APPENDIX A
ENVIRONMENTAL IMPACTS METHODOLOGIES

This appendix briefly describes the methods used to assess the potential direct, indirect, and cumulative effects of the alternatives in this *Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory (CMRR EIS).* Included are impact assessment methods for land use and visual resources, site infrastructure, air quality, noise, geology and soils, surface and groundwater, water quality, ecological resources, cultural and paleontological resources, socioeconomics, waste management and pollution prevention, and cumulative impacts. Each section includes descriptions of the affected resources, region of influence, and impact assessment methods. Descriptions of the methods for the evaluation of human health impacts from normal operations and facility accidents are presented in Appendices B and C, respectively. Environmental justice is addressed in Appendix D.

Impact analyses vary for each resource area. For air quality, for example, estimated pollutant emissions from the candidate facilities were compared with appropriate regulatory standards or guidelines. Comparison with regulatory standards is a commonly used method for benchmarking environmental impacts and is done here to provide perspective on the magnitude of identified impacts. For waste management, waste generation rates were compared with the capacities of waste management facilities. Impacts within each resource area were analyzed consistently; that is, the impact values were estimated using a consistent set of input variables and computations. Moreover, calculations in all resource areas used accepted protocols and up-to-date models.

The baseline conditions assessed in this EIS are consistent with the Expanded Operations Alternative described in the *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory* (*LANL SWEIS*) (DOE 1999) and also consider present actions at the site. The No Action Alternative was used as the basis for the comparison of impacts that would occur under implementation of the other alternatives.

A.1 LAND USE AND VISUAL RESOURCES

A.1.1 Land Use

A.1.1.1 Description of Affected Resources and Region of Influence

Land use includes the land on and adjacent to each candidate site, the physical features that influence current or proposed uses, pertinent land use plans and regulations, and land ownership and availability. The region of influence for land use varies due to the extent of land ownership, adjacent land use patterns and trends, and other geographic or safety considerations, but generally includes the site and areas immediately adjacent to the site.

A.1.1.2 Description of Impact Assessment

The amount of land disturbed and conformity with existing land use were considered in order to evaluate impacts at each candidate site from construction and operation (see **Table A–1**). Both factors were considered for each of the action alternatives. However, since new construction would not take place under the No Action Alternative, only conformity with existing land use was evaluated for this alternative. Land-use impacts could vary considerably from site to site, depending on the extent of new construction and where it would take place (that is, on undeveloped land or within a previously disturbed area).

Table A–1 Impact Assessment Protocol for Land Resources

	Required Data		
Resource	***Affected Environment***	***Alternative***	***Measure of Impact***
Land area used	Site acreage	Facility location and acreage requirement	Acreage converted to project use
Compatibility with existing or future facility land use	Existing facility land use configurations	Location of facility on the site; expected modifications of facility activities and missions to accommodate the alternatives	Incompatibility with existing or future facility land use
Visual resources	Current Visual Resource Management classification	Location of facility on the site; facility dimensions and appearance	Change in Visual Resource Management classification

A.1.2 Visual Resources

A.1.2.1 Description of Affected Resources and Region of Influence

Visual resources are the natural and human-created features that give a particular landscape its character and aesthetic quality. Landscape character is determined by the visual elements of form, line, color, and texture. All four elements are present in every landscape; however, they exert varying degrees of influence. The stronger the influence exerted by these elements in a landscape, the more interesting the landscape. The region of influence for visual resources includes the geographic area from which the candidate facilities may be seen.

A.1.2.2 Description of Impact Assessment

Impacts to visual resources from construction and operation of the proposed action at LANL may be determined by evaluating whether the Bureau of Land Management Visual Resource Management classifications of the candidate sites would change as a result of the proposed action (DOI 1986) (see Table A–1). Existing classifications were derived from an inventory of scenic qualities, sensitivity levels, and distance zones for particular areas. For those alternatives involving existing facilities at LANL, alterations to visual features may be readily evaluated and the impact on the current Visual Resource Management classification determined. In order to determine the range of potential visual effects from new facilities, the analysis considered potential impacts from construction and operation in light of the aesthetic quality of surrounding areas, as well as the visibility of the proposed action from public vantage points.

A.2 SITE INFRASTRUCTURE

A.2.1 Description of Affected Resources and Region of Influence

Site infrastructure includes the physical resources required to support the construction and operation of the candidate facilities. It includes the capacities of onsite road and rail transportation networks, electric power and electrical load capacities, natural gas capacities, and water supply system capacities.

The region of influence is generally limited to the boundaries of the candidate technical areas (TAs) at LANL. However, should infrastructure requirements exceed TA or site capacities, the region of influence would be expanded (for analysis) to include the sources of additional supply. For example, if electrical demand at LANL (with added facilities) exceeded availability, then the region of influence would be expanded to include the likely source of additional power.

A.2.2 Description of Impact Assessment

In general, infrastructure impacts were assessed by evaluating the requirements of each alternative against the TA capacities. An impact assessment was made for each resource (transportation, electricity, fuel, and water) for the various alternatives (see **Table A–2**). Local transportation impacts were addressed qualitatively, as transportation infrastructure requirements under the proposed action were considered negligible. Tables reflecting site availability and infrastructure requirements were developed for each alternative. Data for these tables were obtained from reports describing the existing infrastructure at the sites and from the data reports for each alternative. If necessary, design mitigation considerations conducive to reduction of the infrastructure demand were also identified.

Table A–2 Impact Assessment Protocol for Infrastructure

	Required Data		
Resource	***Affected Environment***	***Alternative***	***Measure of Impact***
Transportation - Roads (kilometers) - Railroads (kilometers)	TA/site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding TA/site capacity
Electricity - Energy consumption (megawatt-hours per year) - Peak load (megawatts)	TA/site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding TA/site capacity
Fuel - Natural gas (cubic meters per year)	TA/site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding TA/site capacity
Water (liters per year)	TA/site capacity and current usage	Facility requirements	Additional requirement (with added facilities) exceeding TA/site capacity

Any projected demand for infrastructure resources exceeding site availability can be regarded as an indicator of environmental impact. Whenever projected demand approaches or exceeds capacity, further analysis for that resource is warranted. Often, design changes can mitigate the impact of additional demand for a given resource. For example, substituting fuel oil for natural gas (or vice versa) for heating or industrial processes can be accomplished at little cost during the design of a facility, provided the potential for impact is identified early. Similarly, a dramatic

spike or surge in peak demand for electricity can sometimes be mitigated by changes to operational procedures or parameters.

A.3 AIR QUALITY

A.3.1 Description of Affected Resources and Region of Influence

Air pollution refers to the introduction, directly or indirectly, of any substance into the air that could:

- endanger human health,
- harm living resources and ecosystems,
- damage material property, or
- impair or interfere with the comfortable enjoyment of life and other legitimate uses of the environment.

For the purpose of this *CMRR EIS*, only outdoor air pollutants were addressed. They may be in the form of solid particles, liquid droplets, gases, or a combination of these forms. Generally, they can be categorized as primary pollutants (those emitted directly from identifiable sources) and secondary pollutants (those produced in the air by interaction between two or more primary pollutants, or by reaction with normal atmospheric constituents that may be influenced by sunlight). Air pollutants are transported, dispersed, or concentrated by meteorological and topographical conditions. Thus, air quality is affected by air pollutant emission characteristics, meteorology, and topography.

Ambient air quality in a given location can be described by comparing the concentrations of various pollutants in the atmosphere with the appropriate standards. Ambient air quality standards have been established by Federal and state agencies, allowing an adequate margin of safety for the protection of public health and welfare from the adverse effects of pollutants in the ambient air. Pollutant concentrations higher than the corresponding standards are considered unhealthy; those below such standards, acceptable.

The pollutants of concern are primarily those for which Federal and state ambient air quality standards have been established, including criteria air pollutants, hazardous air pollutants, and other toxic air compounds. Criteria air pollutants are those listed in 40 CFR Part 50, "National Primary and Secondary Ambient Air Quality Standards." Hazardous air pollutants and other toxic compounds are those listed in Title I of the Clean Air Act, as amended (40 U.S.C. 7401 *et seq.*), those regulated by the National Emissions Standards for Hazardous Air Pollutants (40 CFR 61), and those that have been proposed or adopted for regulation by the applicable state, or are listed in state guidelines. States may set ambient standards that are more stringent than the national ambient air quality standards. The more stringent of the state or Federal standards for each site is shown in this document.

Areas with air quality better than the National Ambient Air Quality Standards (NAAQS) for criteria air pollutants are designated as being in attainment, while areas with air quality worse than the NAAQS for such pollutants are designated as nonattainment. Areas may be designated as unclassified when sufficient data for attainment status designation are lacking. Attainment

status designations are assigned by county, metropolitan statistical area, consolidated metropolitan statistical area, or portions thereof, or air quality control regions. Air quality control regions designated by the U.S. Environmental Protection Agency (EPA) are listed in 40 CFR Part 81, "Designation of Areas for Air Quality Planning Purposes." LANL is located in an attainment area (40 CFR Sections 81.332).

For locations that are in an attainment area for criteria air pollutants, Prevention of Significant Deterioration regulations limit pollutant emissions from new or modified sources and establish allowable increments of pollutant concentrations. Three Prevention of Significant Deterioration classifications are specified, with the criteria established, in the Clean Air Act. Class I areas include national wilderness areas, memorial parks larger than 5,000 acres (2,020 hectares), national parks larger than 6,000 acres (2,430 hectares), and areas that have been redesignated as Class I. Class II areas are all areas not designated as Class I. No Class III areas have been designated (42 U.S.C. 7472, Title I, Section 162). Although LANL is in a Class II area, it is adjacent to the Bandelier National Monument and Wilderness Area Class I area (DOE 1999).

The region of influence for air quality encompasses an area surrounding a candidate site that is potentially affected by air pollutant emissions caused by the alternatives. The air quality impact area normally evaluated is the area in which concentrations of criteria pollutants would increase more than a significant amount in a Class II area (on the basis of averaging period and pollutant: 1 microgram per cubic meter (Fg/m^3) for the annual average for sulfur dioxide, nitrogen dioxide and particulate matter less than or equal to 10 microns in aerodynamic diameter (PM_{10}); 5 Fg/m^3 for the 24-hour average for sulfur dioxide and PM_{10}; 500 Fg/m^3 for the 8-hour average for carbon monoxide; 25 Fg/m^3 for the 3-hour average for sulfur dioxide; and 2,000 micrograms for the 1-hour average for carbon monoxide [40 CFR Section 51.165]). Generally, this covers a few kilometers downwind from the source. Further, for sources within 60 miles (100 kilometers) of a Class I area, the air quality impact area evaluated would include the Class I area if the increase in concentration were greater than 1 Fg/m^3 (24-hour average). The area of the region of influence depends on emission source characteristics, pollutant types, emission rates, and meteorological and topographical conditions. For the purpose of this analysis, impacts were evaluated at the site boundary and along roads within the sites to which the public has access, plus any additional area in which contributions to pollutant concentrations are expected to exceed significance levels.

Baseline air quality is typically described in terms of pollutant concentrations modeled for existing sources at each candidate site and background air pollutant concentrations measured near the sites. For this analysis, concentrations for existing sources were obtained from the *LANL SWEIS* and from modeling of concentrations using recent emissions inventories and the Industrial Source Complex (ISCST3) model (EPA 1995, EPA 2000).

A.3.2 Description of Impact Assessment

Potential air quality impacts of pollutant emissions from construction and normal operations were evaluated for each alternative. This assessment included a comparison of pollutant concentrations from each alternative with applicable Federal and state ambient air quality standards (see **Table A–3**). If both Federal and state standards exist for a given pollutant and

averaging period, compliance was evaluated using the more stringent standard. Operational air pollutant emissions data for each alternative were based on conservative engineering analyses.

For each alternative, contributions to offsite air pollutant concentrations were modeled on the basis of guidance presented in EPA's "Guidelines on Air Quality Models" (40 CFR Part 51, Appendix W). The EPA-recommended model ISCST3 (EPA 1995) was selected as an appropriate model to use for air dispersion modeling because it is designed to support the EPA regulatory modeling program and predicts conservative worst-case impacts.

The modeling analysis incorporated conservative assumptions, which tend to overestimate pollutant concentrations. The maximum modeled concentration for each pollutant and averaging time was selected for comparison with the applicable standard. The concentrations evaluated were the maximum occurring at or beyond the site boundary and at a public access road, or other publicly-accessible area within the site. Available monitoring data, which reflect both onsite and offsite sources, were also taken into consideration. Concentrations of the criteria air pollutants were presented for each alternative. Concentrations of hazardous and toxic air pollutants were evaluated in the public and occupational health effects analysis. At least 1 year of representative hourly meteorological data was used.

Table A–3 Impact Assessment Protocol for Air Quality

	Required Data		
Resource	***Affected Environment***	***Alternative***	***Measure of Impact***
Criteria air pollutants and other regulated pollutants [a]	Measured and modeled ambient concentrations (Fg/m^3) from existing sources at site	Emission rate (kilograms per year) of air pollutants from facility; source characteristics (stack height and diameter, exit temperature and velocity)	Concentration of alternative and total site concentration of each pollutant at or beyond site boundary, or within boundary on public road compared to applicable standard
Toxic and hazardous air pollutants [b]	Measured and modeled ambient concentrations (Fg/m^3) from existing sources at site	Emission rate (kilograms per year) of pollutants from facility; source characteristics (stack height and diameter, exit temperature and velocity)	Concentration of alternative and total site concentration of each pollutant at or beyond site boundary, or within boundary on public road used to calculate hazard quotient or cancer risk

[a] Carbon monoxide; hydrogen fluoride; lead; nitrogen oxides; ozone; PM_{10}; sulfur dioxide; total suspended particulates.
[b] Clean Air Act, Section 112, hazardous air pollutant: pollutants regulated under the National Emissions Standard for Hazardous Air Pollutants, and other state-regulated pollutants.

Ozone is typically formed as a secondary pollutant in the ambient air (troposphere). It is formed in the presence of sunlight from the mixing of primary pollutants, such as nitrogen oxides, and volatile organic compounds that emanate from vehicular (mobile), natural, and other stationary sources. Ozone is not emitted directly as a pollutant from the candidate sites. Although ozone may be regarded as a regional issue, specific ozone precursors, notably nitrogen dioxide and volatile organic compounds, were analyzed as applicable to the alternatives under consideration.

The Clean Air Act, as amended, requires that Federal actions conform to the host state's "state implementation plan." A state implementation plan provides for the implementation, maintenance, and enforcement of NAAQS for the six criteria pollutants: sulfur dioxide, PM_{10}, carbon monoxide, ozone, nitrogen dioxide, and lead. Its purpose is to eliminate or reduce the severity and number of violations of NAAQS and to expedite the attainment of these standards.

No Department, agency, or instrumentality of the Federal Government shall engage in or support in any way (provide financial assistance for, license or permit, or approve) any activity that does not conform to an applicable implementation plan. The final rule for "Determining Conformity of General Federal Actions to State or Federal Implementation Plans" (58 FR 63214) took effect on January 31, 1994. LANL is within an area currently designated as in attainment for criteria air pollutants. Therefore, the alternatives being considered in this *CMRR EIS* are not affected by the provisions of the conformity rule.

Emissions of potential stratospheric ozone-depleting compounds such as chlorofluorocarbons were not evaluated, as no emissions of these pollutants were identified in the conceptual engineering design reports.

A.4 NOISE

A.4.1 Description of Affected Resources and Region of Influence

Sound results from the compression and expansion of air or some other medium when an impulse is transmitted through it. Sound requires a source of energy and a medium for transmitting the sound wave. Propagation of sound is affected by various factors, including meteorology, topography, and barriers. Noise is undesirable sound that interferes or interacts negatively with the human or natural environment. Noise may disrupt normal activities (hearing and sleep), damage hearing, or diminish the quality of the environment.

Sound-level measurements used to evaluate the effects of nonimpulsive sound on humans are compensated by an A-weighting scale that accounts for the hearing response characteristics (frequency) of the human ear. Sound levels are expressed in decibels (dB), or in the case of A-weighted measurements, decibels A-weighted (dBA). EPA has developed noise-level guidelines for different land use classifications. Some states and localities have established noise control regulations or zoning ordinances that specify acceptable noise levels by land use category.

Noise from facility operations and associated traffic could affect human and animal populations. The region of influence for each candidate site includes the site, nearby offsite areas, and transportation corridors where proposed activities might increase noise levels. Transportation corridors most likely to experience increased noise levels are those roads within a few miles of the site boundary that carry most of the site's employee and shipping traffic.

Sound-level data representative of site environs were obtained from existing reports. The acoustic environment was further described in terms of existing noise sources for each candidate site.

A.4.2 Description of Impact Assessment

Noise impacts associated with the alternatives may result from construction and operation of facilities and increased traffic (see **Table A–4**). Impacts from facility construction and operation were assessed according to the types of noise sources and the locations of the candidate facilities

relative to the site boundary. Potential noise impacts from traffic were based on the likely increase in traffic volume. Possible impacts to wildlife were evaluated based on the possibility of sudden loud noises occurring during facility construction or modification and operation.

Table A–4 Impact Assessment Protocol for Noise

Resource	*Required Data*		*Measure of Impact*
	Affected Environment	*Alternative*	
Noise	Identification of sensitive offsite receptors (nearby residences); description of sound levels in the vicinity of the TA/site	Description of major construction, modification, and operational noise sources; shipment and workforce traffic estimates	Increase in day/night average sound level at sensitive receptors

A.5 GEOLOGY AND SOILS

A.5.1 Description of Affected Resources and Region of Influence

Geologic resources include consolidated and unconsolidated earth materials, including mineral assets such as ore and aggregate materials and fossil fuels such as coal, oil, and natural gas. Geologic conditions include hazards such as earthquakes, faults, volcanoes, landslides, sinkholes and other conditions leading to land subsidence and unstable soils. Soil resources include the loose surface materials of the earth in which plants grow, usually consisting of mineral particles from disintegrating rock, organic matter, and soluble salts. Certain soils are considered important to farmlands, which are designated by the U.S. Department of Agriculture Natural Resources Conservation Service. Important farmlands include prime farmland, unique farmland, and other farmland of statewide or local importance as defined in 7 CFR 657.5, and may be subject to the Farmland Protection Policy Act (7 U.S.C. 4201 et seq.).

Geology and soils were considered with respect to those attributes that could be affected by the alternatives, as well as those geologic and soil conditions that could affect each alternative. Thus, the region of influence for geology and soils includes the project site and nearby offsite areas subject to disturbance by facility construction, modification, and operations under the alternatives, and those areas beneath existing or new facilities that would remain inaccessible for the life of the facilities. Geologic conditions that could affect the integrity and safety of facilities under the alternatives include large-scale geologic hazards (for example, earthquakes, volcanic activity, landslides, and land subsidence) and local hazards associated with the site-specific attributes of the soil and bedrock beneath site facilities.

A.5.2 Description of Impact Assessment

Facility construction and operations for the *CMRR EIS* alternatives were considered from the perspective of impacts on specific geologic resources and soil attributes. Construction and facility modification activities were the focus of the impacts assessment for geologic and soil resources; hence, key factors in the analysis were the land area to be disturbed during construction and occupied during operations (see **Table A–5**). The assessment included an analysis of constraints to siting new CMRR Facilities over unstable soils prone to subsidence, liquefaction, shrink-swell, or erosion.

Table A–5 Impact Assessment Protocol for Geology and Soils

Resource	*Required Data*		*Measure of Impact*
	Affected Environment	*Alternative*	
Geologic hazards	Presence of geologic hazards within the region of influence	Location of facility on the site	Potential for damage to facilities
Valuable mineral and energy resources	Presence of any valuable mineral or energy resources within the region of influence	Location of facility on the site	Potential to destroy or render resources inaccessible
Important farmland soils	Presence of prime or other important farmland soils within the region of influence	Location of facility on the site	Conversion of important farmland soils to nonagricultural use

The geology and soils impact analysis (see Table A–5) also considered the risks to existing and new facilities of large-scale geologic hazards such as faulting and earthquakes, lava extrusions and other volcanic activity, landslides, and sinkholes (conditions that tend to affect broad expanses of land). This element of the assessment included collection of site-specific information on the potential for impacts on site facilities from local and large-scale geologic conditions. Historical seismicity within a given radius of each facility site was reviewed as a means of assessing the potential for future earthquake activity. As used in this EIS, earthquakes are described in terms of several parameters as presented in **Table A–6**.

Probabilistic earthquake ground motions in terms of peak ground acceleration and spectral (response) acceleration were determined in order to provide a comparative assessment of seismic hazard. The U.S. Geological Survey National Seismic Mapping Project uses both parameters. The U.S. Geological Survey's latest National Earthquake Hazards Reduction Program (NEHRP) maps are based on spectral acceleration and have been adapted for use in the *International Building Code* (ICC 2000). They depict maximum considered earthquake ground motion of 0.2- and 1.0-second spectral acceleration, respectively, based on a 2 percent probability of exceedance in 50 years (corresponding to an annual probability of occurrence of about 1 in 2,500). Available site-specific seismic hazard analyses were also reviewed and compared.

An evaluation also determined if construction or operation of proposed facilities at a specific site could destroy or preclude the use of valuable mineral or energy resources.

Pursuant to the Farmland Protection Policy Act of 1981 (7 U.S.C. 4201 et seq.), and its implementing regulations (7 CFR 658), the presence of important farmland, including prime farmland, was also evaluated. This Act requires agencies to make Farmland Protection Policy Act evaluations part of the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.) process, the main purpose being to reduce the conversion of farmland to nonagricultural uses by Federal projects and programs. However, otherwise qualifying farmlands in or already committed to urban development, land acquired for a project on or prior to August 4, 1984, and lands acquired or used by a Federal agency for national defense purposes are exempt from the Act's provisions (7 CFR 658.2 and 658.3).

Table A–6 The Modified Mercalli Intensity Scale of 1931, with Generalized Correlations to Magnitude and Peak Ground Acceleration

Modified Mercalli Intensity [a]	*Observed Effects of Earthquake*	*Approximate Magnitude* [b]	*Peak Ground Acceleration* [c] *(g)*
I	Usually not felt, except by a very few under very favorable conditions.	Less than 3	Less than 0.0017
II	Felt only by a few persons at rest, especially on the upper floors of buildings.	3 to 3.9	0.0017 to 0.014
III	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck.		
IV	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy object striking building. Standing motor cars rock noticeably.	4 to 4.9	0.014 to 0.039
V	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.		0.039 to 0.092
VI	Felt by all; many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.	5 to 5.9	0.092 to 0.18
VII	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.	6 to 6.9	0.18 to 0.34
VIII	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings, with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.	7 to 7.9	0.34 to 0.65
IX	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.		0.65 to 1.24
X	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.		1.24 and higher
XI	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.	8 and higher	
XII	Damage total. Lines of sight and level are distorted. Objects thrown into the air.		

[a] Intensity is a unitless expression of observed effects from earthquake-produced ground shaking. Effects may vary greatly between locations based on earthquake magnitude, distance from the earthquake, and local subsurface geology. The descriptions given are abbreviated from the Modified Mercalli Intensity scale of 1931.

[b] Magnitude is an exponential function of seismic wave amplitude, related to the energy released. There are several "magnitude" scales in common use including local "Richter" magnitude, body-wave magnitude, surface wave magnitude, and moment magnitude. Each has applicability for measuring particular aspects of seismic signals and may be considered equivalent within each scale's respective range of validity.

[c] Acceleration is expressed as a percent relative to the earth's gravitational acceleration (g) (g = 980 centimeters per second squared). Given values are correlated to Modified Mercalli Intensity based on measurements of California earthquakes only (Wald et al. 1999).

Sources: Compiled from Wald et al. 1999, USGS 2002.

A.6 SURFACE AND GROUNDWATER QUALITY

A.6.1 Description of Affected Resources and Region of Influence

Water resources are surface and groundwater suitable for human consumption, traditional and ceremonial uses by Native Americans, aquatic or wildlife propagation, agricultural purposes, irrigation, or industrial/commercial purposes. The region of influence used for water resources encompasses those site and adjacent surface water and groundwater systems that could be

impacted by water withdrawals, effluent discharges, and spills or stormwater runoff associated with facility construction and operational activities under the relocation alternatives.

A.6.2 Description of Impact Assessment

Determination of the impacts of the *CMRR EIS* alternatives on surface and groundwater quality consisted of a comparison of site-generated data and professional estimates regarding water use and effluent discharge with applicable regulatory standards, design parameters and standards commonly used in the water and wastewater engineering fields, and recognized measures of environmental impact. Certain assumptions were made to facilitate the impacts assessment: (1) that all water supply (production and treatment) and effluent treatment facilities would be approved by the appropriate permitting authority; (2) that the effluent treatment facilities would meet the effluent limitations imposed by the respective National Pollutant Discharge Elimination System permits; and (3) that any stormwater runoff from construction and operation activities would be handled in accordance with the regulations of the appropriate permitting authority. It was also assumed that, during construction, sediment fencing or other erosion control devices would be used to mitigate short-term adverse impacts from sedimentation, and that, as appropriate, stormwater holding ponds would be constructed to lessen the impacts of runoff on surface water quality.

A.6.2.1 Water Use and Availability

This analysis involved the review of engineering estimates of expected surface water and/or groundwater use and effluent discharge associated with facility construction and operation activities for each alternative, as well as the impacts on local and regional water availability in terms of quantity and quality. Impacts on water use and availability were generally assessed by determining changes in the volume of current water usage and effluent discharge as a result of the proposed activities (**Table A–7**). For facilities intending to use surface water, no credit was taken for effluent discharges back to surface waters or to the subsurface. The impact of discharging withdrawn groundwater to surface waters or back to the subsurface was also considered, as appropriate.

If the determination of impacts reflected an increase in water use or effluent discharge, then an evaluation of the design capacity of the water supply production and treatment facilities and the effluent treatment facilities, respectively, was made to determine whether the design capacities would be exceeded by the additional flows. If the combined flow (the existing flow plus those from the proposed activities) was less than the design capacity of the water supply systems and effluent treatment plants, then it was assumed that there would be no impact on water availability for local users, or on receiving surface waters or groundwater from effluent discharges. Further, a separate analysis (see Section A.6.2.2) was performed, as necessary, to determine the potential for effluent discharge impacts on ambient surface water or groundwater quality based on the results of the effluent treatment capacity analysis.

Table A–7 Impact Assessment Protocol for Water Use and Availability

Resource	Required Data		Measure of Impact
	Affected Environment	Facility Design	
Surface water availability	Surface waters near the facilities, including average flow and current usage	Volume of withdrawals from, and discharges to, surface waters	Changes in availability to local/ downstream users of water for human consumption, irrigation, or animal feeding
Groundwater availability	Groundwater near the facilities, including existing water rights for major water users and current usage	Volume of withdrawals from, and discharges to, groundwater	Changes in availability of groundwater for human consumption, irrigation, or animal feeding

Because water withdrawals and effluent discharges from the site facilities were generally found not to exceed the design capacity of existing water supply systems or effluent treatment facilities, additional analyses were not performed.

A.6.2.2 Water Quality

The water quality impact assessment analyzed how effluent discharges to surface water, as well as discharges reaching groundwater, from the facilities under each alternative would directly affect current water quality. The determination of the impacts of the alternatives is summarized in **Table A–8** and consisted of a comparison of the projected effluent quality with relevant regulatory standards and implementing regulations under the Clean Water Act (33 U.S.C. 1251 et seq.), Safe Drinking Water Act (42 U.S.C. 300 (f) et seq.), state laws, and existing site permit conditions. The impacts analysis evaluated the potential for contaminants to affect receiving waters as a result of spills, stormwater discharges, and other releases under the alternatives. Separate analyses were conducted for surface water and groundwater impacts.

Table A–8 Impact Assessment Protocol for Water Quality

Resource	Required Data		Measure of Impact
	Affected Environment	Facility Design	
Surface water quality	Surface waters near the facilities in terms of stream classifications and changes in water quality	Expected contaminants and contaminant concentrations in discharges to surface waters	Exceedance of relevant surface water quality criteria or standards established in accordance with the Clean Water Act or state regulations and existing permits
Groundwater quality	Groundwater near the facilities in terms of classification, presence of designated sole source aquifers, and changes in quality of groundwater	Expected contaminants and contaminant concentrations in discharges that could reach groundwater	Contaminant concentrations in groundwater exceeding relevant standards or criteria established in accordance with the Safe Drinking Water Act or state regulations and existing permits

Surface Water Quality—The evaluation of surface water quality impacts focused on the quality and quantity of any effluents (including stormwater) to be discharged and the quality of the receiving stream upstream and downstream from the discharges. The evaluation of effluent quality featured review of the expected parameters, such as the design average and maximum flows, as well as the effluent parameters reflected in the existing or expected National Pollutant Discharge Elimination System or applicable state discharge permit. Parameters of concern include total suspended solids, metals, organic and inorganic chemicals, and any other constituents that could affect the local environment. Any proposed water quality management practices were reviewed to ensure that any applicable permit limitations and conditions would be met. Factors that currently degrade water quality were also identified.

During facility modification or construction, ground disturbing activities could impact surface waters through increased runoff and sedimentation. Such impacts relate to the amount of land disturbed, the type of soil at the site, the topography, and weather conditions. They would be minimized by application of standard management practices for stormwater and erosion control (sediment fences, mulching disturbed areas).

During operations, surface waters could be affected by increased runoff from parking lots, buildings, or other cleared areas. Stormwater from these areas could be contaminated with materials deposited by airborne pollutants, automobile exhaust and residues, materials handling releases such as spills, and process effluents. Impacts of stormwater discharges could be highly variable and site specific, and mitigation would depend on management practices, the design of holding facilities, the topography, and adjacent land use. Data from existing water quality databases were compared with expected discharges from the facilities to determine the potential for and the relative impacts on surface waters.

Groundwater Quality—Potential groundwater quality impacts associated with any effluent discharges and other contaminant releases during facility construction and operation activities were examined. Available engineering estimates of contaminant concentrations were weighed against applicable Federal and state groundwater quality standards, effluent limitations, and drinking water standards to determine the impacts of each alternative. The consequences of groundwater use and effluent discharge on other site groundwater conditions were also evaluated.

A.6.2.3 Waterways and Floodplains

The locations of waterways (ponds, lakes, streams) and the 100- and 500-year floodplains were identified from maps and other existing documents to assess the potential for impacts from facility construction and operations activities, including direct effects on hydrologic characteristics or secondary effects such as sedimentation (see Surface Water Quality in Section A.6.2.2.). All activities would be conducted to avoid delineated floodplains and to ensure compliance with Executive Order 11988, *Floodplain Management*. However, for any facilities proposed for location in a floodplain, a floodplain assessment would be prepared.

A.7 ECOLOGICAL RESOURCES

A.7.1 Description of Affected Resources and Region of Influence

Ecological resources include terrestrial resources, wetlands, aquatic resources, and threatened and endangered species. The region of influence for the ecological resource analysis encompassed the site and adjacent areas potentially disturbed by construction and operation of the candidate facilities.

Terrestrial resources are defined as those plant and animal species and communities that are most closely associated with the land; for aquatic resources, a water environment. Wetlands are defined by the U.S. Army Corps of Engineers and EPA as "… those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in

saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (33 CFR Section 328.3).

Federally-endangered species are defined under the Endangered Species Act of 1973 (16 U.S.C. 1531 et seq.) as those in danger of extinction throughout all or a large portion of their range. Threatened species are defined as those species likely to become endangered within the foreseeable future. The U.S. Fish and Wildlife Service and the National Marine Fisheries Service propose species to be added to the lists of Federally-threatened and Federally-endangered species. They also maintain a list of "candidate" species for which they have evidence that listing may be warranted, but for which listing is currently precluded by the need to list species more in need of Endangered Species Act protection. Candidate species do not receive legal protection under the Endangered Species Act, but should be considered in project planning in case they are listed in the future. Critical habitat for threatened and endangered species is designated by the U.S. Fish and Wildlife Service or the National Marine Fisheries Service. Critical habitat is defined as specific areas that contain physical and biological features essential to the conservation of species and that may require special management consideration or protection. States may also designate species as endangered, threatened, sensitive protected, in need of management, of concern, monitored, or species of special concern.

A.7.2 Description of Impact Assessment

Impacts to ecological resources may occur as a result of land disturbance, water use, air and water emissions, human activity, and noise associated with project implementation (see **Table A–9**). Each of these factors was considered when evaluating potential impacts from the proposed action. For those alternatives involving construction of new facilities, direct impacts to ecological resources was based on the acreage of land disturbed by construction. Indirect impacts from factors such as human disturbance and noise were evaluated qualitatively. Indirect impacts to ecological resources, including wetlands, from construction due to erosion were evaluated qualitatively, recognizing that standard erosion and sediment control practices would be followed. Impacts to terrestrial and aquatic ecosystems and wetlands from water use and air and water emissions were evaluated based on the results of the analyses conducted for air quality and water resources. The determination of impacts to threatened and endangered species was based on similar factors as noted above for terrestrial resources, wetlands, and aquatic resources.

A.8 CULTURAL AND PALEONTOLOGICAL RESOURCES

A.8.1 Description of Affected Resources and Region of Influence

Cultural resources are the indications of human occupation and use of the landscape as defined and protected by a series of Federal laws, regulations, and guidelines. For this *CMRR EIS*, potential impacts were assessed separately for each of the three general categories of cultural resources: prehistoric, historic, and Native American. Paleontological resources are the physical remains, impressions, or traces of plants or animals from a former geological age, and may be sources of information on ancient environments and the evolutionary development of plants and animals. Although not governed by the same historic preservation laws as cultural resources, they could be affected by the proposed action in much the same manner.

Table A–9 Impact Assessment Protocol for Ecological Resources

Resource	*Required Data*		*Measure of Impact*
	Affected Environment	*Alternative*	
Terrestrial resources	Vegetation and wildlife within vicinity of facilities	Facility location and acreage requirement, air and water emissions, and noise	Loss or disturbance to terrestrial habitat; emissions and noise values above levels shown to cause impacts to terrestrial resources
Wetlands	Wetlands within vicinity of facilities	Facility location and acreage requirement, air and water emissions, and wastewater discharge quantity and location	Loss or disturbance to wetlands; discharge to wetlands
Aquatic resources	Aquatic resources within vicinity of facilities	Facility air and water emissions, water source and quantity, and wastewater discharge location and quantity	Discharges above levels shown to cause impacts to aquatic resources; changes in water withdrawals and discharges
Threatened and endangered species	Threatened and endangered species and critical habitats within vicinity of facilities	Facility location and acreage requirement, air and water emissions, noise, water source and quantity, and wastewater discharge location and quantity	Measures similar to those noted above for terrestrial and aquatic resources

Prehistoric resources are physical remains of human activities that predate written records; they generally consist of artifacts that may alone or collectively yield otherwise inaccessible information about the past. Historic resources consist of physical remains that postdate the emergence of written records; in the United States, they are architectural structures or districts, archaeological objects, and archaeological features dating from 1492 and later. Ordinarily, sites less than 50 years old are not considered historic, but exceptions can be made for such properties if they are of particular importance, such as structures associated with Cold War themes. Native American resources are sites, areas, and materials important to Native Americans for religious or heritage reasons. Such resources may include geographical features, plants, animals, cemeteries, battlefields, trails, and environmental features. The region of influence for the cultural and paleontological resource analysis encompassed the site and areas adjacent to the site that are potentially disturbed by construction and operation of the candidate facilities.

A.8.2 Description of Impact Assessment

The analysis of impacts to cultural and paleontological resources addressed potential direct and indirect impacts at each candidate site from construction and operation (see **Table A–10**). Direct impacts include those resulting from groundbreaking activities associated with new construction and possibly building modifications. Indirect impacts include those associated with reduced access to a resource site, as well as impacts associated with increased stormwater runoff, increased traffic, and visitation to sensitive areas.

Table A–10 Impact Assessment Protocol for Cultural and Paleontological Resources

Resource	*Required Data*		*Measure of Impact*
	Affected Environment	*Alternative*	
Prehistoric resources	Prehistoric resources within the vicinity of facilities	Facility location and acreage requirement	Potential for loss, isolation, or alteration of the character of prehistoric resources; introduction of visual, audible, or atmospheric elements out of character
Historic resources	Historic resources within the vicinity of facilities	Facility location and acreage requirement	Potential for loss, isolation, or alteration of the character of historic resources; introduction of visual, audible, or atmospheric elements out of character
Native American resources	Native American resources within the vicinity of facilities	Facility location and acreage requirement	Potential for loss, isolation, or alteration of the character of Native American resources; introduction of visual, audible or atmospheric elements out of character
Paleontological resources	Paleontological resources within the vicinity of facilities	Facility location and acreage requirement	Potential for loss, isolation or alteration of paleontological resources

A.9 SOCIOECONOMICS

A.9.1 Description of Affected Resources and Region of Influence

Socioeconomic impacts are defined in terms of changes to the demographic and economic characteristics of a region. The number of jobs created by the proposed action could affect regional employment, income, and expenditures. Job creation is characterized by two types: (1) construction-related jobs, which are transient in nature and short in duration, and thus less likely to impact public services; and (2) operation-related jobs, which would last for the duration of the proposed project, and thus could create additional service requirements in the region of influence.

The region of influence for the socioeconomic environment represents a geographic area where site employees and their families reside, spend their income, and use their benefits, thereby affecting the economic conditions of the region. Site-specific regions of influence were identified as those counties in which approximately 90 percent or more of the site's workforce reside. This distribution reflects an existing residential preference for people currently employed at LANL and was used to estimate the distribution of workers associated with facility construction and operation under the proposed alternatives.

A.9.2 Description of Impact Assessment

Data were compiled on the current socioeconomic conditions near LANL, including unemployment rates, economic area industrial and service sector activities, and the civilian labor force. The workforce requirements of each alternative were determined in order to measure their possible effect on these socioeconomic conditions. Although workforce requirements might be met by employees already working at LANL, it was assumed that new employees would be hired to ensure that the maximum impact was assessed. Census statistics were also compiled on population, housing demand, and community services. U.S. Census Bureau population forecasts for the region of influence were combined with overall projected workforce requirements for

each of the alternatives being considered to determine the extent of impacts on housing demand and levels of community services (see **Table A–11**).

Table A–11 Impact Assessment Protocol for Socioeconomics

Resource	*Required Data*		*Measure of Impact*
	Affected Environment	*Alternative*	
Regional Economic Characteristics			
Workforce requirements	Site workforce projections	Estimated construction and operating staff requirements and timeframes	Workforce requirements added to sites' workforce projections
Region of influence civilian labor force	Labor force estimates	Estimated construction and operating staff requirements and timeframes	Workforce requirements as a percentage of the civilian labor force
Employment	Latest available employment in counties surrounding sites	Estimated construction and operating staff requirements	Potential change in employment
Demographic Characteristics			
Population and demographics of race, ethnicity, and income	Latest available estimates by county from the U.S. Census Bureau	Estimated effect on population	Potential effects on population
Housing and Community Services			
Housing – percent of occupied housing units	Latest available ratios from the U.S. Census Bureau	Estimated housing unit requirements	Potential change in housing unit availability
Education - Total enrollment - Teacher-to-student ratio	Latest available information from the U.S. Department of Education	Estimated effect on enrollment and teacher-student ratio	Potential change in student enrollment Potential change in teacher-student ratio
Health care – number of hospital beds and physicians per 1,000 residents	Latest available rates from the U.S. Census Bureau	Estimated effect on ratio	Potential change in the availability of hospital beds/physicians-population ratio

A.10 WASTE MANAGEMENT AND POLLUTION PREVENTION

A.10.1 Description of Affected Resources and Region of Influence

Depending on the alternative, construction and operation of the candidate facilities would generate several types of waste. Such wastes could include the following:

- Transuranic waste: Radioactive waste not classified as high-level radioactive waste and containing more than 100 nanocuries per gram of alpha-emitting transuranic isotopes with half-lives greater than 20 years.

- Mixed transuranic waste: Transuranic waste that also contains hazardous components regulated under the Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.).

- Low-level radioactive waste: Waste that contains radioactivity and is not classified as high-level radioactive waste, transuranic waste, or spent nuclear fuel, or the tailings or wastes produced by the extraction or concentration of uranium or thorium from any ore processed primarily for its source material. Test specimens of fissionable material irradiated for research and development only, and not for the production of power or plutonium, may be classified as low-level radioactive waste, provided the transuranic concentration is less than 100 nanocuries per gram of waste.

- Mixed low-level radioactive waste: Low-level radioactive waste that also contains hazardous components regulated under the Resource Conservation and Recovery Act (42 U.S.C. 6901 et seq.).

- Hazardous waste: Under the Resource Conservation and Recovery Act, a waste that, because of its characteristics, may: (1) cause or significantly contribute to an increase in mortality or an increase in serious irreversible or incapacitating reversible illness; or (2) pose a substantial present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed. Hazardous wastes appear on special EPA lists or possess at least one of the following characteristics: ignitability, corrosivity, reactivity, or toxicity. This category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act (42 U.S.C. 2011 et. seq).

- Nonhazardous waste: Discarded material including solid, liquid, semisolid, or contained gaseous material resulting from industrial, commercial, mining, and agricultural operations, and from community activities. This category does not include source, special nuclear, or byproduct material as defined by the Atomic Energy Act (42 U.S.C. 2011 et. seq.).

The alternatives could have an impact on existing LANL facilities devoted to the treatment, storage, and disposal of these categories of waste. Waste management activities in support of the proposed action would be contingent on Records of Decision issued for the *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (Waste Management PEIS)* (DOE 1997). In its Record of Decision for the Treatment and Management of Transuranic Waste (63 FR 3629), and subsequent revisions to this Record of Decision (65 FR 82985, 66 FR 38646, and 67 FR 56989, respectively), DOE decided (with one exception) that each DOE site that currently has or will generate transuranic waste would prepare its transuranic waste for disposal, and store the waste onsite until it could be shipped to the Waste Isolation Pilot Plant in Carlsbad, New Mexico, for disposal. In the Record of Decision for hazardous waste, released on August 5, 1998 (63 FR 41810), DOE sites evaluated in this *CMRR EIS* will continue to use offsite facilities for the treatment and disposal of major portions of their nonwastewater hazardous waste. Based on the Record of Decision for low-level radioactive waste and mixed low-level radioactive waste issued on February 18, 2000 (65 FR 10061), minimal treatment of low-level radioactive waste will be performed, and to the extent practical, onsite disposal of low-level radioactive waste will continue. Hanford and NTS will be made available to all DOE sites for the disposal of low-level radioactive waste. Mixed low-level radioactive waste analyzed in the *Waste Management PEIS* will be treated at Hanford, the Idaho National Engineering and Environmental Laboratory, the Oak Ridge Reservation, and the Savannah River Site and will be disposed of at Hanford and NTS.

A.10.2 Description of Impact Assessment

Waste management impacts were assessed by comparing the projected waste stream volumes generated from the proposed activities with LANL's waste management capacities and generation rates (see **Table A–12**). Only the impacts relative to the capacities of waste management facilities were considered; other environmental impacts of waste management facility operations (human health effects) are evaluated in other sections of this *CMRR EIS*, or in other facility-specific or sitewide NEPA documents. Projected waste generation rates for the proposed activities were compared with site processing rates and capacities of those treatment, storage, and disposal facilities likely to be involved in managing the additional waste. The waste generation rates were provided by the sites' technical personnel. Potential impacts from waste generated as a result of site environmental restoration activities are not within the scope of this analysis.

Table A–12 Impact Assessment Protocol for Waste Management

Resource	*Required Data*		*Measure of Impact*
	Affected Environment	*Alternative*	
Waste management capacity - Transuranic waste - Mixed transuranic waste - Low-level radioactive waste - Mixed low-level radioactive waste - Hazardous waste - Nonhazardous waste	Site generation rates (cubic meters per year) for each waste type Site management capacities (cubic meters) or rates (cubic meters per year) for potentially affected treatment, storage, and disposal facilities for each waste type	Generation rates (cubic meters per year) from facility operations for each waste type	Combination of facility waste generation volumes and other site generation volumes in comparison to the capacities of applicable waste management facilities

A.11 CUMULATIVE IMPACTS

Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR Section 1508.7). The cumulative impact analysis for this *CMRR EIS* involved combining the impacts of the alternatives (including the No Action Alternative) with the impacts of other present and reasonably foreseeable activities in the regions of influence. The key resources are identified in **Table A–13**.

In general, cumulative impacts were determined by collectively considering the baseline affected environment (conditions attributable to present actions by DOE and other public and private entities), the proposed action (or no action), and other future actions. Quantifiable information was incorporated to the degree available. Factors were weighed against the appropriate impact indicators (site capacity or number of fatalities) to determine the potential for impact (see **Table A–14**).

Table A–13 Key Resources and Associated Regions of Influence

Resources	*Region of Influence*
Resource use	The site
Air quality	The site, nearby offsite areas within local air quality control regions, where significant air quality impacts may occur, and Class I areas within 100 kilometers
Human health	The site, offsite areas within 80 kilometers of the site, and the transportation corridors among the sites where worker and general population radiation, radionuclide, and hazardous chemical exposures may occur
Waste management	The site

Table A–14 Selected Indicators of Cumulative Impact

Category	*Indicator*
Resource use	- Workers required compared with existing workforce - Electricity use compared with site capacity - Water use compared with site capacity
Air quality	Criteria pollutant concentrations and comparisons with standards or guidelines
Human health	Public - Maximally exposed offsite individual dose - Offsite population dose - Fatalities Workers - Total dose - Fatalities
Waste	- Low-level radioactive waste generation rate compared with existing management capacities and generation rate - Mixed low-level radioactive waste generation rate compared with existing management capacities and generation rate - Hazardous waste generation rate compared with existing management capacities and generation rate - Nonhazardous waste generation rate compared with existing management capacities and generation rate

The analysis focused on the potential for cumulative impacts at LANL from DOE actions under detailed consideration at the time of this *CMRR EIS*, as well as cumulative impacts associated with transportation. The *LANL SWEIS* was used to establish baseline conditions upon which incremental cumulative impacts were assessed.

It is assumed that construction impacts would not be cumulative because construction is typically short in duration, and construction impacts are generally temporary.

