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Draft 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

Chapters 1 through 10
Appendices A through D

Conceptual Drawing CMRR Facility

AVAILABILITY OF THE
DRAFT 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-NF SEIS)

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Location: Los Alamos, New Mexico

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***Abstract*:** NNSA, a semiautonomous agency within DOE, proposes to complete the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL) by constructing the nuclear facility portion (CMRR-NF) of the CMRR Project to provide the analytical chemistry and materials characterization capabilities currently or previously performed in the existing Chemistry and Metallurgy Research (CMR) Building. This *CMRR-NF SEIS* examines the potential environmental impacts associated with NNSA's proposed action.

The existing CMR Building, most of which was constructed in the early 1950s, has housed most of the analytical chemistry and materials characterization capabilities at LANL. Other capabilities at the CMR Building include actinide processing and waste characterization which support a variety of NNSA and DOE nuclear materials management programs. In 1992, DOE initiated planning and implementation of CMR Building upgrades to address specific safety, reliability, consolidation, and security and safeguards issues. Later, in 1997 and 1998, a series of operational, safety, and seismic issues surfaced regarding the long-term viability of the CMR Building. Because of these issues, DOE determined at that time that the extensive upgrades originally planned would be time-consuming and of only marginal effectiveness. As a result, DOE decided to perform only the upgrades necessary to ensure the continued safe and reliable short-term operation of the CMR Building and to seek an alternative path for long-term reliability. Operational, safety, and seismic issues at the CMR Building also prompted NNSA to cease performing certain activities and to reduce the amounts of special nuclear material allowed in the CMR Building.

NNSA completed the *Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico (CMRR EIS)* in 2003. In 2004, NNSA issued a Record of Decision to construct a two-building replacement facility in

LANL Technical Area 55 (TA-55), with one building providing administrative space and support functions and the other building providing secure laboratory space for nuclear research and analytical support activities (a nuclear facility). The first building, the Radiological Laboratory/Utility/Office Building (RLUOB), has been constructed and is being outfitted with equipment and furniture. Enhanced safety requirements and updated seismic information have caused NNSA to re-evaluate the design concept of the second building, the CMRR-NF. The proposed Modified CMRR-NF design concept would result in a more structurally sound building.

The proposed action is to complete the CMRR Project by constructing the CMRR-NF to provide the needed nuclear facility capabilities. The Preferred Alternative is to construct a new CMRR-NF in TA-55, in accordance with the Modified CMRR-NF design concept. Construction options for the Modified CMRR-NF Alternative include a Deep Excavation Option, in which a geologic layer of poorly welded tuff would be removed and replaced with low-slump concrete, as well as a Shallow Excavation Option, in which the foundation would be constructed in a geologic layer above the poorly welded tuff layer. As envisioned in the 2003 *CMRR EIS*, tunnels would be constructed to connect the CMRR-NF to the TA-55 Plutonium Facility and RLUOB. The No Action Alternative would be to construct the new CMRR-NF as envisioned in the 2004 Record of Decision. Another alternative would be to continue using the existing CMR Building, implementing necessary maintenance and component replacements to ensure its continued safe operation. This *CMRR-NF SEIS* evaluates the potential direct, indirect, and cumulative environmental impacts associated with the alternatives analyzed. This *CMRR-NF SEIS* also presents an analysis of the impacts associated with disposition of all or portions of the existing CMR Building and a new CMRR-NF at the end of its useful life.

Public Comments: NNSA conducted scoping for this draft *CMRR-NF SEIS* from October 1 through November 16, 2010. In preparation of this draft *CMRR-NF SEIS*, NNSA considered all comments received from the public. Locations and times of public hearings on this document will be announced in the *Federal Register*, on the CMRR Supplemental EIS website (http://nnsa.energy.gov/nepa/cmrrseis), the DOE NEPA website (http://nepa.energy.gov), and in local media. Comments on this draft *CMRR-NF SEIS* will be accepted for a period of 45 days following publication of the U.S. Environmental Protection Agency's Notice of Availability in the *Federal Register* and will be considered in the preparation of the final SEIS. Any comments received after the 45-day comment period will be considered to the extent practicable.

