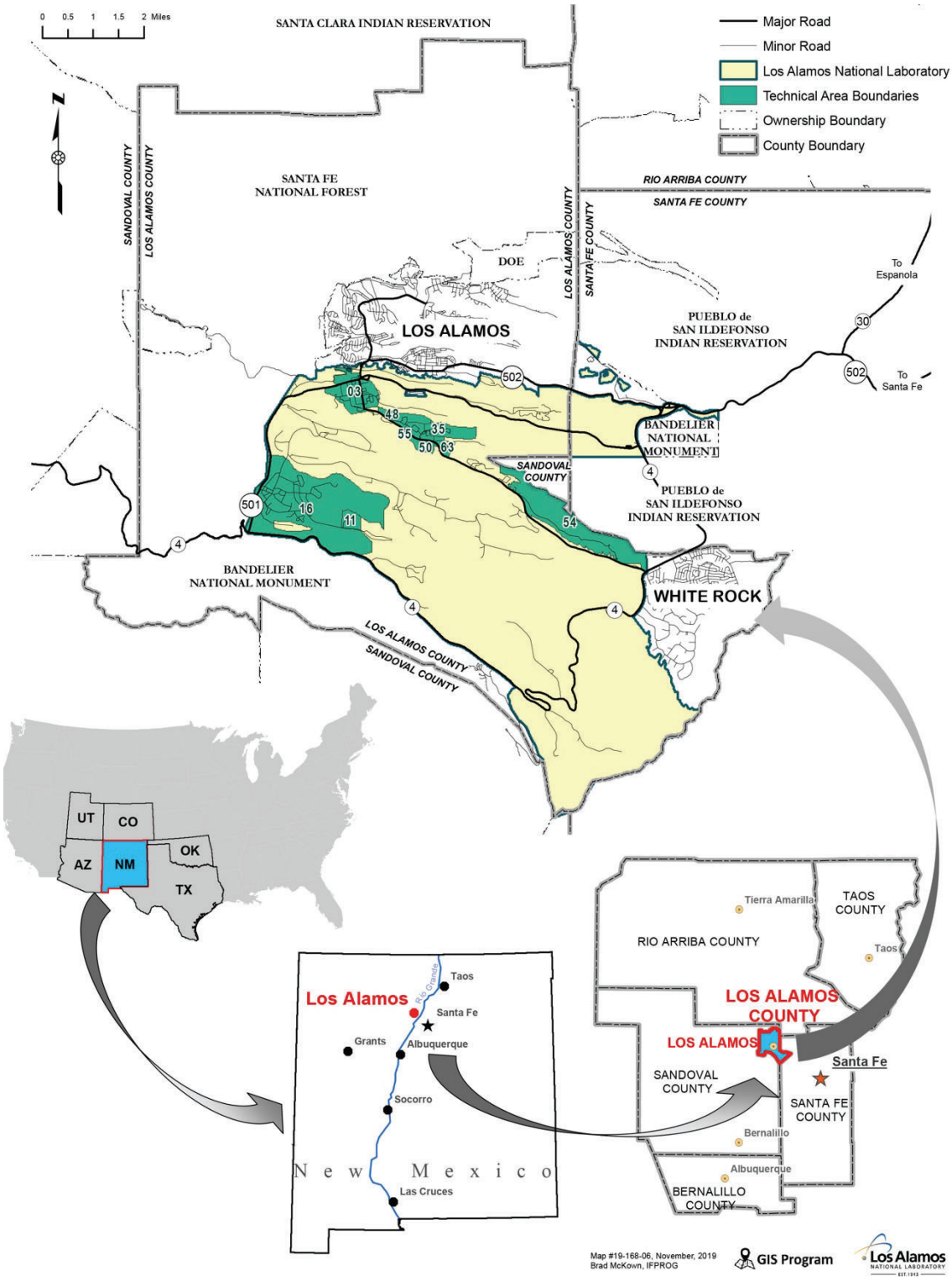

Figure 2-1. Map illustrating the location of Los Alamos National Laboratory and relevant technical areas

Figure 2-2. The Plutonium Facility Complex at TA-55 with PF-4 identified

2.2 ACTIONS FOR PROPOSED PIT PRODUCTION

For purposes of NEPA analyses, actions needed to implement the proposed pit production at LANL were categorized into two groups: (1) those actions to produce a minimum of 30 pits per year and (2) those actions to provide the ability to implement a surge capacity (up to 80 pits per year) to meet mission needs, if necessary. Actions for 30 pits per year and any surge capacity constitute pit production. It is assumed that actions for 30 pits per year are completed prior to implementing surge efforts. For pit production, NNSA would implement the following actions:

- Remove legacy equipment and install new equipment
- Hire and train approximately 400 additional staff
- Upgrade existing support facilities and construct new support facilities
- Repackage and dispose of MFFF fuel rods
- Implement the Replacement Office Buildings Project
- Implement elements of the Security-Driven Traffic Modifications Project
- Management and disposition of additional wastes generated
- Transport additional materials, parts, and waste

2.2.1 Remove Legacy Equipment and Install New Equipment

Equipment that requires removal and/or replacement would be decontaminated and reduced in size to fit into disposal containers. Wastes generated through removal of legacy equipment would include TRU waste, low-level radioactive waste (LLW), mixed-low-level radioactive

waste (MLLW), and chemical waste. Decontamination activities would occur at existing facilities, such as PF-4 at TA-55; the Waste Characterization, Reduction, and Repackaging Facility at TA-50; and the Decontamination and Volume Reduction System and Radioassay Nondestructive Testing Facility at TA-54.

NNSA would install and operate new equipment for pit production to replace aging equipment to meet mission needs in a more efficient manner. The new equipment would provide the ability to produce a minimum of 30 pits per year, with surge efforts to produce 80 pits per year if needed to meet NPR and national policy. This equipment would consist of gloveboxes, hoods, lathes, furnaces, instrumentation, and utility infrastructure. Temporary construction areas for warehouses, management trailers, and laydown areas to support equipment installation, decontamination, and removal would be located within the Perimeter Intrusion, Detection, and Assessment System (PIDAS) at TA-55.

2.2.2 Hire and Train Staff

In order to support a production rate of 30 pits per year, LANL would increase staff by approximately 330 people. Initially, LANL would use staff reassignments to support any surge efforts. LANL anticipates hiring an additional 70 staff for sustained production efforts as necessary. Staffing at this level would be sufficient. New staff performing pit production, protective force, and health and safety programs would be assigned to multiple shifts.

Peak annual construction employment would be approximately 200 individuals. Construction workers would be stationed within the Pajarito Corridor for equipment installation activities for approximately five years.

Before new support facilities would be constructed, LANL would provide office space for new staff by reconfiguring space in existing buildings, office trailers, and leased spaces. Prior to the construction of new training facilities, newly hired radiological workers with duties inside PF-4 would receive training at existing facilities or at leased facilities nearby.

2.2.3 Upgrade Existing Facilities and Construct New Support Facilities

NNSA would upgrade existing support facilities and construct new support facilities for pit production. These facilities would provide office space, parking, training space, administrative space, locker rooms, storage, and cafeteria space for staff. The new support facilities are in pre-conceptual design and could be expected to occupy approximately 21 acres. This construction could occur at TA-03, -05, -48, -50, -52, -54, and -63 (Figure 2-3). To support upgrade and construction efforts, NNSA would establish temporary construction areas within the Pajarito Corridor including warehouses, construction and management trailers, and laydown and staging areas for equipment and personnel.

New office buildings would be sized to accommodate the anticipated hiring needs and would be located primarily within the Pajarito Corridor, with a preferred location likely at TA-48 adjacent to the Plutonium Facility Complex. A new multipurpose training facility may have floors

designated for training and classrooms, laboratories, office space, conference rooms, a large auditorium, and a cafeteria. Multi-story parking for new staff would be made available onsite (TA-03, -05, -48, -50, -52, and -54) and offsite (Los Alamos and White Rock) with shuttles to transport staff parking offsite to the Pajarito Corridor. It is anticipated that the new training facility and new parking would be located within the Pajarito Corridor, with a preferred location at TA-48 although TA-03 may be considered, too. Co-locating the office, parking, and training facilities near PF-4 would increase the effectiveness of staff and facility support.

During the period of construction (approximately six years), NNSA would use interim measures for providing parking and office space for new staff through (1) leasing and/or purchasing trailers for staff onsite, (2) leasing space in Los Alamos and White Rock, and (3) remodeling existing facilities to make additional office space. Remodeling of existing buildings would be minimal modifications to interiors of existing buildings within the Pajarito Corridor as well as TA-03.

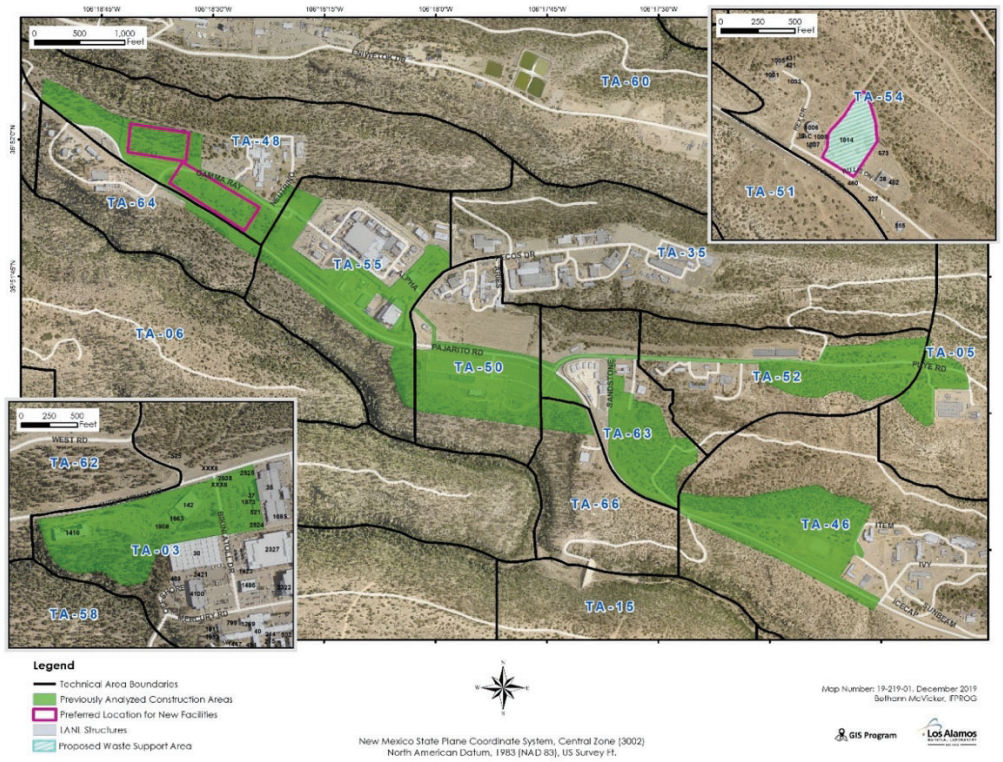

Figure 2-3. Proposed areas for support facilities

2.2.4 Repackage and Dispose of Unirradiated MFFF Fuel Rods

PF-4 provides storage for SNM including unirradiated fuel rods and materials that were fabricated in support of the Mixed Oxide lead test assembly program. Storage, shipping, and receiving of these fuel rods were included in the capabilities and activity levels of the Plutonium Facility Complex in the 2008 LANL SWEIS (DOE 2008a, ch. 3 p. 56–59). NNSA is

reconsidering repackaging and disposing of these fuel rods in accordance with the analysis in the 2008 LANL SWEIS under the Expanded Operations Alternative in order to disposition legacy materials associated with the mixed oxide fuel approach and, in turn, provide space for pit production activities.

2.2.5 Implement Replacement Office Buildings Project

NNSA would construct replacement office buildings that would accommodate staff for pit production. NNSA is reconsidering elements of the Replacement Office Buildings Project from the Expanded Operations Alternative in the 2008 LANL SWEIS. Although evaluated in the 2008 LANL SWEIS, this project has not been implemented. These replacement office buildings would provide the flexibility for LANL to house staff in a location that is near TA-55. In order to transport staff from these new office buildings, a shuttling service would be used to take staff to TA-55. Potential impacts from the Replacement Office Buildings Project are analyzed in the 2008 LANL SWEIS (DOE 2008a, ch. 3 p. 115, Table 3-21). These new buildings would be sited in previously disturbed areas primarily in TA-03. NNSA would establish temporary construction areas within the Pajarito Corridor including warehouses, construction and management trailers, and laydown and staging areas for construction equipment and personnel. Construction of these new office buildings would occur at TA-03.

Improvements or upgrades to existing utility infrastructure to support new office buildings would occur within existing utility corridors. These include repairing, re-routing, or upgrades of existing utility lines; adding or moving fencing or security barriers; extending roads to service new proposed buildings; and other support and maintenance activities.

2.2.6 Implement Elements of the Security-Driven Transportation Modifications

NNSA is reconsidering elements of the Security-Driven Transportation Modification Project from the Expanded Operations Alternative in the 2008 LANL SWEIS. This project considered two parking lots at TA-48 and TA-63, short pedestrian and vehicular bridges connecting TA-63 to TA-35 (Ten-Site Canyon), and bridges across Sandia and Mortandad canyons. NNSA is only considering the parking lots and bridges across Ten-Site Canyon. The lots would include government and personal vehicle parking, with bus transportation to TA-55 (DOE 2008a, Appx. J, p. 3–13). An option considered in the 2008 LANL SWEIS was for personal vehicles to be parked in TA-48 and TA-63 with bus transportation to TA-55. This option could be implemented if the Replacement Office Buildings Project at TA-03 were constructed. None of the elements analyzed as part of the Security-Driven Transportation Modifications Project have been implemented. Implementing these elements would provide NNSA with flexibility for construction efforts and support for staff in the proposed action.

2.2.7 Waste Management

NNSA would continue waste management operations in addition to supporting pit production. Waste management activities were described in the 2008 LANL SWEIS under the Waste Management Operations: Solid Radioactive and Chemical Waste Facilities and Activity Levels.

These activities include waste characterization, packaging, and labeling; waste transport, receipt, and acceptance; waste treatment; and waste storage (DOE 2008a, ch. 3 p. 51–55). Waste management activities would increase operations for managing TRU, LLW, MLLW, and chemical wastes generated by pit production. Projected estimates of waste produced from proposed pit production are provided in more detail in Section 3.3.5.

2.2.8 Transportation of Material, Parts, and Waste

At LANL, NNSA ships and receives radioactive and other hazardous materials to and from other DOE and non-DOE facilities, including commercial facilities. Transportation activities for material and waste shipments would increase as discussed in Section 3.3.6. If needed, LANL may provide SRS with materials and parts to support the SRS pit production efforts which may include plutonium, beryllium, graphite molds, or metallic and ceramic components.

LANL requires support from other DOE sites (e.g., SRS, Pantex, Kansas City National Security Campus (KCNSC), Lawrence Livermore National Laboratory (LLNL), NNSS, and WIPP) to provide nuclear and non-nuclear components and materials that are necessary for pit production and offsite waste disposal. The transportation activities and support functions needed by LANL from other sites were addressed in the 2019 Complex Transformation SPEIS SA (DOE 2019a). Table 2-1 depicts the origins of the transportation activities and destinations involving major facilities that support pit production at LANL.

TABLE 2-1. TYPES OF SHIPMENTS AND LOCATIONS SUPPORTING PIT PRODUCTION AT LANL

Type of Shipments	Origination	Destination
Existing Pits	Pantex	LANL
New Pits	LANL	Pantex
Plutonium Metal	NNSS, SRS, and Pantex	LANL
Enriched Uranium	Y-12	LANL
Nonnuclear Parts	KCNSC	LANL
TRU waste	LANL	WIPP
LLW[a]	LANL	NNSS plus other locations
MLLW	LANL	NNSS
Material Testing	LANL	LLNL
Material Testing	LLNL	LANL

2.2.9 Construction and Operational Estimates of Pit Production

Table 2-2 provides construction estimates for implementing the pit production analyzed in this SA compared to parameters previously analyzed in existing NEPA analyses (2008 LANL SWEIS and 2011 CMRR SEIS). The table lists key construction parameters for pit production

analyzed in this SA and construction. Project designs for constructing support buildings and equipment installation in PF-4 for producing 80 pits per year and producing 30 pits per year would be no greater than the estimates of project designs previously analyzed in existing NEPA analyses (2008 LANL SWEIS and 2011 CMRR SEIS). The estimates for pit production in this SA are generally smaller than existing NEPA analyses since most of the infrastructure has been or would be established through the efforts for 20 pits per year.

TABLE 2-2. CONSTRUCTION ESTIMATES AT LANL

Parameter	Pit Production in this SA	80 Pits Per Year 2008 LANL SWEIS and the 2011 CMRR SEIS
Land Disturbance (acres)	21	134[a]
Construction Duration (years)	6[b]	9[c]
Peak Construction Workforce (persons)	200	790[d]
Peak Electricity (megawatts-electric [MWe])	1.0	12[b]
Peak Water (gallons/year)	2,000,000	4,000,000[d]
Nonhazardous Solid Waste (tons)	3,500	7,100[e]

a. This projection is derived from 115 acres of land disturbance from construction activities analyzed in the 2011 CMRR SEIS (DOE 2011, ch. 4 p. 29, Table 4-14); and 13 acres of land disturbance from construction of Replacement Office Buildings Project in 2008 LANL SWEIS (DOE 2008a, Appx. G p. 23); and from 6 acres of land disturbance from construction activities at TA-48 analyzed in the 2008 LANL SWEIS (DOE 2008a, Appx. J p. 13).
b. Construction to support 80 pits per year design would take place during the construction period for 30 pits per year design.
c. DOE 2011, ch. 4 p. 34.
d. DOE 2011, ch. 4 p. 54.
e. This projection is derived from the 2,600 tons of construction waste analyzed in the 2011 CMRR SEIS (DOE 2011 ch. 4 p. 68, Table 3-34); and 2,550 tons of construction waste analyzed for Replacement Office Buildings Project in 2008 LANL SWEIS (DOE 2008a, Appx. G p. 29); and 1,950 tons of construction waste analyzed for Security Traffic Modifications Project in 2008 LANL SWEIS (DOE 2008a, Appx. J p. 29).

Producing pits at LANL is anticipated to be achieved using multiple shift operations. Table 2-3 presents operational estimates for pit production at LANL, as analyzed in the 2008 LANL SWEIS Expanded Operations Alternative (DOE 2008a) and as proposed in this SA. The estimates in Table 2-3 indicate (1) producing pits as analyzed in this SA, (2) previous analysis in the 2008 LANL SWEIS, and (3) the site total in the 2008 LANL SWEIS. As shown in Table 2-3, operational estimates associated with pit production analyzed in this SA would be no greater than or not significantly different than estimates previously analyzed in the 2008 LANL SWEIS.

TABLE 2-3. LANL PIT PRODUCTION OPERATIONAL ESTIMATES

Parameter	Pit Production in this SA	Prior 2008 LANL SWEIS Analysis (80 Pits Per Year)	Site Totals from 2008 LANL SWEIS
Workforce (persons)	400	1,890[a]	15,394 [a]
Radiation Workers (persons)	250	2,344 – 3,849[b]	2,344 – 3,849[b]
Peak Electrical (MWe)	0.6 – 1.6[c]	1.4[d]	124 [e]
Domestic Water (gallons per year)	8,200,000[d]	8,200,000[d]	522,000,000 [f]
Wastes			
LLW Solid (cubic yards per year)	885 – 2,355[g]	1,400[h]	13,000[h]
MLLW (cubic yards per year)	1.4 – 3.7[g]	20[h]	140[h]
TRU Solid (including Mixed TRU) (cubic yards per year)	140 – 400[g]	690[h]	860[h]
TRU Liquid (gallons per year)	6,000 – 12,000[g]	50,000[i]	5,000,000[i]

a. (DOE 2008a, ch. 5 p. 121). Staffing needed for the Expanded Operations Alternative is 1,890 staff. DOE 2008a, ch.5 p. 121, Table 5-31) 1394.
b. (DOE 2008a, ch. 5, p. 104, Table 5-27). This estimate includes radiological workers associated with remediation. Not all workers are associated with pit production.
c. (LANL 2020)
d. (DOE 2008a, ch. 5 p. 134). The peak load estimate is for additional load beyond 20 pits per year. Domestic water use is for TA-55 only.
e. (DOE 2008a, ch. 5 p. 124, Table 5-32).
f. (DOE 2008a, ch. 5 p. 42).
g. (LANL 2020)
h. (DOE 2008a, ch. 5 p. 149, Table 5-47).
i. (DOE 2008a, ch. 5 p. 150, Table 5-48).

2.3 CONSIDERATIONS FOR PROPOSED PIT PRODUCTION

There are several considerations in existing NEPA documents and decisions that are addressed in this SA for pit production. Considerations that relate to or have bearing on pit production pertain to changes to environmental resource areas since issuance of NEPA documents, changes at LANL regarding programs and operations since issuance of NEPA documents, and changes in NNSA decisions since issuance of NEPA documents. Considerations identified in previous NEPA analyses are considered to be of relative minor impact in this SA or they are discussed further in Section 3.0 (Potential Impacts) of this SA. Considerations are categorized as (1) transportation considerations; (2) the Los Alamos Upgrade Alternative in the Complex Transformation SPEIS; (3) changes to environmental conditions, actions, and decisions in the 2008 LANL SWEIS and the 2018 SWEIS SA; and (4) changes to the CMRR project as analyzed in the 2003 CMRR EIS, the 2011 CMRR SEIS, and the 2015 CMRR SA.

2.3.1 General Considerations

This SA assumes that the population along the transportation routes has increased in a manner consistent with the overall change of population in the United States. Since 2008, the United

States population has increased by approximately eight percent; from 304 million people to approximately 328 million people (Census 2019).

All offsite transportation of pits, plutonium metal, and enriched uranium is assumed to occur by the DOE's Office of Secure Transportation fleet over Federal and State highways to the extent practicable.

2.3.2 Complex Transformation SPEIS

The Los Alamos Upgrade Alternative required upgrade and/or expansion to existing facilities or construction of new facilities to support pit production.

Potential environmental impacts analyzed for the Los Alamos Upgrade Alternative were focused on completion of the CMRR facility and no other construction activities at TA-55. However, several existing and planned LANL facilities were included in the No Action Alternative as they were required to support pit production levels previously decided by NNSA. Resource areas related to this include land use (acres disturbed), utility use (electricity, water, and gas), employment (construction workers), and waste management.

2.3.3 2008 LANL SWEIS

Considerations of changes in the 2008 LANL SWEIS and the 2018 SWEIS SA as they pertain to the proposal for pit production include: (1) changes to environmental resource areas since the 2008 LANL SWEIS was issued, (2) changes to programs at LANL regarding pit production and environmental management actions, and (3) considerations of construction and operations supporting pit production.

Changes to environmental resource areas were reviewed in the 2018 SWEIS SA. Since issuance of the 2018 SWEIS SA, there have been no additional substantial changes to environmental resource areas.

Both the 1999 and 2008 LANL SWEIS describe LANL's plutonium operations, including the production of pit components (DOE 2008a, ch. 3 p. 56–59; DOE 1999a, ch. 2 p. 28–33). Processes and procedures for pit production, as analyzed in the 2008 LANL SWEIS (DOE 2008a, ch. 3, p. 56–57), have not fundamentally changed from those described and analyzed in the 1999 LANL SWEIS (DOE 1999a).

The 2008 LANL SWEIS evaluated cumulative impacts associated with constructing and operating a consolidated plutonium center of excellence which would entail storage and production of 125 pits with a potential surge capacity of 200 pits annually (DOE 2008a, ch. 5 p. 212).

The Expanded Operations Alternative in the 2008 LANL SWEIS analyzed potential environmental resource impacts from production of 80 pits per year at LANL. These impact projections from production are used for the basis of the analysis in this SA.

NNSA notes that LANL has a new management and operating contractor and that the DOE Office of Environmental Management hired their own legacy clean up contractor in 2018. The NNSA LANL management and operating contractor and the DOE-Environmental Management legacy clean up contractor continue to execute their respective NNSA and DOE-Environmental Management mission activities at LANL. Portions of TA-54 are operated by DOE-Environmental Management.

Several of the new support facilities associated with pit production are in a pre-conceptual design stage. The best available design information was used for the analysis in this SA. Where appropriate, conservative estimates were used so that implementation of any final designs are expected to result in lesser impacts than those presented in this SA. Although the impacts of the final design are not certain at this time, LANL does implement administrative controls[5] and processes to minimize potential impacts. Both construction and operational impacts are considered for all resources. Construction impacts are generally short-term (i.e., approximately six years), while operational impacts are expected to be long-term (i.e., would occur annually over a 50-year operating period).

Potential security and waste management support facilities, like those proposed for pit production (Figure 2-3), are analyzed in the 2008 LANL SWEIS in Appendix L, Support Activities (DOE 2008a, Appendix L, p. 2), and in the 2018 LANL SWEIS SA to the 2008 LANL SWEIS (DOE 2018a). LANL would conduct a project review to identify the requirements that could lessen the potential of environmental impacts from constructing such support facilities.

2.3.4 2003 CMRR EIS, 2011 CMRR SEIS, and 2015 CMRR SA

The 2003 CMRR EIS analyzed construction of new administrative and support buildings that would support pit production at LANL (DOE 2003a, ch. 1 p. 9; ch. 2 p. 10). These facilities have not been built. The support buildings were to be located outside of the PIDAS, similar to support buildings identified in the proposed action of this SA (DOE 2003a, ch. 2 p. 10).

The 2015 CMRR SA to the 2003 CMRR EIS proposed action addressed changes to the proposed relocation of AC/MC capabilities. The proposed locations were at a new radiological facility and PF-4. Other changes to the proposed action include installing new equipment in PF-4 and RLUOB, removing aging equipment through decontamination and size reduction, and constructing new support facilities to house offices, parking garages, and training facilities (DOE 2015a, p. 5–6). Installation of equipment is ongoing while construction of new support facilities has not been initiated.

[5] These controls include LANL's Integrated Review Tool used to solicit input from over 40 subject matter experts when a project is first conceived; the use of engineered controls, administrative procedures, or personnel protective equipment as part of LANL's As-Low-As-Reasonably-Achievable program; best management practices; controls from air and water permitting; Cultural Resources Management Plan; and the Habitat Management Plan.

3.0 POTENTIAL IMPACTS

3.1 INTRODUCTION

The analysis in this section is to determine (1) if the potential impacts of pit production would be different from those analyzed in the 2008 LANL SWEIS and other relevant NEPA documents, and (2) if so, whether those differences would be considered significant in the context of NEPA (40 CFR 1508.27) which could require preparation of a supplement to the 2008 LANL SWEIS or a new EIS. Identifying and qualifying potential environmental impacts from pit production informs NNSA's decision to implement pit production beyond what has been previously decided.

Potential impacts evaluated in this SA are those impacts associated with the production of a minimum of 30 pits per year and those associated with the production of 80 pits per year. This SA compares potential impacts of pit production to those impacts that were identified in the 2008 LANL SWEIS and other relevant NEPA documents. The evaluation of potential impacts is based on the considerations for pit production as identified in Section 2 of this SA. Any potential impact that would be no greater than or equal to those impacts analyzed in the 2008 LANL SWEIS is a strong indicator that no additional NEPA documentation would be required.

3.2 POTENTIAL ENVIRONMENTAL IMPACTS

3.2.1 Resource Areas with Minor or Negligible Impacts

As part of the environmental impact analysis for this SA, NNSA analyzed each of the environmental resource areas identified in the 2008 LANL SWEIS for potential impacts. The environmental resource areas that are considered to have minor or negligible impacts and are not different from what was analyzed in previous NEPA analyses are summarized in Table 3-1. These resource areas include land use, visual resources, geology and soil (excluding seismic), water resources, air quality, noise, ecological resources, cultural resources, infrastructure, facility accidents, and intentionally destructive acts. Potential impacts to environmental resources associated with pit production are compared to the impacts previously analyzed in the 2008 LANL SWEIS, 2018 LANL SWEIS SA, and other relevant NEPA documents to evaluate whether the previous analysis remains sufficient. In Table 3-1, NNSA presents a qualitative analysis that identifies differences of environmental impacts between previous analyses and the proposed action described in this SA.

TABLE 3-1. POTENTIAL IMPACTS OF PIT PRODUCTION

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
Land Use	The 2003 CMRR EIS has been incorporated by reference into the 2008 LANL SWEIS, and it analyzes approximately 27 acres of disturbance at TA-55 from constructing a new CMRR facility, associated support buildings, and parking areas. The 2003 CMRR EIS determined that the approximate land disturbance was consistent with the 1999 LANL SWEIS analysis (DOE 2003a, ch.4 p. 12) and the 2000 LANL Comprehensive Site Plan designations of the area (LANL 2000). In addition to the 27 acres analyzed, the 2011 CMRR SEIS analyzed approximately 60 acres (50 undeveloped acres) that would be disturbed under the Modified CMRR-NF Alternative by construction and laydown areas along Pajarito Corridor (DOE 2011, ch 4 p 29, Table 4-14). Lastly, the Security-Driven Transportation Modifications Project in the 2008 LANL SWEIS did evaluate approximately 30 acres for the project, including parking at TA-48 and TA-63. These areas are also being considered in this SA (DOE 2008a, Appx. J, pp. 9–12).	(1) Potential impacts to land use include developing undisturbed land. The construction of support facilities or additions to existing structures that would support producing 80 pits per year would disturb approximately 21 acres. Development and operations for producing 80 pits per year would be consistent with surrounding land use. (2) Construction, development, and operations regarding land use required for producing 30 pits per year would not be greater than those for producing 80 pits per year would. Wow!	**No.** Potential impacts to land use from construction, development, and operations associated with the proposed action would be no greater than the impacts previously analyzed (DOE 2003a, 2008a, 2011).
Visual Resources	The 2011 CMRR SEIS analyzed impacts to visual resources from construction projects along the Pajarito Corridor in the Modified CMRR-NF Alternative. Construction would occur within or adjacent to developed areas along the Pajarito Corridor. There would be little change in the industrial appearance of the area. New construction in these areas would not represent a	(1) Potential impacts to viewsheds are related to the construction of new support buildings for producing 80 pits per year. Construction activities would be short-term and temporary. Any permanent changes would be consistent with adjacent developed areas. Internal or external modification to existing buildings would have no visual impacts. Installation of	**No.** Potential visual impacts from construction would be no greater than those impacts previously analyzed (DOE 2011)

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	significant change in the visual environment (DOE 2011, ch 4 p. 32).	equipment inside PF-4 would have no impacts to visual resources. No permanent changes to viewsheds are expected from operations for producing 80 pits per year. (2) Potential impacts to viewsheds related to construction of new support buildings for producing 30 pits per year would not be greater than those for producing 80 pits per year. No permanent changes to viewsheds are expected from operations for producing 30 pits per year.	
Geology and Soils (seismic addressed in Section 3.3.1)	The 2008 LANL SWEIS analyzed impacts to geology and soils from construction projects and demonstrated that impacts were directly linked to the amount of land disturbance associated with construction. With appropriate mitigation and Best Management Practices (BMP) in place, impacts to geology and soil would be minimized. Proposed facility construction and demolition are not likely to alter LANL subsurface conditions (DOE 2008a, ch. 5, p. 20, Table 5-3). The 2011 CMRR SEIS also analyzed impacts to geology and soils (such as soil erosion, removal of soil and mineral resources, and temporary stockpiling of soils) from construction projects within TA-48, -55, and -63 (DOE 2011, ch. 4 p. 44).	(1) Impacts to geology and soils would be associated with ground disturbance (construction of support buildings, building modifications, or modifications to existing roads and infrastructure) in support of producing 80 pits per year. Potential impacts to geology and soils are anticipated to be minor and temporary. Appropriate mitigation measures, permits, and BMPs would be used to minimize soil erosion and loss of soil and mineral resources. No potential impacts to geology and soils are anticipated from operations for producing 80 pits per year. (2) Potential impacts to geology and soils from ground disturbance for producing 30 pits per year would not be greater than those for producing 80 pits per year. No potential impacts to geology and soils are anticipated from operations for producing 30 pits per year.	**No.** Potential impacts to geology and soils from the proposed action would be no greater than impacts previously analyzed (DOE 2008a, ch. 5 p. 20, Table 5-3; (DOE 2011, ch. 4 p. 44). Potential impacts related to seismic conditions are discussed in more detail in Section 3.3.1.
Water Resources	The 2008 LANL SWEIS analyzed impacts to water resources from construction and decontamination activities and impacts to groundwater from liquid effluent discharge from	(1) Potential impacts to water resources are associated with construction and building modifications in support of producing 80 pits per year. Two million gallons per year is estimated	**No.** Potential impacts from construction and building modifications in the proposed action would be no greater than

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
Valid?	operations. Minor short-term impacts to water quality from construction activities were anticipated, including accelerated erosion that could result in sediment transport offsite. Potential impacts to groundwater quality include liquid effluent releases to permitted outfalls. Compliance with requirements under the Clean Water Act, the National Pollutant Discharge Elimination System Construction General Permit, and Section 404 and 401 permits are monitored regularly, and any instances of contamination are minimized and mitigated through installation of erosion and sediment controls specified in storm water pollution prevention plans (DOE 2008a, ch 5, p. 31–41). The 2011 CMRR SEIS analyzed impacts to water resources from construction. Construction was estimated to use up to 5 million gallons of water over nine years (DOE 2011, ch. 4 p. 33, Table 4-15). Potential impacts to surface-water quality would be mitigated through implementation of storm water pollution prevention plans and BMPs. Impacts to groundwater are not anticipated from construction activities (DOE 2011, ch. 4 p.47–48).	for use during construction over five years. Storm water runoff could potentially impact downstream surface-water quality. Storm water and sediment controls, pollution prevention plans, and BMPs would be implemented to minimize sediment transport and impacts to surface water and groundwater resources. Construction is not anticipated to change the annual liquid effluent discharge volumes from PF-4 to Outfall 03A181 in Mortandad Canyon. No potential impacts from operations are anticipated from producing 80 pits per year as there are no anticipated liquid effluent discharge volumes from PF-4 to Outfall 03A181. (2) Potential impacts to water resources from construction for producing 30 pits per year would not be greater for producing 80 pits per year. No potential impacts from operations are anticipated from producing 30 pits per year as there are no anticipated liquid effluent discharge volumes from PF-4 to Outfall 03A181.	the impacts previously analyzed (DOE 2008a, ch. 5, p. 31, 40; (DOE 2011, ch. 4 p. 47–48). Potential impacts from operations for the proposed action would be no greater than the impacts previously analyzed (DOE 2008a, ch 5 p. 34).
Air Quality[6]	The 2018 LANL SWEIS SA evaluated non-radiological air emissions of criteria pollutants, hazardous air pollutants, and volatile organic	(1) Potential impacts to air quality from non-radiological air emissions include construction activities, waste management operations,	**No.** Potential impacts from non-radiological air emissions and greenhouse gases from

[6] DOE 2018a provides an analysis of climate change in Section 3.17 relative to the region around LANL. NNSA considers the data used to still be relevant and not likely to be significantly different.

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	compounds from 2008 through 2016. The 2018 LANL SWEIS SA determined that these emissions were well below the facility-wide Title V Operating Permit limits at LANL (DOE 2018a, p. 86). Most of the non-radiological emissions from PF-4 were not associated with pit production (DOE 2008a, ch. 5 p. 53–54). The 2018 LANL SWEIS SA analyzed impacts from greenhouse gas emissions at LANL to anticipated demand for electrical power (DOE 2018a, p. 144–145). The 2011 CMRR SEIS analyzed potential impacts from greenhouse gas emissions with 32,600 tons of carbon dioxide equivalent (CO_2e)[7] from construction activities (DOE 2011, ch. 4 p. 40, Table 4-21). The 2008 LANL SWEIS Expanded Operations Alternative analyzed potential radiological air emissions from operations at PF-4. A small annual release ($3.6x10^{-5}$ curies per year) was estimated from production of up to 80 pits per year (DOE 2008a, Appx. C p. 21, Table C-14).	decontamination activities, and commuting staff supporting production of 80 pits per year. Temporary impacts are anticipated from construction and decontamination activities, and are anticipated to be minor and would not result in violations of the National Ambient Air Quality Standards. Minor impacts are anticipated from waste management operations (DOE 2008a, Appx. C p. 21, Table C-13) and commuting staff (DOE 2008a, ch. 3 p. 88–102, Table 3-19). The projected increase in LANL staff would cause a minor increase in vehicle emissions along existing routes used to access the site. Production of 80 pits per year would not result in a significant increase in greenhouse gas emissions from operations. NNSA estimates that production of 80 pits per year would result in an emission of 1.2×10^{-7} curies per year (LANL 2020). (2) Potential impacts from non-radiological air emissions and greenhouse gas emissions for producing 30 pits per year would not be greater for producing 80 pits per year. Impacts from radiological air emissions are anticipated to be minor for producing 30 pits per year (4.5×10^{-8} curies per year) (LANL 2020).	construction and operations in the proposed action would be no greater than the impacts previously analyzed (DOE 2008a, ch. 5 p. 53–54). Potential impacts from radiological air emissions during operations would be no greater than radiological emissions previously analyzed (DOE 2008a, Appx. C p. 21, Table C-14).
Noise	The 2011 CMRR SEIS Modified CMRR-NF Alternative analyzed minor increases in noise from	(1) Potential impacts from noise are associated with construction of support buildings and increased	**No.** Potential impacts from noise from construction would

[7] Carbon dioxide equivalent (CO_2e) is a quantity that describes the amount of CO_2 that would have the same global warming potential when measured over a specified timescale (typically 100 years). CO_2e includes CO_2, methane, and nitrous oxide.

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	construction activities and traffic (DOE 2011, ch. 4, p. 42–43). Noise impacts are not expected to exceed Los Alamos County noise ordinances (DOE 2008a, ch. 5, p. 71–72).	traffic for producing 80 pits per year. Construction activities may temporarily increase the ambient noise in construction areas along the Pajarito Corridor, TA-3, and TA-16. Noise receptors may notice an increase from additional traffic and minor interior construction. Short-term increase in ambient noise would be associated with an increase in commuting workers and 24-hour operations. No long-term impacts from noise are anticipated for operations of producing 80 pits per year. (2) Potential impacts from construction and traffic noise for producing 30 pits per year would not be greater for producing 80 pits per year. Operational noise from producing 30 pits per year is not anticipated to be greater than current ambient noise levels.	be no greater than those impacts previously analyzed (DOE 2008a, ch. 5 p. 71–72; DOE 2011, ch. 4 p. 42–43).
Ecological Resources	The 2008 LANL SWEIS Expanded Operations Alternative addressed potential impacts from construction, land disturbance, water use and discharge, and noise to ecological resources (e.g., forests, wildlife, protected and sensitive species, and wetlands) (DOE 2008a, ch. 5, p. 75–77). There is limited acreage of undeveloped land that may be cleared. Clearing this land could contribute to potential loss of habitat and displacement of wildlife. Construction impacts	(1) Potential impacts to ecological resources would be associated with construction of support buildings for producing 80 pits per year. The Pajarito Corridor includes core and buffer habitats for the Mexican spotted owl in undeveloped areas. Habitat disturbance from construction activities would be minor (less than one acre), with some tree and vegetation removal. LANL and NNSA would follow the Laboratory's habitat management plan to ensure that potential impacts to ecological resources are minimized. If requirements outlined in the *Threatened and Endangered Species Habitat Management Plan* (LANL 2017a) are followed, no significant impacts to ecological resources would be expected. Preferred construction areas for the project are not located in core habitat. If	**No.** Potential impacts to ecological resources from construction would be no greater than those impacts previously analyzed (DOE 2008a, ch. 5 p. 75–77; DOE 2011, ch. 4 p. 49–52).

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	could impact both core and buffer[8] habitat of the Mexican Spotted Owl. NNSA received concurrence from the U.S. Fish and Wildlife Service that construction may affect, but is unlikely to adversely affect, the Mexican Spotted Owl due to removal of a small portion of potential habitat (DOE 2011, ch. 4 p. 49–52). TA-55 is mostly located on developed land, therefore minor impacts to vegetation and no impacts to wetlands would occur.	project changes occur that result in potential impacts to core habitat, DOE would prepare a biological assessment and submit to the U.S. Fish and Wildlife Service for consultation and concurrence. Potential impacts to aquatic and wetland resources related to construction are not anticipated. No impacts are anticipated to ecological resources from operations of producing 80 pits per year. (2) Potential impacts to ecological resources from construction for producing 30 pits per year would not be greater for producing 80 pits per year. No impacts are anticipated to ecological resources from operations of producing 30 pits per year.	
Cultural Resources	The 2008 LANL SWEIS identified that new construction projects under the Expanded Operations Alternative would potentially impact cultural resources (DOE 2008a, ch. 5 p. 111). Construction activities associated with pit production that have the potential for adverse effects on cultural resources would be evaluated and mitigated according to the LANL's Cultural Resources Management Plan (LANL 2017b) and the Programmatic Agreement (DOE 2017b). The 2011 CMRR SEIS analyzed potential impacts to cultural resources from the construction of new	(1) Potential impacts to cultural resources would be associated with construction of support buildings for producing 80 pits per year where resources are present. There is one identified archaeological site within the proposed area to construct new support facilities in TA-48. LANL and NNSA would follow the LANL's Cultural Resources Management Plan (LANL 2017b) and the Programmatic Agreement (DOE 2017b) between DOE and stakeholders for complying with the National Historic Preservation Act and minimize potential impacts to cultural resources. Potential impacts to	**No.** Potential impacts to cultural resources associated with construction in the location of the proposed action would be no greater than those impacts previously analyzed (DOE 2008a, ch. 5 p. 111; DOE 2011, ch. 4 p. 53). The potential impacts from pit production would be reduced

[8] Suitable habitats for federally listed species on the LANL site have been designated as Areas of Environmental Interests, are managed for species protection, and consist of core and buffer habitats. Core habitat protects areas essential to the existence of a species; buffer habitat protects core areas from undue disturbance and habitat degradation (LANL 2017a).