A.12 REFERENCES

DOE (U.S. Department of Energy), 1997, *Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste*, DOE/EIS-0200-F, Office of Environmental Management, Washington, DC, May.

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APPENDIX B
EVALUATION OF RADIOLOGICAL HUMAN HEALTH IMPACTS FROM ROUTINE NORMAL OPERATIONS

B.1 INTRODUCTION

This appendix provides a brief general discussion on radiation and its health effects. It also describes the methods and assumptions used for estimating the potential impacts and risks to individuals and the general public from exposure to releases of radioactivity during normal operations and postulated accidents at facilities used to perform Chemistry and Metallurgy Research (CMR) operations.

This appendix presents numerical information using engineering and/or scientific notation. For example, the number 100,000 also can be expressed as 1×10^5. The fraction 0.001 can be expressed as 1×10^{-3}. The following chart defines the equivalent numerical notations that may be used in this appendix.

FRACTIONS AND MULTIPLES OF UNITS

Multiple	*Decimal Equivalent*	*Prefix*	*Symbol*
1×10^6	1,000,000	mega-	M
1×10^3	1,000	kilo-	k
1×10^2	100	hecto-	h
1×10	10	deka-	da
1×10^{-1}	0.1	deci-	d
1×10^{-2}	0.01	centi-	c
1×10^{-3}	0.001	milli-	m
1×10^{-6}	0.000001	micro-	μ

B.2 RADIOLOGICAL IMPACTS ON HUMAN HEALTH

Radiation exposure and its consequences are topics of interest to the general public. For this reason, this environmental impact statement (EIS) places emphasis on the consequences of exposure to radiation, provides the reader with information on the nature of radiation, and explains the basic concepts used in the evaluation of radiation health effects.

B.2.1 Nature of Radiation and Its Effects on Humans

What Is Radiation?

Radiation is energy transferred in the form of particles or waves. Globally, human beings are exposed constantly to radiation from the solar system and the Earth's rocks and soil. This radiation contributes to the natural background radiation that always surrounds us. Manmade sources of radiation also exist, including medical and dental x-rays, household smoke detectors, and materials released from nuclear and coal-fired powerplants.

All matter in the universe is composed of atoms. Radiation comes from the activity of tiny particles within an atom. An atom consists of a positively charged nucleus (central part of an atom) with a number of negatively charged electron particles in various orbits around the nucleus. There are two types of particles in the nucleus: neutrons that are electrically neutral and protons that are positively charged. Atoms of different types are known as elements. There are more than 100 natural and manmade elements. An element has equal numbers of electrons and protons. When atoms of an element differ in their number of neutrons, they are called isotopes of that element. All elements have three or more isotopes, some or all of which could be unstable (i.e., decay with time).

Unstable isotopes undergo spontaneous change, known as radioactive disintegration or radioactive decay. The process of continuously undergoing spontaneous disintegration is called radioactivity. The radioactivity of a material decreases with time. The time it takes a material to lose half of its original radioactivity is its half-life. An isotope's half-life is a measure of its decay rate. For example, an isotope with a half-life of 8 days will lose one-half of its radioactivity in that amount of time. In 8 more days, one-half of the remaining radioactivity will be lost, and so on. Each radioactive element has a characteristic half-life. The half-lives of various radioactive elements may vary from millionths of a second to millions of years.

As unstable isotopes change into more stable forms, they emit electrically charged particles. These particles may be either an alpha particle (a helium nucleus) or a beta particle (an electron), with various levels of kinetic energy. Sometimes these particles are emitted in conjunction with gamma rays. The alpha and beta particles are frequently referred to as ionizing radiation. Ionizing radiation refers to the fact that the charged particle energy force can ionize, or electrically charge, an atom by stripping off one of its electrons. Gamma rays, even though they do not carry an electric charge as they pass through an element, can ionize atoms by ejecting electrons. Thus, they cause ionization indirectly. Ionizing radiation can cause a change in the chemical composition of many things, including living tissue (organs), which can affect the way they function.

When a radioactive isotope of an element emits a particle, it changes to an entirely different element, one that may or may not be radioactive. Eventually, a stable element is formed. This transformation, which may take several steps, is known as a decay chain. For example, radium, which is a member of the radioactive decay chain of uranium, has a half-life of 1,622 years. It emits an alpha particle and becomes radon, a radioactive gas with a half-life of only 3.8 days. Radon decays first to polonium, then through a series of further decay steps to bismuth, and

ultimately to a stable isotope of lead. Meanwhile, the decay products will build up and eventually die away as time progresses.

The characteristics of various forms of ionizing radiation are briefly described below and in the box to the right (see Chapter 7 for further definitions):

Radiation Type	Typical Travel Distance in Air	Barrier
α	Few centimeters	Sheet of paper or skin's surface
β	Few meters	Thin sheet of aluminum foil or glass
γ	Very large	Thick wall of concrete, lead, or steel
n	Very large	Water, paraffin, graphite

Alpha (α)—Alpha particles are the heaviest type of ionizing radiation. They can travel only a few centimeters in air. Alpha particles lose their energy almost as soon as they collide with anything. They can be stopped easily by a sheet of paper or by the skin's surface.

Beta (β)—Beta particles are much (7,330 times) lighter than alpha particles. They can travel a longer distance than alpha particles in the air. A high-energy beta particle can travel a few meters in the air. Beta particles can pass through a sheet of paper, but can be stopped by a thin sheet of aluminum foil or glass.

Gamma (γ)—Gamma rays (and x-rays), unlike alpha or beta particles, are waves of pure energy. Gamma rays travel at the speed of light. Gamma radiation is very penetrating and requires a thick wall of concrete, lead, or steel to stop it.

Neutrons (n)—Neutrons are particles that contribute to radiation exposure both directly and indirectly. The most prolific source of neutrons is a nuclear reactor. Indirect radiation exposure occurs when gamma rays and alpha particles are emitted following neutron capture in matter. A neutron has about one-quarter the weight of an alpha particle. It will travel in the air until it is absorbed in another element.

Units of Radiation Measure

During the early days of radiological experience, there was no precise unit of radiation measure. Therefore, a variety of units were used to measure radiation. These units were used to determine the amount, type, and intensity of radiation. Just as heat can be measured in terms of its intensity or effects using units of calories or degrees, amounts of radiation or its effects can be measured in units of curies, radiation absorbed dose (rad), or dose equivalent (roentgen equivalent man, or rem). The following summarizes those units (see the definitions in Chapter 7).

Curie—The curie, named after the French scientists Marie and Pierre Curie, describes the "intensity" of a sample of radioactive material. The rate of decay of 1 gram of radium was the basis of this unit of measure. Because the measured decay rate kept changing slightly as measurement techniques became more accurate, the curie was subsequently defined as exactly 3.7×10^{10} disintegrations (decays) per second.

Rad—The rad is the unit of measurement for the physical absorption of radiation. The total energy absorbed per unit quantity of tissue is referred to as absorbed dose (or simply dose). As sunlight heats pavement by giving up an amount of energy to it, radiation similarly gives up energy to objects in its path. One rad is equal to the amount of radiation that leads to the deposition of 0.01 joule of energy per kilogram of absorbing material.

Radiation Units and Conversions to International System of Units

1 curie = 3.7×10^{10} disintegrations per second
= 3.7×10^{10} becquerels
1 becquerel = 1 disintegration per second
1 rad = 0.01 gray
1 rem = 0.01 sievert
1 gray = 1 joule per kilogram

Rem (roentgen equivalent man)—A rem is a measurement of the dose equivalent from radiation based on its biological effects. The rem is used in measuring the effects of radiation on the body as degrees centigrade are used in measuring the effects of sunlight heating pavement. Thus, 1 rem of one type of radiation is presumed to have the same biological effects as 1 rem of any other kind of radiation. This allows comparison of the biological effects of radionuclides that emit different types of radiation.

The units of radiation measure in the International System of Units are: becquerel (a measure of source intensity [activity]), gray (a measure of absorbed dose), and sievert (a measure of dose equivalent).

An individual may be exposed to ionizing radiation externally (from a radioactive source outside the body) or internally (from ingesting or inhaling radioactive material). The external dose is different from the internal dose because an external dose is delivered only during the actual time of exposure to the external radiation source, while an internal dose continues to be delivered as long as the radioactive source is in the body. The dose from internal exposure is calculated over 50 years following the initial exposure. Both radioactive decay and elimination of the radionuclide by ordinary metabolic processes decrease the dose rate with the passage of time.

Sources of Radiation

The average American receives a total of approximately 360 millirem per year from all sources of radiation, both natural and manmade, of which approximately 300 millirem per year are from natural sources. The sources of radiation can be divided into six different categories: cosmic radiation, terrestrial radiation, internal radiation, consumer products, medical diagnosis and therapy, and other sources (NCRP 1987). These categories are discussed in the following paragraphs.

Cosmic Radiation—Cosmic radiation is ionizing radiation resulting from energetic charged particles from space continuously hitting the Earth's atmosphere. These particles and the secondary particles and photons they create comprise cosmic radiation. Because the atmosphere provides some shielding against cosmic radiation, the intensity of this radiation increases with the altitude above sea level. The average dose to people in the United States from this source is approximately 27 millirem per year.

External Terrestrial Radiation—External terrestrial radiation is the radiation emitted from the radioactive materials in the Earth's rocks and soils. The average dose from external terrestrial radiation is approximately 28 millirem per year.

Internal Radiation—Internal radiation results from the human body metabolizing natural radioactive material that has entered the body by inhalation or ingestion. Natural radionuclides in the body include isotopes of uranium, thorium, radium, radon, polonium, bismuth, potassium, rubidium, and carbon. The major contributors to the annual dose equivalent for internal radioactivity are the short-lived decay products of radon, which contribute approximately 200 millirem per year. The average dose from other internal radionuclides is approximately 39 millirem per year.

Consumer Products—Consumer products also contain sources of ionizing radiation. In some products, such as smoke detectors and airport x-ray machines, the radiation source is essential to the product's operation. In other products, such as televisions and tobacco, the radiation occurs as the products function. The average dose from consumer products is approximately 10 millirem per year.

Medical Diagnosis and Therapy—Radiation is an important diagnostic medical tool and cancer treatment. Diagnostic x-rays result in an average exposure of 39 millirem per year. Nuclear medical procedures result in an average exposure of 14 millirem per year.

Other Sources—There are a few additional sources of radiation that contribute minor doses to individuals in the United States. The dose from nuclear fuel cycle facilities (e.g., uranium mines, mills, and fuel processing plants) and nuclear powerplants has been estimated to be less than 1 millirem per year. Radioactive fallout from atmospheric atomic bomb tests, emissions from certain mineral extraction facilities, and transportation of radioactive materials contribute less than 1 millirem per year to the average dose to an individual. Air travel contributes approximately 1 millirem per year to the average dose.

Exposure Pathways

As stated earlier, an individual may be exposed to ionizing radiation both externally and internally. The different ways that could result in radiation exposure to an individual are called exposure pathways. Each type of exposure is discussed separately in the following paragraphs.

External Exposure—External exposure can result from several different pathways, all having in common the fact that the radiation causing the exposure is external to the body. These pathways include exposure to a cloud of radiation passing over the receptor (an exposed individual), standing on ground that is contaminated with radioactivity, and swimming or boating in contaminated water. If the receptor departs from the source of radiation exposure, the dose rate will be reduced. It is assumed that external exposure occurs uniformly during the year. The appropriate dose measure is called the effective dose equivalent.

Internal Exposure—Internal exposure results from a radiation source entering the human body through either inhalation of contaminated air or ingestion of contaminated food or water. In

contrast to external exposure, once a radiation source enters the body, it remains there for a period of time that varies depending on decay and biological half-life. The absorbed dose to each organ of the body is calculated for a period of 50 years following the intake. The calculated absorbed dose is called the committed dose equivalent. Various organs have different susceptibilities to damage from radiation. The quantity that takes these different susceptibilities into account is called the committed effective dose equivalent, and it provides a broad indicator of the risk to the health of an individual from radiation. The committed effective dose equivalent is a weighted sum of the committed dose equivalent in each major organ or tissue. The concept of committed effective dose equivalent applies only to internal pathways.

Radiation Protection Guides

Several organizations have issued radiation protection guides. The responsibilities of the main radiation safety organizations, particularly those that affect policies in the United States, are summarized below.

International Commission on Radiological Protection (ICRP)—This Commission has the responsibility for providing guidance in matters of radiation safety. The operating policy of this organization is to prepare recommendations to deal with basic principles of radiation protection and to leave to the various national protection committees the responsibility of introducing the detailed technical regulations, recommendations, or codes of practice best suited to the needs of their countries.

National Council on Radiation Protection and Measurements (NCRP)—In the United States, this Council is the national organization that has the responsibility for adapting and providing detailed technical guidelines for implementing the International Commission on Radiological Protection recommendations. The Council consists of technical experts who are specialists in radiation protection and scientists who are experts in disciplines that form the basis for radiation protection.

National Research Council/National Academy of Sciences—The National Research Council is an organization within the National Academy of Sciences that associates the broad community of science and technology with the Academy's purposes of furthering knowledge and advising the Federal Government.

U.S. Environmental Protection Agency (EPA)—The EPA has published a series of documents, *Radiation Protection Guidance to Federal Agencies*. This guidance is used as a regulatory benchmark by a number of Federal agencies, including the U.S. Department of Energy (DOE), in the realm of limiting public and occupational work force exposures to the greatest extent possible.

š The Interagency Steering Committee on Radiation Standards (ISCORS), issued a technical report
š entitled *"A Method for Estimating Radiation Risk from TEDE."* ISCORS technical reports are
š guidance to Federal agencies to assist them in preparing and reporting the results of analyses and
š implementing radiation protection standards in a consistent and uniform manner. This report
š provides dose-to-risk conversion factors where doses are estimated using total effective dose

§ equivalent. It is recommended for use by DOE personnel and contractors when computing
§ potential radiation risk from calculated radiation dose for comparison purposes. However, for
§ situations in which a radiation risk assessment is required for making risk management decisions,
§ the radionuclide-specific risk coefficients in Federal Guidance Report No. 13 should be used.

Limits of Radiation Exposure

Limits of exposure to members of the public and radiation workers are derived from International Commission on Radiological Protection recommendations. The EPA uses the National Council on Radiation Protection and Measurements and the International Commission on Radiological Protection recommendations and sets specific annual exposure limits (usually less than those specified by the Commission) in *Radiation Protection Guidance to Federal Agencies* documents. Each regulatory organization then establishes its own set of radiation standards. The various exposure limits set by DOE and the EPA for radiation workers and members of the public are given in **Table B–1**.

Table B–1 Exposure Limits for Members of the Public and Radiation Workers

Guidance Criteria (Organization)	*Public Exposure Limits at the Site Boundary*	*Worker Exposure Limits*
10 CFR 835 (DOE)	—	5,000 millirem per year [a]
10 CFR 835.1002 (DOE)	—	1,000 millirem per year [b]
DOE Order 5400.5 (DOE) [c]	10 millirem per year (all air pathways) 4 millirem per year (drinking water pathway) 100 millirem per year (all pathways)	—
40 CFR 61 (EPA)	10 millirem per year (all air pathways)	—
40 CFR 141 (EPA)	4 millirem per year (drinking water pathways)	—

[a] Although this is a limit (or level) that is enforced by DOE, worker doses must be managed in accordance with as low as is reasonably achievable principles. Refer to footnote b.

[b] This is a control level. It was established by DOE to assist in achieving its goal to maintain radiological doses as low as is reasonably achievable. DOE recommends that facilities adopt a more limiting 500 millirem per year Administrative Control Level (DOE 1999b). Reasonable attempts have to be made by the site to maintain individual worker doses below these levels.

[c] Derived from 40 CFR 61, 40 CFR 141, and 10 CFR 20.

B.2.2 Health Effects

Radiation exposure and its consequences are topics of interest to the general public. To provide the background for discussions of impacts, this section explains the basic concepts used in the evaluation of radiation effects.

Radiation can cause a variety of damaging health effects in people. The most significant effects are induced cancer fatalities. These effects are referred to as “latent” cancer fatalities because the cancer may take many years to develop. In the discussions that follow, all fatal cancers are considered latent; therefore, the term “latent” is not used.

The National Research Council’s Committee on the Biological Effects of Ionizing Radiation (BEIR) has prepared a series of reports to advise the U.S. Government on the health consequences of radiation exposures. *Health Effects of Exposure to Low Levels of Ionizing Radiation*, BEIR V (National Research Council 1990), provides current estimates for excess mortality from leukemia and other cancers that are expected to result from exposure to ionizing

radiation. BEIR V provides estimates that are consistently higher than those in its predecessor, BEIR III. This increase is attributed to several factors, including the use of a linear dose response model for cancers other than leukemia, revised dosimetry for the Japanese atomic bomb survivors, and additional followup studies of the atomic bomb survivors and associated others. BEIR III employs constant, relative, and absolute risk models, with separate coefficients for each of several sex and age-at-exposure groups. BEIR V develops models in which the excess relative risk is expressed as a function of age at exposure, time after exposure, and sex for each of several cancer categories. The BEIR III models were based on the assumption that absolute risks are comparable between the atomic bomb survivors and the U.S. population. BEIR V models were based on the assumption that the relative risks are comparable. For a disease such as lung cancer, where baseline risks in the United States are much larger than those in Japan, the BEIR V approach leads to larger risk estimates than the BEIR III approach.

The models and risk coefficients in BEIR V were derived through analyses of relevant epidemiologic data that included the Japanese atomic bomb survivors, ankylosis spondylitis patients, Canadian and Massachusetts fluoroscopy (breast cancer) patients, New York postpartum mastitis (breast cancer) patients, Israeli tinea capitis (thyroid cancer) patients, and Rochester thymus (thyroid cancer) patients. Models for leukemia, respiratory cancer, digestive cancer, and other cancers used only the atomic bomb survivor data, although results of analyses of the ankylosis spondylitis patients were considered. Atomic bomb survivor analyses were based on revised dosimetry, with an assumed relative biological effectiveness of 20 for neutrons, and were restricted to doses less than 400 rads. Estimates of risks of fatal cancers, other than leukemia, were obtained by totaling the estimates for breast cancer, respiratory cancer, digestive cancer, and other cancers.

The NCRP (NCRP 1993), based on the radiation risk estimates provided in BEIR V and the ICRP (ICRP 1991), estimates the total detriment resulting from low dose[1] or low dose rate exposure to ionizing radiation to be 0.00056 per rem for the working population and 0.00073 per rem for the general population. The total detriment includes fatal and nonfatal cancers as well as severe hereditary (genetic) effects. The major contribution to the total detriment is from fatal cancer, estimated to be 0.0006 per rem for both radiation workers and the general population, respectively. The breakdowns of the risk estimators for both workers and the general population are given in **Table B–2**. Nonfatal cancers and genetic effects are less probable consequences of radiation exposure.

[1]*Low dose is defined as the dose level where DNA repair can occur in a few hours after irradiation-induced damage. Currently, a dose level of about 0.2 grays (20 rad), or a dose rate of 0.1 milligrays (0.01 rad) per minute is considered low enough to allow the DNA to repair itself in a short period (EPA 1994).*

Table B–2 Nominal Health Risk Estimators Associated with Exposure to 1 Rem of Ionizing Radiation

Exposed Individual	*Fatal Cancer* [a, c]	*Nonfatal Cancer* [b]	*Genetic Disorders* [b]	*Total*
Worker	0.0006	0.00008	0.00008	0.00056
Public	0.0006	0.0001	0.00013	0.00073

[a] For fatal cancer, the health effect coefficient is the same as the probability coefficient. When applied to an individual, the units are the lifetime probability of a cancer fatality per rem of radiation dose. When applied to a population of individuals, the units are the excess number of fatal cancers per person-rem of radiation dose.

[b] In determining a means of assessing health effects from radiation exposure, the ICRP has developed a weighting method for nonfatal cancers and genetic effects.

[c] For high individual exposures (greater than or equal to 20 rem), the health factors are multiplied by a factor of 2.

Source: NCRP 1993.

The EPA, in coordination with other Federal agencies involved in radiation protection, has issued Federal Radiation Guidance Report No. 13, Cancer Risk Coefficients for Environmental Exposure to Radionuclides, September 1999. This document is a compilation of risk factors for doses from external gamma radiation and internal intakes of radionuclides. Federal Radiation Guidance Report No. 13 is the basis of the radionuclide risk coefficients used in the EPA Health Effects Assessment Summary Tables (DOE 2002) and in computer dose codes such as the DOE Argonne RESRAD code.

However, the Department and other agencies regularly conduct dose assessments with models and codes that calculate radiation dose from exposure or intake using dose conversion factors and do not compute risk directly. In these cases, where it is necessary or desirable to estimate risk for comparative purposes (e.g., comparing the risk associated with alternative actions), it is common practice to simply multiply the calculated total effective dose equivalent (TEDE) by a risk-to-dose factor. DOE previously recommended a TEDE-to-fatal cancer risk factors of 5×10^{-4} per rem for the public and 4×10^{-4} per rem for working-age populations. These values were based upon recommendations of the former Committee on Interagency Radiation Research and Policy Coordination. The ISCORS guidance supercedes the 1992 CIRRPC guidance and recommends that agencies use a conversion factor of 6×10^{-4} fatal cancers per TEDE (rem) for mortality and 8×10^{-4} cancers per rem for morbidity when making qualitative or semi-quantitative estimates of risk from radiation exposure to members of the general public[2] (DOE 2002).

The TEDE-to-risk factor provided by ISCORS in Technical Report 1 is based upon a static population with characteristics consistent with the U.S. population. There are no separate ISCORS recommendations for workers. For workers (adults), a risk of fatal cancer of 5×10^{-4} per rem and a morbidity risk of 7×10^{-4} per rem may be used. However, given the uncertainties in the risk estimates, for most estimates the value for the general population of 6×10^{-4} per rem could be used for workers (DOE 2002).

The Office of Environmental Policy and Guidance recommends use of these values, but we also emphasize that they are principally suited for comparative analyses and where it would be impractical to calculate risk using the Federal Radiation Guidance Report No. 13. If risk

[2] *Such estimates should not be stated with more than 1 significant digit.*

estimates for specific radionuclides are needed, the cancer risk coefficients in the Federal Radiation Guidance Report No. 13 should be used (DOE 2002).

The ISCORS report notes that the recommended risk coefficients used with TEDE dose estimates generally produce conservative radiation risk estimates (i.e., they overestimate risk)[3]. For the ingestion pathway of eleven radionuclides compared, risks would be overestimated compared to the Federal Radiation Guidance Report No. 13 values for about 8 radionuclides and significantly overestimated (by up to a factor of six) for four of these. Office of Environmental Policy and Guidance also compared the TEDE multiplying the conversion factor approach to Federal Radiation Guidance Report No. 13 for the inhalation pathway and found a bias toward overestimation of risk, although it was not as severe as for ingestion. For 16 radionuclides/ chemical states evaluated, seven were significantly overestimated (by more than a factor of two) and five were significantly underestimated and the remainder agreed within about a factor of two. Generally, these differences are within the uncertainty of transport and uptake portions of dose or risk modeling and, therefore, the approach recommended is fully acceptable for comparative assessments. That notwithstanding, it is strongly recommended that, wherever possible, the more rigorous approach with Federal Radiation Guidance Report No. 13 cancer risk coefficients, be used (DOE 2002).

The values in Table B–2 are "nominal" cancer and genetic disorder probability coefficients. They are based on an idealized population receiving a uniform dose over whole body. Recent studies by the U.S. EPA, based on age-dependent dose coefficients for members of the public indicate that the product of the effective dose and the probability coefficient could overestimate or underestimate radiological risks (EPA 1999b). The risk coefficient provided in Federal Guidance Report No. 13 eliminates the need for separate probability coefficients for cancer incidence and mortalities (EPA 1999b). In support of the risk results provided in Federal Guidance Report No. 13, the U.S. EPA performed an uncertainty analysis on the effects of uniform whole body exposures. The analysis resulted in an increase in the estimated nominal risk coefficient from 0.051 fatal cancers per gray (0.00051 fatal cancers per rad) to 0.0575 fatal cancers per gray (0.000575 fatal cancers per rad) (EPA 1999a). This result indicates an increase in nominal risk coefficient of about 20 percent over that provided in NCRP 1993 for the public (given in Table B–2).

Based on review of the recent EPA reports, the ISCORS recommended that a risk factor of 0.06 fatal cancers per sievert (0.0006 fatal cancers per rem) be used for estimating risks when using calculated dose (ISCORS 2002). The DOE Office of NEPA Policy and Compliance recommended that the 0.0006 fatal cancers per rem be used for both the workers and members of the public (DOE 2003).

[3] *This statement presumes that Federal Radiation Guidance Report No. 13 is a more accurate measure of potential risk than multiplying the TEDE by a single average risk factor. The numerical estimate of cancer deaths is based upon the linear extrapolation of risk estimates for total cancer mortality derived at radiation doses above 10 rad (0.1 Gy). Other methods of extrapolation would yield higher or lower risk estimates at low doses. Epidemiological studies of human radiation exposure are not sufficiently sensitive to determine the actual level of risk. There is scientific uncertainty about cancer risk in the low-dose region and the possibility of zero risk cannot be excluded.*

The numerical estimates of fatal cancers presented in this EIS were obtained using a linear extrapolation from the nominal risk estimated for lifetime total cancer mortality that results from a dose of 0.1 gray (10 rad). Other methods of extrapolation to the low-dose region could yield higher or lower numerical estimates of fatal cancers. Studies of human populations exposed to low doses are inadequate to demonstrate the actual level of risk. There is scientific uncertainty about cancer risk in the low-dose region below the range of epidemiologic observation, and the possibility of no risk cannot be excluded (CIRRPC 1992).

Health Effect Risk Estimators Used in this EIS

Health impacts from radiation exposure, whether from external or internal sources, generally are identified as "somatic" (i.e., affecting the exposed individual) or "genetic" (i.e., affecting descendants of the exposed individual). Radiation is more likely to produce somatic effects than genetic effects. The somatic risks of most importance are induced cancers. Except for leukemia, which can have an induction period (time between exposure to carcinogen and cancer diagnosis) of as little as 2 to 7 years, most cancers have an induction period of more than 20 years.

For a uniform irradiation of the body, the incidence of cancer varies among organs and tissues; the thyroid and skin demonstrate a greater sensitivity than other organs. Such cancers, however, also produce relatively low mortality rates because they are relatively amenable to medical treatment. Because fatal cancer is the most probable serious effect of environmental and occupational radiation exposures, estimates of cancer fatalities rather than cancer incidence are presented in this EIS. The numbers of fatal cancers can be used to compare the risks among the various alternatives.

Based on the preceding discussion, the number of fatal cancers to workers and the general public during normal operations and for postulated accidents in which individual doses are less than 20 rem are calculated using a health risk estimator of 0.0006 per person-rem. (The risk estimators are lifetime probabilities that an individual would develop a fatal cancer per rem of radiation received.) The risk estimators associated with total cancer incidence among the public is 0.0008 per person rem (ISCORS 2002).

Recent analysis by EPA (EPA 1999a and 1999b) address the effects of low dose and dose rate exposure to ionizing radiation. Consistent with the conclusion in NCRP 1993, the risk to individuals receiving doses of 20 rem or more are double those associated with doses of less than 20 rem.

The fatal cancer estimators are used to calculate the statistical expectation of the effects of exposing a population to radiation. For example, if 100,000 people were each exposed to a one-time radiation dose of 100 millirem (0.1 rem), the collective dose would be 10,000 person-rem. The exposed population would then be expected to experience six additional cancer fatalities from the radiation (10,000 person-rem times 0.0006 lifetime probability of cancer fatalities per person-rem = six cancer fatalities).

Calculations of the number of excess fatal cancers associated with radiation exposure do not always yield whole numbers. These calculations may yield numbers less than one, especially in

environmental impact applications. For example, if a population of 100,000 were exposed to a total dose of only 0.001 rem per person, the collective dose would be 100 person-rem (100,000 persons times 0.001 rem = 100 person-rem). The corresponding estimated number of cancer fatalities would be 0.06 (100 person-rem times 0.0006 cancer fatalities per person-rem = 0.06 cancer fatalities). The 0.06 means that there is 1 chance in 16.6 that the exposed population would experience one fatal cancer. In other words, the 0.06 cancer fatalities is the *expected* number of deaths that would result if the same exposure situation were applied to many different groups of 100,000 people. In most groups, no person would incur a fatal cancer from the 0.001 rem dose each member would have received. In a small fraction of the groups, one cancer fatality would result; in exceptionally few groups, two or more cancer fatalities would occur. The *average* expected number of deaths over all the groups would be 0.06 cancer fatalities (just as the average of 0, 0, and 0, added to 1 is 1/4, or 0.25). The most likely outcome is no cancer fatalities.

The same concept is applied to estimate the effects of radiation exposure on an individual member of the public. Consider the effects of an individual's exposure to a 360 millirem (0.36 rem) annual dose from all radiation sources. The probability that the individual will develop a fatal cancer from continuous exposure to this radiation over an average life of 72 years (presumed) is 0.016 (1 person times 0.36 rem per year times 72 years times 0.0006 cancer fatalities per person-rem = 0.016). This corresponds to 1 chance in 64 that the individual would develop a fatal cancer in a lifetime.

B.3 METHODOLOGY FOR ESTIMATING RADIOLOGICAL IMPACTS

B.3.1 GENII Computer Code, a Generic Description

The radiological impacts from releases during normal operation of the facilities used to perform CMR operations were calculated using Version 1.485 of the GENII computer code (PNL 1988). Site-specific input data were used, including location, meteorology, population, and source terms. This section briefly describes GENII and outlines the approach used for normal operations.

B.3.1.1 Description of the Code

The GENII computer model, developed by Pacific Northwest National Laboratory, is an integrated system of various computer modules that analyze environmental contamination resulting from acute or chronic releases to, or initial contamination in, air, water, or soil. The model calculates radiation doses to individuals and populations. The GENII computer model is well documented for assumptions, technical approach, method, and quality assurance issues. The GENII computer model has gone through extensive quality assurance and quality control steps, including comparing results from model computations with those from hand calculations and performing internal and external peer reviews (PNL 1988).

The GENII code consists of several modules for various applications as described in the code manual (PNL 1988). For this EIS, only the ENVIN, ENV, and DOSE computer modules were used. The output of one module is stored in a file that can be used by the next module in the

system. The functions of the three GENII computer modules used in this EIS are discussed below.

ENVIN

The ENVIN module of the GENII code controls the reading of input files and organizes the input for optimal use in the environmental transport and exposure module, ENV. The ENVIN code interprets the basic input, reads the basic GENII data libraries and other optional input files, and organizes the input into sequential segments based on radionuclide decay chains.

A standardized file that contains scenario, control, and inventory parameters is used as input to ENVIN. Radionuclide inventories can be entered as functions of releases to air or water, concentrations in basic environmental media (air, soil, or water), or concentrations in foods. If certain atmospheric dispersion options have been selected, this module would generate tables of atmospheric dispersion parameters that are used in later calculations. If the finite plume air submersion option is selected in addition to the atmospheric dispersion calculations, preliminary energy-dependent finite plume dose factors can be prepared as well. The ENVIN module prepares the data transfer files that are used as input by the ENV module; ENVIN generates the first portion of the calculation documentation—the run input parameters report.

ENV

The ENV module calculates the environmental transfer, uptake, and human exposure to radionuclides that result from the chosen scenario for the user-specified source term. The code reads the input files from ENVIN and then, for each radionuclide chain, sequentially performs the precalculations to establish the conditions at the start of the exposure scenario. Environmental concentrations of radionuclides are established at the beginning of the scenario by assuming decay of pre-existing sources, considering biotic transport of existing subsurface contamination, and defining soil contamination from continuing atmospheric or irrigation depositions. For each year of postulated exposure, the code then estimates the air, surface soil, deep soil, groundwater, and surface water concentrations of each radionuclide in the chain. Human exposures and intakes of each radionuclide are calculated for: pathways of external exposure from finite or infinite atmospheric plumes; inhalation; external exposure from contaminated soil, sediments, and water; external exposure from special geometries; and internal exposures from consumption of terrestrial foods, aquatic foods, drinking water, animal products, and inadvertent intake of soil. The intermediate information on annual media concentrations and intake rates is written to data transfer files. Although these may be accessed directly, they are usually used as input to the DOSE module of GENII.

DOSE

The DOSE module reads the intake and exposure rates defined by the ENV module and converts the data to radiation dose.

B.3.1.2 Data and General Assumptions

To perform the dose assessments for this EIS, different types of data were collected and generated. This section discusses the various data, along with the assumptions made for performing the dose assessments.

Dose assessments were performed for members of the general public at Los Alamos National Laboratory (LANL) to determine the incremental doses that would be associated with the alternatives addressed in this EIS. Incremental doses for members of the public were calculated (via GENII) for two different types of receptors:

- Maximally Exposed Offsite Individual—The maximally exposed offsite individual was assumed to be an individual member of the public located at a position on the site boundary that would yield the highest impacts during normal operations.

- Population—The general population living within 50 miles (80 kilometers) of the facility. An average dose to a member of this population is also calculated.

Meteorological Data

The meteorological data used for all normal operational scenarios discussed in this EIS were in the form of joint frequency data files. A joint frequency data file is a table listing the fractions of time the wind blows in a certain direction, at a certain speed, and within a certain atmospheric stability class. The joint frequency data files were based on measurements taken over a period of several years at LANL.

Population Data

Population distributions were based on U.S. Department of Commerce state population census numbers (DOC 2001). Estimates were determined for the year 2000 for areas within 50 miles (80 kilometers) of the release locations at LANL. The estimated site-specific population in 2000 was used in the impact assessments. The population was spatially distributed on a circular grid with 16 directions and 10 radial distances up to 50 miles (80 kilometers). The grid was centered at the location from which the radionuclides were assumed to be released.

Source Term Data

The source terms used to calculate the impacts of normal operations are provided in Section B.4.

Food Production and Consumption Data

Generic food consumption rates are available as default values in GENII. The default values are comparable to those established in the U.S. Nuclear Regulatory Commission (NRC) Regulatory Guide 1.109 (NRC 1977). This regulatory guide provides guidance for evaluating ingestion doses from consuming contaminated terrestrial and animal food products using a standard set of assumptions for crop and livestock growth and harvesting characteristics.

Basic Assumptions

To estimate annual radiological impacts to the public from normal operations, the following additional assumptions and factors were considered in using GENII:

- Radiological airborne emissions were assumed to be released to the atmosphere at a height of 52 feet (16 meters).

- Emission of the plume was assumed to continue throughout the year. Plume and ground deposition exposure parameters used in the GENII model for the exposed offsite individual and the general population are provided in **Table B–3**.

- The exposed individual or population was assumed to have the characteristics and habits of an adult human.

- A semi-infinite plume model was used for the air immersion doses.

Table B–3 GENII Parameters for Exposure to Plumes (Normal Operations)

Maximally Exposed Offsite Individual				*General Population*			
External Exposure		*Inhalation of Plume*		*External Exposure*		*Inhalation of Plume*	
Plume (hours)	*Ground Contamination (hours)*	*Exposure Time (hours)*	*Breathing Rate (cubic centimeters per second)*	*Plume (hours)*	*Ground Contamination (hours)*	*Exposure Time (hours)*	*Breathing Rate (cubic centimeters per second)*
6,136	6,136	8,766	270	4,383	4,383	8,766	270

Sources: PNL 1988, NRC 1977.

Worker doses associated with CMR operations were determined from historical data. Refer to Section B.4 for a further discussion of worker impacts.

B.3.1.3 Uncertainties

The sequence of analyses performed to generate the radiological impact estimates from normal operations include: selection of normal operational modes, estimation of source terms, estimation of environmental transport and uptake of radionuclides, calculation of radiation doses to exposed individuals, and estimation of health effects. There are uncertainties associated with each of these steps. Uncertainties exist in the way the physical systems being analyzed are represented by the computational models and in the data required to exercise the models (due to measurement, sampling, or natural variability).

In principle, one can estimate the uncertainty associated with each source and predict the remaining uncertainty in the results of each set of calculations. Thus, one can propagate the uncertainties from one set of calculations to the next and estimate the uncertainty in the final results. However, conducting such a full-scale quantitative uncertainty analysis is neither practical nor a standard practice for a study of this type. Instead, the analysis is designed to ensure—through judicious selection of release scenarios, models, and parameters—that the results represent the potential risks. This is accomplished by making conservative assumptions in the calculations at each step. The models, parameters, and release scenarios used in the

calculations are selected in such a way that most intermediate results and, consequently, the final estimates of impacts are greater than would be expected. As a result, even though the range of uncertainty in a quantity might be large, the value calculated for the quantity would be close to one of the extremes in the range of possible values, so the chance of the actual quantity being greater than the calculated value would be low. The goal of the radiological assessment for normal operation in this study is to produce results that are conservative in order to capture any uncertainties in operation at the new CMRR Facility.

The human health impacts from routine normal CMR activities may have different impacts on specific populations such as American Indians or Hispanics whose cultural heritage can result in special pathways of exposure that are different than those modeled to evaluate the doses to the general population and maximally exposed individual. Although the analyses performed to evaluate the public impacts of the CMR alternatives did include normally significant pathways and were designed to be conservative, no pathways were included to specifically address local population use of local resources. Therefore, there is potentially more uncertainty in the effects of CMR activities on these specific population groups. A qualitative evaluation of the potential impacts to these specific groups was performed based on the nuclides emitted and an understanding of the most significant pathways.

Parameter selection and practices of the population and maximally exposed individual were chosen to be conservative. For example, it was assumed that the population breathed contaminated air all the time (spent no time away from the local area) and that all food was produced in the potentially affected area (no food from outside the local area). The dose to a member of the public was dominated by internal exposures from inhalation and ingestion. Typically, about one third of the dose was from inhalation and two thirds was from ingestion. Inhalation of ambient air and the resulting dose would be about the same for a all members of population surrounding LANL. Since the diet of the general population was modeled as coming completely from the local area, the most significant difference to the American Indian or Hispanic population would be the portions of the diet that come from different food groups than those modeled. The *LANL SWEIS* (DOE 1999a) evaluated potential impacts associated with special pathways associated with subsistence hunting, fishing, gathering, and consumption of tea (cota) made from local flora. **Table B–4** summarizes the results of the special pathways analysis.

As noted in the *LANL SWEIS*, the dose associated with these special pathways is primarily due to existing levels of radioactive materials in the environment. Although not quantitatively evaluated, the incremental impact of the alternatives evaluated in this EIS are judged to be minimal with respect to these special pathways. Additionally, the impacts would be roughly proportional to the doses to the general public so they would not provide a discriminator among the alternatives.

Table B–4 Worst-Case Public Radiological Dose and Potential Consequences by Ingestion Pathways for Special Pathways Receptors, All Alternatives [a]

	Special Pathways Receptors [b]	
Exposure Pathway	***Dose (millirem per year)***	***Chance of an Excess Latent Cancer Fatality Per Year***
Fish	0.46	1 in 4,300,000
Elk heart and liver	0.034	1 in 59,000,000
Piñon nuts	0.13	1 in 15,000,000
Indian tea (cota)	2.60	1 in 770,000
Total	3.22	1 in 620,000

[a] Because almost all public ingestion is from naturally-occurring radionuclides, weapons testing fallout, and contamination from past operations, the ingestion dose is not affected by the alternatives (DOE 1999b, Section 5.1.6).

[b] Special pathways receptors are those with traditional Native American or Hispanic lifestyles.

B.4 RADIOLOGICAL RELEASES DURING ROUTINE NORMAL OPERATIONS

The estimated radiological releases to the environment associated with routine normal CMR operations are discussed below and are based on the methodology provided in Section B.3.1. The resulting impacts to the public and to workers associated with each alternative are presented and discussed in Chapter 4 of this EIS.

Routine radiological releases during normal CMR operations under the No Action Alternative and Alternatives 1 through 4 are presented in **Table B–5**. The actinide releases consist of plutonium, uranium, thorium, and americium isotopes. Of these isotopes, plutonium-239 has the highest equivalent dose in curies. Therefore, plutonium-239 was used for modeling purposes to conservatively represent all of the actinides released. By using plutonium-239, the estimated dose for members of the public presented in this EIS are higher than what would be experienced if the actual actinides were used in the model calculations.

Table B–5 Normal Operations Radiological Release

	No Action Alternative (curies per year)	***Alternatives 1-4 (curies per year)***
Actinides	0.00003	0.00076
Fission Products		
Kr-85	—	100
Xe-131m	—	45
Xe-133	—	1,500
Tritium	—	1,000

Source: DOE 1999a.

Under the No Action Alternative, air emissions of actinides (with no measurable releases of fission products or tritium) would continue from the existing CMR Building at current restricted operational levels. For Alternatives 1 through 4, the amount of anticipated radiological releases from CMR operations at the new CMRR Facility would be the same as that projected under the Expanded Operations Alternative in the *LANL SWEIS* Record of Decision.

B.5 REFERENCES

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APPENDIX C
EVALUATION OF HUMAN HEALTH IMPACTS FROM FACILITY ACCIDENTS

C.1 INTRODUCTION

Accident analyses were performed to estimate the impacts to workers and the public from reasonably foreseeable accidents for the Los Alamos National Laboratory (LANL) Chemistry and Metallurgy Research Building Replacement (CMRR) project alternatives. The analyses were performed in accordance with U.S. Department of Energy (DOE) National Environmental Policy Act (NEPA) guidelines, including the process followed for the selection of accidents, definition of accident scenarios, and estimation of potential impacts. The sections that follow describe the methodology and assumptions, accident selection process, selected accident scenarios, and consequences and risks of the accidents evaluated.

C.2 OVERVIEW OF METHODOLOGY AND BASIC ASSUMPTIONS

The radiological impacts from accidental releases from the facilities used to perform chemistry and metallurgy research (CMR) operations were calculated using the MACCS computer code, Version 1.12 (MACCS2). A detailed description of the MACCS model is provided in NUREG/CR-6613. The enhancements incorporated in MACCS2 are described in the *MACCS2 Users Guide* (NRC 1998). This section presents the MACCS2 data specific to the accident analyses. Additional information on the MACCS2 code is provided in Section C.8.

As implemented, the MACCS2 model evaluates doses due to inhalation of airborne material, as well as external exposure to the passing plume. This represents the major portion of the dose that an individual would receive because of a facility accident. The longer-term effects of radioactive material deposited on the ground after a postulated accident, including the resuspension and subsequent inhalation of radioactive material and the ingestion of contaminated crops, were not modeled for this environmental impact statement (EIS). These pathways have been studied and found to contribute less significantly to the dosage than the inhalation of radioactive material in the passing plume; they are also controllable through interdiction. Instead, the deposition velocity of the radioactive material was set to zero, so that material that might otherwise be deposited on surfaces remained airborne and available for inhalation. Thus, the method used in this EIS is conservative compared with dose results that would be obtained if deposition and resuspension were taken into account.

The impacts were assessed for the offsite populations surrounding each candidate site for the new CMRR Facility and the existing CMR Building, as well as a maximally exposed offsite individual, and noninvolved worker. The impacts to involved workers, those working in the facility where the accident occurs, were addressed qualitatively because no adequate method exists for calculating meaningful consequences at or near the location where the accident could

occur. Involved workers are also fully trained in emergency procedures, including evacuation and personal protective actions in the event of an accident.

The offsite population is defined as the general public residing within 50 miles (80 kilometers) of each site. The population distribution for each proposed site is based on U.S. Department of Commerce state population projections (DOC 1999). State and county population estimates were examined to interpolate the data to the year 2002. These data were fitted to a polar coordinate grid with 16 angular sectors aligned with the 16 compass directions, with radial intervals that extend outward to 50 miles (80 kilometers). The offsite population within 50 miles (80 kilometers) of TA-3 was estimated to be 302,130 persons (No Action Alternative); 309,154 persons for TA-55 (Alternative 1 [Preferred Alternative] and Alternative 3); and 315,296 persons for TA-6 (Alternatives 2 and 4). For this analysis, no credit was taken for emergency response evacuations and other mitigative actions such as temporary relocation of the public.

The maximally exposed offsite individual is defined as a hypothetical individual member of the public who would receive the maximum dose from an accident. This individual is usually assumed located at a site boundary. However, because there are public sites within the LANL site boundary, the maximally exposed individual could be at an onsite location.

The maximally exposed offsite individual location was determined for each alternative. The maximally exposed individual location can vary at LANL based on accident conditions. For this analysis, the maximally exposed offsite individual is located 0.75 miles (1.2 kilometers) north-northeast from TA-3, 1.1 miles (1.7 kilometers) north-northeast from TA-55, and 1.2 miles (1.9 kilometers) east-northeast from TA-6.

A noninvolved worker is defined as an onsite worker who is not directly involved in facility activities where the accident occurs. The noninvolved worker is conservatively assumed to be exposed to the full release, without any protection, located at a distance of 304 yards (278 meters) from TA-3, 240 yards (219 meters) from TA-55, and 264 yards (241 meters) from TA-6. Workers would respond to a site emergency alarm and evacuate to a designated shelter area, reducing their exposure potential. For purposes of the analyses, however, no credit was taken for any reduced impacts afforded by evacuation.

Doses to the offsite population, the maximally exposed offsite individual, and a noninvolved worker were calculated based on site-specific meteorological conditions. Site-specific meteorology is described by one year of hourly wind speed atmospheric stability and by rainfall recorded at each site. The MACCS2 calculations produce distributions based on the meteorological conditions. For these analyses, the results presented are based on mean meteorological conditions. The mean produces more realistic consequences than a 95^{th} percentile condition, which is sometimes used in safety analysis reports. The 95^{th} percentile condition represents low-probability meteorological conditions that are not exceeded more than 5 percent of the time.

As discussed in Appendix B, the probability coefficient for determining the likelihood of a latent cancer fatality for low doses or dose rates is 0.0006 fatal cancers per rem, applied to individual

workers and maximum exposed offsite individuals. For high doses or dose rates, the probability coefficient is 0.0012 fatal cancers per rem applied to any individual. The higher-probability coefficients apply where individual doses are above 20 rem.