OVERVIEW

The National Nuclear Security Administration (NNSA) is a semi-autonomous agency within the Department of Energy (DOE). NNSA is responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation and naval reactor programs. NNSA is also responsible for administration of the Los Alamos National Laboratory (LANL).

Since the early 1950s, DOE has conducted analytical chemistry and materials characterization work in the Chemical and Metallurgy Research Building (CMR) at LANL. CMR supports various national security missions including nuclear nonproliferation programs; the manufacturing, development, and surveillance of pits (the fissile core of a nuclear warhead); life extension programs; dismantlement efforts; waste management; material recycle and recovery; and research. CMR is a Hazard Category 2 nuclear facility with significant nuclear material and nuclear operations, and the potential for significant onsite consequences.

The CMR is almost 60 years old and near the end of its useful life. Many of its utility systems and structural components are aged, outmoded, and deteriorated. Recent geological studies identified a seismic fault trace located beneath two of the wings of CMR, which raised concerns about the structural integrity of the facility. Over the long term, NNSA cannot continue to operate the mission-critical CMR support capabilities in the existing CMR building at an acceptable level of risk to worker safety and health. NNSA has already taken steps to minimize the risks associated with continued operations at CMR. To ensure that NNSA can fulfill its national security mission for the next 50 years in a safe, secure, and environmentally sound manner, NNSA proposed in 2002 to construct a CMR replacement facility, known as the CMRR.

NNSA has undertaken extensive environmental review of the CMRR project; after thoroughly analyzing its potential environmental impacts and considering public comments, NNSA issued a Final EIS in November 2003 and a Record of Decision (ROD) in February 2004. The ROD announced that CMRR would consist of two buildings: a single, above-ground consolidated special nuclear material-capable, Hazard Category 2 laboratory building (the CMRR-NF), and a separate but adjacent administrative office and support building, the Radiological Laboratory/Utility/Office Building (RLUOB). Construction of the RLUOB is complete and radiological operations are scheduled to begin in 2013.

Since issuance of the 2004 ROD, new developments have arisen indicating that changes to CMRR are appropriate. Specifically, a new site-wide analysis of the geophysical structures that underlay the LANL area was prepared. In light of this new geologic information regarding seismic conditions at the site, and more detailed information on the various support functions and infrastructure needed for construction such as concrete batch plants and lay-down areas, NNSA has proposed changes to the design of CMRR-NF. Even with these changes, the scope of operations remains the same as before (the 2004 ROD), as does the quantity of special nuclear material that can be handled and stored in CMRR-NF.

Though the changes would affect the structural aspects of the building and not its purpose, NNSA elected to prepare a Supplemental EIS (SEIS) to address the ways in which the potential environmental effects of the proposed CMRR-NF may have changed since the project was analyzed in the 2003 EIS. Development of the SEIS includes a scoping process, public meetings, and a comment period on a draft SEIS to ensure that the public has a full opportunity to participate in this review. Because NNSA decided in the 2004 ROD to build CMRR – as a necessary step in maintaining critical analytical chemistry and materials characterization capabilities at LANL – the SEIS is not intended to revisit that decision. Instead the SEIS is limited to supplementing the prior analysis by examining the potential environmental impacts related to the proposed change in CMRR design. So in addition to the no-action alternative (proceed with

CMRR-NF as announced in the 2004 ROD), the SEIS considers two action alternatives: construct a new CMRR-NF in accordance with the modified CMRR-NF design concept (construction options include shallow and deep excavation); and continue using CMR with minor upgrades and repairs to ensure safety, together with RLUOB.

On March 11, 2011, the Fukushima Daiichi nuclear power station in Japan was damaged by the tsunami generated by a magnitude 9.0 earthquake. Officials from the U.S. Department of Energy, the U.S. Nuclear Regulatory Commission, and other Federal agencies are maintaining close contact with Japanese officials and providing the Japanese government with expertise in a variety of areas. At the current time, efforts are focused on emergency response, and we do not yet have all of the information needed on lessons to be learned from the incident. Nevertheless, safety and security remain at the forefront of our management of the nuclear weapons complex. Bearing in mind the critical differences between a nuclear power plant and a nuclear materials research laboratory, DOE is committed to learning from Japan's experience, will continue to monitor the unfolding events, and will make every effort to keep stakeholders updated as new information relevant to this SEIS develops.