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	support buildings in the Pajarito Corridor (DOE 2011, ch. 4 p. 53). The 2008 LANL SWEIS discussed potential impacts from construction activities and operations to traditional cultural properties (TCPs[9]) at LANL. A consultation process is in place to address possible impacts to these properties at LANL (DOE 2008a).	cultural resources that require mitigation would be consulted on with the NM State Historic Preservation Office. Based on information regarding TCPs and consultations with descendant communities presented in the 1999 LANL SWEIS and 2008 LANL SWEIS analyses, no potential impacts to cultural resources are anticipated from operations of producing 80 pits per year. (2) Potential impacts to cultural resources from construction for producing 30 pits per year would not be greater for producing 80 pits per year. No impacts to cultural resources are anticipated from operations of producing 30 pits per year.	by following the requirements for protecting sensitive areas. Adverse impacts are not anticipated if requirements outlined in the Cultural Resources Management Plan are followed (LANL 2017b). If sites cannot be avoided, a consultation with the NM State Historic Preservation Office, descendant communities, and/or the relevant Tribal Historic Preservation Officers in accordance with Section 106 of the National Historic Preservation Act would be conducted (DOE 2011, ch. 4 p. 53). A consultation process is in place to address possible impacts to these properties at LANL.
Infrastructure	The 2008 LANL SWEIS identified minor incremental increase in utility demands for pit production. TA-55 could require an additional 1.4 megawatts in electric peak load and 8.2 million	(1) Potential impacts regarding infrastructure would be associated with utilities needed for construction of support buildings and an incremental increase in utility demands for producing 80 pits per year. Construction of	**No.** Potential infrastructure impacts from the proposed action would not be greater than the impacts previously analyzed

[9] Traditional cultural properties (TCPs) are tangible and intangible resources that are integral to the traditional practices and cultural affiliation of Native American and other ethnic groups. Examples of TCPs located at LANL can be, but are not limited to: ceremonial and archaeological sites, natural features, ethnobotanical sites, artisan material sites, and subsistence features (DOE 2008a).

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	gallons of water annually (DOE 2008a, ch. 5, p. 134). The 2018 LANL SWEIS SA estimates that LANL would use approximately 103 megawatts in electric peak load by 2022. The site capacity for electric peak load would be 168 megawatts by 2022 (DOE 2018a p. 108). LANL would consume approximately 351 million gallons of water across the site by 2022. The site capacity is estimated to be 542 million gallons annually (DOE 2018a, p. 109). TA-55 generally contributes less than five percent of LANL's consumption of water and electricity (DOE 2008a, ch. 5 p. 134) and LANL operates well under capacity (DOE 2018a, Section 3.11.2).	support buildings would require approximately 1.0 megawatt of electric peak load and approximately 2 million gallons of water for dust suppression, during the construction period of five years. Operations of producing 80 pits per year would require approximately 0.6 megawatts in electric peak load (LANL 2020) and 8.2 million gallons per year (DOE 2008a, ch. 5 p. 134). (2) Potential impacts from construction of support facilities for producing 30 pits per year would not be greater for producing 80 pits per year. Approximately 0.4 megawatts of peak power (LANL 2020) and 1.7 million gallons of water would be required for construction activities associated with pit production.	(DOE 2008a, ch. 5, p. 124–134).
Facility Accidents	Radiological and chemical accidents were analyzed in the 2008 LANL SWEIS. The accident scenarios that resulted in potential release include facility fires, wildfires, and earthquakes. Based on the postulated accident scenarios, the Maximally Exposed Individual (MEI)[10] could receive a dose[11] of 150 rem from an earthquake resulting in an increased latent cancer fatality (LCF) risk of 0 (0.17). The resultant dose to the population within	(1) In 2019, DNFSB submitted a report of its findings to NNSA regarding the PF-4 documented safety analyses, the methodology used to calculate risk of potential consequences, and hazard and accident analyses (DNFSB 2019). NNSA acknowledges the DNFSB findings in this report and is currently reviewing information that is relevant to the PF-4 Documented Safety Analysis (DSA). The DNFSB report does not constitute a significant	**No**. The potential impacts from facility accidents (including a seismic event with spill and fire) associated with the proposed action would not be greater than those previously analyzed (DOE 2008a, ch. 5 p. 191; LANL 2018a). The population in the Region of

[10] Maximally exposed individual—a hypothetical individual whose location and habits result in the highest total radiological or chemical exposure (and thus dose) from a particular source for all exposure routes (i.e., inhalation, ingestion, direct exposure, resuspension).
[11] Dose—a generic term meaning absorbed dose, dose equivalent, effective dose equivalent, committed dose equivalent, committed effective dose equivalent, or committed equivalent dose. For ionizing radiation, the energy imparted to matter by ionizing radiation per unit mass of the irradiated material (e.g., biological tissue). The units of absorbed dose are the rad and the gray. In many publications, the rem is used as an approximation of the rad.

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
	50 miles would be 14,000 rem which could result in nine LCFs (DOE 2008a, ch. 5, p. 192, Table 5-71). The 2008 LANL SWEIS analyzed operational accident dose and LCF risk to non-involved workers, the MEI, and the offsite population at 50 miles from a material staging area fire at PF-4. Non-involved workers could receive a collective dose of 1,600 rem with an LCF risk of 1.0 (DOE 2008a, ch. 5 p. 182, Table 5-64). The MEI could receive a dose of 73 rem with an LCF risk of 0 (0.087). The offsite population could receive a dose of 9,000 person-rem and the LCF risk would be 5.4 (DOE 2008a, ch. 5, p. 181, Table 5-63).	change in terms of the NEPA analysis on potential impacts from a facility accident (including a seismic event with spill and fire). The DNFSB 2019 report indicates that a seismic event with spill and fire could result in an individual of the public (equivalent to the MEI) receiving a dose of 74 rem (DNFSB 2019, p. 4). This calculation by the DNFSB is less than analyzed in the 2008 LANL SWEIS (150 rem) (DOE 2008a, ch. 5. p. 191, Table 5-71). Potential impacts related to consequences of accidents are dependent on the amount of material-at-risk (MAR)[12] in a facility and not the number of pits produced. MAR is administratively limited in TA-55 to reduce potential consequences to human health and the environment and is documented in the 2018 DSA for TA-55 (LANL 2018a). MAR in PF-4 is administratively reduced to address risk of seismic vulnerabilities while at the same time ensuring that mission-critical work is not significantly impacted. The 2018 DSA projected potential exposure to the MEI in a seismic event with a fire to be 24.2 rem (LANL 2018a, ch. 3 p. 321) resulting in an increased LCF risk of 0.01. Production of 80 pits per year would not increase the amount of plutonium available for an accident because the MAR limit would remain the same within PF-4 (LANL 2018a).	Influence (ROI) has increased approximately six percent since 2008 (NM-IBIS 2018), which does not constitute a significant change and would not significantly increase potential population doses from accidents. Although information from the DNFSB 2019 report point to potential revisions to the PF-4 DSA prior to commencing pit production at PF-4, such changes do not constitute a significant difference to potential impacts that have been analyzed in the 2008 LANL SWEIS. Potential revisions to the PF-4 DSA, if warranted, would be completed before the proposed action is implemented. Specifics of the PF-4 DSA with regards to the DNFSB report findings are not discussed further in this SA.

[12] MAR is nuclear material that may be involved in a postulated accident. MAR quantities used in accident analyses are based on conservative assumptions that balance risk of consequences from accident scenarios along with capabilities in nuclear facilities.

Resource Area	Impacts Analyzed in the 2008 LANL SWEIS or other Relevant NEPA Documents	Potential Impacts from Production of (1) 80 Pits Per Year, and (2) 30 Pits Per Year	Is there a Significant Difference in Environmental Impacts?
		Probabilities of risk postulated in the accident scenarios are expected to remain unchanged from those analyzed in the 2008 LANL SWEIS (LANL 2018a). (2) Potential impacts to the MEI for producing 30 pits per year would not be greater than those for producing 80 pits per year, because the MAR limit in PF-4 is not anticipated to change (LANL 2018a).	
Intentionally Destructive Acts	NNSA prepared a classified Appendix for the 2008 LANL SWEIS, which analyzed the potential impacts of intentional destructive acts (e.g., sabotage, terrorism). The conclusion in the classified Appendix can be summarized as follows: "Depending on the malevolent, terrorist, or intentionally destructive acts, impacts may be similar to or could exceed bounding accident impacts analyses prepared for the SWEIS" (DOE 2008a, ch. 5, p. 204).	(1) Potential impacts of intentional destructive acts are generally a function of the MAR quantity in the facility. Pit production at the Plutonium Facility Complex would not increase the amount of plutonium in the facility at any one time and would not increase the risk postulated in the intentional destructive acts scenarios. In preparing this SA, NNSA reviewed the classified Appendix that was prepared for the 2008 LANL SWEIS addressing intentional destructive acts. As a result of that review, NNSA concluded that the classified Appendix analysis is reasonable and adequate to represent the proposed action in this SA and does not need to be revised (LANL 2020).	**No.** The potential impacts from intentional destructive acts in the proposed action would not be greater than impacts previously analyzed (DOE 2008a, ch. 5 p. 204) and is consistent with the review of the classified Appendix (LANL 2020).

3.3 POTENTIAL ENVIRONMENTAL IMPACTS DISCUSSION

Environmental resource areas that require additional analysis or to address public concerns are reviewed in more detail in the following subsections. These resource areas consist of seismic geology and earthquakes (facility accidents), human health, socioeconomics, environmental justice, waste management, and transportation. Criteria for this additional discussion may include perceived risk or issues raised by public comments to the 2019 Complex Transformation SPEIS SA (DOE 2019a).

Potential impacts to environmental resources associated with pit production are discussed in three parts. First, a description of the affected environment associated with that resource is provided. This description incorporates the 2008 LANL SWEIS (DOE 2008a) and the 2018 LANL SWEIS SA (DOE 2018a) by reference as the baseline for consideration of potential changes to environmental conditions and potential impacts from the proposed action as well as any new information related to resource areas since issuance of these documents. Specific potential environmental impacts that pertain to the evaluated resources from the 2008 LANL SWEIS, or other relevant documents, are also presented. Second, a brief description and analysis of any potential impacts to that resource area from the proposed action are presented. Finally, NNSA describes how those impacts are different from impacts in previous NEPA documents.

3.3.1 Geology – Seismic and Earthquakes

3.3.1.1 *Affected Environment, Existing NEPA Analysis, and New Information*

The 2008 LANL SWEIS describes the geologic conditions as related to seismic activity and risk surrounding LANL. LANL sits on the Pajarito Plateau, on the eastern flank of the Jemez Mountains and along the active western margin of the Rio Grande rift. The geology of the LANL area is the result of complex faulting, sedimentation, volcanism, and erosion over the past 20 to 25 million years. The dominant contributor to seismic risk at LANL is the Pajarito fault system, which forms the local active western boundary of the Rio Grande rift in the vicinity of LANL. The main element of the system is the Pajarito fault; secondary elements include the Rendija Canyon fault, the Guaje Mountain fault, and the Sawyer Canyon fault (DOE 2008a, ch. 4 p.15–22). In 2007, a comprehensive update to the 1995 seismic hazard analysis of LANL was completed and incorporated in the 2008 LANL SWEIS analysis (DOE 2008a). The 2007 comprehensive update (URS 2007) indicated that the seismic hazard was higher than previously understood.

DOE evaluates seismic hazards and risk to structures that hold nuclear materials to ensure that nuclear material is not released into the environment from a seismic event. The evaluation considers the design of the facility, MAR quantities, the likelihood and severity of a potential seismic event, and the impact that event would have on the structure. A potential seismic hazard is based on a prediction of ground motion that can be produced from an earthquake. The U.S. Geological Survey (USGS) produces National Seismic Hazards Maps that contain data and maps that describe earthquake ground motions at various probability levels. The most recent

publication of the National Seismic Hazards Maps is depicted in the 2014 USGS Report (Petersen et al. 2014). USGS National Seismic Hazards Maps are derived from seismic hazard curves that describe the annual frequency of exceeding the set of ground motions in relation to probabilistic ground motion occurrence. Spectral accelerations are calculated based on the anticipated hazard curves and annual frequency to determine the potential impact ground motion would have on structures. The spectral accelerations based on the USGS National Seismic Hazards Maps are often applied to seismic provisions in civic building codes (i.e., American Society of Civil Engineers [ASCE]-7), insurance rate structures, risk assessments, and other public policy.

NNSA used the USGS online tool to identify the peak ground acceleration (PGA) at firm rock and the modified PGA at the surface.[13] These two PGAs were used to determine if the earthquake hazard based on PGA, as depicted in the 2014 USGS Report, has significantly changed since the issuance of the 2008 USGS Report. The modified PGA at the surface is calculated to account for local site amplification. To compute the modified PGAs for LANL, NNSA assumed a site Class D and a Risk Category III structure. A site Class D is an area with stiff soil and is more susceptible to elevated ground motion (Kelly 2006). A Risk Category III structure is a critical facility most commonly associated with utilities that is required to protect the health and safety of a community (ASCE-7 Table 1604.5).

At LANL, the coordinates of PF-4 (35.8367 N, 106.3029 W) were entered into the USGS online tool to calculate an estimate of the PGA at firm rock with two percent probability of exceedance in 50 years for both the USGS 2008 Report and the USGS 2014 Report. Based on the calculation, the PGA at LANL changed from approximately 0.224 g[14] in 2008 to approximately 0.225 g in 2014, which represents an increase in predicted ground motion of less than 0.5 percent. NNSA also evaluated the PGA at rock values on contour maps provided by USGS in order to check the values obtained using the online calculator. The mapped values for LANL are well within the online calculator values.

The USGS online tool calculated that the modified PGA at the surface, corrected for site Class D, with two percent probability of exceedance in 50 years, changed from approximately 0.303 g

[13] In 2014, the USGS issued a report titled "Documentation for the 2014 Update of the United States National Seismic Hazards Maps" (USGS 2014 Report) (Petersen et al. 2014). The USGS 2014 Report provides seismic hazard maps by geographic area of the entire country. The USGS provides an on-line tool where specific geographic coordinates (latitude/longitude) can be entered to obtain various parameters that help identify potential seismic hazards in a geographic area. A similar tool is provided by the ASCE that incorporates USGS data to help compute ground motion parameters. Access to the USGS design ground motion values for a particular latitude, longitude, risk category, and site class, may be obtained at https://earthquake.usgs.gov/ws/designmaps/. The ground motion values for the 2008 National Hazards Maps may be obtained either by using the 2009 National Earthquake Hazard Reduction Program Standard or 2010 ASCE Y Standard. The values for the 2014 National Hazards Maps may be obtained using either the 2015 National Earthquake Hazard Reduction Program Standard or the 2016 ASCE 7 Standard.

[14] A gravitational force of 1 g is equal to the conventional value of gravitational acceleration on Earth's surface (9.8 meters per second per second).

in 2008 to approximately 0.31 g in 2014. The change represents an increase in predicted ground motion of about 2.0 percent.

DOE has developed a set of design criteria (DOE 2016b) that incorporates more stringent requirements than ASCE-7 or the International Building Code for the development of natural phenomena hazards assessments. Since DOE requirements are more stringent than ASCE-7 building codes, DOE nuclear facilities must meet the applicable DOE orders. DOE requires a site-specific probabilistic seismic hazards assessment (PSHA) for the design of critical facilities, including high-risk structures. The site-specific PSHA involves extensive field work including geologic mapping, fault excavation, geophysics, geologic age dating, evaluation of seismic (vibratory ground motion) wave propagation through rock and soil layers, expert judgement, and peer review. Many parameters for specific siting of facilities are evaluated including PGA, peak ground velocity, and peak ground displacement to define potential hazards. The development of these values is achieved by developing seismic source models and ground motion models. These parameters, and subsequent models, are affected by local variables such as bedrock type, depth to bedrock, and local soil thickness. The incorporation of these parameters and extensive evaluations in a focused PSHA site study can increase or decrease design ground motions as compared to the USGS National Seismic Hazards Maps.

Although data from the USGS National Seismic Hazards Maps are used in the development of PSHAs, the USGS maps are not a substitute for a PSHA. Each site-specific PSHA study, as well as the USGS, follows a similar basic framework in producing seismic hazard analyses. However, LANL site-specific PSHA studies incorporate detailed, site-specific geologic, geophysical, and geotechnical information that are not readily available to researchers at the USGS to determine hazard curves. Figure 3-1 shows the difference in the site-specific hazard curves as derived from 2008 and 2014 USGS data and PSHA studies for TA-55 and LANL site-wide. Based on the hazard curves presented in Figure 3-1, site-specific seismic hazard predictions determined in PSHA studies are greater than those based on the USGS National Seismic Hazards Maps. By incorporating PSHA studies in critical facility design criteria, a more conservative approach to seismic hazard mitigation is implemented into LANL high-risk structure design. To ensure that seismic risk is mitigated at PF-4, structural upgrades at PF-4 are ongoing to reduce risks posed by a seismic event and to meet DOE seismic code requirements (LANL 2019a, p. 1).

Figure 3-1. Hazard curves

The 2018 DSA for TA-55 evaluated seismic conditions. This evaluation did not identify any new seismic information at LANL (LANL 2018a, ch. 1 p. 22). The report describes the facility's (1) structural ability to withstand seismic hazards and (2) safety systems to prevent a fire from occurring during a seismic event. The 2018 DSA analyzed structural improvements to PF-4 that meet seismic requirements and further details what consequences could potentially occur if a seismic event took place. The PF-4 Seismic Performance Reassessment Project is ongoing and aims to determine the seismic performance of the PF-4 building (LANL 2019a). LANL's Seismic Analysis of Facilities and Evaluation of Risk Project is a multi-year analysis of the seismic design loads on existing facilities in the Plutonium Facilities Complex. This comprehensive seismic hazard analysis of PF-4 provides a better understanding of the tensional stress the building could sustain during an earthquake, and how it might react during an earthquake event. Additionally, paleoseismic trenching investigations conducted in 2018 provide new seismic source characterization information on earthquake timing and recurrence to be incorporated into the upcoming update to the LANL PSHA.

Although many subsidiary fault strands of the Pajarito fault system are present across the Pajarito Plateau, numerous site-specific investigations at TA-55 found no evidence for any active surface-displacing faults at the Plutonium Facility Complex (LANL 1999; LANL 2008). Investigations at and near TA-55 using intensive geologic field techniques have concluded that the identified geologic structures pose no independent seismic surface rupture hazard (DOE 2011, ch. 3, p. 27). The potential for seismically induced land subsidence at TA-55 is expected to be low and negligible for soil liquefaction (DOE 2011, ch. 3, p. 28).

The 2018 LANL SWEIS SA evaluated potential changes in conditions and an analysis for seismic activity and risks since the 2008 LANL SWEIS was issued. The 2018 LANL SWEIS SA did not identify USGS data from 2014 although, as Figure 3-1 indicates, the NNSA data provides a more conservative case for analysis. A principle change was the issuance of the 2009 Defense Nuclear Facilities Safety Board Recommendation following the 2007 seismic hazard study. Subsequently, the 2007 seismic hazard study was updated in 2009 to incorporate a new set of ground motion attenuation relationships and to examine potential conservatism in the 2007 study (LANL 2009). The 2009 recommendation from the DNFSB identified the need to execute both immediate and long-term actions to reduce risks posed by a seismic event at PF-4 (DNFSB 2009, DOE 2018a, p. 55). In 2017, DNFSB submitted a letter recognizing that numerous upgrades have been completed and other improvements would continue to be implemented at the Plutonium Facility to continue meeting seismic hazard requirements (DNFSB 2017). In 2019, DNFSB submitted a report expressing concerns on delays for completing seismic upgrades and improvements to the Plutonium Facility. NNSA acknowledges concerns regarding delays and will continue to implement seismic upgrades and improvements to PF-4 prior to implementing pit production analyzed in this SA.

Based on information gathered for the LANL Seismic Analysis of Facilities and Evaluation of Risk Project there are no new seismic conditions at TA-55 that vary from the accident analysis presented in the 2008 LANL SWEIS (LANL 2019a).

3.3.1.2 *Potential Impacts as a Result of Pit Production*

Data in the USGS 2014 study do not identify any new hazard posed by a seismic event at PF-4. The proposed action would not increase the MAR as the MAR in TA-55 would be administratively controlled to reduce potential consequences to human health and environment in an accident scenario (LANL 2018a); therefore, the facility accident scenario as described in the 2008 LANL SWEIS for earthquakes continues to be the appropriately conservative accident scenario for the proposed action. Population in the ROI increased about six percent since 2008, which does not constitute a significant change and would not significantly increase potential population doses from accidents (NM-IBIS 2018).

NNSA continues to implement immediate and long-term actions to reduce risk of human health impacts as a result of a seismic-spill-fire scenario at PF-4. PF-4 structural and safety upgrades to address seismic risk include (1) glovebox support stands, (2) structural modifications identified in LANL's Seismic Analysis of Facilities and Evaluation of Risk Project, (3) carbon fiber reinforced polymer to strengthen roof girders, (4) shear strengthening of short basement columns, (5) addition of seismic rattle space in basement columns that were constrained by reinforced masonry walls, (6) upgrades to confinement system safety, and (7) anchorage upgrades to a number of safety class components. Additional safety upgrades are ongoing for PF-4 including ventilation system modifications, fire alarm system replacements, and fire suppression modifications (LANL 2019a). NNSA will continue to revise the PF-4 DSA to identify further immediate and long-term actions related to risks from seismic geology prior to implementation of the proposed action (*see* Table 3-1 for additional discussion of Facility

Accidents). NNSA is also considering DNFSB comments (2019 DNFSB) provided on the PF-4 DSA.

3.3.1.3 *Differences in Potential Impacts*

NNSA finds that potential impacts of seismic activity and risk levels related to pit production are consistent with the impacts analyzed in the 2008 LANL SWEIS (DOE 2008a) and the evaluation in the 2018 LANL SWEIS SA (DOE 2018a).

3.3.2 Human Health – Public and Workers

3.3.2.1 *Affected Environment, Existing NEPA Analysis, and New Information*

The 2008 LANL SWEIS analyzed potential impacts to workers and the public from operations at LANL that include radiological and chemical impacts for all operations including pit production (DOE 2008a). The 2018 LANL SWEIS SA incorporated new requirements under DOE Order 458.1 for protecting the public and the environment from risk from radiation associated with DOE facilities. These protections include the all-pathway public dose limit of 100 millirem per year, requirements for clearance of real and personal property, public exposure limits under as low as reasonably achievable principles, requirements for environmental monitoring, and all-pathway dose limits for the protection of biota (DOE 2018b, p. 95).

Public Health

Public exposure associated with the activities within the Pajarito Corridor is primarily limited to the inhalation of particles from chemical and radiological emissions and ingestion of contaminated foodstuffs and water. Ingestion pathway dose to LANL operators is extremely small and is most likely due to naturally occurring radioactivity in the environment (DOE 2018b). A hazardous chemical emission of concern from the Plutonium Facility Complex is beryllium. Beryllium emissions are controlled at LANL by a high-efficiency particulate air filtration with a removal efficiency of 99.95 percent and are unlikely to affect members of the public.

The majority of offsite dose from all LANL operations to the public comes by point source emissions from LANL's tritium facilities and the Los Alamos Neutron Science Center (LANL 2018b). The Pajarito Corridor has several other radiological emission point sources at three Technical Areas: TA-48-1, Radiochemistry Complex; TA-55, RLUOB and PF-4; and TA-50, Radioactive Liquid Waste Treatment Facility and the Waste Management Facility. Radiological emissions are controlled using multiple stages of high-efficiency particulate air filters with a 99.95 percent removal efficiency.

In 2018, the maximum offsite dose to the MEI was 0.35 millirem (LANL 2019b). The Environmental Protection Agency radioactive air emissions limit for DOE facilities is 10 millirem per year. In 2017, the Plutonium Facility Complex accounted for 2.28×10^{-4} millirem or 0.05 percent of the total maximum offsite dose to the MEI (LANL 2018b). In 2017, the offsite dose to the population within 50 miles of LANL has been estimated to be 0.2 person-

rem per year (LANL 2018b). The 2008 LANL SWEIS Expanded Operations Alternative (including production of 80 pits per year) projected a dose to the MEI of 8.2 millirem per year and an offsite dose of 36 person-rem (DOE 2008a, ch. 5 p. 96, Table 5-22). The 2017 population in ROI was about 418,432 (NM-IBIS 2018).

Worker Health

NNSA operates in a manner that protects the health and safety of employees and the public, preserves the quality of the environment, and prevents property damage. LANL uses workplace evaluation and establishes controls, training, and medical surveillance to maintain worker safety and health. Most workplace injuries at LANL are sprains and strains associated with everyday activities (LANL 2019b). In 2018, LANL's Total Recordable Cases were 89 (LANL 2019b). Recordable cases are those that were submitted to the Occupational Safety and Health Administration and required treatment beyond first aid or a diagnosis of significant injury or illness. In 2018, LANL's days away, restricted or transferred cases were 21, or 0.21 case for every 200,000 hours worked (LANL 2019b). LANL's three-year average Total Recordable Cases and Days Away, Restricted or Transferred cases were 1.17 and 0.23 respectively. These rates were evaluated against comparison industries' three-year rates of 1.87 and 0.88 (LANL 2019b). Recordable injuries that require the worker to miss work or changes in job responsibilities were recorded in the cases resulting days away or restricted or transferred duties database.

Workers at the Plutonium Facility Complex, Transuranic Waste Facility, and at other LANL locations within the Pajarito Corridor, may be exposed to a variety of hazardous chemicals and radioactive materials. Exposure pathways to workers include direct dermal contact, inhalation of particles, and ingestion. Typically, operations are controlled so workers that may be exposed to these materials are below the safety threshold of concern throughout the duration of work performance. LANL evaluates all operations and prevents worker exposures to hazardous chemicals through engineering and administrative controls, and the use of appropriate personal protective equipment.

Occupational radiation exposure to workers is controlled and monitored to ensure that an individual's dose is as low as reasonably achievable.

In 2017, of the 10,876 monitored[15] workers at LANL, 1,850 workers had received a measurable effective dose (DOE 2018b). The total effective dose to workers within the Plutonium Facility Complex was 109 person-rem, which represents the majority of collective total effective dose throughout LANL (LANL 2020). In 2018, the highest individual dose for a worker at the Plutonium Facility Complex was 1,483 millirem which is below regulatory and administrative limits (LANL 2020). The DOE limit on annual worker radiation exposure is 5,000 millirem as

[15] All monitored workers LANL enrolled in the LANL dosimetry program.

mandated in 10 CFR 835. DOE established an agency-wide administrative control limit of 2,000 millirem per year in its *Radiological Control Manual* (DOE 1994).

3.3.2.2 *Potential Impacts as a Result of the Proposed Action*

Public Health

Collective total effective dose within the Plutonium Facility Complex would increase with the implementation of the proposed action. Based on projections, by implementing pit production, the collective population within 50 miles of LANL would receive a dose of 2.8×10^{-5} person-rem per year for 80 pits per year and 1.05×10^{-5} person-rem per year for 30 pits per year, see Table 3-2. The calculated dose to the MEI is 6.7×10^{-6} millirem per year for 80 pits and 2.5×10^{-6} millirem per year for 30 pits, see Table 3-2 (LANL 2020). The population in the ROI increased approximately six percent since 2008, which does not constitute a significant change and would not significantly increase potential doses from the proposed action (NM-IBIS 2018).

Worker Health

The individual dose to workers performing radiological work is calculated to be approximately 206 person-rem per year for 80 pits per year and 155 person-rem per year for 30 pits per year, see Table 3-2 (LANL 2020). Staff would be administratively controlled to a maximum dose of 2,000 millirem per year. Construction worker collective dose has been estimated at 100 person-rem per year for work inside PF-4 and 0.07 person-rem for work outside of PF-4 (LANL 2020). The individual dose is 183 millirem per year inside PF-4 and 0.0225 millirem per year outside (LANL 2020).

TABLE 3-2. PROJECTED PUBLIC AND WORKER DOSE

Projected Dose	Population Dose within 50 miles (Person-rem per year)	MEI (Millirem per year)	Collective Dose to workers (Person-rem per year)
2008 LANL SWEIS projected dose for the Plutonium Facility under the Expanded Operations Alternative	0.2 [a]	0.012 [b]	220 [c]
2008 LANL SWEIS projected dose for all LANL operations under the Expanded Operations Alternative	36 [d]	8.2 [d]	543 [e]
Estimated Projected Dose for 30 pits under the proposed action at PF-4	1.05×10^{-5}	2.5×10^{-6}	155
Estimated Projected Dose for 80 pits under the proposed action at PF-4	2.8×10^{-5}	6.7×10^{-6}	206

a. (DOE 2008a, Appx. C p. 28, Table C-20).
b. (DOE 2008a, Appx. C p. 27, Table C-19).
c. (DOE 2008a, ch. 5 p. 104).
d. (DOE 2008a, ch. 5 p. 96, Table 5-22).
e. (DOE 2008a, ch. 5 p. 104, Table 5-27). As projected with the MDA Removal Option.

It is anticipated that repackaging of the MFFF fuel rods will take several months to complete and worker doses would not be significantly different than dose estimates for pit production (DOE 2008a). LANL has not conducted this activity before, so specific dose estimates are not available. The composition of the fuel rods suggests doses to workers would be no greater than pit production doses. It is anticipated that the concentration of material in the fuel rods is lower than that encountered with pit production. In addition, shielding will result in lower worker doses (LANL 2020).

The implementation of pit production would likely increase the number of annual occupational injuries and illnesses due to the expanded workforce and the construction of support buildings. It is assumed the total recordable cases and cases resulting days away or restricted or transferred duties would increase to approximately 104 Total Recordable Cases per year and 21 Days Away, Restricted or Transferred Cases per year with the implementation of the proposed action. The increase is proportional to an increase in the workforce population.

3.3.2.3 *Differences in Potential Impacts*

Public Health

The 2008 LANL SWEIS analyzed the expansion of pit production operations at the Plutonium Facility Complex. It projected the maximum offsite dose to a MEI would be approximately 0.012 millirem per year (DOE 2008a, ch. 5 p. 90). The proposed pit production estimated offsite dose to the MEI is 6.7×10^{-6} millirem per year for 80 pits per year and 2.5×10^{-6} millirem per year for 30 pits per year (Table 3-2). This projection is less than the 0.012 millirem per year as projected in the 2008 LANL SWEIS. As pit production expands at the Plutonium Facility Complex, the projected population dose is calculated to be 2.8×10^{-5} person-rem per year for 80 pits per year and 1.05×10^{-5} person-rem per year for the 30 pits per year (LANL 2020) (Table 3-2). This projection is less than the 0.2 person-rem per year as presented in the 2008 LANL SWEIS (DOE 2008a, ch. 5 p. 98).

Worker Health

In the 2008 LANL SWEIS, the projected collective worker dose by expanding pit production was 220 person-rem per year (DOE 2008a, ch. 5 p. 104, Table 5-27). However, the projected collective worker dose associated with the proposed action is estimated to be 206 person-rem per year for 80 pits per year and 155 person-rem per year for 30 pits per year (LANL 2020) (Table 3-2).

The 2008 LANL SWEIS projected an increase in the number of annual occupational injuries and illnesses from pit production (DOE 2008a, ch. 5 p. 106). Higher occupational injuries and illnesses are due to an increase in workforce size and project related construction work. The 2008 LANL SWEIS estimated both the Total Recordable Cases and Days Away or Restricted or Transferred duties would be 12 to 13 percent higher than existing operations (DOE 2008a, ch. 5 p. 106). The projected Total Recordable Cases and Days Away or Restricted or Transferred duties associated with the implementation of pit production are expected to be no greater than the

expected increase in full-time equivalents (FTEs) which would be three percent higher than existing operations. However, this percentage is expected to be lower because of multiple shifts. All human health and public safety potential impacts under pit production caused by occupational injuries and illnesses are consistent with those analyzed in the 2008 LANL SWEIS.

Impacts analyzed for human health and public safety for the expansion of the pit production mission in the 2008 LANL SWEIS are consistent with the potential impacts related to the proposed pit production.

3.3.3 Socioeconomics

3.3.3.1 *Affected Environment, Existing NEPA Analysis, and New Information*

The 2008 LANL SWEIS estimated a staffing increase of 1,890 associated with the Expanded Operations Alternative. The 2008 LANL SWEIS analyzed potential impacts related to socioeconomics for employment, housing, local government finance, and services within the three counties closest to LANL. In the 2008 LANL SWEIS the counties of Los Alamos, Rio Arriba, and Santa Fe make up the socioeconomic region of influence (DOE 2008a). The 2018 LANL SWEIS SA analyzed potential impacts to socioeconomics in an expanded region of influence that included Sandoval, Los Alamos, Rio Arriba, and Santa Fe counties (DOE 2018a, p. 101). The analysis in this SA evaluates an expanded region of influence (e.g., Sandoval, Mora, San Miguel, Taos, Los Alamos, Rio Arriba, and Santa Fe counties) because, as stated in the 2019 Economic Impact of Los Alamos National Laboratory, potential socioeconomic impacts would be more apparent due to the majority of LANL FTEs residing in those counties (UNM 2019).

Employment

Regional Economic Characteristics

The ROI for LANL includes seven-counties in northern New Mexico. The majority (83 percent) of 12,416 LANL FTEs and their families live in Los Alamos, Rio Arriba, Mora, Sandoval, San Miguel, Taos, and Santa Fe counties (LANL 2020, UNM 2019). The socioeconomic impacts associated with pit production would have the most potential to directly or indirectly influence the economic conditions of those counties.

The total population of the ROI is 418,432 people with a total workforce population of 137,157 people (NMDWS 2018, DOC 2018). As of 2018, LANL FTEs represent 8.9 percent of the total workforce within the ROI and 1.0 percent of the total workforce in New Mexico (NMDWS 2018). For comparison, as of 2018, there were 10,308 New Mexico state employees and 7.5 percent of that workforce was within the ROI (NMDWS 2018). The annual unemployment rate in the ROI is 4.8 percent, compared to New Mexico's annual unemployment rate of 4.9 percent (DOC 2018).

Regional Income

As of 2018, LANL has a total direct labor income of $1.34 billion. Expenditures by LANL and its FTEs generate $1.65 billion in sales for businesses within the ROI. Indirectly, LANL supports 19,122 jobs and those jobs equal $1.57 billion in labor income to the State of New Mexico (UNM 2019).

LANL benefits New Mexico by creating jobs, generating income, and purchasing goods and services from local businesses. Based on a three-year study, LANL expended an average of $752.6 million on procurement of goods, services, and construction within the ROI, New Mexico, and out of state. Just over one-half of those purchases were from New Mexico-based businesses (UNM 2019).

Housing

Table 3-3 lists the total number of housing units and vacancy rates in the ROI. In 2018, there were a total of 199,678 housing units in the ROI, with 75 percent of those occupied and 25 percent vacant. The median value of owner-occupied homes in Los Alamos County ($285,300) was the greatest of the seven counties (DOC 2018). The vacant units and vacancy rate represent housing units that were not currently owner-occupied. Vacancy rate can be an indicator of available housing in a particular area. Typically, lower vacancy rates indicate housing shortage (<50 percent), while higher rates indicate housing surplus (>50 percent). Although available housing can change year-to-year, in 2018 there was a general housing shortage as indicated by the low vacancy rate across the ROI.

TABLE 3-3. HOUSING IN THE REGION OF INFLUENCE

Housing (2018)	
Total units	199,678
Owner-occupied housing units	148,988
Vacant units	50,690
Average owner-occupied housing rate	75 percent
Average vacancy rate	25 percent
Average median value	$196,257

Source: (DOC 2018)

Los Alamos County is experiencing a housing shortage that affects the quality of life for individuals that work in Los Alamos, including at LANL, and reside elsewhere in the ROI. A 2019 housing study indicates that approximately 576 new units would be needed to accommodate new hires to the county including LANL (LAC 2019a, p. 44).

Local Government Finances

LANL, through direct and indirect activities, contributes to state and local governments revenues that fund education, public safety, health and human services, judiciary, and other public services

(UNM 2019). LANL FTEs and vendors use services provided by state and local government. Table 3-4 summarizes LANL contributions to the New Mexico general fund and local governments within the ROI.

TABLE 3-4. FISCAL REVENUES TO STATE AND ROI GOVERNMENTS

Revenue (2017)	New Mexico	Region of Influence
Personal Income	$62,092,631	-
Gross Receipts	$67,320,454	$47,366,069
LANL Residential Property	-	$20,307,999
LANL Non-Residential property	-	$3,084,985
Total Revenue	**$129,413,085**	**$70,759,053**

Source: (NMDWS 2018)

Services

New Mexico is divided into 89 school districts, eight of which are predominantly located within the ROI. As of the 2018/2019 school year, the total public enrollment in the eight districts within the ROI was 23,473 students (NMPED 2018).

The Los Alamos County Fire Department provides fire suppression, medical, rescue, and fire prevention services to both LANL and Los Alamos County. There are six manned fire stations with 150 budgeted personnel positions (LAC 2019b).

As of 2018, the Los Alamos County Police Department had 33 officers. The ratio of commissioned police officers in Los Alamos County was 1.76 per 1,000 of population (LAC 2019c).

3.3.3.2 *Summary of Potential Impacts as a Result of the Proposed Action*

Socioeconomic impacts are defined by changes to the demographic and economic characteristics of a region. The numbers of jobs created by the implementation of the proposed action could affect regional employment, income, and expenditures. Job creation is characterized by two types (1) construction-related jobs, which are short-term and less likely to affect public services, and (2) operations-related jobs, which are long-term and could create additional public service requirements in the ROI.

Potential impacts to direct socioeconomic resources were determined by analyzing projected changes in employment (in terms of FTEs at LANL). Changes in employment are based on the projected employment needs related to the proposed action. Employment for the rest of LANL is assumed to remain the same.

The 2008 LANL SWEIS evaluated impacts to indirect socioeconomics resources using multipliers developed by the U.S. Department of Commerce, Bureau of Economic Analysis's

Regional Input-Output Modeling System to predict the total LANL socioeconomic impacts to the ROI (DOE 2008a). Based on the results of a recent report, *The Economic Impact of Los Alamos National Laboratory*, the initial modeling results were determined to be valid (UNM 2019). Additional modeling for this analysis is not required because changes to indirect socioeconomic resources have not occurred.

It is anticipated that the implementation of pit production would require the addition of approximately 400 new FTEs at LANL. The proposed change would result in direct changes to employment, salaries, and expenditures in the ROI, and demands for social services. The indirect changes within the ROI include the creation of additional jobs that would create local opportunities.

Projected changes used to determine whether there would be an impact to socioeconomic resources in the ROI include housing units, construction requirements at LANL, local government finances, and the need for public services.

Employment

The addition of 400 FTEs would be a three percent increase to the current FTEs at LANL, a total of 12,734 FTEs (UNM 2019). For the purpose of this analysis, it is assumed that the majority of additional FTEs would reside within the ROI. With the additional FTEs, it is anticipated that another 575 indirect jobs would be added to the estimated 19,122 indirect jobs that LANL supports. Peak annual construction employment during this time would be approximately 200 individuals, and potential socioeconomic impacts associated with construction would be bounded by operational impacts.

Construction efforts related to pit production would increase; however, construction projects would likely be staffed by workers already present in the ROI. It is anticipated as support buildings are constructed there would be regional increases in construction jobs, but this increase would be short-term.

Housing

An increase within the ROI in direct and indirect employment would likely increase the need for housing. The vacancy rate of 25 percent throughout the ROI has been relatively low when compared to similar locations with national laboratories. For example, Sandia National Laboratories in Bernalillo County, NM, had a vacancy rate of 37.2 percent, and Oak Ridge National Laboratory in Anderson County, TN, had a vacancy rate of 32.6 percent (DOC 2018). Nationally, the vacancy rate has been 36.2 percent (DOC 2018). A low vacancy rate indicates that available housing in a ROI is limited. Any available housing in the ROI would likely be filled quickly, and a larger percentage of LANL-related housing needs would be accommodated by workers relocating outside the ROI (*see* Section 3.3.6 for indirect impacts on Transportation). In Los Alamos County, new planned units and existing units for sale would provide for approximately 34 percent (197 units) of current housing needs. Future housing plans to mitigate housing needs in Los Alamos County are being developed (LAC 2019a).

Additional housing needs in the ROI would not be expected to exceed regional growth projections because the region is expected to grow by approximately 6.7 percent between 2016 and 2026 or 0.67 percent annually (NMDWS 2018).

Local Government Finance

LANL in 2017 through direct and indirect employment and procurements, contributed $70,759,053 in tax revenue to local governments within the ROI and $129,413,085 to the New Mexico general fund. The implementation of pit production would be expected to increase tax revenue within the ROI and New Mexico. In terms of employment, the expected increase of direct FTEs would increase an estimated 0.03 percent to the annual gross receipt taxes. Any increases in tax revenues would offset the cost of additional services to support the associated increased population.

Services

Municipal services (i.e., police and fire) in conjunction with LANL-related employment (both direct and indirect) would likely increase in proportion to increases in LANL-related employment (both direct and indirect) associated with the implementation of pit production.

As expected, FTEs would relocate within the ROI, and annual school enrollments would likely increase. An increase in school enrollment would require additional funding assistance from the State of New Mexico. With limited housing in the ROI, expected increases to school enrollment would likely be greater in neighboring school districts.

3.3.3.3 *Differences in Potential Impacts*

The 2008 LANL SWEIS estimated 15,400 FTEs would be employed at LANL (an increase of 1,890 FTEs) under the Expanded Operations Alternative and up to 27,130 indirect positions would be employed within the ROI (DOE 2008a, ch. 5 p. 121). Proposed pit production would add approximately 400 direct and 575 indirect jobs to the ROI.

Similar to projected employment, the 2008 LANL SWEIS analysis expected that (1) additional housing needs would not exceed regional growth projections of approximately 2.3 percent annually, (2) annual gross receipt taxes would increase between 1.3 and 3.9 percent, and (3) annual school enrollment would increase as the workforce relocated to the ROI (DOE 2008a, ch. 5 p. 122).

Potential impacts with regards to socioeconomics related to pit production are anticipated to be consistent with the impacts analyzed in the 2008 LANL SWEIS (DOE 2008a) and the evaluation in the 2018 LANL SWEIS SA (DOE 2018a).