The preceding discussion focuses on radiological accidents. Chemical accident scenarios were not evaluated, since inventories of hazardous chemicals to support CMR operations do not exceed the Threshold Planning Quantities as stipulated on the Extremely Hazardous Substances List provided in Section 3.02 of the Emergency Planning and Community Right-to-Know Act (EPA 1998). Industrial accidents were evaluated and the results are presented in Section C.7.

C.3 ACCIDENT SCENARIO SELECTION PROCESS

In accordance with DOE NEPA guidelines, this EIS contains to the extent applicable, a representative set of accidents that include various types such as fire, explosion, mechanical impact, criticality, spill, human error, natural phenomena, and external events. DOE's Office of NEPA Policy and Compliance, in the *Recommendations for Analyzing Accidents under the National Environmental Policy Act*, July 2002 (DOE 2002a), provides guidance for preparing accident analyses in environmental impact statements. The guidance clarifies and supplements *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*, which the Office of NEPA Oversight issued in May 1993 (DOE 1993).

The accident scenario selection was based on evaluation of accidents reported in the *CMR Basis for Interim Operations* (*CMR BIO)* (LA-CP-98-142) (DOE 2002b) and data provided by LANL (LANL 2002). The selection and evaluation of accidents was based on a process described in the *DOE Standard: Preparation Guide for U.S. Department of Energy Nonreactor Nuclear Facility Documented Safety Analyses (Nonreactor SAR Preparation Guide)* (DOE 1994a). The accident selection process for this EIS is described in Sections C.3.1 through C.3.3 for Steps 1 through 3, respectively.

C.3.1 Hazard Identification – Step 1

Hazard identification, or hazards analysis, is the process of identifying the material, system, process, and plant characteristics that can potentially endanger the health and safety of workers and the public and then analyzing the potential human health and safety consequences of accidents associated with the identified hazards. The hazards analysis examines the complete spectrum of accidents that could expose members of the public, onsite workers, facility workers, and the environment to hazardous materials. Hazards that could be present in the new CMRR Facility were identified by reviewing data in source documents (*CMR BIO* and LANL 2002), assessing their applicability to the existing CMR Building, and identifying the potential hazards posed by the CMR activities that would be carried out in the new CMRR Facility.

Hazards analyses were prepared by UC at LANL, which involved collecting and reviewing documentation pertinent to CMR operations. Twenty-seven CMR processes were examined. **Table C–1** indicates the range of CMR processes investigated and assessed for inclusion in the hazards analysis.

Table C–1 CMR Activities Evaluated in the Hazards Analysis

Process	*Process*
Mass Spectroscopy	Mixed Oxide Fuel Pin Fabrication
Gas Generation Matrix Depletion	Plutonium Rolling
Seal-Tube Neutron Generator Operations	Radioactive Source Recovery Process
Uranium Process Chemistry	Material Receipt, Storage, and Transfer
Synthesis of Nonradioactive, Inorganic Compounds	Waste Handling
Magnetic Isotope Separation	Plutonium Assay
Target Fabrication	Actinide Spectroscopy
Hanford Site Tank Remediation	Material Characterization
Glass Encapsulation	Waste Handling
Uranium Hexafluoride	Waste Compaction
Mechanical Testing of Pu and Pu Alloys	Enriched Uranium Foundry
Trace Element Analysis	Standards Laboratory
Special Furnace Operations	Enriched Uranium Extrusion
Thermal Processing/Dilatometry and Immersion	

The result of the hazards identification step was the preparation of hazard tables containing 326 potential hazards applicable to CMR processes.

C.3.2 Hazard Evaluation – Step 2

The subset of approximately 326 major radiological hazards developed in Step 1 was subsequently screened. Using a hazards analysis process based on guidance provided by the *Nonreactor SAR Preparation Guide* (DOE 1994a), the major hazards were reduced to 21 major accidents. The process ranks the risk of each hazard based on estimated frequency of occurrence and potential consequences to screen out low-risk hazards.

C.3.3 Accidents Selected for this Evaluation – Step 3

The subset of 21major accidents was further screened to select a spectrum of accident scenarios for the *CMRR EIS* alternatives. Screening criteria used in the selection process included, but were not limited to: (1) consideration of the impacts to the public and workers of high-frequency/low-consequence accidents and low-frequency/high-consequence accidents; (2) selection of the highest-impact accident in each accident category to envelope the impacts of all potential accidents; and (3) consideration of only reasonably foreseeable accidents. In addition, hazards and accident analyses for the alternatives were reviewed to determine the potential for accidents initiated by external events (e.g., aircraft crash, and explosions in collocated facilities) and natural phenomena (e.g., external flooding, earthquake, extreme winds, and missiles). Accident scenarios initiated by human error are also evaluated in this EIS.

The results of the Step-3 selection process are presented below.

Fire—Fires that occur in the facility can lead to the release of radioactive materials with potential impacts to workers and the public. Initiating events may include internal process and human error events, natural phenomena, such as an earthquake, or external events, such as an airplane crash into the facility. Combustibles near an ignition source can be ignited in a

laboratory room containing the largest amounts of radioactive material. The fire may be confined to the laboratory room, propagate uncontrolled and without suppression to adjacent laboratory areas or lead to a facility-wide fire. A fire or deflagration in a HEPA filter can also occur due to an exothermic reaction involving reactive salts and other materials.

Explosion—Explosions that occur in the facility can lead to the release of radioactive materials with potential impacts to workers and the public. Initiating events may include internal process and human error events, natural phenomena such as an earthquake, or external events such as an explosive gas transportation accident. Explosions can disperse nuclear material as well as initiate fires that can propagate throughout the facility. An explosion of methane gas followed by a fire in a laboratory area can potentially propagate to other laboratory areas and affect the entire facility.

Spills—Spills of radioactive and/or chemical materials can be initiated by failure of process equipment and/or human error, natural phenomenal or external events. Radioactive and chemical materials spills typically involve laboratory room quantities of materials that are relatively small compared to releases caused by fires and explosions. Laboratory room spills could impact members of the public but may be a more serious risk to the laboratory room workers. Larger spills involving vault size quantities are also possible.

Criticality—The potential for a criticality exists whenever there is a sufficient quantity of nuclear material in an unsafe configuration. Although a criticality could impact the public, its effects are primarily associated with workers near the accident.

Operations at the CMR Building and the new CMRR Facilities would mostly involve fissile material handling below the minimum critical mass. Only a few operations would involve fissile materials in excess of critical masses. These operations have been reviewed by the DOE and LANL and it was concluded that existing procedures, limits and controls would make a criticality accident an incredible event (an event with an annual likelihood of occurrence less than 1 in 1 million). Even for a beyond design basis accident, an extreme earthquake driven accident with sufficient reflector material (water), whereby all the vault inventory ends up on the floor, DOE's evaluations concluded that the size and volume of the vault would maintain subcriticality (DOE 2002b). If a criticality accident were assumed to occur, its consequences and risks to the public and workers would be small in comparison to the consequences and risks from the low-frequency accidents analyzed in this EIS. Since a criticality accident was found to be a low-consequence and low-frequency event, it was not included among the accidents analyzed in detail.

Natural Phenomena—The potential accidents associated with natural phenomena include earthquakes, high winds, flooding and similar naturally occurring events. For *CMRR EIS* alternatives, a severe earthquake can lead to the release of radioactive materials and exposure of workers and the public. A severe earthquake could cause the collapse of facility structures, falling debris and failure of glove boxes and nuclear materials storage facilities. An earthquake could also initiate a fire that propagates throughout the facility and results in an unfiltered release of radioactive material to the environment. In addition to the potential exposure of workers and the public to radioactive and chemical materials, an accident could also cause human injuries and

fatalities from the force of the event, such as falling debris, during an earthquake or the thermal effects of a fire.

Chemical—The quantities of regulated chemicals used and stored in the facility are well below the threshold quantities set by the EPA (40 CFR 68), and pose minimal potential hazards to the public health and the environment in an accident condition. Accidents involving small laboratory quantities of chemicals are primarily a risk to the involved worker in the immediate vicinity of the accident. There will be no bulk quantities of chemicals stored at the new CMRR Facility.

Airplane Crash—The potential exists for an airplane crash into the new CMRR Facility. The probability of an airplane crash during over flight is less than 10^{-6} and under DOE NEPA guidelines does not have to be considered in the EIS. During landing and takeoff operations at the local Los Alamos airport, there is a reasonable probability of a small commercial or military airplane crashing into the facility. However, the impacts of a small airplane crash into the facility are bounded by other accidents addressed in this EIS.

C.4 Accident Scenario Descriptions and Source Term

This section describes the accident scenarios and corresponding source term developed for the *CMRR EIS* alternatives. The spectrum of accidents described in this section was used to determine, for workers and the public, the consequences and associated risks for each alternative. Assumptions were made when further information was required to clarify the accident condition, update some of the parameters, or facilitate the evaluation process; these are referenced in each accident description.

The source term is the amount of respirable radioactive material released to the air, in terms of curies or grams, assuming the occurrence of a postulated accident. The airborne source term is typically estimated by the following equation:

Source term = material at risk × damage ratio × airborne release fraction × respirable fraction × leak path factor

where:

MAR = material at risk
DR = damage ratio
ARF = airborne release fraction
RF = respirable fraction
LPF = leak path factor

The material at risk is the amount of radionuclides (in curies of activity or grams for each radionuclide) available for release when acted upon by a given physical stress or accident. The material at risk is specific to a given process in the facility of interest. It is not necessarily the total quantity of material present, but is that amount of material in the scenario of interest postulated to be available for release.

The damage ratio is the fraction of material exposed to the effects of the energy, force, or stress generated by the postulated event. For the accident scenarios discussed in this analysis, the value of the damage ratio varies from 0.1 to 1.0.

The airborne release fraction is the fraction of material that becomes airborne due to the accident. In this analysis, airborne release fractions were obtained from the *CMR BIO*, data supplied by LANL (LANL 2002), or the *DOE Handbook* on airborne release fractions (DOE 1994b).

The respirable fraction is the fraction of the material with a 0.0004 inches (10-microns) or less aerodynamic-equivalent diameter particle size that could be retained in the respiratory system following inhalation. The respirable fraction values are also taken from the *CMR BIO*, data supplied by LANL (LANL 2002), or the *DOE Handbook* on airborne release fractions (DOE 1994b).

The leak path factor accounts for the action of removal mechanisms, for example, containment systems, filtration, and deposition, to reduce the amount of airborne radioactivity ultimately released to occupied spaces in the facility or the environment. A leak path factor of 1.0 (no reduction) is assigned in accident scenarios involving a major failure of confinement barriers. Leak path factors were obtained from the *CMR BIO*, data supplied by LANL (LANL 2002), and site-specific evaluations.

Since the isotopic composition and shape of some of the nuclear materials are classified, the material inventory has been converted to equivalent amounts of plutonium-239. The conversion was on a constant-consequence basis, so that the consequences calculated in the accident analyses are equivalent to what they would be if actual material inventories were used. The following sections describe the selected accident scenarios and corresponding source terms for the alternatives.

The accident impacts for the CMRR differ in some respects from the CMR for the following reasons.

- The CMR Building accident scenarios are based on a Basis for Interim Operations (BIO) safety analysis (DOE 2002b) prepared by LANL. The CMRR Facility accident scenarios are based on information and data prepared by LANL (LANL 2002) specifically for the CMRR.

- The CMR Building has been operating under a restricted basis that limits the kinds of operations that can be performed and the amount of radioactive material in the building. The CMRR Facility, on the other hand, would not have such restrictions, allowing a larger quantity of radioactive material to be in the facility and potentially available for release in the event of an accident.

- A major accident for the CMR Building is an earthquake with a frequency of occurrence driven by the building's location near a fault. The CMRR Facility has alternative locations that are not affected by the fault.

- An accident postulated for the CMR Building is a wing-wide fire while the equivalent accident for the CMRR Facility is a facility-wide fire. The CMR Building wing-wide fire is based on analyses in the BIO where it was determined that a major fire could not spread to other wings because of building design and fire safety features. Because of limited CMRR Facility design information, the CMRR analysis for the equivalent accident did not have a technical basis for limiting the progression of a major fire to a portion of the CMRR Facility.

The net effect of these differences is that unmitigated accidents at the CMRR Facility would have higher consequences than accidents at the CMR Building. Radiological risks would be small for all of the alternatives.

C.4.1 New CMRR Facility Alternatives

The accidents described in this section pertain to the new CMRR Facility at TA-55 and TA-6.

Facility-Wide Fire—The accident scenario postulates that combustible material near an ignition source are ignited in a laboratory area or vault containing large amounts of radioactive materials. The fire could be initiated by natural phenomena, human error, or equipment failure. The fire is assumed to propagate uncontrolled and without suppression to adjacent laboratory areas and the entire facility. The material at risk is estimated to be approximately 13,228 pounds (6,000 kilograms) of plutonium-239 equivalent in the form of metal (95 percent) and liquid (5 percent). The scenario conservatively assumes the damage ratio and leak path factors are 1.0. No credit is taken for equipment and facility features and mitigating factors that could cause the damage ratio and leak path factors to be less than 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated to be 0.00025 for metal and 0.002 for liquid. The source term for radioactive material released to the environment is 3.14 pounds (1.43 kilograms) of plutonium-239 metal and 1.32 pounds (0.6 kilograms) of plutonium-239 liquid. The frequency of the accident is estimated to be less than 0.000005 and is conservatively assumed at 5.0×10^{-6} per year for risk calculation purposes.

Process Fire—The accident scenario postulates combustibles near an ignition source are ignited in a laboratory area containing radioactive materials. The fire is assumed to propagate uncontrolled and without suppression throughout the laboratory area but does not propagate to other laboratory areas. The material at risk is estimated to be 66.15 pounds (30 kilograms) of plutonium-239 equivalent in the form of liquid. The scenario conservatively assumes the damage ratio is 1.0. The leak path factor is 0.016, and the released respirable fraction (airborne release fraction times respirable fraction) is estimated to be 0.002. The resulting source term of radioactive material released to the environment is estimated to be 0.034 ounces (0.96 grams) of plutonium-239 liquid. The frequency of the accident is estimated to be in the range of 0.0001 to 0.001 per year and is conservatively assumed to be 0.001 per year for risk calculation purposes.

Fire in the Main Vault—This accident postulates a fire in the main vault. In this scenario, the main vault door is accidentally left open and a fire inside the vault or propagating to the main vault engulfs the entire contents of plutonium. The material at risk is estimated to be 12,568 pounds (5,700 kilograms) of plutonium-239 equivalent in metal form. The scenario conservatively assumes the damage ratio and leak path factors are 1.0. No credit is taken for

equipment and facility features and mitigating factors that could cause the damage ratio and leak path factors to be less than 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated to be 0.00025. The resulting source term of radioactive material released to the environment is estimated to be 3.14 pounds (1.43 kilograms) of plutonium-239 metal. The frequency of the accident is estimated to be 0.000001.

Process Explosion—This accident postulates an explosion of methane gas present in the process followed by a fire in a laboratory area containing radioactive materials. The material at risk is 15.88 pounds (7.2 kilograms) of plutonium equivalent in powder form. The damage ratio is conservatively assumed at 1.0. The leak path factor is estimated to be 0.016. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.0015. The resulting source term of radioactive material released to the environment is estimated at 0.006 ounces (0.17 grams) of plutonium-239 powder. The frequency of the accident is estimated to be in the range of 0.0001 to 0.001 per year and is conservatively assumed to be 0.001 per year for risk calculation purposes.

Process Spill—This accident postulates a spill of radioactive material in the process area caused by human error or equipment failure. The material at risk is estimated at 15.88 pounds (7.2 kilograms) of plutonium-239 equivalent in powder form. The damage ratio is assumed to be 1.0. The leak path factor estimated to be 0.016. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.002. The resulting source term of radioactive material released to the environment is estimated at 0.0081 ounces (0.23 grams) of plutonium-239 powder. The frequency of the accident is estimated to be in the range of 0.05 and 0.1 per year and is conservatively assumed to be 0.1 per year for risk calculation purposes.

Seismic-Induced Laboratory Spill—An earthquake is postulated to occur that exceeds the Performance Category-3 design capability of the facility. Internal enclosures topple and are damaged by falling debris. The material at risk is estimated to be 661.5 pounds (300 kilograms) of plutonium-239 in powder form. The scenario conservatively assumes the damage ratio and leak path factors are 1.0. No credit is taken for equipment and facility features and mitigating factors that could cause the damage ratio and leak path factors to be less than 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.002 for powder. The source term for radioactive material released to the environment is 1.32 pounds (0.6 kilograms) of plutonium-239 powder. The frequency of the accident is estimated to be in the range of 0.00001 to 0.0001 per year and is conservatively assumed to be 0.0001 per year for risk calculation purposes.

Seismic-Induced Fire—An earthquake is postulated to occur that exceeds the Performance Category-3 design capability of the facility. Internal enclosures topple and are damaged by falling debris. Combustibles in the facility are ignited and the fire engulfs radioactive material in the laboratory area. The material at risk is estimated to be 661.5 pounds (300 kilograms) of plutonium-239 in liquid form. The scenario conservatively assumes the damage ratio and leak path factors are 1.0. No credit is taken for equipment and facility features and mitigating factors that could cause the damage ratio and leak path factors to be less than 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.002 for liquid. The source term for radioactive material released to the environment is 1.32 pounds

(0.6 kilograms) of plutonium-239 liquid. The frequency of the accident is estimated to be in the range of 0.000001 to 0.00001 per year and is conservatively assumed to be 0.00001 per year for risk calculation purposes.

Facility-Wide Spill—An earthquake is postulated to occur that exceeds the Performance Category-3 design capability of the facility. A vault and process areas containing radioactive material are severely damaged and their plutonium-239 contents in the form of powder spills. The material at risk is estimated to be 13,230 pounds (6,000 kilograms) of plutonium-239 in powder form. The scenario conservatively assumes the damage ratio and leak path factors are 1.0. No credit is taken for equipment and facility features and mitigating factors that could cause the damage ratio and leak path factors to be less than 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.002 for powder. The source term for radioactive material released to the environment is 26.461 pounds (12 kilograms) of plutonium-239 powder. The frequency of the accident is estimated to be less than 5.0×10^{-6} and is conservatively assumed at 5.0×10^{-6} per year for risk calculation purposes.

C.4.2 No Action Alternative

The accidents described in this section pertain to the No Action Alternative.

Wing-Wide Fire—The accident scenario postulates combustibles in the vicinity of an ignition source are ignited in a laboratory area containing the largest amounts of radioactive materials. The fire is assumed to propagate uncontrolled and without suppression to adjacent laboratory areas an entire facility wing. The material at risk is estimated at 13.23 pounds (6 kilograms) of plutonium-239 equivalent in the form of metal (20 percent), powder (40 percent) and solution (40 percent). The scenario conservatively assumes the damage ratio and leak path factors are 1.0, and the released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.017. The frequency of the accident is estimated to be 0.00005 per year.

HEPA Filter Fire—A fire or deflagration is assumed to occur in the HEPA filters due to an exothermic reaction involving reactive lasts or other materials. Two filters containing 0.18 ounces (5 grams) of plutonium-239 equivalent each are affected. The material at risk is estimated at 0.35 ounces (10 grams) of plutonium-239 equivalent in the form of oxide particles. The damage ratio and leak path factors are conservatively assumed at 1.0 and the released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.4. The resulting source term of radioactive material released to the environment is estimated at 0.14 ounces (4 grams) of plutonium-239 equivalent. The frequency of the accident is estimated to be in the range of 0.0001 to 0.01 and is conservatively assumed to be 0.01 per year for risk calculation purposes.

Fire in the Main Vault—This accident postulates a fire in the main vault. In this scenario, the main vault door is accidentally left open and a fire inside the vault or propagating to the main vault engulfs the entire contents of plutonium. The material at risk is estimated at 440.92 pounds (200 kilograms) of plutonium-239 equivalent. The damage ratio and leak path factors are conservatively assumed at 1.0 and the released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.002. The resulting source term of radioactive material

released to the environment is estimated at 14.11 ounces (400 grams) of plutonium-239 equivalent. The frequency of the accident is estimated to be less than 1.0×10^{-6} per year and is conservatively assumed to be 1.0×10^{-6} per year for risk calculation purposes.

Flammable Gas Explosion—This accident postulates an explosion of methane gas followed by a fire in a laboratory area containing radioactive materials. The material at risk is 8.75 pounds (3.97 kilograms) of plutonium-239 equivalent. The damage ratio is conservatively assumed at 1.0. The leak path factor is assumed at 0.68. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.005. The resulting source term of radioactive material released to the environment is estimated at 0.48 ounces (13.5 grams) of plutonium-239 equivalent. The frequency of the accident is estimated to be in the range of 1.0×10^{-6} to 0.0001 per year and is conservatively assumed to be 0.0001 per year for risk calculation purposes.

Propane/Hydrogen Transport Explosion—An accidental explosion is postulated to occur during the onsite transportation of propane or hydrogen near the CMR Building. The vehicle accident results in the breach of gas containers followed by ignition and explosion of the gas causing damage to the facility and affecting some radioactive materials. The material at risk is estimated at 26.90 pounds (12.2 kilograms) of plutonium-239 equivalent. The damage ratio is conservatively assumed at 1.0 and the leak path factor is 0.3. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.005. The resulting source term of radioactive material released to the environment is estimated at 0.65 ounces (18.3 grams) of plutonium-239 equivalent. The frequency of the accident is estimated to be less than 1.0×10^{-6} per year and is conservatively assumed to be 1.0×10^{-6} per year for risk calculation purposes.

Radioactive Spill—This accident postulates a spill of radioactive material caused by human error. The accident involves the spill of plutonium-238 while work is done outside of confinement. The accident potentially impacts workers as well as the public. The material at risk for public impacts is estimated at 0.0000529 ounces (0.0015 grams) of plutonium-238. The damage ratio and leak path factor are conservatively assumed at 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.05. The resulting source term of radioactive material released to the environment is estimated at 2.65×10^{-6} ounces (0.000075 grams) of plutonium-238. The frequency of the accident is estimated at 0.1 per year.

Natural Gas Pipeline Rupture—This accident postulates the accidental rupture of a natural gas pipeline near the CMR Building. The released natural gas initiates a flammable gas explosion and a wing-wide fire. The material at risk is 13.23 pounds (6 kilograms) of plutonium-239 equivalent. The damage ratio and leak path factor are conservatively assumed at 1.0. The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.017. The source term for radioactive material released to the environment 3.56 ounces (101 grams) of plutonium-239 equivalent. The frequency of the accident is estimated at 1.0×10^{-7} per year.

Severe Earthquake—A large earthquake is postulated to occur that exceeds design capability of the facility. It is assumed that all internal enclosures topple and are damage by falling debris and

that the hot cells fail. All radioactive material in the hot cells is at risk of being released. The material at risk is estimated at 44.53 pounds (20.2 kilograms) of plutonium-239 equivalent composed of metal (20 percent), powder (40 percent), and solution (40 percent). The released respirable fraction (airborne release fraction times respirable fraction) is estimated at 0.005. The source term for radioactive material released to the environment 3.56 ounces (101 grams) of plutonium-239 equivalent. The frequency of the accident is estimated at 0.0024 per year.

C.5 ACCIDENT ANALYSES CONSEQUENCES AND RISK RESULTS

The consequences of a radiological accident to workers and the public can be measured in a number of ways depending on the application. Three measures are used in this EIS. The first measure of consequences is individual dose expressed in terms of rem or millirem for a member of the public or worker and collective dose expressed in terms of person-rem for members of the public or a population of workers. The second measure is a post-exposure effect that reflects the likelihood of latent cancer fatality for an exposed individual or the expected number of latent cancer fatalities in a population of exposed individuals. Individual or public exposure to radiation can only occur if there is an accident involving radioactive materials, which leads to the third measure. The third measure of accident consequences is referred to as risk that takes into account the probability (or frequency) of the accident's occurrence. Risk is the mathematical product of the probability or frequency of accident occurrence and the latent cancer fatality consequences. Risk is calculated as follows:

$R_i = C_i \times P$ for an individual, where
$C_i = \text{Minimum}\ (D_i \times F, 1)$
$R_p = D_p \times F \times P$ for the population

where,

R_i – is the risk of a latent cancer fatality for an individual receiving a dose D_i in latent cancer fatalities per year
R_p – is the risk of a number of latent cancer fatalities for a population receiving a dose D_p in latent cancer fatalities per year
C_i – likelihood of an individual contracting a fatal cancer as a result of exposure to dose D_i
D_i – the dose in rem to an individual
D_p – the dose in person-rem to a population
F = dose-to-latent cancer fatality conversion factor which is 0.0006 latent cancer fatalities per rem for individuals or person-rem for members of the public.
P = the probability or frequency of the accident usually expressed on a per year basis.

Once the source term, the amount of radioactive material released to the environment for each accident scenario is determined, the radiological consequences are calculated. The calculations and resulting impacts vary depending on how the radioactive material release is dispersed, what materials are involved, and which receptors are being considered.

For example, if the dose to the maximally exposed individual is 10 rem, the probability of a latent cancer fatality for an individual is $10 \times 0.0006 = 0.006$, where 0.0006 is the dose-to-latent cancer fatality conversion factor. If the maximally exposed individual receives a dose exceeding

20 rem, the dose-to-latent cancer fatality conversion factor is doubled to 0.0012. Thus, if the maximally exposed individual receives a dose of 30 rem, the probability of a latent cancer fatality is 30 × 0.0012 = 0.036. For an individual, the calculated probability of a latent cancer fatality is in addition to the probability of cancer from all other causes.

For a noninvolved worker, the dose-to-latent cancer fatality conversion factor is also 0.0006. If a noninvolved worker receives a dose of 10 rem, the probability of a latent cancer fatality is 10 × 0.0006 = 0.006. As with the maximally exposed individual, if the dose exceeds 20 rem, the latent cancer probability factor doubles to 0.012.

For the population, the same dose-to-latent cancer fatality conversion factors are used to determine the estimated number of latent cancer fatalities. The calculated number of latent cancer fatalities in the population is in addition to the number of cancer fatalities that would result from all other causes. The MACCS2 computer code calculates the dose to each individual in the exposed population and then applies the appropriate dose-to-latent cancer fatality conversion factor to estimate the latent cancer fatality consequences. In other words, 0.0006 for doses less than 20 rem or 0.0012 for doses greater than or equal to 20 rem. Therefore, for some accidents, the estimated number of latent cancer fatalities will involve both dose-to-latent cancer fatality conversion factors. This indicates that some members of the population received doses in excess of 20 rem.

The following tables provide the accident consequences for each alternative. For each alternative, there are two tables showing the impacts. The first table presents the consequences (doses and latent cancer fatality and latent cancer fatalities) assuming the accident occurs, that is, not reflecting the frequency of accident occurrence. The second shows accident risks that are obtained by multiplying the latent cancer fatality and latent cancer fatalities values in the first table by the frequency of each accident listed in the first table.

Table C–2 Accident Frequency and Consequences under the No Action Alternative

Accident	*Frequency (per year)*	*Maximally Exposed Offsite Individual*		*Offsite Population* [a]		*Noninvolved Worker*	
		Dose (rem)	*Latent Cancer Fatality* [b]	*Dose (person-rem)*	*Latent Cancer Fatalities* [c]	*Dose (rem)*	*Latent Cancer Fatality* [b]
Wing-wide fire	0.00005	0.55	0.00033	1020	0.61	2.67	0.0016
Severe earthquake	0.0024	2.92	0.0018	1680	0.10	66.9	0.080
Flammable gas explosion	1.0×10^{-6} to 0.0001	0.073	0.000044	135	0.081	0.35	0.00021
HEPA filter fire	0.0001 to 0.01	0.12	0.000072	66.5	0.040	2.65	0.0016
Fire in main vault	$< 1.0 \times 10^{-6}$	2.15	0.0013	4000	2.4	10.5	0.0063
Propane/hydrogen transport explosion	$< 1.0 \times 10^{-6}$	0.53	0.00032	304	0.18	12.1	0.0072
Natural gas pipeline rupture	1.0×10^{-7}	0.55	0.00033	1020	0.61	2.67	0.0016
Radioactive spill	0.1	0.00054	2.2×10^{-7}	0.31	0.00019	0.012	7.2×10^{-6}

[a] Based on a population of 302,130 persons residing within 50 miles (80 kilometers) of the site.
[b] Increased likelihood of latent cancer fatality for an individual assuming the accident occurs.
[c] Increased number of latent cancer fatalities for the offsite population assuming the accident occurs.

Table C–3 Annual Accident Risks under the No Action Alternative

Accident	Risk of Latent Cancer Fatality		
	Maximally Exposed Offsite Individual [a]	Offsite Population [b, c]	Noninvolved Worker [a]
Wing-wide fire	1.7×10^{-8}	0.000031	8.0×10^{-8}
Severe earthquake	4.2×10^{-6}	0.0024	0.00019
Flammable gas explosion	4.4×10^{-9}	8.1×10^{-6}	2.1×10^{-8}
HEPA filter fire	7.2×10^{-7}	0.00040	0.000016
Fire in main vault	1.3×10^{-9}	2.4×10^{-6}	6.3×10^{-9}
Propane/hydrogen transport explosion	3.2×10^{-10}	1.8×10^{-7}	7.3×10^{-9}
Natural gas pipeline rupture	3.3×10^{-11}	6.1×10^{-8}	1.6×10^{-10}
Radioactive spill	3.2×10^{-8}	0.000019	7.2×10^{-7}

[a] Risk of increased likelihood of a latent cancer fatality to the individual.
[b] Risk of the increased number of latent cancer fatalities for the offsite population.
[c] Based on a population of 302,130 persons residing within 50 miles (80 kilometers) of the site.

Table C–4 Accident Frequency and Consequences under Alternatives 1 and 3

Accident	Frequency (per year)	Maximally Exposed Offsite Individual		Offsite Population [a]		Noninvolved Worker	
		Dose (rem)	Latent Cancer Fatality [b]	Dose (person-rem)	Latent Cancer Fatalities [c]	Dose (rem)	Latent Cancer Fatality [b]
Facility-wide fire	5.0×10^{-6}	7.0	0.0042	17,018	10.2	51.4	0.062
Process fire	0.001	0.004	2.4×10^{-6}	9.78	0.0059	0.03	0.000018
Fire in the main vault	1.0×10^{-6}	5.92	0.004	14,500	8.70	43.88	0.053
Process explosion	0.001	0.0036	2.2×10^{-6}	2.5	0.0015	0.15	0.00009
Process spill	0.1	0.0046	2.8×10^{-6}	3.19	0.0019	0.19	0.000011
Seismic-induced laboratory spill	0.0001	12.1	0.0073	8,394	5.0	495	0.59
Seismic-induced fire	0.00001	2.5	0.0015	6,110	3.7	18.5	0.011
Facility-wide spill	5.0×10^{-6}	243.1	0.29	167,705	100.6	9,352	1.0

[a] Based on a population of 309,154 persons residing within 50 miles (80 kilometers) of the site.
[b] Increased likelihood of latent cancer fatality for an individual assuming the accident occurs.
[c] Increased number of latent cancer fatalities for the offsite population assuming the accident occurs.

Table C–5 Annual Accident Risks under Alternatives 1 and 3

Accident	Risk of Latent Cancer Fatality		
	Maximally Exposed Offsite Individual [a]	Offsite Population [b, c]	Noninvolved Worker [a]
Facility-wide fire	2.1×10^{-8}	0.000051	3.1×10^{-7}
Process fire	2.4×10^{-9}	5.9×10^{-6}	1.8×10^{-8}
Fire in the main vault	4.0×10^{-9}	8.7×10^{-6}	5.3×10^{-8}
Process explosion	2.2×10^{-9}	1.5×10^{-6}	9.0×10^{-8}
Process spill	2.8×10^{-7}	0.00019	0.000011
Seismic-induced laboratory spill	7.3×10^{-7}	0.0005	0.000059
Seismic-induced fire	1.5×10^{-8}	0.000037	1.1×10^{-7}
Facility-wide spill	1.5×10^{-6}	0.0005	5.0×10^{-6}

[a] Risk of increased likelihood of a latent cancer fatality to the individual.
[b] Risk of the increased number of latent cancer fatalities for the offsite population.
[c] Based on a population of 309,154 persons residing within 50 miles (80 kilometers) of the site.

Table C–6 Accident Frequency and Consequences under Alternatives 2 and 4

Accident	Frequency (per year)	Maximally Exposed Offsite Individual		Offsite Population [a]		Noninvolved Worker	
		Dose (rem)	Latent Cancer Fatality [b]	Dose (person-rem)	Latent Cancer Fatalities [c]	Dose (rem)	Latent Cancer Fatality [b]
Facility-wide fire	5.0×10^{-6}	4.0	0.002	15,173	9.10	44.98	0.054
Process fire	0.001	0.0023	1.4×10^{-6}	8.71	0.0052	0.026	0.000016
Fire in the main vault	1.0×10^{-6}	3.41	0.0020	12,938	7.76	38.3	0.046
Process explosion	0.001	0.0017	1.0×10^{-6}	2.37	0.0014	0.08	0.000048
Process spill	0.1	0.002	1.2×10^{-6}	3.01	0.0018	0.172	0.0001
Seismic-induced laboratory spill	0.0001	5.54	0.0033	7,920	4.75	453	0.54
Seismic-induced fire	0.00001	1.44	0.00086	5,440	3.26	16.1	0.0097
Facility-wide Spill	5.0×10^{-6}	111.3	0.13	158,000	94.8	9,100	1.0

[a] Based on a population of 315,296 persons residing within 50 miles (80 kilometers) of the site.
[b] Increased likelihood of latent cancer fatality for an individual assuming the accident occurs.
[c] Increased number of latent cancer fatalities for the offsite population assuming the accident occurs.

Table C–7 Annual Accident Risks under Alternatives 2 and 4

Accident	Risk of Latent Cancer Fatality		
	Maximally Exposed Offsite Individual [a]	Offsite Population [b, c]	Noninvolved Worker [a]
Facility-wide fire	1.2×10^{-8}	0.000046	2.7×10^{-7}
Process fire	1.4×10^{-9}	5.2×10^{-6}	1.6×10^{-8}
Fire in the main vault	2.0×10^{-9}	7.8×10^{-6}	4.6×10^{-8}
Process explosion	1.0×10^{-9}	1.4×10^{-6}	4.8×10^{-8}
Process spill	1.2×10^{-7}	0.00018	0.000010
Seismic-induced laboratory spill	3.3×10^{-7}	0.00048	0.000054
Seismic-induced fire	8.6×10^{-9}	0.000033	9.7×10^{-8}
Facility-wide spill	6.7×10^{-7}	0.00048	5.0×10^{-6}

[a] Risk of increased likelihood of a latent cancer fatality to the individual.
[b] Risk of the increased number of latent cancer fatalities for the offsite population.
[c] Based on a population of 315,296 persons residing within 50 miles (80 kilometers) of the site.

C.6 Analysis Conservatism and Uncertainty

The analysis of accidents is based on calculations relevant to postulated sequences of accident events and models used to calculate the accident's consequences. The models provide estimates of the frequencies, source terms, pathways for dispersion, exposures, and the effects on human health and the environment as realistic as possible within the scope of the analysis. In many cases, the rare occurrence of postulated accidents leads to uncertainty in the calculation of the consequences and frequencies. This fact has promoted the use of models or input values that yield conservative estimates of consequences and frequency.

Due to the layers of conservatism built into the accident analysis for the spectrum of postulated accidents, the estimated consequences and risks to the public represent the upper limit for the individual classes of accidents. The uncertainties associated with the accident frequency estimates are enveloped by the conservatism in the analysis.

Of particular interest are the uncertainties in the estimates of cancer fatalities from exposure to radioactive materials. The numerical values of the health risk estimators used in this EIS were obtained by linear extrapolation from the nominal risk estimate for lifetime total cancer mortality resulting from exposures of 10 rad. Because the health risk estimators are multiplied by conservatively calculated radiological doses to predict fatal cancer risks, the fatal cancer values presented in this EIS are expected to be conservative estimates.

C.7 INDUSTRIAL SAFETY

Estimates of potential industrial impacts on workers during construction and operations were evaluated based on DOE and U.S. Bureau of Labor Statistics. Impacts are classified into two groups, total recordable cases and fatalities. A recordable case includes work-related fatality, illness, or injury that resulted in loss of consciousness, restriction of work or motion, transfer to another job, or required medical treatment beyond first aid.

DOE and contractor total recordable cases and fatality incidence rates were obtained from the CAIRS database (DOE 2000a, 2000b). The CAIRS database is used to collect and analyze DOE and DOE contractor reports of injuries, illnesses, and other accidents that occur during DOE operations. The five-year average (1995 through 1999) rates were determined for average construction total recordable cases, average operations total recordable cases, and average operations fatalities. The average construction fatality rate was obtained from the Bureau of Labor Statistics (Toscano and Windau 1998).

Table C–8 presents the average occupational total recordable cases and fatality rates for construction and operations activities.

Table C–8 Average Occupational Total Recordable Cases and Fatality Rates (per worker year)

Labor Category	*Total Recordable Cases*	*Fatalities*
Construction	0.053	0.00014
Operations	0.033	0.000013

Expected annual construction and operations impacts on workers for each alternative are presented in **Table C–9**.

Table C–9 Industrial Safety Impacts from Construction and Operations (per year)

Alternative	*Estimated Number of Construction Workers*	*Estimated Number of Operations Workers*	*Construction Injuries*	*Construction Fatalities*	*Operations Injuries*	*Operations Fatalities*
No Action	0	204	0	0	6.7	0.003
TA-55 New Facility	300 (peak)	550	15.9	0.042	18	0.007
TA-6 New Facility	300 (peak)	550	15.9	0.042	18	0.007
Hybrid Facility at TA-55	300 (peak)	550	15.9	0.042	18	0.007
Hybrid Facility at TA-6	300 (peak)	550	15.9	0.042	18	0.007

As expected, the incidence of impacts, above and beyond those requiring first aid, do indeed exceed impacts from radiation accidents evaluated in this analysis. However, no fatalities would be expected from either construction or operations of any facility.

C.8 MACCS2 CODE DESCRIPTION

The MACCS2 computer code is used to estimate the radiological doses and health effects that could result from postulated accidental releases of radioactive materials to the atmosphere. The specification of the release characteristics, designated a "source term," can consist of up to four Gaussian plumes that are often referred to simply as "plumes."

The radioactive materials released are modeled as being dispersed in the atmosphere while being transported by the prevailing wind. During transport, whether or not there is precipitation, particulate material can be modeled as being deposited on the ground. If contamination levels exceed a user-specified criterion, mitigating actions can be triggered to limit radiation exposures.

There are two aspects of the code's structure basic to understanding its calculations: (1) the calculations are divided into modules and phases, and (2) the region surrounding the facility is divided into a polar-coordinate grid. These concepts are described in the following sections.

MACCS is divided into three primary modules: ATMOS, EARLY, and CHRONC. Three phases are defined as the emergency, intermediate, and long-term phases. The relationship among the code's three modules and the three phases of exposure are summarized below.

The ATMOS module performs all of the calculations pertaining to atmospheric transport, dispersion, and deposition, as well as the radioactive decay that occurs before release and while the material is in the atmosphere. It uses a Gaussian plume model with Pasquill-Gifford dispersion parameters. The phenomena treated include building wake effects, buoyant plume rise, plume dispersion during transport, wet and dry deposition, and radioactive decay and in growth. The results of the calculations are stored for use by EARLY and CHRONC. In addition to the air and ground concentrations, ATMOS stores information on wind direction, arrival and departure times, and plume dimensions.

The EARLY module models the period immediately following a radioactive release. This period is commonly referred to as the emergency phase. The emergency phase begins at each successive downwind distance point when the first plume of the release arrives. The duration of the emergency phase is specified by the user, and it can range between one and seven days. The exposure pathways considered during this period are direct external exposure to radioactive material in the plume (cloud shine); exposure from inhalation of radionuclides in the cloud (cloud inhalation); exposure to radioactive material deposited on the ground (ground shine); inhalation of resuspended material (resuspension inhalation); and skin dose from material deposited on the skin. Mitigating actions that can be specified for the emergency phase include evacuation, sheltering, and dose-dependent relocation.

The CHRONC module performs all of the calculations pertaining to the intermediate and long-term phases. CHRONC calculates the individual health effects that result from both direct

exposure to contaminated ground and from inhalation of resuspended materials, as well as indirect health effects caused by the consumption of contaminated food and water by individuals who could reside both on and off the computational grid.

The intermediate phase begins at each successive downwind distance point upon the conclusion of the emergency phase. The user can configure the calculations with an intermediate phase that has a duration as short as zero or as long as one year. In the zero-duration case, there is essentially no intermediate phase and a long-term phase begins immediately upon conclusion of the emergency phase.

Intermediate models are implemented on the assumption that the radioactive plume has passed and the only exposure sources (ground shine and resuspension inhalation) are from ground-deposited material. It is for this reason that MACCS2 requires the total duration of a radioactive release be limited to no more than four days. Potential doses from food and water during this period are not considered.

The mitigating action model for the intermediate phase is very simple. If the intermediate phase dose criterion is satisfied, the resident population is assumed present and subject to radiation exposure from ground shine and resuspension for the entire intermediate phase. If the intermediate phase exposure exceeds the dose criterion, then the population is assumed relocated to uncontaminated areas for the entire intermediate phase.

The long-term phase begins at each successive downwind distance point upon the conclusion of the intermediate phase. The exposure pathways considered during this period are ground shine, resuspension inhalation, and food and water ingestion.

The exposure pathways considered are those resulting from ground-deposited material. A number of protective measures, such as decontamination, temporary interdiction, and condemnation, can be modeled in the long-term phase to reduce doses to user-specified levels. The decisions on mitigating action in the long-term phase are based on two sets of independent actions: (1) decisions relating to whether land at a specific location and time is suitable for human habitation (habitability), and (2) decisions relating to whether land at a specific location and time is suitable for agricultural production (ability to farm).

All of the calculations of MACCS2 are stored based on a polar-coordinate spatial grid with a treatment that differs somewhat between calculations of the emergency phase and calculations of the intermediate and long-term phases. The region potentially affected by a release is represented with a (r, È) grid system centered on the location of the release. The radius, r, represents downwind distance. The angle, È, is the angular offset from north, going clockwise.

The user specifies the number of radial divisions as well as their endpoint distances. The angular divisions used to define the spatial grid are fixed in the code. They correspond to the 16 points of the compass, each being 22.5 degrees wide. The 16 points of the compass are used in the United States to express wind direction. The compass sectors are referred to as the coarse grid.

Since emergency phase calculations use dose-response models for early fatalities and early injuries that can be highly nonlinear, these calculations are performed on a finer grid basis than the calculations of the intermediate and long-term phases. For this reason, the calculations of the emergency phase are performed with the 16 compass sectors divided into three, five, or seven equal, angular subdivisions. The subdivided compass sectors are referred to as the fine grid.

Two types of doses may be calculated by the code, "acute" and "lifetime."

Acute doses are calculated to estimate deterministic health effects that can result from high doses delivered at high dose rates. Such conditions may occur in the immediate vicinity of a nuclear facility following hypothetical severe accidents where confinement and/or containment failure has been assumed to occur. Examples of the health effects based on acute doses are early fatality, prodromal vomiting, and hypothyroidism.

Lifetime doses are the conventional measure of detriment used for radiological protection. These are 50-year dose commitments to either specific tissues (e.g., red marrow and lungs) or a weighted sum of tissue doses defined by the International Commission on Radiological Protection and referred to as "effective dose." Lifetime doses may be used to calculate the stochastic health effect risk resulting from exposure to radiation. MACCS2 uses the calculated lifetime dose in cancer risk calculations.

C.9 REFERENCES

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APPENDIX D
ENVIRONMENTAL JUSTICE

D.1 INTRODUCTION

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (59 FR 7629), directs Federal agencies to identify and address, as appropriate, disproportionately high and adverse health or environmental effects of their programs, policies, and activities on minority populations and low-income populations.

The Council on Environmental Quality (CEQ) has oversight responsibility for documentation prepared in compliance with the National Environmental Policy Act (NEPA). In December 1997, CEQ released its guidance on environmental justice under NEPA (CEQ 1997). The CEQ guidance was adopted as the basis for the analysis of environmental justice contained in this *Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory (CMRR EIS).*

This appendix provides an assessment of the potential for disproportionately high and adverse human health or environmental effects on minority and low-income populations resulting from the implementation of the alternatives described in Chapter 2 of this EIS.

D.2 DEFINITIONS

Minority Individuals and Populations

The following definitions of minority individuals and populations were used in this analysis of environmental justice:

- **Minority individuals—**Individuals who are members of the following population groups: Hispanic or Latino, American Indian or Alaska Native, Asian, Black or African American, Native Hawaiian or Other Pacific Islander, or two or more races. This definition is similar to that given in the CEQ environmental justice guidance (CEQ 1997), except that it has been modified to reflect *Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity* (62 FR 58782) and recent guidance (OMB 2000) published by the Office of Management and Budget. These revisions were adopted and used by the Census Bureau in collecting data for Census 2000. When data from the 1990 census are used, a minority individual will be defined as someone self-identified as: Hispanic; American Indian, Eskimo, or Aleut; Asian or Pacific Islander; or Black. As discussed below, racial and ethnic data from the 1990 census cannot be directly compared with that from Census 2000.

  The Office of Management and Budget has also recommended that persons self-identified as multi-racial should be counted as a minority individual if at least one of the races is a minority race (OMB 2000). During Census 2000, approximately two percent of the

population identified themselves as members of more than one race (DOC 2001a). Approximately two-thirds of those designated themselves as members of at least one minority race.

- **Minority population—**Minority populations should be identified where either: (a) the minority population of the affected area exceeds 50 percent, or (b) the minority population percentage of the affected area is meaningfully greater than the minority population percentage in the general population or other appropriate unit of geographic analysis. In identifying minority communities, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a geographically dispersed and transient set of individuals (such as migrant workers or American Indians/Alaska Natives), where either type of group experiences common conditions of environmental exposure or effect. The selection of the appropriate unit of geographic analysis may be a governing body's jurisdiction, a neighborhood, census tract, or other similar unit that is to be chosen so as to not artificially dilute or inflate the affected minority population. A minority population also exists if there is more than one minority group present and the minority percentage, as calculated by aggregating all minority persons, meets one of the above-stated thresholds.