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ACRONYMS, ABBREVIATIONS, AND CONVERSION CHARTS

ACRONYMS, ABBREVIATIONS, AND CONVERSION CHARTS

AASHTO	American Association of State Highway and Transportation Officials
AC and MC	analytical chemistry and materials characterization
ACHP	Advisory Council on Historic Preservation
AEA	Atomic Energy Act
AEI	areas of environmental interest
ALARA	as low as is reasonably achievable
ATSDR	Agency for Toxic Substances and Disease Registry
BLM	Bureau of Land Management
BLS	Bureau of Labor Statistics
CAIRS	Computerized Accident/Incident Reporting System
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	*Code of Federal Regulations*
CMR	Chemistry and Metallurgy Research
CMRR	Chemistry and Metallurgy Research Building Replacement
CMRR-NF	Chemistry and Metallurgy Research Building Replacement Nuclear Facility
CWA	Clean Water Act
DART	days away, restricted, or transferred
dB	decibels
dBA	decibels A-weighted
DD&D	decontamination, decommissioning, and demolition
DNFSB	Defense Nuclear Facilities Safety Board
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
DSA	Documented Safety Analysis
EA	Environmental Assessment
EIS	environmental impact statement
EPA	U.S. Environmental Protection Agency
FR	*Federal Register*
GHG	greenhouse gases
GTCC	Greater-Than-Class C
HCM	Highway Capacity Manual
HEPA	high-efficiency particulate air filter
HLW	high-level radioactive waste
IPCC	Intergovernmental Panel on Climate Change
LANL	Los Alamos National Laboratory
LANSCE	Los Alamos Neutron Science Center
LCF	latent cancer fatality
LEED	Leadership in Energy and Environmental Design
LEED-NC	Leadership in Energy and Environmental Design for New Construction and Major Renovations

LLW	low-level radioactive waste
LOS	level of service
MAR	material at risk
MDA	Material Disposal Area
MEI	maximally exposed individual
MLLW	mixed low-level radioactive waste
MMI	Modified Mercalli Intensity
NAAQS	National Ambient Air Quality Standards
NASA	National Aeronautics and Space Administration
NEPA	National Environmental Policy Act of 1969
NHPA	National Historic Preservation Act
NMDOT	New Mexico Department of Transportation
NMED	New Mexico Environmental Department
NNSA	National Nuclear Security Administration
NNSS	Nevada National Security Site
NOI	Notice of Intent
NPDES	National Pollutant Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
OSHA	Occupational Safety and Health Administration
PC	Performance Category
PCB	polychlorinated biphenyl
PDSA	preliminary documented safety analysis
PHV	peak hourly volume
PM_n	particulate matter less than or equal to *n* microns in aerodynamic diameter
POVs	privately owned vehicles
ppm	parts per million
PRSs	potential release sites
PSHA	Probabilistic Seismic Hazards Analysis
RCNM	Roadway Construction Noise Model
RCRA	Resource Conservation and Recovery Act
RLUOB	Radiological Laboratory/Utility/Office Building
RLWTF	Radioactive Liquid Waste Treatment Facility
RMP	Resource Management Plan
ROD	Record of Decision
ROI	Region of Influence
RSL	Remote Sensing Laboratory
SA	supplement analysis
SC	Safety Class
SEIS	Supplemental Environmental Impact Statement
SERF	Sanitary Effluent Reclamation Facility
SNM	special nuclear material
SSC	structure, system, and component
SWEIS	site-wide environmental impact statement
SWPPP	Storm Water Pollution Prevention Plan

SWWS	Sanitary Wastewater Systems Plant
TA	technical area
TRAGIS	Transportation Routing analysis Geographic Information System
TRCs	total recordable cases
TRU	transuranic waste
TSD	treatment storage and disposal
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
VAP	Vehicle Access Portals
VCP	Vehicle Control Point
VMT	vehicle miles traveled
WETF	Weapons Engineering Test Facility
WIPP	Waste Isolation Pilot Plant