3.3.4 Environmental Justice

3.3.4.1 *Affected Environment, Existing NEPA Analysis, and New Information*

As defined by Executive Order 12898—"Federal Actions to Address Environmental Justice in Minority and Low-Income Populations"—environmental justice is the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies (EPA 2016; Executive Order 12898). Environmental justice is analyzed to identify and address the fair treatment of all people so that no group of people should bear a disproportionate burden of environmental harms and risks resulting from negative environmental consequences of industrial, governmental, and commercial operations (EPA 2019).

Minority and Low-Income Populations

In this section, NNSA will assess whether minority and low-income populations could be disproportionately affected by the proposed action. Minority populations are defined as those members of the population that are not single-race white and not Hispanic. Populations of individuals who are members of the following groups are considered part of a minority population: American Indian or Alaskan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic (EPA 2019).

Low-income populations, as defined by the poverty status, are represented as the number of persons with annual income below the national poverty threshold. The Census Bureau defines the 2018 poverty threshold as an annual income of $12,784 for one person with no dependents and an annual income of $25,701 for a family of four (DOC 2018). Annual incomes below these thresholds are considered low-income populations.

The minority populations and low-income populations that would potentially be influenced by the pit production mission are described in terms of the ROI. Similar to the 2008 LANL SWEIS, the ROI for environmental justice consists of Bernalillo, Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe, and Taos counties (DOE 2008a, ch. 4 p. 169). The majority of properties within a 50-mile radius of LANL consist of Federal property without full-time residents. The analysis in this SA evaluates the ROI that captures minority and low-income populations that would most likely be impacted by the proposed action. By including the entire populations of surrounding counties, a conservative estimate of potential impacts is more likely. The population in the ROI increased approximately six percent since 2008 (NM-IBIS 2018). The analysis in this SA evaluates the ROI that includes all counties within a 50-mile radius of PF-4 (DOE 2008a, ch 4. p. 169).

The 2018 demographic profile of the ROI is included in Table 3-5 (DOC 2018). Persons self-designated as minority individuals in the ROI comprise 68 percent of the total population (DOC 2018). This minority population is composed largely of Hispanic or Latino/a and American Indian residents. The majority of the Hispanic or Latino/a are located in the Española Valley and in the Santa Fe metropolitan area. The Pueblos of San Ildefonso, Cochiti, Jemez, Sandia, Santa

Clara, Ohkay Owingeh, San Felipe, Santo Domingo, Nambe, Picuris, Pojoaque, Taos, Tesuque, Zia, and part of the Jicarilla Apache Indian Reservation are included in the ROI. Within the ROI approximately 68,184 (16 percent) of the population are considered low-income (DOC 2018).

TABLE 3-5. DEMOGRAPHIC PROFILE OF REGION OF INFLUENCE

Population Group	Region of Influence – Population (percent)
Hispanic	232,023 (56)
Black or African American	5,019 (1)
American Indian or Alaska Native	31,370 (8)
Asian	5,079 (1)
Native Hawaiian and other Pacific Islander	597 (0.1)
Two or More Races	8,843 (2)
Total Minority	**282,931 (68)**
Total White	**135,501 (32)**
Total	**418,432 (100)**

Source: (DOC 2018).

Disproportionately High and Adverse Effects

Adverse health effects are measured in risks and rates that could result in latent cancer fatalities, as well as other fatal or nonfatal adverse impacts on human health. Adverse health effects may include bodily impairment, infirmity, illness, or death. Disproportionately high and adverse human health effects occur when the risk or rate of exposure to an environmental hazard for a minority or low-income population is significant (as defined by NEPA) and appreciably exceeds the risk or exposure rate for the general population or for another appropriate comparison group (CEQ 1997, DOE 2008a).

A disproportionately high environmental impact that is significant (as defined by NEPA) refers to an impact or risk of an impact on the natural or physical environment in a low-income or minority community that appreciably exceeds the environmental impact on the larger community. Such effects may include ecological, cultural, human health, economic, or social impacts. An adverse environmental impact is an impact that is determined to be both harmful and significant (as defined by NEPA). In assessing cultural and aesthetic environmental impacts, impacts that uniquely affect geographically dislocated or dispersed minority or low-income populations or American Indian Tribes are considered (CEQ 1997, DOE 2008a).

Environmental Justice Analysis in NEPA Documents

Environmental justice and potential disproportionately high and adverse effects were analyzed in the 2008 LANL SWEIS for pit production operations and associated activities. No disproportionately high and adverse impacts were anticipated from pit production operations (DOE 2008a, ch. 5 p. 232, Appx. C.1.4). The 2018 LANL SWEIS SA re-evaluated the potential

impacts to minority and low-income populations in the ROI and addressed potential changes from actions that were implemented since the 2008 LANL SWEIS as well as new projects that include construction of support buildings (DOE 2018a, pp. 125–126). Construction activities analyzed in the 2011 CMRR SEIS were considered to be temporary and would not extend beyond the boundary of LANL. For these reasons, construction activities were not anticipated to result in disproportionately high and adverse environmental impacts on the low-income and minority populations within the ROI (DOE 2011, ch. 4 p. 22). Construction of support buildings was analyzed in the 2015 CMRR SA and no disproportionately high and adverse impacts on low-income or minority populations were anticipated within the ROI (DOE 2015a, pp. 22–23).

3.3.4.2 *Potential Impacts as a Result of the Proposed Action*

Environmental justice impact analysis focuses on the potential for disproportionately high and adverse impacts to minority and low-income populations in the ROI from implementing pit production. Factors considered in determining whether pit production would have disproportionate impacts to minority and low-income populations, include the extent or degree the action would change any social, economic, physical, environmental; or health conditions that disproportionately affect the minority population or low-income populations.

Potential impacts to the minority and low-income populations associated with the pit production are comparable to the population as a whole. Potential impacts to the population as a whole are consistent with the impacts discussed in the human health and public safety analysis provided in Section 3.3.2, socioeconomics analysis provided in Section 3.3.3, and transportation analysis provided in Section 3.3.6. It is not anticipated that pit production would change any social, economic, physical, environmental, or health conditions of the population, and specifically minority populations or low-income populations.

As discussed in Section 3.3.2, the estimated radiological dose from proposed pit production operations is anticipated to be less than impacts presented in the 2008 LANL SWEIS (0.2 person-rem per year) (DOE 2008a, ch. 5 p. 91). Based on projections, by implementing pit production, the collective population within 50 miles of LANL would receive a dose of 2.8×10^{-5} person-rem per year for 80 pits per year and 1.05×10^{-5} person-rem per year for the 30 pits per year (LANL 2020). This is a minor increase and is not considered to be a disproportionately high or adverse effect to minority or low-income populations.

Human health impacts from radiological exposure through special pathways are a potential concern for impacts to minority populations and low-income populations. Potential special pathways include subsistence consumption of native vegetation (piñon nuts and Indian tea [cota]), locally grown produce and farm products, groundwater, surface waters, fish (game and nongame), game animals, other foodstuffs, and incidental consumption of soils and sediments (i.e., on produce, in surface water, and ingestion, or inhaled dust) (DOE 2008a, Appx. C p. 5). Radiological exposure through these special pathways are mostly associated with the release of contaminants from site remediation efforts. Potential impacts to minority populations and low-income populations through these special pathways would only occur with the disturbance of soil

associated with remediation efforts. Though the proposed action would involve soil disturbance, the proposed action is not expected to impact special pathways as it is not a remediation effort (DOE 2008a, ch. 1 p. 46).

3.3.4.3 *Differences in Potential Impacts*

Based on the analyses for human health–public and workers, socioeconomics, transportation, and the proposed action, it is not likely to adversely affect human health through special pathways; the pit production mission would not result in disproportionately high and adverse impacts on low-income or minority groups and would be within the analysis provided in the 2008 LANL SWEIS (DOE 2008a, ch. 5, p. 173).

3.3.5 Waste Management

3.3.5.1 *Affected Environment, Existing NEPA Analysis, and New Information*

Construction and demolition debris that are not hazardous may be disposed of in an approved municipal landfill or an approved construction and demolition debris landfill (NMAC 20.9.1). In 2018, 386 cubic meters of construction and demolition debris were processed at LANL (LANL 2019b).

Radioactive and chemical wastes are generated by production, maintenance, and remediation activities. Radioactive wastes are divided into the following categories (1) LLW, (2) MLLW, and (3) TRU including mixed TRU. Chemical wastes categories include (1) hazardous (i.e., designated under Resource Conservation and Recovery Act (RCRA) regulations), (2) toxic, (3) hazardous construction and demolition debris, and (4) special waste as defined by RCRA[16]. Waste quantities vary with different operations, construction activities, and implementation of waste minimization activities. Site-wide capabilities to manage all waste categories generated at the Laboratory, including pit production, are analyzed in the 2008 LANL SWEIS under the solid radioactive and chemical waste facilities (DOE 2008a, ch. 3 pp. 51–55, Section 3.1.3.15) and the radioactive liquid waste treatment facility (DOE 2008a, ch. 3 pp. 44–46, Section 3.1.3.13). Activities and capabilities for waste management include: waste characterization, packaging, and labeling; waste transport, receipt, and acceptance; waste treatment; waste staging; waste disposal; and radioactive liquid waste treatment. Waste management facilities across the Laboratory would continue to conduct these activities to support pit production.

Annual waste estimates for routine operations were provided in the 2008 LANL SWEIS including projected waste generation at the Plutonium Facility Complex, see Table 3-6. The 2008 LANL SWEIS No Action Alternative is used to compare to waste generated in 2018 for all LANL operations including the Plutonium Facility Complex. TRU waste, LLW, and mixed

[16] Special wastes include cement kiln dust waste, crude oil and natural gas waste, fossil fuel combustion waste, and mining and mineral waste.

LLW were no greater than the projections in the 2008 LANL SWEIS. Operations contributing to chemical waste exceedance of the 2008 LANL SWEIS estimate were press filter cake from the LANL Sanitary Effluent Reclamation Facility in TA-03 (LANL 2019b). The Plutonium Facility Complex exceeded the 2008 LANL SWEIS projections of mixed LLW due to waste drums from TA-55 that were converted from TRU waste to MLLW waste (LANL 2019b). Table 3-6 describes the amount of radioactive and chemical waste that was generated in 2018 at LANL.

TABLE 3-6. 2018 RADIOACTIVE AND CHEMICAL WASTE GENERATED AT LANL

Waste Type	2008 LANL SWEIS No Action Alternative Projection for LANL/Plutonium Facility Complex (Cubic yards per year)	2018 LANL annual total (Cubic yards per year)	2018 Plutonium Facility Complex annual total (Cubic yards per year)
LLW	12,000 / 990 [a]	4,622.3 [b]	405.3
MLLW	130 / 20 [a]	79.7 [b]	26.2 [b, c]
TRU/Mixed TRU	570 / 440 [a]	201 [b]	118.8 [b]
Chemical	2,749 / 19 [a]	3,747.9 [b, e]	17.3 [b, d]

a. (DOE 2008a, ch. 5 p. 139, Table 5-39).
b. (LANL 2019b). Reported in cubic meters. To convert to cubic yards, multiply by 1.308.
c. In 2018, MLLW at the Plutonium Facility Complex exceeded 2008 LANL SWEIS projections due to waste drums from TA-55 that were reclassified from TRU waste to MLLW waste, which contributed to 87 percent (17.8 cubic yards) of the total MLLW generated at the Plutonium Facility (LANL 2019b).
d. Pounds x 10^3 per year
e. The total LANL volume of chemical waste was above the annual volume projected in the 2008 SWEIS. Chemical waste exceeded 2008 LANL SWEIS projections due to the disposal of press filter cakes from the Sanitary Effluent Reclamation Facility and due to non-routine maintenance, upgrade, and cleanup activities. LANL has generated less than half of the cumulative chemical waste analyzed in the 2008 LANL SWEIS so an exceedance in a given year is not considered significant (LANL 2020). LANL continues efforts to reduce its chemical waste volume and experienced a significant reduction during 2018 (9,062 cubic yards) (LANL 2019b).

3.3.5.2 *Summary of Potential Impacts as a Result of the Proposed Action*

Potential impacts associated with the implementation of pit production include the management of construction and demolition debris and radioactive and chemical waste. Construction and demolition debris may be disposed of at an approved solid waste landfill, an approved construction and demolition debris landfill, or recycled where appropriate.

Radioactive and chemical wastes are expected to be generated from the pit production operations, modifications, and upgrades to existing operational equipment. Projected radioactive and chemical waste quantities related to pit production are presented in Table 3-7. Across the site, LANL generation of LLW would be under the 2008 LANL SWEIS site estimate for 80 pits per year. The generation of LLW for production of 30 pits per year would be under Plutonium Facility Complex and site estimates of LLW generation in the 2008 LANL SWEIS (*see* Table 3-7 of this SA). Similarly, generation of chemical waste for production of 30 and 80 pits per year would exceed the estimate for the Plutonium Facility Complex but remain under the site estimate for chemical waste per year as analyzed in the 2008 LANL SWEIS. LLW and chemical waste projections for the proposal remain well under the total site estimates in the 2008 LANL

SWEIS. Local area exceedances that do not result in a site-wide exceedance are not anticipated to result in any additional impacts beyond those already considered in the 2008 LANL SWEIS. All chemical waste and LLW would continue to be managed under LANL waste management operations using waste management facilities across the site (DOE 2008a, ch. 3 pp. 51 – 55).

LANL waste infrastructure at the Plutonium Facility Complex would require some modification to be able to meet the increases in waste generated. One modification would be expanding space at existing waste storage areas. Overall, LANL waste infrastructure is expected to accommodate waste generated under proposed pit production. The number of waste shipments under proposed pit production is not expected to increase beyond what was analyzed in the 2008 LANL SWEIS (*see* Section 3.3.6). Exceeding rates of generation at the Plutonium Facility Complex for LLW and chemical waste volumes, as analyzed in the 2008 LANL SWEIS, does not affect LANL's capacity to compliantly store these wastes.

TABLE 3-7. PROPOSED ACTION WASTE ESTIMATES

Waste Type	2008 LANL SWEIS Expanded Operations Alternative Projection for LANL / Plutonium Facility Complex (Cubic yards per year)	80 pits per year projected waste (Cubic yards per year)	30 pit per year projected waste (Cubic yards per year)
LLW	13,000 / 1,400 [a]	2,355 [b]	885 [b]
MLLW	140 / 20 [a]	3.7 [b]	1.4 [b]
TRU/Mixed TRU	860 / 690 [a]	400 [b]	140 [b]
Chemical [c]	2,750 / 19 [a]	414 [b, d]	155 [b, d]

a. (DOE 2008a, ch. 5 p. 149, Table 5-47).
b. (LANL 2020). Reported in cubic meters. To convert to cubic yards, multiply by 1.308. The projected LLW for 80 pits exceeds the estimate in the 2008 LANL SWEIS for the Plutonium Facility Complex under the Expanded Operations Alternative. The pit production estimate of 2,355 is based on data from 2007 through 2011 during pit production runs (LANL 2020). LANL will still be under the site estimate of 13,000 cubic yards per year.
c. Pounds x 10^3 per year
d. The chemical waste estimate for pit production (80 pits and 30 pits) is greater than the 2008 LANL SWEIS estimate for the Plutonium Facility Complex under the Expanded Operations Alternative. The pit production estimate is based on data from 2007 through 2011 during pit production runs (LANL 2020). LANL has generated less than half of the cumulative chemical waste analyzed in the 2008 LANL SWEIS (LANL 2020).

The estimate of TRU waste[17] for pit production is anticipated to remain below the 2008 LANL SWEIS estimate. It is anticipated that neither TRU waste from other activities at PF-4 nor total TRU waste from LANL would be greater than the 2008 LANL SWEIS estimates. Repackaging of the MFFF fuel rods discussed in Section 2.2.4 above would, conservatively, generate up to 200 TRU drums or 54 cubic yards (LANL 2020). This activity would not cause an exceedance of the 2008 LANL SWEIS estimate for TRU waste.

[17] All TRU waste considered in this SA would be defense TRU waste acceptable for disposal at WIPP.

The LLW estimate for all LANL operations in the 2008 LANL SWEIS was 13,000 cubic yards per year under the Expanded Operations Alternative. LLW from the proposed pit production and other site activities (approximately 7,000 cubic yards per year) would not be greater than the site-wide LLW estimate of 13,000 cubic yards per year. Projected LLW volume for any surge capacity could exceed the 2008 LANL SWEIS estimate for the Plutonium Facility Complex by approximately 955 cubic yards. The proposed pit production waste projection is based on waste generated during pit production in 2007 through 2011. Across the site, LANL generation of LLW would be under the 2008 LANL SWEIS site estimate for 80 pits per year. The generation of LLW for production of 30 pits per year would be under Plutonium Facility Complex and site estimates of LLW generation in the 2008 LANL SWEIS (*see* Table 3-7 of this SA and Table 3-8 of LANL 2019b). Similarly, generation of chemical waste for production of between 30 and 80 pits per year would exceed the estimate for the Plutonium Facility Complex but remain under the site estimate for chemical waste per year as analyzed in the 2008 LANL SWEIS. LLW and chemical waste projections would remain well under the total site estimates in the 2008 LANL SWEIS. All chemical waste and LLW would continue to be managed under LANL waste management operations using waste management facilities across the site (*see* DOE 2008a, ch. 3 p. 51 through 55). Repackaging of the MFFF fuel rods could generate one MLLW drum or less than one cubic yard (LANL 2020). This activity would not cause an exceedance of the 2008 LANL SWEIS estimate for MLLW waste.

Exceeding rates of generation at the Plutonium Facility Complex for LLW and chemical waste volumes, as analyzed in the 2008 LANL SWEIS, do not result in an impact for storage volume.

The 2008 LANL SWEIS projected total of 5.3 million gallons per year of liquid radioactive waste would be treated at the Radioactive Liquid Waste Treatment Facility (RLWTF) (DOE 2008a, ch.5, p. 136, Table 5-37). Based on the projected liquid waste that would be treated under pit production (1.7 million gallons per year) and the current annual treatment of liquid waste (one million gallons), it is expected that the proposed action would not exceed the 2008 LANL SWEIS analyzed projections (LANL 2019b).

3.3.5.3 *Differences in Potential Impacts*

Under the 2008 LANL SWEIS Expanded Operations Alternative, pit production would result in larger quantities of radioactive and chemical wastes, but NNSA does not expect this to cause significant impacts since the project overages are less than the anticipated cumulative waste totals that were projected in the 2008 LANL SWEIS (DOE 2008a, ch. 5 p. 148). The 2018 LANL SWEIS SA states that chemical and radioactive waste will fluctuate annually, but that the average generation for most waste types is projected to remain within the 2008 LANL SWEIS projections. LLW would potentially exceed the 2008 LANL SWEIS for the Plutonium Facility Complex but not for the site when producing 30 and 80 pits per year. Chemical waste generation would exceed estimates in the 2008 LANL SWEIS for production of 80 and 30 pits. LANL has generated less than half of the cumulative chemical waste analyzed in the 2008 LANL SWEIS (LANL 2020). Other waste estimates for the 30 and 80 pit production would not exceed the 2008 LANL SWEIS.

3.3.6 Transportation

3.3.6.1 *Summary of Affected Environment, Existing NEPA Analysis, and New Information*

The primary methods used for transportation analysis under the Expanded Operations Alternative include commuting FTEs and onsite and offsite waste and material shipments.

Motor vehicles are the primary means of transportation to and from LANL. Regional transportation routes connecting LANL with Albuquerque, Santa Fe, and Española include I-25 to US 84/285 or NM 30 to NM 502.

Commuting FTEs

The majority of commuters access Los Alamos County and LANL from NM 502. As of 2017, the annual average daily commuter traffic from NM 502 to Los Alamos and NM 502 to NM 4 through White Rock is between 8,000–15,000 vehicles per day (DOT 2018).

The majority of commuter traffic consists of personal vehicles. The Park & Ride service from Santa Fe and Española provides another transportation option for commuters. As of 2017, daily ridership using the Park & Ride service was 515 passengers, which represents approximately 68 percent of the total capacity (DOT 2017).

In 2017, there were approximately 4,400 motor vehicle accidents in Los Alamos, Rio Arriba, and Santa Fe counties resulting in 23 fatalities (DOT 2019a).

Onsite/Offsite Shipments

Hazardous, radioactive, industrial, commercial, and recyclable materials including wastes are transported to, from, and within LANL site boundaries during routine operations. Offsite shipments from and to LANL are carried by commercial carriers (e.g., truck, air-freight, and government transport) and by DOE safe secure transport trailers. Numerous regulations and requirements govern the transportation of hazardous and radioactive materials, including those of the U.S. Department of Transportation, U.S. Nuclear Regulatory Commission, DOE, U.S. Federal Aviation Administration, and International Air Traffic Association.

The primary route for the transportation of hazardous and radioactive materials, as designated by the State of New Mexico and governed by 49 CFR 177.825, is approximately a 40-mile corridor between LANL and Interstate 25 near Santa Fe. This route passes through the Pueblos of San Ildefonso, Pojoaque, Nambe, and Tesuque, as well as through Los Alamos and Santa Fe counties. The primary transportation route goes through the northern and western sides of the City of Santa Fe on NM 599 to I-25.

Onsite[18] hazardous and radioactive material shipments are transported in conformance with U.S. Department of Transportation regulations. In limited cases where materials are required to be shipped onsite without meeting conformance requirements, onsite roads are temporarily closed. Potential impacts (i.e., worker dose from handling and transporting radioactive materials) from these activities are part of normal operations and are analyzed in the 2008 LANL SWEIS (DOE 2008a, Appendix K).

Offsite transports of radioactive materials occur using both trucks and airfreight. The radioactive materials transported under pit production may include plutonium, uranium (both depleted and enriched), LLW, and TRU waste. Shipments are required to meet applicable U.S. Department of Transportation (49 CFR Parts 171–185) and U.S. Nuclear Regulatory Commission (10 CR 71.5) requirements as stated in the Hazardous Materials Transportation Act. Most unclassified shipments are transported offsite by commercial carriers. The destination of these materials includes disposal locations such as NNSS, WIPP, commercial sites in Utah, or material processing/recycling sites such as SRS, Pantex, LLNL, or Y-12. The 2008 LANL SWEIS evaluated transportation for potential impacts from all actions at LANL including those from pit production (*see* Table 3-8).

TABLE 3-8. TRANSPORTATION RISKS FROM 2008 SWEIS EXPANDED OPERATIONS ALTERNATIVE

Activities	Number of Shipments	Round Trip Miles Traveled (Million)	Incident-Free				Accident	
			Crew		Population		Radiological Risk [a]	Non-radiological Risk
			Dose (Person-rem)	Risk [a]	Dose (Person-rem)	Risk [a]		
Expanded Operations Alternative [b]	122,445	186.4[c]	910.3	0.55	286.8	0.17	0.0016	2.96
Pit Production Analyzed in this SA	1,553	2.3	18.0	0.01	8.95	0.0054	1.1×10^{-5}	0.024

a. Risk is expressed in terms of latent cancer fatalities, except for nonradiological risk, where it refers to the number of traffic accident fatalities.
b. DOE 2008a, Appx. K p. 25, Table K-6. Projections are for ten-year risks of transporting radioactive materials.
c. The 2008 LANL SWEIS reported round trip as 299.9 million kilometers. To convert to miles, multiply by 0.621371.

LLW and MLLW are transported to various locations, including the NNSS in Nevada; EnergySolutions disposal facility in Clive, Utah; and Waste Control Specialists disposal facility in Andrews County, Texas. TRU and mixed TRU wastes are characterized, certified, and placed in drums or other containers, which are then loaded into shipment containers for transport to

[18] A shipment is considered an onsite shipment if both the origin and destination are at LANL. Onsite transport constitutes the majority of activities that are part of routine operations in support of operations.

WIPP. In 2018, LANL completed 275 shipments of hazardous materials and 258 shipments of radioactive materials for a total of 533 waste shipments to offsite locations (LANL 2019b). Forty-six of the radioactive waste shipments went to NNSS.

DOE operates safe and secure trailers that are used for offsite shipments of SNM. Safe and secure trailers are similar in appearance to commercial tractor-trailers. However, the trailers are equipped with unique security and safeguard features that prevent unauthorized cargo removal and minimize the likelihood of an accidental radioactive material release caused by a vehicle accident.

For the purpose of this analysis, it is assumed that the population along the transportation routes analyzed in the 2008 LANL SWEIS has increased in a manner consistent with the overall U.S. population change. Since 2008, the U.S. population has increased by approximately eight percent; from 304 million people to approximately 328 million people (Census 2019).

3.3.6.2 *Summary of Potential Impacts as a Result of the Proposed Action*

Commuting FTEs

The increase of approximately 400 FTEs and the additional offsite shipments would impact local transportation. With the lower vacancy rate in the surrounding counties, FTEs are likely to commute from further locations. It is anticipated that traffic on NM 502 and NM 4 to Los Alamos County could increase from a maximum 15,000 vehicles per day to 15,500 vehicles per day. The number of New Mexico's Park & Ride riders could possibly increase from 515 to 530 per year. Impacts associated with construction traffic would be temporary in that these impacts would only last for the anticipated five years of construction activities.

Onsite/Offsite Shipments

Estimated impacts of transportation associated with the proposed action are provided in this discussion. With the implementation of pit production analyzed in this SA, onsite transportation of hazardous, radioactive, industrial, commercial, and recyclables materials including wastes would still constitute the majority of activities that are part of routine operations at LANL. Onsite shipments would likely increase within the Pajarito Corridor. Offsite shipments of hazardous, radioactive, industrial, commercial, and recyclable materials including waste would increase with the implementation of pit production, but be below projected shipment estimates as presented in the 2008 LANL SWEIS. Table 3-9 describes the estimated number of trips for waste and materials of the Expanded Operations Alternative and pit production in the 2008 LANL SWEIS.

TABLE 3-9. NUMBER OF SHIPMENTS FROM 2008 SWEIS FOR EXPANDED OPERATIONS ALTERNATIVE AND PROPOSED PIT PRODUCTION [A]

Activities	Number of Shipments										
	Radioactive Materials									Miscellaneous	
	Low Specific Activity	Decontamination Decommissioning and Demolition	LLW	High Activity	LLW – Remote Handled	MLLW	TRU	SNM [b]	Plutonium Dioxide	Hazardous	Other
Expanded Operations	49,940	9,538	9,919	36,521	856	9,019	5,044	1,558	50	4,749	41,506
Pit Production Analyzed in this SA	0	0	701	0	0	6	246	600	0	0	0

a. DOE 2008a, Appx. K p. 24, Table K-5. The waste shipment values presented in the 2008 LANL SWEIS are based on the differences between the Expanded Operations Alternative and pit production for projected waste volumes for routine operations.
b. Includes enriched uranium.

The 2008 LANL SWEIS risk transportation evaluation was performed using the RADTRAN[19] Version 5 computer program in conjunction with the Transportation Rating Analysis Geographic Information System computer program (DOE 2008a, ch. 5 p. 153). The transportation analysis provided in the 2008 LANL SWEIS identified the uncertainty associated with a potential increase in the populations along the transportation routes. Potential impacts to the population associated with a potential increase were not specifically identified in the transportation analysis; however, with the conservatism in the estimated impacts, it is anticipated that population increase would not affect the comparison of risks identified in this SA. The national U.S. population has increased by about eight percent (Census 2019) and the population in the eight counties making up LANL's ROI increased by approximately six percent (NM-IBIS 2018).

It is anticipated that the expected annual total number of offsite shipments would be 200 for 30 pits per year and up to approximately 530 for any periods of surge operations (LANL 2020). This is less than the 1,553 shipments (sum of the Proposed Pit Production row in Table 3-9) evaluated in the 2008 LANL SWEIS.

[19] The 2008 LANL SWEIS used RADTRAN Version 5 to estimate potential health impacts to workers and the public resulting from transportation of radioactive materials (e.g., pits, plutonium metal and powder, highly enriched uranium, TRU waste, and LLW) among DOE and commercial sites. In 2015, the Defense Nuclear Facilities Safety Board identified quality assurance issues associated with RADTRAN. For this reason, in more recent applications of RADTRAN for other EISs, DOE has validated RADTRAN results using alternative methods.

Potential impacts associated shipping include radiation dose to the transportation crew (i.e., driver and security personnel) and general populations along transportation routes and potential transportation accidents.

3.3.6.3 *Differences in Potential Impacts*

Daily traffic to LANL is expected to increase by three percent with the implementation of pit production. Increases to traffic would be noticed at each LANL entrance. The majority of traffic would be expected at the Pajarito Road and NM 4 entrance, as the Pajarito Corridor would likely experience the biggest increase in employee traffic. The expected increase in daily traffic at LANL from implementation of pit production conservatively evaluated by the 2008 LANL SWEIS that estimated a traffic increase of 85 percent from the Pajarito Road and NM 4 (DOE 2008a, ch. 5 p. 165, Table 5-54).

Offsite shipments of radioactive waste would be transported to WIPP, NNSS, and other locations as discussed in previous sections. Materials supporting pit production activities would be transported between NNSA sites across the complex. The number of annual offsite shipments of waste and special nuclear material projected with the implementation of pit production is estimated to be 200 for 30 pits per year and up to 530 for a potential surge capacity of up to 80 pits per year (LANL 2020). The projected total of shipments analyzed in the 2008 LANL SWEIS Expanded Operations Alternatives for an increase in pit production activities was 1,553 (DOE 2008a, ch. 5 pp. 157–158, Table 5-51). Because the inputs to transportation risk analysis from pit production (i.e., shipments and accident/fatality rates) are no greater than those used for the transportation risk evaluation in the 2008 LANL SWEIS, potential impacts are conservatively evaluated by the 2008 LANL SWEIS. National population increase of about eight percent and ROI population increase of six percent are not anticipated to significantly affect the comparison of risks identified in the 2008 LANL SWEIS (DOE 2008a, Appx. K pp. 31–32). The potential transportation impacts identified in this SA for accident and incident-free health impacts would not be greater than those analyzed in the 2008 LANL SWEIS. The subsequent risks associated with the projected shipments with the implementation of the proposed action were consistent with those modeled in the 2008 LANL SWEIS (DOE 2008a, ch. 5 pp. 157–158, Table 5-51; Appx. K p. 24, Table K-5 and pp. 25–26, Table K-6).

4.0 CUMULATIVE IMPACTS

The Council of Environmental Quality regulations (40 CFR 1508.7) define cumulative impacts as "the incremental impacts of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (Federal or non-Federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time."

4.1 TECHNICAL APPROACH

Section 3.0 of this SA documents the potential impacts of proposed pit production at LANL. The section demonstrates that potential impacts are not notably different than those analyzed and presented in the 2008 LANL SWEIS. Consequently, the contribution to cumulative impacts from pit production is expected to be not significantly different than in the 2008 LANL SWEIS. The technical approach to evaluate cumulative impacts includes (1) a description of relevant NEPA analyses that may influence pit production; (2) a discussion of the past, present, and foreseeable actions that may affect, or be affected by, pit production; and (3) the identification of potential cumulative impacts to resource areas associated with pit production. Through this evaluation, NNSA can determine if the potential cumulative impacts associated with pit production are significantly different from those analyzed in the 2008 LANL SWEIS and other relevant NEPA documents.

4.2 RELEVANT ANALYSIS

The 2019 Complex Transformation SPEIS SA (DOE 2019a) has identified changes to the actions considered for potential cumulative impacts in the 2008 Complex Transformation SPEIS. As a result, past, present, new, or reasonably foreseeable future actions at SRS, LANL, or WIPP that could have a bearing on potential cumulative impacts associated with pit production are addressed in the 2019 Complex Transformation SPEIS SA.

The Complex Transformation SPEIS evaluated, among other things, constructing a new pit production facility ("Greenfield Alternative") to produce 125 to 200 pits per year at one of five site alternatives including LANL (DOE 2008b, ch. 3 p. 20). In addition to the Greenfield Alternative at LANL, the Complex Transformation SPEIS includes an analysis of two distinct upgrades to existing LANL facilities: one to support production of 125 pits per year and one to support production of 50–80 pits per year (Los Alamos Upgrade Alternative) (DOE 2008a, ch. 1 p. 35). All three of these NEPA analyses are considered in this SA for cumulative impacts.

4.3 PAST, PRESENT, AND REASONABLY FORESEEABLE ACTIONS

Past, present, and reasonably foreseeable actions that may affect, or be affected by, pit production considered for cumulative impacts consist of (1) Surplus Plutonium Disposition, (2) AC/MC at TA-55, (3) an Environmental Testing Facility at LANL, (4) commuter route road

modifications, and (5) proposed housing developments. Each of these actions is discussed in the following sections.

4.3.1 Surplus Plutonium Disposition

Since the end of the Cold War, the United States has safely stored surplus plutonium at Pantex, with lesser quantities at SRS and other locations within the Complex. Surplus plutonium includes pit and non-pit plutonium that has been declared excess to U.S. national security needs. Surplus plutonium is separate from plutonium reserved for nuclear weapons programs.

In the mid-1990s, DOE began studying technologies for preparing surplus plutonium for disposal and identifying locations for siting facilities needed to dispose of surplus plutonium. In 2000, DOE issued a decision to construct and operate the MFFF at SRS for the primary purpose of dispositioning surplus plutonium (65 FR 1608). Construction of the MFFF began in 2007. In 2018, DOE issued a decision to terminate the plan to disposition surplus plutonium as mixed oxide fuel and terminate construction of the MFFF. In 2019, the Nuclear Regulatory Commission terminated the MFFF construction authorization. At this time, NNSA has not made a decision on the remaining surplus plutonium intended for disposition at the MFFF.

In 2015, the DOE published the Surplus Plutonium Disposition (SPD) SEIS analysis and, in 2016, issued a ROD documenting the disposal of six metric tons of surplus plutonium using the dilute and dispose process. In the SPD SEIS, DOE also evaluated alternatives for disposition of an additional 7.1 metric tons of surplus plutonium, but DOE has not made a decision on its disposition. The 13.1 metric tons of surplus plutonium are separate from both the 34 metric tons of surplus plutonium previously intended to be processed at the MFFF and from plutonium that remains available for use in nuclear weapons programs.

As part of the plutonium stabilization capability for the Plutonium Facility Complex, LANL has an existing pit disassembly capability (DOE 2008a, ch. 3 p. 57, Table 3-18). The 2015 SPD SEIS considered several alternatives that included using LANL's PF-4 for the SPD program (DOE 2015c). Under the dilute and dispose approach, utilization of LANL's PF-4 for the disassembly and processing of surplus pits would increase above what was analyzed in the 2008 SWEIS in order to implement Dilute and Dispose, but no decision has been made.

The cumulative impacts for both proposed pit production and the current and potential future SPD program at TA-55 are not anticipated to be greater than those impacts presented in the 2015 SPD SEIS cumulative impacts analysis because the program is not yet at, nor expected to expand to, the capacity previously analyzed (DOE 2015c). Any changes to the SPD program that would have impacts beyond what have previously been analyzed would be analyzed in a new NEPA analysis.

4.3.2 Analytical Chemistry and Materials Characterization (AC/MC) at TA-55

An ongoing action that may affect, or be affected by, pit production is the relocation of the AC/MC operations from the CMR Building. A 2015 SA to the CMRR EIS evaluated potential

impacts for moving AC/MC operations from the aging CMR building to PF-4 and RLUOB, and it was determined that impacts were consistent with analyses in the 2003 CMRR EIS and the 2008 LANL SWEIS (DOE 2015a, p. 49). The relocation of AC/MC operations is ongoing.

In 2018, NNSA issued the *Final Environmental Assessment of Proposed Changes for Analytical Chemistry and Materials Characterization at the Radiological Laboratory/Utility/Office Building* (2018 RLUOB EA) (DOE 2018c) and associated finding of no significant impacts. The 2018 RLUOB EA analyzed a proposal to re-categorize RLUOB from a radiological facility to a HC-3 nuclear facility (DOE 2014b, Attachment 2, Table 1)[20]. The re-categorization would allow for a greater number and range of AC/MC operations to be performed in RLUOB and would reduce the need for additional AC/MC operations in PF-4 (DOE 2018c, p. 2). The 2018 RLUOB EA analyzed potential cumulative impacts of re-categorizing RLUOB in addition to pit production. Potential impacts were anticipated to be less than those considered in the 2008 LANL SWEIS (DOE 2018c, p. 81).

4.3.3 Environmental Testing Facility at LANL

A potentially foreseeable action would be the consolidation of existing environmental testing capabilities at LANL for plutonium and non-nuclear weapons components designed at LANL. Environmental testing consists of evaluating the effects of environmental stresses (e.g., heat or vibration) for each nuclear weapon system. Environmental testing of plutonium and non-nuclear weapons components are conducted at several LANL locations, including TA-55 (DOE 2008a, ch. 3 pp. 23–26 and 56-59; DOE 1999a, ch. 2 pp. 28–33 and 60–73).

NNSA is considering the construction of a non-destructive environmental testing facility for plutonium components at LANL. The proposed testing facility will require a hardened surface facility[21], support control rooms, a PIDAS, and a HC-2 facility. The proposed testing facility would be located at either TA-55 or TA-11. At either location, upgrades to existing infrastructure will be required.

Based on currently available information, potential impacts from operating this facility at either TA-55 or TA-11 are not anticipated to be greater than those analyzed in the 2008 LANL SWEIS.

[20] DOE has determined threshold quantities for individual radionuclides that define the lower boundaries for the hazard categories: a DOE HC-3 Nuclear Facility threshold quantity is 2,610 grams of plutonium equivalent. RLUOB has a limit of 400 grams in consideration of additional security requirements above 400 grams.
[21] A hardened facility is designed to provide protection of material and has considerable redundancies to withstand an attack.

4.3.4 Commuter Route Road Modifications

4.3.4.1 *East Jemez Road Intersection Modifications*

NNSA and Bandelier National Monument propose modifications and upgrades to the intersection of NM 4 and East Jemez Road (Figure 4-1). The intersection modification and upgrade design was part of the Supplemental Environmental Projects that was established in an agreement between DOE and the State of New Mexico (DOE 2018a, p. 19). The proposed design modifications and upgrades include a second eastbound turn lane to East Jemez Road, a second northbound lane through to NM 4, and a new turn bay to a proposed Tsankawi trailhead parking lot. The modifications and upgrades to NM 4 and East Jemez Road would improve safety and increase the capacity and efficiency of the intersection. Potential short-term impacts could include temporary delays during construction, which could potentially increase greenhouse emissions from vehicles.

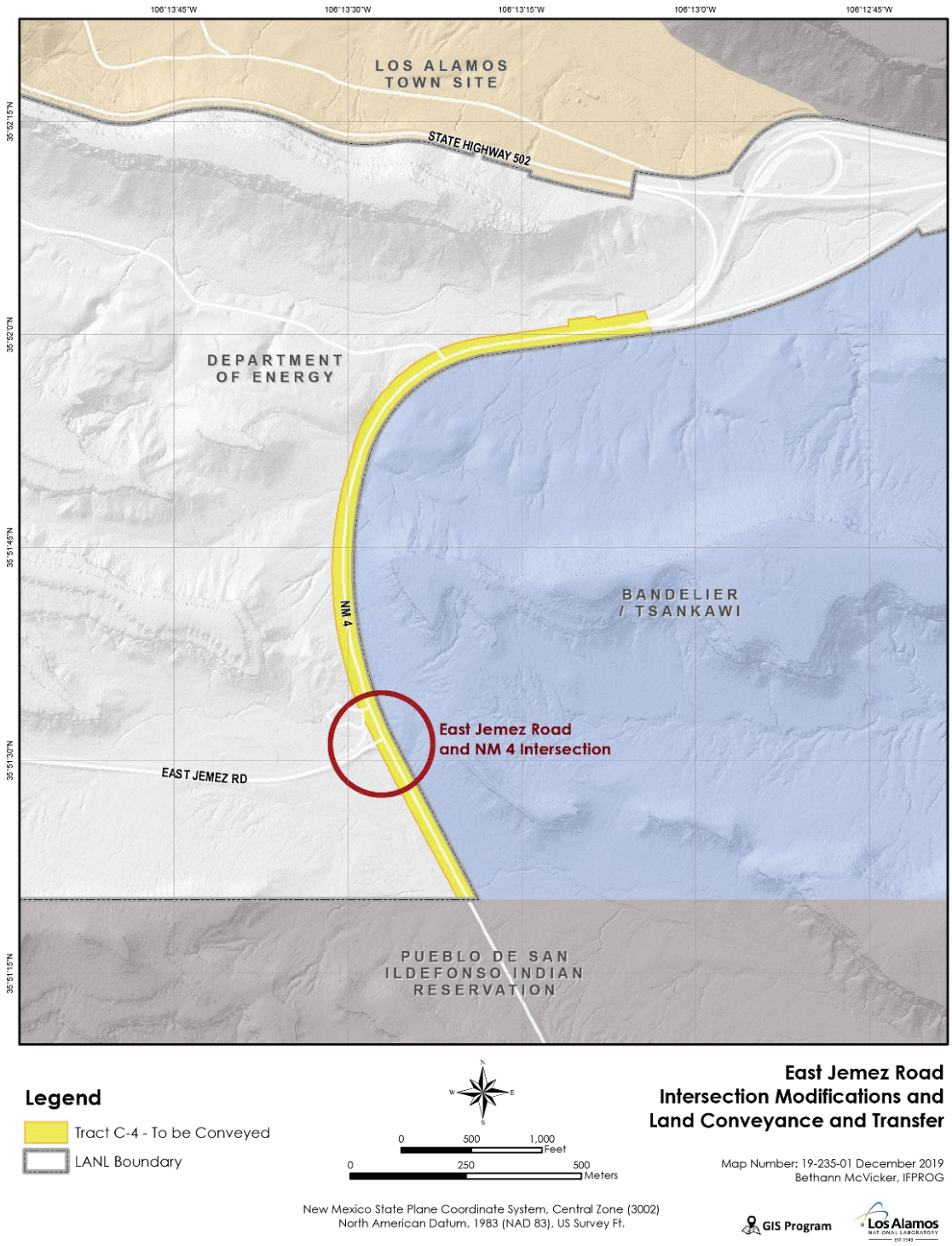

Figure 4-1. East Jemez Road intersection modifications and land conveyance and transfer

4.3.4.2 *NM 502 Los Alamos Roadway Reconstruction & Roundabout*

This project would improve NM 502 through Los Alamos between Kneckt Street and Tewa Loop (0.8 mile). The project includes roadway reconstruction, earthwork, curbs and gutters, sidewalks, concrete retaining walls, storm drains, landscaping, permanent signing, lighting, traffic signalizations, and utilities. The project would replace the existing intersection at NM 502 and Central Avenue with a roundabout to improve traffic flow through Los Alamos. Potential short-term impacts could include temporary delays during construction, which could potentially increase greenhouse emissions from vehicles. This project is underway and completion is expected to occur in advance of pit production.