In the discussions of environmental justice in this EIS, persons self-designated as Hispanic or Latino are included in the Hispanic or Latino population, regardless of race. For example, the Asian population is composed of persons self-designated as Asian and not of Hispanic or Latino origin. Asians who designated themselves as having Hispanic or Latino origins are included in the Hispanic or Latino population. Data for the analysis of minority populations in 2000 were extracted from the U.S. Census Bureau's Summary File 1 (DOC 2001b).

Low-Income Populations and Individuals

Executive Order 12898 specifically addresses "disproportionately high and adverse effects" on "low-income" populations. The CEQ recommends that poverty thresholds be used to identify "low-income" individuals (CEQ 1997).

The following definition of low-income population was used in this analysis:

- **Low-income population—**Low-income population in an affected area should be identified with the annual statistical poverty thresholds from the U.S. Census Bureau's *Current Population Reports, Series P–60 on Income and Poverty*. In identifying low-income populations, agencies may consider as a community either a group of individuals living in geographic proximity to one another, or a set of individuals (such as migrant workers or American Indians/Alaska Natives), where either type of group experiences common conditions of environmental exposure or effect (CEQ 1997).

Data for the analysis of low-income populations were extracted from the U.S. Census Bureau's Summary File 3 (DOC 2002a).

Disproportionately High and Adverse Human Health 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 to human health. Disproportionately high and adverse human health effects occur when the risk or rate of exposure to an environmental hazard for a minority population or low-income population is significant and exceeds the risk of exposure rate for the general population or for another appropriate comparison group (CEQ 1997).

Disproportionately High and Adverse Environmental Effects

A disproportionately high environmental impact refers to an impact or risk of an impact in a low-income or minority community that is significant and exceeds the environmental impact on the larger community. An adverse environmental impact is an impact that is determined to be both harmful and significant. In assessing cultural and aesthetic environmental impacts, impacts that uniquely affect geographically dislocated or dispersed or minority low-income populations are considered (CEQ 1997).

Potentially affected areas examined in this EIS include areas defined by a 50-mile (80-kilometer) radius centered on candidate facilities for chemical and metallurgy research (CMR) activities. Potentially affected areas used in the analysis of environmental justice are the same as those used in the analysis of radiological health effects described in Chapter 4.

D.3 SPATIAL RESOLUTION

For the purposes of enumeration and analysis, the Census Bureau has defined a variety of areal units (DOC 2002b, Appendix F). Areal units of concern in this document include (in order of increasing spatial resolution) states, counties, census tracts, block groups, and blocks. The "block" is the smallest of these entities and offers the finest spatial resolution. This term refers to a relatively small geographical area bounded on all sides by visible features such as streets and streams or by invisible boundaries such as city limits and property lines. During the 2000 census, the Census Bureau subdivided the United States and its territories into 8,269,131 blocks (DOC 2002b, Appendix F). For comparison, the number of counties, census tracts, and block groups used in the 2000 census were 3,232; 66,304; and 211,267, respectively. While blocks offer the finest spatial resolution, economic data required for the identification of low-income populations are not available at the block level of spatial resolution. In the analysis below, block-level resolution is used to identify minority populations and block-group-level resolution is used to identify low-income populations.

Boundaries of the areal units are selected to coincide with features such as streams and roads or political boundaries such as county and city borders. Boundaries used for aggregation of the census data usually do not coincide with boundaries used in the calculation of health effects. As discussed in Chapter 4, radiological health effects due to an accident at each of the sites considered for the proposed actions are evaluated for persons residing within a distance of 50 miles (80 kilometers) of an accident site. In general, the boundary of the circle with a 50-mile (80-kilometer) radius centered at the accident site would not coincide with boundaries used by

the Census Bureau for enumeration of the population in the potentially affected area. Some blocks or block groups lie completely inside or outside of the radius used for health effects calculation, while others are only partially included. As a result of these partial inclusions, uncertainties are introduced into the estimate of the population at risk from the accident.

In order to estimate the populations at risk in partially included block groups, it was assumed that populations are uniformly distributed throughout the area of each block group. For example, if 30 percent of the area of a block or block group lies within 50 miles (80 kilometers) of the accident site, it was assumed that 30 percent of the population residing in that block or block group would be at risk.

D.4 Environmental Justice Analysis

This analysis of environmental justice concerns is based on the assessment of the environmental impacts reported in Chapter 4. This analysis was performed to identify any disproportionately high and adverse human health or environmental impacts on minority or low-income populations surrounding the candidate sites. Demographic information obtained from the Census Bureau was used to identify the minority populations and low-income communities in the zone of potential impact surrounding the sites (DOC 2001b, DOC 2002a). Data from Census 2000 were used to identify populations at risk in potentially affected counties.

As discussed in Chapter 2, three technical areas at LANL are associated with the relocation of CMR operations (see **Figure D–1**): (1) TA-3, the location of the existing CMR Building; (2) TA-55, the proposed location for the new CMRR Facility; and (3) TA-6, an alternative "Greenfield" location for the new CMRR Facility. All of the candidate locations are within approximately 1 mile (1.6 kilometers) of each other.

D.4.1 Results for the No Action Alternative

Under the No Action Alternative, CMR operations would continue at the existing CMR Building in TA-3 and no new facilities would be constructed. This section describes the low-income and minority populations living within the potentially affected area surrounding TA-3. It also describes the potential environmental impacts on those populations that could result from implementation of the No Action Alternative.

D.4.1.1 Minority Populations Surrounding TA-3

Figure D–2 shows the potentially affected area centered on Wing 9 of the existing CMR Building. It shows the counties at radiological risk and the composition of the population at risk in each county. The "population at risk" refers to all persons who reside within 50 miles (80 kilometers) of the existing CMR Building or the proposed locations for the new CMRR Facility at TA-55 and TA-6. The 50-mile (80-kilometer) distance was selected to correspond to the radius-of-effects for potential radiological health impacts. The counties at radiological risk are Bernalillo, Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe, and Taos.

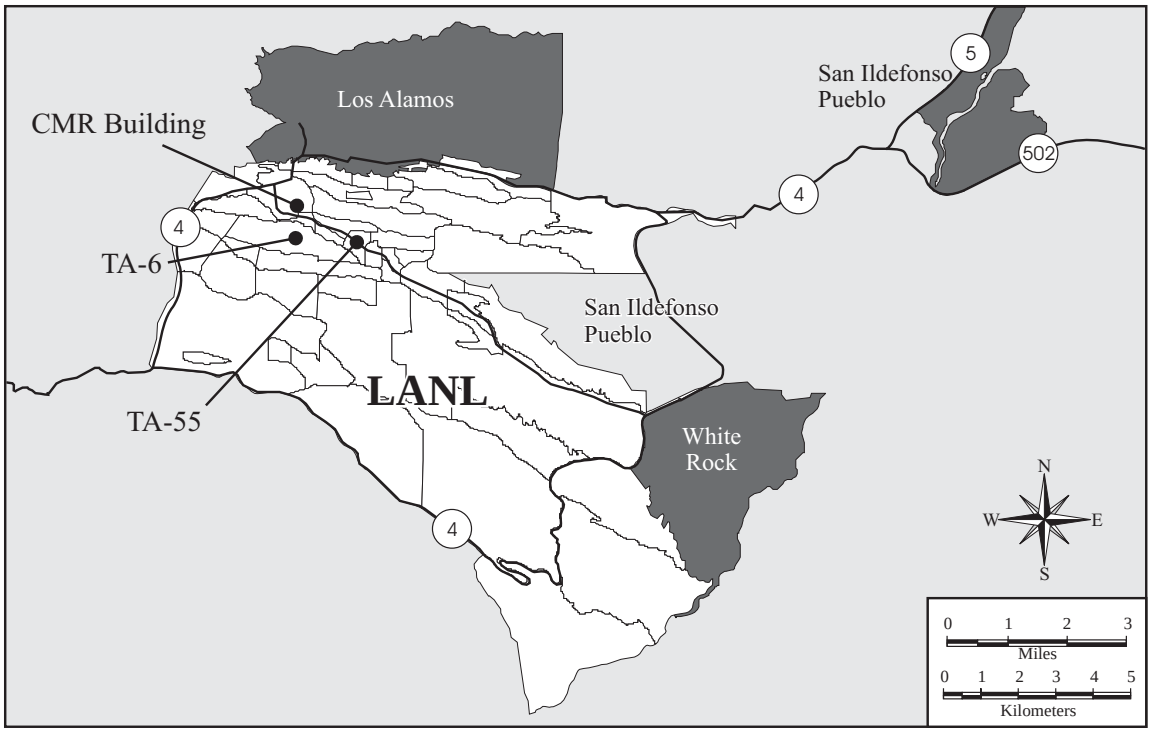

Figure D–1 CMR Building and Sites for the new CMRR Facility

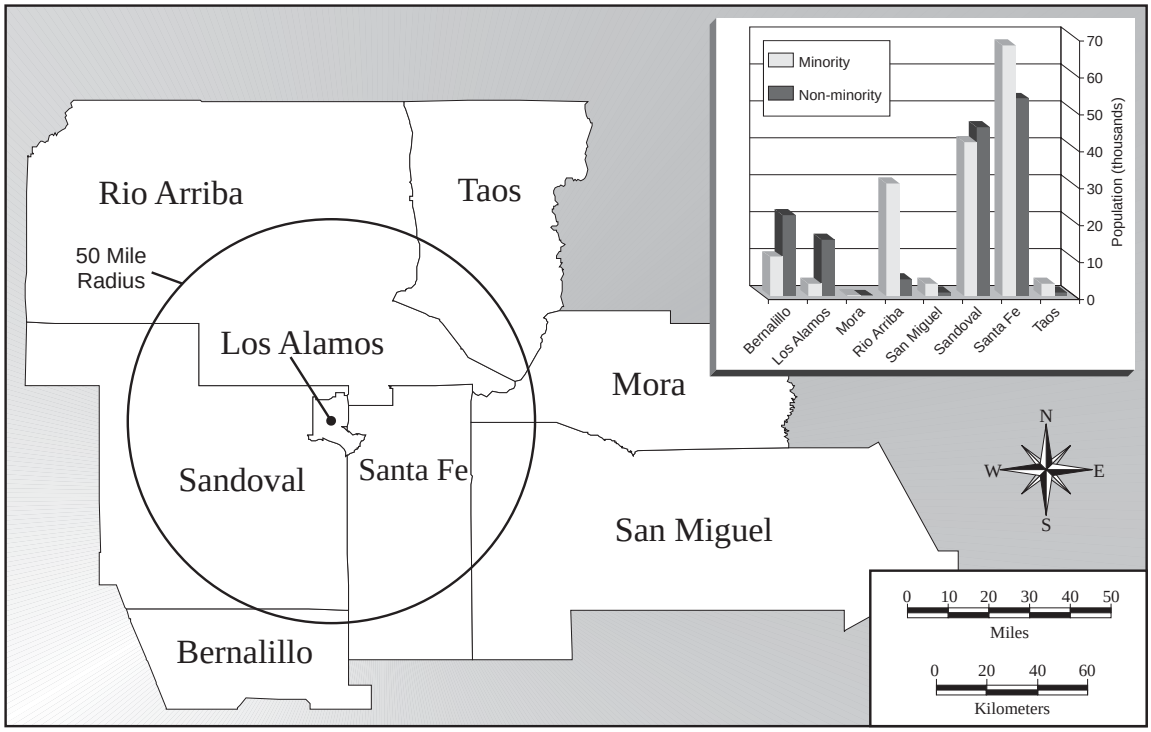

Figure D–2 Minority and Non-Minority Populations Living in Potentially Affected Counties Surrounding TA-3

Minority and non-minority populations living within the 50-mile (80-kilometer) distance from the existing CMR Building are shown as a bar graph for each potentially affected county.

Figure D–3 shows the composition of the minority population as a function of distance from the existing CMR Building. For the potentially affected area surrounding the existing CMR Building, the combined Hispanic or Latino and American Indian populations comprised 94 percent of the total potentially affected minority population in 2000. Moving outward from the location of the existing CMR Building, minority populations increase most noticeably near the outskirts of Española, Santa Fe, and Albuquerque. More than one-half of the potentially affected Hispanic or Latino population lived in the Española-Santa Fe area in the year 2000.

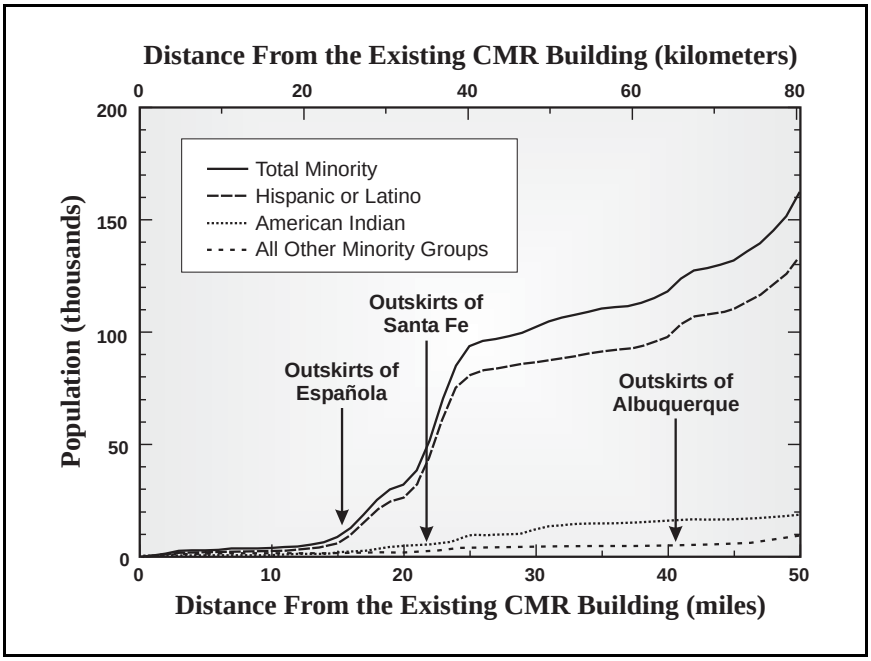

Figure D–3 Minority Populations as a Function of Distance from the Existing CMR Building

As shown in **Table D–1**, approximately 160,000 minority individuals lived within 50 miles (80 kilometers) of the existing CMR Building in the year 2000. Eighty-seven percent of the potentially affected minority population was resident in three of the eight potentially affected counties: Rio Arriba, Sandoval, and Santa Fe Counties.

Table D–1 Minority Populations Living in Potentially Affected Counties Surrounding the Existing CMR Building in the Year 2000

County	*Total Minority Population*	*Potentially Affected Minority Population*	*Percentage of the Totally Affected Minority Population*
Bernalillo	285,081	10,522	6.6
Los Alamos	3,235	3,235	2.0
Mora	4,293	118	< 0.1
Rio Arriba	35,404	30,309	18.9
San Miguel	24,332	3,256	2.0
Sandoval	44,165	41,635	26.0
Santa Fe	69,713	67,686	42.3
Taos	19,597	3,186	2.0
Total	485,820	159,947	100.0*

* Sum of individual percentages may not equal 100 percent due to roundoff.

D.4.1.2 Low-Income Populations Surrounding TA-3

Figure D–4 shows the counties at radiological risk from CMR activities in the existing CMR Building. Low-income and non-low-income populations living within the 50-mile (80-kilometer) distance from the existing CMR Building are shown as a bar graph for each potentially affected county. Eighty-seven percent of the potentially affected low-income population lives in three of the eight potentially affected counties: Rio Arriba, Sandoval, and Santa Fe (See **Table D–2**). Among the 33 counties in New Mexico, 4 of the potentially affected counties have the lowest percentages of their population with incomes below the poverty threshold: Bernalillo, Los Alamos, Sandoval, and Santa Fe.

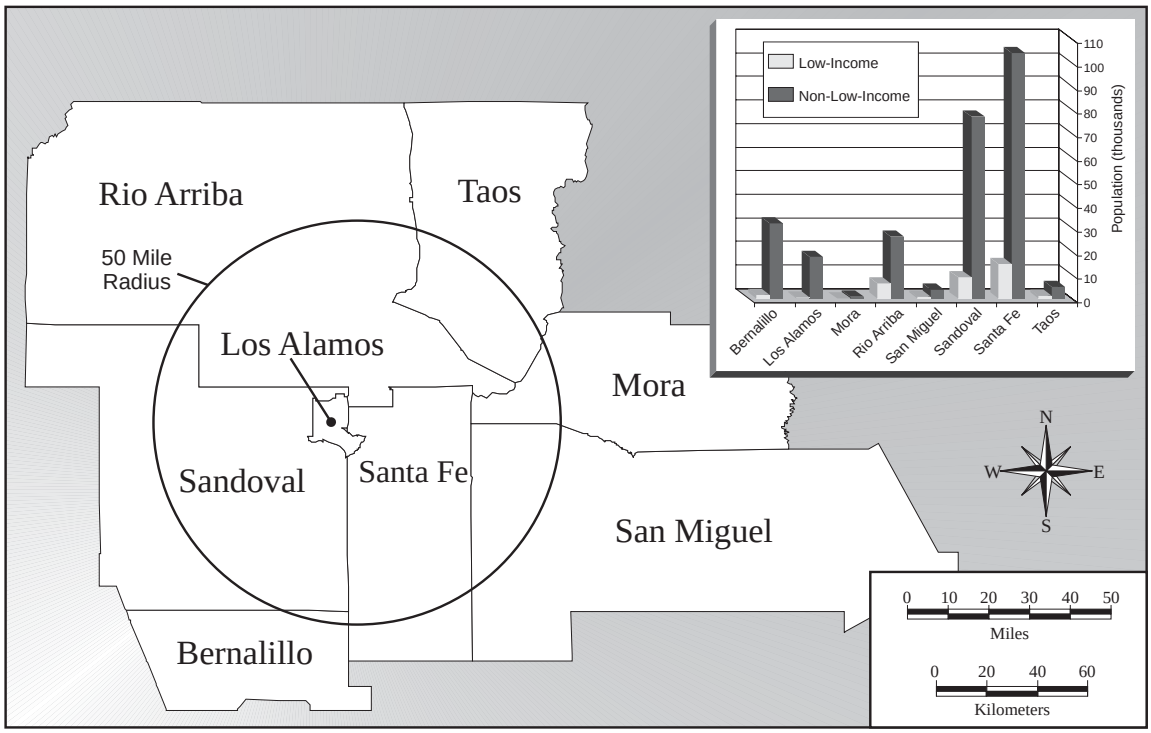

Figure D–4 Low-Income and Non-Low-Income Populations Living in Potentially Affected Counties Surrounding TA-3

Table D–2 Low-Income Populations Surrounding the Existing CMR Building by County

County	*Rank Among All New Mexico Counties (lowest percent poverty among the total county population)*	*Number of Low-Income Persons in County in 2000*	*Low-Income Population at Risk in 2000*	*Percent of the Total Low-Income Population at Risk*
Bernalillo	4	74,987	1,623	4.7
Los Alamos	1	543	543	1.5
Mora	28	1,305	265	0.8
Rio Arriba	18	8,303	6,509	18.6
San Miguel	25	7,110	846	2.4
Sandoval	3	10,847	9,266	26.4
Santa Fe	2	15,241	14,742	42.0
Taos	19	6,232	1,284	3.7

Figure D–5 shows the low-income population surrounding TA-3 as a function of distance from the existing CMR Building. Moving outward from the location of the existing CMR Building, low-income populations increase most noticeably near the outskirts of Española, Santa Fe, and Albuquerque. Approximately one-half of the low-income population lives within 25 miles (40 kilometers) of the existing CMR Building.

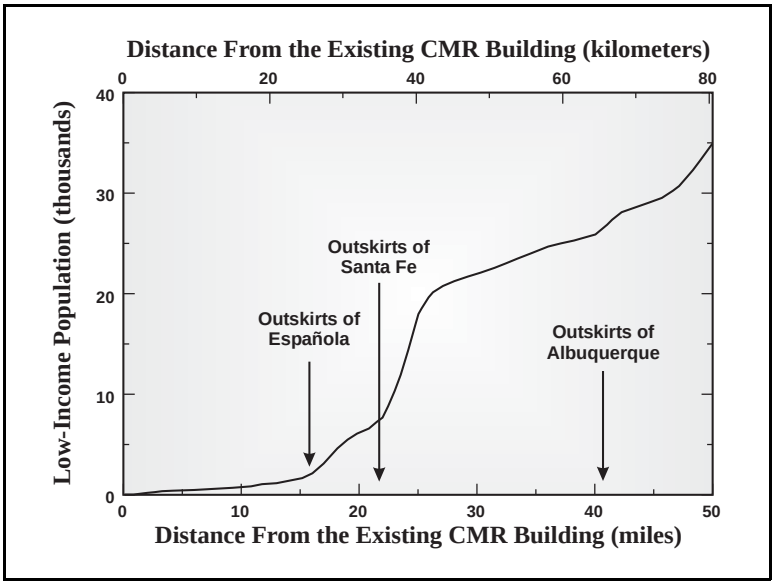

Figure D–5 Low-Income Population as a Function of Distance from the Existing CMR Building

D.4.1.3 Impacts of the No Action Alternative on Low-Income and Minority Populations

Normal Operations

As discussed in Section 4.2.9.1 (see Table 4–3), the likelihood of a fatal cancer to the maximally exposed offsite individual under the No Action Alternative from normal operations would be less than approximately 1 chance in 13 million for each year of exposure. The risk of a latent cancer fatality occurring among the population surrounding the CMR Building would be approximately 1 chance in 2,000 for each year of exposure. Under normal operating conditions, the dose from radiological emissions from the CMR Building would be approximately a factor of 1,400 less than the dose from background radiation present in the potentially affected area surrounding the CMR Building. Also during normal operations under the No Action Alternative, chemical releases to the atmosphere would be less than EPA screening thresholds (40 CFR 68) that designate a hazard to human health.

Thus, normal operations under the No Action Alternative would pose no adverse radiological risk to persons residing in the potentially affected area surrounding the CMR Building, including minority and low-income persons. In addition, the special pathways analysis described in Section D.4.4 shows that CMR operations under the No Action Alternative would not pose an adverse risk to American Indians or others who depend upon subsistence hunting, fishing, and gathering.

Radiological and Chemical Accidents

The risks to the public from potential accidents under the No Action Alternative are discussed in Section 4.3.9.2 (Table 4–5). A severe earthquake would result in the largest radiological risk for the public and the maximally exposed offsite individual. These risks are approximately 1 chance in 500 per year of causing a latent cancer fatality (0.002 latent cancer fatalities) in the total population. Thus, for the accidents evaluated in this EIS under the No Action Alternative, no

latent cancer fatalities among the public would be expected to result from any of these accidents, including minority or low-income persons.

Quantities of toxic and carcinogenic chemicals that would be stored in the CMR Building under the No Action Alternative are less than EPA screening thresholds (40 CFR 68) that designate a hazard to human health. Accidents that could occur at the CMR Building under the No Action Alternative would not pose a chemical release hazard to the public, including minority and low-income persons.

Waste Generation and Management

Waste generated under the No Action Alternative would be the same as currently experienced at LANL. This is because waste generation during CMR operations would not change due to operational restrictions, and therefore, the same types and volumes of waste would be generated (see Section 4.2.11). Section 3.12.1 presents a discussion on the waste types and quantities generated by current CMR activities and compares the waste generated with LANL's available waste management capacities. All wastes currently generated are within LANL's capacity for handling waste. Continuation of CMR activities at the existing CMR Building would not be expected to adversely affect air or water quality, or to result in contamination of Tribal lands adjacent to the LANL boundary.

In summary, implementation of the No Action Alternative would not pose disproportionately high or adverse environmental risks to low-income or minority populations living in the potentially affected area surrounding the existing CMR Building.

D.4.2 Results for Action Alternatives 1 and 3

Under Alternatives 1 and 3, new laboratory building(s) would be constructed at TA-55 to house analytical chemistry and materials characterization activities that are currently conducted at the existing CMR Building. Under Alternative 1, a new administrative offices and support functions building would also be constructed at TA-55 and the existing CMR Building would be partly or totally dispositioned. Under Alternative 3, the existing CMR Building would continue to house administrative offices and support functions for CMR operations. This section describes the low-income and minority populations living within the potentially affected area surrounding TA-55. It also describes the potential environmental impacts on those populations that could result from implementation of Alternatives 1 and 3.

D.4.2.1 Minority Populations Surrounding TA-55

Figure D–6 shows the potentially affected area centered on the proposed location for a new CMRR Facility at TA-55. It shows the counties at radiological risk and the composition of the population at risk in each county. The "population at risk" refers to all persons who reside within 50 miles (80 kilometers) of the new CMRR Facility. The 50-mile (80-kilometer) distance was selected to correspond to the radius-of-effects for potential radiological health impacts. The counties at radiological risk are the same as those discussed under the No Action Alternative: Bernalillo, Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe, and Taos.

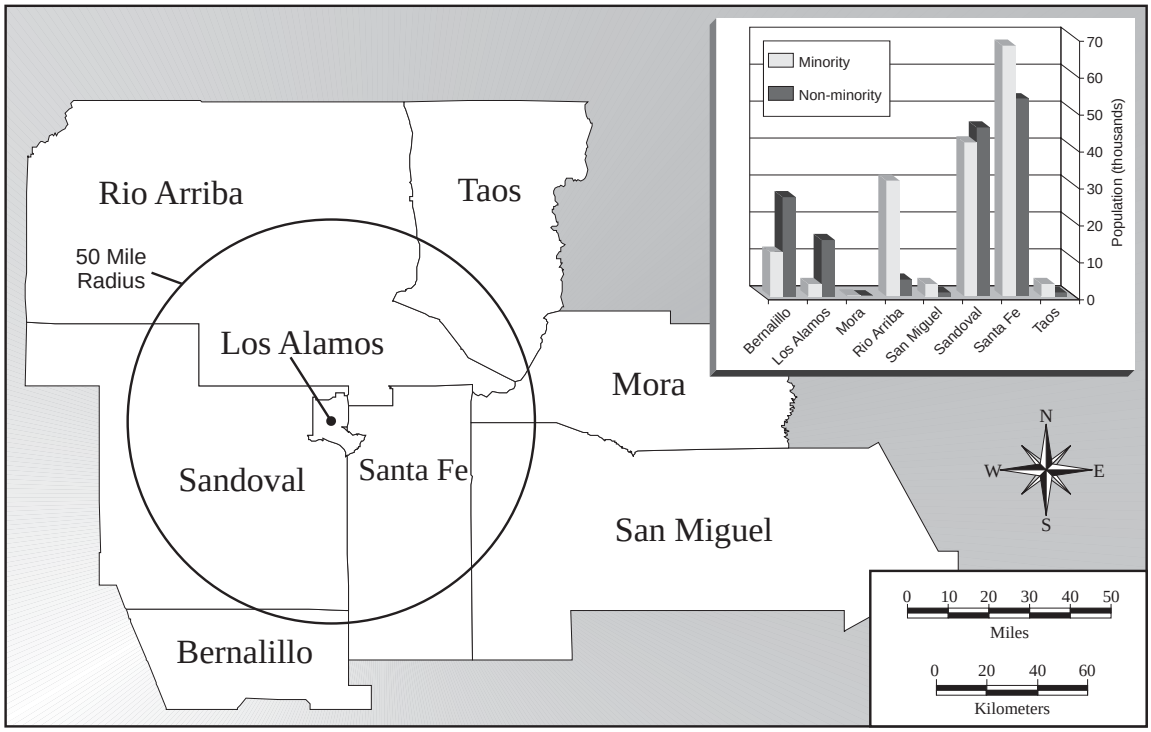

Figure D–6 Minority and Non-Minority Populations Living in Potentially Affected Counties Surrounding TA-55

Minority and non-minority populations living within the 50-mile (80-kilometer) distance from TA-55 are shown as a bar graph for each potentially affected county.

Figure D–7 shows the composition of the minority population as a function of distance from TA-55. The combined Hispanic or Latino and American Indian populations comprised 94 percent of the total potentially affected minority population. Moving outward from TA-55, minority populations increase most noticeably near the outskirts of Española, Santa Fe, and Albuquerque. More than one-half of the potentially affected Hispanic or Latino population lived in the Española-Santa Fe area in the year 2000.

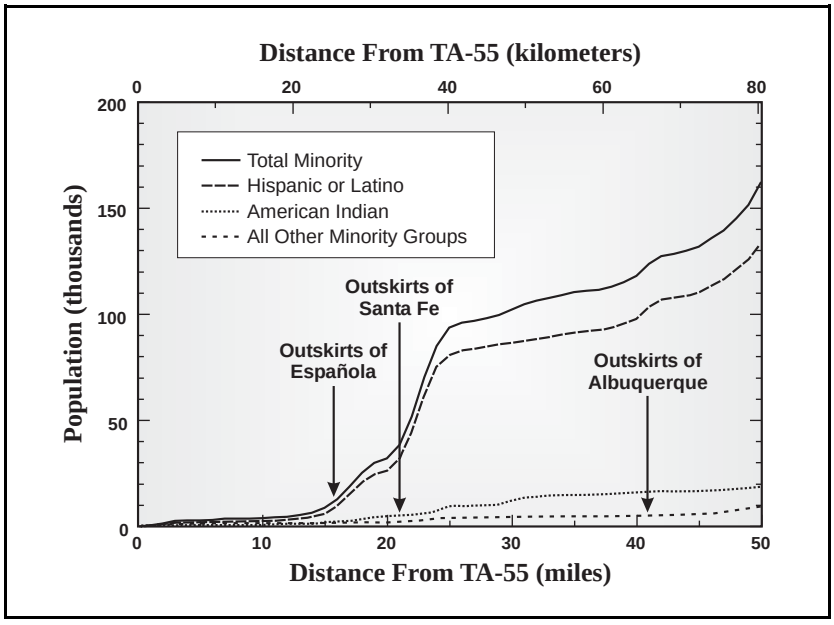

Figure D–7 Minority Populations as a Function of Distance from TA-55

As shown in **Table D–3**, approximately 162,000 minority individuals lived within 50 miles (80 kilometers) of TA-55 in the year 2000. Eighty-six percent of the potentially affected minority population was resident in three of the eight potentially affected counties: Rio Arriba, Sandoval, and Santa Fe Counties.

Table D–3 Minority Populations Living in Potentially Affected Counties Surrounding TA-55 in the Year 2000

County	*Total Minority Population*	*Potentially Affected Minority Population*	*Percentage of the Totally Affected Minority Population*
Bernalillo	285,081	12,432	7.7
Los Alamos	3,235	3,235	2.0
Mora	4,293	172	0.1
Rio Arriba	35,404	30,297	18.7
San Miguel	24,332	3,395	2.1
Sandoval	44,165	41,375	25.6
Santa Fe	69,713	67,746	41.8
Taos	19,597	3,244	2.0
Total	485,820	161,896	100.0

D.4.2.2 Low-Income Populations Surrounding TA-55

Figure D–8 shows the counties at radiological risk from CMR operations that would be conducted at TA-55. Low-income and non-low-income populations living within 50-miles (80-kilometers) are shown as a bar graph for each potentially affected county. Eighty-six percent of the potentially affected low-income population lives in three of the eight potentially affected counties: Rio Arriba, Sandoval, and Santa Fe (see **Table D–4**). Among the 33 counties in New Mexico, 4 of the potentially affected counties have the lowest percentages of their population with incomes below the poverty threshold: Bernalillo, Los Alamos, Sandoval, and Santa Fe.

Table D–4 Low-Income Populations Surrounding TA-55 by County

County	*Rank Among All New Mexico Counties (lowest percent poverty among the total county population)*	*Number of Low-Income Persons in County in 2000*	*Low-Income Population at Risk in 2000*	*Percent of the Total Low-Income Population at Risk*
Bernalillo	4	74,987	1,975	5.6
Los Alamos	1	543	543	1.5
Mora	28	1,305	293	0.8
Rio Arriba	18	8,303	6,495	18.3
San Miguel	25	7,110	920	2.6
Sandoval	3	10,847	9,168	25.8
Santa Fe	2	15,241	14,757	41.6
Taos	19	6,232	1,356	3.8

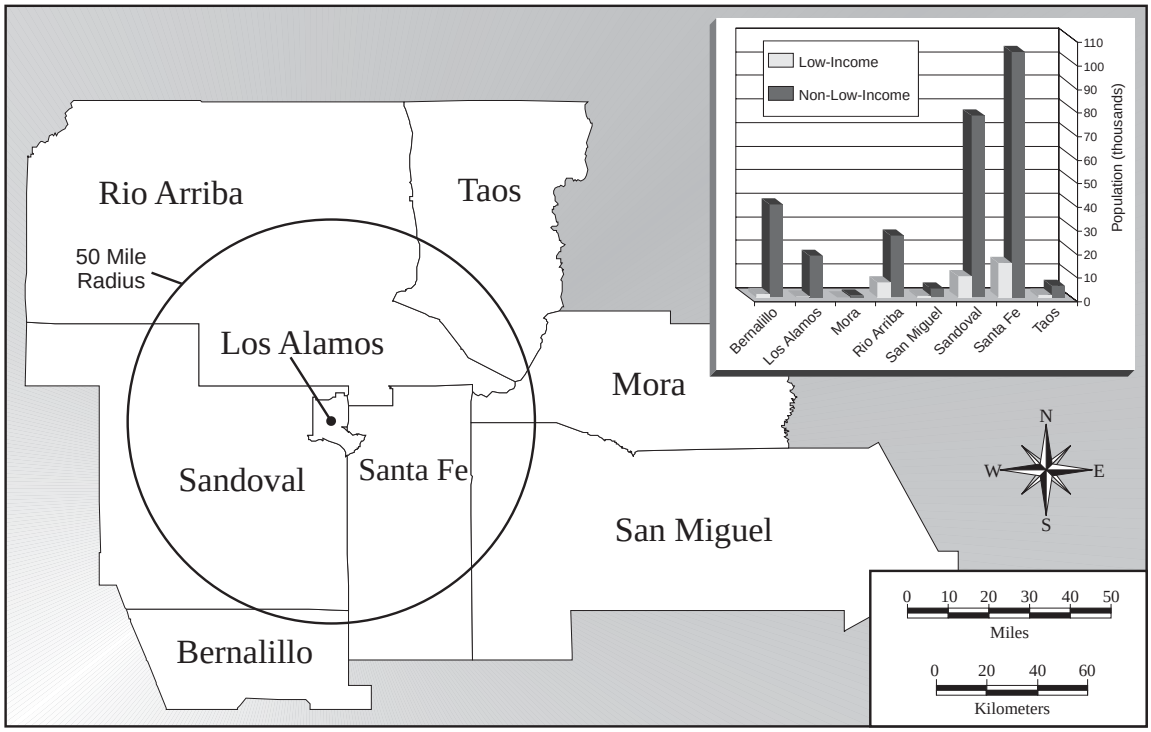

Figure D–8 Low-Income and Non-Low-Income Populations Living in Potentially Affected Counties Surrounding TA-55

Figure D–9 shows the low-income population surrounding TA-55 as a function of distance from TA-55. Moving outward from this location, low-income populations increase most noticeably near the outskirts of Española, Santa Fe, and Albuquerque. Approximately one-half of the low-income population lives within 24 miles (39 kilometers) of TA-55.

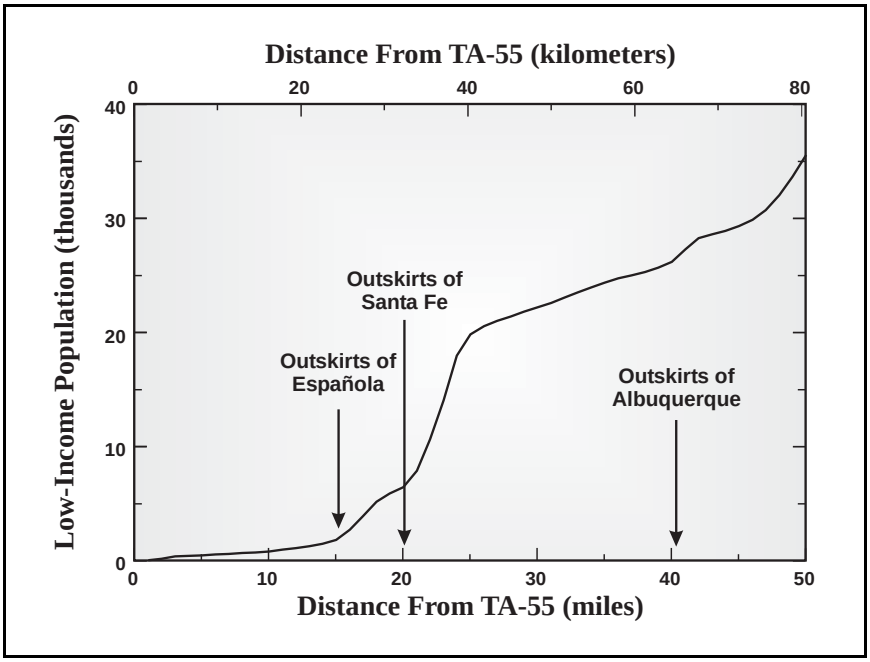

Figure D–9 Low-Income Population as a Function of Distance from TA-55

D.4.2.3 Impacts of Alternatives 1 and 3 on Low-Income and Minority Populations Surrounding TA-55

Construction

Under Alternative 1 (Preferred Alternative), a new administrative offices and support functions building and laboratory building(s) would be constructed at TA-55. Alternative 3 is similar, except that the existing CMR Building would continue to house administrative offices and support functions activities with only new laboratory building(s) being constructed at TA-55. As discussed throughout Sections 4.3 and 4.5, environmental impacts due to construction would be temporary and would not extend beyond the boundary of LANL. Under Alternatives 1 and 3, construction at TA-55 would not result in adverse environmental impacts to members of the public living within the potentially affected area surrounding TA-55, including low-income and minority populations.

Normal Operations

As discussed in Sections 4.3.9.1 and 4.5.9.1, under Alternatives 1 and 3, the likelihood of a cancer fatality to the maximally exposed offsite individual from normal operations at the new CMRR Facility would be less than approximately 1 chance in 6 million for each year of exposure. The risk of a latent cancer fatality occurring among the population surrounding the CMRR Facility at TA-55 would be approximately 1 chance in 1,000 for each year of exposure. Under normal operating conditions, the dose from radiological emissions from the CMRR Facility at TA-55 would be a factor of 700 less than the dose from background radiation present in the potentially affected area surrounding TA-55. Also, during normal operations under Alternatives 1 and 3, chemical releases to the atmosphere would be less than EPA screening thresholds (40 CFR 68) used to designate a hazard to human health.

Thus, normal operations under Alternatives 1 and 3 would pose no adverse risk to minority and low-income populations residing in the potentially affected area surrounding the CMRR Facility at TA-55. In addition, the special pathways analysis described in Section D.4.4 shows that CMR operations would not pose an adverse risk to American Indians or others who depend upon subsistence hunting, fishing, and gathering.

Radiological and Chemical Accidents

The risks to the public from potential accidents under Alternatives 1 and 3 are discussed in Section 4.3.9.2 and presented in Table 4–15. A facility-wide spill would result in the largest radiological consequences for the public and the maximally exposed offsite individual. These risks are approximately 1 chance in 238 of causing a latent cancer fatality (0.0042 latent cancer fatalities) in the total population. Thus, for the accidents evaluated in this EIS under Alternatives 1 and 3, no latent cancer fatalities among the public would be expected to result from any of these accidents, including minority or low-income persons.

Quantities of toxic and carcinogenic chemicals that would be used and stored in the CMRR Facility at TA-55 under Alternatives 1 and 3 are less than EPA screening thresholds (40 CFR 68)

that would pose a hazard to human health. Accidents that could occur at the CMRR Facility under Alternatives 1 and 3 would not pose a chemical release hazard to the public, including minority and low-income persons.

Waste Generation and Management

As discussed in Sections 4.3.11 and 4.5.11, waste generated under Alternatives 1 and 3 would be managed under the existing waste management system at LANL. All waste generated would be within LANL's capacity for handling waste.

In summary, CMR operations under Alternatives 1 and 3 would not be expected to adversely affect air or water quality, or to result in contamination of Tribal lands adjacent to the LANL boundary. Implementation of Alternatives 1 and 3 would not pose disproportionately high or adverse environmental risks to low-income or minority populations living in the potentially affected area surrounding the CMRR Facility at TA-55.

D.4.3 Results for Action Alternatives 2 and 4

Under Alternatives 2 and 4, new laboratory building(s) would be constructed at TA-6 to house analytical chemistry and materials characterization activities that are currently conducted at the existing CMR Building. Under Alternative 2, a new administrative offices and support functions building would also be constructed at TA-6 and the existing CMR Building would be partly or totally dispositioned. Under Alternative 4, the existing CMR Building would continue to house administrative offices and support functions for CMR operations. This section describes the low-income and minority populations living within the potentially affected area surrounding TA-6. It also describes the potential environmental impacts on those populations that could result from implementation of Alternatives 2 and 4.

D.4.3.1 Minority Populations Surrounding TA-6

Figure D–10 shows the potentially affected area centered on the proposed location for a new CMRR Facility at TA-6. It shows the counties at radiological risk and the composition of the population at risk in each county. The "population at risk" refers to all persons who reside within 50 miles (80 kilometers) of the new CMRR Facility. The 50-mile (80-kilometer) distance was selected to correspond to the radius-of-effects for potential radiological health impacts. The counties at radiological risk are the same as those discussed under the No Action Alternative and Action Alternatives 1 and 3: Bernalillo, Los Alamos, Mora, Rio Arriba, Sandoval, San Miguel, Santa Fe, and Taos.

Minority and non-minority populations living within the 50-mile (80-kilometer) distance from TA-6 are shown as a bar graph for each potentially affected county.

Figure D–11 shows the composition of the minority population as a function of distance from TA-6. The combined Hispanic or Latino and American Indian populations comprised 94 percent of the total potentially affected minority population. Moving outward from TA-6, minority populations increase most noticeably near the outskirts of Española, Santa Fe, and Albuquerque.

More than one-half of the potentially affected Hispanic or Latino population lived in the Española-Santa Fe area in the year 2000.

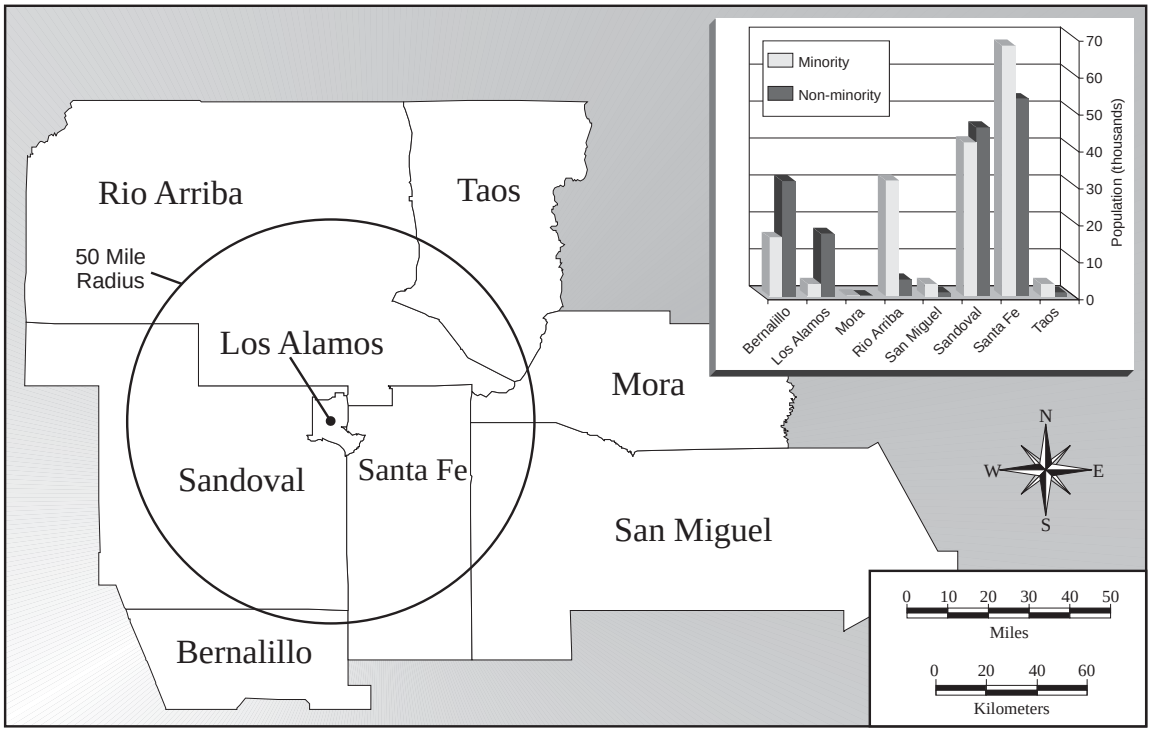

Figure D–10 Minority and Non-Minority Populations Living in Potentially Affected Counties Surrounding TA-6

As shown in **Table D–5**, approximately 165,000 minority individuals lived within 50 miles (80 kilometers) of TA-6 in the year 2000. Eighty-five percent of the potentially affected minority population was resident in three of the eight potentially affected counties: Rio Arriba, Sandoval, and Santa Fe Counties.