CONVERSIONS

METRIC TO ENGLISH			ENGLISH TO METRIC		
Multiply	**by**	**To get**	**Multiply**	**by**	**To get**
Area					
Square meters	10.764	Square feet	Square feet	0.092903	Square meters
Square kilometers	247.1	Acres	Acres	0.0040469	Square kilometers
Square kilometers	0.3861	Square miles	Square miles	2.59	Square kilometers
Hectares	2.471	Acres	Acres	0.40469	Hectares
Concentration					
Kilograms/square meter	0.16667	Tons/acre	Tons/acre	0.5999	Kilograms/square meter
Milligrams/liter	1 [a]	Parts/million	Parts/million	1 [a]	Milligrams/liter
Micrograms/liter	1 [a]	Parts/billion	Parts/billion	1 [a]	Micrograms/liter
Micrograms/cubic meter	1 [a]	Parts/trillion	Parts/trillion	1 [a]	Micrograms/cubic meter
Density					
Grams/cubic centimeter	62.428	Pounds/cubic feet	Pounds/cubic feet	0.016018	Grams/cubic centimeter
Grams/cubic meter	0.0000624	Pounds/cubic feet	Pounds/cubic feet	16,025.6	Grams/cubic meter
Length					
Centimeters	0.3937	Inches	Inches	2.54	Centimeters
Meters	3.2808	Feet	Feet	0.3048	Meters
Kilometers	0.62137	Miles	Miles	1.6093	Kilometers
Temperature					
Absolute					
Degrees C + 17.78	1.8	Degrees F	Degrees F - 32	0.55556	Degrees C
Relative					
Degrees C	1.8	Degrees F	Degrees F	0.55556	Degrees C
Velocity/Rate					
Cubic meters/second	2118.9	Cubic feet/minute	Cubic feet/minute	0.00047195	Cubic meters/second
Grams/second	7.9366	Pounds/hour	Pounds/hour	0.126	Grams/second
Meters/second	2.237	Miles/hour	Miles/hour	0.44704	Meters/second
Volume					
Liters	0.26418	Gallons	Gallons	3.78533	Liters
Liters	0.035316	Cubic feet	Cubic feet	28.316	Liters
Liters	0.001308	Cubic yards	Cubic yards	764.54	Liters
Cubic meters	264.17	Gallons	Gallons	0.0037854	Cubic meters
Cubic meters	35.314	Cubic feet	Cubic feet	0.028317	Cubic meters
Cubic meters	1.3079	Cubic yards	Cubic yards	0.76456	Cubic meters
Cubic meters	0.0008107	Acre-feet	Acre-feet	1233.49	Cubic meters
Weight/Mass					
Grams	0.035274	Ounces	Ounces	28.35	Grams
Kilograms	2.2046	Pounds	Pounds	0.45359	Kilograms
Kilograms	0.0011023	Tons (short)	Tons (short)	907.18	Kilograms
Metric tons	1.1023	Tons (short)	Tons (short)	0.90718	Metric tons
ENGLISH TO ENGLISH					
Acre-feet	325,850.7	Gallons	Gallons	0.000003046	Acre-feet
Acres	43,560	Square feet	Square feet	0.000022957	Acres
Square miles	640	Acres	Acres	0.0015625	Square miles

a. This conversion is only valid for concentrations of contaminants (or other materials) in water.

METRIC PREFIXES

Prefix	Symbol	Multiplication factor
exa-	E	1,000,000,000,000,000,000 = 10^{18}
peta-	P	1,000,000,000,000,000 = 10^{15}
tera-	T	1,000,000,000,000 = 10^{12}
giga-	G	1,000,000,000 = 10^{9}
mega-	M	1,000,000 = 10^{6}
kilo-	k	1,000 = 10^{3}
deca-	D	10 = 10^{1}
deci-	d	0.1 = 10^{-1}
centi-	c	0.01 = 10^{-2}
milli-	m	0.001 = 10^{-3}
micro-	µ	0.000 001 = 10^{-6}
nano-	n	0.000 000 001 = 10^{-9}
pico-	p	0.000 000 000 001 = 10^{-12}