4.3.4.3 *NM 30 Improvements Project from NM 502 to US 84/285*

The New Mexico Department of Transportation, in cooperation with the Federal Highway Administration, is improving traffic and safety conditions on NM 30 between NM 502 and the US 84/285 intersection in Española (DOT 2019b). This is a major commuter route serving northern New Mexico and LANL (FHWA 2013). The project would provide physical, operational, and safety improvements. When completed, the projects would reduce congestion and delays. Potential short-term impacts could include temporary delays during construction, which could potentially increase greenhouse emissions from vehicles.

4.3.5 Los Alamos County and ROI Housing Developments

Los Alamos County plans to construct the two housing developments in two locations: the Land Conveyance and Transfer tract on DP Road which has capacity for 261 dwelling units and the former DOE Los Alamos Site Office which has the capacity to accommodate 150 housing units (LAC 2016). A housing development is currently in the construction phase on a Land Conveyance and Transfer tract in White Rock and will provides approximately 160 single-family homes (Laskey 2018). These three housing developments were analyzed in the 1999 *Final Environmental Impact Statement for the Conveyance and Transfer of Certain Land Tracts Administered by the U.S. Department of Energy and Located at Los Alamos National Laboratory* (1999 Land Conveyance and Transfer EIS) (DOE 1999b) and incorporated by reference in the 2008 LANL SWEIS (DOE 2008a, ch. 1 p. 29 and ch. 5 p. 212).

In Santa Fe County approximately 2,800 housing units are planned or in construction (City of Santa Fe 2019). Other information about planned housing developments are not available for other counties located in the ROI.

Potential cumulative impacts attributed to housing development projects include increased greenhouse gas emissions, increased traffic, increased demand of utilities, and a temporary contribution to construction noise and dust. Furthermore, the additional housing units may increase housing vacancy rates as mentioned in Section 3.3.3.

4.4 POTENTIAL CUMULATIVE IMPACTS

The cumulative impact analysis in this section is to determine (1) if potential cumulative impacts of pit production would be different from those analyzed in the 2008 LANL SWEIS and other relevant NEPA documents, and (2) if so, whether those differences would be considered significant in the context of NEPA (40 CFR 1508.27). Identifying the potential cumulative impacts from pit production informs NNSA's decision to implement pit production beyond what was previously decided.

Potential cumulative impacts evaluated in this SA are those associated with the production of a minimum of 30 pits per year and those associated with the production of 80 pits per year. The evaluation of potential cumulative impacts is based on the cumulative impact analysis conducted in relevant analysis and past, present and reasonably foreseeable actions that may affect, or be affected by, pit production. A potential impact that is significantly different than to those impacts analyzed in the 2008 LANL SWEIS is a strong indicator that there is a significant cumulative impact associated with pit production.

4.4.1 Potential Cumulative Impacts to Resource Areas

As part of the cumulative impact analysis in this SA, NNSA evaluated each of the environmental resource areas identified in the 2008 LANL SWEIS. The environmental resource areas considered to have minor or negligible impacts and were not different from what was analyzed in previous NEPA analyses and are not affected by past, present, and foreseeable future actions are summarized in Table 4-1. These resource areas include land use, visual resources, geology and soil (excluding seismic), water resources, air quality, noise, ecological resources, cultural resources, infrastructure, facility accidents, intentionally destructive acts, socioeconomics, and environmental justice. In Table 4-1, NNSA presents environmental resource areas that have no significant cumulative impact and a qualitative justification for not providing further discussion.

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TABLE 4-1. ENVIRONMENTAL RESOURCE AREAS WITH NO SIGNIFICANT CUMULATIVE IMPACTS

Resource Area	Rationale
Land Use	The past, present, and foreseeable future projects considered in this SA do not identify new developments in the vicinity of the proposed project at this time.
Visual Resources	The past, present, and foreseeable future projects considered in this SA are not expected to cumulatively exceed the visual impacts anticipated in the 2008 SWEIS, which anticipated construction of new buildings and support infrastructure within the Pajarito Corridor.
Geology and Soils	The past, present, and foreseeable future projects considered in this SA would not involve new developments in the vicinity of the proposed project. All proposed activities would follow appropriate mitigation measures, permits, and BMPs to minimize soil erosion and the transport of soil materials in storm water runoff. There would be no changes to existing facilities that would affect their ability to withstand a seismic event.
Water Resource (Surface Water and Groundwater Quality)	Potential impacts to water resources from construction activities and building modifications of past, present, and foreseeable future projects considered in this SA would be minor. Storm water runoff could potentially impact downstream surface-water quality. Storm water and sediment controls, pollution prevention plans, and BMPs would be implemented to minimize sediment transport and impacts to surface water and groundwater resources.
Air Quality	The past, present, and foreseeable future projects considered in this SA are not expected to cumulatively exceed the impacts analyzed in the 2008 LANL SWEIS. Total emissions of criteria pollutants, hazardous air pollutants, and volatile organic compounds for 2008 through 2016 were well below the facility-wide Title V Operating Permit limits at LANL (DOE 2018a, p. 86).
Noise	The past, present, and foreseeable future projects considered in this SA are not expected to cumulatively exceed the impacts analyzed in the 2008 LANL SWEIS. Activities are either indoors or temporary, and would be within regional noise ordinance restrictions.
Ecological Resources	The past, present, and foreseeable future projects are not expected to cumulatively exceed the impacts analyzed in the 2008 LANL SWEIS. All projects are either indoors or would comply with the Threatened and Endangered Species Habitat Management Plan (LANL 2017a).
Cultural Resources	LANL and NNSA would follow the LANL's Cultural Resources Management Plan (LANL 2017b) and the Programmatic Agreement (DOE 2017b) between DOE and stakeholders for complying with the National Historic Preservation Act and minimize potential impacts to cultural resources. Potential impacts to cultural resources that require mitigation would be consulted on with the New Mexico State Historic Preservation Officer.

Resource Area	Rationale
Infrastructure	A minor increase in utility infrastructure requirements is anticipated, however, the past, present, and foreseeable future projects considered in this SA are not expected to cumulatively exceed the utility infrastructure impacts analyzed in the 2008 LANL SWEIS (DOE 2008a, ch. 5 p. 124).
Facility Accidents	MAR is the primary driver for facility accidents. The MAR at PF-4 does not increase for pit production. Administrative controls will be used to reduce MAR. The past, present, and foreseeable future projects considered for cumulative impacts in this SA do not change the assumptions about facility accidents.
Intentional Destructive Acts	The past, present, and foreseeable future projects considered for cumulative impacts in this SA do not change the assumptions about intentional destructive acts that are described in Table 3-1.
Socioeconomics	Potential cumulative impacts to socioeconomics are related to the number of people employed at LANL. The majority of increased hiring is attributable to existing mission activities (*see* Section 2.1 of this SA). The past, present, and foreseeable future projects are not expected to cumulatively exceed the socioeconomic impacts analyzed in the 2008 LANL SWEIS.
Environmental Justice	The past, present, and foreseeable future projects considered in this SA are not expected to disproportionally impact low-income or minority communities.

4.4.2 Cumulative Impacts by Resource Area

Environmental resource areas that require additional cumulative impact analysis are reviewed in more detail in the following subsections. These resource areas consist of human health, waste management, and transportation. Criteria for this additional discussion may include perceived risk or issues raised by public comments to the 2019 Complex Transformation SPEIS SA.

Potential cumulative impacts to environmental resources associated with pit production are discussed by describing the resource relation to relevant analysis and past, present, and foreseeable future projects that could affect that resource.

4.5 CUMULATIVE IMPACTS SUMMARY

The potential cumulative impacts associated with pit production and in relation to past, present, and reasonably foreseeable actions at LANL discussed in this SA are consistent with the impacts presented in the 2008 LANL SWEIS, and the cumulative impacts of the proposed actions are not significantly different from previous NEPA analyses, including those impacts NNSA considered in the 2008 LANL SWEIS, 2008 Complex Transformation SPEIS, 2015 SPD SEIS, and the 2018 RLUOB EA cumulative impacts analyses.

4.5.1.1 *Human Health*

Potential cumulative impacts from pit production may affect the population within 50 miles of LANL, the MEI, and workers. The foreseeable actions that affect human health are discussed in the Expanded Operations Alternative in the 2008 LANL SWEIS (DOE 2008a), the proposed SPD project at LANL (DOE 2015c), and relocated AC/MC operations from the CMR building to TA-55 (DOE 2015a, DOE 2018a).

The Public and the MEI

Table 4-2 presents radiological impacts to human health to the MEI and the population within 50 miles of the LANL boundary as analyzed in the 2008 LANL SWEIS, the 2018 RLUOB EA, and the 2015 SPD SEIS. These are compared to the impacts of the proposed action in Table 3-2 of this SA.

TABLE 4-2. ESTIMATED CUMULATIVE RADIOLOGICAL HEALTH EFFECTS TO THE PUBLIC AND MEI

Action	Population within 50 Miles (80 kilometers)		MEI	
	Dose (Person-rem per year)	LCF Risk per year [a]	Dose (Millirem per year)	LCF Risk per year [a]
2008 LANL SWEIS – Expanded Operations Alternative [b]	36 [c]	0 (0.02)	8.2[c, d]	0 (4.9×10^{-6})
RLUOB EA [e]	0.98	0 (6.0×10^{-4})	0.082	0 (5.0×10^{-8})
2015 SPD SEIS [f]	0.21	0 (1.0×10^{-4})	0.081	0 (5.0×10^{-8})
LANL Total [f]	**38**	**0 (0.02)**	**8.6**	**0 (5.0×10^{-6})**
Estimated Dose for 30 pits under the proposed action [g]	1.05×10^{-5}	0 (6.3×10^{-9})	2.5×10^{-6}	0 (1.5×10^{-12})
Estimated Dose for 80 pits under the proposed action [g]	2.8×10^{-5}	0 (2.0×10^{-8})	6.7×10^{-6}	0 (4.0×10^{-12})

a. LCFs are calculated using a conversion of 0.0006 LCFs per rem or person-rem (DOE 2003b). The annual LCFs for the analyzed population represents the number of LCFs calculated by multiplying the listed doses by the risk conversion factor; no population LCFs are expected from any individual activity or from all combined activities. The annual MEI LCF risk represents the calculated risk of an LCF to an individual.
b. (DOE 2008a, ch. 5 p. 91, Table 5-18 and ch. 5 p. 221, Table 5-81)
c. (DOE 2008a, ch. 5 p. 91, Table 5-18)
d. (LANL 2019c)
e. (DOE 2018c, p. 34, Table 9)
f. (DOE 2015c, ch. 4 p. 125, Table 4-40)
g. See Table 3-2 in this SA for dose. These rows are provided to compare to the proposed action and are not incremental cumulative increases.

Involved Workers

Table 4-3 presents radiological impacts to human health for involved workers at LANL as analyzed in the 2008 LANL SWEIS, the 2018 RLUOB EA, and the 2015 SPD SEIS. Potential impacts to involved workers from the proposed action are presented to compare to previously analyzed impacts.

The potential impacts to involved workers from pit production represent a small fraction of the impacts analyzed in existing NEPA documents including the 2008 LANL SWEIS (DOE 2008a), the 2018 RLUOB EA (DOE 2018c), and the 2015 SPD SEIS (DOE 2015c) and are consistent with the impacts considered in these existing NEPA documents.

TABLE 4-3. ESTIMATED CUMULATIVE RADIOLOGICAL HEALTH EFFECTS TO WORKERS

Action	Involved Workers	
	Dose (Person-rem per year)	LCF Risk per year [a]
2008 LANL SWEIS – Expanded Operations Alternative [b]	543	0 (0.33)
RLUOB EA [c]	8.2	0 (5.0×10^{-3})
2015 SPD SEIS [d]	190	0 (0.1)
LANL Total [d]	741.2	0 (0.4)
Estimated Dose for 30 pits under the proposed action [e]	155	0 (0.09)
Estimated Dose for 80 pits under the proposed action [e]	206	0 (0.12)

a. LCFs are calculated using a conversion of 0.0006 LCFs per rem or person-rem (DOE 2003b). The annual LCFs for the analyzed population represent the number of LCFs calculated by multiplying the listed doses by the risk conversion factor; no population LCFs are expected from any individual activity or from all combined activities. The annual MEI LCF risk represents the calculated risk of an LCF to an individual.
b. (DOE 2008a, ch. 5 p. 221, Table 5-81)
c. (DOE 2018c, p. 35, Table 10)
d. (DOE 2015c, ch. 4 p. 126, Table 4-41)
e. See Table 3-2 in this SA for dose. These rows are provided to compare to the proposed action and are not incremental cumulative increases.

4.5.1.2 *Waste Management*

Projections of TRU waste, LLW, MLLW, and chemical waste generation from present and foreseeable actions are presented in Table 4-4 through Table 4-8. These present and foreseeable actions are those identified in the 2008 LANL SWEIS (DOE 2008a), Surplus Plutonium Disposition project at LANL (DOE 2015c), and in the AC/MC operations (DOE 2015a, 2018d).

TRU Waste

Table 4-4 presents total TRU waste projections for ongoing activities at LANL and reasonably foreseeable actions that include pit production at SRS. The TRU waste generation estimate at LANL is based on operational data resulting in a lower estimate than SRS. The 2008 LANL SWEIS Expanded Operations Alternative for TRU waste generation includes the projections from the Plutonium Facility Complex, the Sigma Complex, the CMR facility, RLWTF, Solid Radioactive and Chemical Waste facilities, and decontamination and remediation waste.

TABLE 4-4. TRU WASTE PROJECTIONS

NEPA Analysis	Facility	TRU Waste Projections (Cubic yards per year)
2008 LANL SWEIS Expanded Operations Alternative (Includes proposed pit production)	Plutonium Facility Complex [a]	690
	CMR [a]	90
	RLWTF [a]	18
	Solid Radioactive and Chemical Waste Facilities [a]	35
	Decontamination Waste [b]	171
	Remediation Waste [b]	2,200
	Total LANL (Operations, decontamination, and Remediation Waste)[b]	**3,300**
2018 RLUOB EA	PF-4 and RLUOB AC/MC Modifications and Operations [c]	109
2015 SPD SEIS Operations at LANL	PF-4[d]	24
LANL Total		**3,433**
Proposed production of 50 to 80 pits per year at SRS [e]	Savannah River Plutonium Processing Facility	820 – 1,200
Production of 30 to 80 pits per year at LANL [f]	PF-4	140 – 400

a. (DOE 2008a, ch. 5 p. 149, Table 5-47)
b. (DOE 2008a, ch. 5 p. 151, Table 5-49). Values presented in Table 5-49 in the 2008 LANL SWEIS are for 10-year projections (DOE 2008a). These values are divided by 10 to represent an approximate annual generation rate in this SA.
c. (DOE 2018c, p. 54, Table 18). Projections are reported in the 2018 RLUOB EA as 2,920 cubic feet. To convert to cubic yards, multiply by 0.037.
d. (DOE 2015c, ch. 4 p. 60, Table 4-19). Peak annualTRU waste projections are reported in the 2015 SPD SEIS as 18 cubic meters for processing two metric tons over a period of 6.67 years. To convert to cubic yards, multiply by 1.307.
e. (DOE 2020, Table 4-14)
f. See Table 3-7 in this SA. These rows are provided to compare to the proposed action and are not incremental cumulative increases.

In addition, the projected rates of TRU waste from the 2018 RLUOB EA and 2015 SPD SEIS are consistent with the rates projected in the 2008 LANL SWEIS Expanded Operations Alternative and 2015 SPD SEIS. Potential TRU waste generated by pit production would be a small fraction of the projected waste that was analyzed in previous NEPA analyses and include those rates from the 2008 LANL SWEIS (DOE 2008a), the 2015 SPD SIES (DOE 2015c), and the 2018 RLUOB EA (DOE 2018c).

The environmental impacts from construction and operation of WIPP have been addressed in several NEPA analyses, particularly in the WIPP SEIS-II (DOE 1997). The WIPP SEIS-II evaluated the impacts from disposal at WIPP of a TRU waste quantity equivalent to that established by the WIPP Land Withdrawal Act, as well as a larger quantity of waste from other sources (e.g., TRU waste that was not generated from defense activities). The WIPP SEIS-II

analysis concludes that WIPP could be operated safely and that WIPP would not be expected to result in any long-term (over 10,000 years) impacts on human health (DOE 1997). The WIPP SEIS-II supported DOE's decision to open WIPP for TRU waste disposal (63 FR 3624, January 23, 1998).

In January 2018, DOE submitted a request to modify the New Mexico Environment Department WIPP Hazardous Waste Facility Permit to differentiate between the way RCRA waste volumes was defined versus the way the WIPP Land Withdrawal Act TRU waste volume (175,564 cubic meters) was calculated and tracked (DOE 2018d; NMED 2018). In December 2018, the New Mexico Environment Department approved the DOE's request to modify the existing WIPP Hazardous Waste Facility Permit (NMED 2018) and in January of 2019 DOE fully implemented the change in the method of tracking, reporting, and recording the volumes of generated waste. The permit modification is under appeal.

This method for TRU disposed waste volumes as of July 25, 2020, is 69,470 cubic meters.[22] Based on the statutory limitations and agreements between DOE and the State of New Mexico and considering past disposals of TRU waste from across the DOE Complex, for NEPA purposes, NNSA estimated a TRU waste remaining disposal capacity of just over 100,000 cubic meters.

The potential cumulative impacts associated with TRU waste disposal at WIPP from disposal of TRU waste generated from the pit production and other applicable DOE activities are listed in Table 4-5. The WIPP Land Withdrawal Act volume capacity limit for TRU waste disposal is also listed in Table 4-5 (DOE 2019c). Assuming a production rate of 30 pits per year, approximately 5,350 cubic meters of TRU waste is projected to be generated over the life (i.e., 50 years) of pit production at LANL.

With regard to the potential cumulative impacts on the available TRU waste capacity at WIPP, Table 4-5 presents a summary of the estimated TRU waste generation rates of the proposed action over a 50-year period along with past, present, and reasonably foreseeable TRU waste generation and WIPP capacity estimates.

[22] The Annual Transuranic Waste Inventory Report- 2019 focuses on all TRU waste stored or projected to be generated through CY 2033 at the TRU waste generator sites but includes data on projected TRU waste inventories through CY 2050. This report can be viewed online at https://wipp.energy.gov/library/TRUwaste/DOE-TRU-19-3425_R0_FINAL.pdf. This report shows that past, present, and reasonably foreseeable future actions, including TRU waste to be generated as a result of this proposed action, would not exceed the volume of record. TRU waste numbers will change over time and this table represents a snapshot of the waste inventory. The Annual TRU Waste Inventory Report is updated annually and current TRU waste volumes at WIPP are posted at https://wipp.energy.gov/shipment-information.asp.

TABLE 4-5. CUMULATIVE TRU WASTE GENERATION

Activity	TRU Waste (Cubic Meters)
Past TRU Waste Disposed of at WIPP as of July 25, 2020[a]	**69,470**
Present and Projected TRU Waste Needing Disposal (Annual Transuranic Waste Inventory Report – 2019)	
Contact-handled TRU waste total inventory volume [b]	42,600
Remote-handled TRU waste total inventory volume [c]	2,580
Projected TRU volume beyond 2033 [d]	14,290
Present and Projected TRU Waste Needing Disposal (Other Potential NNSA Actions)	
TRU waste projected from LANL Plutonium Pit Production (30 pits per year): 50-year projection [e]	5,350
TRU waste projected from SRS Pit Production (50 pits per year): 50-year projection [f]	31,350
Projected TRU waste for Surplus Plutonium (7.1 MT of surplus Pu) [g]	365
Total of Present and Reasonably Foreseeable (Projected) Future Actions	**96,535**
Total Past, Present, and Reasonably Foreseeable Future Actions	**166,005**
Land Withdrawal Act TRU waste volume of record [h]	**175,564**

a. Volume represents WIPP Land Withdrawal Act total volume of record. Information obtained from https://wipp.energy.gov/shipment-information.asp is a snapshot of levels on July 25, 2020. Some waste that was emplaced at WIPP between the inventory report on this date will show up in past, present, and projected waste volumes so there is a small variation in waste volume numbers depending on the dates of publication of these reports and the date the waste volume emplaced is pulled from this website. Any future evaluation should start with a review of current TRU waste volumes at WIPP online at https://wipp.energy.gov/shipment-information.asp.
b. (DOE 2019c Table 3-1). Provides contact-handled TRU waste projections through 2033. This volume includes TRU waste resulting from disposition of six metric tons of surplus plutonium (SR-KAC-PuOx) which was evaluated in the 2015 SPD SEIS (DOE 2015c).
c. (DOE 2019c Tables 3-2). Provides remote-handled TRU waste projections through 2033.
d. (DOE 2019c Table 4-4). The projected TRU volume beyond 2033 is 18,400 cubic meters. The LANL waste stream LA-MHD01.001 was subtracted from this total to prevent double counting of LANL TRU waste (18,400 – 4,110 = 14,290 cubic meters). Table 4-5 of this SA uses 14,290 cubic meters.
e. Based on the annual TRU waste volume from Table 3-7 of this SA.
f. (DOE 2020, Table 5-4). NNSA anticipates this estimate will be reduced in the Final SRS EIS.
g. (DOE 2019c Table 4-2). DOE directed potential WIPP waste streams (SR-KAC-HET-1 and SR-KAC-PuOx-1) represent TRU waste resulting from disposition of the 7.1 metric tons of surplus plutonium (DOE 2015c).
h. Public Law 102-579, *The WIPP Land Withdrawal Act* identifies the WIPP volume of record as 6.2 million cubic feet (175,564 cubic meters)

Low-Level Waste

Table 4-6 presents total anticipated LLW waste projections for ongoing activities at LANL and reasonably foreseeable actions, including the proposed action for producing 80 pits per year.

TABLE 4-6. LOW-LEVEL WASTE PROJECTIONS

NEPA Analysis	Facility	LLW Projections (Cubic yards per year)
2008 LANL SWEIS Expanded Operations Alternative (Includes proposed pit production)	Plutonium Facility Complex [a]	1,400
	Sigma Complex [a]	1,300
	CMR [a]	2,600
	RLWTF [a]	390
	Solid Radioactive and Chemical Waste Facilities [a]	300
	Decontamination Waste [b]	23,350
	Remediation Waste [b]	105,820
	Total LANL (Operations, decontamination, and Remediation Waste) [b]	**141,570**
2018 RLUOB EA (Modifications and Operations)	PF-4 and RLUOB [c] AC/MC Operations	2,675
2015 SPD SEIS Operations at LANL	PF-4 [d]	39
LANL Total		**144,624**
Production of 30 to 80 pits per year at LANL [e]	PF-4	885 – 2,355

a. (DOE 2008a, ch. 5 p. 149, Table 5-47)
b. (DOE 2008a, ch. 5 p. 151, Table 5-49). Values presented in Table 5-49 in the 2008 LANL SWEIS are for 10-year projections (DOE 2008a). These values are divided by 10 to represent an approximate annual generation rate in this SA.
c. (DOE 2018c, p. 54, Table 18). Projections in the 2018 RLUOB EA were reported as 72,230 cubic feet. To convert to cubic yards, multiply by 0.037.
d. (DOE 2015c, ch. 4 p. 60, Table 4-19). Peak annual LLW projections in the 2015 SPD SEIS were reported as 30 cubic meters for processing two metric tons over a period of 6.67 years. To convert to cubic yards, multiply by 1.307.
e. Table 3-7 of this SA. This row is provided to compare to the proposed action and is not an incremental cumulative increase.

Projected rates of low-level waste, cumulatively with all foreseeable projects, are consistent with the rates projected in the 2008 LANL SWEIS Expanded Operations Alternative, the 2015 SPD SEIS, and the 2018 RLUOB EA. Potential low-level waste generated by pit production would be a small fraction of the waste impacts analyzed in previous NEPA analyses including the 2008 LANL SWEIS (DOE 2008a), the 2015 SPD SEIS (DOE 2015c), and the 2018 RLUOB EA (DOE 2018c).

Mixed Low-Level Waste

Table 4-7 presents total anticipated MLLW projections for ongoing activities at LANL and reasonably foreseeable actions, including the proposed action for producing 80 pits per year.

TABLE 4-7. MIXED LOW-LEVEL WASTE PROJECTIONS

NEPA Analysis	Facility	MLLW Projections (Cubic yards per year)
2008 LANL SWEIS Expanded Operations Alternative (Includes proposed pit production)	Plutonium Facility Complex [a]	20
	Sigma Complex [a]	5
	CMR [a]	30
	RLWTF [a]	3
	Solid Radioactive and Chemical Waste Facilities [a]	10
	Decontamination Waste [b]	190
	Remediation Waste [b]	18,000
	Total LANL (Operations, decontamination, and Remediation Waste)[b]	**18,300**
2018 RLUOB EA (Modifications and Operations)	PF-4 and RLUOB AC/MC Operations [c]	49
2015 SPD SEIS Operations at LANL	PF-4 [d]	0.39
LANL Total		**18,351**
Production of 30 to 80 pits per year at LANL [e]	PF-4	1.4 – 3.7

a. (DOE 2008a, ch. 5 p. 149, Table 5-47)
b. (DOE 2008a, ch. 5 p. 151, Table 5-49). Values presented in Table 5-49 in the 2008 LANL SWEIS are for 10-year projections (DOE 2008a). These values are divided by 10 to represent an approximate annual generation rate in this SA.
c. (DOE 2018c, p. 54, Table 18). Projection in the 2018 RLUOB EA was reported as 1,330 cubic feet. To convert to cubic yards, multiply by 0.037.
d. (DOE 2015c, ch. 4 p. 60, Table 4-19). Peak annual MLLW projections in the 2015 SPD SEIS were reported as 0.3 cubic meters for processing two metric tons over a period of 6.67 years. To convert to cubic yards, multiply by 1.307.
e. Table 3-7 of this SA. This row is provided to compare to the proposed action and is not an incremental cumulative increase.

Projected rates of MLLW, cumulatively with all foreseeable projects, are consistent with the rates projected in the 2008 LANL SWEIS Expanded Operations Alternative, the 2015 SPD SEIS, and 2018 RLUOB EA. Potential MLLW waste generated by the pit production would be a small fraction of the waste impacts analyzed in previous NEPA analyses including the 2008 LANL SWEIS (DOE 2008a), the 2015 SPD SEIS (DOE 2015c), and the 2018 RLUOB EA (DOE 2018c).

Chemical Waste

Table 4-8 presents total anticipated chemical waste projections for ongoing activities at LANL and reasonably foreseeable actions, including the proposed action for producing 80 pits per year.

Projected rates of chemical waste, cumulatively with all foreseeable projects, are consistent with the rates projected in the 2008 LANL SWEIS Expanded Operations Alternative, the 2015 SPD SEIS, and 2018 RLUOB EA. Potential chemical waste generated by the pit production would be a small fraction of the waste impacts analyzed in previous NEPA analyses including the 2008 LANL SWEIS (DOE 2008a), the 2015 SPD SEIS (DOE 2015c), and the 2018 RLUOB EA (DOE 2018c).

TABLE 4-8. CHEMICAL WASTE PROJECTIONS.

NEPA Analysis	Facility	Chemical Waste Projections pounds per year
2008 LANL SWEIS Expanded Operations Alternative (Includes proposed pit production)	Plutonium Facility Complex [a]	19,000
	Sigma Complex [a]	22,000
	CMR [a]	25,000
	RLWTF [a]	1,100
	Decontamination Waste [b]	442,500
	Remediation Waste [b]	9,700,000
	Total LANL (Operations, Decontamination, and Remediation Waste)[b]	**12,900,000**
2018 RLUOB EA (Includes Modifications and Operations)	PF-4 and RLUOB [c] AC/MC Operations	24,700
2015 SPD SEIS Operations at LANL	PF-4	N/A
LANL Total		**12,924,700**
Production of 30 to 80 pits per year at LANL [d]	PF-4	150,000 – 399,000

a. (DOE 2008a, ch. 5 p. 149, Table 5-47)
b. (DOE 2008a, ch. 5 p. 151, Table 5-49). Values presented in Table 5-49 in the 2008 LANL SWEIS are for 10-year projections (DOE 2008a). These values are divided by 10 to represent an approximate annual generation rate in this SA.
c. (DOE 2018c, p. 54, Table 18)
d. Table 3-7 of this SA. This row is provided to compare to the proposed action and is not an incremental cumulative increase.

Summary

Potential cumulative impacts associated with TRU waste, LLW, MLLW, and chemical waste for ongoing activities at LANL and reasonably foreseeable related activities, including changes in plutonium operations, surplus plutonium disposition, and ongoing operations at LANL, are anticipated to be consistent with the cumulative impacts analyses in the 2008 LANL SWEIS (DOE 2008a), the RLUOB EA (DOE 2018c), and the 2015 SPD SEIS (DOE 2015c). NNSA would re-evaluate the cumulative impacts that might result from future decisions on plutonium

disposition activities if those activity levels were to increase at LANL, but at this time such impacts are expected to be within the impacts considered under prior NEPA analyses.

4.5.1.3 *Transportation*

Cumulative impacts for transportation of nuclear material and waste were evaluated in previous NEPA analyses and center on radiological impacts to the public and worker health. The collective doses and cumulative health effects resulting from a projected 130 years (from 1943 to 2073) of nuclear material and waste transport across the United States have been estimated in the Surplus Plutonium Disposition Final SEIS (DOE 2015c, ch. 4 p. 136, Table 4-48 and ch. 4 p. 139, Table 4-49) and are shown in Table 4-9 in this SA.

The majority of the collective doses for workers and the general population would be associated with general transportation of radioactive materials. Examples of these activities include shipments of radiopharmaceuticals to nuclear medicine laboratories and shipments of LLW to commercial disposal facilities. The total collective worker doses from all types of shipments (e.g., general transportation, historical shipments, reasonably foreseeable actions, and shipments under the 2015 SPD SEIS (DOE 2015c) were estimated to be 421,000 person-rem, which could result in 252 excess LCFs among the worker population, as shown in Table 4-9. The total collective doses to the general public were estimated to be 436,000 person-rem, which could result in 262 excess LCFs among the general population. As shown in Table 4-9, the estimated doses associated with radioactive waste and material transportation under the Expanded Operations Alternative in this SA (as described in Section 4.4), and projects considered for cumulative impacts, would be a small fraction of the cumulative impacts previously analyzed in existing NEPA analyses.

TABLE 4-9. TRANSPORTATION CUMULATIVE IMPACTS

Action	Crew Dose (Person-rem)	Risk of LCF	Population Dose (Person-rem)	Risk of LCF
2008 LANL SWEIS Expanded Operations Alternative [a]	910	0 (0.15)	287	0 (0.17)
Final Surplus Plutonium Disposition SEIS [b]	650	0 (0.4)	580	0 (0.3)
All other action from 1943 to 2073[b]	421,000	252	436,000	262
RLUOB Operations [c]	125	0 (0.08)	41	0 (0.02)
WIPP SEIS-II [d]	790	0 (0.47)	5,900	3.54
Total	423,475	253.1	442,808	266

a. (DOE 2008a, ch. 5 p. 230, Table 5-85)
b. (DOE 2015c, ch. 4 p. 139, Table 4-49)
c. (DOE 2018c, p. 61, Table 21)
d. (DOE 2016a)

5.0 CONCLUSIONS AND DETERMINATION

NNSA's proposed action is to implement elements of the Expanded Operations Alternative in the 2008 LANL SWEIS, as needed, to produce a minimum of 30 war reserve pits per year during 2026 for the national pit production mission and to implement surge efforts to exceed 30 pits per year to meet NPR and national policy. This SA evaluates the potential impacts of implementing elements of the Expanded Operations Alternative for pit production and considers new circumstances or information relevant to environmental concerns through a comprehensive review of existing NEPA analyses to determine if additional NEPA analysis is required per DOE's NEPA regulations in 10 CFR 1021.314. For all resource areas, the analyses verified that the potential environmental impacts would not be different, or would not be significantly different, than impacts in existing NEPA analyses identified in Section 1.4 and reevaluated in Section 3.0.

Based on the results of this SA, NNSA has determined that the proposed action does not constitute a substantial change from actions previously analyzed, and there is no significant new circumstances or information relevant to environmental concerns. Therefore, as Field Office Manager for the DOE/NNSA Los Alamos Field Office and pursuant to NNSA's Administrative Procedure and DOE's NEPA implementing procedures (10 CFR 1021.314(c)), I have determined that no further NEPA documentation is required, and NNSA may amend the existing 2008 LANL SWEIS ROD.

DOE/NNSA Concurrence:

Kristen M. Dors Digitally signed by Kristen M. Dors
Date: 2020.08.25 09:56:13 -06'00'

Kristen Dors
NEPA Compliance Officer, DOE/NNSA
Los Alamos Field Office

Date

Silas R. DeRoma Digitally signed by Silas R. DeRoma
Date: 2020.08.25 11:10:23 -05'00'

Silas DeRoma
General Counsel, DOE/NNSA
Los Alamos Field Office

Date

Approving Agent:

Michael J. Weis Digitally signed by Michael J. Weis
Date: 2020.08.25 10:21:05 -06'00'

Michael Weis
Field Office Manager, DOE/NNSA
Los Alamos Field Office

Date

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APPENDIX A. COMMENT RESPONSE DOCUMENT

A.1 THE SUPPLEMENT ANALYSIS PUBLIC COMMENT PERIOD OVERVIEW

This appendix consists of responses to comments received on the Draft SA. NNSA values the state, tribal, and public comments received and has made revisions to the Final SA based upon comments received or to clarify this SA as needed. Although pertinent regulations do not require public comment on an SA, as a discretionary matter, NNSA decided to include public comments and responses to better assist the process.

NNSA issued a notice on March 10, 2020, to the GovDelivery mailing lists for persons who have requested notification of activities related to LANL to provide notice of the availability of the Draft SA for review. NNSA also made the Draft SA available for public review and comment on the NNSA NEPA reading room (https://www.energy.gov/nnsa/nnsa-nepa-reading-room).

The Draft SA was available for public comment starting March 10, 2020. During the comment period, NNSA accepted comments from all interested agencies (Federal, State, and local), Native American Tribes, public interest groups, businesses, and members of the public. Due to the COVID-19 pandemic, the comment period was extended to May 9, 2020, for a total of a 60-day comment period.

NNSA received 148 comment documents, including 14 comments that were received after the May 9, 2020 deadline. Seven comments were either blank or sent to the email box in error and thus considered irrelevant. NNSA considered all comments received, including late comments. Table A-1 provides a list of the commenters who submitted one or more comment documents during this SA process. A summary of the comments, as well as NNSA's corresponding responses to those summary comments, are provided in Section A.2. All comment documents received are included in the Administrative Record for this SA.

TABLE A-1. INDEX OF COMMENTERS

Commenter Name	Affiliation (If Provided)
Acosta, Miguel	Earth Care Youth Leadership for Community Change
Albrecht, Kathryn	
Allen, Tom	Veterans for Peace Albuquerque Chapter
Anderson, Glen	
Anhara, Andrew Lovato	
Arends, Joni	Concerned Citizens for Nuclear Safety
Asmus, Mark	
Baker, Lawrence	
Balsamo, Bea	
Barfield, Ellen	
Beaumont, Holly	Interfaith Worker Justice
Benson, Jody	Rio Grande Chapter of Sierra Club
Bergier, Kim	
bxxx@hotmail.com	
Bezanson, David, Ph.D.	Physicians for Social Responsibility
Billups, Elizabeth	
Block, John, Esq.	
Bonafanti, Charles	
Boudart, Jan	
Boyer, Jan	
Brown, Rick	
Brush, AnJanette	
Bryan, Mary	
Burns, Terry, M.D.	The Alamo Group of the Sierra Club
Burrowes PhD, Robert J.	
Carberry, Mike	Green State Solutions
Carpenter, Tom	Hanford Challenge
Carroll, Glenn	Nuclear Watch South
Cat, Laura	
Chavarria, J. Michael	Governor, Santa Clara Indian Pueblo
Chaves, Denis	
Chaves, Theresa	

Commenter Name	Affiliation (If Provided)
Chavez, Dennis	
Clark, Terrance	Western North Carolina Physicians for Social Responsibility
Clemens, Steve	
Clements, Tom	Savannah River Site Watch
Coghlan, Jay	Executive Director, Nuclear Watch New Mexico
Colley, Vina	PRESS (Generic)
Collins, Jessie Pauline	Co-Chair, Citizens' Resistance at Fermi 2
Collins, Judy	
Colton, Julie	
Conroy, Barbara	
Cooley, Laura	
Corning, Gregory	
Cowan, Margaret	
D'Andrea, Karen	Ex. Director, Physicians for Social Responsibility Maine Chapter
D'Arrigo, Diane	Nuclear Information and Resource Service
dxxx@gmail.com	
Davis, Andrew	
Daw, Malachi	Naabeehó/Diné (Navajo Nation member)
Dear, Rev. John	Pace e Bene
Devereaux, Paul	
Dodge, Robert, M.D.	President, Physicians for Social Responsibility-LA
Donald, Gary	
Doyle, James	
Doyle, Jim	
D'Souza, Neville	
DuBois, Claudette	
DuBois, Gwen, MD, MPH	Chesapeake Physicians for Social Responsibility
Duffield, Denise	Physicians for Social Responsibility-Los Angeles
Eagle, Dr. and Mrs. James N.	
Euwer, Brenda	
Evans, Sally	Aiken Worship Group of CFM; Aiken Friends
Farewell, Kelly	
Farley, Desaray	

Commenter Name	Affiliation (If Provided)
Farley, Steven	
Fenoglio, Ella Joan	
Fernbach, Harvey	
Finney, Doris	
Fisher, Richard	
Fleck, Martin	Program Director, Physicians for Social Responsibility
Frisch, Dr. Ann	
Garduno, Ilsa	CARD, Albuquerque, NM
Garduno, Lisa	CARD, Albuquerque, NM
Gellert, Sally Jane	Occupy Bergen County
Gifford, Grace	Horry Friends
Gilchrist, Pamela	
Gordon, Susan	Coordinator, Multicultural Alliance for a Safe Environment
Gould, Robert M.	President, Physicians for Social Responsibility-Bay Area
Grant, David	Treaty Compliance Campaign
Green, Carol E	
Green, Jeanne	
Greene, Jean	Veterans for Peace Albuquerque Chapter
Greenwald, Janet	Coordinator, Citizens for Alternatives to Radioactive Dumping
Gregg, Nona Lee	
Haire, Emily	
Hancock, Don	Southwest Research and Information Center
Hansen, Anna	Santa Fe County Commissioner
Hawkins, Janice	
Heaton, Phyllis	
Healey, Gerilyn	
Heinrich, Martin	United States Senator
Henderson, Helen	
Hicks, Miranda	
Hoerig, Gudrun	
Hoff, Marilyn	Veterans for Peace Albuquerque Chapter
Homans, Dee	
Hormel, Jay	
Hotvedt, Mary	Rio Grande Chapter of Sierra Club

Commenter Name	Affiliation (If Provided)
Hunt, John	
Hutchison, Ralph	Coordinator, Oak Ridge Environmental Peace Alliance
Hyde, Don	
Jagiello, Carol	
Jantz, Eric	Interim Executive Director, New Mexico Environmental Law Center
Johnson, Nancy	Professor Emeritus, Emory University School of Medicine
Johnson, Richard	Veterans for Peace Albuquerque Chapter
Josephs, Robert	Veterans for Peace Albuquerque Chapter
Kahn, Henry S	Professor Emeritus, Emory University School of Medicine
Kamps, Kevin	Beyond Nuclear
Katz, Deb	Citizens Awareness Network
Kelley, Marylia	Executive Director, Tri-Valley CAREs
Kenney, James C	Cabinet Secretary, New Mexico Environment Department
King, Nicholas	Pastor, Carlsbad Mennonite Church
King, Ronda	
Kinniry, Janet	
Klose, Donald	
Koponen, Emmy	
Korman, Bonnie	
Kotowski, Sherrie Inez	Embudo Valley Environmental Monitoring Group
Kovac, Scott	Nuclear Watch New Mexico
Kristensen, Hans	Federation of American Scientists
Kuerschner, Erich	Public Choice Economist
Kuhn, Betty	
Laffan, Denise	
LaForge, John	Co-Director, Nukewatch
Lawton, William N.	Eubanks and Associates, LLC
Lloyd, Brennain	Northwatch, North Bay
Lodge, Terry J., Esq.,	Toledo Coalition for Safe Energy
Lorimer, Joel	
Luckey, Marjorie	
Lundeen, Kelly	Co-Director, Nukewatch
Macks, Victor	Michigan Stop the Nuclear Bombs Campaign
Magrath, Barney	

Commenter Name	Affiliation (If Provided)
Malmed, Maureen	
Marcus, Jill	
Marida, Patricia A.	
Martinez, Jose	Youth United for Climate Crisis Action
Martinez, Sofia	Concerned Citizens of Wagon Mound & Mora County
Matthews, Kay	La Jicarita News
McCulloch, Robyn	Veterans for Peace Albuquerque Chapter
McCoy, Dave	Executive Director, Citizen Action
McGrory, Mark	
Medeiros, Kimberly	Citizens Awareness Network
Mello, Greg	Los Alamos Study Group
Meyer, Scott	Don't Waste Arizona
Mezoff, Rebecca	
Michels, Nancy Sue	
Michetti, Susan	
Miller, Basia	
Miller, Shelby	
Mohling, Judith	Rocky Mountain Peace and Justice Center
Montaño, Charles and Elaine	Veterans for Peace Albuquerque Chapter
Moore, Ginny	
Moore, Leroy	Rocky Mtn Peace & Justice Center
Muhich, Mark	Sierra Club Nuclear Free Core Team
Murphy, Ellen	
Murphy-Young, Paige	
Myers, Winslow	Rotarian Action Group for Peace
N, Susan	
Nanansi, Mariel	New Energy Economy
Neymark, Shel	
Nichols, Jean	MAS Comunidad
O, F	
Obuszewski, Max	Baltimore Nonviolence Center
O'Connor, B	
Oleshansky, David	
Oliver, David	Columbia Friends Meeting

Commenter Name	Affiliation (If Provided)
Oyster, James Randall	
Padilla, Michael	
Paine, Christopher	NRDC (ret)
Parks, Sheila	Executive Director, On Behalf of Planet Earth
Parry, Ronald	Emeritus Professor of Chemistry, Rice University
Paul, Bobbie	Atlanta Grandmothers for Peace
Peacock, Rich	
Pettit, Karen	
Pettit, Kern	
Pinkham, Susanne	
Pino, Paul	
Potter, Iris	Palisades Shutdown Campaign Coalition
Powell, Tracy W	
Presbey, Gail	
Preston, Priscilla	
Propst, Sarah Cottrell	Cabinet Secretary, Energy, Minerals and Natural Resources Department
Pyle, Sasha	Concerned Citizens for Nuclear Safety
Reade, Deborah	Concerned Citizens for Nuclear Safety
Richards, Jean P.	
Riegle, Rosalie	
Riseley, Mary	Veterans for Peace Albuquerque Chapter
Romero, Denisha	
Romero, Diana	
Romero, Felina	Youth United for Climate Crisis Action
Romero, Joann	
Romero, Valeria	
Ryan, Bud	
Sadow, Emily	
Sanborn, Erin	
Schwart, Lizbet	
Schwartz, Alexander and Suzanne	Taoseños for Peaceful and Sustainable Futures
Schwartz, Sandy	Fairholm Builders LLC
Schwartz, Suzie	Taosneos for Peaceful and Sustainable Futures

Commenter Name	Affiliation (If Provided)
Seamster, Teresa	Rio Grande Chapter of Sierra Club
Seaton, Paula	
Seeley, Linda	Vice President, San Luis Obispo Mothers for Peace
Seret, Sylvia	
Sevre-Duszynska, Janice	Prevent Nuclear War
Shaw, Sally	New England Coalition
Shepp, Martha	Veterans for Peace Albuquerque Chapter
Silvia, Yasmeen	Beyond the Bomb
Kathryn, Simmons	
Slater, Alice	Nuclear Age Peace Foundation
Smith, Sara	Constituent Services Liaison, Santa Fe County Commissioner
Smithberger, Mandy	Project on Government Oversight
Speicher, Jo	
Sprinkle, James	
Stein, Cletus	The Peace Farm
Stein, Jerry	Peace Farm
Steinhoff, Monika	
Stevens, Jean	Veterans for Peace Albuquerque Chapter
Stewart, Laura	
Stoleroff, Debra	Vermont Yankee Decommissioning Alliance
Stroud, Sophia	Nuclear Watch
Suellentrop, Ann M.S.R.N.	PeaceWorks Kansas City & PSR
Sullivan, Cathie	Veterans for Peace Albuquerque Chapter
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Swanson, David	RootsAction.org & World BEYOND War
Thompson, Horace	
Tinl, Joel	
Tiwald, Bill	Veterans for Peace Albuquerque Chapter
Trujillo, Susan	
Tsosie-Peña, Beata	Tewa Women United's, Tsaya In'/ Circle of Grandmothers Program
Udall, Tom	United States Senator
Ulmer, Barby	
Van Susteren, Lise, MD	Physicians for Social Responsibility
Verchinski, Stephen	Green Party

Commenter Name	Affiliation (If Provided)
Vigil, Darlene	Veterans for Peace Albuquerque Chapter
Vigil, Darlene and Mario	
Voutselas, Eleanore	
Way, Ineke	
Webster, Lee	Veterans for Peace Albuquerque Chapter
Weehler, Cynthia	Southwest Alliance for Our Future
Weehler, Karen	
Weinstein, Elyette	
Young, Stephen	Washington Representative, Global Security Program, Union of Concerned Scientists
Ziegler, Bart	

A.2 CONSIDERATIONS USED BY NNSA TO ASSESS RELEVANT PUBLIC COMMENTS ON THIS LANL SA

NNSA considered every comment document received, determined if a comment document contained comments either directly related to the Draft SA or indirectly addressing a programmatic issue, summarized those comments, and prepared responses to address those comments. The comment summaries and NNSA's corresponding responses are shown below. Where applicable, the comment response indicates the section(s) of the Draft SA that was modified. For the benefit of the public and NNSA, this comment response appendix is organized to group comment summaries by similar topic. The topics include:

- Validity of the SA determination
- Purpose and need
- NEPA process
- New information/changed circumstances
- Impact analyses
- Nuclear weapon policies/new weapon designs
- General opposition or support
- Miscellaneous comments

In addition to the summarized comments and responses, NNSA responded directly to any comments made by government agencies and federally recognized Indian tribes that directly related to the Draft SA or indirectly addressed a LANL-specific issue. Two such comment documents were received, including from: 1) two Cabinet Departments under the Governor of New Mexico, New Mexico Environment Department (NMED) and New Mexico Energy, Minerals and Natural Resources Departments (EMNRD) (collectively, the Departments); and 2) the Santa Clara Pueblo. Comments from the Departments and Santa Clara Pueblo are presented in Section A.2.1., a response is provided after each comment.