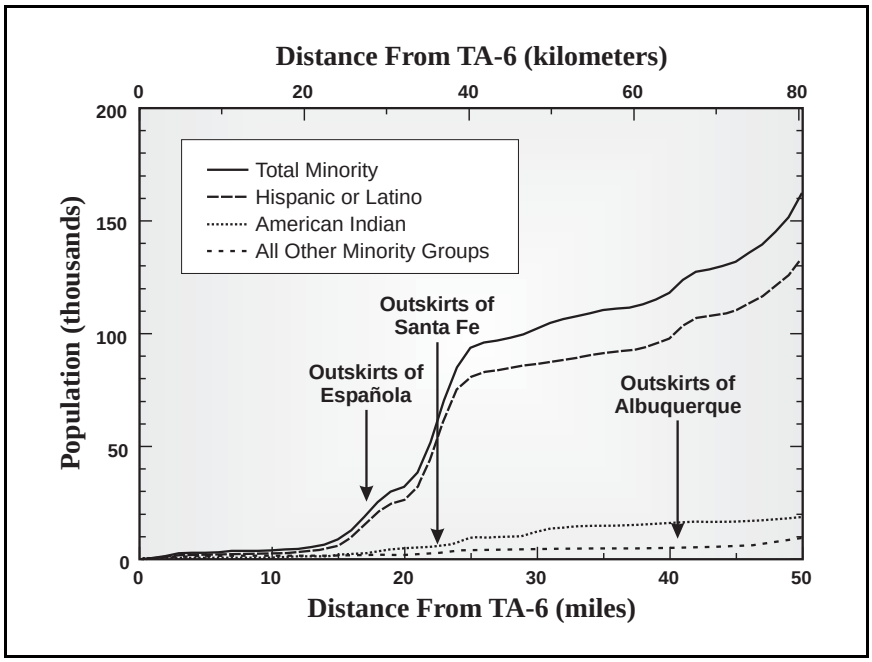

Figure D–11 Minority Populations as a Function of Distance from TA-6

Table D–5 Minority Populations Living in Potentially Affected Counties Surrounding TA-6 in the Year 2000

County	*Total Minority Population*	*Potentially Affected Minority Population*	*Percentage of the Totally Affected Minority Population (percent)*
Bernalillo	285,081	14,999	9.1
Los Alamos	3,235	3,235	2.0
Mora	4,293	111	0.1
Rio Arriba	35,404	30,302	18.4
San Miguel	24,332	3,259	2.0
Sandoval	44,165	41,688	25.3
Santa Fe	69,713	67,712	41.2
Taos	19,597	3,161	1.9
Total	485,820	164,467	100.0

D.4.3.2 Low-Income Populations Surrounding TA-6

Figure D–12 shows the counties at radiological risk from CMR operations that would be conducted at TA-6. Low-income and non-low-income populations living within 50-miles (80-kilometers) are shown as a bar graph for each potentially affected county. Eighty-five percent of the potentially affected low-income population lives in three of the eight potentially affected counties: Rio Arriba, Sandoval, and Santa Fe (see **Table D–6**). Among the 33 counties in New Mexico, 4 of the potentially affected counties have the lowest percentages of their population with incomes below the poverty threshold: Bernalillo, Los Alamos, Sandoval, and Santa Fe.

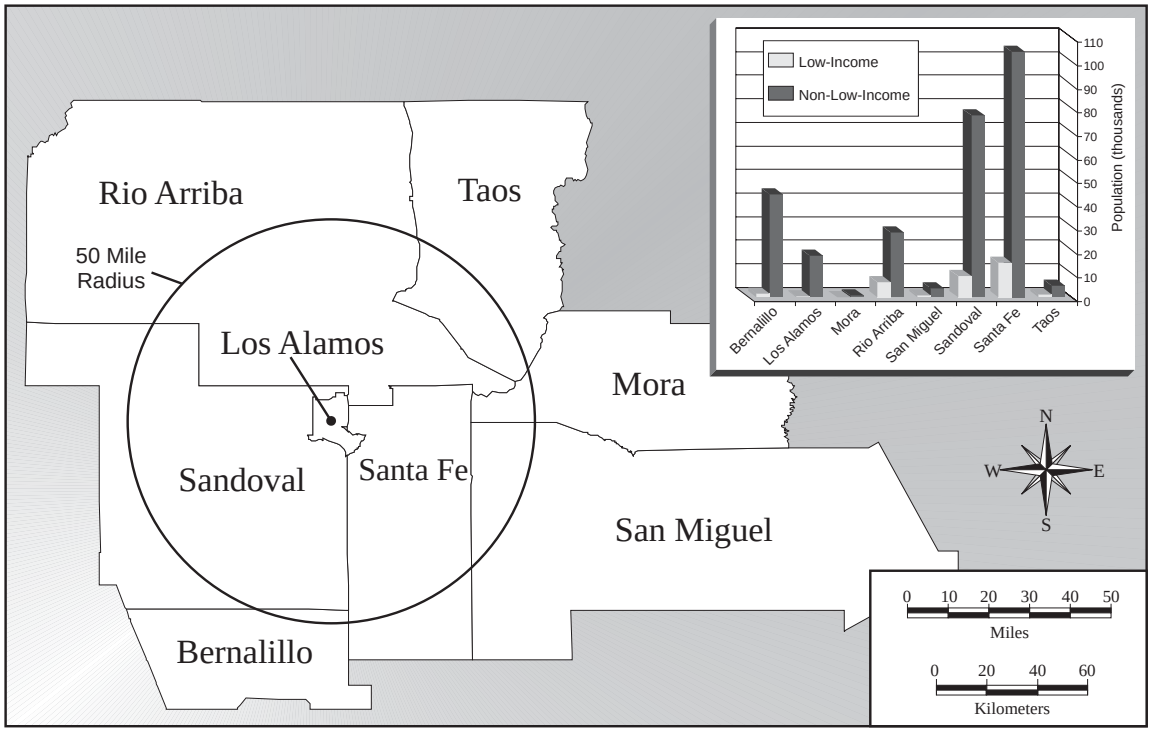

Figure D–12 Low-Income and Non-Low-Income Populations Living in Potentially Affected Counties Surrounding TA-6

Table D–6 Low-Income Populations Surrounding TA-6 by County

County	*Rank Among All New Mexico Counties (lowest percent poverty among the total county population)*	*Number of Low-Income Persons in County in 2000*	*Low-Income Population at Risk in 2000*	*Percent of the Total Low-Income Population at Risk*
Bernalillo	4	74,987	2,319	6.5
Los Alamos	1	543	543	1.5
Mora	28	1,305	261	0.7
Rio Arriba	18	8,303	6,503	18.1
San Miguel	25	7,110	847	2.4
Sandoval	3	10,847	9,292	26.0
Santa Fe	2	15,241	14,747	41.3
Taos	19	6,232	1,236	3.5

Figure D–13 shows the low-income population surrounding TA-6 as a function of distance from TA-6. Moving outward from this location, low-income populations increase most noticeably near the outskirts of Española, Santa Fe, and Albuquerque. Approximately one-half of the low-income population lives within 25 miles (40 kilometers) of TA-6.

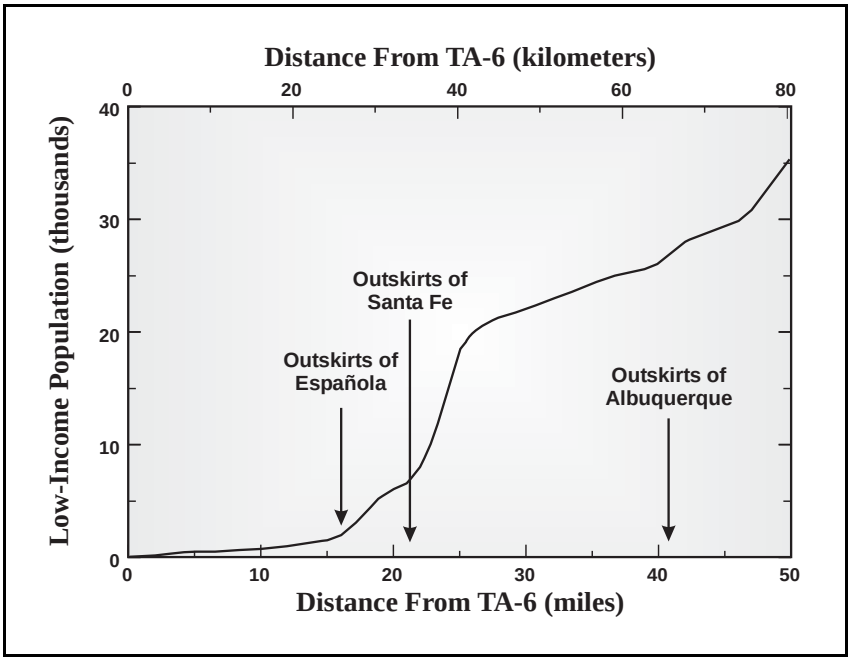

Figure D–13 Low-Income Population as a Function of Distance from TA-6

D.4.3.3 Impacts of Alternatives 2 and 4 on Low-Income and Minority Populations Surrounding TA-6

Construction

Under Alternative 2, a new administrative offices and support functions building and laboratory building(s) would be constructed at TA-6. Alternative 4 is similar, except that the existing CMR Building would continue to house administrative offices and support functions activities with only new laboratory building(s) being constructed at TA-6. As discussed throughout Sections 4.4 and 4.6, environmental impacts due to construction would be temporary and would not extend beyond the boundary of LANL. Under Alternatives 2 and 4, construction at TA-6

would not result in adverse environmental impacts to members of the public living within the potentially affected area surrounding TA-6, including low-income and minority populations.

Normal Operations

As discussed in Sections 4.4.9.1 and 4.6.9.1, under Alternatives 2 and 4, the likelihood of a cancer fatality to the maximally exposed offsite individual from normal operations at the new CMRR Facility would be less than approximately 1 chance in 5.6 million for each year of exposure. The risk of a latent cancer fatality occurring among the population surrounding the CMRR Facility at TA-6 would be approximately 1 chance in 1,000 for each year of exposure. Under normal operating conditions, the dose from radiological emissions from the CMRR Facility would be a factor of 700 less than the dose from background radiation present in the potentially affected area. Also, during normal operations under Alternatives 2 and 4, chemical releases to the atmosphere would be less than EPA screening thresholds (40 CFR 68) that designate a hazard to human health.

Thus, normal operations under Alternatives 2 and 4 would pose no adverse risk to minority and low-income populations residing in the potentially affected area surrounding the CMRR Facility at TA-6. In addition, the special pathways analysis described in Section D.4.4 shows that CMR operations would not pose an adverse risk to American Indians or others who depend upon subsistence hunting, fishing, and gathering.

Radiological and Chemical Accidents

The risks to the public from potential accidents under Alternatives 2 and 4 are discussed in Section 4.3.9.2 and presented in Table 4–25. A severe facility-wide spill would result in the largest radiological consequences for the public and the maximally exposed offsite individual. These risks are approximately 1 chance in 250 of causing a latent cancer fatality (0.004 latent cancer fatalities) in the total population. Thus, for beyond design basis accidents evaluated in this EIS under Alternatives 2 and 4, no latent cancer fatalities among the public would be expected to result from any of these accidents, including minority or low-income persons.

Quantities of toxic and carcinogenic chemicals that would be used and stored at the CMRR Facility at TA-6 under Alternatives 2 and 4 are less than EPA (40 CFR 68) screening thresholds used to designate hazards to human health. Accidents that could occur at the CMRR Facility under Alternatives 2 and 4 would not pose a chemical release hazard to the public, including minority and low-income persons.

Waste Generation and Management

As discussed in Sections 4.4.11 and 4.6.11, waste generated under Alternatives 2 and 4 would be managed under the existing waste management system at LANL. All waste generated would be within LANL's capacity for handling waste.

In summary, CMR operations under Alternatives 2 and 4 would not be expected to adversely affect air or water quality, or to result in contamination of Tribal lands adjacent to the LANL

boundary. Implementation of Alternatives 2 or 4 would not pose disproportionately high or adverse environmental risks to low-income or minority populations living in the potentially affected area surrounding the CMRR Facility at TA-6.

D.4.4 Special Pathways Analysis

As shown in Figures D–3, D–7, and D–11, minority populations surrounding the existing CMR Building and the proposed locations for the CMRR Facility at TA-55 and TA-6 are comprised largely of Hispanics and American Indians. Radiological health impacts discussed in Chapter 4 and Appendix B of this EIS consider the exposure of the general public to external radiation, inhalation of airborne radioactive materials and hazardous chemicals, ingestion of contaminated water and food, and the inadvertent ingestion of contaminated soils. Special exposure pathways such as the ingestion of radiologically contaminated herbal teas, game, and fish could have additional impacts on American Indians or others who depend on subsistence hunting, fishing, and gathering. An evaluation of health impacts that could arise from the ingestion of contaminated food through special pathways was performed during preparation of the *LANL SWEIS* (DOE 1999; Appendix D, Section D.2). It found that ingestion risks from special pathways were the same for all alternatives evaluated in the *LANL SWEIS* (including the Expanded Operations Alternative) because most of the ingestion risk is attributable to existing levels of radiological contamination in water and soils local to the Los Alamos area (DOE 1999, Section 5.3.6.1). **Table D–7** summarizes the results of the special pathways analysis. The annual dose to exposed individuals resulting from the ingestion of local fish, elk, piñon nuts, and herbal tea brewed from locally grown plants was estimated to be approximately 3.2 millirem. The associated radiological risk would be approximately 1 chance in 620,000 of an exposed individual contracting a fatal cancer for each year of exposure. Since the operational characteristics of the CMRR Facility are based on the level of CMR operations required to support the *LANL SWEIS* Expanded Operations Alternative and the ingestion risk is the same for all of the alternatives evaluated in the *LANL SWEIS*, CMR operations would not be expected to pose an adverse risk to American Indians or others who depend on subsistence hunting, fishing, and gathering.

Table D–7 Worst-Case Public Radiological Dose and Potential Consequences by Ingestion Pathways for Special Pathways Receptors, All Alternatives [a]

Exposure Pathway	*Special Pathways Receptors* [b]	
	Dose (millirem per year)	*Chance of an Excess Latent Cancer Fatality Per Year*
Fish	0.46	1 in 4,300,000
Elk heart and liver	0.034	1 in 59,000,000
Piñon nuts	0.13	1 in 15,000,000
Indian tea (cota)	2.60	1 in 770,000
Total	3.22	1 in 620,000

[a] Because almost all public ingestion is from naturally-occurring radionuclides, weapons testing fallout, and contamination from past operations, the ingestion dose is not affected by the alternatives (DOE 1999, Section 5.1.6).

[b] Special pathways receptors are those with traditional Native American or Hispanic lifestyles.

D.5 REFERENCES

CEQ (Council on Environmental Quality), 1997, *Environmental Justice Guidance Under the National Environmental Policy Act*, Executive Office of the President, Washington, DC, (*available at http://tis.eh.doe.gov/nepa/tools/guidance/volumei.htm*), December 10.

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DOC (U.S. Department of Commerce), 2001b, *TECHNICAL DOCUMENTATION: Census 2000 Summary File 1 Technical Documentation*, SF1/04 (RV), Bureau of the Census, Washington, DC, (*available at http://www2.census.gov/census_2000/datasets/Summary_File_1/*), December.

DOC (U.S. Department of Commerce), 2002a, *TECHNICAL DOCUMENTATION: Census 2000 Summary File 3 Technical Documentation*, U.S. Census Bureau, SF3/02(RV), Washington, DC, (*available at http://www2.census.gov/census_2000/datasets/Summary_File_3/*), August.

DOC (U.S. Department of Commerce), 2002b, *Census 2000 TIGER/Line Files Technical Documentation*, UA 2000, Bureau of the Census, Washington, DC, (*available at http://www.census.gov/geo/www/tiger/tigerua/ua_tgr2k.html*), April.

DOE (U.S. Department of Energy), 1999, *Site-Wide Environmental Impact Statement for Continued Operation of the Los Alamos National Laboratory*, DOE/EIS-0238, Albuquerque Operations Office, Albuquerque, New Mexico, January.

OMB (Office of Management and Budget), 2000, *Guidance on Aggregation and Allocation of Data on Race for Use in Civil Rights Monitoring and Enforcement*, OMB Bulletin No. 00-02, Washington, DC, (*available at http://www.whitehouse.gov/omb/bulletins/b00-02.html*), March 9.

APPENDIX E
PUBLIC PARTICIPATION PROCESS

This appendix describes the public comment process for the National Nuclear Security Administration's (NNSA) *Draft Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory, Los Alamos, New Mexico*. Section E.1 describes the process for obtaining public comments on the *CMRR Draft EIS* and identifies the comment period and the location and date of public hearings. Section E.2 addresses the public hearing format, while Section E.3 discusses comment disposition. Sections E.4 and E.5 provide the comments presented at the public hearings and received via U.S. mail, e-mail, toll-free 800-number phone line, and toll-free fax, respectively, as well as NNSA's responses to those comments.

E.1 OVERVIEW

In May 2003, NNSA published the *CMRR Draft EIS*. National Environmental Policy Act (NEPA) regulations mandate a minimum 45-day public comment period after publication of a draft EIS to provide an opportunity for the public and other stakeholders to comment on the EIS analysis and results. The public comment period on the *CMRR Draft EIS* began on May 16, 2003 and ended June 30, 2003 (46 days). During this comment period, public hearings were held in Los Alamos and Pojoaque, New Mexico. In addition, the public was encouraged to submit comments via the U.S. mail, e-mail, toll-free phone number, and fax.

The number of persons estimated in attendance at each hearing or meeting, together with the number of comments submitted and recorded, are presented in **Table E–1**. These attendance estimates are based on the number of registration forms completed and returned at each hearing or meeting, as well as a rough "head count" of the audience, and may not include all those present.

The public hearing comments were combined with comments received by other means (specifically, U.S. mail, e-mail, toll-free phone number, and fax) during the public comment period. Written comments were date-stamped and assigned a sequential document number. **Table E–2** lists the number of comments received by method of submission.

Table E–1 Public Hearing/Meeting Locations, Attendance, and Comments Received

Location	*Date*	*Estimated Attendance*	*Comments*
Los Alamos, New Mexico	June 3, 2003	14	9
Pojoaque, New Mexico	June 4, 2003	10	17

Table E–2 Method of Comment Submission

Method	*Number of Comments*
1-800 Number	0
E-mail	142
Fax	22
Hearings (written / oral)	0 / 29
U.S. Mail	29
Total	222

E.2 PUBLIC HEARING FORMAT

The public hearings were organized to encourage public comments on the *CMRR Draft EIS* and to allow two-way interaction between members of the public and representatives of the U.S. Department of Energy (DOE) and NNSA. A court reporter was present at each hearing to record the proceedings and provide a transcript of the public comments and the dialogue between the public and the NNSA representatives on hand. These transcripts are available in DOE public reading rooms in New Mexico and Washington, DC.

The format used for each hearing included a presentation, question and answer session, and a public comment period. The hearing opened with a welcome from the facilitator, followed by a presentation of the proposed action by a representative of the NNSA. The facilitator next opened the question and answer session to give the audience a chance to ask questions about the presentation. This was followed by the public comment session, during which attendees were given an opportunity to comment and read from prepared statements. Following the public hearings, comments were identified from the transcripts of each hearing.

E.3 COMMENT DISPOSITION

All comments received during the *CMRR Draft EIS* comment period appear in Section E.4 and E.5 of this appendix. Section E.4 contains transcripts of the oral comments made at each of the two public hearings, along with NNSA's responses to each comment. Section E.5 presents scanned images of written comments received via U.S. mail, e-mail, and fax, along with NNSA's response to each comment.

Table E–3 is an index of all commentors who made statements at the public hearings or submitted comments during the public comment period, including members of the public, representatives of organizations or agencies, and public officials. Commentors are listed alphabetically by their last name, along with the page on which their comments appear in Sections E.4 or E.5. **Table E–4** identifies separately Federal, state, and local officials and agencies; companies; organizations; and special interest groups that submitted comments.

Table E–3 Index of Commentors

Commentor	***Commentor Number***	*Page Number*
John R. Acker	13 (campaign)	E-91
Matt Alexander	13 (campaign)	E-92
Denise Arthur	13 (campaign)	E-92
Linda Aspenwind	13 (campaign)	E-92
Leslie Behn	13 (campaign)	E-92
Shama Beach	13 (campaign)	E-92
Julie Bechko	13 (campaign)	E-92
Michael Bechko	13 (campaign)	E-92
Kathryn S. Becker	13 (campaign)	E-92
Deborah Beleff-Raynor	13 (campaign)	E-92
Shirley A. Belz	13 (campaign)	E-92
James T. Bemy	13 (campaign)	E-92
Stanley Beyrle	13 (campaign)	E-92
A.D. Bittson	13 (campaign)	E-92
Peter Botting	13 (campaign)	E-92
Jan Boyer	13 (campaign)	E-92
Keri Boynt	13 (campaign)	E-92
Bill Brimijoin	13 (campaign)	E-92
Andy Brokmeyer	14	E-93
Mary Bronsteter	13 (campaign)	E-92
Sarah Brooke Bishop	13 (campaign)	E-92
Mark W. Bundy	13 (campaign)	E-92
Janet Burstein	13 (campaign)	E-92
Aaron B. Czerny	13 (campaign)	E-92
Clark Case	13 (campaign)	E-92
Karen Cohen	13 (campaign)	E-92
Myles Courtney	13 (campaign)	E-92
Kathy & Phil Dahl-Bredine	13 (campaign)	E-92
Steve D. Dees	13 (campaign)	E-92
Michele Desgroseilliers	13 (campaign)	E-92
Jody C. Donaldson	13 (campaign)	E-92
Ann Eberlein	13 (campaign)	E-92
M. Jane Engel	13 (campaign)	E-92
Jay Ertel	13 (campaign)	E-92
Barbara Ford	13 (campaign)	E-92
Bernadette Fernandez	13 (campaign)	E-92
Sierra Fernandez	13 (campaign)	E-92
Raymond Finck	13 (campaign)	E-92
Dee Finney	13 (campaign)	E-92
Bobbie Fleming	13 (campaign)	E-92
Kimberly A. Foree	13 (campaign)	E-92
John & Diane Forsdale	13 (campaign)	E-92
Antoinette Fox	13 (campaign)	E-92
Colby Friend	13 (campaign)	E-92
Graciela Garcia	13 (campaign)	E-92
Jade Garcia	13 (campaign)	E-92
Myra Garcia	13 (campaign)	E-92

Commentor	***Commentor Number***	*Page Number*
Percyne Gardner	13 (campaign)	E-92
David R. Genth	13 (campaign)	E-92
Janice Gildea	13 (campaign)	E-92
Joe Gildea	13 (campaign)	E-92
Beth Ann Gillian	13 (campaign)	E-92
Kathleen Ann Gonzalez	13 (campaign)	E-92
Sally Goodknight	13 (campaign)	E-92
Matthew Goodro	13 (campaign)	E-92
Abraham J. Gordon	13 (campaign)	E-92
Patricia Griffin	13 (campaign)	E-92
Irena Grygorowicz	13 (campaign)	E-92
Linda H. Hardman	13 (campaign)	E-92
Jonathan Hare	13 (campaign)	E-92
Bob Harris	13 (campaign)	E-92
Barry Hatfield	13 (campaign)	E-92
Ann Hendrie	13 (campaign)	E-92
Linda Hibbs	15	E-94
Leah Hobgood	13 (campaign)	E-92
Nathan Houchin	13 (campaign)	E-92
Douglas Hughes, M.D.	13 (campaign)	E-92
Tiffany Hunter	13 (campaign)	E-92
Dorothy Jensen	13 (campaign)	E-92
Norma Jett	16	E-95
Marge Johnson	13 (campaign)	E-92
Richard Johnson	8	E-80
Alison Jones	13 (campaign)	E-92
Miles Jones	13 (campaign)	E-92
Kate Keely	13 (campaign)	E-92
Joy Kincaid	13 (campaign)	E-92
Kim A. Kirkpatrick	13 (campaign)	E-92
Sheri Kotowski	13 (campaign)	E-92
Tom Krozik	13 (campaign)	E-92
Alice K. Ladas	13 (campaign)	E-92
Leslie LaKind, D.D.S.	13 (campaign)	E-92
Brad Landers	13 (campaign)	E-92
Shaphan Laos	13 (campaign)	E-92
Jack Larson	13 (campaign)	E-92
Rick Lass	13 (campaign)	E-92
James Latorie	13 (campaign)	E-92
Lisa Law	13 (campaign)	E-92
Pilar Law	13 (campaign)	E-92
Patricia A. Leahan	13 (campaign)	E-92
R. Leland Lehrman	13 (campaign)	E-92
Andy Lilley	13 (campaign)	E-92
Susannah H. Lippman	13 (campaign)	E-92
Becky Lo Dolce	13 (campaign)	E-92
Ashana Lobody	13 (campaign)	E-92
Dale Lock	13 (campaign)	E-92

Commentor	***Commentor Number***	*Page Number*
Ross Lockridge and Ann Murray	17	E-96
Jane Lumsden	13 (campaign)	E-92
Sue Shen Lyons	13 (campaign)	E-92
Michael Mandell	13 (campaign)	E-92
Tor Matson	13 (campaign)	E-92
Dominique Mazeaud	13 (campaign)	E-92
Kristina McCarthy	13 (campaign)	E-92
M. Rachel McCarthy	13 (campaign)	E-92
Karen McClaren & Marcia Naveau	13 (campaign)	E-92
Anne McConnell	13 (campaign)	E-92
Beverly A. McCrary	13 (campaign)	E-92
Rita McElmury	13 (campaign)	E-92
Eric McEuen	13 (campaign)	E-92
Amy McFall	13 (campaign)	E-92
Caitlin McKee	13 (campaign)	E-92
Christine McLorrain	13 (campaign)	E-92
Lesley A. Michaels	13 (campaign)	E-92
Chris Mechels	201	E-15
Celeste Miller	13 (campaign)	E-92
Larry Miller	13 (campaign)	E-92
Ian Mioh	13 (campaign)	E-92
Ignacio Montano	13 (campaign)	E-92
Phyllis Montgomery	13 (campaign)	E-92
Carlos Mora	13 (campaign)	E-92
Ramona Morino	13 (campaign)	E-92
Amanda Murchison	13 (campaign)	E-92
Frank E. Murchison	13 (campaign)	E-92
Linda Naranjo-Huebl	13 (campaign)	E-92
Margaret Nes	13 (campaign)	E-92
David Nesbit	13 (campaign)	E-92
Renze Nesbit	13 (campaign)	E-92
Shel Neymark	13 (campaign)	E-92
Francesca Oldeni-Neff	13 (campaign)	E-92
Dennis Overman	13 (campaign)	E-92
Eileen Overman	13 (campaign)	E-92
Michael T. Pacheco	13 (campaign)	E-92
Claudia Parker	13 (campaign)	E-92
Robert E. Pearson	13 (campaign)	E-92
Antonio Perz	10	E-87
Giselle Piburn	13 (campaign)	E-92
Dave Pierce	13 (campaign)	E-92
Steve Piersol	13 (campaign)	E-92
Peter Prandoni	13 (campaign)	E-92
Jean Porteus	13 (campaign)	E-92
Robert Raynor	13 (campaign)	E-92
Adam Read	13 (campaign)	E-92
Matthew Reen	13 (campaign)	E-92
Alan Reis, II	13 (campaign)	E-92

Commentor	***Commentor Number***	*Page Number*
Robert Romeo	13 (campaign)	E-92
A. Ronew	13 (campaign)	E-92
Stanley Rosen	13 (campaign)	E-92
Eva Marie Salas	11	E-88
Jay Gilbert Sanchez	202	E-16
Cathy Sanchez	203	E-18
Lara A. Schwartz	13 (campaign)	E-92
Paula Seaton	13 (campaign)	E-92
Robert Seton	13 (campaign)	E-92
Michael Shorv	13 (campaign)	E-92
Raymond Singer, Ph.D.	13 (campaign)	E-92
Wendy Singer	13 (campaign)	E-92
Elliott Skinner	18	E-97
Shannyn Sollitt	13 (campaign)	E-92
J. Thea Spaeth	13 (campaign)	E-92
Jeff Spicer	13 (campaign)	E-92
Sonia Stromberg	13 (campaign)	E-92
Martin Suazo, Sr.	13 (campaign)	E-92
Cathie Sullivan	9	E-83
Cathy Swedlund	13 (campaign)	E-92
Michael Thebo	13 (campaign)	E-92
Stephanie Thebo	13 (campaign)	E-92
Laura Thompson	13 (campaign)	E-92
Elizabeth Blythe Timken	13 (campaign)	E-92
Aileen Torres-Hughes	13 (campaign)	E-92
Patrick L. Travers	13 (campaign)	E-92
Robin Urton	13 (campaign)	E-92
Jason P. Walsh	13 (campaign)	E-92
Ann P. Ware	12	E-89
Sally J. Warnick	13 (campaign)	E-92
Deanna M. Watson	13 (campaign)	E-92
Mark L. Watson	13 (campaign)	E-92
Kimberly Webber	13 (campaign)	E-92
Melonie Weishuhn	13 (campaign)	E-92
Michael Wiese	13 (campaign)	E-92
Michael Wiggs-West	13 (campaign)	E-92
Amy Williams	13 (campaign)	E-92
Dean Williamson	13 (campaign)	E-92
Natasha Williamson	13 (campaign)	E-92
Keith R. Wuertz	13 (campaign)	E-92
John F. Young	13 (campaign)	E-92
Nina Zelenunsky	13 (campaign)	E-92
Tiffin Zellers	13 (campaign)	E-92
Cecile J. Zeigler	13 (campaign)	E-92
Alice Zorthian	13 (campaign)	E-92

Table E–4 Index of Public Officials, Organizations, and Public Interest Groups

Commentor Information	***Commentor Number***	***Page Number***
Concerned Citizens for Nuclear Safety, Joni Arends	13 101	E-90 E-9
Pueblo De San Ildefonso, Governor John Gonzales, New Mexico	1	E-25
Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani, Ph.D	5	E-40
Nuclear Watch, Jay Coghlan	7 200	E-65 E-14
Sisters of Loretto, Pennelope McMullen	6 204	E-52 E-20
State of New Mexico Environment Department, Ron Curry, Secretary	4	E-33
State of New Mexico Environment Department, Bob Weeks	205	E-23
State of New Mexico Environment Department, Stephen Yanicak	100	E-8
United States Department of the Interior, Stephen R. Spencer	3	E-32
United States Environmental Protection Agency, Michael P. Jansky, P.E.	2	E-31

E.4 PUBLIC HEARING COMMENTS AND NNSA RESPONSES

Comments presented in this section were submitted during oral presentations at the public hearings held on June 3, 2003, in Los Alamos, New Mexico, and June 4, 2003, in Pojoaque, New Mexico. NNSA's responses to these comments are also presented.

Comments from the Los Alamos, New Mexico, Public Hearing June 3, 2003		
***Comment** No.*	***Comment***	***NNSA Response***
Stephen Yanicak – Commentor No. 100		
	I'm Steve Yanicak, I'm with the Environment Department of New Mexico Oversight Bureau. And I didn't really read the Volume 1, I'm basing this on the summary that I see here. And, since I work at the facility, we allow these sites, there is some general concerns that maybe are addressed in Volume 1. I don't know.	
100-1	So I'm seeing on page S-34, your waste streams that you have identified for the no action alternative which I assume is the CMRR upgrading as it is, then the preferred alternative where we have TA-55. I see all the waste streams like doubling and tripling, transuranic mixed waste low level, mixed low level, hazardous waste. I know where a lot of this stuff goes, the transuranic, mixed transuranic, all the low level, mixed low level, even the hazardous waste, I know a lot of that is either stored permanently at TA-44 or processed and moved off-site. I don't see in the summary now, it might be in volume 1, a summary of the liquid waste. It makes mention here that it is not discharged to the environment, but it's treated a TA-50. My concern is, since all this stuff is doubling and tripling, what is the liquid rad load to TA-50 going to be which is also another old facility that in my personal view should be upgraded and/or replaced. And again that's because I see all these waste streams going up and I know that the TA-50 operations are kind of struggling with what's going on now. So that's my comment.	As discussed in the *CMRR EIS*, Section 3.12.4, radioactive liquid waste (RLW) generated by CMR capabilities are transferred to the LANL Radioactive Liquid Waste Treatment Facility (RLWTF) at TA-50 for treatment; the treatment process removes radioactive solids, which are then disposed of as low-level radioactive waste at LANL's Area G within TA-54, and the resulting treated water is discharged to the environment through a permitted outfall within Mortandad Canyon. Discharges to Mortandad Canyon from TA-50 must meet stringent discharge parameters. The figures sited in the *CMRR EIS* for disposal of solid low-level waste include the solidified radioactive components removed from the previously RLW stream.
100-2	When I see a book like this for the CMRR building being moved, I know pretty much that this is probably going to happen. When I do see something like this for an antiquated facility, TA-50, even though I hear it might be in the works, I'm kind of wary that it's going to be overburdened. So I guess I would like to see maybe a list or maybe in a summary or something written where it lists the actual waste stream liquid that's currently going to TA-50 and if that's going to be up when they move to TA-55.	The TA-50 RLWTF has been upgraded several times over its operating history and NNSA is now contemplating a replacement facility that might be proposed and built sometime over the next 5 years. Changing and improving technology has allowed DOE to install several in-house small pretreatment or new treatment units of various types at the RLWTF and within buildings that house processes generating RLW. This has improved the way that LANL

Comments from the Los Alamos, New Mexico, Public Hearing June 3, 2003		
***Comment** No.*	***Comment***	***NNSA Response***
100-2 (cont'd)	And how TA-50, the toilet of the operation is going to be able to manage all that. So from my standpoint that's what I'm concerned about.	manages this waste stream and has allowed the wastewaters discharged to the environment to meet regulatory requirements. Given the timing of contemplated replacement of the existing RLWTF before the year 2010 when the CMRR Facility, if constructed, would be completed, it is likely that a new RLWTF could receive future CMRR Facility RLW. A decision on the need for a contemplated replacement of the RLWTF would be independent of any decision made on the proposed CMRR Project. Changes have been made to the text in Section 4.3.11.1 of the *CMRR EIS* to clarify information presented regarding this liquid waste stream.
Joni Arends – Commentor No. 101		
101-1	My name is Joni Arends and I'm with Concerned Citizens for Nuclear Safety. On page 4-73, when you talk about the cumulative effects, there is -- actually on 475, there's no actual numbers being listed for the water or the generation, the electrical generation. And so I was really looking for those numbers because I specifically asked for those in our comments during the scoping process to find out where the water was going to come from and the electricity to run the building, because obviously this building or these buildings will use a lot of water. In this it says that the increase of the water will be a million -- water gallons for the construction alone for the administrative offices and support it will be 13 or 1.35 million gallons. And then, when you talk about for the operations, it's 10.4 million gallons. I guess that's per year. But where that water is going to come from, that's an issue with the regard to the San Juan-Chama, and where the electricity is going to come from.	Sections 4.3.2, 4.4.2, 4.5.2, and 4.6.2 of the *CMRR EIS* reference projected demands on key site infrastructure resources including electricity and water. As stated in these sections, none of the action alternatives are projected to exceed DOE's leased groundwater rights to the Los Alamos water supply system or the electric import and production capabilities for LANL. Overall, no infrastructure capacity constraints are anticipated in the near term as LANL operational demands on site infrastructure, notably for electricity and water, have been well below those forecast in the 1999 SWEIS. Increases in electrical and water demand by the new CMMR Facility would be largely offset by decreases in operational use at the existing CMR Building as its operations are reduced or completely eliminated over time. Nevertheless, LANL is actively pursing potable water use and electricity consumption reductions through conservation methods. For example, the new Nicholas C. Metropolis Center for Modeling and Simulation reuses water in its chilling towers, low-flush toilets, and low-energy use lighting fixtures were installed in the building, along with the use of native vegetation for landscaping, all of which are examples of conservation-minded measures implemented for all new LANL construction projects. Additionally, on-site electric power generator(s) will be installed in the next year to meet peak-loading requirements into the future. Additional electric power can be purchases from the national

Comments from the Los Alamos, New Mexico, Public Hearing June 3, 2003		
***Comment** No.*	***Comment***	***NNSA Response***
101-1 (cont'd)		electric power grid when available and up to the maximum carrying capacity of the LANL supply grid system. NNSA would like to clarify the commentor's statement regarding water use: projections for the construction phase of the administrative offices and support function building is 1.35 million gallons per year and 10.4 million gallons per year for the CMRR Facility during operations.
101-2	And then also we support what Steve Yanicak said with regard to TA-50. And it seems like TA-50, it's been talked about every decade since the seventies, the eighties, and nineties, that it would be upgraded or that it would be replaced. And Steve Fong said that it's going to be replaced in -- it's on the schedule for '05, '06, or '07. And it seems like again the cart is before the horse because, you know, the discharges are going into the Mortandad Canyon. Another problem that CCNS has is you state on one of these pages that there's not going to be any discharge from TA-50. Let's see, the liquid waste.	NNSA notes the commentor's support of the need for a new TA-50 Radiological Liquid Waste Treatment Facility at LANL. No untreated radioactive liquid effluent would be produced from the proposed CMRR Facility. Text clarification has been added to Section 4.3.11.1 of the *CMRR Final EIS* regarding this waste stream.
101-3	And you have a footnote B on that page, where it says that there is -- oh, here it is. Page S-25, radiological -- nonradiological liquid effluent in gallons. You say that's going to be a half a million gallons a year. But that, you know, there's not going to be any radiological release when, in fact, there are. There are radionuclides. They're below the standards, but there are radionuclides that go down into Mortandad Canyon. And I think, because of the concerns about the transport systems or the lack of knowledge about the transport systems through Mortandad Canyon with regard to these contaminants and that some of the contaminants may be showing up in the springs, during this time period of this construction project, the TA-50 issue should really be looked at. I kind of skipped over some space. But basically that there are discharges into Mortandad Canyon and flushing that happens every single day from operations at TA-50. And the CMRR building and TA-55 need to be addressed in this document, you know, because it's causing the flushing of the contaminants through the system to the river.	The commentor refers to information contained in Footnote "b" to Table S-2 of the Summary document, which states "No direct discharge to the environment. Radiological liquid waste would be collected and transported to TA-50 for treatment". This statement is elaborated upon in the text of the *CMRR EIS*. The RLWTF discharges treated water (effluent) into the environment through an outfall that is permitted by the State of New Mexico; the outfall effluent is periodically monitored against permit limitations for several water quality standards.
101-4	And then CCNS has some real concerns about the design and build approach with regard to this building in terms of its an unacceptable way to proceed, I mean you guys, the LANL in general, you see DOE has so many problems.	There has been no formal decision on the acquisition strategy for the CMRR Facility Project as the NEPA process is not final yet and a decision to proceed with an action alternative for the project has not been made. NNSA is investigating the potential use of design-build procurements

Comments from the Los Alamos, New Mexico, Public Hearing *June 3, 2003*		
***Comment** No.*	***Comment***	***NNSA Response***
101-4 (cont'd)		where appropriate as the conceptual design for the CMRR Facility is developed. At the current stage of project development, NNSA is of the opinion that application of design-build procurement for certain elements of the project, most notably the Administrative Offices and Support Activities Building, may be warranted. This opinion is based on size, complexity, and recent operational experience with design-build procurement applications on similar projects at LANL. Final decisions regarding CMRR procurement strategies would be made through the Critical Decision 1 process (currently projected for about March 2004) if the NNSA decides to proceed with one of the project action alternatives.
101-5	If I'm the only person speaking, do you mind if I speak longer than the five minutes? It's really an insult, excuse me. I have spent a lot of time preparing for this. And, you know, the five-minute limit I understand, but there's nobody signed up. CCNS has some major problems with regard to the design and build approach of this facility in terms of there's an envelope of space between $450 million and $900 million. And it seems like, with the cost overruns that have happened historically at Los Alamos, that this just opens the door for this to become a $1.8 billion project in reality. And so there has to be some kind of constraint on this project. We have really a lot of problems with this design and build.	While cost is one of the factors to be considered by decision makers in any Record of Decision, cost analysis is beyond the scope of the *CMRR EIS*, which focuses on evaluating potential environmental impacts of the proposed action alternatives. CMRR Project cost estimates are currently described in terms of a range ($420M to $955M) consistent with DOE Order 413.3 requirements for this phase of a project. The final detailed cost estimate for the project would be established at Critical Decision 2 (Approval of Performance Baseline) currently projected to occur in 2005 if the decision is to proceed with the CMRR Project. Congress determines funding allocations among DOE and NNSA projects; NNSA then spends monies consistent with this congressional direction.
101-6	And we have a lot of problems with the fact that the estimates for the CMRR demolition are not really taken into account because, at the time of the building was built, if it's the largest building in New Mexico, 550 thousand square feet. And where is all that waste going. I mean you say that it's going to be able to fit in TA-54. And we know that TA-54 is basically full because there's other alternatives to build other landfills in other places. I mean that's part of the environmental impact statement as well.	NNSA notes the commentor's concern that Area G in TA-54 will not accommodate waste from demolition of the Existing CMR Building. As discussed in Section 3.12.4 of the *CMRR EIS*, LANL will expand disposal capacity sites for low-level waste in Area G to provide onsite disposal for an additional 50 to 120 years. Solid low-level waste can alternately be packaged for disposal at off-site licensed commercial facilities.