A.2.1 Comments from NMED and EMNRD (referred to as NM)

NM-1. *DOE and NNSA must account for cumulative impact from failing to prioritize legacy contamination cleanup (2016 Consent Order) at Los Alamos. This SA should also discuss the settlement agreement between DOE and the State of Idaho.*[23]

Response

NNSA agrees with the Departments on the importance of considering potential cumulative impacts related to legacy cleanup, including the 2016 Consent Order, the 2019 Supplemental Agreement between DOE and the State of Idaho, and remediation of legacy waste at LANL.

[23] NM comments included the comment topics provided and additional narrative elements. Only the comment topics are reproduced here.

DOE recognizes the need for continuity in the transport of TRU waste from LANL to WIPP and that any agreements should not disrupt that ability. Negotiation of the 2019 Supplemental Agreement with the State of Idaho was conducted in a manner that ensures TRU waste disposal needs at LANL are recognized.

In this case, the Departments maintain that this SA should include discussion of the 2016 Consent Order between DOE and NMED and also discussion of a 2019 settlement between DOE and the State of Idaho in the cumulative impact analysis of the document, with particular regard to the prioritization of legacy cleanup at LANL. While NNSA differs from the Departments' position that discussion of these two documents is warranted in the cumulative analysis, NNSA agrees that it would be appropriate to review environmental impacts arising from these requirements, if any.

Implementation of the Consent Order was a fundamental part of the 2008 LANL SWEIS and understanding impacts from past, current, and future LANL operations to several environmental resources was central to this agreement. The 2016 Consent Order provides for increased communication and collaboration between the NMED and DOE during planning and execution of work. The 2016 Consent Order placed an emphasis in implementation of interim and corrective measures, sampling and monitoring, risk assessments, and excavation of contaminated areas. The 2016 Consent Order does not change the scope of the investigations, cleanup, and corrective measures to be conducted at LANL; and therefore, the cumulative waste impacts are not different than those analyzed in the 2008 LANL SWEIS.

While the procedural changes reflected in the 2016 Consent Order are not expressly addressed in this SA, the original impacts of remediating LANL contaminated sites (the ultimate goal of both the 2005 and 2016 Consent Orders) have been evaluated in the 2008 LANL SWEIS. The 2008 LANL SWEIS analyzed 2005 Consent Order actions and the cumulative waste impacts in the Expanded Operations Alternative. These impacts are not changed by the 2016 Consent Order. Moreover, NNSA's prior NEPA reviews have incorporated consideration of the 2016 Consent Order. For example, in the 2018 SWEIS SA, the modified Consent Order was reviewed in light of current and future expected Laboratory operations and concluded that impacts would in general be less than the 2008 LANL SWEIS projections. Next, the impacts noted by the joint comments are in fact reconsidered in this SA with potential impacts from the proposed action for pit production (*see* Section 4.4). This analysis shows impacts would be consistent with the 2008 LANL SWEIS. Finally, while it is NNSA's view that the impacts relating to the aim of the 2005 and 2016 Orders on Consent are adequately considered in the Draft SA, NNSA has revised Section 1.4 (*Other Relevant Documents*) of this SA to ensure that readers are aware of the 2016 Consent Order.

Regarding the 2019 Supplemental Agreement between DOE and the State of Idaho, NNSA understands the Departments' comment to relate to the potential impacts of this agreement on storage and shipment of transuranic waste at LANL as constituting information which should be assessed as a cumulative impact in this SA. NNSA agrees that the Draft SA did not include a discussion of the Idaho 2019 Supplemental Agreement, which addresses deadlines and

commitments made in a 1995 Settlement Agreement between DOE and Idaho, and NNSA has revised Section 1.4 (*Other Relevant Documents*) of this SA to ensure it reflects that existence of the 2019 Supplemental Agreement. However, NNSA respectfully submits that any impacts that might result from execution of the 2019 Supplemental Agreement are amply addressed in post-1995 NEPA documents.

The Settlement Agreement commitments were made long before the 2008 LANL SWEIS and the 2019 Supplemental Agreement, which reaffirms DOE commitments made in 1995, and is not a change that is significant within the meaning of NEPA. The 2008 LANL SWEIS analyzed the capability to store waste at various locations onsite, including TA-54. NNSA acknowledges that the Consent Order requires DOE to cleanup legacy waste and NNSA's pit production mission will not negatively impact the DOE Office of Environmental Management (DOE-EM) ability to continue to carry out its mission.

LANL has operated for nearly 25 years since the 1995 Supplemental Agreement and has had sufficient storage during that period, even during the WIPP closure. It is worth noting that since 1995, Idaho National Labs have removed approximately 90 percent of their TRU waste covered by this agreement.

NM-2. *DOE and NNSA must utilize its fully appropriated congressional budget on legacy contamination remediation activities to protect New Mexicans.*

Response

NNSA agrees that it is important to utilize funding appropriated by Congress for cleanup on legacy contamination remediation activities. NNSA also maintains that impacts relating to cleanup of legacy contamination are appropriate to discuss in the context of NEPA, and, as noted above, NNSA has reviewed impacts related to cleanup of legacy contamination in several documents such as the LANL SWEIS from 1999 and 2008. NNSA respectfully disagrees with the Departments that the LANL SWEIS SA must compare appropriated and expended funding as part of its NEPA analysis as the focus of the LANL SWEIS SA is to evaluate the potential environmental impacts of producing a minimum of 30 pits per year at LANL and implementing surge efforts to exceed 30 pits per year. To the extent these activities impact – or are impacted by – cleanup of legacy waste, consideration of those impacts is appropriate. With regard to such impacts, this SA remains consistent with the impacts of legacy cleanup in the 2008 LANL SWEIS.

NM-3. *LANL must ensure compliance with all applicable regulatory requirements and must improve their record of non-compliance.*

Response

NNSA acknowledges the importance of LANL complying with all applicable regulatory requirements. LANL's management and operating contractor, Triad National Security, LLC (Triad), emphasizes environmental compliance and is focused on continuous improvement of

performance against permit conditions. LANL has been entrusted with the responsibilities of environmental stewardship on the land designated for missions on behalf of the nation. As such, establishing and maintaining environmental leadership for our local communities is a value held by NNSA.

NNSA understands this comment to convey the Departments' concerns that a reduced environmental management budget at LANL introduces risk into environmental compliance. NNSA expects that DOE will continue to conduct remediation activities under the 2016 Consent Order in good faith and expects that Congress will continue to fund those obligations. The environmental compliance operating budget for Triad and the DOE environmental management legacy remediation budget are separately authorized and appropriated. Any actual or perceived increase or reduction in the LANL DOE environmental management budget does not reduce funding for LANL's operational environmental compliance program. NNSA acknowledges that increasing site operations introduces compliance risk due to increased site activities. However, increased NNSA funding at LANL, including for pit production, results in increased funding for Triad's operational environmental compliance program so these concerns are addressed.

LANL uses an Integrated Review Tool (IRT) to manage new or modified projects and evaluates against any applicable federal, state, county or local regulation/ordinance. The IRT is managed by Triad through trained environmental subject matter experts who help ensure any proposed project meets environmental compliance requirements. Furthermore, the 1999 and 2008 LANL SWEIS has considered impacts on environmental compliance areas under increased operations and, as a result, LANL has mitigation commitments that include additional environmental compliance monitoring and reporting such as the SWEIS Yearbook and the SWEIS Mitigation Action Plan Annual Report.

LANL recognizes the Departments' commitment to consider the compliance history of permitted facilities when executing administrative permitting decisions on behalf of the State of New Mexico, and NNSA commits to maintaining transparent lines of communication with the Department's staff as NNSA strives to ensure compliance with all applicable compliance requirements. It is NNSA's view that LANL and NMED from the highest levels of leadership down to the respective compliance staff have made great progress toward building a communicative, collaborative compliance relationship, and NNSA looks forward to continuing the positive outcomes that result from that relationship. As NNSA works through its analysis of how and where to appropriately site its pit production and manufacturing capabilities, NNSA assures that LANL will remain focused on compliance to all applicable requirements.

NM-4. *DOE and NNSA did not discuss and/or quantify various environmental legal matters that could have a material impact on its conclusion.*

Response

NNSA acknowledges that NMED's Final Decision on the WIPP Permit modification request which clarified the TRU mixed waste disposal volume reporting has been appealed. Regardless

of the outcome of this appeal, NNSA expects the waste evaluations made in the 2008 LANL SWEIS with respect to LANL activities to remain valid. With regard to the NEPA analysis of potential environmental impacts, the proposed action for producing 30 pits per year and surge operations for producing up to 80 pits per year as needed would have fewer impacts for TRU waste shipping to WIPP than were analyzed in the 2008 LANL SWEIS, derived from waste volume estimates that were based on operations data collected during pit production runs from 2007 to 2011. NNSA waste estimates provide a realistic disclosure of waste generated that are only from pit production activities. These waste estimates are less than the waste estimate volumes evaluated in the 2008 LANL SWEIS (*see* Section 3.3.5 Affected Environment, Existing NEPA Analysis, and New Information). The Final SA has been revised to include reference to the pending appeal.

In the event the pending appeal was to impact an activity in a manner not foreseen in previous NEPA reviews, NNSA would re-evaluate the activities prior to initiating action on them. As noted above, NNSA appreciates the collaborative relationship between NNSA and NMED, and NNSA and the Carlsbad Field Office will continue to work with NMED on issues related to shipping and disposal of TRU waste at WIPP.

NM-5. *Construction activities must have air quality permits, if applicable, and reasonable measures must be taken to control emissions of ozone precursors, nitrogen oxides, volatile organic compounds, and fugitive dust. This SA should also discuss reclamation of land disturbed by construction and noise.*

Response

NNSA agrees that construction activities at LANL must operate in compliance with applicable permitting, to include air quality permits. LANL has a mature air quality compliance program and routinely operates in compliance with these requirements and would continue in this fashion for this proposal. LANL is in full compliance with the current Title V permit and is currently working with NMED Air Quality Bureau on a Title V permit renewal permit which is anticipated to be issued in October 2020. There is no history of current or pending notices of violation associated with the LANL Title V air permit.

As noted above, LANL uses an IRT to manage new or modified projects and evaluate against any applicable federal, state, county or local regulation/ordinance. The IRT is managed by Triad through trained environmental subject matter experts who help ensure any proposed project meets LANL internal environmental best management practices and any environmental (current and pending) regulation. Currently, LANL air emissions are well within Title V and New Source Review construction permit limits.

LANL non-radiological air emissions remain very low as indicated in Section 3.5.2.2 of the 2018 LANL SWEIS SA. Potential air quality impacts from LANL's pit mission proposal are discussed in Table 3-1 of this SA. LANL takes actions to reduce air quality impacts such as:

- Prior to the construction, for equipment used that requires a federal or state permit, it will be obtained, filed and approved by NMED.
- A list of major equipment that may emit air pollutants will be provided along with the temporary duration of time expected to be used.
- Any open burning operations, must comply with the Open Burning and Smoke Management requirements of New Mexico Administrative Code Sections 20.2.60 and 20.2.65 as well as LANL's Title V Operating Permit.

Areas disturbed by construction activity are stabilized through reseeding with native perennial vegetation or the installation of permanent non-vegetative measures (e.g., pavement, riprap, gravel, and geotextiles). For construction activities subject to the National Pollutant Discharge Elimination System (NPDES) Construction General Permit (CGP), stabilization is executed and maintained in accordance with CGP requirements until final stabilization is achieved. CGP permitted projects are also required to minimize dust through the appropriate application of water or other dust suppression techniques to control the generation of pollutants.

Following construction, these actions occur on areas of land disturbance:

- Stabilization measures where earth-disturbing activities have permanently or temporarily ceased on any portions of a site. Stabilization activities are within 7-calendar days for sites that discharge to an impaired watercourse.
- The use of appropriate storm water management, sediment, and erosion control best management practices in accordance with LANL Engineering Standards, Chapter 3 Civil, G10GEN, 6.0, A, the LA-UR-11-10371, construction specifications, good engineering practices, and industry standards are required for all construction projects.
- Although there are no local or county air quality regulations on minimizing fugitive dust from construction sites, good management practices are to periodically use a water spray on active haul roads and construction sites in coordination with any Storm Water Pollution Prevention Plan requirements.

Prior to commencement of construction projects, all equipment used that requires a federal or state permit will be obtained, filed and approved by NMED. A list of major equipment that may emit air pollutants will be provided along with the temporary duration of time expected to be used.

NMED and Los Alamos County have air quality jurisdiction for LANL. There are no local requirements in Los Alamos County that are more stringent than current applicable air permit requirements found in 20.2 NMAC, the New Mexico statewide air quality regulation.

Current and future industrial activities at LANL will not adversely affect the contribution of ozone to the atmosphere. LANL will continue to apply engineering and administrative best management practices in full compliance with any and all applicable regulations at all times.

NM-6. *Construction activities must have a NPDES Construction General Permit, if applicable.*

Response

NNSA acknowledges the NPDES CGP requirement. LANL routinely operates in compliance with these requirements and would continue in this fashion for the subject proposal. LANL has a mature storm water quality compliance program that oversees implementation of compliance activities including the acquisition of CGP coverage for construction projects, the development and implementation of Storm Water Pollution Prevention Plans, and the installation and maintenance of storm water control measures. Since the start of the current CGP in May 2017, LANL has achieved a 93 percent compliance rate, as identified through permit required site inspections, and continually works to maintain and improve CGP compliance status. The Laboratory also has an established IRT that is utilized to screen upcoming construction projects and activities for applicable regulatory permits and requirements. When NPDES CGP requirements are identified through the project review process, LANL's storm water quality program is engaged to implement the necessary requirements. LANL routinely operates in compliance with these requirements and would continue in this fashion for the subject proposal.

NM-7. *Best management practices must be employed to protect sources of drinking water supply.*

Response

NNSA agrees that it is important to protect the four regulated public drinking water wells identified by the Departments' and supports the requirements for best management practices to protect sources of drinking water supply. LANL operates in compliance with these requirements and would continue compliance for the subject proposal.

The Laboratory's drinking water supply system is under the operation of Los Alamos County who is responsible for executing the regulatory requirements of the Safe Drinking Water Act (SDWA) with respect to this system. LANL samples drinking water supply wells on behalf of Los Alamos County to support SDWA compliance. To evaluate and protect drinking water supply sources, LANL monitors groundwater quality on a quarterly and annual basis through the Interim Facility Ground Water Monitoring Program (IFGMP). IFGMP data is reported to LANL stakeholders through periodic monitoring reports and inclusion in Intellus New Mexico. Additionally, agreements are in place and activities are executed to notify the Buckman Diversion Project of large storm water runoff events from specified LANL watersheds so that the Buckman Facility can appropriately manage their drinking water source intakes.

NM-8. *The March 2020 draft supplemental analysis of the 2008 LANL SWEIS does not fully investigate potential negative impacts on existing solid waste management units.*

Response

NNSA recognizes that the subject proposal has the potential for activities within or adjacent to solid waste management units (SWMUs) at LANL. All LANL activities have this potential and there are no unique or specific potential impacts for the subject proposal. The 2008 LANL SWEIS analyzed all LANL operations, including construction and decontamination and demolition activities, in the context of the LANL Consent Order and Individual Permit (which address SWMUs). The proposal for pit production would not have significant impacts to SWMUs beyond those already analyzed. Please refer to Appendix I of the 2008 LANL SWEIS, which provides a detailed evaluation of the SWMU's. Some of the investigations of these contaminated areas date back decades through records and personnel interviews. The fidelity of these investigations is considered as an indication of LANL's desire to correct past issues. The 2011 CMRR Supplemental EIS (Section 4.3.12) provides further discussion of a contamination area at TA-48 (PRS-48-001). This location is an area where major construction for the proposed pit missions support facilities would take place. Prior NEPA reviews in the 2008 LANL SWEIS (Sections 5.1 – 5.9) and the 2011 CMRR Supplemental EIS (Section 4.3.12) did not indicate any significant impacts and these impacts were reconsidered in this SA.

All construction activities and new or modified projects are reviewed through the IRT process for regulatory compliance, including potential impacts to SWMUs and for NEPA compliance. This review was conducted using the same IRT process discussed in comment #'s NM-3, NM-5, and NM-6. Project staff are provided information from environmental subject matter experts on locations of areas of potential contamination. Potential impacts are managed by avoiding disturbance of contaminated areas through re-siting or establishing barriers. Sampling would be conducted to ensure negligible disturbance. The proposed facilities considered in this SA have been sited to negate or minimize impacts at SWMUs. Table 3-1 of this SA was updated to describe practices used to minimize impacts with SWMUs. NNSA anticipates similar impacts to SWMUs as those already addressed in the 2011 CMRR Supplemental EIS and the 2008 LANL SWEIS.

NM-9. *Increased pit production will generate extra waste and DOE and NNSA will likely have to request permit modifications to increase their hazardous waste storage capacity.*

Response

NNSA agrees that low-level waste and chemical waste projections for producing up to 80 pits per year as reviewed in this SA shows higher estimates for the proposal than estimated for the Plutonium Facility Complex in the 2008 LANL SWEIS (Section 5.9.3) but not for LANL overall at a site-level. This estimate only relates to annual rate of generation and not the ability or capacity to store these waste types. These waste streams currently have disposal pathways and

while NNSA respects the Departments' forecast that a future permit modification may be necessary, NNSA would point out that this SA and other NEPA analyses address the impacts underlying the activities that would necessitate that and also that such a request, if needed, would be conducted in accordance with the Resource Conservation and Recovery Act and the New Mexico Waste Act.

NM-10. *The DOE and NNSA must include the State of New Mexico Radioactive Waste Consultation Task Force in its transportation planning process for legacy waste removal.*

Response

NNSA agrees with the Departments on the importance of coordinating with the State of New Mexico and NMED, including the Waste Consultation Task Force, on planning efforts regarding transportation planning for legacy waste removal. However, the scope for this SA does not include legacy waste removal and did not identify impacts affecting the planning for legacy waste removal.

NM-11. *The DOE and NNSA must include current census data in the environmental justice analysis for transportation impacts to disproportionate populations.*

Response

NNSA agrees with the Departments' on the importance of environmental justice analysis, particularly in identifying and addressing fair treatment so that no group of people bears a disproportionate burden of environmental harms and risks resulting from adverse environmental consequences of industrial, governmental, and commercial operations. NEPA requires the use of best available information. The 2020 census is not yet available, therefore NNSA used the best available information to identify the location of low income and minority populations. NNSA does not have a reasonable basis to conclude that that demographics relating to environmental justice have changed markedly since the 2008 LANL SWEIS.

In 2018, NNSA again reviewed the 2008 LANL SWEIS environmental justice impacts and determined that there were no disproportionally high and adverse impacts on minority or low-income populations residing near LANL, including from current pit production activities. The radiological dose from emissions associated with normal operations would, in fact, be slightly lower for members of Hispanic, Native American, total minority, and low-income populations than for members of the population that are not in these groups (*see* 2018 SWEIS SA, pp. 125–126). This SA includes updated information regarding minority and low-income populations as it pertains to potential disproportionally high and adverse impacts from pit production at LANL. This includes demographic profile information obtained from the U.S. Census Bureau website in 2019 that is used to compare to estimated projections for dose. These estimated doses for minority and low-income populations in the region surrounding LANL are within the range of impacts that NNSA previously evaluated in the 2008 LANL SWEIS (*see* Section 3.3.3).

NM-12. *The DOE and NNSA must include an assumption in its surplus plutonium analysis based on potential court reversal on the method of waste volume calculation that includes potential impacts to transportation regarding pit production and SPD, and the current statutory limitations at the WIPP, existing inventory of legacy waste, and future waste generated for disposition at the WIPP.*

Response

Please see NNSA's response to the Departments' comment #NM-4 above. With respect to the fact that DOE has identified surplus plutonium that "is under consideration or slated for disposition at WIPP" and the Departments' concerns that this could result in an exceedance of the authorized volume at WIPP, DOE has not announced a decision regarding the referenced surplus plutonium and has not arrived at a proposal for this material that is sufficiently developed for NEPA analysis. Future activities related to surplus plutonium would be subject to additional NEPA analysis and environmental review before proceeding. Based on day-to-day operational processes, the DOE Carlsbad Field Office tracks the volume of TRU waste disposed at the WIPP facility using proven and audited quality assurance procedures, and therefore, will ensure that the total TRU waste volume capacity limit of 6.2 million cubic feet (175,564 cubic meters) established in Public Law 102-579, *The WIPP Land Withdrawal Act* is not exceeded.

A.2.2 Comments from Santa Clara Pueblo (referred to as SC)

SC-1. *Santa Clara Pueblo states that it "trusts these comments will be respected as part of government-to-government relationship with the U.S. Department of Energy" and references DOE Orders, DOE policy, and agreements with DOE. Santa Clara Pueblo requests government-to-government consultation on NNSA's decisions related to this SA before such decisions are made.*

Response

NNSA has committed to engaging Santa Clara Pueblo in government-to-government consultations. NNSA will continue to engage in these consultations with Santa Clara Pueblo. NNSA understands Santa Clara Pueblo's comment to include a request for consultation on decisions relating to increasing pit production at LANL; however, Congress and the President have already made these decisions in accordance with national security requirements. NNSA is re-evaluating the environmental impacts of these decisions at the site-level at LANL in the LANL SA.

SC-2. *Santa Clara Pueblo states that its comments are limited in scope because of the need to focus time and resources on COVID-19 matters and Santa Clara Pueblo requested an additional extension to the comment period.*

Response

NNSA recognizes the disruptive nature of the COVID-19 pandemic and NNSA shares Santa Clara Pueblo's concerns over the risk and dangers of the novel coronavirus. LANL and the NNSA as a whole perform vital national security missions. While NNSA is doing everything it can to protect the workforce and the surrounding communities, NNSA cannot abandon the tasks which form a foundation for national security. The pit production project is one of those critical missions, and NNSA is moving forward both at LANL and SRS in a manner that takes the risks of the COVID-19 pandemic into account. The NEPA activities that are required for the pit mission must therefore also continue to move forward. The opportunity for public comment was carried out in a manner that did not contradict social distancing and shelter-in-place guidelines.

Although pertinent regulations do not require public comment on an SA, as a discretionary matter, NNSA decided to include public comments and responses to better assist the process. NNSA issued the Draft SA for a 45-day public review period and, for reasons related to the COVID-19 pandemic, extended the comment period for an additional 15 days to May 9, 2020. With regard to extending the comment period on the Draft SA further, NNSA respectfully did not agree to extend the comment period further. Given the importance of this effort at LANL, additional extension of the comment period would have a severe adverse impact on the detailed planning and coordination of this effort. NNSA appreciates Santa Clara Pueblo's interest in NNSA's proposal to produce plutonium pits at LANL. NNSA considered late comments to the extent practicable.

SC-3. *Santa Clara Pueblo states that the Draft SA does not comport with the requirements of NEPA for several reasons, including:*

- *This SA does not meet the standards set forth in 2019 DOE SA guidance.*
- *The Draft SA does not discuss new information related to "seismic environmental impacts" or is otherwise conclusory or incomplete and it does not explain how "the seismic intensity measure for ground motion fits within criteria for acceptable damage" and raises concerns about implementing facility upgrades and compliance.*
- *The Draft SA does not discuss a 2019 DNFSB report concerning the Plutonium Facility and does not state clearly that required facility upgrades will be completed before increased plutonium pit production would start.*
- *The description of the proposed action in the Draft SA is too vague, including references to new support facilities and implementing improvements without explaining specific work.*

Response

NNSA respectfully disagrees that this SA does not comport with the requirements of NEPA. NNSA has prepared this SA for the 2008 LANL SWEIS in accordance with DOE NEPA implementing procedures in 10 CFR 1021 and consistent with agency guidance. As the proposal has not significantly changed since the analysis of the 2008 LANL SWEIS, the proposed action and potential environmental impacts have not changed significantly in a manner that would warrant additional NEPA analysis. NNSA provides the description of proposed new support facilities through identifying its previous proposals and analyses in existing NEPA documents (DOE 2008a, 2011a, and 2015c).

This SA discusses seismic intensity and potential impacts related to seismic conditions, including information from the USGS, the PSHA, and the 2019 DNFSB technical report. NNSA continues to implement improvements to the PF-4 facility addressing seismic concerns and requirements identified by both NNSA and the DNFSB. These include analyzing the seismic capability for components of safety systems and making seismic upgrades to PF-4's structure, ventilation system, glovebox support stands for gloveboxes that contain molten plutonium operations, and the electrical distribution system (DNFSB 2019). These upgrades are anticipated to be completed before LANL would conduct pit production above 20 pits per year.

NNSA acknowledges the 2019 DNFSB and other technical reports and this SA has been revised to include additional discussion of DNFSB reports (*see* Sections 1.4.4 and 3.3.1). The DNFSB 2019 technical report discusses ongoing upgrades to PF-4 to meet seismic requirements that were analyzed in the 2008 LANL SWEIS. NNSA continues to execute both immediate and long-term actions to reduce risks posed by a seismic event at PF-4. As further information is developed, that information will be used as a basis for further upgrades. While there have been many infrastructure improvements, efforts will continue for several years. Upgrades are ongoing and scheduled through the mid-2020s. NNSA continues to monitor operational issues for all of its facilities, including PF-4. Issuance of a ROD related to pit production at LANL will not modify NNSA's monitoring and continued evaluation of operations and seismic risks.

SC-4. *At a minimum, a supplemental environmental impact statement should be prepared because there is new significant circumstances or information relevant to environmental concerns. Specifically, Santa Clara Pueblo states that the 2019 DNFSB Report contains information that contradicts statements in the Draft SA regarding potential impacts related to facility accidents and public health risks and this information is "controversial" and thus "significant," warranting the development of a supplemental EIS.*

Response

NNSA respectfully disagrees that a supplemental environmental impact statement is required based on the 2019 DNFSB Report. DNFSB provided an alternate approach for seismic requirements of PF-4 and is being evaluated by NNSA currently. The safety basis analysis for PF-4 is ongoing and is required to be completed before the proposal for pit production is

implemented. NNSA has determined that there are no changes to the proposed action or environmental conditions that provide a reasonable basis for concluding that the potential environmental impacts would be different from those analyzed in the 2008 LANL SWEIS in a manner that is significant. The fact that there have been, and will continue to be, facility changes does not mean the proposed action constitutes a substantial change to the proposal from actions analyzed previously and/or there are significant new circumstances or information relevant to environmental concerns (10 CFR 1021.314(a)). This SA evaluates the proposed action in light of these changes in accordance with 10 CFR 1021.314(a). Based on the technical analysis discussed in this SA, NNSA concluded that no further NEPA documentation is required, as the changes either have less environmental impact than previously analyzed or if there is an increased impact that impact is not significant.

A.2.3 Public Comments Summarized (referred to as PC)

As discussed in Section A.2, the general comments from the public for the Draft SA are summarized into the following topics: (1) validity of the LANL SA determination, (2) purpose and need, (3) NEPA process, (4) new information/changed circumstances, (5) impact analyses, (6) nuclear weapons policies/nuclear weapons designs, (7) general opposition/general support, and (8) miscellaneous comments.

A.2.3.1 *Validity of the SA Determination*

PC-1. *Commenters state that a new programmatic EIS is needed before this SA is completed for many reasons, including but not limited to:*

- *Public support for a new PEIS based on several petitions;*
- *The expansion of pit production at LANL and establishing pit production at SRS are "connected," "cumulative," and "similar" actions and NNSA's plan for simultaneous pit production at two sites was not considered in the Complex Transformation SPEIS or the analysis regarding SRS in Complex Transformation SPEIS is mischaracterized by the Draft LANL SA;*
- *Need to address Pantex role including production of plutonium oxide for pits and role of other sites involved in pit production.*
- *Competing programs at an "overcrowded PF-4 facility" requires programmatic review;*
- *Need to review lessons learned from Rocky Flats employees*
- *NNSA needs to consider new alternatives, including LANL for R&D and SRS for production because PF-4 is old and not sufficient and new facility would be needed;*
- *"Real proposed facilities" and "not hypothetical ones" need to be evaluated and it is inappropriate to "bound" the environmental impacts of potential future actions then "argue later that additional NEPA analysis is unnecessary;"*
- *Need an analysis of a stockpile stewardship program that avoids all possible changes that could introduce uncertainties;*
- *The roles of the two design agencies, LLNL and LANL, is not clear and any changes should be considered in a new programmatic EIS.*

Response

NNSA received numerous versions of this comment. This SA is part of an overall NNSA NEPA strategy for pit production, as referenced in the Notice of Availability for the Draft Complex Transformation SA (84 FR 31055) and described in the Notice of Intent To Prepare an Environmental Impact Statement for Plutonium Pit Production at the Savannah River Site (84 FR 26849). Pursuant to this strategy, NNSA first prepared a programmatic review of the Complex Transformation SPEIS. For the purposes of the programmatic analysis, NNSA's proposed action was adopting a Modified Distributed Centers of Excellence (DCE) Alternative that would allow NNSA to produce a minimum of 50 pits per year at a repurposed MFFF at SRS and a minimum of 30 pits per year at LANL, with additional surge capacity at each site, if needed, to meet the requirements of producing pits at a rate of no fewer than 80 pits per year during 2030 for the nuclear weapons stockpile. The 2019 Complex Transformation SPEIS SA evaluates the potential complex-wide impacts of adopting this Modified DCE Alternative and of producing up to 80 pits per year at both SRS and LANL and considers any new circumstances or information relevant to environmental concerns. An SA allows NNSA to determine whether the quantitative or qualitative environmental consequences associated with a proposed action were envisioned by the original EIS. During the process, NNSA considers substantial changes to the proposal or significant new circumstances or information. For all resource areas, the 2019 Complex Transformation SPEIS SA analyses verified that the potential programmatic environmental impacts would not be different, or would not be significantly different, than impacts in existing NEPA analyses.

NNSA invited public comment of its programmatic review and considered public comments received during that process. In December 2019, NNSA issued the Final 2019 Complex Transformation SPEIS SA which concludes that no further NEPA documentation is required at a programmatic level. That programmatic review has been conducted and is now completed. In order to implement the proposed action from the 2019 Complex Transformation SPEIS SA, NNSA stated that it would prepare site-specific documents, including at least: (1) a site-specific EIS for the proposal to repurpose the MFFF at SRS to produce a minimum of 50 pits per year, and implement surge efforts to meet NPR and national policy; and (2) a site-specific SA for the proposal to produce a minimum of 30 pits per year at LANL, and implement surge efforts to meet NPR and national policy. Comments associated with programmatic actions were addressed in the Final 2019 Complex Transformation SPEIS SA and discussion of those issues are beyond the scope of the analysis in this site-specific SA. The conclusion that no further programmatic analysis is necessary is likewise outside the scope of this SA.

NNSA respectfully disagrees that the Draft SA is inadequate and that inadequacy of a site-specific SA would provide a reasonable basis for requiring a new PEIS. This SA characterized the programmatic analyses conducted in the Complex Transformation SPEIS as they were described in the 2019 Complex Transformation SPEIS SA. The 2019 Complex Transformation SPEIS SA noted that the Complex Transformation SPEIS "included an analysis of a pit production facility that would use the MFFF and Pit Disassembly and Conversion Facility (PDCF)" and explained that Complex Transformation SPEIS "analyzed the environmental

impacts of pit production at both SRS and LANL, consistent with, and even significantly beyond, the programmatic proposed action" addressed in the 2019 Complex Transformation SPEIS SA (DOE 2019a, pp. 1, A-6, A-24).

PC-2. *Commenters state that a new LANL site-specific NEPA document or SWEIS is needed instead of an SA to the existing LANL SWEIS for many reasons, including but not limited to:*

- *Public support for a new SWEIS based on several petitions;*
- *The LANL SWEIS is dated, its estimates may be either "low" or "there is no way to verify" these estimates, environmental conditions have changed so significantly since 2008 that the LANL SWEIS no longer applies, analyze large intentional radioactive releases, and full operations at LANL must be reviewed in a new EIS;*
- *It is inappropriate to limit the scope of this SA to pit production without reviewing the impacts of full operations at LANL and therefore the scope of the SA is too narrow; and*
- *Need to analyze cleanup programs at LANL to protect groundwater resources.*

Response

NNSA is in compliance with its NEPA obligations for addressing the age of NEPA documents as described in DOE NEPA implementing procedures (10 CFR 1021). Per 10 CFR 1021.330, DOE shall evaluate site-wide EIS documents every five years. Per 10 CFR 1021.314, when it is unclear whether or not a supplemental to an EIS is required, DOE prepares a SA to determine if additional NEPA documentation is required. DOE has complied with these requirements for the 2008 LANL SWEIS through annual review and publication of the Laboratory's environmental impacts (LANL Yearbooks) and the 2018 SA to the 2008 LANL SWEIS (DOE 2018a).

NNSA prepared the 2018 LANL SA to determine whether the existing LANL SWEIS should be supplemented, a new environmental impact statement should be prepared, or no further NEPA analysis is required prior to proceeding with the continued operation of LANL and future projects at LANL. For the 2018 LANL SA, NNSA considered relevant new circumstances or information and potential substantial changes since publication of the 2008 LANL SWEIS. The 2018 SA to the 2008 LANL SWEIS reviewed at a site level all operations at LANL, and any changes in conditions since 2008, and determined that the ongoing operations and new and modified projects and modifications in site operations do not constitute a substantial change in actions previously analyzed in the 2008 LANL SWEIS, and there are no significant new circumstances or information relevant to environmental concerns. See comment #'s PC-12 through PC-16 and PC-29 for additional responses about new information and changed conditions. The 2018 LANL SA was completed prior to any change in law and national policy requiring LANL to produce more than 20 pits per year.

After the change in law and national policy concerning pit production at LANL, NNSA prepared this SA to determine whether the 2008 LANL SWEIS should be supplemented, a new environmental impact statement should be prepared, or no further NEPA analysis is required prior to proceeding with the pit production at a level greater than 20 pits per year at LANL. This

SA considers relevant new information since publication of the 2008 LANL SWEIS and the 2018 LANL SA. The 2008 LANL SWEIS, and the 1999 LANL SWEIS, evaluated the environmental impacts of producing greater than 20 pits per year at LANL, including the environmental impacts associated with production levels of 80 pits per year. This SA reviewed these estimates of potential impacts for all resource areas (Sections 3.2 and 3.3) and determined that at the site level the likely impacts of producing greater than 20 pits per year at LANL are in fact lower than the 2008 estimates for some resource areas. Therefore, the evaluation of impacts is still representative, and are not significantly different, for all resource areas evaluated in the 2008 LANL SWEIS.

Sections 5.3 and 5.4 of the 2008 LANL SWEIS address impacts of the site operations on water and air resources, respectively. Appendix I of the 2008 LANL SWEIS provides a detailed analysis of Consent Order actions. For further discussion, refer to NM Comments # 1, 5, 6, and 7. The 2018 LANL SA evaluates changes to environmental conditions on a site-wide level. The finding that 2018 LANL SA supports the conclusion in this SA that there are no significant environment conditions on a site level that require further analysis for pit production.

PC-3. *NNSA is inappropriately relying on bounding analysis, either as it relates to the 2008 LANL SWEIS or related to the Complex Transformation SPEIS.*

Response

NNSA respectfully disagrees that bounding analysis is improper or that it has improperly relied on a bounding analysis. This SA: (1) identifies changes in the proposed action and/or new circumstances or information; and (2) compares the new proposed action and/or new circumstances or information to pertinent alternatives analyzed in the 2008 LANL SWEIS, including a comparison of their potential impacts. In considering the environmental impacts of the proposed change or new information, NNSA believes that a finding that the associated environmental impacts would be less than (or not significantly greater than) those of any of the relevant alternatives analyzed in the existing 2008 LANL SWEIS or related NEPA documents is a strong indicator that a supplement to the 2008 LANL SWEIS is not required. Use of bounding analysis is consistent with NEPA implementing regulations. 40 CFR 1501.2 requires agencies to "integrate the NEPA process with other planning at the earliest possible time to ensure that planning decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts." LANL operates under a comprehensive Environmental Management System that requires it to mitigating adverse impacts and use of bounding analysis will not impede the agency's effort to fulfill this responsibility. For further discussion, please refer to NM Comments #3, 5, 6, and 7.

NNSA understands this comment, as it relates to the Complex Transformation SPEIS, to express concerns about the site-specific NEPA evaluations tiering from the programmatic NEPA analysis. NNSA respectfully disagrees that tiering is improper or that it has improperly utilized tiering. Complicated projects such as the pit production project benefit from a tiered approach where a programmatic document analyzes site selection and connected and cumulative impacts

between sites and then a site-specific document analyzes impacts that are more local and regional in nature. Other DOE or NNSA missions have been reviewed through separate NEPA processes and are not included in the project-specific review except to the extent that their impacts could be cumulative in nature. Future proposals for DOE or NNSA missions would be reviewed through further NEPA evaluation and those evaluations would also consider any cumulative impacts.

PC-4. *Commenters state that this SA description of the proposed action is too vague or underinclusive, or results in segmentation, for many reasons, including:*

- *The number, size, and location of buildings analyzed in this SA are vague and so the analysis is not of "real facilities." This SA needs to address the construction requirements of specific facilities, access roads, water and utilities, and traffic;*
- *This SA compares the impacts of the proposed action to operations at LANL as a whole, which is not a fair comparison;*
- *Potential offsite projects, such as a training facility, offsite facilities in Santa Fe, a new bridge over White Rock Canyon, and several miles of new highways "are portrayed in non-NEPA venues as reasonable." Failure to include these projects or alternative is segmentation under NEPA; and*
- *The bridge in the 2008 SWEIS Security-driven Traffic Project of the Expanded Operations Alternative is not included as part of the proposed action.*

Response

The evaluation of the impacts of the proposed action, which is to implement elements of the 2008 LANL SWEIS Expanded Operations Alternative as needed to produce a minimum of 30 war reserve pits per year during 2026 for the national pit production mission and to implement surge efforts to exceed 30 pits per year to meet NPR and national policy, is based on the most recent and best available information. NNSA has integrated the NEPA process with other planning at the earliest possible time to ensure that planning decisions reflect environmental values, to avoid delays later in the process, and to head off potential conflicts. The available information allows NNSA to conduct a full analysis of impacts. Proposed construction in the Pajarito Corridor reviewed in this SA is within previously analyzed areas for construction in prior NEPA analyses (*see* LANL SA Figure 2-3; 2011 CMRR SEIS Figure 2-9; 2008 LANL SWEIS). This SA discusses the infrastructure requirements for the proposed action that includes utility consumption, construction workforce, and associated impacts (*see* Table 3-1). NNSA has determined that the potential impacts of these projects are still representative, and are not significantly different, for all resource areas analyzed in the 2008 LANL SWEIS.

NNSA has followed appropriate guidance for preparation of an SA, and this SA compares the potential impacts of the proposed action to those analyzed in the 2008 LANL SWEIS. The impacts analyzed in this SA compares impacts of the proposed action first to the 2008 LANL SWEIS analysis for the Plutonium Complex Facility, then to operations at LANL as a whole, only to fully disclose the potential impacts of the proposed pit production mission.

There are no offsite facilities being considered at this time for the proposed action, and therefore, no such actions are evaluated in this SA. Offsite facility ideas are in pre-conceptual planning phases and are not ripe for NEPA analysis. NEPA analyses would be prepared for LANL activities if and when they become actionable proposals. NNSA does not implement decisions concerning potential new regional roads, highways, and bridges that are mentioned by some commenters. Activities analyzed in the 2008 LANL SWEIS, and re-examined in this SA, would occur regardless of whether other state or federal agencies decide to undertake these other activities. At this time, NNSA is aware of no specific proposals. These types of projects would be developed by state and federal transportation officials and are not part of the actions evaluated in this SA. Should any such projects be proposed or implemented by other state or federal agencies, NNSA would evaluate the impacts of those reasonably foreseeable actions as part of a cumulative impacts analysis in any future LANL NEPA document.

The bridges across Mortandad and Sandia canyons in the Security-Driven Traffic Modifications Project of the 2008 LANL SWEIS are not part of the proposal in this SA. This SA states that LANL proposes to implement only elements of the Security-Driven Transportation Modifications Project (Section 2.2). Specifically, parking lots and short pedestrian and vehicular bridges across Ten-Site Canyon that were analyzed in the Security-Driven Transportation Modifications Project in the 2008 LANL SWEIS. Clarification has been added to the Final SA to indicate that the parking lots and short pedestrian and vehicular bridges are the only elements of the Security-Driven Traffic Modification Project included in this proposal.

PC-5. *Commenters state that this SA does not comport with the requirements of NEPA and must be supplemented or revised and re-released for public comment for many reasons, including:*

- *Commenters raise issues surrounding a lack of alternatives in the SA.*
- *This SA should discuss "overlap" between pit production, surplus plutonium, and the Versatile Test Reactor (VTR), address "what would happen to plutonium taken to LANL for pit production if pit production were halted" as well as the impacts on LANL if pit production was not implemented at SRS, or was implemented at a level lower than planned;*
- *The competition for floor space at PF-4 was not addressed and "remodeling projects underway at PF-4 and RLUOB" would "prejudice this SA";*
- *A document on the "modern pit facility" MPF (1996 SSM PEIS) is not included in this SA; and*
- *Impacts for the "baseline program to support production at a rate of 20 pits per year" are not addressed.*

Response

NNSA respectfully disagrees with statements that the Draft SA does not comport with the requirements of NEPA and that it must be supplemented or revised and re-released for public comments. NNSA invited public comment on this SA and considered public comments received, although there is no regulatory requirement for NNSA to include public comment in an

SA process. This SA compares the new proposed action and/or new circumstances or information to pertinent alternatives analyzed in the 2008 LANL SWEIS, including a comparison of their potential impacts.

The two-site proposal for pit production is to improve resiliency, flexibility, and redundancy of the Nuclear Security Enterprise by not relying on a single production site. If SRS was unable to produce pits as proposed, LANL would produce 80 pits per year to meet requirements. The environmental impacts of producing 80 pits per year at LANL were evaluated in the 2008 LANL SWEIS and reviewed in this SA. The VTR and the pit production mission would use different sources of plutonium (*see* Notice of Intent at 84 FR 38021). There would be no conflicts for the pit production mission and the VTR or other potential plutonium decisions in the future would be evaluated pursuant the requirements of NEPA as appropriate.

Floor space at PF-4 is strictly allocated for approved missions and for potential missions during conceptual planning to avoid any conflicts. Generating plutonium oxide is ongoing at PF-4 on a small scale and floor space is available to increase plutonium oxide production as well as manufacturing of pits. Upgrades at PF-4 and RLUOB are ongoing for current plutonium activities. Those projects are occurring and NNSA's prior decisions continue regardless of a decision based on information contained in this SA.

DOE cancelled the MPF Project in 2006 after publication of the MPF Draft EIS. Relevant information from the MPF Project, such as whether to proceed with a pit production facility and if so, where to locate such a facility, was included in the Complex Transformation SPEIS as appropriate. Consequently, this SA mentions the Complex Transformation SPEIS document. More generally, NNSA respectfully disagrees with conclusion that a failure to include a document reference would render an SA not in compliance with the requirements of NEPA.

NNSA acknowledges that it is undertaking actions that are required for LANL to meet a production level of 20 pits per year but respectfully disagrees that this has any bearing on whether this SA comports with the requirements of NEPA. The scope of this SA is to evaluate whether the 2008 LANL SWEIS should be supplemented, a new environmental impact statement should be prepared, or no further NEPA analysis is required prior to implementing elements of the 2008 LANL SWEIS Expanded Operations Alternative as needed to produce a minimum of 30 war reserve pits per year during 2026 for the national pit production mission and to implement surge efforts to exceed 30 pits per year to meet NPR and national policy. In preparation of this SA, NNSA carefully assessed the actions needed to support the proposed action and the impacts of those actions are included in this SA. Actions pertaining to producing 20 pits per year were considered and thoroughly evaluated in prior NEPA analysis and decisions for this level of pit production at LANL have been in place for over twenty years (*see* 2008 Record of Decision [73 FR 55833; 74 FR 33232] and 1999 Record of Decision [64 FR 50797]).

A.2.3.2 *The Purpose and Need for NNSA's Proposal*

PC-6. *Commenters state that there is no need for new pits because the lifetime of existing pits is 100 -150 years and there are 15,000 pits currently in storage at Pantex.*

Commenters question the need for 80 pits per year if the current goal of 20 pits per year is not being met. Commenters also state that reuse should be evaluated as an alternative to pit production in the Draft SA for consistency with the SRS EIS, this SA should reference a 2019 JASON letter report, and plans to refurbish all weapons in the stockpile was not previously anticipated.

Response

The purpose and need for the continued operation of LANL is to provide support for NNSA's core missions as directed by Congress and the President (DOE 2008a, ch. 1 p. 11). Congress and the President have directed that during 2026 LANL will produce a minimum of 30 war reserve pits per year for the national pit production mission and implement surge efforts to exceed 30 pits per year to meet NPR and national policy (50 USC 2538a; Public Law 115-232). Pit reuse alone would not meet national security requirements.[24] As described further in the Complex Transformation SPEIS SA, for the foreseeable future, NNSA will rely on a combination of newly manufactured pits and judicious reuse of existing pits to modernize the U.S. nuclear stockpile. This approach enables NNSA to implement a moderately sized pit manufacturing capability of no fewer than 80 pits per year by 2030 (DOE 2019a). While NNSA will continue to reuse existing pits to the extent practicable, pit reuse is not a reasonable alternative to new pit production (DOE 2019a).

Further discussion of issues relating to pit lifetime and aging can be found in Section 1.1.2.1 of the 2019 Complex Transformation SPEIS SA and as well as in NNSA's responses in that document regarding questions about Pantex and the purpose and need. As stated in Section 2.3.4 of the SRS Pit Production Draft EIS, NNSA currently stages plutonium pits at Pantex. Like the pits in the active stockpile, those pits are aging and would not mitigate plutonium aging risks or enable NNSA to implement enhanced safety features to pits to meet NNSA and DoD requirements. Consequently, only reusing pits was eliminated from detailed analysis in the SRS Pit Production Draft EIS. NNSA is continuing pit aging studies but a complete assessment will take considerable time. The 2019 JASON letter report "…urge[s] that pit manufacturing be re-established as expeditiously as possible…" in addition to continuing the pit aging studies. To delay pit production only to later determine that pit aging is a concern would jeopardize the effectiveness and readiness of the United States nuclear deterrent.

[24] Pit production means production and manufacturing activities needed to fabricate new pits, to modify the internal features of existing pits, and to certify or requalify pits (DOE 2008a; DOE 2008b; DOE 1999a; DOE 1996). No new pit reuse program is proposed at LANL.

PC-7. *Commenters state that the Nuclear Posture Review is not U.S. law, but rather a "posture" and "an indication of policy of the current administration and can be changed."*

Response

Federal law requires that "consistent with the requirements of the Secretary of Defense, the Secretary of Energy shall ensure that the nuclear security enterprise . . . during 2030, produces not less than 80 war reserve plutonium pits" (50 USC 2538a(a)(5)). Other production requirements are provided for 2024, 2025, and 2026. These requirements are codified federal law. It is the policy of the United States, as established by Congress and the President, that LANL will produce a minimum of 30 pits per year for the national production mission and will implement surge efforts to exceed 30 pits per year to meet NPR and national policy (Public Law 115-232, Section 3120). The NPR is a legislatively mandated, comprehensive review of the United States nuclear deterrence policy, strategy, and force posture. The 2018 NPR affirms the requirements of the Secretary of Defense for a national production level of 80 pits per year that exist in federal law.

A.2.3.3 *NEPA Process*

PC-8. *Commenters question that the Draft SA was not announced in the Federal Register.*

Response

NNSA shares the focus on the importance of public awareness of the environmental impacts of environmental actions; however, NNSA declined to publish a notice of availability for this SA in the Federal Register. NNSA respectfully points out that a Federal Regester notice is not required for an SA. This SA is one aspect of a larger initiative concerning NNSA's plutonium pit manufacturing capability and production mission. This initiative involves pit manufacturing at LANL and SRS. In reviewing the impacts of these efforts, NNSA has reviewing existing NEPA analyses set out in the Complex Transformation SPEIS and 2008 LANL SWEIS. At the time of their publication, notices of availability for both the Complex Transformation SPEIS and the LANL SWEIS were published in the Federal Register. In addition, because plutonium pit production using the proposed Savannah River Plutonium Processing Facility would be a new capability not previously analyzed, NNSA is preparing an Environmental Impact Statement, which has been noticed in the Federal Register. Furthermore, NNSA's intent to prepare this SA was expressed in the NEPA strategy that was published in the Federal Register on June 1, 2019 (84 FR 26,849). This Federal Register Notice described NNSA's decision to prepare this SA as part of its overall NEPA strategy for future plutonium pit production. The strategy was also discussed in the draft and final Complex Transformation SPEIS SA documents, and at the scoping meeting held at SRS in June.

Publishing in the Federal Register is not the only form of acceptable public notice. NNSA previously informed the public of its decision to prepare this SA. The Draft SA was posted online in the NNSA NEPA Reading Room on March 10, 2020, for a 45-day public comment

period that ended April 24, 2020. The comment period was extended through May 9, 2020. The availability of the Draft SA was announced using the LANL GovDelivery listserve system. This system is used for all public notifications at LANL, reaches over 8500 people, and is where interested parties expect to find LANL NEPA documents and decisions. In addition, before posting the Draft SA, NNSA notified all interested state and tribal governments and congressional delegations of the document's release for comment.

Please note that NEPA and related documentation on this initiative continues to be available in the NNSA NEPA Reading Room (https://www.energy.gov/nnsa/nnsa-nepa-reading-room).

PC-9. *Commenters and petitions requested that the public comment period be extended during the COVID pandemic.*

Response

NNSA appreciates the public interest in this SA. Please see NNSA's response to comment #SC-2. NNSA considered late comments to the extent practicable.

PC-10. *Commenters state that public comment is valuable and is not being utilized in a meaningful way in this process or that this is not a sincere process (predetermined).*

Response

Although pertinent regulations do not require public comment on an SA, as a discretionary matter, NNSA decided to include public comments and responses to better assist the process. NNSA appreciates and considered all of the comments received. NNSA has engaged in a thoughtful process, reviewed these comments, prepared responses in this comment document, and made appropriate comments in the Final SA prior to issuance of a determination.

PC-11. *Commenters state that NNSA has effectively made its decision on pit production at two sites first and is considering environmental circumstances afterward, in contravention of NEPA.*

Response

With respect to a review of pit production at two sites, NNSA analyzed the decision in the 2019 Complex Transformation SPEIS SA. Please see NNSA's response to comment #'s PC-1 and PC-2. NNSA did not issue a Record of Decision authorizing pit production at two sites prior to performing site-specific evaluations. The NEPA process was initiated during the early conceptual stages starting with a review at the programmatic level through the 2019 Complex Transformation SPEIS SA. While NNSA has issued a policy statement concerning locating pit production at two sites, it has not completed its environmental review and NEPA analysis of locating pit production at a second site. This SA focuses on increased pit production at LANL consistent with the purpose and need identified in the 2008 LANL SWEIS. This site-specific

NEPA decision for LANL has been previously analyzed at both a programmatic and site-specific level and can be made independently of a decision on any other pit production site.

A.2.3.4 *New Information/Changed Circumstances*

PC-12. *Commenters state that the Environmental Justice section of this SA does not address members of minority populations that may not speak English or may not speak English as a first language.*

Response

NNSA public participation process for this SA is consistent with the requirements of Executive Order 12898 and agency guidance. Although it received no such requests, had NNSA received a request for alternate means to provide written or oral comments, NNSA would have made reasonable efforts to accommodate the request. For the 2008 LANL SWEIS, with respect to minority populations that may not speak English, alternate means of providing both oral and written comments on the 2008 LANL SWEIS were discussed with tribal governments and at multiple public meetings. For those purposes, no comments were submitted by alternative means. In other words, minority populations that may not speak English or may not speak English as a first language was an issue that was considered for the 2008 LANL SWEIS. NNSA respectfully disagrees with any inference that a lack of Spanish-language translation for documents directly corresponds with any lack of effective involvement of the Spanish-speaking population of New Mexico in the NEPA compliance process.

PC-13. *Commenters state that there are significant changes regarding facilities that support pit production that warrant a new NEPA analysis. Specifically, commenters state:*

- *Pit production at LANL depends on completion of the CMRR-NF, a project that was cancelled.*
- *The construction impacts of the proposed action are not clearly bounded by NEPA analysis relating to CMRR.*
- *The "RLUOB mission was expanded at LANL" and the MFFF at SRS was cancelled.*

Response

Pit production at LANL does not depend on completion of the CMRR-NF. As discussed in Section 1.4 of this SA, the CMRR-NF was never envisioned to house pit production, but it was previously thought necessary to support AC/MC capabilities for pit production. However, in the ensuing years, alternatives for AC/MC capabilities were identified which have separate and sufficient NEPA analysis, and the CMRR-NF was not required to support LANL pit production capabilities.

Construction areas for support facilities similar to those described in the proposed action were analyzed in both the 2008 LANL SWEIS and the 2011 CMRR SEIS. NNSA found that potential impacts from construction of such support structures would be less than the impacts previously analyzed for most resource areas in either the 2008 LANL SWEIS or the 2011 CMRR SEIS,

although with some resource areas the impacts would be different, but not significantly different, than previously analyzed. Therefore, the potential impacts from construction are bounded by these prior NEPA analyses.

In the 2018 *Final Environmental Assessment of Proposed Changes for Analytical Chemistry and Materials Characterization at the Radiological Laboratory/Utility/Office Building* (DOE/EA-2052), NNSA analyzed the proposal to modify RLUOB and enable its operation as a MAR-limited, HC-3 Nuclear Facility to perform more AC/MC operations than previously analyzed. The proposed action in the EA was to provide adequate physical means for accommodating AC/MC capabilities in RLUOB in a safe, secure, and environmentally sound manner. The 2018 RLUOB EA states that the proposal to provide more efficient AC/MC capabilities at RLUOB are required to support NNSA-established LANL mission requirements and are not tied specifically to LANL's pit production capability or for any pit production level. Mission-related work at RLUOB is outside the scope of this SA. The fact that there have been facility changes and that NNSA has implemented efficiencies and innovative operations in using existing facilities does not mean this SA proposed action constitutes a substantial change to the proposal from actions analyzed previously and/or there are significant new circumstances or information relevant to environmental concerns at a programmatic level (10 CFR 1021.314(a)). This SA evaluates the proposed action in light of these changes in accordance with 10 CFR 1021.314(a).

Changes regarding the MFFF at SRS are outside the scope of this SA. However, the 2019 Complex Transformation SPEIS SA considers and addresses the changes in facilities at SRS and LANL at a programmatic level (*see*, for example, Sections 1.4, 4.3.1, and 4.3.2 of the 2019 SPEIS SA). See the Draft EIS for plutonium pit production at SRS (DOE 2020) and NNSA's Response to comment #PC-1 for further discussion.

PC-14. *Since the 2008 LANL SWEIS, commenters state that there has been new information regarding seismic risks at LANL PF-4 that NNSA must consider in a new SWEIS or supplemental EIS including a 2019 report from the DNFSB and new information from the USGS. Commenters state that the Draft SA does not identify specific improvements to PF-4 that address seismic requirements and that current LANL PSHA is outdated and should be reanalyzed.*

Response

For a discussion of the 2019 DNFSB Report, see NNSA's response to comments #SC-3, which notes that NNSA considered the 2019 DNFSB and other technical reports and the SA has been revised to include additional discussion of DNFSB reports, and SC-4. This SA includes recent information from the USGS in the discussion of seismic geology (*see* Section 3.3.1). NNSA determined that this information, although recent, does not present a significant change for seismic conditions analyzed in the 2008 LANL SWEIS. This SA determined that site-specific seismic hazard predictions determined in PSHA studies are greater than those based on the USGS information. The LANL PSHA studies incorporate detailed, site-specific geologic, geophysical, and geotechnical information that are used to determine and monitor hazards and

determine critical facility design criteria for LANL facilities. As such, a more conservative approach to seismic hazard mitigation is implemented into LANL high-risk structure design. To ensure that seismic risk is mitigated at PF-4, structural upgrades at PF-4 are ongoing to reduce risks posed by a seismic event and to meet DOE seismic code requirements (*see* Section 3.3.1.2 and comment #SC-3 of this SA).

NNSA respectfully disagrees with commenters that a new PSHA analysis is necessary. DOE O 420.1c, Chg. 2 (7/28/18) Ch. IV, 3.d.(1) requires that existing natural phenomena hazards be reviewed every 10 years for significant changes. NNSA continues to monitor operational issues for all of its facilities, including PF-4. Issuance of a ROD related to pit production at LANL will not modify NNSA's monitoring and continued evaluation of operations and seismic risks.

PC-15. *Commenters state there have been several changes in environmental conditions at LANL since the 2008 LANL SWEIS that should be considered in a supplemental EIS or new SWEIS, including: the 2011 Las Conchas fire, drought conditions, and increased rate of wildfire; climate change and global warming; new designations of water resources (Waters of the United States and the Española Basin Sole Source Aquifer System); past contamination of water resources; water use; 2011 revision to DOE Standard 1027; and increased populations in the ROI.*

Response

NNSA has considered all the changes in conditions noted by commenters, including conditions that have changed or would change as a result of the proposed action, and respectfully disagrees that these changes in conditions trigger a requirement for a new EIS or supplement to an EIS. In the 2018 LANL SWEIS SA, NNSA considered changes in environmental conditions related to wildfire since the 2008 LANL SWEIS, including the 2011 Las Conchas fire, drought conditions, and regional trends in climate towards increased risk of wildfire (DOE 2018a). NNSA determined that drought and wildland fire were identified in the 2008 and that the continued risk of severe wildfire and higher soil erosion rates require the continued need for active wildland fire and forest health programs. Wildland fire is an anticipated event at LANL and in the areas surrounding LANL. While the Cerro Grande fire had a significant impact on LANL operations, neither it nor the 2011 Las Conchas fire jeopardized the LANL nuclear facilities or created conditions that would result in significant changes in impacts arising from the proposed action. Greenhouse gases are discussed in the Air Quality row of Table 3-1 and Section 4.3.4 and 4.3.5 of this SA. A footnote on climate change has been added to Table 3-1. The 2011 revision to DOE Standard 1027 is addressed in DOE 2018a, Section 3.1.

On April 21, 2020, the U.S. Environmental Protection Agency (EPA) and the Department of the Army published the Navigable Waters Protection Rule redefining "Waters of the United States" under the Clean Water Act in the *Federal Register* (85 FR 22250). On May 19, 2020, NMED announced a challenge to that ruling due to concern for protection of water resources in the state and similar litigation has been filed across the country. Until regulatory uncertainties are resolved, which many take several years, NNSA expects that LANL will continue to

implement water compliance programs. If any final regulatory changes impact Clean Water Act regulated programs at LANL, NNSA will analyze those impacts with respect to all LANL operations at the appropriate time. Please see NNSA's response to comment #'s NM-5 through NM-7 concerning groundwater, storm water, and drinking water. See Section 2.2.9 and Table 3-1 of this SA for estimates of water use under this SA. Past management or contamination of water resources are not within the scope of this SA.

Regarding population in the ROI, NM-IBIS 2018 identifies that t the population has increased by approximately six percent since 2008 (*see* NM-IBIS 2018). NNSA does not consider this population increase as a significant for the purposes of NEPA. Please see also NNSA's response to comment #NM-11.

PC-16. *Commenters have concerns about air emissions and state that this SA does not mention potential significant changes in LANL's "ability to pollute" due to the Environmental Protection Agency (EPA) March 26, 2020 Memo regarding COVID-19 Implications for EPA's Enforcement and Compliance Assurance Program*

Response

LANL has maintained compliance with its permits, including monitoring and reporting, during the COVID-19 pandemic. NNSA acknowledges the guidance from the EPA regarding limited enforcement discretion for noncompliance. Even under the temporary policy, entities are encouraged to make every effort to comply with their environmental compliance obligations (EPA 2020a). Please note that EPA issued a termination notice for this temporary policy to end August 31, 2020 (EPA 2020b). Air emissions, water discharges, and other releases from LANL operations are permitted under applicable permits that LANL and NNSA maintain through coordination with the EPA and NMED. NNSA will ensure that these permit and regulatory requirements are maintained throughout the COVID-19 pandemic. Please also see NNSA's response to comment #NM-5.

A.2.3.5 *Impact Analyses*

PC-17. *Commenters have asked several questions related to TRU waste. Specifically, commenters have asked for clarification on: WIPP capacity impacts that include surplus plutonium, pit production, cancellation of the MFFF at SRS, and potential impacts from a legal challenge to the WIPP volume calculation; expanding the pit production mission will delay the closure of WIPP; and, differences in TRU waste generation projected from pit production at LANL and SRS. Commenters also raised issues surrounding the 2014 WIPP closure.*

Response

For information regarding WIPP capacity, please see NNSA's responses to comment #'s NM-4 and NM-12. With respect to the disposition of surplus plutonium, DOE has not announced a decision regarding this material and has not arrived at a proposal for this material that is

sufficiently developed for NEPA analysis. NNSA will abide by applicable laws and regulations for the disposal of TRU waste at WIPP. See Table 4-5 in this SA for a 50-year projection of TRU waste generation compared to WIPP capacity. Projections for SRS are outside of the scope of this SA, but are addressed programmatically in the 2019 Complex Transformation SPEIS SA (DOE 2019a) and at a site-specific level in the Draft SRS Pit Production EIS (DOE 2020). The SRS DEIS cumulative impacts analysis used the bounding values for SRS TRU generation rates (which assume that aqueous recovery is not used), whereas expected values for LANL TRU generation are available based off of site operations (aqueous recovery is used). The use of aqueous recovery results in less waste being generated.

TRU waste streams to WIPP are discussed in the Cumulative Impacts section of this SA (*see* Section 4.5.1.2). An estimated 140 – 400 cubic yards of TRU waste would be generated annually from the proposed action at LANL. This is a very small portion of the WIPP capacity. Table 4-5 includes information for the most recent WIPP Annual Inventory Report (DOE 2019c) and indicates there is sufficient capacity at WIPP for disposal of TRU waste from other DOE sites and proposed pit production at SRS and LANL for 50 years. Please see also response to comment #NM-1.

PC-18. *Commenters request clarification of chemical waste and LLW management for pit production at LANL. These wastes are anticipated in this SA to exceed levels analyzed in existing NEPA documents.*

Response

Although this SA indicates that PF-4 may have a facility-specific increase in chemical waste and LLW, this SA also indicates that these wastes are not anticipated to exceed total levels at LANL analyzed in existing NEPA documents. In other words, although there may be more LLW estimated in this SA, it is based on operational data from 2007 through 2011 during pit production runs (LANL 2020). Across the site, LANL generation of LLW would be under the 2008 LANL SWEIS site estimate for 80 pits per year. The generation of LLW for production of 30 pits per year would be under Plutonium Facility Complex and site estimates of LLW generation in the 2008 LANL SWEIS (*see* Table 3-7 of this SA and Table 3-8 of LANL 2019b). Similarly, generation of chemical waste for production 30 and 80 pits per year would exceed the estimate for the Plutonium Facility Complex but remain under the site estimate for chemical waste per year as analyzed in the 2008 LANL SWEIS. LLW and chemical waste projections for the proposal remain well under the total site estimates in the 2008 LANL SWEIS. All chemical waste and LLW would continue to be managed under LANL waste management operations using waste management facilities across the site (*see* DOE 2008a, ch. 3 p. 51 through 55).

Exceeding rates of generation at the Plutonium Facility Complex for LLW and chemical waste volumes, as analyzed in the 2008 LANL SWEIS, do not result in an impact for storage volume. This SA has been revised to include this additional information in Section 3.3.5 on waste management.

PC-19. *Commenters state that the human health analysis is inadequate because the location of the MEI is not defined in the Draft SA.*

Response

As discussed in the 2008 LANL SWEIS, the MEI for PF-4 pit production operations is assumed to be located nearly 1,125 meters to the north (DOE 2008a, ch. 5 p. 89, Table 5-16). This SA refers to where the MEI is described in the 2008 LANL SWEIS.

PC-20. *Commenters disagree with this SA's assumption that security and safety issues identified in the 2015 DOE Office of Inspector General "Audit Report: Follow-up on Nuclear Safety: Safety Basis and Quality Assurance at the Los Alamos National Laboratory" have been resolved. Commenters also state concern about a "closure" at PF-4 and that a surge is different from a planned built-in capacity, and impacts on increased safety accidents.*

Response

NNSA notes commenters' disagreement with this assumption. In 2013, LANL paused work on all fissile material operations in PF-4. The pause stemmed from self-reported procedural issues and resulted in management evaluation of work, identifying potential deficiencies in work processes and procedures and mechanisms for continuous improvement. NNSA has taken actions to address the criticality safety concerns. Corrective actions include revising the Nuclear Criticality Safety Program. In addition, a causal analysis of criticality safety infractions that occurred in 2013 was conducted, and a plan was submitted to DOE for reopening PF-4 for operations. Finally, corrective actions from prior assessments were incorporated into the 2014 Nuclear Criticality Safety Program Upgrades Project Management Plan. Full operations, including pit manufacturing, resumed at PF-4 in 2016 commensurate with this plan.

Planning for surge capability at LANL ensures that mission needs for pit production are met in the event that production at SRS is less than 50 pits per year. Requirements for this capability at LANL are understood and plans to implement such efforts would be initiated to ensure an increased production of pits is conducted safely and securely as analyzed for operations at PF-4. The equipment and infrastructure to increase production of pits above 30, including up to 80, would be installed and available upon a NNSA decision to implement this proposal. Operational adjustments would be made to manufacture pits and perform maintenance on multiple shifts. Production of pits would occur at the same rate per shift as under the 30 pit per year mode.

This SA considered accidents, such as criticality events, which are dependent on the quantity of plutonium in a facility that could be released in an accident (e.g., the MAR) rather than the specific number of pits produced. Producing 30 pits per year and surge capacity for producing 80 pits per year if needed would have the same MAR at PF-4. The potential consequences from accidents, including criticality events, if LANL were to implement surge efforts would be consistent with and not greater than analyzed in the 2008 LANL SWEIS. Implementation of the

proposed action for pit production at LANL would not modify NNSA's monitoring and continued evaluation of operations.

PC-21. *Commenters state that they identified an error for TRU waste shipment numbers in Table 3-9 and request clarification. Commenters also state there is no discussion of increased waste shipments.*

Response

NNSA has reviewed and confirmed the TRU waste shipment numbers in Table 3-9. NNSA has revised Table 3-9 to include footnote "i" from Table K-5 of the 2008 LANL SWEIS for clarification. Section 3.3.6.2 provides an analysis of potential impacts associated with transportation for the proposed action.

PC-22. *Commenters state the socioeconomics analysis of the Draft SA is inconsistent or inadequate, or requires clarification, for several reasons, including:*

- *The impacts of hiring workers needed for producing 20 pits per year are not included;*
- *Housing needs and prices have increased since the 2008 LANL SWEIS and should be analyzed for new workers;*
- *A potential increase in commuter traffic is not addressed and this SA only states that an increase of 500 vehicles per day is anticipated and additional infrastructure is needed in the ROI to support additional hiring;*
- *Tax revenues from LANL going to school districts in NM for funding and hiring teachers should be addressed; and*
- *The environmental and community impacts of offsite construction are not addressed in this SA.*

Response

NEPA review requires analysis of socioeconomic impacts, and disclosure of both adverse and positive impacts. The proposed action for meeting the requirement of producing 30 pits per year and surge capability for producing up to 80 pits per year identifies that approximately 330 new hires are needed to perform functions for producing from 20 pits per year up to 30 pits per year with an additional 70 new hires to produce up to 80 pits per year. Requirements for producing 80 pits per year were analyzed in the 1999 LANL SWEIS (DOE 1999a) and the 2008 LANL SWEIS (DOE 2008a) and the RODs were issued for 20 pits per year in 1999 and 2008 respectively (64 FR 50797, 73 FR 55833). The hiring needs for producing 20 pits per year in PF-4 for pit production are addressed by the 2008 LANL SWEIS.

This SA acknowledges there is a general housing shortage as indicated by the low vacancy rate across the ROI and this SA has been updated to note that the 2019 *Los Alamos Housing Market Needs* report identifies an acute housing shortage in Los Alamos County (LAC 2019a) (*see* Section 3.3.3 of this SA). However, this housing shortage is not strictly attributed to the proposed action in this SA. NNSA identifies that this housing shortage would likely result in

available housing being filled quickly and a larger percentage of LANL-related housing needs would be accommodated by workers relocating outside the ROI. This demand on housing is not expected to exceed regional growth projections because the region is expected to grow by approximately 6.7 percent between 2016 and 2026 or 0.67 percent annually. Higher rates than this for regional growth were considered in the analysis of the 2008 LANL SWEIS (DOE 2008a, ch. 5 p. 122). Additional housing is planned in Los Alamos County (*see* Section 4.3.5 of this SA).

Increased commuter traffic within the ROI is anticipated to be associated with this anticipated hiring increase. Construction of new infrastructure to support increased hiring and commuter traffic is funded by state tax revenues, which LANL contributes towards in the ROI. This SA identifies that LANL contributes tax revenue to local governments within the ROI and the New Mexico general fund. These contributions help to fund various services in the ROI including for state roads and highways, public services, and school districts in the ROI. Implementation of the pit production mission beyond 20 pits per year is expected to increase tax revenue within the ROI and New Mexico overall and increases in tax revenues would offset the cost of additional services to support the associated increased population (*see* Section 3.3.3). With respect to potential impacts from offsite activities not included in the scope of this SA, please see NNSA's response to comment PC-4.

PC-23. *Commenters expressed concerns that the environmental justice analysis in the Draft SA and the analysis in the 2008 LANL SWEIS is inadequate and that the proposal would exacerbate "environmental injustice". These concerns include that SA is "insensitive to the cultures of northern New Mexico", a "burden on pueblos, and those downwind, downstream", including food pathways and generational impacts, and assumes that "impacts to local cultures would be alleviated by an infusion of gross receipts taxes and a few higher-paying jobs for locals; "that new workers and the subsequent demands for housing and infrastructure would affect local communities, and put jobs and money above cultural values, "possibly impinging to the point of extinction on these cultures;" and that DOE "could propose mitigation that might reduce the disparate effects on Hispanic and Native communities."*

Response

This SA acknowledges changes to environmental justice conditions as analyzed in the 2018 LANL SWEIS SA (DOE 2018c, pp. 125-126). As discussed in NNSA's response to comment #NM-11 above, no disproportionately adverse impacts to minority and low-income populations are anticipated from the proposed action. NNSA adopted mitigations in the 2008 LANL SWEIS ROD to develop a work plan jointly with Santa Clara Pueblo to address environmental justice, human health concerns, and issues identified by Santa Clara Pueblo during the SWEIS process (73 FR 55833). Mitigation status is tracked in the Mitigation Action Plan Annual Report (LANL 2019d). NNSA has identified no additional mitigations that are required at this time (see Section 3.3.4 of this SA).

NNSA recognizes the sensitivities of cultures in New Mexico. The vibrancy of local cultures and the interplay of different cultural heritages in New Mexico is part of what attracts individuals to New Mexico generally and to LANL in particular. However, the analysis of the interplay between the cultural longevity and individual choice of employment is beyond the scope of NEPA review. NNSA also notes that the potential impacts to culture raised by commenters relate to the existence of LANL in proximity to traditional cultures in general and the proposed action does not uniquely contribute to the concerns raised. Regarding impacts related to socioeconomic benefits and environmental justice, NNSA acknowledges that socioeconomic benefits are not a substitute for mitigating potential disproportionately adverse impacts to minority and low-income populations. The socioeconomic and environmental justice analyses are separate resource areas with some consideration for overlap regarding potential impacts. The environmental justice impacts identified in this SA remain less than those analyzed in the 2008 LANL SWEIS and NNSA plans to continue mitigating potential disproportionately adverse impacts to minority and low-income populations in the region of influence of LANL. Please see NNSA's response to comment #SC-1.

PC-24. *Commenters state that LANL has failed to maintain protections that would prevent a potential terrorist attack on LANL facilities.*

Response

In accordance with DOE Order 470.3A*, Design Basis Threat Policy*, and DOE Order 470.4, *Safeguards and Security Program*, NNSA conducts vulnerability assessments and risk analyses of the facilities and sites under its management to evaluate the possible threats and the protection elements, technologies, and administrative controls used to protect against these threats. These specific elements, technologies, and controls are outside the scope of this SA. However, this SA did evaluate intentional destructive acts in the last row of Table 3-1.

A.2.3.6 *Nuclear Weapon Policies/New Weapon Designs*

PC-25. *Commenters raise several questions and comments concerning pit production requirements, new weapon designs, and pit production processes, including but not limited to:*

- *Why is there a need for new nuclear weapon designs and what new designs are pits needed for?*
- *How many pits are needed for refurbished weapons in the stockpile?*
- *What is the status and justification for pursuing new warheads including the W87-1-like and W93 that were not planned for a decade ago?*
- *Would new designs require new techniques and new sources of plutonium for production?*

Response

Specific pit production requirements regarding weapons design are classified and beyond the scope of this SA. NNSA is responsible for producing the pit quantities and pit types specified by federal law and in the Nuclear Weapons Stockpile Memorandum (NWSM) and Nuclear Weapons Stockpile Plan (NWSP). Under federal law (50 USC 2538a), and consistent with defense requirements, the United States must produce no fewer than 80 pits per year during 2030. Refurbishment of weapons in the stockpile is driven by the NNSA mission of stockpile stewardship to ensure proper maintenance and performance of the stockpile. Pit production supports stockpile stewardship by ensuring that pit components meet requirements for assurance, performance, and capability.

PC-26. *Commenters have concerns regarding testing the safety and reliability of weapons using a new plutonium pit without the ability to conduct full-scale testing, including issues related to: renewed testing and compliance with the Comprehensive Nuclear-Test-Ban Treaty, the Nuclear Non-Proliferation Treaty, and the Strategic Arms Reduction Treaty; and that development of new pits could lead to nuclear escalation and proliferation worldwide, resulting in a new nuclear arms race.*

Response

The issue of testing is beyond the scope of this SA. With respect to certifying the safety and reliability of the stockpile, NNSA's Stockpile Stewardship Program was established in 1994 to sustain the deterrent in the absence of nuclear explosive testing. That program has allowed DOE and DoD to certify the safety, security, and effectiveness of the U.S. nuclear weapons stockpile to the President without the use of nuclear explosive testing for the past 23 consecutive years. The status of the current stockpile is monitored through continuous, multi-layered assessments of the safety, security, and effectiveness of each U.S. nuclear weapon system. NNSA is responsible for producing the pit quantities and pit types specified under federal law and in the NWSM and NWSP and lacks discretion to consider alternatives outside of national policy. A discussion of the interplay between current federal law and national policy and issues raised by commenters is included in the programmatic NEPA review (*see* 2019 Complex Transformation SPEIS SA, pp. 4–5, 34).

A.2.3.7 *General Opposition or Support*

PC-27. *Commenters express opposition to pit production for a variety of reasons, including but not limited to:*

- *Health and environmental risks and accidents;*
- *Opposition to the NNSA mission and use of nuclear weapons;*
- *Disagreement with the determination of this SA;*
- *Disregard for public comment and feedback;*
- *Continuing threat to the world environment, peace, and security; and*
- *Support for abolition of nuclear weapons worldwide.*

Response

The commenters' opposition to pit production is noted.

PC-28. *Commenters express favor of pit production for a variety of reasons, including retaining the capabilities and knowledge for such production.*

Response

The commenters' support for pit production is noted.

A.2.3.8 *Miscellaneous Comments*

PC-29. *Commenters request that this SA include discussion and analysis of several topics that are addressed in SWEIS, including an analysis of "proposed tritium venting (100,000 curies) or other large releases" and remaining remediated nitrate salt drums at LANL. Commenters asked that past waste management issues be discussed.*

Response

NNSA recognizes the continued public interest in these topics that were analyzed in the 2008 LANL SWEIS and associated supplement analyses. The proposed tritium venting was analyzed in the 2018 LANL SWEIS SA (DOE/EIS-0380-SA-05). The remediated nitrate salt drums were analyzed in the 2016 LANL SWEIS SA (DOE/EIS-0380-SA-04). These topics are outside of the scope of this SA. NNSA posted two SAs for the management of the remediated nitrate salt drums, see DOE/EIS-380-SA-03 and DOE/EIS-380-SA-04. These SAs evaluated handling, treatment, repackaging, and storage of the nitrate salt drums. These SAs can be found at https://www.energy.gov/nepa/listings/supplement-analyses-sa.

PC-30. *Commenters request that this SA include discussion and analysis of several topics that are addressed in other NEPA including NNSA decisions relating to the RLUOB MAR increase and remediation of a chromium plume.*

Response

NNSA recognizes the continued public interest in these topics that were analyzed in other NEPA documents. The proposal to increase AC/MC operations at RLUOB were analyzed in the 2018 Final Environmental Assessment of Proposed Changes for Analytical Chemistry and Materials Characterization at the Radiological Laboratory/Utility/Office Building (DOE/EA-2052). The ongoing chromium plume control measures and characterization was analyzed in the 2015 Final Environmental Assessment for Chromium Plume Control Interim Measure and Plume-Center Characterization, Los Alamos National Laboratory, Los Alamos, New Mexico (DOE/EA-2005) and its supplement analysis (DOE/EA-2005-SA-001). These topics are outside of the scope of this SA.

The use of LANL facilities for more than nominal pit production resulted from a DOE decision after completing the SSM PEIS (DOE 1996, 61 FR 68014). This decision is not within the scope

of this SA. Similarly, cleanup jobs are part of a different mission and not within the scope of this SA.

PC-31. *Commenters request that this SA include discussion and analysis of several topics which are otherwise outside scope of this SA, including but not limited to:*

- *The adequacy of the definition of "public health and safety" in DOE Order 140.1;*
- *NNSA did not provide data needed for JASON Report resulted in brief 2019 letter report*
- *2019 Supplemental Agreement to the 1995 Settlement between DOE and the State of Idaho;*
- *Uranium mining and milling on Tribal lands, geologic exploration or fracking in the region;*
- *LANL's responsibility to contribute to public education in the ROI beyond gross receipts taxes paid;*
- *LANL funding of its own free transport system from Rio Rancho and points north plus one from Las Vegas to NTS to reduce the need for parking garages and other infrastructure; and*
- *Modifying Atomic Energy Act to allow more than the President deciding if pit production goes forward.*

Response

NNSA recognizes that the public has continued interest in these topics. However, these are not topics that are within the scope of this SA. For more information on the 2019 Supplemental Agreement, which modifies the 1995 Settlement Agreement, with the State of Idaho, please see NNSA's response to comment #NM-1.