Comments from the Los Alamos, New Mexico, Public Hearing June 3, 2003		
***Comment** No.*	***Comment***	***NNSA Response***
101-6 (cont'd)	And then, with regard to page 4-76, there are statements in here about the waste management, specifically with regard that there are statements that sufficient capacity exists to manage waste in these operations. And in some respects that's a disingenuous statement because we know that there are proposals for other waste dumps that are in the site wide environmental impact statement. We have concerns about the next paragraph where it says there could be in terms of the expanded operations alternative and the LANL SWEIS, the environmental impact statement could result in the generation of a large amount of TRU waste. And so then there's a statement about the available capacity and then there's mention of new capacity of a replacement facility. And that's something I have never heard about before, a replacement facility for WIPP. But it says that the large volumes of waste will be accommodated or the estimated cumulative volumes of TRU waste from the CMRR replacement modern pit facility and other DOE facility operations. So, when there's 40,000 drums of transuranic waste at the current time at TA-54 and there's only a process right now to deal with 2,000 of those drums and you're going to leave 38,000 drums on the mesa and then you're saying these facilities, these new buildings, the modern pit facility but then the CMRR replacement, that you're going to have many buildings, the possibility of five buildings total, four buildings? Three? But some of your drawings have more than that, don't they, in terms of the administrative buildings? So anyways 38,000 drums are going to be sitting on the mesa top in the meantime while you're going to be generating more waste, you're going to be generating waste from the demolition of the CMRR building which there will inevitably be some TRU waste in that waste stream as well.	DOE considered proposals for LANL's future low level radioactive waste disposal needs in the *LANL SWEIS* analyses. The *LANL SWEIS* analyzed impacts associated with the expansion of Area G into adjacent areas within TA-54. Regarding to the disposition of TRU wastes anticipated to be generated within the next 10 years and the existing inventory of TRU waste drums awaiting disposal at WIPP, many if not all of these drums of waste will be deposited at WIPP before the proposed CMRR Facility, if approved, would be expected to become operable in 2010. The placement of the Modern Pit Facility at LANL is under consideration at this time. NNSA will require TRU waste disposition into the future for all its facilities. The NNSA is already contemplating the disposal of TRU waste when WIPP has been filled to capacity. As the planning and construction of such a facility would take a number of years, it is appropriate for NNSA to begin contemplating this eventuality now. No project plans have been developed yet regarding a WIPP replacement project.
101-7	So there's just a lot of concerns that I don't think are directly addressed in these documents, in the summary or in this, with regard to waste generation, with regard to water usage, where the water is coming from, where the electricity is going to come from, if it's going to impact, you know, are you going to try to run the Ojo line again or bring that proposal forward to get more electricity up here. So we're very concerned about the lack of thoroughness with the CMRR replacement EIS at this point. Thank you.	NNSA refers the commentor to the previous 8 comment responses. NNSA is not aware of any plan to install the previously proposed Ojo Line into LANL across the Jemez Mountains. The Ojo Line was proposed in the 1980s and a multi-agency EIS was prepared for the project as the transmission line would have involved crossing lands managed by several Federal agencies. The Ojo Line would have been installed and operated by the Public Service Company of New Mexico (PNM), which is a New Mexico

Comments from the Los Alamos, New Mexico, Public Hearing June 3, 2003		
***Comment** No.*	***Comment***	***NNSA Response***
101-7 (cont'd)		based electric service corporation; the new electric power transmission line would have serviced northern New Mexico customers. However, the project was ultimately aborted before implementation.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
Jay Coghlan – Commentor No. 200		
200-1	And I'm actually especially saddened by this chemical and metallurgical replacement project, seeing that, you know, pretty much the essence of the same proposal was defeated in the early nineties, when Congress declined to appropriate funds for it given the end of the Cold War. And I think the same principle still holds true. This facility is not really needed.	The purpose and need for the proposed CMRR Facility is stated in Chapter 1 of the *CMRR EIS*. NNSA notes the commentor's opinion about the need for the CMRR Project.
200-2	I think the draft EIS is deficient in a number of ways. And here I get to sneak in a number of my questions. You've got nothing about costs. It was reported last August the costs were up to $950 million. In the '04 budget, NNSA states that it's going to be $600 million. And the approximate $400 million in savings is a result of taking a design-build approach. Well, that's certainly an interesting approach for Los Alamos. Using the dual access radiographic hydrodynamic testing facility as an example, we start out with a facility that initially is going to cost 80 million and now it's around 300 million. Needless to say there's much in the news and Congressional hearings, et cetera, et cetera, about Los Alamos fiscal mismanagement. The premise that 400 million can be saved by taking a simultaneous design-build approach is absurd to me. I think the final EIS should address both costs and just identify these cost savings as well.	While cost is one of the factors to be considered by decision makers in any Record of Decision, cost analysis is beyond the scope of the *CMRR EIS*, which focuses on evaluating potential environmental impacts of the proposed action alternatives. CMRR Project cost estimates are currently described in terms of a range ($420M to $955M) consistent with DOE Order 413.3 requirements for this phase of a project. The final detailed cost estimate for the project would be established at Critical Decision 2 (Approval of Performance Baseline) currently projected to occur in 2005 if the decision is to proceed with the CMRR Project. Congress determines funding allocations among DOE and NNSA projects; NNSA then spends monies consistent with this congressional direction.
200-3	Okay. Another primary mission for this replacement facility that's stated in the draft EIS and that I have a particular interest in is that the facility would use at the cleanout facility containment vessels. I don't doubt that these containment vessels would be cleaned out there. I don't think that's the true purpose. First, for the sake of those that may not know, this would involve hydrotests, where they blow up plutonium and highly enriched uranium and noncritical test. But I suggest that the final EIS especially given that this facility's primary mission is for analytical chemistry and material characterization should discuss the role of what I believe would be analysis of test shot debris. That's what I suspect is the real submission to the facility, that you'll do these hydrotests. You blow them up in these containment vessels, you bring them to the project, analyze, you know, analytical chemistry, et cetera, et cetera, all of which leads to enhanced tests, diagnosis. And furthermore in the EIS the exact relationship to future advanced hydrotest facilities should be discussed. And I'll cut it off.	The cleanout of containment vessels from testing procedures is being proposed for the new CMRR Facility as a matter of practicality, work efficiency and worker safety. Analyses of debris removed from the these types of vessels has been conducted in the CMR Building for many years; continuing the analytical procedures in the new CMRR Facility is included by the analyses of the operation of the new facility in the *CMRR EIS*. No additional text has been added to the *CMRR Final EIS*.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
Chris Mechels – Commentor No. 201		
201-1	A brief history of the CMR building for those of you who may not know about it, some of you may agree, the history of the CMR building is replete with such things as exploding ovens. Remember when we blew them all to pieces. Fortunately nobody was killed. That was one stand-down. Then there was the mishandled nuclear target, when they sort of forgot that radiation had more than one direction coming off a target. Well, that was sort of fortunate that nobody was killed. Then we had the situation where somebody got contaminated but not killed. It takes some time to die so it doesn't matter. Then we had the fire alarm system where it turned out that they had neglected to have an up-to-date fire alarm system in spite of the fact that people had been cautioned about this for five years. That resulted in everybody having fire watches at CMR then for some years. Well, they finally put a new fire alarm system in which they hadn't gotten around to before then. I draw your attention to what's going on here. There's nothing wrong with the building. I repeat, there was nothing wrong with the building that caused any of these outrageous accidents. What was wrong was the management of Los Alamos National Laboratory. Fixing that building will not fix the management of Los Alamos National Laboratory. And I suggest that is a problem. Indications of the problem are these Los Alamos National Laboratory site profiles which are quite interesting reading. And they mention a lot of problems with CMR including their stand-down in '87, their stand-downs in '98, I think they had a stand-down in '96. They were doing an awful lot of work which cost us a lot of money. Nothing has to do with the building, it all has to do with Los Alamos management. By the way, these same profiles are no longer available, they pulled them off the web. The occurrence reports which reflected some of the accidents going on at the CMR building and TA-55 reflected Los Alamos' horrible management record including the famous mess-up at TA-55 in 2000. This is not the way to do business, folks.	The NNSA would like to clarify the commentor's statements about accessibility of information about LANL, in particular about incidents at LANL facilities. After the events of September 11, 2001, the NNSA, along with other Federal agencies, either restricted access to certain information already posted electronically on Internet web sites, or removed the information entirely from the Internet for security reasons. The NNSA has gradually been reviewing electronic information and re-establishing Internet accessibility to information either on a restricted basis or not, depending upon the sensitivity of the information. Publicly available information, such as NEPA documents, remains available in hard copy form. Information about LANL incidents, actions and related lessons learned is available in hard copy form via a quarterly publication by LANL called the *Los Alamos Mirror*; this document may be obtained by calling (505) 667-0604 and requesting a copy. The NNSA notes the commentor's suggestions about the management of LANL and about the assignment of the Modern Pit Facility and the CMRR Facility to the DOE's Savannah River facility. As stated in Section 2.6.1, relocating CMR capabilities from LANL was considered and dismissed from further analysis in the *CMRR EIS*.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
201-1 (cont'd)	All of this stuff became unavailable in February of this year. I've been talking to DOE trying to say why did it take the occurrence reports off the web site, why are you hiding all this. I don't get an answer. Is it because it's inconvenient? Look, the problem here is not anything but the Los Alamos management. Giving it a new building will not fix that. But I would suggest, as a taxpayer and somebody who concerned himself with worker safety and has for a long time, that you take this modern pit facility and the attendant needs that you have for metallurgical research and give it to Savannah River. Unlike Los Alamos they actually have a record of knowing how to manage things without totally messing it up. Just look at the occurrence reports. I can't get them anymore. But the occurrence reports would show you that the record at Savannah River which is run by Allied Chemical I believe. They actually have some idea of what to do about running facilities without messing up their employees and the citizens and endangering them. So I suggest, why don't you take the modern pit facility and why don't you hold off on the CMR building because it's not hurting the operations at Los Alamos, their management is hurting the operations at Los Alamos. The CMR building I think could last six more years. Take the modern pit facility and CMR and don't put them at Los Alamos because they're clueless, and all indications are they will remain clueless because they've been clueless for six years, and give it to Savannah River.	
201-2	I don't like this project, but for God's sake put it someplace where they have a track record of knowing how to do this stuff. This place does not. Spare us, please. Thank you.	The NNSA notes the commentor's dislike for the CMRR Project.
Jay Gilbert Sanchez – Commentor No. 202		
202-1	I have great concerns of what is going on up there not only with this building. The first question I have or concern I have is you have not satisfied me as a private person or as a former tribal official as to what you have done about the safety hazards and the safety violations that you have not adhered to over the last 60 years and how you are going to adhere to those guidelines impacting my people, my future. If you don't know, if my tribal leadership has not made you aware, we're feeling the impacts finally after 60 years of being your neighbors, your gracious neighbors. And you sit on my most holiest of holy ground, the holiest of holy land.	The NNSA notes the commentor 's concerns about safety hazards and violations, as well as the commentor's concerns that LANL's operations have caused harm to neighboring people and that the facility is located on ground considered holy by the Pueblo of San Ildefonso.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
202-2	In another era, maybe in the future, my people, my young men, my young women, might stand up against you and do what the Palestinians are doing against the Israelis with all the odds and scientific knowledge and weapons they have against them, just believing in their faith to stand up against you as we did in 1680. But this time we will not fail because our commitment to our life-giver will be much greater. You sit on my holiest of holy land, building the weapons of mass destruction for this person called Bush, pretending under the name of peace to be doing these things. I ask you, each and every one of you, in your heart look to see how much damage we have done to ourselves, how much damage we are doing to others. We are the casualties, the community casualties of war. You have not dropped the atomic bomb on my people. But the waste and the legacy that has come off that hill is devastating. It is showing in my Pueblo brothers and sisters to the south of us along the Rio Grande. It's showing up in Brownsville.	The NNSA notes the commentor's opinion regarding radioactive wastes causing damages to members of Pueblos along the Rio Grande all the way to the Gulf of Mexico. The NNSA refers the commentor to response 6-23 regarding radionuclides being present in the Rio Grande. The quality of the surface water reaching the Rio Grande from canyons located across LANL is better than the quality of the waters of the river at that point in its journey to the Gulf of Mexico due to naturally occurring contaminants, primarily heavy metals, carried by the waters. (See LANL Annual Surveillance Reports for additional water quality information.)
202-3	At this point in time, I would like to implement an old tradition. When an elder speaks, there's no time limitations within our customs. This is nothing but bureaucracy, American bureaucracy that we're talking about here. Life is not 5 minutes of breath, life is not 5 minutes of being cleansed. You cleanse my area, you cleanse my holy land, and I will think about allowing you to stand up there and do the things you want to do. And I'm talking about all the things you want to do. Sixty years of dirt, of trash, of waste of plutonium in my water. Nitrates in my water that cannot be found that are not biological. Those things are what I'm talking about. I appreciate your understanding, I appreciate what you're doing for world peace. But for humanity's sake, let's quit killing ourselves. As I said I am the casualty, community casualty of the war machine of this country and you work for him. You may call yourself the Department of Energy. But you work for him. You work for the development of weapons of mass destruction. If this is what your concern is, why don't we all go en masse back to the Atlantic, start walking there en masse, and simply kill ourselves and cleanse this world of what we have done. The vegetables you eat are contaminated from waste from Los Alamos National Laboratory. Don't forget in February, late March, late December or late winter, early spring, we get all the vegetables coming in from South Valley, Texas. We get the water from the Rio Grande. I know I am privileged to be here. I thank you.	The NNSA notes the commentor's statements about the need to clean up the legacy waste at LANL and his opinion about water contamination from LANL operations. NNSA would like to clarify that no plutonium has been identified in LANL-area drinking water or in the southern reaches of the Rio Grande. Vegetables and fruits grown in the close vicinity of LANL are not known to be contaminated with radionuclides at levels above those grown elsewhere in nearby areas of northern New Mexico; crops grown in southern Texas and watered from the Rio Grande are not known to be contaminated with radionuclides at levels above those grown elsewhere in southern Texas. Also see the response to Comment 6-23.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
Cathy Sanchez – Commentor No. 203		
203-1	Okay. My name is Cathy Sanchez, I am from the San Idelfonso Pueblo. I am speaking in terms of my native women perspective and also as mother and grandmother and a person very conscious about the wellness of children and families and the business that is happening up there at Los Alamos. I don't have anything scientifically to ask as far as questioning or as far as wanting to debate over issues that are wrong and happening. But my gut level reaction, because we do see the death, the illnesses, and the contamination of our Mother Earth that's happening. I today did a whole workshop on pottery making and a spiritual cultural context of the clay. And I felt very good about that interaction with Mother Earth and to generate and give life. And yet here tonight I stand before you knowing that the business that's happening in our most sacred area is contaminating our water, our land, our clays, our foods, our animals, and our children and our genetic pools. And I have traveled enough to know in other parts of the world, especially in Russia and South Africa and Japan and China, I see nuclear reactors, nuclear mishaps. I have talked to people in Russia, the women, and what business the scientists are in. And we see our scientists from Los Alamos and watch the Tar Village people being used as guinea pigs. And I wonder how much the people around here are being used as guinea pigs, because we have not had the proper safeguards, the trainings, the cleansing, the taking care of the waste and the reactive waste that's coming off the hill and how it's affecting us. I have grandchildren. And I pray that they are physically, mentally, and spiritually connected and well because I also have seen babies and have also seen the deformities that have started happening down south of us in Mexico and the fish that we're pulling out of the river and the cesspool that sits up south of us known as Cochiti Lake. I went to a graduation reception there. And just seeing the gray wall that's there and knowing that behind that wall lies a settling pond, a pool that's been dredged of the nuclear sediments. I have asked earlier times for the solid waste pond or pool, for the cleansing of that.	NNSA notes the commentor's concerns regarding health issues associated with LANL operations and waste disposal practices. Chapter 4 of this EIS describes impacts on health and waste management.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
203-1 (cont'd)	What is being done for that so far? I haven't gotten any comments back from that to see where that's going with the discharge into the Rio Grande. And I think the last I heard was that they were using evaporation to lessen the amount of volume, to take care of what's happened up there. I don't know what else to say, but I'm here because I know I should be here, knowing that my comments may not impact on the brain and the mind area. But if it just touches further down into the heart area. People are realizing we didn't departmentalize different buildings and different programs, knowing that they all come together to make the mechanisms that are going to create the weapons of mass destruction that are going to be used against our own brothers and sisters throughout the world. And, if there were any peaceful use to the nuclear industry, I would say go for it. But, knowing in my gut reaction there is no peaceful use because we are contaminating ourselves, we are having the waste, we're not taking care of the waste that's coming out of the river, we're not thinking of how safe and how feasible the plans are for the CMR buildings. We talked earlier about the neutron facilities that were being built earlier. I hope that did not happen. I hope that this thing does not happen in Los Alamos as far as getting it prepped and ready for bigger detonations. And we are hearing the blasts that are happening and we are keeping track and we are seeing planes fly over to check for hot spots and release. So we are conscious that things are happening up there that shouldn't be happening. And, in our spiritual way, we really need to get back to our wellness. And that's not going to happen as long as we are disrupting the energy cycles that are not meant to be that. Native indigenous peoples throughout the world are praying for the wellness of everybody including the Americans. We want our younger brothers and sisters to come back to the heart and learn how to be united as a family to stop this business that is very harmful and destructive and polluting and toxic and not well intended for our peoples. Money does not generate -- money generation is tainted money from this. And I hope you realize where that is coming from. Thank you.	

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
Pennelope McMullen – Commentor No. 204		
204-1	Okay. The Federal Register lists potential issues for analysis. The first two issues listed are potential human health impacts both to members of the public and to workers and potential impacts to air, water, and soil. I consider these two issues to be interrelated because a contaminated environment affects human health.	The NNSA acknowledges the commentor's statement about the interrelationship of contaminant in the environment and human health concerns.
204-2	The draft environmental impact statement summary states that, quote, for the most part, environmental impacts would be small, unquote. I find that statement to be amazing. It has been documented at every nuclear site that, for every stage of production, the making of nuclear weapons, even if never used, is hazardous to workers, to our environment, to people yet unborn. Nuclear production from the mining and the milling of uranium ore to transportation, actual production, testing, and the disposal of radioactive waste is harmful to the workers, the environment, and the public. What the DOE considers small is not considered small by the public.	The summary statement characterizing potential environmental impacts of a new CMRR Facility as "small" is correct. The *CMRR EIS* considers direct, indirect and cumulative impacts related to the proposed action alternatives and for the No Action Alternative. The CMRR Facility would not be a mining, milling, production, testing or disposal site for nuclear weapons as suggested by the commentor. LANL is operated under an Integrated Safety Management System designed to achieve operational effectiveness through the integration of environmental compliance, quality assurance, risk assessment and mitigation, and safety and health protection procedures, incorporated by design into work planning and implementation of those plans. The CMRR Facility would be operated in accordance with the LANL management system.
204-3	My summary in terms of transportation and waste only talks about the onetime transport of special nuclear material. But special nuclear material will have to be shipped into the Los Alamos area and the subsequent waste will need to be disposed of. This part of the DEIS is woefully inadequate. I'm not going to say more about that right now.	The DEIS and its Summary identify the one-time transportation needed for the initial loading of special nuclear material (SNM) into a new CMRR Facility from the existing CMR Building, along with routine shipments of samples between the Plutonium Facility and a new CMRR Facility. Adequate inventories of SNM are already present at LANL for ongoing AC and MC operations; no additional SNM would need to be shipped to LANL as a result of a NNSA decision to proceed with the construction and operation of the CMRR Facility at LANL. The shipment of SNM between other DOE sites and LANL that occurs periodically for a variety of purposes was analyzed in the *LANL SWEIS*. Therefore, no additional analysis of offsite transport of SNM is provided in the *CMRR EIS*. The transportation impact assessment as explained in Sections 2.9.3 and 4.7.1 of the *CMRR EIS*, analyzes the one-time movement of SNM, equipment, and other materials during transition from the existing CMR Building to the new CMRR Facility, and the routine onsite transport of AC and MC samples between the Plutonium Facility and the new CMRR Facility.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
204-3 (cont'd)		SNM would be transported from the existing CMR Building and from the Plutonium Facility at LANL. The one-time transport of these materials would be performed on restricted and controlled roads that would be closed to the public. Once a shipment is prepared for low speed and controlled movement onsite, the likelihood and consequence of any foreseeable accident are considered to be small. The various wastes generated in the new CMRR Facility are those evaluated in the 1999 *LANL SWEIS* under the Expanded Operations Alternative. The impacts of the disposition of these wastes are also evaluated in the *LANL SWEIS*. Therefore, the impacts from disposition of the generated wastes have already been evaluated and accounted for in the *CMRR EIS*, as part of the site-wide cumulative impacts. (Section 4.7.1 of the Final *CMRR EIS* has been revised to reference 1999 *LANL SWEIS* for the transportation impacts from disposition of generated wastes.)
204-4	Regarding environmental justice, the DEIS summary table S-3 concludes, quote, no disproportionately high and adverse impacts on minority or low income populations. The glossary did not include the definition of minority. In its environmental assessment for the biosafety lab 3, LANL lists the Hispanic population as white. So that the surrounding population does not appear to be a minority. A national survey of sites for the production, testing of nuclear weapons, and disposal of radioactive waste shows most of them located in low income minority communities, an example of severe environmental racism.	Definitions of the terms "minority population" and "low-income populations" have been added to the glossary of the Summary document; the terms were defined in glossary of the *CMRR Draft EIS* and discussed in detail in Appendix D of this EIS. As described in Section D.2, all persons self-identified as Hispanic or Latino (of any race) are counted among the minority population in the *CMRR EIS* analyses. As described in Section D.4, among all counties in New Mexico, Los Alamos County has the smallest percentage of persons living below the poverty threshold and the smallest percentage of minority residents; the residents of Los Alamos County live in closer proximity to LANL than do the residents of any other New Mexico county.
204-5	Regarding socioeconomics the DEIS summary table S-3 considered only whether or not there was an increase in work force. This is not the only criteria for considering socioeconomic impacts. We need to look at the total picture. Most New Mexico citizens remain in the low income range. We have one of the highest percentages of children living in poverty. Los Alamos is not helping the economy of New Mexico. On the contrary, there have been a number of studies which show that, when the defense industry has moved out of an area, civilian industry moved in and the general economy of the area improved.	The NNSA opines that the economy of New Mexico is helped by LANL. Should LANL cease to employee over 12,000 people in direct jobs, many of which are highly specialized and require advanced education, civilian industry would not readily move into the area given its location, lack of transportation (specifically air cargo jet, aircraft service, train service, or interstate highway service),and lack of readily available raw materials. A more likely scenario resulting from LANL closure would be that local communities near LANL would suffer and that the overall economy of New Mexico would diminish.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
204-5 (cont'd)	In one study conducted by the U.S. Government of 100 bases that have been closed around the country, in 98 of these areas, alternative industry had been developed and had brought an increase in the economy of the local community. You may read Economics and Military. Some economics explain that every million dollars spent means a loss of more than 2,000 civilian jobs. Our nation spends more tax dollars on the military defense than on housing, education, social welfare, food, employment, transportation, energy, and environmental programs combined. As a result one in four U.S. children now lives in poverty. And New Mexico's children rank high on the poverty scale. The monies spent on nuclear weapons production has, in effect, been stolen from the poor. National security also requires an economic vitality with healthy and well-educated citizens. New Mexico citizens do not feel secure when we cannot find employment, cannot afford health insurance, or cannot pay the rent. And one argues who will run our nation tomorrow that cannot figure basic math problems. We would feel much more secure if those millions of dollars would be spent on the necessity of life, affordable housing, renewable energy, high quality education, meaningful employment, accessible healthcare, and adequate nutritional food for everyone.	
204-6	In conclusion, in addition to nuclear weapons being illegal which we'll talk about in the question and answer thing, they are also immoral and are condemned by all the major religions because they murder many citizens. 2,000 Catholic bishops gathered publicly and explained that the use of nuclear weapons is a crime against God and humanity itself. Each time that I speak about the evil of nuclear weapons, someone in the nuclear industry tells me that she or he is not an evil person. I grant that the people involved are mostly good people. But so are the Germans who cooperated with the Nazis. It's easy for good people to get caught in an evil system. And, once information is given to you, it points out the rawness of continuing an evil system, it is on your conscience. There is one place in the Bible where Genesis tells us what we will be asked when our personal judgment day comes. I challenge each of you involved in any part of the CMRR plan to imagine your last	The NNSA notes the commentor's conclusions about the issue of the immorality of nuclear weapons.

Comments from the Pojoaque, New Mexico, Public Hearing June 4, 2003		
Comment No.	***Comment***	***NNSA Response***
204-6 (cont'd)	day on this earth and to prepare to meet your Creator. You will be asked if you fed the hungry, if you helped the poor and the disadvantaged, or did you participate in the use of tax monies for expensive building of weapons, preventing the poor and disadvantaged from receiving the help they needed. Think about it, DOE. Thank you.	
Bob Weeks – Commentor No. 205		
205-1	My name is Bob Weeks, I'm with the New Mexico Environment Department. My question pertains to the numbers on page S-34 of the draft statement. Particularly I'm looking at the no-action alternatives and the number of pounds of hazardous waste per year and then the alternative options and the number of pounds of hazardous waste per year and wondering why is there an increase of about 2.5 times for the alternatives if emission is essentially the same.	The apparent jump in waste quantities listed in Table S-3 of the Summary document between the No Action Alternative and the action alternatives is a reflection of the status quo of the CMR Buildings restricted operations and the Expanded Operations Alternative that DOE would pursue for LANL operations over the foreseeable future, including the operations conducted with the CMRR Facility, if the decision is made to pursue this facility project. Emissions from use of hazardous materials would increase for the action alternatives over that identified for the No Action Alternative but would be expected to remain within regulatory standards. More complete discussion of emissions is provided within Sections 4.3.3, 4.4.3, 4.5.3 and 4.6.3 of the *CMRR EIS*. The summary table provided in the referenced page is, by design, very brief in the discussion it provides.
205-2	And then secondly, if we look at the maximally exposed individual on an annual basis, the dose under alternative number two is about 200 times what it is for no action. And so these are technical questions. And I wonder if somebody could give me a technical answer. Thank you.	The restricted level of operations for the No Action Alternative and the increased level of operations for the action alternatives result in the projected differences regarding the maximally exposed individual.

E.5 WRITTEN COMMENTS AND NNSA RESPONSES

All comments submitted in writing to NNSA via the U.S. mail, e-mail, and fax during the public comment period are reproduced in this section. This section provides a side-by-side display of the written comments received (full-text reproductions) and NNSA's responses. Individual comments are numbered in the margins of the comment letters, and NNSA responses to each of the numbered comments are provided on the right side of each page.

Commentor No. 1: Pueblo De San Ildefonso, John Gonzales, Governor

Office of Governor

PUEBLO DE SAN ILDEFONSO
TEWA
NEW MEXICO 87

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Santa Fe, New Mexico 87501

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SI-GC03-242

June 19, 2003

Elizabeth R. Withers
CMRR EIS Document Manager
U.S. DOE/NNSA
Los Alamos Site Office
528 35th Street
Los Alamos, New Mexico 87544-2201

Dear Ms. Withers:

The Pueblo of San Ildefonso appreciates the opportunity to comment on the *Draft Environmental Impact Statement for the Proposed Chemistry and Metallurgy Building Replacement Project at Los Alamos National Laboratory (CMRR DEIS).* After our review of the document, the Pueblo believes that certain considerations as to the impact upon the Pueblo's environmental and cultural resources have not been adequately addressed. Please refer to the specific comments attached to this letter.

The Pueblo is disappointed that DOE did not fully consider Environmental Justice and the environmental health risks to the Pueblo population as envisioned by the Environmental Health Protection Project recently submitted to DOE and LANL.

Due to the proximity of the proposed CMRR and potential adverse impact upon the Pueblo's environmental health and cultural resources, DOE should fully consider implementation of measures that will protect the environmental health and integrity of our community.

Should you wish to discuss the Pueblo's position in detail, do not hesitate to contact me.

1-1

Sincerely,

John Gonzales
Governor

Attachment

Cc: Ralph Erickson, Manager, LASO
Neil Weber, DECP

Response to Commentor No. 1

1-1: The NNSA notes the Governor's disappointment and concerns regarding the *CMRR EIS*. Given that the referenced Environmental Health Protection Project Plan was submitted to the NNSA Los Alamos Site Office on April 17, 2003, NNSA was not able to consider this document in the preparation of the Draft EIS. The Draft EIS document was already being printed on that date. The Plan remains under separate review at this time. NNSA fully considers the implementation of measures protective of the human health and environmental well being of all LANL neighbors in its undertakings.

Commentor No. 1: Pueblo De San Ildefonso, John Gonzales, Governor (Cont'd)

COMMENTS ON THE DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE CHEMISTRY AND METALLURGY RESEARCH BUILDING REPLACEMENT PROJECT

GENERAL COMMENT

The CMRR facility is projected to operate for a minimum of fifty (50) years, and is generally assumed to have the same amount of operational impacts, i.e. equivalent amounts of emissions and radioactive releases to the surrounding environment, in addition to the associated transportation impacts over the same period. The CMRR facility analysis of human health risks and environmental impacts has not kept pace with the latest technological advancements in genetic medicine and integrated environmental health essential to the emergency preparedness, and establishment of preventive and early diagnostic measures from potential exposure damages for community health care. In this context, we strongly believe that the NEPA and associated environmental health risks to the San Ildefonso Pueblo (Pueblo) community and its cultural resources will have to be addressed and managed within the broader framework envisioned by the Pueblo Department of Environmental and Cultural Preservation (DECP) Environmental Health Plan (EHP), which was submitted to the NNSA Los Alamos Site Office on April 17, 2003. 1-2

Without the minimum tribal human resources, infrastructure and technologies requested by the EHP, the Pueblo community does not have the basic means to effectively participate in the protection and maintenance process of its own health and welfare over the anticipated 50 years of operation of the proposed CMRR, especially within the context of the vulnerable Pueblo critical subpopulations and their unique culture-based exposure scenarios and in light of the existing genomic and biomedical technologies. Please note that the Pueblo population is culturally inseparable from the aboriginal homeland environment and the endemic biological resources. 1-3

DECP requests that NNSA consider and recognize the minimum requests made by the submitted EHP proposal as part of the pertinent comments on this EIS.

SPECIFIC COMMENTS BY SECTION

SUMMARY

1. The summary states that; "NNSA's overall concept for TA-55 would have it contain all or at least most of the Security Category I nuclear operations needed for LANL operations"; and "NNSA is separately considering the construction and operation of a pit manufacturing facility on a scale greater than can currently be accommodated by LANL's existing facilities and is considering LANL's TA-55 as a possible site (though it is not currently identified as the preferred site location)." 1-4

Response to Commentor No. 1

1-2: The use of the same amounts of emissions, effluents, and other environmental effects as were projected for the existing CMR Building under the Expanded Operations Alternative analyzed in the *LANL SWEIS* is intended to be bounding for potential impacts of a new CMRR Facility. The actual CMRR Facility would be expected to have lower levels of emissions, effluents and other environmental effects due to more modern, technologically advanced design features and equipment not present at the existing CMR Building.

1-3: The *CMRR EIS* was prepared in compliance with NEPA and implementation regulations adopted by the Council on Environmental Quality and the DOE. The *CMRR EIS* uses standard human health risk assessment methodology approved by the Environmental Protection Agency; it also makes use of the most up to date computer modeling programs. The type of predictive analyses needed to assess human health risks potentially associated with operating a new future facility are not the same as those that would likely be germane to genetic medicine and emergency preparedness, or the establishment of early diagnostic measures for community health care. The commentor's stated beliefs regarding how the NEPA analyses should be performed are noted; the NNSA will consider this issue related to future NEPA analyses after the Los Alamos Site Office staff has sufficiently reviewed the referenced Environmental Health Plan.

1-4: NNSA notes the commentor's concern that the consolidation of Security Category I operations at TA-55 would result in disparate impacts on minorities. Regardless of the number, size, level, or type of operations performed at facilities located within LANL's TA-55 or elsewhere at LANL, the effluent that would be collected, treated and discharged from the Radioactive Liquid Waste Treatment Facility (RLWTF) must meet stringent discharge parameters before it is released into the environment. Therefore, significant quantities of pollution would not be released to Mortandad Canyon, which drains onto San Ildefonso property. The existence of multiple Security Category I nuclear facilities at the head of Mortandad Canyon would not affect the quality of the discharge of treated water from the RLWTF. No matter where facilities were to be placed within LANL, all liquid radioactive liquid wastes would likely be directed either via pipeline or by truck transport to the RLWTF. Aggregate risk of operating multiple facilities at LANL was the focus point of the *LANL SWEIS* analyses. This programmatic analysis will be reviewed and

Commentor No. 1: Pueblo De San Ildefonso, John Gonzales, Governor (Cont'd)

Please note that a basic tenet of Environmental Justice is that no group of people should shoulder a disproportionate share of negative environmental impacts. No group should suffer a disparate impact due to exposure from the aggregation of risk from multiple sources of pollution. The CMRR Project is part of the NNSA goal of consolidating facilities at TA-55. These facilities have the potential to release large amounts of pollution to Mortandad Canyon, which drains onto San Ildefonso property. Environmental Justice requires an evaluation of the aggregate risk of placing multiple Security Category I nuclear facilities at the head of Mortandad Canyon. **1-4 (Cont'd)**

Further, please consider the possibility that concentrating all or most Security Category I nuclear operations in one area may make them more vulnerable to natural or man-made disasters. **1-5**

2. Part of both Alternatives 1 and 2 is sending radioactive liquid waste to the TA-50 Radioactive Liquid Waste Treatment Facility. With either of these Alternatives, the waste effluent is still released to Mortandad Canyon, which drains onto San Ildefonso property. **1-6**

VOLUME 1 (CHAPTERS 1 THROUGH 10; APPENDICES A THROUGH F)

CHAPTER 2 PROJECT DESCRIPTION AND ALTERNATIVES

2.5.2 Alternative 1 (Preferred)

1. Figure 2-2 gives the impression that the proposed facility boundary extends across Pajarito Road. Will the road be moved, or is this merely an artifact of creating the figure? **1-7**

2.7.7.4 Waste Management and Pollution Prevention Techniques

1. This section describes the fate of radioactive waste being either disposal at TA-54 Area G or an offsite commercial facility. Please note that Area G borders the San Ildefonso Sacred Area, and is a potential source of pollution to tribal land, and every shipment to Area G increases the potential impact. **1-8**

CHAPTER 3 AFFECTED ENVIRONMENT

3.11.4 Accident History

1. The CMR accident history includes spills, stack releases, and fires. This section should address lessons learned and how they will be applied to the CMRR. **1-9**

CHAPTER 4 ENVIRONMENTAL IMPACTS

4.3.7.3 Traditional Cultural Properties

1. This section states; "If any traditional cultural properties were located during construction, work would stop while appropriate action would be undertaken." Please clarify what is meant by "appropriate action". **1-10**

Response to Commentor No. 1

potential impacts associated with new or changed activities or operations, changes to the site, and new or decommissioned buildings and facilities will be considered for any cumulative changes to environmental impacts at LANL in 2004, and again in 2009. If the CMRR Facility and the MPF are approved for siting at LANL, impacts from these projects will be subject to this review.

1-5: The NNSA notes the commentor's concerns regarding the potential risks from natural or man-made disasters that could result from consolidating Security Category I nuclear operations at one LANL area, and shares this concern. This risk would be a key consideration in the design and construction of new facilities and their associated security measures, if these proposals are approved for TA-55 at LANL.

1-6: The NNSA would like to clarify that all four action alternatives would generate radioactive liquid wastes that would be transported to the TA-50 RLWTF, which releases its treated effluent into Mortandad Canyon. Present and future discharges to the Canyon from TA-50 must meet stringent discharge parameters, and would pose small radiological risks to adjacent property.

1-7: The referenced Figure 2-2 shows the approximate area at TA-55 available for siting the CMRR Facility. It is not intended to show a change in the TA boundary onto the opposite side of Pajarito Road or relocation of the road.

1-8: The issue of radioactive waste being placed at Area G within LANL's TA-54 waste management facility, which is located adjacent and upwind and upstream from the San Ildefonso Sacred Area, is noted by NNSA as requested.

1-9: Lessons Learned from past CMR Building activities and operations are being used in the preliminary CMRR Facility planning and would be used in the detailed design if NNSA decides on an action alternative for the project. As the Facility designs were developed, formal reviews and conduct of value engineering studies required by DOE Order 413.3 would be conducted to ensure implementation of current standards and codes, as well as the inclusion of best practices proven through operational experience. The preliminary CMRR Facility plan for the separation of administrative office space from Hazard Category II and III laboratory

Commentor No. 1: Pueblo De San Ildefonso, John Gonzales, Governor (Cont'd)

4.3.9.2 Facility Accidents

1. The accident scenario should include TA-55 as a whole. It would be impossible to separate the effects of the different facilities due to (for example) an earthquake, or man-made disaster. **1-11**

4.3.10 Environmental Justice

1. This section is restricted to discussing fatalities and illness. Environmental Justice also addresses the effects of disparate impacts due to exposure from the aggregation of risk from multiple sources of pollution. The CMRR is a component of a disparately high number of facilities in one location with the potential to significantly pollute tribal land. Also, harmful effects on Tribal land can not be strictly measured by numbers of additional cancers per year, but also by the presence of ANY amount of pollution in sacred areas. **1-12**

4.4.5.1 Surface Water

1. This is to reiterate the earlier comment that with any of the alternatives, effluent will still be released from the TA-50 RLWTF into Mortandad Canyon, which drains onto San Ildefonso land. **1-13**

4.4.7.3 Traditional Cultural Properties

1. This section states; "If any traditional cultural properties were located during construction, work would stop while appropriate action would be undertaken." Please clarify what is meant by "appropriate action". **1-10 (Cont'd)**

4.4.10 Environmental Justice **1-12 (Cont'd)**

1. See the comment above under section 4.3.10.
2. Please note that this alternative would be less likely to negatively effect Tribal land. **1-14**

4.7.5 Radiological Impacts of Sabotage Involving the CMRR Facility

1. It seems likely that any sabotage effort at TA-55 would not be limited to a single facility. This section (and the referenced Appendix) should address the possibility of simultaneous sabotage to all nuclear facilities at TA-55. **1-15**

4.10.1 Unavoidable Adverse Environmental Impacts

1. This section states; "Overall air quality at LANL would not be changed by implementing any of the alternatives analyzed in this EIS." This may be true, but the TA-6 location for the CMRR would be further from and have less impact on Tribal land. **1-16**

Response to Commentor No. 1

spaces is an example of lessons learned. The existing CMR Building combines these two functions and past experience indicate that this is not an optimum arrangement. As Chapter 3 addresses the existing environment, which includes past site events and accidents, no changes have been made to the text.

1-10: "Appropriate action" in the case of the unexpected discovery of cultural resources during site construction work would include assessing the nature of the discovery, contacting the apparent appropriate parties for consultation (the State Historic Preservation Officer and the group of individuals likely affiliated with the resource), making decisions about site data recovery, removal of the artifact or feature, or shifting of the construction around the feature, and other similar and associated activities. Traditional cultural properties at LANL could be affiliated with local pueblos, nearby tribes or Spanish, Mexican or U.S. settlers and homesteaders. Because the appropriate action required would be dependent upon the exact nature of the traditional cultural property discovered, exact language regarding what might constitute appropriate action has not been added to the *CMRR EIS*.

1-11: The objective of the accident analysis was to bound the consequences of severe accidents at the CMRR Facility whatever the cause. Terrorist attacks or extreme accidents at the CMRR Facility could directly affect the CMRR Facility itself, while leaving other facilities at LANL relatively undamaged. Other potential causes, such as earthquakes, could damage a widespread area throughout the Los Alamos area, including LANL. Section 5.2.11 and Appendix D of the *LANL SWEIS* provide an analysis of accidents involving multiple key facilities including those within TA-55. This *CMRR EIS* focuses on the environmental impacts that could result from implementation of the Alternatives described in Section 2.5.

1-12: Section 4.8 of the *CMRR EIS* provides an estimate of the aggregate (cumulative) impacts from present actions and reasonably foreseeable future actions at LANL. Aggregation of nuclear facilities at TA-55 would not exacerbate the potential pollution of land surrounding LANL because disposition paths for any specific type of waste generated at LANL is independent of the generation point. Although the risk of latent cancer fatalities is not the only radiological risk that could result from CMRR Facility activities, it is the largest and most serious radiological risk. While

Commentor No. 1: Pueblo De San Ildefonso, John Gonzales, Governor (Cont'd)

APPENDIX A ENVIRONMENTAL IMPACTS METHODOLOGIES

A.6.1 Description of Affected Resources and Region of Influence

1. This section begins with a description of water resources. This description should include traditional and ceremonial uses. **1-17**

APPENDIX C EVALUATION OF HUMAN HEALTH IMPACTS FROM FACILITY ACCIDENTS

C.3.3 Accidents Selected for This Evaluation – Step 3

1. To reiterate the concern expressed in the comment under sections 4.3.9.2 and 4.5 above, the impacts from an accident involving all nuclear facilities at TA-55 should be discussed. **1-11 (Cont'd)**

C.4.1 New CMRR Facility Alternatives

1. Again, the impacts from an accident involving all nuclear facilities at TA-55 should be discussed. **1-11 (Cont'd)**

APPENDIX D ENVIRONMENTAL JUSTICE

D.4.1.3 Impacts of the No Action Alternative on Low-Income and Minority Populations

1. This section is limited to a discussion of risk from radiation. As stated earlier, Environmental Justice is about much more than radiation risk. See earlier comments about disparate effects from exposure from the aggregation of risk from multiple sources of pollution. Also, traditional risk assessment does not address Native American exposure pathways, so is not appropriate for discussing risk to tribal members. **1-18**

D.4.2.3 Impacts of Alternatives 1 and 3 on Low-Income and Minority Populations

1. See the preceding comment.

D.4.4 Special Pathways Analysis

1. The analysis is incomplete. It lacks pathways, is limited to radionuclides, and is based on health effects to non-Natives. **1-19**

Response to Commentor No. 1

zero radiological risk and pollution would not be an attainable goal, the radiological risks and pollution (discussed in Chapter 4) that could result from implementation of the action alternatives would be small.

1-13: NNSA notes the commentor's concern about effluent releases to Mortandad Canyon. Under each of the alternatives, radioactive liquid waste would be treated at the RLWTF. Resulting effluent from the RLWTF would meet stringent discharge parameters prior to discharge in Mortandad Canyon. (See the Response 1-4.)

1-14: The NNSA notes that Pueblo de San Ildefonso considers the Greenfield Alternative to be less likely to negatively affect Tribal land.

1-15: The probability of sabotage occurring at TA-55 is small. Safeguards and security protective measures and programs would be taken to protect the CMRR Facility. Locating the CMRR Facility at TA-55 would enhance its overall security posture. Sabotage, as an initiating event for an accident, was not analyzed in the CMRR EIS; consequences of such an event would be very similar to the bounding accidents provided in the CMRR EIS. However, sabotage as an accident scenario initiator meets the requirements for serious consideration by the safeguards and security program and the facilities' protective measures would include redundant features to minimize the possibility of such an event.

1-16: With regard to air shed effects, all four action alternatives considered would result in small and nearly identical air quality effects on Tribal land. (See Chapter 4.)

1-17: As recommended by the commentor, text has been added to Appendix A.6.1.

1-18: See responses to comments 1-11, 1-12, and 1-15. A special pathways analysis that addresses traditional Native American and Hispanic lifestyles is provided in Section D.4.4 of the *CMRR EIS*.

1-19: As discussed in Section D.4.4, the *CMRR EIS* special pathways analysis is based on the special pathways analysis performed during preparation of the *LANL SWEIS*. It includes ingestion of contaminated foods that would be applicable to traditional Native American or Hispanic lifestyles. Potential health impacts resulting from exposure to radiation are

Commentor No. 1: Pueblo De San Ildefonso, John Gonzales, Governor (Cont'd)

Response to Commentor No. 1

independent of the racial or ethnic origins of the exposed individual or population. NNSA knows of no credible method for evaluating radiological health effects that are dependent on the race or ethnic origin of the receptor.

Commentor No. 2: United States Environmental Protection Agency, Michael P. Jansky, P.E.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

June 30, 2003

Ms. Elizabeth Withers
U.S. DOE/NNSA
Los Alamos Site Office
528 35th Street
Los Alamos, NM

Dear Ms. Withers:

In accordance with our responsibilities under Section 309 of the Clean Air Act, the National Environmental Policy Act (NEPA), and the Council on Environmental Quality Regulations (CEQ) for Implementing NEPA, the U.S. Environmental Protection Agency (EPA) Region 6 office in Dallas, Texas, has completed its review of the Draft Environmental Impact Statement (DEIS) for the Proposed Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, New Mexico. The preferred alternative is to construct a new facility at Technical Area 55. This facility will replace the existing Chemistry and Metallurgy Research Building.

EPA classified your DPEIS and proposed action as "LO," i.e., EPA has "Lack of Objections" to the proposed alternative. Our classification will be published in the Federal Register according to our responsibility under Section 309 of the Clean Air Act, to inform the public of our views on proposed Federal actions. **2-1**

EPA appreciates the opportunity to review the DEIS. We request that you send our office one (1) copy of the Final PEIS at the same time that it is sent to the Office of Federal Activities (2251A), EPA, 1200 Pennsylvania Avenue, N.W., Washington, D.C. 20004. **2-2**

Sincerely yours,

Michael P. Jansky, P.E.

Michael P. Jansky, P.E.
Regional 309 Review Coordinator

Response to Commentor No. 2

2-1: The NNSA acknowledges the EPA's classification of the *CMRR EIS* and the proposed action.

2-2: The NNSA acknowledges the request to send a copy of the Final *CMRR EIS* to the Region 6 office at the same time it is filed with the EPA's Washington Office of Federal Activities; NNSA has provided a copy as requested.

Commentor No. 3: United States Department of the Interior, Stephen R. Spencer

United States Department of the Interior

OFFICE OF THE SECRETARY
Office of Environmental Policy and Compliance
Post Office Box 649
Albuquerque, New Mexico 87103

IN REPLY REFER TO:

June 27, 2003

ER 03/443

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers:

The U.S. Department of the Interior has reviewed the Draft Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico. In this regard, we have no comments. Thank you for the opportunity to review this document. **3-1**

Sincerely,

Stephen R. Spencer
Acting Regional Environmental Officer

Response to Commentor No. 3

3-1: The NNSA notes the commentor's evaluation of the *CMRR EIS*.

Commentor No. 4: State of New Mexico, Environment Department, Ron Curry, Secretary

State of New Mexico
ENVIRONMENT DEPARTMENT
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BILL RICHARDSON
GOVERNOR

RON CURRY
SECRETARY

DERRITH WATCHMAN-MOORE
DEPUTY SECRETARY

June 23, 2003

Elizabeth Withers
CMRR EIS Document Manager
U.S. DOE/NNSA
Los Alamos Site Office
528 35th Street
Los Alamos, N.M. 87544-2201

Dear Ms. Withers:

RE: DRAFT ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED CHEMISTRY AND METALLURGY RESEARCH BUILDING REPLACEMENT PROJECT AT LOS ALAMOS NATIONAL LABORATORY, LOS ALAMOS, NEW MEXICO (CMRR DEIS)

This transmits New Mexico Environment Department (NMED) comments concerning the above-referenced Draft Environmental Impact Statement (DEIS).

BACKGROUND

The National Nuclear Security Administration (NNSA) of the Department of Energy (DOE) proposes to replace the existing Chemistry and Metallurgy Research (CMR) Building at the Los Alamos National Laboratory (LANL) with a new facility. The DEIS evaluates the potential environmental impacts associated with the proposed action of consolidating and relocating CMR capabilities from an aging building to a new building(s). The DEIS also addresses disposition of the existing CMR building. Impacts from the demolition of the existing CMR Building would result from the decontamination and demolition of the building and the transport and disposal of radiological and non-radiological waste materials.

The Preferred Alternative is to construct a new CMRR Facility at Technical Area (TA) 55. One of the new buildings would provide space for administrative offices and support functions. The other building(s) would house secure laboratory spaces for analytical chemistry and materials characterization activities. The buildings would be expected to operate for a minimum of 50 years. Tunnels may be constructed to connect the buildings. Transportation accidents for the

Response to Commentor No. 4

Commentor No. 4: State of New Mexico, Environment Department, Ron Curry, Secretary (Cont'd)

Elizabeth Withers
June 18, 2003
Page 2

Preferred Alternative, that can cause radiological exposures to workers and the public, are predicted to go to zero since the new CMRR at TA-55 would eliminate the need for transporting special nuclear material between it and the adjacent Plutonium Facility on public roads at LANL.

Alternative 2 is to construct the new CMRR Facility in an undeveloped "Greenfield" area within TA-6. Alternatives 3 and 4 are to continue using the existing CMR Building for administrative offices and to construct a new nuclear laboratory building(s) at either TA-55 or TA-6.

Some environmental impacts are common to all of the action alternatives described above. Each option would produce equivalent amounts of emissions and radioactive releases into the environment. Infrastructure requirements would be the same, and each alternative would generate the same amount of radioactive and non-radioactive waste, regardless of the ultimate location of the new CMRR Facility at LANL. According to the DEIS, soil erosion controls would be put in place during excavation and demolition activities for both the construction of the new CMRR and the demolition of the existing old CMR Building. Silt fences, hay bales, or other appropriate best management practices would be employed to ensure that fine particles are not transported by stormwater into surface water features in the vicinity of the CMR Building. The DEIS states that the overall air quality at LANL over the 50-year operating period would remain within standards during construction and operation of the new CMRR Facility.

Under the No Action Alternative, the NNSA cannot continue to operate the assigned LANL mission-critical CMR support capabilities in the existing CMR Building at an acceptable level of risk to public and worker health and safety without operational restrictions. The operational restrictions preclude the full implementation of the level of operation DOE decided upon through its Record of Decision for the LANL Site-Wide Environmental Impact Statement (SWEIS). The CMR Building is near the end of its useful life, and action is required now by NNSA to assess alternatives for continuing these activities for the next 50 years.

The Preferred Alternative decreases the overall nuclear footprint at LANL, makes more efficient use of resources and lowers the overall radiological release risk due to eliminating the possibility of transportation accidents.

We have three specific comments regarding both the operations at the new CMRR and the disposition of the old CMR Building.

1. The DEIS does not give details on the types and/or volumes of liquid radiological waste expected to be produced during the operation of the new CMRR Facility and identifies the lack of liquid radiological waste monitoring at the existing CMR. Future radiological waste streams are project by the DEIS to increase. The current radiological liquid waste treatment system at TA-50 that will receive this increased liquid radiological waste stream may require additional upgrades to stay in compliance with the National Pollutant Discharge Elimination System (NPDES) permit and DOE Order. 4-1

2. The demolition of the existing CMR Building will generate an estimated 16,000 cubic yards of radioactive waste. Although some discussion elaborates on disposition options, final 4-2

Response to Commentor No. 4

4-1: Although the DEIS did not specifically identify a lack of liquid radiological waste monitoring at the existing CMR, the DEIS provides an estimate of liquid low-level radioactive waste generated annually under current CMR operations. This same estimate has been added to the Final EIS as bounding information regarding liquid low-level radioactive waste generation at the proposed CMRR Facility. (See the discussion of waste management impacts in Section 4.3.11.1.) Because some mission activities that are currently restricted at the CMR Building would be pursued at higher operations levels, some waste streams would be expected to increase over current levels. However, for liquid low-level radioactive waste generation, rates are not expected to increase. Operations levels at the CMRR Facility are based on the level of CMR Building operations identified in the Expanded Operations Alternative in the *LANL SWEIS*. The SWEIS evaluated the impacts on waste generation, including the RLWTF, of this expanded level of operations at the CMR Building. Waste generation at the CMRR Facility would not be expected to exceed that evaluated in the SWEIS. More specific information regarding the composition of the wastes is not available at this time.

4-2: Available information regarding CMR Building disposition generated waste is included in the *CMRR EIS* in Section 4.7.2. The exact volumes of different waste types would be dependent upon decisions about the level of building demolition pursued. Further, as indicated in Section 2.7.7, additional NEPA compliance review would be required when disposition of the CMR Building has undergone more detailed planning in about 15 years.

disposition for all of the CMR Building's radioactive waste resulting from decontamination and demolition (D & D) activities should be clearly identified and not include temporary storage at TA-54, if it is avoidable.

4-2 (Cont'd)

3. Construction practices at LANL in the past have designed storm water conveyance systems to remove the storm water from building and parking lot drains as fast as possible and deliver the runoff to the canyons without treatment. This has contributed to flash flooding in canyons such as Sandia and Mortandad where contaminants from past and current operations are subject to mobilization and offsite transport by these flash flood events. The CMR buildings will occupy 8.75 acres of land and an additional 5 acres of land will be utilized for parking. These impervious surfaces will generate significant amounts of runoff into Mortandad Canyon if the preferred alternative is chosen (other canyons may be impacted if another alternative is chosen). The final configuration of the CMR project should mitigate undesirable storm water impacts on affected canyons. This project should be designed with storm water runoff controls that utilize detention or retention of storm water on the mesa tops. For example, constructed wetlands could be used for treating the runoff prior to discharge to the canyon system. Parking lots could be designed to direct water to shade tree plantings located internally to the parking lot. These types of designs would reduce the "first flush" contaminant loading from the parking lots and roof drains and reduce the instantaneous discharge of storm water to the canyon systems. This will result in a reduction of both new contaminant discharge to the canyon system and disturbance and re-transport of contaminants already deposited to soil bodies and sediments within the canyon system.

4-3

HAZARDOUS WASTE

General Comments:

1. Los Alamos National Laboratory (LANL) and the Department of Energy (DOE) must provide a more concise presentation of draft/final environmental impact statements. Factual information presented is often too vague and supported only by anecdotal statements, is not supported by the referenced documents or supported by any document references. For example, in Section A.6.2.2: Water Quality; states that the "determination of the impacts of the alternatives is summarized in Table A-8 and consisted of a comparison of the projected effluent quality with relevant regulatory standards and implementing regulations…". LANL and DOE do not support this statement by providing the assumptions, calculations, regulatory levels, etc. used to compile Table A-8. Table A-8 should compare individual constituent relative to applicable standards, limits, derived concentration guides, etc. It is difficult for the public and other stakeholders to evaluate/assess DOE and LANL conclusions on impacts to the environment without this information.

4-4

2. Prior to decontamination and demolition activities at the current CMR structure (TA-3-29), DOE and LANL must close all Resource Conservation and Recovery Act (RCRA) interim status and/or permitted units following proper procedures including but not limited to, public participation and permit modification requirements.

4-5

4-3: The NNSA notes the State of New Mexico's concerns regarding storm water management for the new CMRR Facility. As stated in Section 2.7 for all of the action alternatives considered, the design and operation of new buildings would incorporate appropriate storm water management controls. These controls would be included in the final design of the CMRR Facility, including site landscaping practices.

4-4: Best available information is included in the *CMRR EIS* analyses. The administrative record for the *CMRR EIS* includes the data reports, calculations, and other reference documentation used in analyzing environmental impacts and against which the methods and environmental impact indicators contained in Table A-8 and similar tables in the Appendix were applied. The NNSA is of the opinion that a comparison of individual constituents and their regulatory levels is not necessary or meaningful for inclusion in this table.

4-5: Prior to any decontamination and demolition activities at the existing CMR Building, NNSA and the LANL contractor would undertake all necessary actions, including any pertinent legal and regulatory requirements in effect at that time.

Commentor No. 4: State of New Mexico, Environment Department, Ron Curry, Secretary (Cont'd)

Elizabeth Withers
June 18, 2003
Page 4

3. Prior to D&D activities at the current CMR structure (TA-3-29), DOE and LANL must investigate and remediate all solid waste management units (SWMUs) and areas of concern (AOCs) potentially impacted by D&D activities. **4-6**

4. SWMUs 55-011(d) a drain or outfall, and possibly others, are located within the proposed boundary or may be impacted by construction of the Chemistry and Metallurgy Research Building Replacement (CMR Replacement) preferred location at TA-55. DOE and LANL must investigate remediate all SWMUs and AOCs to appropriate ecological and human health based standards prior to initiation of construction activities at TA-55 (or TA-3 or TA-6). A work plan(s) outlining the investigation and remedial activities at the SWMUs and AOCs must be submitted to and approved by the NMED's Hazardous Waste Bureau (HWB) prior to corrective action activities. An investigation report documenting corrective action activities is also required. All waste generated during the remediation(s) must be characterized prior to disposal and subsequently stored and disposed in appropriate facilities. **4-7**

5. If DOE and LANL have not already done so, the Seismic Hazards Borehole one (SHB-1), located to the west of TA-55, must be properly plugged and abandoned (according to New Mexico regulations) prior to construction activities. All other open borings, wells, etc. that are in the impacted area must also be identified and properly plugged and abandoned prior to commencement of construction activities. The locations of all borings and wells, prior to P&A activities, should be surveyed and the borehole/well should be screened for the presence of vapor phase contamination and water following proper procedures. A report documenting each well and the details of the surveying, screening and P&A activities associated with each well must be submitted to the NMED's HWB following completion. **4-8**

6. DOE and LANL must identify and properly plug and abandon (according to New Mexico regulations) all open borings, wells, etc. in the general area surrounding the TA-3 CMR building, which may be impacted by D&D activities. The locations of all borings and wells, prior to P&A activities, should be surveyed and the borehole/well should be screened for the presence of vapor phase contamination and water following proper procedures. A report documenting each well and the details of the surveying, screening and P&A activities associated with each well must be submitted to the NMED's HWB following completion. **4-9**

7. DOE and LANL should discuss in detail the volumetric increases in waste generation (i.e. transuranic, mixed transuranic, low-level, mixed low-level and hazardous wastes). For example, discuss what form(s) (e.g., liquid, solid, air) the waste streams and the expected percentage of each, list the constituents/radionuclides expected to be present in the various waste streams and identify expected concentrations and activities in each waste stream. It is difficult for the public and other stakeholders to scrutinize DOE and LANL conclusions without this information. **4-10**

8. DOE and LANL should discuss in detail the expected impacts to air emissions and increased discharge to/from the TA-50 Radioactive Liquid Waste Treatment Facility (RLWTF). Discharge volume increases, constituents and associated concentrations and activities should be discussed in detail as it relates to each waste stream identified. It is difficult for the public and **4-11**

Response to Commentor No. 4

4-6: See response 4-5.

4-7: The NNSA notes the commentor's statements regarding preconstruction investigations, remediation, work plans, investigation reports and waste characterization needs. NNSA will comply with all applicable state and Federal laws and regulations if it goes forward with the CMRR Project.

4-8: The NNSA acknowledges the commentor's statements regarding plugging and abandonment of boreholes, wells and other such items, and necessary reports at TA-55, and will comply with applicable state regulations.

4-9: The NNSA acknowledges the commentor's statements regarding plugging and abandonment of boreholes, wells and other such items, and necessary reports at TA-3, and will comply with applicable state regulations.

4-10: The NNSA notes the commentor's statements about the amounts of the various possible waste steams that could be generated if one of the action alternatives were implemented. The *CMRR EIS* includes best available information, as well as being bounding information, about the various possible waste streams, as detailed information is not available.

4-11: The NNSA notes the commentor's statements about the air emissions and radioactive liquid waste volumes that could be generated if one of the action alternatives were implemented. The *CMRR EIS* includes the best available information, as well as being bounding information, about the various possible air emissions, as detailed information is not available.

other stakeholders to scrutinize DOE and LANL conclusions regarding environmental impacts without this information. **4-11 (Cont'd)**

9. DOE and LANL should clarify if the proposed site, located at TA-6, is suitable due to hazard radii associated with firing sites. Also, clarify if access to the proposed site, at TA-6, would be hindered or limited by firing site activities. **4-12**

Section Specific Comments:

10. Section 3.5.1.3: Seismicity; DOE and LANL do not discuss seismic conditions at either of the proposed locations. Vaniman and Wohletz, 1993 (ER ID 48822) describe a zone of "abundant fracturing" around TA-55. As the zone of "abundant fracturing" is located on the trace of the Rendija Canyon Fault, it may be related. DOE and LANL must discuss in detail recent studies that have considered the TA-55 and TA-6 locations in order for DOE, LANL, the public and other stakeholders to adequately assess these locations for the possible location of the new CMR Building. **4-13**

11. Section 3.6.1: Surface water; indicates the compliance during 2001 with the NPDES permit was "nearly 100 percent." Because construction of the new CMR Building will undoubtedly impact effluent discharges, DOE and LANL should discuss historic compliance with NPDES discharges from the TA-50 RLWTF outfall and resulting cumulative impacts to surface water, sediment quality and groundwater quality. In addition, as discharges from the RLWTF will be impacted, DOE and LANL should discuss their "compliance" history with internally DOE derived concentration guides (DCGs) for radionuclides. It is impossible for the public and other stakeholders to adequately scrutinize DOE and LANL conclusions regarding possible environmental impacts without this information. **4-14**

12. Section 3.6.2: Groundwater; indicates "most aquifers underlying LANL and the vicinity, except for perched groundwater bodies, are considered Class II aquifers (i.e., those used or potentially available for drinking water or other beneficial use." NMED strongly disagrees with the statement, all groundwater or subsurface water potentially used for water supply (single household, municipal, etc.) having less than 10,000 pm total dissolved solids may potentially be used for "drinking water or other beneficial use." Beneficial use would include springs emanating from groundwater bearing intervals that wildlife/other receptors may utilize. The text should be updated to state that other groundwater bearing zones, in addition to the regional aquifer, are capable of water supply. In addition, DOE and LANL have demonstrated an interconnection between the surface water and regional aquifer systems as indicated by LANL Facility derived contaminants found in the regional aquifer (e.g., perchlorate, nitrate, tritium, etc.). **4-15**

13. Section 3.6.2: Groundwater; does not indicate the actual subsurface conditions beneath Mortandad Canyon. Perched groundwater was encountered at 646 feet at R-15 (12 ppb perchlorate). Samples from the regional aquifer, R-15 indicate 4 ppb perchlorate. R-15 (pore water collected near the top of the regional aquifer contained 1662 pbb perchlorate at 740 feet). The top of the regional aquifer is identified at 958 feet. At intermediate well MCOBT-4.4 water **4-16**

Response to Commentor No. 4

4-12: The TA-6 proposed site is a suitable construction site. The NNSA only considered those sites at LANL where the CMRR Facility could reasonably be constructed and operated in its EIS analyses. Those areas that were considered as possible sites due to favorable site physical features were later screened from further consideration if operational constraints precluded their reasonable use for the Facility. The *CMRR EIS* includes a discussion of the site selection process in Chapter 2.6.3.

4-13: Section 3.5.1.3 discusses the relative distribution and frequency of earthquakes, while Section 3.5.1.2 discusses LANL site stratigraphy followed by a detailed discussion of structural geology and faulting. Specifically, a detailed discussion of geologic mapping and associated seismic investigations that have conducted by the LANL Seismic Hazards Program and others relative to TA-3, TA-6, and TA-55 is included in the last three paragraphs of Section 3.5.1.2 of the *CMRR EIS*.

4-14: Current compliance with National Pollutant Discharge Elimination System (NPDES) permit specifications and DOE guidelines, with regards to operation of the TA-50 RLWTF, is germane to a decision to construct and operate a new CMRR Facility at LANL and is discussed in Section 3.6.1.

4-15: The definition cited for describing aquifers in the vicinity of LANL is consistent with the three classes defined by the U.S. EPA in its *Guidelines for Groundwater Classification under the EPA Ground-Water Protection Strategy* (EPA 1986). DOE commonly uses this terminology in providing a general overview of groundwater resource potential around its sites using a consistent methodology, especially when sites in multiple states are being analyzed. Consistent with the State of New Mexico's groundwater standards, the text has been revised to state: "All groundwater underlying LANL and the vicinity having a total dissolved solids concentration of 10,000 milligrams per liter or less is considered a potential source of water for domestic or other beneficial use (NMAC 20.6.2.3000)."

4-16: The NNSA notes the State of New Mexico's detailed information about Mortandad Canyon groundwater quality and perched groundwater occurrences. A general description of site hydrogeology and groundwater quality is provided in Section 3.6.2 of the *CMRR EIS*. The implementation of any of the four CMRR Facility action alternatives would not be expected to affect groundwater quality at LANL, since the proposed

Commentor No. 4: State of New Mexico, Environment Department, Ron Curry, Secretary (Cont'd)

Elizabeth Withers
June 18, 2003
Page 6

was encountered at 485-520 feet and perchlorate ranging from 142-179 ppb, nitrate at 12-13.2 ppm (WQCC standard of 10 pm), and tritium at 14, 900 pick/L. Per chlorate was detected in core samples from the vamoose zone at MCOBT-4.4 and MCOBT-8.5, no plugged and abandoned, between 80 and 380 feet (per chlorate concentrations range between roughly 300 ppb and more than 800ppb). In addition, springs located throughout the facility and White Rock Canyon contains anthropogenic contaminants derived from the LANL Facility (e.g., per chlorate, high explosives, nitrate, tritium, strontium-90, etc.).

4-16 (Cont'd)

14. Section 3.6.2: Groundwater; indicates the RLWTF at TA-50 has installed a treatment system to remove per chlorate, but does not indicate that the treatment system only treats current discharges and does nothing to remove per chlorate from the down gradient and interconnected alluvial, intermediate or regional groundwater systems. It should be noted that LANL and DOE installed a permeable reactive barrier that may treat per chlorate in the shallow alluvial aquifer between alluvial monitoring wells MCO-4 and MCO-5. The effectiveness of the barrier has yet been demonstrated; however, it would only prove effective for alluvial groundwater treatment. The text should be updated to include all relevant information.

4-17

15. Section 3.11: Human Health; DOE and LANL should identify and describe in detail, the individual chemicals that comprise the "volatile organic compounds" and "hazardous air pollutants" as well as radio nuclides, concentrations and activities, volumes and types of impacted environmental media that may cause adverse health impacts. Contaminants can have highly variable health based standards that are dependent on a variety of factors such as the characteristics of the individual contaminant, exposure route(s) and affects of other commingled contaminants.

4-18

16. Section 4.3.6: Ecological Resources; In addition to discussions on loss of habitat due to construction of the new CMR Building, DOE and LANL should cite information (if available) regarding current facility operational impacts (e.g., air emissions and waste water discharges) on the overall ecological health (e.g., affected terrestrial and aquatic receptors; impacts to species populations, diversity, mutagenic affects, etc.) of the system. If no specific ecological information is available regarding current facility (including TA-3, TA-6, TA-50 and TA-55) operations, DOE and LANL should identify the impacts from the current/historic releases prior construction of a new facility where discharges are likely to increase. Impacts to the ecological resources should also be evaluated for the other alternatives/locations considered for the CMR building replacement.

4-19

17. Section 5: Applicable Laws, Regulations and Other Requirements; LANL and DOE should provide a list of all facility permits that will or may require modification (e.g., Clean Water Act, Clean Air Act, Resource Conservation and Recovery Act), the timetable for such modifications and the changes that are anticipated.

4-20

AIR QUALITY

The proposed project is in an area that is currently in attainment for all National Ambient Air Quality Standards (NAAQS) and in compliance with National Emissions Standards for

Response to Commentor No. 4

facility would replace the physical building housing existing operations rather than introduce an additional new facility and new operations to LANL that could reasonably result in additive environmental impacts. Therefore, the NNSA is of the opinion that no additional discussion of existing groundwater contamination is necessary.

4-17: The NNSA acknowledges the commentor's remarks about the treatment of perchlorates present in groundwater within Mortandad Canyon. As further described in response to Comment 4-16, the implementation of any of the four CMRR Facility action alternatives would not be expected to have any additional impact on groundwater in Mortandad Canyon or elsewhere at LANL. The reactive barrier installed within Mortandad Canyon, as noted by the commentor, has been in place less than a year. If effective, it would reduce contamination within the shallow alluvial aquifer. Sampling has recently been initiated to determine the barrier's effectiveness; data is not yet conclusive.

4-18: The NNSA notes the commentor's remarks about the human health discussion provided in Chapter 3 of the *CMRR EIS*. As discussed in Sections 4.2.9, 4.3.9, 4.4.9, 4.5.9, and 4.6.9, hazardous chemicals were used in the CMR Building would be stored and used in the new CMRR Facility. Quantities of these chemicals would be below threshold quantities set by the EPA (40 CFR 68). The laboratory use of 10 to a few hundred milliliter quantities of such chemicals that would actually be used would pose a hazard only to involved workers under accident conditions and would not result in appreciable releases to the atmosphere. Volatile organic compounds that could be released by construction vehicles and equipment during any construction of new facilities would be of temporary duration and would be typical of that expected during any building construction. Risks from hazardous chemicals do not warrant the level of detail requested.

4-19: The *LANL SWEIS* provides ecological resource impact information regarding overall LANL operations. The information provided in Chapter 3 of the *CMRR EIS* reflects updated ecological setting information including resource changes after the Cerro Grande Fire. The health of wildlife in the area and vegetation at LANL is also reported each year in the LANL Annual Surveillance Reports. Impacts specific to the CMRR

Commentor No. 4: State of New Mexico, Environment Department, Ron Curry, Secretary (Cont'd)

Hazardous Air Pollutants (NESHAP). Although potential exists in the project for increase of air emissions, the project should not result in non-attainment or violation of air quality standards. However, there are special considerations for the project that are outlined below.

For each of the action alternatives (Alternatives 1, 2, 3 or 4), potential exists for temporary increases in dust and emissions from earthmoving and construction equipment during construction; however, the increases should not result in non-attainment of air quality standards. Dust control measures should be taken to minimize the release of particulates during construction. Contractors that supply asphalt for the project must have current air quality permits. **4-21**

The DOE National Nuclear Security Administration should be aware that emissions resulting from the project must not exceed NESHAP. Asbestos emissions should be managed per applicable protocols and the DOE National Nuclear Security Administration can contact the New Mexico Air Quality Bureau for assistance in determining and complying with regulations pertaining to the management of asbestos emissions. The U.S. Environmental Protection Agency (EPA) has jurisdiction over radionuclide emissions, thus the DOE National Nuclear Security Administration should consult 40 CFR 61 Subpart H or contact EPA for assistance in determining and complying with applicable regulations. **4-22**

Please let us know if you have any questions. We appreciate the opportunity to comment on this document.

Sincerely,

Ron Curry
Secretary

NMED File No. 1726ER

Response to Commentor No. 4

Facility action alternatives is provided in Chapter 4, Sections 4.3 to 4.8, of the *CMRR EIS*.

4-20: The NNSA acknowledges the commentor's remarks about facility permits that would be needed if the NNSA pursues one of the CMRR Facility proposed action alternatives. NNSA will comply with the listed laws and all applicable regulations and permitting requirements in the event that one of the action alternatives is selected for implementation.

4-21: The NNSA acknowledges the commentor's remarks about dust control measures and air quality permits being required for asphalt suppliers.

4-22: The NNSA acknowledges the commentor's remarks about the need to meet the National Emission Standards for Hazardous Air Pollutants (NESHAPs) for any CMRR Facility construction and operational activities. NNSA appreciates the offer of assistance from the New Mexico Air Quality Bureau in determining and complying with regulations pertaining to asbestos emissions.

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani, Ph.D

From: Lois Chalmers / IEER [mailto:lois@ieer.org]
Sent: Monday, June 30, 2003 11:24 AM
To: *CMRR EIS*
Cc: Arjun Makhijani
Subject: Comments - Chemical and Metallurgical Research (CMR) Building Replacement Project Draft EIS

Elizabeth Withers
NEPA Compliance Officer
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Dear Ms. Withers,

Attached are the comments of the Institute for Energy and Environmental Research on the Department of Energy/National Nuclear Security Administration's draft environmental impact statement (hereinafter the "DEIS") proposed Chemical and Metallurgical Research (CMR) Building Replacement Project at the Los Alamos National Laboratory (LANL).

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Response to Commentor No. 5

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

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30 June 2003

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Dear Ms. Withers,

Here are the comments of the Institute for Energy and Environmental Research on the Department of Energy/National Nuclear Security Administration's draft environmental impact statement (hereinafter the "DEIS") proposed Chemical and Metallurgical Research (CMR) Building Replacement Project at the Los Alamos National Laboratory (LANL).

Thank you

Arjun Makhijani, Ph.D
President
Institute for Energy and Environmental Research
Takoma Park, MD 20912

Response to Commentor No. 5

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

Comments on the Draft Environmental Impact Statement (EIS) For the Proposed Chemical and Metallurgical Research (CMR) Building Replacement Project

Submitted by
Arjun Makhijani
Institute for Energy and Environmental Research, Takoma Park, Maryland
to
Ms. Elizabeth Withers
NEPA Compliance Officer
U.S. DOE/NNSA Los Alamos Site Office
Fax: 505.667.9998; e-mail: cmrreis@doeal.gov, sent by e-mail and fax

June 30, 2003

A. Need for the Project

While the CMR Replacement (CMRR) Draft EIS is not very forthcoming on the details of the need for the new facility, there is an abundant amount of indication that this is an unneeded facility.

The CMR Replacement Facility is proposed primarily to create advanced capabilities for analytical chemistry and for materials characterization related to nuclear materials, non-radioactive analogs and other aspects of nuclear weapons programs that are part of the DOE Stockpile Stewardship Program. 5-1

DOE historical data shows that there have never been aging related safety problems in the primaries of nuclear weapons. Nor have any of the pits in the current arsenal ever had aging related reliability problems. As part of the evidence for that, I am enclosing the IEER study on the Stockpile Stewardship Program that analyzed aging-related issues based on data supplied by LANL. That study is an integral part of these comments.

The CMRR EIS itself states that "no problems [related to aging of pits] have been identified" (p. S-11). The Draft EIS on the Modern Pit Facility states that aging research provides confidence that pit lifetime is 45 years or more and indicates that data exists to support a lifetime estimate of 60 years. It identifies no problems that require pit replacement even beyond that time. Other evidence along the same lines is cited in the comments of Jay Coghlan of Nuclear Watch of New Mexico. Those citations from the DOE and other literature regarding aging are incorporated here by reference and I will not repeat them.[1]

Some materials characterization activities are being carried on in the restricted operations mode in the current CMR building. The Draft EIS provides no detailed rationale that for the going beyond these activities, much less a rationale for an entirely new replacement facility for the CMR. The estimated radiological impacts from some accident events postulated in the Draft EIS are among the most severe outside of reactor and reprocessing plant related events. They are also far more 5-2 5-3

[1] Jay Coghlan, "Comments on the Draft EIS on the CMRR," Nuclear Watch of New Mexico, Santa Fe, June 30, 2003.

Response to Commentor No. 5

5-1: As described in Section 1.3 of the CMRR EIS, the CMRR Facility is needed to house existing LANL mission-critical CMR capabilities. The issue of pit aging is of relevance to the Stockpile Stewardship Program. However, the actinide research and material characterization capabilities housed in the CMR Building and which would be housed in the CMRR Facility support most of DOE and NNSAs mission responsibilities, and are not limited to just supporting the Stockpile Stewardship Program.

5-2: The DOE announced its decision in a 1999 Record of Decision for the *LANL SWEIS*, to operate LANL at the level identified in that *SWEIS* as the Expanded Operations Alternative. This then became the level of operation analyzed in the *CMRR EIS* for the proposed action alternatives. The purpose and need for a new CMRR Facility is discussed in Section 1.3 of the *CMRR EIS*. The level of operation that the new facility would be expected to accommodate is discussed in Section 2.4.

5-3: As shown in Tables 4-5, 4-15, and 4-25 of the *CMRR EIS*, radiological risks associated with all of the alternatives would be small. No latent cancer fatalities due to accidents would be expected under any of the alternatives, and the highest risk to the offsite population under the action alternatives (0.0005 latent cancer fatalities, facility-wide spill or seismic-induced spill) would be less than the highest risk expected under the No Action Alternative (0.0024, severe earthquake). Comparing the operation of the new CMRR Facility to the operation of a nuclear reactor or nuclear material reprocessing plant does not provide a reasonable comparison. The consequences shown for severe accidents in the CMRR Facility are bounding values that are calculated taking no credit for the safety design and shielding that would actually be present in the new CMRR Facility.

severe than the "no action alternative." Given that the DOE/NNSA is planning to increase risks to the public considerably, there is a need to justify the project in detail to the public that will suffer these risks. A great deal has, in the past, been simply swept under the rug of national security, only later to be revealed to be gratuitously damaging to the health and environment of the people. It is worthwhile, in this context, to recall the statement of then-Deputy Secretary W. Henson Moore in 1989, during the administration of President George H.W. Bush, on his visit to Rocky Flats in June of that year. Nuclear weapons production, he told the press, has been "a secret operation not subject to laws . . . no one was to know what was going on." He added that "the way the government and its contractors operated these plants was: This is our business, it's national security, everybody else butt out."[2]

5-3 (Cont'd)

The skimpiness of the Draft EIS on the justification for a facility that will create significant risks (see below) is lamentable and raises the possibility of a return to these attitudes that should be consigned to regrettable footnotes in history books. The problem should be fixed in the final EIS with a detailed justification for the project including exactly what will be done in the new facilities. Based on the present information, it appears clear that the "no action alternative" is the soundest one among the ones enumerated. Further, the serious consequences of a main vault fire in the existing CMR building described in Appendix C indicate the need to perform operations there with a plutonium inventory that is significantly lower than the 200 kilograms indicated in the Draft EIS.

5-4

B. Air Emissions from Routine Operations

The Draft EIS shows that emissions to the air from routine operations would increase greatly. Current CMR emissions are stated to be 0.03 millicuries of actinides, including plutonium, with no releases of fission products or tritium. The new facility releases would be much higher. Actinide releases would increase by more than 25 times to 0.76 millicuries, and there would be significant releases of fission product noble gases, krypton-85, xenon-131m, and xenon-133 (100, 45, and 1,500 curies per year respectively). The new facility would also release 1,000 curies of tritium, mostly in the more hazardous form of radioactive water vapor.

5-5

The Draft EIS does not detail where the fission products will come from. The two xenon isotopes mentioned have relatively short half-lives (11.9 and 5.2 days respectively). Hence these would appear to be from some kind of hot cell operations in which newly radiated actinides would be processed. However, the Draft EIS states that the hot cell operations in Wing 9 of the present CMR building would not be transferred to the new facility. The EIS does not discuss where the irradiated material would come from. It also does not discuss any new hot cell operations, though these seem to be implied by the release in Table 4-21 on page 4-41. Finally, the Draft EIS does not mention potential releases of other fission products such as cesium-137, strontium-90, or iodine-131 even in case of accidents and severe fires. This is mysterious, since the presence of fission product noble gas mixtures is generally accompanied by the presence of other fission products. While these other products might be filtered out of routine emissions, it is unlikely that their release could be prevented in severe accidents, such as those discussed in Appendix C.

5-6

C. Accident Analysis

[2] As quoted in *The Washington Post*, 17 June 1989.

Response to Commentor No. 5

5-4: The NNSA notes the commentor's statement that the No Action Alternative is the "soundest" alternative under consideration. As shown in Section 4.2.9.2, Table 4-5, the risk of any latent cancer fatalities resulting from a fire in the main vault is approximately 1 in 500,000. That level of risk would not warrant a reduction in materials inventory at the existing CMR Building. The No Action Alternative fails to meet the NNSA's need for action, and implementing this alternative would result in mission support delays and problems at LANL. Considering the analytical results and the increased technological safety features planned for the CMRR Facility at a LANL location less vulnerable to earthquakes, the CMRR Facility would have the net effect of reducing accident risks to the public. Additionally, the computed consequences of a main vault fire in the existing CMR Building are "unmitigated", meaning that no credit is taken for safety features that would reduce or prevent the progression of a fire and the subsequent release of hazardous radioactive materials in the analyses. This is indicated by the conservative estimate of a leak path factor equal to one and a damage ratio equal to one. If credit were taken for a leak path factor and damage ratio less than one, the estimated consequences and risks for this accident would be greatly lessened. Accident analyses are prepared in part for existing facilities and during the planning stages of new facilities to facilitate the implementation of accident mitigations so that low probability, high consequence accidents can either be precluded by structure design features or management controls, or so the effects of such accidents can be minimized.

5-5: The NNSA proposes to construct the new CMRR Facility so that it could function at the expanded operational level identified by the 1999 *LANL SWEIS*'s Expanded Operations Alternative and its associated Record of Decision. As stated in Chapter 2 of the *CMRR EIS*, the new CMRR Facility would not include any hot cell operations, although hot cell operations have been conducted in the existing CMR Building. The *CMRR EIS* is tiered from the *LANL SWEIS*'s Expanded Operations Alternative. This analytical tiering and document production process has resulted in "bounding" impact analyses for the CMRR Facility. Fission products identical to those produced in the CMR Building's hot cells may never be produced by any operation conducted in the new CMRR Facility. However, using the greater operating envelope for the CMR Building and applying it to the new CMRR Facility provides a conservative analyses of

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

Chapter 4 and Appendix C of the Draft EIS contain accident analysis that suffers from a number of technical deficiencies. They also appear therefore to misstate the risks arising from the various events that are postulated. At any rate, they provide no sound and sufficient scientific basis for the conclusion of low overall risk, given the conclusion of high accident consequences for several of the postulated events. 5-7

Appendix C lists five different accidents that it estimates would result in cancer deaths in the offsite population within 50 miles of the facility. These accidents, together with the comparable accidents for the no action alternative are summarized in Table 1 below.[3] 5-8

Plutonium-239 (equivalent) release, offsite population dose, and offsite fatal cancer estimates for No Action and Preferred Alternatives, CMR Replacement Facility

Event	No Action Alternative, Pu-239 release, grams	No Action Alternative population dose, rem	No action Alt., fatal cancers	Preferred Alt. (#1), Pu-239 release, grams	Preferred Alt. (#1), population dose, rem	Preferred Alt. (#1), fatal cancers
Facility-wide (wing-wide for No Action) fire	102	1,020	0.51	2,030	17,029	8.5
Main vault fire	400	4,000	2.0	1,430	14,500	7.25
Seismic induced spill	101	1,680	0.84	600	8,394	4.2
Seismic induced fire	not listed	not listed	not listed	600	6,110	3.1
Facility wide spill (radioactive spill for No Action)	0.02 (Note 1)	0.31	0.00016	12,000	167,705	83.9

Source: Appendix C, Draft CMRR EIS

Note 1: The Draft EIS gives a Pu-238 spill of 0.000075 grams. The Pu-239 equivalent of this is estimated here (to one significant figure) by multiplying the weight by the inverse of the half lives and the ratio of the whole body dose equivalent for inhalation for the insoluble varieties of these isotopes.

Note that in every case, the consequences of an accident at the proposed new facility would be far greater than that at the present facility. The existing building is estimated to potentially cause more than one fatal cancer in only one possible event – a main vault fire. This possibility could be eliminated by reducing the amount of plutonium stored in this building from the present 200 kilograms mentioned in the Draft EIS. Instead of that the new facility would greatly increase the plutonium stored.

In order to get the annual risks, the DOE/NNSA multiplies the dose and fatal cancer estimates by an estimate of the frequency of occurrence. Since the frequencies of occurrences are estimated to be very low (apart from the case of a process spill, not shown here) where the population dose estimate is low in any case, the DOE/NNSA estimates that the risk to offsite populations is very low. The highest fatal cancer risk calculated in this way is about 4 in 10,000 per year for the whole offsite population.

[3] The accident designations in the no-action alternative are not exactly the same as those in the preferred alternative (Alternative 1), so the closest terms have been put together for comparison.

Response to Commentor No. 5

its operating impacts - the real impacts of operating a new CMRR Facility would be, therefore, bounded by those associated with the old building and its operations. The waste impact analysis for the *CMRR EIS* is also bounding, as are most of the other resource impact analyses presented in this document.

5-6: The accident scenario analyses presented for all four action alternatives in Appendix C of the *CMRR EIS* evaluated the potential impacts to the public and to site workers from potential accidental radioactive releases. These accident analyses did not include any fission products, such as cesium-137, or strontium-90 because there is currently no material in the existing CMR Facility that would potentially produce significant quantities of fission products. Therefore these isotopes were excluded from the calculated consequences of the accident analyzed the *CMRR EIS*. Even though the new CMRR Facility would not have hot cell operation capabilities, small quantities (gram-sized samples) of irradiated material for AC and MC activities could be used at the new CMRR Facility. The gram-sized quantities could be produced at other facilities with hot cell capabilities such as the Plutonium Facility. The AC and MC activities on this sample would lead to release of fission noble gases that would be within the fuel matrix, but in small quantities, much smaller than those considered for the analyses in the normal releases. The fission products within this sample would not contribute to the consequences that could result from releases of plutonium compounds.

5-7: See response to comment 5-3. In addition, Appendix C of the CMRR EIS contains technical details and references pertaining to accident consequences and risks for each alternative.

5-8: See response to comment 5-3. In addition, the existing CMR Building has restricted operations which reduces materials at risk and, hence, the consequences and risk to workers and the public in the event of an accident. The new CMRR Facility would operate with materials at risk commensurate with mission support activities up to the maximum level of operation identified by the Record of Decision for the SWEIS, therefore the expected effects to workers and the public in the event of an accident would be correspondingly greater. As noted in Chapter 1.5 of the *CMRR EIS*, NNSA will not address at this time, any decision to remove mission

A quick check of the calculations indicates that the arithmetic appears to have been properly done using models that are in common use currently. However, there are some problems with these figures. A good part of the problem lies in the estimates of event probabilities and to some extent in the determination of fractions of radionuclides that would be released in case of catastrophic events. It is also noteworthy that if the analysis had been extended to a 60-mile radius instead of 50 miles used in the Draft EIS, the affected population would increase from just over 300,000 to more than 800,000, since Albuquerque would come within a 60-mile radius. 5-9

For instance, in case of a fire that "engulfs the entire contents of plutonium" in the main vault amounting to 5.7 million grams, the total estimated to be released is only about one part in 3,000. The event probability is assumed as one in a million. And voilà, the risk to the public become minuscule – a chance of about 7 in a million of a fatal cancer per year in the entire population in a fifty mile radius. In other words if 2,000 identical CMR replacement facilities were built and each operated for 70 years, there would be only one additional cancer in that time in the entire population in a fifty mile radius due to a catastrophic fire. Given the reality of intense fires in the region, this does not appear, on the face of it, to be a credible estimate unless it is provided with a detailed empirical and statistical justification. 5-10

This kind of result may be credible in Cheerapunji, which is the wettest place on Earth, or something resembling it, but not in semiarid, New Mexico. Astonishingly, the Draft EIS makes no mention of the immense Cerro Grande Fire on May-June 2000 that almost engulfed LANL and did destroy many homes in the town of Los Alamos. New Mexico has been suffering from an extended drought and is at risk of large forest fires. To assume that the risk of a fire in the main vault without an analysis of fires that have occurred historically and the probability that they might reach the main vault of the proposed facility is unscientific and renders the risk estimates invalid. Interestingly, the probability of a facility wide fire is assumed to be five times that of a fire in the main vault. Throughout the analysis, the DOE/NNSA has not provided a single reference or piece of data on how the event probabilities were calculated. The complete absence of any discussion of large forest fires indicates that existing data may not have been factored into the analysis at all. It is imperative that DOE/NNSA publish the data and the basis on which it has estimated event probabilities. 5-11

Similarly, the DOE/NNSA has not cited any data to support its assumptions regarding the tiny fractions of plutonium in the proposed facilities that would be released in case of severe fires. During the Cerro Grande fire, LANL facilities had to be abandoned, and had the doors been left open, as postulated in the Draft EIS for the Main Vault fire, the result could have been far more catastrophic than that estimated by DOE/NNSA. The town of Los Alamos also had to be abandoned by its residents. The fire reached within a furlong or two of Area G, where a large amount of radioactive waste is stored in plastic tents and 55-gallon drums. 5-12

The possibility that the Rio Grande near Los Alamos and a considerable downstream area would be severely contaminated with plutonium in the aftermath of the more severe accidents is also not discussed in the Draft EIS. This could be among the most damaging consequences of a main vault fire or a facility wide spill, for instance. 5-13

Further, the DOE/NNSA has not properly examined the consequences of the events it has postulated. Cancer risks are important, but only one part of the problem. For instance, if there were a 12,000 gram spill of plutonium-239, as postulated in one of the events, a part of the town of Los Alamos would turn into a low-level radioactive waste dump. Much of LANL itself, if not 5-14

5

critical support assignments of CMR capabilities from LANL, nor will the NNSA address any discussion to alter the level of those capabilities.

5-9: Appendix C of the *CMRR EIS* describes the basis for the accident consequences and risks and also references documents that form the basis for release fractions (such as DOE 1994b). Estimates of accident frequencies are made based on best available information (such as DOE 2002b). In the case of accidents with a leak path factor equal to one, accident frequencies are low, reflecting the chain of failure events that would have to occur in order for radioactive material to be released in the quantities indicated in the EIS. In such cases, if a leak path factor less than one was included in the analyses, the frequency of the accident would be higher but the consequences and risks would be proportionately lower, reflecting the reduction of material released to the environment. The accident analyses performed for the *CMRR EIS* considered impacts to LANL's surrounding population out to a distance of 50 miles from the accident site because the concentration of radioactive materials decreases with increasing distance from the release point. For example, for an accident at TA-55, increasing the distance used in the calculation of radiological impacts from 50 miles to 80 miles increases the population under consideration from approximately 309,000 persons to over 1,021,000 persons. However, the corresponding radiological impacts on the population that could result from the release of radioactive materials from a fire in the main vault were found to increase from 8.7×10^{-6} to 9.3×10^{-6} (about 7 percent). Conclusions concerning the radiological impacts of accidents on the population surrounding LANL would be the same whether the 50-mile distance or the 80-mile distance is used in the calculation. Also see response to comment 9-7.

5-10: See response to comment 5-9. Additionally, although a regional forest fire would likely have a much higher frequency of occurrence than the postulated internal fire at the CMRR Facility, the consequences of a regional fire on plutonium facilities such as the proposed CMRR Facility would be considerably lower, not just because of the actions routinely taken to protect plutonium in main vaults, but because of the forest thinning actions taken recently at LANL in forested areas to reduce the potential for high-intensity crown fires, such as the Cerro Grande Fire of 2000. (The LANL Site-Wide EIS addresses the effects of a forest fire on

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

all of it would have to be written off. The postulated event is much more severe than most scenarios for dirty bombs. All of the severe events postulated by the DOE/NNSA for the new facility are far more serious than any postulated for the current CMR building, including those arising from an earthquake. The root of the problem is that the inventory of plutonium-239 and other radionuclides that the DOE/NNSA proposed to store in the proposed CMR replacement facility is about 30 times the inventory currently at risk in the CMR building. The amount currently at risk is stated to be 200 kilograms.

5-14 (Cont'd)

In the aftermath of the Cerro Grande fire a good case can be made that large inventories of plutonium do not belong in the Los Alamos area precisely because the entire facility as well as the towns of Los Alamos and White Rock, as well as the nearby San Ildefonso pueblo would be seriously affected. Other pueblos and towns farther away such as Española and Santa Fe could be at serious risk. The possibility that LANL, which is now at the center of the nuclear weapons establishment, would have to be abandoned along with its namesake town in the event of three or four of the events described is not even mentioned in the Draft EIS. What any of these events would do to the economy and society of New Mexico is, of course, not broached at all.

5-15

The Draft EIS also does not consider the alternative of locating the new building at another site, or moving the existing restricted CMR facilities to another site. Neither does the Draft EIS make a serious substantive case for a massive new facility, given that the analytical and materials characterization capabilities proposed for the new CMR Replacement facility would also be present at the proposed new Modern Pit Facility. The Draft EIS mentions that analytical chemistry and materials characterization would be created in the MPF, but provides no real in-depth case for a facility at LANL over and above that now in use at the CMR building. All in all, the proposal for a new CMR facility has the strong scent of plutonium pork (the silvery meat, one might call it).

5-16

5-17

Were it just a matter of pork-barrel politics, IEER would not make any comments on this Draft EIS. But as discussed above, the proposed facility would greatly increase the severity of the harm that would occur to LANL, nearby communities, and possibly to the entire state of New Mexico.

5-18

Conclusions and recommendations for the Final EIS

This is perhaps the most unusual Draft Environmental Impact Statements to have been issued by the DOE. A new facility has been proposed to replace one that is half-a-century old. Yet the consequences of severe accident estimates of cancer fatalities has gone up dramatically. The most severe consequences estimated for an accident at the existing CMR projects two cancer deaths in the fifty mile radius. The corresponding estimate for the new facility is more than 80 cancer deaths.

5-19

Granted that the scale of operations and plutonium storage would be greater at the new facility. Still, it is proposed to build a new facility because the old building can no longer withstand seismic and other rigors for the nature of the work proposed. IEER suggests that, even taking an inadequate and seriously deficient analysis at face value, the proposed new facility does not meet the minimal test of protecting public health.

5-20

The Draft EIS is deficient both scientifically and as regard the alternatives that are considered. It is also seriously lacking in its exploration of the consequences of the most serious events for LANL, for the US nuclear posture, for communities near LANL and for the economy and society

5-21

Response to Commentor No. 5

existing LANL facilities at TA-55 as conditions existed in 1999; the area forest conditions have since been modified both by the Cerro Grande Fire and by subsequent massive forest thinning projects conducted over a widespread area of the Pajarito Plateau, by the Santa Fe National Forest, Bandelier National Monument, the county of Los Alamos, the Pueblos of Santa Clara and San Ildefonso, and LANL).

5-11: See responses 9-7, 5-9 and 5-10. The *CMRR EIS* discusses the Cerro Grande Fire in Chapter 3. There is no need to perform an analyses of the probability of a Cerro Grande-like wildfire occurring as an initiating event for a facility-wide fire at LANL or at the new CMRR Facility in order to make a decision about the CMRR Facility. The worst wildfire in the LANL-area history did not burn any of LANL's key facilities (including the Plutonium Facility and the CMR Building), and the risk of a fire of that severity occurring again at LANL within the next 100 years or more has been significantly reduced over the past 3 post-fire years of forest thinning activities. LANL staff is currently engaged in preparing the information needed to perform a new wildfire model for LANL given the recent changes to the area fuel loading. This information will be available in about 2004 as part of the *LANL SWEIS* 5-year review. The *CMRR EIS* considered a facility-wide fire in its accident analyses (see Appendix C.4.1 for details). Consequences of such a fire are independent of the initiating event.

5-12: To clarify the events of the Cerro Grande Fire, this wildfire was recognized as such on a Friday. LANL activated its Emergency Response Center late that day, and all operations at LANL underwent normal shut down for the weekend. As the fire progressed (on Saturday it was reported in the local papers as being under control only to have this information reversed the next day as winds carried the fire into new areas), a decision was made late Sunday based on site forest conditions, the unpredictable winds in the area, and the fact that there are a limited number of evacuation routes at LANL, to suspend LANL operations on Monday. Suspension of operations would limit the number of people that would later need to be evacuated to those that live within the townsite, less than half the number of people that would have needed evacuation had the LANL workforce been in place at LANL. The statement regarding the "abandonment of LANL facilities' inaccurately implies a disorderly element to the closure action in the face of the Cerro Grande Fire. The vault fire accident scenario analyzed in the *CMRR EIS*, Appendix C, in which the doors of the vault would remain

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

of New Mexico. Shockingly, it appears not to have taken the Cerro Grande fire of only three years ago into account in its event analysis. Equally disturbing is the lack of any discussion of the impact of any of the postulated events on the Rio Grande and the quality of water resources in the region. There is no estimate of the potential economic damage that could result to the state and possibly even to areas beyond the state. 5-21 (Cont'd)

Also problematic is the omission of frank discussion of the impact of a severe accident on Native Americans. The deposition of a large amount of plutonium on Native lands might threaten the survival of the Native Americans of the area as a people connected to the land. Their entire culture depends on it. For these lands to be contaminated with plutonium in range of tens or hundreds of picocuries per gram could have catastrophic consequences. The Draft EIS discussion on environmental justice wrongly dismisses the potential impact as being low and states that it "would not be disproportionately high" (p.4-65). Given that one of the severe incidents postulated might result in high levels of plutonium contamination that could raise the possibility of one of more pueblos becoming too polluted to live and farm on, and given the fact that Native American identity is closely tied to specific lands, the statement by the DOE/NNSA without an accompanying analysis of how much plutonium would be deposited on pueblo lands is cavalier at best. 5-22

The Draft EIS implies that irradiated materials would be processed in the new facility because it gives estimates of releases of fission product noble gases. But it does not discuss any hot cell operations. Nor does it provide any explicit estimate of releases of other fission products such as iodine-131 or strontium-90 in case of accidents. If these are present in the facility, it could have a material impact on the post accident analysis. The allusion to "plutonium-equivalent" may include fission products. If it does, this is scientifically inappropriate and highly unusual. It also does not allow for estimation of long-term impacts of accidents, notably the impacts on land and water resources. The limits for some radionuclides, such as strontium-90, in safe drinking are far more stringent in terms of implied radiation dose than the limits for plutonium. 5-23

The very least that the DOE/NNSA could do in the Final EIS is to:

- Provide a scientific basis for its accident and release fraction estimates, based on real, historical data as well as realistic technical analysis. 5-24
- Provide a realistic analysis of the risk, taking into account the fires that have recently occurred, and especially the Cerro Grande fire. 5-25
- Provide details on any hot cell or irradiated material processing that would occur in the new facility and explicitly include a range of fission products, as they are proposed to be present in the facility, in accident and radiation dose scenarios and social and economic impacts of accidents. 5-26
- Estimate that consequences of severe events to life and property, given that nearby areas may be converted into de facto radioactive waste sites in the event of a facility-wide spill. 5-27
- Estimate the consequences to the present national nuclear posture in case of a severe event. 5-28
- Estimate the consequences to the economy and society of New Mexico in case of a severe event. 5-29
- Provide a detailed case for why the new facility is needed, with and without the assumption that the Modern Pit Facility might be built. 5-30
- Provide an analysis of the consequences of similar events at a different location, where severe fires pose a smaller hazard than at LANL. 5-31
- Extend the accident analysis radius to include impacts on Albuquerque. 5-32

Response to Commentor No. 5

open, would be unlikely to occur. This scenario was included in the analyses, nonetheless, because leaving the doors open to the vault would be the only plausible means by which a fire could involve material within the main vault. See response to comment 5-10. Furthermore, standard operating procedures require that plutonium in vaults be placed in a safe and secure condition as identified through a Process Hazard Analysis, DOE Orders and other requirements. Special nuclear material is placed within certified containers, on seismically qualified shelving within locked vaults, and so forth. An accident scenario that includes a failure to carry out these required storage conditions, in addition to the vault doors being left open, and simultaneously having a facility-wide fire occur would be characterized by a still lower accident frequency.