PC-32. *Commenter request that this SA include discussion and analysis of several topics related to cost of cleanup and funding, economics, and related topics, including:*

- *Schedule, budget, and feasibility of the proposal;*
- *Using financial resources for better things such as climate change research, cyber security, cleanup, or other matters;*
- *Changes to and clarification of contract responsibilities for LA-EM, NNSA, N3B, and Triad;*
- *Cleanup funding cut by 46 percent;*
- *"Site needs to reduce activities and transition to cleanup";*
- *Life-cycle costs of the LANL pit project must be discussed in this SA;*
- *Defense Programs including NNSA nuclear weapons programs have been on the Government Accountability Office's High-Risk List since 1992;*
- *Investigations into possible fraud, waste, abuse and mismanagement at Mixed Oxide needed before pit production pursued at SRS or LANL; and*
- *Doubts about whether replacement of PF-4 is possible or economically reasonable.*

Response

NNSA recognizes the public interest and concern in these topics related to schedule, budget, and feasibility of the proposal. The longer the NEPA and planning processes takes, the greater the risk to some of these areas of concern. These factors, and GAO assessment of spending, are not applicable to the analysis of potential impacts to environmental resources and are therefore outside the scope of this SA. Please also see NNSA's response to comment #NM-2.

PC-33. *Commenters ask if the wrought process (an alternative in the Draft SRS Pit Production EIS) would be used at LANL for pit production.*

Response

NNSA does not plan to use the wrought process for pit production at LANL at this time. If this process were proposed for LANL in the future, NNSA would conduct additional NEPA review and analysis as appropriate.

PC-34. *Commenters note that reports, such as a recent [May 2019] Institute for Defense Analyses (IDA) report and a report from the National Academy of Sciences Plutonium Panel, raise questions concerning the feasibility of the proposal.*

Response

The Fiscal Year 2019 National Defense Authorization Act required the Secretary of Defense, in consultation with the NNSA Administrator, to contract a federally funded research and development center to conduct an assessment of NNSA's approach to achieve DoD's requirement for producing no fewer than 80 plutonium pits per year by 2030. That study was prepared by IDA and delivered to Congress on April 16, 2019, by DoD. The IDA study found that all of the options considered by NNSA had cost and schedule risks. The study concluded that NNSA's two-site plan is potentially achievable, noting that sufficient time, resources, and management focus will be necessary. IDA also examined costs and found the current approach to be comparable in costs to the other three one-site options it considered. The full IDA report is classified. The introduction of the IDA report is available at https://www.energy.gov/sites/prod/files/2019/06/f63/NNSA-IDA-study-introduction.pdf. Whether NNSA can achieve completion of the proposed action within the requested schedule is outside the scope of the NEPA evaluation. The purpose of this SA is to determine whether additional NEPA analysis at a site-specific level is required.

PC-35. *Commenters state the references to existing NEPA documents are outdated and confusing, this SA does not provide specific citations to other NEPA documents, and that the public is inconvenienced in trying to understand the full history of pit production. Many references are not publicly available and no direct page*

references in the LANL SA result in guessing the reference locations in several multi-volume NEPA documents.

Response

This SA provides specific citations where appropriate to reference existing and relevant NEPA documents incorporated into the analysis. Although not required, where feasible, NNSA has provided specific citation and page number references in support of the Draft SA. Document references are used without page numbers when this SA does not require specific referencing. However, when referring to a specific part of a reference document, NNSA included chapter and page numbers in the Final SA. NNSA has reviewed its citations to ensure specific page number references are included where appropriate.

PC-36. *Commenters state that the interconnectedness of DOE sites represents new information about pit production that is not addressed in this SA. Comments request that the specific roles of all DOE sites involved in pit production are described and analyzed for impacts: LANL, SRS, Pantex, NNSS, Y-12, KCNSC, LLNL, and WIPP.*

Response

NNSA acknowledges the continued public interest in the roles of all DOE sites that support the pit production mission. The 2019 Complex Transformation SPEIS SA includes discussion of all sites involved at a programmatic level. The roles of other DOE sites are outside of the scope of the site-specific SA for LANL.

PC-37. *Commenters state that this SA needs to define "war reserve," "surge capacity," and "short-term surge capacity."*

Response

The term "war reserve" as used in this SA is consistent with how that term is used in federal law and national policy, including 50 USC 2538a and the 2018 NPR. The terms relating to surge capacity as used in this SA are consistent with how those terms are used in federal law and national policy, including Public Law 115-232. The specific details as to what constitutes a war reserve pit and specific details concerning production capabilities are classified and outside of the scope of this SA.

PC-38. *Commenters state that increasing pit production "so quickly" is dangerous and that production should start with sustained production of a small number before ramping*

up. Commenters state that this SA needs to clarify how many pits are currently produced, if LANL is meeting its current goals.

Response

The exact number of pits produced at LANL is classified and is not in the scope of this SA. NNSA respectfully disagrees that the decision to increase pit production can be characterized as being made quickly. In fact, national pit production levels have been under review for several decades. NNSA recognizes and has analyzed the impacts of pit production. NNSA will implement plans to ensure that mission work is conducted safely and securely to meet mission requirements as pit production increases at PF-4. Issuance of an Amended ROD for pit production at LANL will not modify NNSA's monitoring and continued evaluation of operations.

PC-39. *Commenters state that first responders in the ROI are not adequately trained to handle COVID-19 and potential radiological accidents from pit production and that funds for pit production should be diverted towards COVID-19 pandemic research and response; and that the pit production mission should be suspended during the COVID-19 pandemic.*

Response

NNSA acknowledges that the United States is continuing to recover from the COVID-19 pandemic. The scope of this SA is to evaluate if the proposal has any potential significant environmental impacts and does not evaluate the economic capabilities of funding the proposal. NNSA has determined through this SA that no significant changes with regard to environmental impacts have been identified and that the proposal is bounded by the existing NEPA analysis in the 2008 LANL SWEIS.

PC-40. *Commenters state that the WIPP operating timeframe has exceeded its original 25-year timeframe and that DOE "wants a new shaft" and to "keep WIPP open forever."*

Response

The operating timeframe of WIPP is outside of the scope of this SA.

STATE OF NEW MEXICO NEW MEXICO
WATER QUALITY CONTROL COMMISSION

IN THE MATTER OF: PROPOSED AMENDMENTS TO STANDARDS FOR INTERSTATE AND INTRASTATE WATERS, SECTION 20.6.4 NMAC.	)))))	**Docket No. WQCC 20-51 (R)**

REBUTTAL TESTIMONY OF PAMELA E. HOMER ON BEHALF OF COMMUNITIES FOR CLEAN WATER AND GILA RESOURCES INFORMATION PROJECT

JUNE 22, 2021

1. Background

I am Pamela Homer, and I am an Environmental Scientist in Santa Fe, New Mexico. I am providing this written rebuttal testimony on behalf of Communities for Clean Water ("CCW") and Gila Resources Information Project ("GRIP") in the triennial review hearing on proposed amendments to the Water Quality Control Commission ("WQCC") Standards of Interstate and Intrastate Surface Waters (the "Standards") at 20.6.4 NMAC.

I hold a B.S. in earth sciences from the University of Notre Dame and a M.S. in Resource Geography from Oregon State University. I worked at the New Mexico Environment Department ("NMED") for 18 years, until 2020, in various technical and management positions in the Ground Water Quality Bureau and the Surface Water Quality Bureau ("SWQB"). My position in the SWQB was as the Water Quality Standards Coordinator, a position I held from 2007 until 2012. My responsibility in that position was to provide guidance to the SWQB in implementing the Standards across the federal Clean Water Act ("CWA") programs, including impaired waters assessment, National Pollutant Discharge Elimination System ("NPDES") permits, the establishment of total maximum daily loads ("TMDLs") for impaired waters, and stream restoration efforts. I also managed a team that developed new and revised water quality standards

CCW-GRIP EXHIBIT 5

proposals based on scientific analysis, state and federal policy, and stakeholder concerns. My primary task during my tenure was to initiate and coordinate the 2009 Triennial Review, which began with public outreach in 2008 and culminated in 2010 with EPA's approval of the adopted revisions to the Standards. I was the SWQB's primary technical witness in that rulemaking. I also coordinated an update of the WQCC's Water Quality Management Plan/Continuing Planning Process document, which describes and directs implementation of water quality programs in the state. In this position I gained a strong understanding of the Standards and the role they play in water quality protection in New Mexico. I also had to be familiar with EPA rules and guidance, especially as related to water quality standards.

In the Ground Water Quality Bureau I held technical and management roles in the review, issuance, and enforcement of Ground Water Discharge Permits, pursuant to the WQCC's Ground and Surface Water Protection Regulations, 20.6.2 NMAC. I also served as the Voluntary Remediation and Brownfields Team Leader and the Remediation Oversight Section Manager. As a result of my work in both bureaus, I have broad experience with the N.M. Water Quality Act and water quality protection programs in the state. My resume is **CCW-GRIP Exhibit #6**. It is accurate and up to date, except that I recently began working as a Project Manager for INTERA, Inc., a geosciences and engineering consulting firm. I am offering this testimony as a private individual, not as an INTERA employee.

2. Focus of Testimony

I have reviewed NMED's Amended Petition and the Notices of Intent and direct testimony provided by all parties. I would like to provide rebuttal testimony to comments and proposals by Triad National Security, LLC ("Triad"), and the United States Department of Energy National Nuclear Security Administration (collectively, "DOE"); the New Mexico Mining Association

("NMMA"); and the San Juan Water Commission ("SJWC") on the topics of climate change, toxic pollutants, analytical methods, and the application of human health-organism only criteria. In particular I will address:

- The SJWC's contention that addressing climate change is inappropriate as an objective of in the Standards;
- Changes to the definition of "toxic pollutants" proposed by DOE and NMMA;
- DOE's position on the general criterion for toxic pollutants;
- DOE's criticism of the proposals relating to Contaminants of Emerging Concern,
- DOE's proposal to disallow analytical methods that are not included in 40 CFR 136, and
- DOE's proposal to limit the application of human health-organism only criteria to waters with a fish consumption designated use.

3. Climate change

CCW and GRIP support the inclusion of an objective into the Standards that calls out the importance of considering, slowing, and mitigating the impacts of climate change on surface water quality and aquatic ecosystems. Climate change is, after all, the overarching environmental issue facing the planet, and changes in climate are intimately connected with the quantity, distribution and quality of water. In its recent West-Wide Climate and Hydrology Assessment[1], the U.S. Bureau of Reclamation projects that for the Rio Grande Basin above Elephant Butte dam, the coming decades will bring increased temperatures, decreased annual precipitation, decreased runoff, temporal shifts in stream runoff, and droughts of greater severity and longer duration than

[1] U.S. Bureau of Reclamation, West-Wide Climate and Hydrology Assessment, Technical Memorandum No. ENV-2021-001, Sections 3.6 and 4.

any of the observed historical or paleo events. Such hydrologic shifts will continue to manifest themselves in the "physical, chemical, and biological integrity" – to use the phrase from the Clean Water Act ("CWA") Section 101(a)(2) goal – of New Mexico's surface waters. Given that the Standards stand at the center of CWA programs in the state, setting as an objective – as a priority – to consider how the Standards can protect water quality in the face of climate change impacts is an important directive.

In her testimony on behalf of the San Juan Water Commission, Jane DeRose-Bamman opposes NMED's proposal to add an objective at Section D of 20.6.2.6 NMAC that would state, "These surface water quality standards serve to address the inherent threats to water quality due to climate change." She argues that the Standards do not address this threat in that they have nothing to do with greenhouse gas emissions, and that it is the implementation of the Standards, as in identifying causes of impairment and setting TMDLs, not the Standards themselves, that combats this threat as well as other threats to water quality. She goes so far as to claim that "neither the N.M. Water Quality Act nor the federal Clean Water Act provides authority for the proposition that a goal of the WQS is the address climate change." On this point I must disagree. I find nothing in either of those Acts that would prohibit adding such an objective.

If the wording of the proposal is part of what gives Ms. DeRose-Bamman pause, then I admit to sharing that unease. On first reading, I also found it problematic to include an objective and a definition but no other provisions relating to climate change by name. Upon reflection, however, my perspective has shifted. Having a policy statement provides permission, even direction, to investigate how and whether the Standards could mitigate the impacts of climate change. It invites NMED and other parties to consider the question and to develop proposals that could better shield our aquatic ecosystems, drinking water sources, ceremonial traditions, water-

dependent industries, and favorite recreational pastimes from the deleterious effects of climate change.

CCW and GRIP propose the following alternate language for subsection D of the objective at 20.6.4.6:

> A further purpose of these surface water quality standards is to address the inherent threats to water quality due to climate change.

4. Toxic pollutants

DOE and NMMA propose replacing the narrative description in the "toxic pollutant" definition with the CWA list of toxic pollutants, and other named pollutants as might eventually be adopted, as follows:

> **"**Toxic pollutant" means those pollutants, or combination of pollutants~~, including disease-causing agents, that after discharge and upon exposure, ingestion, inhalation or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, will cause death, shortened life spans, disease, adverse behavioral changes, reproductive or physiological impairment or physical deformations in such organisms or their offspring~~ listed by the EPA Administrator under section 307(a) of the federal Clean Water Act. 33 33 U.S.C. 1313(a) or in the list below.

In direct testimony on behalf of DOE David Bryan Dail argues that this approach would be consistent with the 40 CFR 131.3(d) and the WQCC's approach to regulating toxic pollutants in the groundwater regulations. 40 CFR 131.3(d) is the definitions section of the water quality standards regulations. It defines toxic pollutants as "those pollutants listed by the Administrator under section 307(a) of the [Clean Water] Act." By consistency with the approach in the groundwater regulations (20.6.2 NMAC), I assume he means the coupling of a specific list of pollutants in the definition with a narrative standard. The final phrase "or in the list below" is to allow the option of listing additional contaminants.

I agree that lists are helpful. It is perhaps an oversight that the Standards currently do not specify which pollutants in 20.6.4.900 fall under the definition. It would be appropriate to

reference the CWA list here. The toxic pollutant list from 20.6.2 NMAC could be referenced here as well. If that list from 20.6.2 NMAC is to be included, this is the better place for it than in the General Criterion for toxic pollutants at 20.6.4.13(F) as NMED has proposed.

I do not agree, however, that the narrative description in the definition should be deleted. DOE and NMMA want to strike it because it creates regulatory uncertainty for them. From my perspective the higher public goal is to prevent our waters from being toxic to living organisms. If a discharge or a surface water meets all the criteria established in Section 20.6.4.900 but still causes death or chronic harm to organisms, then we have not accomplished our task. The narrative portion of the definition should continue to serve the function it always has: to allow flexibility to address a contaminant not currently on the list without waiting to go through a years-long regulatory revision. If a contaminant that meets the narrative description is reasonably suspected to be in a discharge, for example, NMED needs the ability to require monitoring for it and, in appropriate cases, set effluent limits. The definition could both retain the narrative description and add the lists.

DOE proposes an addition to the existing general criterion for toxic pollutants in 20.6.4.13(F)(1), as follows:

> Except as provided in 20.6.4.16 NMAC, surface waters of the state shall be free of toxic pollutants from other than natural causes in amounts, concentrations, duration or combinations that affect the propagation of fish or that are toxic to humans, livestock or other animals, …

I find no justification for this addition in the testimony provided by DOE witnesses. I oppose the change. It is grammatically incorrect and technically vague. What is the duration of a pollutant? Does this refer to its persistence in the environment? Does it refer to a duration of exposure? The description in the definition as it stands now is clear and sufficient.

5. Contaminants of emerging concern

On behalf of DOE, David Bryon Dail expresses several objections to NMED's proposal to add a definition for "contaminants of emerging concern" and to add this group of contaminants to the criterion for toxic pollutants at 20.6.4.13(F). He prefers the development and adoption of numeric criteria for specific pollutants. He presents a case that such criteria could be developed, which I understand as a concession that such criteria are indeed needed for at least some contaminants of emerging concern, but he does not offer any estimate of how long or how many resources such a process would require. Nor does he offer DOE's lobbying support to secure legislative funding to develop even a few such criteria! Meanwhile, he takes issue with NMED's intent to require monitoring – only monitoring – of some per- and polyfluoroalkyl substances, commonly known as PFAS, by some dischargers.

In her direct testimony on behalf of Amigos Bravos, Rachel Conn detailed the extent to which PFAS and numerous pharmaceuticals and personal care products have been detected in New Mexico waters. NMED needs to be able to require monitoring for contaminants of concern that are not currently on the CWA toxic pollutants list. Monitoring does not always lead to further regulation. It provides data, so that New Mexicans can make informed decisions about identifying sources and risks and what further actions are warranted.

6. Analytical methods

DOE proposes to make several changes regarding analytical methods:

> 20.6.4.12(E): The commission may establish a numeric water quality criterion at a concentration that is below the ~~minimum quantification level~~ lowest minimum level (ML) of the analytical methods approed by EPA under 40 CFR part 36 for the measured pollutant or pollutant parameter. In such cases, the water quality standard is enforceable at the ~~minimum quantification level~~ at the ML of the sufficiently sensitive method approved by EPA under 40 CFR part 136.
>
> New definition at 20.6.4.S:

> "Sufficiently sensitive" means any method approved under 40 CFR part 136 for the analysis of pollutants or pollutant parameters for which (1) the method minimum level (ML) is at or below the level of the effluent limit established in the permit; or (2) the method has the lowest ML of the analytical methods approved under 40 CFR part 136 for the measured pollutant or pollutant parameter.
>
> 20.6.4.14.(A): 40 CFR Part 136 approved methods shall be used to determine compliance with these standards and in Section 401 certifications under the federal Clean Water Act. In all other cases, sampling and analytical techniques shall conform with methods described in the following references unless otherwise specified by the commission pursuant to a petition to amend these standards:

In his direct testimony, John Toll argues that the change to 20.6.4.12(E) and the new definition will provide clarity and conformance with the federal CWA and federal NPDES regulations. He claims that only methods approved in 40 CFR 136 may be used for monitoring of NPDES permits, according to 40 CFR 122.44. These regulations do not tell states what they must adopt in the water quality standards; rather, they tell EPA what to include in NPDES permits. EPA apparently is of the opinion that its regulations allow for methods other than those included in 40 CFR 136. The pending draft NPDES permit for Los Alamos National Laboratory requires the use of "EPA published congener Method 1668 Revision and detection limits," a method that is not included in 40 CFR 136, for analyzing samples for total PCB. The permit requires in Part II.A that test methods be "sufficiently sensitive" and explains what that means. The current permit includes a similar provision. If DOE believes EPA is misapplying its regulations, then it should take its complaint to EPA. A copy of the draft permit is **CCW-GRIP Exhibit #7**.

Pursuant to 40 CFR 131, the regulations pertaining to the establishment of water quality standards which is the subject of this proceeding, the state must designate uses and establish criteria to support those uses. States may include in their standards policies "generally affecting their application and implementation," such as those in 20.6.4.12 and 20.6.2.14 NMAC. The state also has the obligation, under 40 CFR 123.3, to certify that "a discharge from a Federally licensed or

permitted activity will comply with water quality requirements." I am aware of no requirement that the state must limit analytical methods to those in 40 CFR 136. Doing so would constrict the state's ability to ensure through monitoring that water quality standards are actually attained. The state should retain the flexibility it now has and reject these proposals.

7. Application of Human Health-Organism Only Criteria

DOE proposes to amend Section 20.6.4.11(G) to restrict the applicaton of human health–organism only criteria, as follows:

> 20.6.4.11(G). Human health-organism only criteria in Subsection J of 20.6.4.900 NMAC apply to those waters with a designated, existing or attainable aquatic life fish consumption use. If a tributary does not have an attainable fish consumption use, then HH-OO criteria do not apply to the tributary. If the fish consumption designated use is not attained in the first downstream segment with an attainable fish consumption designated use, then the tributary should be assigned a load allocation as required by 40 CFR Part 130. ~~When limited aquatic life is a designated use, the human health-organism only criteria apply only if adopted on a segment specific basis. The human health-organism only criteria for persistent toxic pollutants, as identified in Subsection J of 20.6.4.900 NMAC, also apply to all tributaries of waters with a designated, existing or attainable aquatic life use~~.

The proposal would limit the HH-OO criteria to only those waters with a "fish consumption" use. Conducting a "Find" on the term "fish consumption" in the Standards reveals no matches. Indeed, no waters have a designated fish consumption use, nor do the Standards identify such a use in Section 20.6.4.900. So this proposal, if adopted, would eliminate these criteria from all waters. As HH-OO criteria have been adopted for 93 pollutants and currently apply to most waters in the state, this would be a dramatic change indeed.

CCW-GRIP oppose this proposal. The HH-OO criteria, as stated in Section 20.6.4.900(J)(2)(f), "are intended to protect human health when aquatic organisms are consumed from waters containing pollutants." They are based on EPA's nationally recommended criteria, which "represent specific levels of chemicals or conditions in a water body that are not expected

to cause adverse effects to human health," as explained on the website where EPA lists its recommended human health criteria.[2]

The WQCC does not control who fishes where in this state, so it is reasonable and prudent to apply these criteria anywhere aquatic life communities are present. In its current form, Section 20.6.4.11(G) already restricts the application of these criteria in that only a small subset of the HH-OO criteria – those for persistent toxic pollutants, which are designated with a "P" in the table of criteria in Section 20.6.4.900 – applies to waters with a "limited aquatic life" use. (DOE proposes deleting this restriction in favor of its much more restrictive language.)

The term "fish consumption" does present itself in the NM water quality arena, in that NMED collects fish samples from around the state and samples the tissue for certain contaminants. Information about this program is available at the following NMED website: https://www.env.nm.gov/surface-water-quality/fish-consumption-advisories/. As explained there, "In some New Mexico fish, three particular contaminants have been detected at levels that could result in health problems from long term fish consumption, such as for weeks, months, or longer. These contaminants are mercury, polychlorinated biphenyls (PCBs), and dichloro-diphenyl-trichloroethane (DDT)." The advisories provide information to the public on limiting consumption of fish where these elevated levels have been detected. The need for such advisories is precisely what the HH-OO criteria are intended to prevent. Fortunately, the list of contaminants detected so far is short. Retaining the HH-OO criteria on all waters with aquatic life uses, not just those waters from which we think people might be consuming fish, is an important human health protection.

[2] https://www.epa.gov/wqc/national-recommended-water-quality-criteria-human-health-criteria-table

This concludes my rebuttal testimony.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 22nd day of June 2021

Pamela E Homer

Pamela E. Homer

PAMELA E. HOMER
Santa Fe, NM 87505

CCW-GRIP EXHIBIT 6

PROFILE

Ms. Homer's experience with surface and ground water quality/management issues includes permitting and enforcement, remedial action oversight, Brownfield redevelopment, policy analysis and development, and rulemaking initiatives. She has testified in administrative proceedings, managed grants and contracts, and conducted public involvement processes.

EDUCATION

M.S. Geography with Water Resources Emphasis, Oregon State University.
B.S. Earth Science, B.A. German, University of Notre Dame.
Secondary Science Teaching, University of New Mexico.

PROFESSIONAL EXPERIENCE

Reuse Team Lead, Pollution Prevention Section

NMED Ground Water Quality Bureau, 2017-2020

Ensured that provisions for wastewater reuse in discharge permits were protective of public health. Coordinated with Office of the State Engineer in reviewing and overseeing aquifer recharge projects and proposals. Provided support for the 2018 rulemaking to amend the Ground and Surface Water Protection Regulations, and assisted in developing implementation for new provisions, e.g. fact sheets for federal facilities, vapor intrusion, and toxic pollutants. Participated in drafting the 2018 draft inter-agency white paper *Oil and Natural Gas Produced Water Governance in the State of NM.* Supervised staff and participated on management team to address personnel and policy.

Lower Rio Grande Project Manager

New Mexico Interstate Stream Commission, 2016-2017

Provided technical analyses of complex hydrologic and water-resource engineering issues to ISC and the Attorney General's Office in preparation of technical defenses related to interstate water litigation. Developed workplans and managed technical contractors in the areas of surface and ground water hydrology, water quality, water use, land use analysis, data management, river operations and river gaging. Provided direction to contractors to ensure efficient use of contract monies and high quality work products on time; tracked budgets and deliverables. Provided support for State Water Plan update.

Program Manager/Team Leader, Remediation Oversight Section

NMED Ground Water Quality Bureau, 2012-2015

Team Leader for the Voluntary Remediation Program (2012-2013), then served as section manager (2014-2015) to oversee voluntary and obligatory state cleanup programs. Responsible for ensuring that assessment and remediation of soil and ground water contamination met regulatory requirements and protected human health and the environment. Managed caseload of sites, and guided staff in setting priorities, resolving policy questions, and selecting appropriate technical/regulatory strategies. Coordinated closely with EPA Region 6 Brownfields Program in identifying potential sites, conducting workshops, building partnerships, administering a revolving loan fund, completing assessments and cleanups. Prepared grant applications, work plans, budgets, and quarterly reports for multiple federal grants.

Managed contracts for environmental services and revolving loan fund: approved work orders, tracked budgets, monitored contract requirements, reviewed RFPs and scopes of work. Supervised technical staff; participated in hiring decisions. Assisted with bureau-wide management tasks, such as SOP development and personnel actions.

Water Quality Standards Coordinator 2007-2011

NMED Surface Water Quality Bureau, Santa Fe, NM

Provided guidance on the development and interpretation of surface water quality standards as they affected implementation of Clean Water Act programs, e.g., discharge permits, impaired waters identification, and stream

restoration efforts. Served as lead staff coordinating NMED's technical arguments in the 2008-2010 Triennial Review of surface water quality standards before the Water Quality Control Commission. Managed team that conducted public outreach and developed proposals based on scientific analysis, state and federal policy, and stakeholder concerns. Developed new initiatives, prioritized issues, negotiated with stakeholders, and prepared extensive written direct and rebuttal testimony to explain and justify positions. Stood for oral cross examination. The WQCC adopted all of NMED's positions.

Completed a stalled effort to integrate and update two Clean Water Act required documents - the Water Quality Management Plan and Continuing Planning Process – and gained WQCC approval. Supervised Quality Assurance Officer, who updated the quality management documents annually, and set quality assurance expectations for the bureau.

Environmental Scientist 2001-2006

NMED Ground Water Quality Bureau, Santa Fe, NM

Managed ground water discharge permit caseload of domestic, industrial and agricultural facilities for compliance with the NM Water Quality Act and WQCC Regulations. Conducted administrative and technical review of applications, oversaw public notice process, responded to public comment and inquiries, negotiated and recommended final permit conditions. Conducted compliance inspections and sampling, reviewed monitoring and investigation reports, issued compliance letters, required corrective actions. Provided testimony in hearing on a controversial permit. Drafted letter templates, monitoring forms, and revised application materials for the program.

Supervised three technical staff (2004 - 2006). Coordinated the Underground Injection Control primacy program (2006), guiding staff in developing permit conditions and compliance strategies. Oversaw enforcement cases addressing unpermitted discharges and illegal septage dumping.

Water Resources Planner 1990-1994

Oregon Water Resources Department, Salem, OR

Facilitated year-long process to develop state policy on water allocation for new water rights. Assisted in developing the Willamette Basin Plan, particularly the portions pertaining to surface water allocation and future municipal water needs. Participated in development of legislative concept and subsequent rules to streamline water right process for beneficial environmental projects such as wetland enhancement and mitigation. Reviewed state and federal environmental documents, such as forest and grazing plans, dam projects, and wildlife policies, for impacts on watershed health and consistency with state water policy. Implemented legislative mandate requiring municipalities and irrigation districts to report water use and well owners to conduct pump tests. Researched water rights and responded to heavy load of inquiries and complaints.

TRAINING & WORKSHOPS

Public Servant Leadership Course (2014)
ASTM Phase I and Phase II Environmental Site Assessment
EPA: Chemistry for Environmental Professionals
Hazardous Waste Operations and Emergency Response
Introduction to Environmental Enforcement
Administrative Practice and Procedure

Region 6
1201 Elm Street, Suite 500
Dallas, Texas 75270-2102

NPDES Permit No. NM0028355

AUTHORIZATION TO DISCHARGE UNDER THE NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM

In compliance with the provisions of the Clean Water Act, as amended, (33 U.S.C. 1251 et. seq; the "Act"),

Triad National Security, LLC
Los Alamos National Laboratory
PO Box 1663, K491
Los Alamos, New Mexico 87544

AND

U.S. Department of Energy
Los Alamos Area Office, A316
3747 West Jemez Road
Los Alamos, NM 87544

are authorized to discharge from a facility located at Los Alamos,

to receiving waters named: Perennial portion of Sandia Canyon in Waterbody Segment No. 20.6.4.126, and Mortandad Canyon, Canada del Buey, Los Alamos Canyon, ephemeral portion of Sandia Canyon, Ten Site Canyon, and Canon de Valle, in Waterbody Segment No. 20.6.4.128 of the Rio Grande Basin,

in accordance with this cover page and the effluent limitations, monitoring requirements, and other conditions set forth in Parts I [Requirements for NPDES Permits], II [Other Conditions], III [Standard Conditions for NPDES Permits], and IV [Sewage Sludge Requirements] hereof.

This permit, prepared by Isaac Chen, Environmental Engineer, Permitting Section (6WDPE), supersedes and replaces NPDES Permit No. NM0028355 issued August 12, 2014, then modified March 27, 2015, with an expiration date of September 30, 2019.

This permit shall become effective on

This permit and the authorization to discharge shall expire at midnight,

Issued on

Charles W. Maguire
Director
Water Division (6WQ)

CCW-GRIP EXHIBIT 7

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PART I - REQUIREMENTS FOR NPDES PERMITS

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

OUTFALL 001

Discharge Type: Continuous
Latitude 35°52'26"N, Longitude 106°19'09"W (TA-3-22)

During the period beginning the effective date of the permit and lasting through the expiration date of the permit (unless otherwise noted), the permittee is authorized to discharge Power Plant waste water from cooling towers, boiler blowdown drains, demineralizer backwash, R/O reject, and including treated sanitary wastewater effluent from the Sanitary Wastewater System (SWWS) Facility, recycled sanitary effluent from the Sanitary Effluent Reclamation Facility (SERF), and treated cooling tower blowdown from the Strategic Computing Complex (SCC) to Sandia Canyon, and the discharge creates a perennial portion of Sandia Canyon, Segment Number 20.6.4.126 of the Rio Grande Basin.

Such discharges shall be limited and monitored by the permittee as specified below:

EFFLUENT CHARACTERISTIC	DISCHARGE LIMITATIONS				MONITORING REQUIREMENTS	
	CONCENTRATION (mg/L, unless stated)		LOADING (Lbs/day, unless stated)		FREQUENCY	SAMPLE TYPE
	MONTHLY AVERAGE	DAILY MAXIMUM	MONTHLY AVERAGE	DAILY MAXIMUM		
Flow (MGD)	***	***	Report	Report	Continuous	Record
TSS	30	100	Report	Report	1/Month	24-hr Composite
BOD (*1)	30	45	73	109	1/Month	24-hr Composite
E. Coli (#/100 ml) (*2)	126	410	***	***	2/Month	Grab
Total Residual Chlorine	***	0.011 (*3)	***	***	1/Week	Grab
Total Recoverable Aluminum	Report	Report	***	***	1/Year	Grab
Total Copper	0.0087	0.0087	***	***	1/Year	Grab
Total Zinc	0.126 (*4)	0.126 (*4)	***	***	1/Year	Grab
6T3 Temperature (°C)	20°C (*5)	***	***	***	1/Hour	Grab (or Continuous Record)
Total PCB (µg/l) (*6)	0.00064	0.00064	Report	Report	1/Year	24-hr Composite

pH (Standard Unit)	Range from 6.6 to 8.8	***	***	1/Week	Grab

EFFLUENT CHARACTERISTICS	DISCHARGE MONITORING	MONITORING REQUIREMENTS	
WHOLE EFFLUENT TOXICITY (*7) (7-day Chronic Static Renewal)	VALUE	MEASUREMENT FREQUENCY	SAMPLE TYPE
Ceriodaphnia dubia (Limit)	100%	1/6-Months	24-Hr Composite
Pimephales promelas	Report	1/5-Years	24-Hr Composite

FOOTNOTES

*1 BOD monitoring is required when discharges of treated sanitary waste occur at Outfall 001.

*2 Geometric mean. Effluent limitations and monitoring requirements only apply when effluent from Outfall 13S is rerouted and discharged at Outfall 001.

*3 Effluent limitation for TRC is the instantaneous maximum and cannot be averaged for reporting purposes.

*4 Effluent limitations take effective on the date of three years from the effective date of the permit.

*5 6T3 Temperature of 20°C (68°F) shall not be exceeded for six or more consecutive hours in a 24-hour period on more than three consecutive days. Daily maximum temperature shall be determined by 6T3 temperature record when 6T3 temperature.

*6 EPA published congener Method 1668 Revision and detection limits shall be used. [The permittee is allowed to develop an effluent specific MDL in accordance with Appendix B of 40 CFR Part 136 (instructions in Part II.A of this permit).] Human health-based limitations.

*7 Critical dilution 100%, and the dilution series are 32%, 42%, 56%, 75%, 100%. See Part II, Section G. Whole Effluent Toxicity (7-Day Chronic Testing). WET limit applies to Ceriodaphnia dubia. WET monitoring only applies to Pimephales promelas.

SAMPLING LOCATION(S)

Samples taken in compliance with the monitoring requirements specified above shall be taken at the following location(s): following final treatment and prior to or at the point of discharge from Outfall 001.

NO DISCHARGE REPORTING

PART II - OTHER CONDITIONS

A. MINIMUM QUANTIFICATION LEVEL (MQL)

EPA-approved test procedures (methods) for the analysis and quantification of pollutants or pollutant parameters, including for the purposes of compliance monitoring/DMR reporting, permit renewal applications, or any other reporting that may be required as a condition of this permit, shall be sufficiently sensitive. A method is "sufficiently sensitive" when (1) the method minimum level (ML) of quantification is at or below the level of the applicable effluent limit for the measured pollutant or pollutant parameter; or (2) if there is no EPA-approved analytical method with a published ML at or below the effluent limit (see table below), then the method has the lowest published ML (is the most sensitive) of the analytical methods approved under 40 CFR Part 136 or required under 40 CFR Chapter I, Subchapters N or 0, for the measured pollutant or pollutant parameter; or (3) the method is specified in this permit or has been otherwise approved in writing by the permitting authority (EPA Region 6) for the measured pollutant or pollutant parameter. The Permittee has the option of developing and submitting a report to justify the use of matrix or sample-specific MLs rather than the published levels. Upon written approval by EPA Region 6 the matrix or sample-specific MLs may be utilized by the Permittee for all future Discharge Monitoring Report (DMR) reporting requirements.

Current EPA Region 6 minimum quantification levels (MQLs) for reporting and compliance are provided in Appendix A of Part II of this permit. The following pollutants may not have EPA approved methods with a published ML at or below the effluent limit, if specified:

POLLUTANT	**CAS Number**	**STORET Code**
Total Residual Chlorine	7782-50-5	50060
Cadmium	7440-43-9	01027
Silver	7440-22-4	01077
Thallium	7440-28-0	01059
Cyanide	57-12-5	78248
Dioxin (2,3,7,8-TCDD)	1764-01-6	34675
4, 6-Dinitro-0-Cresol	534-52-1	34657
Pentachlorophenol	87-86-5	39032
Benzidine	92-87-5	39120
Chrysene	218-01-9	34320
Hexachlorobenzene	118-74-1	39700
N-Nitrosodimethylamine	62-75-9	34438
Aldrin	309-00-2	39330
Chlordane	57-74-9	39350
Dieldrin	60-57-1	39380
Heptachlor	76-44-8	39410
Heptachlor epoxide	1024-57-3	39420
Toxaphene	8001-35-2	39400

Unless otherwise indicated in this permit, if the EPA Region 6 MQL for a pollutant or pollutant parameter is sufficiently sensitive (as defined above) and the analytical test result is less than the MQL, then a value of zero (0) may be used for reporting purposes on DMRs. Furthermore, if the EPA Region 6 MQL for a

STATE OF NEW MEXICO
WATER QUALITY CONTROL COMMISSION

IN THE MATTER OF:

PROPOSED AMENDMENTS TO
STANDARDS FOR INTERSTATE AND
INTRASTATE SURFACE WATERS
20.6.4 NMAC **NO. WQCC 20-51(R)**

REBUTTAL TESTIMONY OF ALLYSON SIWIK
ON BEHALF OF GILA RESOURCES INFORMATION PROJECT

My name is Allyson Siwik. I am the Executive Director of Gila Resources Information Project (GRIP). My duties as Executive Director include setting goals and priorities for GRIP and developing positions on environmental and health issues. I also represent GRIP on local and state-wide community and environmental health bodies.

I have a Bachelor of Arts degree in Biology from Colby College in Waterville, Maine, which I received in 1983. I have a Master of Environmental Management, Economics and Policy from Duke University School of the Environment in Durham, North Carolina, which I received in 1991. A copy of my resume is **CCW-GRIP Exhibit 9**. It is accurate and up to date.

GRIP is a New Mexico nonprofit membership organization, tax-exempt under section 501(c)(3) of the Tax Code, established in 1998, and based in Silver City, New Mexico. GRIP has approximately 1000 members. GRIP's mission is to promote community health by protecting the environment and natural resources of southwest New Mexico, including protecting surface water and groundwater. GRIP advocates for protection of surface water and groundwater. GRIP's mission statement, from its Articles of Incorporation, states:

> Recognizing that human and environmental systems are inseparable and interdependent, Gila Resources Information Project pursues two goals:
>
> 1. To protect and nurture human communities by safeguarding the natural resources that sustain us all; and

CCW-GRIP EXHIBIT 8

2. To safeguard natural resources by facilitating informed public participation in resource use decisions.

GRIP engages in various activities including public outreach, education, and advocacy. These activities include publishing a newsletter, communicating with members via a website, e-mail, and social media, offering community meetings, issuing press releases, placing display advertisements, and encouraging and facilitating public participation in regulatory deliberations regarding water quality in southwest New Mexico. GRIP organizes the annual Gila River Festival, now in its 16th year. Festival activities include kayaking trips, fishing workshops, and educational programming.

GRIP is active in legal and regulatory proceedings before federal and state government agencies that affect water and water quality in New Mexico. For example, on April 15, 2019, GRIP submitted comments to the Environmental Protection Agency, and the United States Army Corps of Engineers on the 2019 proposed rule revising the definition of "waters of the United States" under the Clean Water Act. Some fifty-one other environmental, community, and conservation organizations and the Village of Questa, New Mexico also signed the comment letter.

For the past 20 years, GRIP has participated in numerous administrative proceedings before the New Mexico Environment Department and the New Mexico Water Quality Control Commission involving water quality. For example, GRIP has participated as a party in administrative proceedings involving groundwater discharge permits under the New Mexico Water Quality Act for the Freeport-McMoRan (formerly Phelps Dodge) Tyrone Mine in Grant County, New Mexico, the Freeport-McMoRan Chino Mine, also in Grant County, and the Copper Flat Mine in Sierra County, New Mexico. GRIP has also been a party to appeals of

groundwater discharge permits for the Tyrone and Copper Flat mines to the New Mexico Court of Appeals.

GRIP also participated in the rulemaking proceeding before the Water Quality Control Commission on the Copper Mine Rule under the New Mexico Water Quality Act and was a party in the appeals to the New Mexico Court of Appeals and the New Mexico Supreme Court.

GRIP has established a Water Resources Protection Program that promotes water quality and water supply protection, including education of community members about water quality protection and water conservation, participation in local and regional water planning, and facilitation of community participation in public processes related to water resources protection. Through its Silver City Watershed Keepers initiative, GRIP educates and trains volunteer citizen scientists to monitor water quality and steward the area's water resources.

For the past 18 years, GRIP has been one of the organizations leading the effort to keep the Gila River a free-flowing river. GRIP provided public comments for the New Mexico Unit of the Central Arizona Project Environmental Impact Statement scoping process and the Draft Environmental Impact Statement. Additionally, GRIP has been involved with advocacy before the New Mexico Interstate Stream Commission regarding the New Mexico Unit project.

Most GRIP members live in southwestern New Mexico. GRIP members use and enjoy the rivers, streams, lakes, and other waters in southwest New Mexico for irrigation, livestock watering, fishing, river rafting, kayaking and canoeing, swimming, other recreation, educational and aesthetic interests. For example, one of GRIP's members is a professional photographer, who specializes in photographing pristine ecosystems including riparian habitat. Another of GRIP's members provides commercial kayaking and rafting trips on the Gila River as part of the annual Gila River Festival. Other GRIP members irrigate using Gila River water. A few GRIP

members are teachers who bring their students to the Gila River for educational programming, including water quality testing, macroinvertebrate inventories as indicators of water quality, and hydrological studies. Many GRIP members recreate at the Gila River regularly, including swimming, fishing, boating, inner-tubing, and picnicking.

I am a member of GRIP. I personally, and with my family, enjoy the rivers, lakes, and streams in New Mexico. In southwest New Mexico specifically, I and my family regularly recreate on the Gila River. We hike, typically crossing the river multiple times, picnic, photograph, and swim at the Gila River. I have kayaked the Gila many times. I am also a birder and I frequently bird along the Gila River in the Cliff-Gila Valley as it has one of the largest populations of non-colonial breeding birds in North America. I have also participated for many years in Southwest New Mexico Audubon Society's bird counts covering Mangas Creek and the Gila River to the Bird Area.

GRIP supports the testimony of Pamela E. Homer and James R Kuipers in this proceeding.

GRIP's interests in this proceeding are not represented by any of the other parties. GRIP is a community organization seeking to provide a public-interest perspective to federal and state administrative agencies responsible for the protection and management of our precious water resources in New Mexico.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on this 22nd day of June 2021.

Allyson Siwik

ALLYSON SIWIK

P.O. Box 91 Tyrone, NM 88065 | 575.590.7619 | allysonsiwik@gmail.com

EMPLOYMENT HISTORY

Executive Director, Gila Conservation Coalition October 2004 – Present
Silver City, NM

Coordinate coalition of three conservation groups that work to protect the free-flow of the Gila River, New Mexico's last free-flowing river. In consultation with coalition partners and advisors, develop coalition priorities and positions on regional water management issues, including New Mexico's access to Gila River water under the Arizona Water Settlements Act. Responsible for fundraising, management of contractors and volunteers, and project implementation.

Executive Director, Gila Resources Information Project May 2003 – Present
Silver City, NM

Responsible for administration of nonprofit environmental advocacy group that promotes community health by protecting the environment in southwestern New Mexico. Working with the Board of Directors, establish goals and priorities for the group and develop positions on environmental and health issues. Program areas include responsible mining, aquifer protection, environmental health, climate change and sustainability, and healthy rivers. Represent organization at local and statewide community and environmental forums. Obtain project funding, implement projects and manage staff, contractors, and volunteers.

Owner, Siwik Consulting 2003 – 2015
Silver City, NM

As an independent consultant, provided environmental consulting services to Federal, state, and local government and universities.

- Appointed in 2004 U.S. Co-leader of Border 2012 New Mexico-Chihuahua Rural Task Force. Under contract to the New Mexico Environment Department, facilitated collaboration and strategic planning between border communities in southwestern New Mexico and northwestern Chihuahua to address transboundary environmental and natural resource problems. Facilitated scrap tire cleanup project for Palomas and Ascension. Served as project coordinator for unpaved road GIS inventory and dust control for improved particulate matter air quality in Columbus-Palomas.
- Provided grant assistance to Border Cluster, New Mexico State University
- Developed a Community Environmental Health Assessment Tool Box for New Mexico; Southern Area Health Education Center, NMSU.

CCW-GRIP EXHIBIT 9

Border Outreach Coordinator, EPA El Paso Border Office 1997 – 2003
U.S. Environmental Protection Agency, El Paso, TX

Facilitated strategic plan for Joint Advisory Committee for Improvement of Air Quality in Paso del Norte Region. Assisted with development and outreach for U.S.-Mexico Border XXI and Border 2012 programs.

Policy Analyst, Office of Air Quality Planning and Standards 1991 - 1997
U.S. Environmental Protection Agency, Durham, NC

Conducted economic analyses of National Ambient Air Quality Standards.

EDUCATION

Duke University School of the Environment
Master of Environmental Management, Resource Economics and Policy, 1989 – 1991

Colby College
BA in Biology, 1983 – 1987

STATE OF NEW MEXICO NEW MEXICO
WATER QUALITY CONTROL COMMISSION

IN THE MATTER OF: PROPOSED AMENDMENTS TO STANDARDS FOR INTERSTATE AND INTRASTATE WATERS, SECTION 20.6.4 NMAC.	)))))	**Docket No. WQCC 20-51 (R)**

TECHNICAL REBUTTAL TESTIMONY OF
MR. JAMES R. KUIPERS P.E., ON BEHALF OF
COMMUNITIES FOR CLEAN WATER AND
THE GILA RESOURCES INFORMATION PROJECT

I. Introduction

My name is James R. Kuipers and I am offering testimony as an expert on behalf of Communities for Clean Water and the Gila Resources Information Project in response to technical testimony of Mr. David Gratson, a witness on behalf of the New Mexico Mining Association (NMMA), in response to the New Mexico Environment Department's (NMED) Petition to Amend the Standards for Interstate and Intrastate Surface Waters (20.6.4 NMAC). This testimony provides my qualifications, discusses the proposed rulemaking, and provides testimony regarding the significant figures for numerical limits set forth in 20.6.4.900 NMAC in the proposed rule. I provide this rebuttal testimony in support of some of the proposed amendments Communities for Clean Water and the Gila Resources Information Project have introduced as part of its rulemaking.

II. Qualifications and Expertise

I have been employed since 1996 as Principal Consulting Engineer with Kuipers & Associates. I am a 1983 graduate of Montana College of Mineral Science and Technology in Mineral Processing and have more than 38 years of professional experience in performing, validating and evaluating environmental chemistry data. This includes fundamental first principal knowledge of mathematics as it applies to science and engineering, and extensive actual experience with analytical chemistry and the determination of water quality standards and laboratory analytical values, and their comparison with respect to water

CCW-GRIP
EXHIBIT
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quality criteria, including with respect to significant figures, rounding, precision and accuracy. My curriculum vitae is **CCW-GRIP Exhibit 11**. It is accurate and up to date.

III. NMED's Proposed Amendments to Standards for Interstate and Intrastate Waters (20.6.4 NMAC)

The Standards for Interstate and Intrastate Waters (20.6.4 NMAC) include Section 20.6.4.900 CRITERIA APPLICABLE TO EXISTING, DESIGNATED OR ATTAINABLE USES UNLESS OTHERWISE SPECIFIED IN 20.6.4.97 THROUGH 20.6.4.899 NMAC. Part I describes how the acute and chronic aquatic life criteria are calculated as a function of dissolved hardness (as mg $CaCO_3$/L). The table in Part I.(1) Acute aquatic life criteria for metals, shows equation parameters and conversion factors (CF). The parameters and CF in the table have from two (e.g., Silver CF = 0.85) to seven significant digits (e.g., Cadmium CF = 1.136672). Similarly, the table in Part I.(2) Chronic aquatic life criteria for metals, shows equation parameters and conversion factors. The parameters and conversion factors in the table have from three (e.g., Chromium CF = 0.860) to seven significant digits (e.g., Cadmium CF = 1.101672). The Table in Part I.(3) Selected values of calculated acute and chronic criteria (µg/L), shows calculated values for selected dissolved hardness concentrations. The values in the table have from one (e.g., Hardness = 25, Acute Ag = 0.3) to four significant digits (e.g., Hardness = 25 Acute Mn = 1,881). I The number of significant digits in the table in Part I.(3) is not consistent with the number of significant digits in the values in the tables in Part I.(1) or (2). The table shows "selected values" and in making a determination the table would not be used, but rather the criteria would be calculated according to the equations and criteria in Part I.(1) and Part I.(2).

IV. How would NMED actually apply their Proposed Amendments to Standards for Interstate and Intrastate Waters (20.6.4 NMAC).

The regulations do not address how actual water quality data are to be compared to the criteria in 20.6.4 NMAC. Specifically, they do not provide information on how laboratory values with certain precision limits, expressed as significant digits, should be compared to the criteria calculated in accordance with 20.6.4 NMAC. However, there are generally accepted and understood mathematical

principles that apply to water quality reporting. As noted by Austin et al (2016)[1] (**CCW-GRIP Exhibit 12**), "Significant digits are the number of digits within a value that carry meaning and are determined by the level of accuracy and precision that can be attained for each specific method and constituent (Table 1). So, the number of significant digits or places beyond the decimal will vary between constituents, as well as with the accuracy and precision of the actual measurements. The significant digits are also tied to the lower limits of quantification, or how small of a concentration we can actually measure." Table 1 defines "Accuracy" as "Describes how close a measured value is to the true value" and "Precision" as "Degree of similarity between measured values among duplicates or replicates of a sample, independent of the accuracy of the values."

NMED staff are aware of the role of significant digits in water quality reporting. NMED certified laboratories use approved methods for each constituent that report their results in significant digits. NMED then compares the laboratory results for each constituent with the corresponding regulatory criteria calculated in 20.6.4.900.I. NMAC by rounding the numeric value to the same number of significant digits as are provided by the laboratory results. In doing this they would first determine the number of significant digits that are contained in the laboratory results for each constituent based on the Rules for Significant Figures. While there are numerous variations of the Rules, the version submitted as **CCW-GRIP Exhibit 13** provides a comprehensive explanation of how significant figures should be addressed.

V. Rebuttal of Gratson/NMMA Concerns

Gratson's testimony on behalf of NMMA uses an example where a laboratory reports a value of 1,700 µg/L for aluminum and a hardness value of 60 mg/L as $CaCO_3$. His testimony suggests that NMED would compare the value of 1,700 µg/L to the chronic aquatic life criteria for aluminum in the table in Section 20.6.4.900.I(2) NMAC of 1,699 µg/L for aluminum, and that NMED would make a direct

[1] Austin, B.J., J.T. Scott, M. Daniels, B.E. Haggard. 2016. Water Quality Reporting Limits, Method Detection Limits, and Censored Values: What Does it All Mean?. Arkansas Water Resources Center, Fayetteville, Arkansas, FS-2016-01: 8 pp.

comparison of the figures and determine the water body as exceeding the chronic aquatic life criteria standard for aluminum. He goes on to suggest that "Numerous additional examples could be envisioned where a direct comparison between the Standards and a laboratory reported value with two or three significant figures would require subjective interpolation instead of direct evaluation of analytical data to the criteria set forth in 20.6.4.900 NMAC." It is our professional opinion that in applying the criteria set forth in 20.6.4.900 NMAC, NMED would use fundamental mathematical principles to directly evaluate the analytical data and criteria, and in doing so avoid subjective interpolation.

Using Gratson's example, NMED would determine, according to the Rules for Significant Figures, that the reported value of 1,700 µg/L contains two significant figures. NMED would then compare the value to the chronic aquatic life criteria for aluminum in the table in Section 20.6.4.900.I(2) NMAC of 1,699 µg/L for aluminum by rounding that calculated value, regardless of the number of significant digits, to two significant digits to match the significant digits in the laboratory reported value. The rounded value for aluminum to two significant digits would be 1,700 µg/L. Based on the result, we would expect NMED to determine that the reported value of 1,700 µg/L for aluminum is equal to the criteria. This approach follows basic fundamental mathematical principles that are widely known and accepted. This method does not require subjective interpolation and can be applied to however many significant figures are contained in the reported value, or are calculated using the regulatory criteria, and is, or at least should be, always used as the standard in interpreting such data for the purpose of determining water quality exceedances.

VI. Conclusion

The water quality criteria information provided in Section 20.6.4.900.I NMAC do not require amendments to address significant figures as proposed by Gratson/NMMA. NMED would be expected to use fundamental principles of mathematics such as significant digits and rounding to perform a comparison of acceptable laboratory reported values with the calculated criteria modified to reflect the same number of significant digits as the laboratory reported values.

This concludes my direct testimony in this matter.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on this 22nd day of June 2021

James R. Kuipers

JAMES R. KUIPERS, P.E.
P.O. Box 145, Wisdom, MT 59761
Phone (406) 689-3464
E-mail jkuipers@kuipersassoc.com

SUMMARY OF EXPERIENCE

Over 35 years experience in mining and environmental process engineering design, operations management, regulatory compliance, waste remediation, reclamation and closure, and financial assurance. Over 20 years experience providing technical assistance to public interest groups and tribal, local, state and federal governments on technical aspects of mining and environmental issues.

EDUCATION

Montana College of Mineral Science and Technology, B.S. Mineral Process Engineering, 1983.

PROFESSIONAL REGISTRATION

Professional Engineer (PE Mining/Minerals): Colorado (No. 30262), Montana (No. 7809 & Corp. No. 197)

PROFESSIONAL EXPERIENCE

1996 to Present **Kuipers & Associates/J. Kuipers Engineering, Butte, MT.**

- *ABN AMRO Bank, Netherlands*: Consulting Engineer, confidential mine evaluation.
- *Amigos Bravos, Taos, NM*: Consulting Engineer, Molycorp Questa Mine, technical review committee and working group member in reclamation and closure/closeout permitting and bonding process.
- *Anaconda Deer Lodge County, MT*: Consulting Engineer/Project Manager, Anaconda Superfund Site, provide technical services related to institutional controls, property conveyance and redevelopment, property and facility operation and maintenance, review of regulatory documents, renewable energy development, air and water monitoring and other tasks related to county involvement in Superfund activities.
- *Bannock Technologies, Pocatello, ID*: Consulting Engineer, Shoshone Bannock Tribe mining oversight project studies.
- *Blackfoot Legacy, Lincoln, MT:* Consulting Engineer, McDonald Project, review of project feasibility and environmental issues.
- *Border Ecology Project, Santa Fe, NM:* Consulting Engineer, Cananea Project (Mexico), consulting engineer mine reclamation and closure planning.
- *Cabinet Resource Group, Noxon, MT*: Consulting Engineer, Rock Creek Project, review of proposed tailing impoundment.
- *Clark Fork River Technical Advisory Committee, Missoula, MT*: Technical Advisor, Clark Fork River and Milltown Reservoir Operable Units, Upper Clark Fork Basin Superfund Sites.

CCW-GRIP EXHIBIT 11

- *Center for Science in Public Participation, Bozeman, MT:* See separate description below.

- *Citizens' Technical Environmental Committee, Butte, MT:* Technical Advisor, Butte-Silver Bow Site Operable Units, Upper Clark Fork Basin Superfund Sites.

- *Cottonwood Resource Council, Big Timber, MT:* Consulting Engineer, Lodestar Mine and Mill, review of operating and MPDES permits, financial assurance and operations data.

- *Earthjustice, Bozeman, MT:* Consulting Engineer, Montanore and Rock Creek Projects permitting process.

- *Earthworks, Washington, D.C.:* Project Manager and co-author, Water Quality Predictions and NEPA/EIS Studies.

- *Environmental Defender Law Center, Bozeman, MT*: Expert Witness and Consulting Engineer, Boliden Promel, Chile arsenic waste disposal.

- *Gila Resources Information Project, Silver City, NM:* Consulting Engineer, Phelps Dodge Chino, Cobre and Tyrone Mines, reclamation and closure/closeout permitting and bonding process.

- *Great Basin Mine Watch, Reno, NV:* Expert Witness and Consulting Engineer, various NV projects, permitting and reclamation and closure/closeout permitting and bonding process.

- *Great Lakes Indian Fish and Wildlife Commission, Odinah, WI*: Gigotec Project and Polymet Project permitting.

- *ICF International, Stafford, VA*: Consulting Engineer, 108(b) rulemaking technical support contract including financial assurance cost estimation model evaluations.

- *Idaho Conservation League, Boise, ID*: Consulting Engineer, Atlanta Mine water treatment and permitting.

- *IEc, Boston, MA*: Consulting Engineer, mining and financial assurance technical support.

- *Institute for Governance & Sustainable Development, Washington, DC:* Consulting Engineer, reclamation and closure and financial assurance, U.S. Chile Mining Financial Assurance Seminar.

- *Johnson County, KS:* Consulting Engineer, Sunflower Limestone Mine reclamation plan and financial assurance.

- *Little Salmon Carmacks First Nation, Yukon Territory, Canada*: Expert Witness and Consulting Engineer, Carmacks Copper Project.

- *Mining Watch Canada:* Consulting Engineer MEND Tailings Guide Review; Ecuador Mines Evaluations.

- *Minnesota Center for Environmental Advocacy, Saint Paul, MN:* Consulting Engineer, PolyMet NorthMet Project, review permits, reclamation and closure, financial assurance, tailings facilities.

- *Montana Attorney Generals Office, Helena, MT:* Consulting Engineer, assist in defense of I-137 Open

Pit Cyanide Mine Ban appeals.

- *Montana Department of Environmental Quality, Helena, MT*: General Contractor, Pony Mill Site Reclamation.

- *Montana Environmental Information Center, Helena, MT and National Wildlife Federation, Missoula, MT*: Expert Witness and Consulting Engineer, Golden Sunlight Mine, EIS Review and assist appeal of State operating permit.

- *Montana Environmental Information Center, Helena, MT*: Expert Witness, Bull Mountain Coal Mine appeal.

- *Montana Trout Unlimited, Missoula, MT*: Consulting Engineer, Trout Unlimited's Four Mines Campaign, review and provide technical assistance on McDonald, Crandon, New World and Rock Creek Mines.

- *Montana Trout Unlimited, Missoula, MT*: Consulting Engineer, I-147 initiative campaign; Black Butte Copper Proposal; Beal Mountain Mine Remediation.

- *Multicultural Alliance for a Safe Environment, Santa Fe, NM*: Consulting Engineer and Expert Witness, Homestake Uranium Mill and Mt Taylor Mine.

- *Natural Resources Defense Council*; New York State: Consulting Engineer, review of Oil & Gas Draft EIS.

- *New Mexico Environmental Law Center, Santa Fe, NM*: Consulting Engineer, Oglebay Norton Mica Mine reclamation and financial assurance; New Mexico Environment Department Copper Rules Stakeholder Process.

- *Nez Perce Tribe Fisheries Department, McCall, ID*: Consulting Engineer, Midas Gold Stibnite Project permitting.

- *Northern Plains Resource Council, Cottonwood Resource Council, Stillwater Protective Association, Billings. MT:* Consulting Engineer, Stillwater Mining Company Nye and East Boulder Mines, facilitate and perform technical aspects of Good Neighbor Agreement.

- *Northern Plains Resouce Council, Billings, MT; Wyoming Outdoor Council, Sheridan, WY:* Consulting Engineer, Montana Statewide and Wyoming Powder River Basin Coal Bed Methane EIS.

- *Northern Plains Resouce Council, Billings, MT:* Project Manager and co-author, Coal Bed Methane Produced Water Studies.

- *Northern Alaska Environmental Council, Fairbanks, AK:* Consulting Engineer, Pogo Mine NPDES permit negotiations.

- Patagonia Area Resource Alliance, Patagonia, AZ: Consulting Engineer, Arizona Mining, Remediation Plans

- *Picuris Pueblo, Penasco, NM:* US Hill Mica Mine Reclamation Plan and financial assurance cost estimate and site reclamation project management.

- *Powder River Basin Resource Council, Sheridan, WY/Steven Adami, Buffalo, WY:* Expert Witness, Kennedy Oil IMADA POD appeals.

- *Rock Creek Alliance, Missoula, MT:* Expert Witness and Consulting Engineer, Rock Creek and Montanore Mines permitting.

- *Selkirk First Nation, Yukon Territory, Canada:* Expert Witness and Consulting Engineer, Minto Mine Project reclamation and closure and financial assurance; Casino Mine Proposal permit review.

- *Sheep Mountain Alliance, Telluride, CO*: Expert Witness and Consulting Engineer, Silver Bell Tailings remediation.

- *Shoshone-Paiute Tribes of the Duck Valley Reservation, NV:* Consulting Engineer, Rio Tinto Mine Reclamation and Closure.

- *Sierra Club and Mineral Policy Center:* Expert Witness, Cripple Creek and Victor Mining Company Clean Water Act case.

- *SKEO, Charlottesville, VA*: Consulting Engineer, mining and financial assurance technical support contract and EPA Region NEPA review and financial assurance support.

- *Southern Environmental Law Center, Charleston, SC*: Consulting Engineer, Haile Gold Mine permitting.

- *Systems Research and Applications Corporation, Fairfax, VA:* Consulting Engineer, mine cleanup and financial assurance guidelines subcontract to EPA.

- *Tohono O'odham Nation, San Xavier District, AZ:* Consulting Engineer, Mission Mine reclamation plan and financial assurance.

- *Trust for Public Lands, San Francisco, CA:* Consulting Engineer, Viceroy Castle Mountain Mine, evaluated pit backfill and reclamation alternatives for settlement agreement trust fund determination.

- *Tsilhqot'in National Government, Williams Lake, BC, Canada*: Consulting Engineer and Expert Witness, New Prosperity Project permitting.

- Turner Ranch Properties, Ladder Ranch, NM: Consulting Engineer Copper Flat Project Permitting, Expert Witness related water rights case.

- *Walz and Associates, Albuquerque, NM:* Expert Witness and Consulting Engineer, assist in defense of New Mexico Environment Department and Mining and Minerals Division permitting and takings case (Manning v. NM).

- *Western Organization of Resource Councils, Billings, MT:* Oil and gas reclamation and financial assurance guide.

- *Western Resource Advocates, Salt Lake City, UT*: Expert Witness and Consulting Engineer, Red Leaf Resources oil shale project permitting.

- *Williams Lake and Soda Creek Indian Bands, British Columbia, Canada:* Consulting Engineer, Mount Polley Tailings Facility breach investigations and mine reopening permitting.

1997 to 2005 **Center for Science in Public Participation, Bozeman, MT.**

- *Canadian Earthcare Society, Vancouver, BC*: Consulting Engineer, Brenda Mine, assist appeal of reclamation and closure permit.

- *CEE Bankwatch, Budapest, Hungary*: Consulting Engineer, Rosario Montana Mine (Romania), economic feasibility study of mine proposal.

- *Friends of the Similkameen, Hedley, BC*: Consulting Engineer, Candorado Mine, assist appeal of reclamation and closure permit.

- *Fort Belknap Tribal Council and Environment Department, Fort Belknap, MT*: Consulting Engineer, Zortman and Landusky Mines, Alternative Reclamation and Closure Plan, multiple accounts analysis working group member and technical advisor during supplemental environmental impact statement.

- *Guardians of the Rural Environment, Yarnell, AZ*: Consulting Engineer, Yarnell Project, EIS review and assist appeal of State operating permit.

- *Mineral Policy Center, Washington, D.C.*: Technical Advisor on general mining issues and Author of MPC Issue Paper.

- *National Wildlife Federation, Boulder, CO*: Consulting Engineer authoring report on Hardrock Mining Reclamation and Closure Bonding Practices in the Western United States.

- *Sakoagan Chippewa Tribes, Mole Lake Reservation, Wisconsin.* Consulting Engineer, Crandon Project, permitting process review.

1993 - 1995 **Denver Mineral Engineers, Inc., Littleton, CO.**

- Manager, Process Engineering Department.

- Manager, Mining and Environmental Wastewater Treatment Program

- *Arrowhead Industrial Water Co., San Jose, CA*: Project Manager, evaluation of reverse osmosis for mine wastewater treatment.

- *Barrick Goldstrike, USA, Elko, NV*: Project Engineer, engineering design, construction and installation of 1.5 M oz/year stainless steel electrowinning system.

- *Battle Mountain Gold, Co., Battle Mountain, NV*: Project Manager, evaluation, pilot testing, and preliminary feasibility study of wastewater treatment options for groundwater remediation of Fortitude Mine tailings area.

- *Commerce Group Corporation, Milwaukee, WI*: Project Manager, San Sebastian Gold Project, El Salvador.

- *Independence Mining Corp, Jerritt Canyon, NV*: Project Manager, technical evaluation and feasibility study of column flotation for beneficiation of refractory ores.

- *Kennecott Utah Copper, Bingham Canyon, UT*: Project Manager, design and construct stainless steel solvent extraction mixer settlers for prototype SX/EW plant.

- *Israeli Chemical Corp., Beersheeba, Israel*: Project Manager, evaluation of bromine as an alternative to cyanide gold leaching and prototype design.

- *Marston and Marston, St Louis, MO*: Project Manager, Kommunar Gold Mill Modernization Project, Kommunar, Siberia, Russia (CIS) and Suzak Polymetal Leach Circuit Evaluation and Feasibility Study, Kazakhstan (CIS).

- *Nevada Goldfields Mining Co., Denver, CO*: Project Manager, Nixon Fork Mine Preliminary Engineering Design and Feasibility Study, Concentrate Marketing Study, and environmental permitting studies.

- *Southern Pacific Railroad, Denver, CO*: Project Manager, design, construction and installation of dissolved air flotation wastewater treatment system.

1991 - 1992 **Western States Minerals Corp.**

- Project Manager, Northumberland Gold Mine, Round Mountain, NV.

- Corporate Senior Metallurgist, Wheat Ridge, CO. Engineering design and feasibility evaluations.

1986 - 1991 **Western Gold Exploration and Mining Co. (WESTGOLD)/Minorco**

- Corporate Senior Metallurgist / Project Manager, WESTGOLD, Golden, CO. Acquisitions and engineering design and feasibility evaluations, corporate acquisitions and business development group.

- Project Manager, Shamrock Resources (WESTGOLD Subs.), Reno, NV. Evaluation, engineering design and feasibility study, and prototype plant operation of refractory gold ore bioleaching technology program.

- Project Manager, Balmerton Mine, Ontario: Refractory gold ore bioleaching project and feasibility evaluation.

- Project Engineer, Johannesburg South Africa: Evaluation of Anglo American Corp. Pumpcell Technology.

- Mill Superintendent, Austin Gold Venture (WESTGOLD), Austin, NV.

- Shift Foreman, Inspiration Consolidated Copper Co, Globe, AZ.

1984 - 1985 **Canyonlands 21st Century Corporation**

- Director of Metallurgy, Blanding, UT. Project Manager, Jarbidge, NV.

1983 - 1984 **Cumberland Mining Corporation**

- Mill Superintendent / Head Metallurgist, Basin and Virginia City, MT.

1974 – 1980 **Huckaba Construction**

- Summer employment as Underground and Surface Miner, Millwright, Mill Operator, Fire Assayer, Whitehall and Cooke City, MT. Family owned small mining operation.

PRESENTATIONS and PUBLICATIONS

- *Hardrock Mine Financial Assurance Training Workshop*, National Tribal Mining Workgroup, McCall, ID, October 11-12, 2017.

- *The Development of Remedial Design Options for the Questa Mine Waste Rock Piles using a Collaborative Approach*, Kuipers, J. et al, Tailings and Mine Waste 2017, Nov 5-8, Banff, Alberta, Canada

- *Mine Reclamation and Closure Planning: Reducing the Risk from Mining Influenced Water, Mine Financial Assurance: Addressing the Cost of Mining Influenced Water,* U.S. EPA The Mining Lifecycle: Tribal Engagement and Responsibility Conference, Phoenix, AZ, November 2-4, 2016.

- *Mine Tailings Fundamentals: Current Technology and Practice for Mine Tailings Facilities Operations and Closure*, U.S. EPA Contaminated Site Clean-Up Information Webinar Series May 19-20, 2015

- *North American Indigenous Peoples Perspectives on the Reliability of Mine Water Technology*, International Mine Water Association, Golden, CO, 2013 Annual Conference.

- *Financial Assurance Regulations and Cost Estimation at US Hardrock Mines,* U.S. Chile Mining Financial Assurance Seminar, US Office of Surface Mining and Environmental Protection agency and Chilean Ministry of Mining, Santiago, Chile, May 2012.

- *Mining Reclamation and Closure Regulations and Best Practices*, 2012 International Conference on Mining in Mindanao, Ateneo de Davao University, Davao City, Philippines, January 26-27, 2012.

- *Beyond the Global Acid Rock Drainage Guide,* Lake Superior Binational Program, Mining in the Lake Superior Basin Webinar Series, Environmental Impacts of Mining in the Lake Superior Basin, October 27, 2009

- *Characterizing, Predicting, and Modeling Water at Mine Sites,* California Environmental Protection Agency, California Water Board Training Academy, May 18 - 21, 2009

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Water Quality Reporting Limits, Method Detection Limits, and Censored Values: What Does It All Mean?

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The Arkansas Water Resources Center (AWRC) maintains a fee-based water-quality lab that is certified by the Arkansas Department of Environmental Quality (ADEQ). The AWRC Water Quality Lab analyzes water samples for a variety of constituents, using standard methods for the analysis of water samples (APHA 2012). The lab generates a report on the analysis, which is provided to clientele, and reports the concentrations or values as measured.

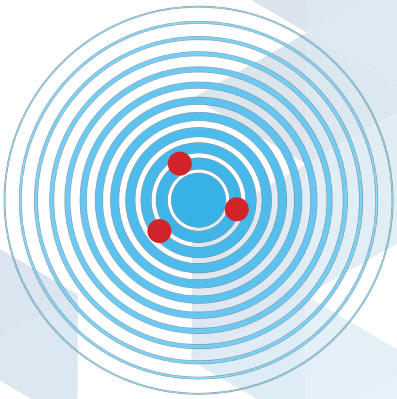
Often times the concentrations or values might be very small, even zero as reported by the lab – what does this mean? How should we use this information? This document is intended to help our clientele understand the analytical report, the values, and how one might interpret information near the lower analytical limits.

Every client wants the analysis of their water sample(s) to be accurate and precise, but what do we really mean when we say those two words? These words are often used synonymously or thought of as being the same, but the two words mean two different things. Both are equally important when analyzing water samples for constituent concentrations.

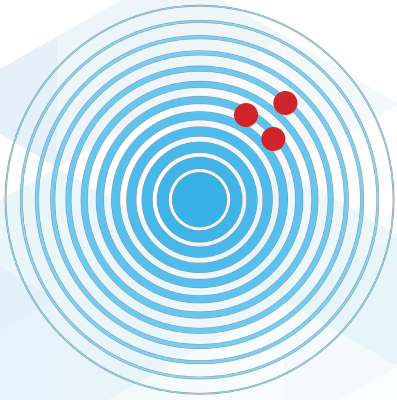
So, What Is The Difference Between Accuracy and Precision?

Accuracy of an analysis describes how close the measured values are to the true values (Table 1).

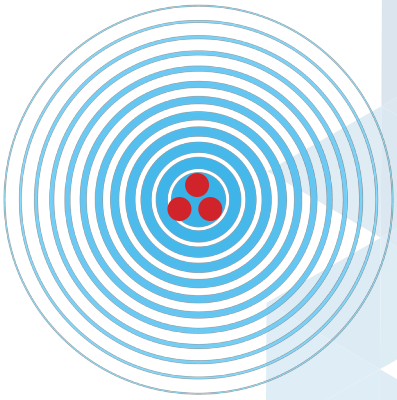
Precision of an analysis describes how similar measured values are to each other, regardless of how accurate or inaccurate the analysis may be (Table 1).



High Accuracy
Low Precision



Low Accuracy
High Precision



High Accuracy
High Precision

Table 1: Glossary of Terms

Term	Definition
Accuracy	Describes how close a measured value is to the true value.
Precision	Degree of similarity between measured values among duplicates or replicates of a sample, independent of the accuracy of the values.
Significant Digits	The number of digits within a measured value that carry meaning.
Reporting Limit (RL)	The lowest quantified level within an analytical methods operational range.
Method Detection Limit (MDL)	Minimum concentration measured with 99% confidence that the true value is greater than zero.
Censored Data	Reported value that provides some information about the measured value but limits the accuracy of the values by grouping data into specific categories (i.e., below MDL, between MDL and RL etc.).

Both accuracy and precision are equally important when analyzing water samples.

What Are Significant Digits?

Significant digits are the number of digits within a value that carry meaning and are determined by the level of accuracy and precision that can be attained for each specific method and constituent (Table 1). So, the number of significant digits or places beyond the decimal will vary between constituents, as well as with the accuracy and precision of the actual measurements. The significant digits are also tied to the lower limits of quantification, or how small of a concentration we can actually measure.

The goal of water quality analysis (and all analyses) is to have high accuracy and precision. However, every analytical method has a lower limit related to the physical properties of the instrumentation and human error in chemical preparation. As the lower limits of a method are reached, accuracy and precision of reported values decrease. The AWRC Water Quality Lab derives reporting limits (RLs) and method detection limits (MDLs) for each of the constituents analyzed at the lab to aid in the understanding of what the reported values in your water quality analysis report mean.

Every analytical method has a lower limit related to the physical properties of the instrumentation and human error in chemical preparation.

Reporting Limit

The reporting limit, commonly known as the RL, is the lowest concentration of a constituent that can be reliably measured with accuracy and precision (Table 1). In many cases, a calibration curve is used to measure the concentration of a constituent in a sample. The AWRC Water Quality Lab reports the RL as the lowest non-zero standard that's used in the calibration for a given analysis. RLs can change over time, and generally do so to meet the needs for determining MDLs for each constituent as described below.

Method Detection Limit

The method detection limit, commonly known as an MDL, should be viewed as the lower concentration limit of a constituent that the analytical equipment and technician is capable of detecting (Table 1). Concentrations or values below this lower limit should be interpreted cautiously because the concentration or reported value is lower than what can be measured with sufficient accuracy. The MDL is based on statistics, and the AWRC Water Quality Lab calculates MDLs every year for each constituent.

What is The MDL?

- The MDL for a specific constituent is the minimum concentration that can be measured with 99% confidence that the constituent concentration is greater than zero (U.S. EPA, 1997; Oblinger Childress et al., 1999).
- The MDL is a statistically derived value and, as indicated in the name, is specific to the method used; additionally it is specific to the laboratory conducting the analysis.

Measured values at or below the MDL should be interpreted cautiously because the true value is lower than what can be measured with sufficient accuracy.

MDLs can change over time for various reasons, including new or aging equipment, chemical reagents, concentration evaluated, etc. However, these variations should be relatively small in magnitude – but, still it is very common and required for certification to calculate MDLs every year and that's what the AWRC Water Quality Lab does.

How is The MDL Calculated?

Similar to the U.S. Geological Survey, the AWRC Water Quality Lab follows methods set by the U.S. Environmental Protection Agency (U.S. EPA) to determine the MDLs for almost all constituents analyzed in the Lab.

1 The lab technician adds the constituent to seven blanks (water that does not have the constituent in it at measurable concentrations); the constituent is added at a set concentration equivalent to the lowest calibration standard or RL.

2 Following the analysis of the seven water samples where the constituent was added, the MDL is calculated as the standard deviation across the samples multiplied by the Students' t-value (i.e., 3.14 for n=7) for the 99% confidence interval (U.S. EPA, 1997; Oblinger Childress et al., 1999).

The MDL must be less than the RL but greater than 1/10 of that concentration. For example if the concentration for the RL for soluble reactive phosphorus (SRP) is 0.010 mg/L, the MDL should be less than 0.010 mg/L but greater than 0.001 mg/L (i.e., 1/10 RL < MDL < RL).

If the MDL is greater than the RL, the procedure must be repeated using a higher concentration for the RL. Similarly, if the MDL is lower than 1/10 of the RL, the procedure must be repeated using a lower concentration for the RL (Rosecrance, 2000).

The MDL must be less than the RL but greater than 1/10 of the RL

$$1/10\ RL < MDL < RL$$

How Should You Interpret Values Less Than the MDL and/or RL? Why are These Considered Estimated Values?

The AWRC Water Quality Lab reports the concentrations as measured – we do not censor data that is greater than zero and above the reported level of significant digits for a constituent (i.e., show the values as less than (<) the MDL or RL). Therefore, the analytical reports provided to clientele might have reported values which are less than the MDL and or RL. The lab reports the concentration data like this to allow clientele to determine how concentrations less than the lower limits of detection will be interpreted. It is important to remember that values below the MDL may be difficult to distinguish between an actual measured value and background noise of the analytical equipment.

Interpreting Values Less than the MDL and RL Con.

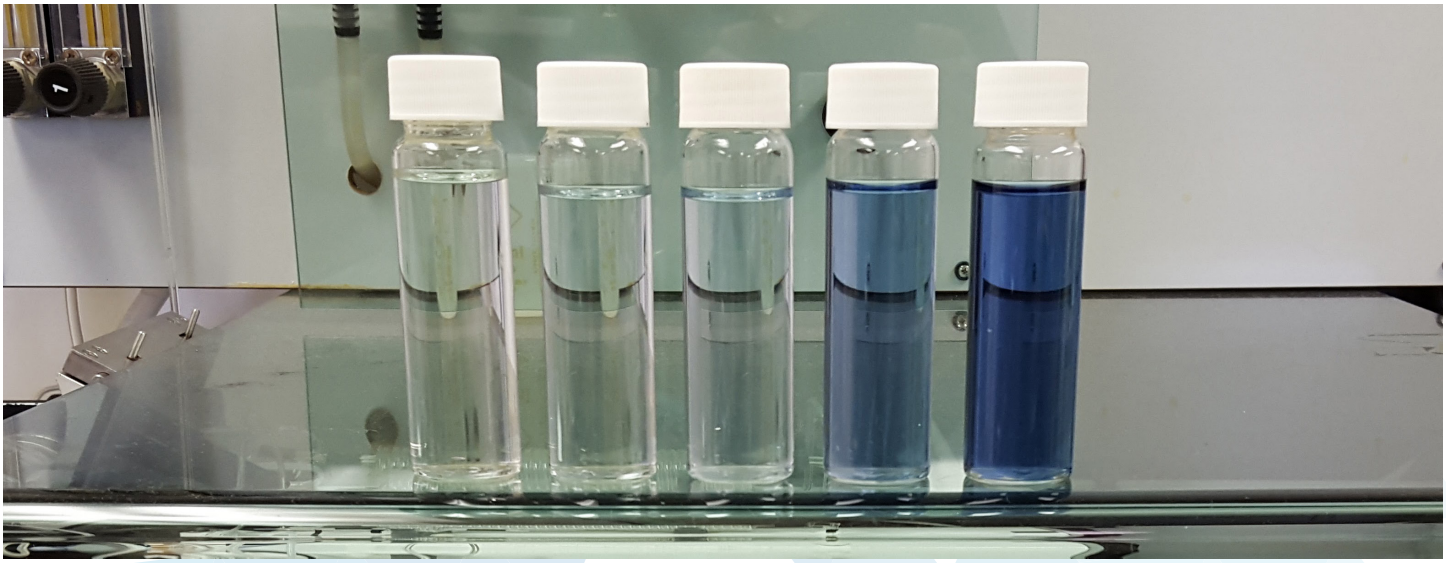
- For example, if you get your water quality analysis report back and the reported value of a water sample for SRP is 0.001 mg/L but the MDL is 0.002 mg/L, you cannot say for certain that the actual concentration is different from zero.

Reported values that fall between the RL and MDL should also be considered as estimated values, but we would generally have more confidence in the accuracy of these measures – that is, these values are probably good estimates of the actual concentrations. However, measured values falling within this range are approaching the analytical limits of the lab's equipment and methods and our clientele should be aware that these values are less than the RL.

- Keeping with the same example, if your reported SRP value is 0.004 mg/L and the RL is 0.005 mg/L, it is certain that the actual concentration is greater than zero but we cannot be certain of the accuracy of the reported value.
- However, if the reported value is 0.006 mg/L, as this value is greater than the RL we should have high confidence in the accuracy of the reported value.

With this understanding in mind, all values below the MDL and RL are estimated and denoted with an "E" to the left of the value in each analytical report. These values should be analyzed and reported with caution, realizing that the values reported may not be true to what is actually present in the sample. The AWRC Water Quality Lab allows its clientele to determine the best way to handle these values.

With few exceptions the AWRC reports values as they are measured to allow our clientele the ability to determine the best way to analyze and report their own data.



What Are Censored Data, and Why Can These Values Be Problematic?

Censored data relate to values that fall below specific detection limits for a particular constituent (Table 1). If a concentration falls below the applicable MDL, instead of reporting that measured value, water-quality labs might report the MDL with a less than sign next to the value.

- Returning to the first example where the measured SRP value fell below the MDL, some labs may report < 0.002 mg/L, instead of 0.001 mg/L.

Additionally, some labs may report only the MDL for any measured value that falls between the MDL and RL.

- In the example where the measured SRP value was 0.004 mg/L, between the RL and MDL, some water-quality labs might report 0.002 mg/L (the MDL) instead of 0.004 mg/L.

While this provides more information about the true value of the constituent for the sample than just reporting 0, data about the true value of the constituent is lost. The AWRC water quality lab reports values as they are measured even when these are less than the MDL and RL, instead of reporting the MDL. This allows researchers or clientele to control how they prefer to analyze and report data.

The AWRC Water Quality Lab only reports censored data when the measured value is negative and or below the reported level of significant digits for a constituent. In the event of a negative value measured for a constituent, zero is reported. Similarly, a zero is reported when the measured value for a constituent is lower than the reported level of significant digits. For example, the measured value for SRP in a sample is 0.0002 mg/L; however, since the number of significant digits reported for this constituent is 3, when the measured value is rounded to three significant digits the reported value will be 0.000 mg/L. So, it is not necessarily that there is no SRP in the water sample – it is that there is no measureable concentration of SRP in the water sample at the lab's level of accuracy, precision, and significant decimal places.

Values below the MDL may be difficult to distinguish between an actual measured value and background noise of the analytical equipment.

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Significant Figures

Annotation category:
Chapter 5

Note:

RULES FOR SIGNIFICANT FIGURES

1. **All non-zero numbers ARE significant.** The number 33.2 has THREE significant figures because all of the digits present are non-zero.

2. **Zeros between two non-zero digits ARE significant.** 2051 has FOUR significant figures. The zero is between a 2 and a 5.

3. **Leading zeros are NOT significant.** They're nothing more than "place holders." The number 0.54 has only TWO significant figures. 0.0032 also has TWO significant figures. All of the zeros are leading.

4. **Trailing zeros to the right of the decimal ARE significant.** There are FOUR significant figures in 92.00.

92.00 is different from 92: a scientist who measures 92.00 milliliters knows his value to the nearest 1/100th milliliter; meanwhile his colleague who measured 92 milliliters only knows his value to the nearest 1 milliliter. It's important to understand that "zero" does not mean "nothing." Zero denotes actual information, just like any other number. You cannot tag on zeros that aren't certain to belong there.

5. **Trailing zeros in a whole number with the decimal shown ARE significant.** Placing a decimal at the end of a number is usually not done. By convention, however, this decimal indicates a significant zero. For example, "540." indicates that the trailing zero IS significant; there are THREE significant figures in this value.

6. **Trailing zeros in a whole number with no decimal shown are NOT significant.** Writing just "540" indicates that the zero is NOT significant, and there are only TWO significant figures in this value.

7. **Exact numbers have an INFINITE number of significant figures.** This rule applies to numbers that are definitions. For example, 1 meter = 1.00 meters = 1.0000 meters = 1.0000000000000000000 meters, etc.

So now back to the example posed in the Rounding Tutorial: *Round 1000.3 to four significant figures.* 1000.3 has five significant figures (the zeros are between non-zero digits 1 and 3, so by rule 2 above, they are significant.) We need to drop the final 3, and since 3 < 5, we leave the last zero alone. so 1000. is our four-significant-figure answer. (from rules 5 and 6, we see that in order for the trailing zeros to "count" as significant, they must be followed by a decimal. Writing just "1000" would give us only one significant figure.)

8. **For a number in scientific notation: N x 10^x, all digits comprising N ARE significant by the first 6 rules; "10" and "x" are NOT significant.** 5.02 x 10^4 has THREE significant figures: "5.02." "10 and "4" are not significant.

Rule 8 provides the opportunity to change the number of significant figures in a value by manipulating its form. For example, let's try writing 1100 with THREE significant figures. By rule 6, 1100 has TWO significant figures; its two trailing zeros are not significant. If we add a decimal to the end, we have 1100., with FOUR significant figures (by rule 5.) But by writing it in scientific notation: 1.10 x 10^3, we create a THREE-significant-figure value.

Find this term in: par #

CCW-GRIP
EXHIBIT
13