5-13: Postulation of an incident by which the Rio Grande and a considerable downstream area would be severely contaminated due to an accident in the new CMRR Facility is such a remote possibility that it would constitute a "worse case scenario" analysis. NEPA analyses include accident scenarios that are estimated to be reasonably likely to occur rather than worst imaginable case scenarios. Should a fire or spill accident occur at the CMRR Facility, the effects would be mostly confined to the CMRR Facility. Postulation of contaminates reaching downstream to the Rio Grande would have to assume unlikely multiple site failures, including no emergency response site cleanup at the CMRR Facility or over the nearly 6 or more miles of territory that would separate it from the Rio Grande.

5-14: See responses to comments 5-3 and 5-4, which also apply to a facility wide spill at the CMRR Facility. In addition, the frequency of a facility-wide spill accident occurring at the CMRR Facility is estimated to be 5×10^{-6}/year, or once in 200,000 years as discussed in Appendix C. Multiple mitigative design features of the CMRR Facility structures, operational procedures, and engineering controls would all be present at the CMRR Facility. A spill of any size within the building would not result in portions of the Los Alamos townsite being turned into a "low-level radioactive waste dump", nor would LANL have to be "written off". Spills, if they occurred, would be contained and remediated as appropriate.

5-15: See responses 5-3 and 5-4, along with responses to comments 5-10 through 5-14. The 1999 *LANL SWEIS* analyzed multiple facility failures due to an earthquake at LANL. Seismic or other causative events of

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

Sent By: IEER; 3012703029; Jun-30-03 15:23; Page 9/9

- Perform a detailed analysis of the consequences of severe plutonium releases on the nearby pueblos. 5-33
- Perform a detailed analysis of the consequences of severe plutonium releases on the Rio Grande, on the economy and society of nearby communities, of New Mexico, and of states near New Mexico. 5-34
- Conduct an analysis of whether a major deposition of plutonium in the Rio Grande Basin might affect U.S.-Mexico relations. 5-35
- Provide an alternative in which no new facility is built and the present inventory of plutonium at the CMR building could be reduced. Such an alternative would seem to be called for in light of the fact that tens of billions of dollars of research on stockpile stewardship have yet to reveal a single aging-related problem connected to plutonium pits. 5-36
- Provide an environmental justice analysis in case pueblos have to be abandoned. 5-37

8

Response to Commentor No. 5

sufficient magnitude to result in the kind of cataclysmic devastation postulated by the commentor are considered "incredible" events of sufficiently remote likelihood of occurrence to be beyond reasonable inclusion in NEPA analyses.

5-16: Refer to Section 1.3 of the *CMRR EIS* for the discussion about the need for AC and MC operations at LANL. Consideration of these operations being moved to other DOE and NNSA sites is discussed specifically in Section 1.5.

5-17: AC and MC capabilities are needed at LANL irrespective of whether DOE determines that it will pursue a new modern pit facility (refer to DOE/EIS-0236-S2, *Supplemental Programmatic Environmental Impact Statement on Stockpile Stewardship and Management for a Modern Pit Facility*, and the discussion in Section 1.6.2.1 of the *CMRR EIS*). LANL's CMR Building was constructed and operated 50 years before LANL was assigned any mission to support pit production. Should the DOE decide to pursue a Modern Pit Facility at LANL, or at any of the other 4 locations under consideration, the need for a CMRR Facility at LANL will remain.

5-18: NNSA opines that the *CMRR EIS* analyses of impacts demonstrates that the operation of a new CMRR Facility would pose small risks to the people and the environment surrounding LANL.

5-19: See responses to Comment Nos. 5-3 and 5-8. As discussed throughout Chapter 3 of the *CMRR EIS*, radiological risk to the population surrounding LANL is small.

5-20: The NNSA notes the commentor's opinion about the CMRR Facility. A new CMRR Facility would be designed to meet current building codes, including seismic codes, and construction requirements for nuclear facilities of its type, with new state-of-the-art systems and equipment, and utilizing the lessons learned over 50 years of operating and maintaining the existing CMR Building. The operation of the new CMRR Facility would be more protective of human health than that of its predecessor building.

5-21: The NNSA opines that the impact analyses provided by the *CMRR Draft EIS* is adequate. Accidents of severe consequence involving plutonium spills and fire are described in detail Appendix C of the EIS. High-consequence accidents evaluated in the *CMRR EIS* bound consequences

that could occur from a combined plutonium spill and fire, whatever the cause of the spill and fire. As indicated in Appendix C and Chapter 4, accident frequencies and radiological risks are small and indicate that the risks to the Rio Grande and regional water resources are also small. Economic damage to the State of New Mexico and surrounding states would be unlikely.

5-22: Potential environmental justice impacts for the alternatives are discussed in Sections 4.2.10, 4.3.10, 4.4.10, 4.5.10, 4.6.10, and Appendix D of the *CMRR EIS*. As discussed throughout Chapter 4, severe accidents with high consequences are unlikely to occur. If such an accident were to occur, and if lands surrounding LANL were contaminated, NNSA would respond immediately to ensure public and worker safety. The NNSA would then cleanup contaminated land as required by Federal regulations and DOE orders. DOE Order 151.1A describes the Department's Comprehensive Emergency Management System. Residents in the contaminated area could be temporarily displaced during emergency and cleanup operations.

5-23: See response to comment 5-5 and comment 5-6.

5-24: As explained in Appendix C, release fractions were obtained from the *CMRR Basis for Interim Operations (BIO)* data supplied by UC at LANL or the DOE handbook on release fractions. Accident scenarios and release fractions were selected to bound the consequences of severe accidents.

5-25: See responses to comments 1-9 through 1-12. Recent fires, including the Cerro Grande Fire, did not burn nuclear facilities in TA-55. The risks associated with severe accidents are described in Appendix C of the EIS. High-consequence events evaluated in the *CMRR EIS* bound the consequences of severe accidents, including those that could result from a plutonium spill and fire, whatever the cause of the fire.

5-26: No hot cells would be located in the new CMRR Facility. See also the response to comment 5-5.

5-27: See response to comment 5-14.

5-28: A severe event at any nuclear facility, including the CMRR Facility, would not have immediate impact on the Nation's nuclear posture. Should such a severe event occur, the damaged facilities would have to be replaced.

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

Response to Commentor No. 5

Support for maintenance of the Nation's nuclear stockpile would be temporarily disrupted in the unlikely event of a severe event at the CMRR Facility, but not permanently impeded.

5-29: The NNSA uses a sliding-scale approach based on DOE's NEPA as described in DOE's guidance on document preparation, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements (May 1993)*. Guidelines to determine the extent of environmental impact analysis for all environmental resource areas of concern. As shown in Appendix C of the *CMRR EIS*, the frequency and risk of a severe accident were found to be small, and the level of analysis for socioeconomic effects stated by the commentor would not be warranted.

5-30: The purpose and need for the Proposed Action are discussed in Section 1.3 of the *CMRR EIS*. The need for the Proposed Action is independent of decisions regarding construction and operation of the Modern Pit Facility. If the Modern Pit Facility were to be constructed, it would be self-contained with regard to AC and MC activities for pit manufacturing (See Section 1.6.2.1 of the *CMRR EIS*.)

5-31: As discussed in Section 1.5 of the *CMRR EIS*, it would not be feasible to provide AC and MC support services to LANL if the new CMRR Facility were to be located at another DOE or NNSA facility site.

5-32: See response to Comment 5-9.

5-33: See response to Comment 5-22.

5-34: The NNSA uses a sliding-scale approach as described in DOE's guidance on document preparation, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements (May 1993),* to determine the extent of environmental impact analysis for all environmental resource areas of concern. As shown in Appendix C of the *CMRR EIS*, the frequency and risk of a severe accident that would cause a severe plutonium release were found to be small, and the level of analysis stated by the commentor would not be warranted.

Commentor No. 5: Institute for Energy and Environmental Research, Lois Chalmers, Arjun Makhijani (Cont'd)

Response to Commentor No. 5

5-35: As discussed in Appendix C and Chapter 4, the frequency and risk associated with severe accidents at the CMRR Facility are small. It is unlikely that a severe accident at the CMRR Facility would cause a major deposition of plutonium in the Rio Grande Basin or have any effect on U.S. relations with Mexico. The risks associated with severe accidents at the CMRR Facility do not warrant the level of analysis requested by the commentor.

5-36: The recommended alternative would not satisfy NNSA's mission assignment for support and maintenance of the Nation's nuclear arsenal.

5-37: See response to Comments 5-22.

Commentor No. 6: Sisters of Loretto, Penelope McMullen

Withers, Elizabeth

From: Penny McMullen
Sent: Thursday, June 19, 2003 6:58 AM
To: Withers, Elizabeth
Cc: James Bearzi; Steve Zappe
Subject: RE: CMRR #2

Dear Ms. Withers:

I discovered that the word "not" was omitted from one of my sentences, which obviously changes the meaning.

I decided to resubmit my comments with the correction. Please discard my previously sent comment.

Sorry about the inconvenience.
Penelope McMullen, SL

COMMENT ON DEIS FOR CMRR AT LANL

Dear Ms. Elizabeth Withers:

I am a Sister of Loretto and I am authorized to speak for the Loretto Community on nuclear issues. I have been studying the effects of nuclear production since 1979, and when I lived in New York I worked with Dr. Rosalie Bertell who is internationally recognized for her studies on the effects of radiation on employees, on members of the U.S. Armed Services and on the general public.

The purpose of the Chemistry and Metallurgy Research Replacement (CMRR) Project is to support the development of our nation's nuclear weapons. The NNSA says that the CMRR building is needed to perform analytical chemistry and materials characterization critical to current nuclear weapons stockpile stewardship activities conducted at LANL. The Draft EIS (DEIS) also states that "the CMMR Facility could provide AC and MC support capabilities for pit manufacturing at LANL if a decision were made to not construct a new MPF." The NNSA has announced that it will not make any decisions as a result of these hearings that change LANL's participation in its "Integrated Nuclear Planning" initiative, or change DOE's selection of the Expanded Operations Alternative of the 1999 SWEIS for Continued Operation of LANL, including programmatic decisions that require retaining CMR capabilities at LANL. I am writing to establish in the hearing record that the American public knows that these activities are illegal and destabilizing, and thus undermine our own security.

1

6-1

Response to Commentor No. 6

6-1: The NNSA notes the commentor's concern for the legality of CMR capabilities and the effect on national security. The U.S. Congress and the President ultimately direct the DOE's national security missions, including AC and MC capabilities and activities. CMR mission support activities at LANL are conducted in compliance with state, Federal, and international laws and regulations. Chapter 5 of the *CMRR EIS* describes applicable laws and regulations.

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

LAW

In 1996 the International Court of Justice (ICJ) declared nuclear weapons to be illegal according to international law because of their harm to innocent civilians. We cannot claim that because mini-nukes are smaller, they are therefore not harmful to innocent civilians. This month Energy Undersecretary Linton Brooks, when asked if it was possible to develop a low-yield weapon without global fallout, answered "almost certainly not." 6-2

President Bush has declared a crusade against the "axis of evil." The ICJ's President Judge Bedjaoui, in giving his opinion, emphasized that nuclear weapons are "the ultimate evil." How do NNSA, DOE and LANL justify violating international law, causing the rest of the world to see the United States as a rogue nation?

Continuing the nuclear weapons mission of the CMRR building, whether in the new building or in the old building, also violates the Nuclear Non-Proliferation Treaty which the U.S. ratified in 1970 and renewed in 1995. In this treaty, the United States agreed to work toward total nuclear disarmament. In 2000 the United States recommitted itself to "an unequivocal undertaking ... to accomplish the total elimination of their nuclear arsenals" and agreed to remove plutonium and uranium from nuclear warheads and to negotiate within five years a treaty banning the production of weapons-grade nuclear material. How do NNSA, DOE and LANL justify violating this treaty, causing the United States to be known around the world as blatant liars? 6-3

The DEIS indicates that nonproliferation training will be totally eliminated from LANL operations, contrary to the LANL SWEIS which requires expanded operations at the CMRR to include training in support of nuclear nonproliferation. 6-4

The United States Constitution recognizes ratified treaties as "the supreme law of the land." How does the NNSA, DOE and LANL justify violating our own Constitution? 6-5

SECURITY

The only effective way to convince other nations not to develop their own nuclear weapons is for the nuclear powers to dismantle theirs. The more the United States continues to produce or even maintain nuclear weapons, the more other nations will be encouraged to develop their own nuclear weapons, and thereby increase the

2

Response to Commentor No. 6

6-2: The NNSA notes the commentor's position that nuclear weapons violate international law. While the manufacture and use of nuclear weapons is a subject of continuing national and international debate, this debate is beyond the scope of the *CMRR EIS*, which focuses on evaluating potential environmental impacts of the proposed action and alternatives. Chapter 4 of the *CMRR EIS* evaluates these potential environmental impacts. As previously stated, the DOE, NNSA and the University of California (as the contract manager and operator of LANL) are not violating international law through the conduct of congressionally-assigned mission support activities at LANL.

6-3: The DOE, NNSA and the University of California at LANL are not in violation of the terms of the Treaty on the Non-Proliferation of Nuclear Weapons as is stated by the commentor. Continuing to provide the physical accommodations for CMR capabilities at LANL violates none of the terms of the referenced treaty.

As discussed in Section 1.1 of the *CMRR EIS*, the NNSA has developed a comprehensive program of stockpile stewardship and management that maintains essential capabilities for stockpile safety and reliability while meeting other legal and policy objectives. Stockpile stewardship capabilities are currently viewed by the United States as a means to further the nation's nonproliferation objectives. U.S. confidence in its stockpile stewardship capabilities are likely to remain important in future arms control negotiations as the Nation moves to further reduce its overall stockpile size.

6-4: The commentor's statement that nonproliferation training would be totally eliminated from LANL operations is incorrect. As discussed in Section 2.4.7 of the *CMRR EIS*, not all capabilities, either previously or currently conducted at the CMR Building, would be transferred into a new CMRR Facility. The activities identified in the *CMRR EIS* that would not move to the new CMRR Facility, including nonproliferation training, could continue to be conducted in the existing CMR Building if the necessary portions of that building are not decommissioned and demolished, or these activities could cease to be conducted anywhere at LANL. There are many other nonproliferation training activities and exercises conducted at various LANL facilities that would be unaffected by either the construction and operation of a new CMRR Facility or the decommissioning of the existing

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

chance that nuclear weapons will be used, even against U.S. citizens. The CMRR
building encourages, not discourages, other nations to build their own weapons of
mass destruction and thus will most likely lead to a new nuclear arms race.
Concerned about the Bush administration's Nuclear Posture Review and
Congress's recent approval of mini-nukes and the Robust Nuclear Earth Penetrator,
Russia and China have already begun to consider modernizing their own nuclear
weapons stockpile.

6-6

The CMRR makes us more likely to become a target and makes us less secure,
not more secure. Our national security is best served by cooperating with the
United Nations in stringent international verification and control which is universally
observed, including allowing verification inspections in our own country.

6-6 (Cont'd)

The nations of the world do not trust that we will have nuclear weapons merely as a
deterrent with no intention of using them. We are the only country that has actually
used a nuclear weapon. It is now well-known that we did not have to drop the
atomic bombs on Japan in order to end WWII. Even the very scientists who made
the bombs opposed using them against Japanese civilians.

Now the Bush administration has announced a policy of pre-emptive strikes on
nations that it fears might be a potential threat. This leads other nations to worry
that the United States might be a threat to them, and therefore to consider
pre-emptive strikes against us. LANL is now participating in making nuclear
weapons that may be used offensively, despite that fact that this is against
international law. This policy is more destabilizing than anything we have ever
experienced in history.

In the DEIS summary, the NNSA mission is listed. Part 4 states "promote
international safety and nonproliferation" and Part 5 states "reduce global danger
from weapons of mass destruction." By accepting continued nuclear work at Los
Alamos, the NNSA is working against its own mission.

6-7

There are alternatives not listed in this DEIS. The Loretto Community offers the
alternative that the NNSA sincerely work for nuclear disarmament and the
promotion of the Non-Proliferation Treaty. We cannot expect the rest of the world to
disarm if we refuse to do so ourselves.

6-8

SAFETY

Nuclear weapons cannot protect us from terrorist attacks. All our weapons did not

6-9

3

Response to Commentor No. 6

CMR Building, however. Many of these activities are planned for consolidation into a new building that was the subject of a 1999 environmental assessment (the Nonproliferation and International Security Center) identified as an action then under consideration in the *LANL SWEIS* referenced by the commentor (Chapter 1.6.3.1 of the SWEIS).

6-5: Article VI of the United States Constitution recognizes the Constitution itself, laws of the United States and Treaties made under the authority of the United States as the supreme law of the land. The NNSA's policies and activities comply fully with the United States Constitution. DOE, NNSA and the University of California at LANL have not violated the Constitution of the United States by pursuing congressionally-assigned missions and necessary mission support activities.

6-6: The NNSA notes the commentor's concern that CMRR Facility activities would encourage other nations to build weapons of mass destruction that could lead to a new nuclear arms race. The continuing national and international debate on the manufacture and use of nuclear weapons is outside of the scope of the *CMRR EIS*, which focuses on evaluating potential environmental impacts of the proposed action and alternatives. Chapter 4 of the *CMRR EIS* evaluates these potential environmental impacts.

6-7: The NNSA notes the commentor's concern that the CMRR Facility would enhance the United States as a target leading to the nation being less secure and less stable rather than more secure against such action and more stable. To clarify the statement that NNSA is working against its own mission by continuing nuclear work at LANL, NNSA pursues congressionally-assigned missions and necessary mission support activities, including nuclear-related missions. In accordance with the directives of the National Defense Authorization Act of 1994, NNSA is confident that its nuclear missions reduce the danger from weapons of mass destruction. Section 1.1 of the *CMRR EIS* describes these missions.

6-8: The NNSA notes the commentor's support for nuclear disarmament and nuclear nonproliferation. Alternatives evaluated in detail in the *CMRR Draft EIS* are those that reasonably meet the NNSA's stated purpose and need for action. Section 2.5 of the *CMRR EIS* describes the alternatives evaluated in detail.

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

help us on 9/11/01. On the contrary, having so many nuclear weapons in our state
makes our state a more likely target for attack, not only from other nation states, but
also from terrorists. There have been numerous documented security breaches
at LANL, making all buildings and waste sites vulnerable to terrorists. There are
765 kg of plutonium missing from LANL (that we know of).

COST

The DEIS provides no actual cost estimates to indicate how the NNSA arrived at its
figure of $450 million for construction.

Spending so much money on the nuclear industry may be a total waste of much
needed funds for basic human needs in a struggling economy. For example, LANL
spent many millions on building radiation detection equipment, yet U.S. forces could
not find any evidence of nuclear weapons in Iraq!

SEISMIC ACTIVITY

One of the reasons for the need for the new building given in the July 23, 2002
Federal Register, is that there is a seismic fault trace located beneath the current
CMR building. However, the proposed locations for the new building are close to
the current building. The DEIS states that "slope stability studies have been
performed," but does not give the results. It goes on to say that "other geologic
hazards due to seismic activity...are considered low." The DEIS cites recorded
earthquakes in magnitude up to 4.5, but that does not eliminate the possibility that a
higher magnitude earthquake could occur, and some scientists estimate the
potential magnitude to be as high as 6.5. The fact that there could be greater
seismic activity in the region is reason for DIScontinuing all work with radioactive
materials at Los Aiamos.

WASTE

The DEIS estimates a doubling of low-level waste, more than doubling of hazardous
waste, and a fourfold increase in mixed low-level waste, yet does not explain how
that waste will be disposed of. When I asked about this at the June 4 hearing in
Pojoaque, Ms. Withers said that the waste that does not go to WIPP would be put
into Area G. But Area G will reach capacity by 2009 according to the 1999 LANL
SWEIS, and it is an unlined and therefore unsafe site for storage, causing over
3000 New Mexicans and 27 environmental organizations to call for its immediate
closing.

LANL still has 38,000 drums of TRU waste stored at TA-54 in fabric

6-9 (Cont'd)

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6-13

Response to Commentor No. 6

6-9: The NNSA notes the commentor's concern about attacks on New Mexico by nation states and terrorists. While it is not possible to determine the motives and targets of terrorist's or nation states with certainty, NNSA and LANL give high priority to safety and security. As noted in a text box within Section 1.1 of the *CMRR EIS*, NNSA uses a graded approach to safeguards and security for SNM.

6-10: While cost is one of the factors to be considered by decision makers in any Record of Decision, cost analysis is beyond the scope of the *CMRR EIS*, which focuses on evaluating potential environmental impacts of the proposed action alternatives. CMRR Project cost estimates are currently described in terms of a range ($420M to $955M) consistent with DOE Order 413.3 requirements for this phase of a project. The final detailed cost estimate for the project would be established at Critical Decision 2 (Approval of Performance Baseline) currently projected to occur in 2005 if the decision is to proceed with the CMRR Project. Congress determines funding allocations among DOE and NNSA projects; NNSA then spends monies consistent with this congressional direction.

6-11: The *CMRR Draft EIS* states in Section 3.5.1.3 that slope stability studies have been performed at LANL where a hazard has been identified. Slope stability study results vary given the circumstances of the site under investigation. In general, LANL slope stability study results have been used to develop conservative construction practices for building set-back distances from canyon edges that are included in new building design approval processes at LANL. The *CMRR EIS* does not elaborate on this issue, as both the TA-55 and the TA-6 construction site options are located away from canyon edges in excess of the building construction set-back practices of 50 to 100 feet for south facing and north facing slopes, respectively.

The risk of seismic activity resulting in accidents at LANL nuclear facilities is factored into their design and construction requirements. Design criteria are used to minimize a building's potential for seismic structural damage and operational control criteria are used to limit adverse effect contributions from operations in the event of a high-magnitude earthquake. The combination of building design and operational controls results in nuclear facilities at LANL that would minimize structural damage should a large earthquake occur. Potential radiological impacts from an accident

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

tents, which
certainly cannot be considered safe storage and does not speak for a good record
for LANL.

The increased waste generated by a new CMRR facility violates the Department
of Energy's pollution prevention policy, which requires facilities to reduce
the volume of waste generated.

Regarding the question of what to do with the current CMR building, demolishing it
would create a large amount of radioactive waste because 44,000 square feet of
the CMR is contaminated with radioactive material. We do not believe that TA-54
could contain that amount of extra waste, when LANL has not kept up with the
current waste (leaving it in fabric tents).

Given the contamination of the current CMR building and its location on a fault trace,
it should not be used for administration or any other activities. I question whether it
can be demolished without affecting air quality, and so I suggest looking into other
alternatives such as encasing it. One suggestion I heard that may make sense is to
deposit the waste that needs to be removed from Area G into the existing CMR
building and then encase it all.

TRANSPORTATION

The DEIS Summary only talks about the one-time transport of special nuclear
material. But SNM will have to be shipped into the Los Alamos area and the
subsequent waste will need to be disposed of. This part of the DEIS is woefully
inadequate.

Transportation of radioactive material cannot be made totally safe. The DOE
expects that there will be a number of transportation accidents, and admits that
some accidents will release radiation. New Mexico has one of the highest DWI
accident rates of the nation. The NM State Police reported that in 1988, there was
an average of one accident nearly every week involving vehicles carrying hazardous
waste. As the number of transports has increased, I expect that the number of
accidents has also increased. (There was a serious accident with a TRUpact
shipment just last August.)

In the event of a nuclear accident, even the dust in the area will be contaminated.
When the dust is inhaled or ingested by people living or working in that area, those
people will contract cancer.

The Health Workers Union reports that they have not been adequately trained to

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6-13 (Cont'd)

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6-17

Response to Commentor No. 6

scenario involving a facility-wide spill caused by an earthquake that would severely damage the new CMRR Facility are presented in Sections 4.2.9.2, 4.3.9.2, 4.4.9.2, and Appendix C of the *CMRR EIS*.

6-12: The *CMRR EIS* discusses waste management at LANL in Section 3.12 and for each of the alternatives analyzed in Sections 4.2.11, 4.3.11, 4.4.11, 4.5.11 and 4.6.11. The 1999 *LANL SWEIS* analyzed impacts for the expansion of LANL's TA-54, Area G radioactive low-level waste disposal area. The Record of Decision identified the decision to expand Area G so that LANL could dispose of waste well beyond the then estimated date of 2009, when the portion of Area G currently used for low-level waste disposal was expected to reach its fill capacity, although waste minimization may extend this anticipated closure date for the existing Area G site. The issue of lining pits in use at Area G is currently under consideration, although their current unlined condition has not been demonstrated to be an unsafe practice. The CMRR Facility, if constructed, would not become operational until about 2010. As stated in the *CMRR EIS* regarding wastes generated at LANL, transuranic (TRU) waste will be disposed of at the Waste Isolation Pilot Plant (WIPP) or its replacement facility; hazardous and mixed low-level waste are currently disposed of at commercially available existing facilities or at other DOE sites, as appropriate, and this practice is expected to continue into the foreseeable future, low-level waste will continue to be disposed of at LANL's Area G into the foreseeable future or may be disposed of offsite at commercially available existing facilities, as is also the current practice. Solid waste is currently disposed of at the Los Alamos County landfill and, after its closure in about 2007, will be disposed of at its replacement facility.

6-13: TRU waste is currently stored in aboveground arrays at LANL's Area G within specially designed dome structures. While waste drum storage in these structures is conducted in a safe manner, the ultimate destination for these drums is the WIPP facility. Current schedules for shipments of TRU waste to WIPP from LANL provide for removal of all the drums of TRU waste bound for WIPP to be removed by 2011.

6-14: Wastes generated by the new CMRR Facility would be minimized in accordance with LANL's waste minimization and pollution prevention policy. The increase in waste generation alluded to by the commentor would be due to the different level of operations conducted in the new

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

deal with nuclear accidents, and hospitals along the routes are not equipped to deal
with de-contamination. Every community along the routes needs a self-contained
hospital unit where people can be isolated, tested and washed, and where even the
water used for washing will need to be contained so it will not contaminate the
community's sewer system. All persons who may have to respond, within each and
every section of the route needs to receive full and extensive training. Sufficient
equipment and clothing should be provided in every area. Paper suits and not
sufficient because paper stops alpha particles but not beta or gamma rays. Alpha
particles are fatal if breathed or ingested. Most of the Chernobyl clean-up workers
are now dead.

And what about all the other people in the area? Everyone living or working within a
five mile radius all along every route should also be provided with sufficient
protective clothing and masks.

Geiger counters and alpha particle detectors should be stored for easy access all
along the routes. Alpha particle detectors, though quite expensive, are necessary
because plutonium emits alpha particles which cannot be detected by Geiger
counters, and just one alpha particle breathed in by either a volunteer or innocent
bystander will produce cancer in that person. While some of the equipment will be
in the trucks, we cannot rely on that because they could be damaged in a serious
accident.

Should a fire occur, a plutonium fire cannot be put out with water -- it needs sand.
Every fire department will need to be supplied with a sufficient amount of sand to
handle a serious accident involving fire.

Where is the funding for all of this preparation? Where is the funding for this kind of
clean-up operation needed after an accident? And is there automatic, full cancer
insurance for all persons exposed during a nuclear transportation accident?

The DOE has also admitted that radiation is emitted from the TRUpact containers
within a five mile radius as they pass through our towns, even without accidents.
The DOE claims that this amount of radiation will be harmless. But the Petcau
effect belies this assertion -- see "NO SAFE LEVEL" below.

The Dept. of Transportation guidelines stress that "the State adequately consider
public
risk to all those who may be affected by radioactive material transportation." The
numerous safeguards listed above for such transportation have not

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6-17 (Cont'd)

6-18

Response to Commentor No. 6

facility as compared to the lower, restricted level of operations currently conducted in the existing CMR Building, which do not meet mission goals.

6-15: The NNSA acknowledges the commentor's concerns regarding the future use of the existing CMR Building for any purpose. Demolition of contaminated buildings is safely conducted under stringent health and safety requirements that also serve to protect the environment from uncontrolled emissions, effluents and releases. Remote handling capabilities are employed where necessary to protect workers and the public from potentially dangerous situations during demolition work. Constructing an aboveground mixed waste site out of the CMR Building to provide for the permanent disposition of that building together with other LANL radiological wastes, as described by the commentor, would not be consistent with state and Federal disposal regulations and DOE Orders regarding disposal of such wastes.

6-16: The DEIS and its Summary identify the one-time transportation needed for the initial loading of special nuclear materials (SNM) into a new CMRR Facility from the existing CMR Building, along with routine shipments of samples between the Plutonium Facility and a new CMRR Facility. Adequate inventories of SNM are already present at LANL for ongoing AC and MC operations; no additional SNM would need to be shipped to LANL as a result of a NNSA decision to proceed with the construction and operation of the CMRR Facility at LANL. The shipment of SNM between other DOE sites and LANL that occurs periodically for a variety of purposes was analyzed in the *LANL SWEIS*. Therefore, no additional analysis of offsite transport of SNM is provided in the *CMRR EIS*.

The transportation impact assessment as explained in Sections 4.7.1 and 2.9.3 of the *CMRR EIS*, analyzes the one-time movement of SNM, equipment, and other materials during transition from the existing CMR Building to the new CMRR Facility, and the routine onsite transport of AC and MC samples between the Plutonium Facility and the new CMRR Facility. SNM would be transported from the existing CMR Building and from the Plutonium Facility at LANL. The one-time transport of these materials would be performed on restricted and controlled roads that would be closed to the public. Once a shipment is prepared for low speed and controlled movement onsite, the likelihood and consequence of any foreseeable accident are considered to be small.

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

been followed
and therefore transporting nuclear material is no where near safe.

ENVIRONMENTAL AND HEALTH EFFECTS

The DEIS does not say where the extra 10.4 million gallons of water per year will
come from. 6-19

The Federal Register lists Potential Issues for Analysis. The first two issues listed
are "potential human health impacts (both to members of the public and to
workers)" and "potential impacts to air, water, soil." I consider these two issues to
be interrelated because a contaminated environment affects human health.

The DEIS Summary states that "for the most part, environmental impacts would be
small." I find that statement to be amazing. It has been documented at every
nuclear site and for every stage of production that the making of nuclear weapons,
even if never used, is hazardous to the workers, to our environment, and to people
yet unborn. Nuclear production, from the mining and milling of uranium ore to
transportation, actual production, testing and the disposal of radioactive waste, is
harmful to the workers, the environment and the public. What the DOE considers
"small" is not considered small by the public -- see "NO SAFE LEVEL" below. 6-20

Radiation weakens our immune system, making it harder for our bodies to fight off
the normal illnesses. It is commonly believed that the higher rate of allergies in this
area is due to contamination from the Los Alamos National Lab. 6-21

In addition to causing diseases such as cancer, arthritis, and respiratory or heart
problems, exposure to radiation pollution also causes genetic damage, resulting in
reduced fertility, miscarriages, stillbirths, higher infant mortality, deformity,
retardation and other abnormalities. The genetic defects are then passed on to all
succeeding generations. Whenever we damage our own genes, we harm all our
descendants forever.

In the 1940s, Loretto Sisters taught children of some of the scientists who worked
on the Trinity test. The day after the explosion of the first nuclear bomb, the children
brought to school what they called "clinkers," the melted blobs from the bomb
tower. These clinkers were passed around the school before it was known that they
were radioactive. The second definition of "clinker" in the Miriam Webster
Collegiate Dictionary is: "a serious mistake."

This is just one of many examples of how our state and our people have been 6-22

Response to Commentor No. 6

The various wastes generated in the new CMRR Facility are those evaluated in the 1999 *LANL SWEIS* under the Expanded Operations Alternative. The impacts of the disposition of these wastes are also evaluated in the *LANL SWEIS*. Therefore, the impacts from disposition of the generated wastes have already been evaluated and accounted for in the *CMRR EIS*, as part of the site-wide cumulative impacts. (Section 4.8 of the Final *CMRR EIS* has been revised to reference 1999 *LANL SWEIS* for the transportation impacts from disposition of generated wastes.)

6-17: The NNSA notes the commentor's views and observations regarding transportation risks within New Mexico. The NNSA expects that there is a finite likelihood that an accident could occur leading to dispersal of radioactive materials during transport. To reduce the likelihood and consequence of a foreseeable accident, NNSA uses a fleet of specially built vehicles called safe and secure transport (SST) vehicles to ship SNM. The SST is essentially a mobile vault that is highly resistant to unauthorized entry and provides a high degree of cargo protection under various accident conditions. Each SST is pulled by an armored, penetration-resistant tractor. Armored couriers in escort vehicles equipped with communications and electronic systems, radiological monitoring and other required equipment accompany each SST to enhance safety and security. All vehicles undergo extensive maintenance checks prior to the trip, as well as, periodic maintenance inspections. "Type B" containers used for such nuclear shipments are Department of Transportation (DOT) and Nuclear Regulatory Commission (NRC) certified packagings that provide protection under both normal conditions of transport and in the event of severe accidents. Notification and coordination between the DOE, NNSA and affected Native American and State governments is made prior to any SST shipments. The required security measures and controlled transport of these materials have resulted in safe transport of these materials, with minimal or no impact to the environment. Communities located along DOE shipment routes participate in training and education programs sponsored by the DOE. These programs include emergency response training to address transport accidents involving nuclear materials and wastes, first responder training, incident command systems training, training for trainers, and medical management training. Exercises to "test the system" are conducted annually. Appropriate equipment for emergency and first responders has been provided to communities through a combination of

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

contaminated with radiation by the nuclear weapons complex, from uranium mining
to production and testing and transportation and waste disposal. The people of
New Mexico have had enough of this industry that harms us. We feel that our
government is killing its own citizens in the name of defense!

Using UNSCEAR's (UN Scientific Committee on the Effects of Atomic Radiation)
estimates of ionizing radiation dose to the public from nuclear activities between
1943 and 1990, Dr. Bertell figures that over 30 million fatalities and serious injuries
have or will result from nuclear activities that took place during the first five decades
(Planet Earth 2002: A Nuclear Postscript, International Peace Update, March
2002). This is more than 3000 times the death toll from all four terrorist attacks on
Sept. 11, 2001. And this figure will undoubtedly rise after the 1990s are factored in
and as nations continue to produce nuclear weapons, power and waste.

There is already enough contamination danger at LANL. Area G is an unlined
waste dump, where radioactive materials and toxins can eventually leak into the
ground water. There is a toxic plume under area L, where the Manhattan project
dumped its waste. Thyroid cancer in Los Alamos has increased about 400%
during the last decade.

After the Cerro Grande fire, radioactive material was found in the Rio Grande, the
largest fresh water artery in New Mexico. Downstream from LANL, over 10 million
people use the Rio Grande for drinking, irrigation of crops, recreation and industry.
LANL downplays the significance of this, because ingesting plutonium is less risky
than breathing plutonium. However, the Centers for Disease Control states in
ToxProfiles that the effects of exposure to water containing plutonium "are not
known." Also, as water evaporates in our desert climate, sediments become dust
and are airborne on windy days.

Radionuclides have been found in produce downwind from the Cerro Grande fire.
While the FDA (Federal Drug Administration) lists the normal amounts of each of
these radionuclides for the same crops as "zero," LANL claims these are normal
amounts of "natural" radiation that would occur after any forest fire. However,
plutonium, americium, strontium 90, cesium 137, U234 and DU are all man-made,
and are only released by the fire because the fire happened in the area where these
contaminants were deposited from testing and dumping by man.

National security requires environmental health. The ordinary New Mexico citizen

8

6-22 (Cont'd)

6-23

6-24

Response to Commentor No. 6

local, state and Federal funding. DOE emergency response teams are on-call and available for duty at all times.

6-18: Funding for emergency preparedness and emergency response is provided through a combination of local, state and Federal funds, as for any necessary subsequent clean-up activities required in the event of accidents. The NNSA is not aware of an automatic Federal or private cancer insurance for persons that may be exposed during a radiological, chemical, or any other hazardous material transportation accident along our nation's highways.

The NNSA notes the commentor's concerns regarding safe transportation of radiological materials along public highways. As discussed in Section 4.7.1 of the *CMRR EIS*, transportation of radioactive materials under the Proposed Action would be conducted within the LANL site, on DOE-controlled roads, under current LANL security procedures. The likelihood of exposure of the general public from routine movement or accidental release of radioactive materials during intrasite transportation activities is remote.

6-19: The 10.4 million gallons of water needed for operating the new CMRR Facility would come from the existing Los Alamos water supply that furnishes water to LANL and other Los Alamos County users. This water system is described in Section 3.3.4 of the *CMRR EIS*. The water demand would be phased in as the new CMRR Facility ramped up to its full level of operations, while the water demand of existing CMR Building operations was reduced or completely eliminated over time. Therefore, the water requirement for the new CMRR Facility would not represent an extra demand on the Los Alamos water supply over the long term.

6-20: The summary statement characterizing potential environmental impacts of a new CMRR Facility as "small" is correct. The CMRR EIS considers direct, indirect and cumulative impacts related to the proposed action alternative and for the No Action Alternative. The CMRR Facility would not be a mining, milling, production, testing or disposal site for nuclear weapons, as suggested by the commentor. LANL is operated under an Integrated Safety Management System designed to achieve operational effectiveness through the integration of environmental compliance, quality assurance, risk assessment and mitigation, and safety and health protection

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

does not feel secure when the production and testing of nuclear weapons, along
with disposal of consequent waste, pollutes our land, water and air, making us ill,
killing some of us and causing birth defects in our children. The making of nuclear
weapons, rather than helping us feel secure, harms all of us, and not just today but
for generations to come.

NO SAFE LEVEL

Since no part of the weapons-producing process can avoid exposing the workers to
some degree of radiation, governmental agencies have set "permissible" levels of
radiation exposure. However, these "permissible" levels are really the levels of
illness and deformed children which they, the regulatory agencies, think the public
will accept in return for the supposed benefits of nuclear technology. Today most
scientists agree that the effects of low-level radiation are much more serious than
we were originally aware of -- 1000 times more damaging than is commonly
believed. Many radiobiologists agree with Dr. Bertell that any degree of exposure
to radioactive particles causes some biological damage and that there is no level
of radiation exposure that can truly be called safe, especially when it is
continuous over a specific area. This is mainly because radiation has a cumulative
effect.

Item #10 of "Issues for Analysis" for the previous scoping CMRR hearing listed
"cumulative impacts of the Proposed Action" as an issue to be considered. The
Petcau study conducted by the Canadian Atomic Energy Dept. proved that
radiation has a cumulative effect in the body -- each time you are exposed, it builds
up in your body. Each of us who lives or works or goes to school near a nuclear
facility or along a nuclear transportation route is exposed to "safe levels" again and
again and again, until the radiation build-up is no longer a safe level and produces
cancer or genetic defects in our bodies. Children, pregnant women and senior
citizens are especially susceptible.

DECEPTION

When Dr. Bertell first began publishing her results, showing that the effects of
low-level radiation are much more lethal than previously thought, her government
funding was cut off because the government did not want such results to reach the
American public.

A shocking number of other scientists also lost their funding or their jobs when they
started reporting similar results, and a few, including Dr.

9

6-24 (Cont'd)

6-25

Response to Commentor No. 6

procedures, incorporated by design into work planning and implementation of those plans. The CMRR Facility would be operated in accordance with the LANL management system.

6-21: The NNSA notes the commentor's statement regarding the attribution of a higher rate of allergies in the Los Alamos area to LANL site contamination. The effects of radiation on human health and the environment have been studied by a large number of scientific groups and individuals. These studies have been sponsored by a variety of organizations, including the U.S. Government, the United Nations, foreign governments, medical researchers, and independent scientific groups, such as the International Commission on Radiation Protection (ICRP). These studies fail to confirm scientific knowledge of such a cause-and-effect relationship. Arthritis, respiratory and heart problems are predominantly attributed to etiologies other than radiation exposure(s).

6-22: The NNSA notes the commentor's statements regarding New Mexico State residents and their opinions and feelings about the nuclear industry and national defense.

6-23: The commentor's statement regarding thyroid cancer in Los Alamos refers to a 1996 report prepared by William F. Athas, PhD, of the New Mexico Department of Health. The author conducted an epidemiologic investigation to document in detail the recent excess cases of thyroid cancer in Los Alamos County were thyroid cancers had increased four-fold, and to explore possible causes. Information regarding cases of thyroid cancers diagnosed between 1988 and 1995 was collected. The author stated as a conclusion to his study that, "…the results cannot be used to measure risk, which is usually the main desire of communities identified as having a high cancer rate." And, also, "The epidemiologic investigation described in this report did not identify a specific cause for the unusually high number of recent thyroid cancers in LAC [Los Alamos County]. The likelihood is that the recent excess had multiple causes, some of which have been examined in this study, and some of which may never be identified. This has been the general experience of investigation of excess cancer in communities across the nation." Since the study was completed in 1995, the rate of Los Alamos County thyroid cancer cases has dropped and the overall cancer rate for Los Alamos County is now below the national

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

Bertell, have survived
suspicious life-threatening "accidents."

Dr. Robert March's testimony on April 9, 1990, (WIPP route hearing) included
evidence of the U.S. government's pattern of deliberately keeping the health effects
of radiation secret from the American public. Dr. Bertell also uncovered a great
deal of evidence of the U.S. government's pattern of deliberately keeping the health
effects of radiation secret. One was an Atomic Energy Commission memo which
recommended suppression of studies by Public Health Services because they
"would cause adverse public reaction and law suits, and would jeopardize the
testing program." Dr. Bertell discovered case after case where the DOE lied to
people involved in nuclear work. Many of us in the general public can no longer
believe the DOE.

State Senator Payne told us during a Legislative Oversight Committee meeting
(Aug.21,02) that the committee could not comment on the issue of nuclear weapons because so much of it is "classified." The DOE has a habit of calling "classified" any information that they do not want the public to know about.

I recommend Dr. Bertell's book No Immediate Danger: Prognosis for a Radioactive
Earth, The Women's Press, 229 College St. #204, Toronto, Ontario, for
documentation of secrecy regarding nuclear hazards.

The Los Alamos National Lab has been insisting for a decade now that they had no
intention of taking over the plutonium trigger-pit production work of Rocky Flats. Yet
now they may build a new facility to do just that. Claiming that it is different from
Rocky Flats because they will manufacture fewer trigger-pits per year does not
change the essential work. It is the production itself that it hazardous, even if LANL
only made one new bomb trigger-pit per year.

LANL and the DOE often use misleading language. For example, LANL has for
years been telling the public that they are not making any "new" weapons, but they
define "new" so unusually that it is not what the general public means by "new."

LANL, along with every other nuclear weapons plant, has a history of accidents,
radiation leaks, coverups and lies. Last August there was another news article
about LANL employees complaining that the Lab does not take their safety
concerns seriously, and I attended a town meeting in Los Alamos with
Congressman Tom Udall where a current LANL employee talked about his
frustration with this issue.

10

Response to Commentor No. 6

average according to statistics published by the National Cancer Institute (available at: http://satecancerprofiles.cancer.gov).

There have always been radionuclides in the waters of the Rio Grande. The river flows through geologic formations containing naturally occurring radioactive materials and picks up some amount of radioactive material from the rocks. Worldwide radioactive fallout from global weapons testing and other events is also present across the Rio Grande watershed and contributes to the river's waterborne radionuclide load as well. Fires give off radioactive particles from burning vegetation that have taken up radionuclides from the surrounding soils – in the Rocky Mountain reach this uptake includes both naturally occurring and man-made radionuclides. LANL researches have been sampling surface water, soils, vegetables and fruits from upwind/upstream areas and downwind/downstream areas of LANL for years. After the Cerro Grande Fire, many samples of media were obtained from various locations upwind/upstream and downwind/downstream of LANL, including vegetables and fruits grown in areas where the public identified particular concerns about possible contamination as a result of the Cerro Grande Fire. Levels of radionuclides in produce grown downwind of the Cerro Grande Fire smoke plume, in particular, were found to be the same as historical background levels obtained in produce examined before the Cerro Grande Fire. The location of the fire burning partially across LANL did not significantly affect the release of radionuclides that occurred as a result of the fire as stated by commentor (see LANL's annual Environmental Surveillance reports for additional information about LANL area media sampling results).

6-24: The NNSA notes the commentor's beliefs about the relationship between nuclear weapons production and national security.

6-25: As previously stated, the effects of low-level radiation on workers, the public and the environment have been studied by a large number of scientific groups and individuals including the ICRP. All of the U.S. Government agencies involved in radiation protection, including DOE, EPA, and the NRC, base their work upon guidance established by Presidential Directive. This guidance follows the recommendations of the ICRP, as do the regulations of essentially all other nations. This is indicative of the global acceptance by the world-wide scientific and safety communities of the authoritative recommendations made by the ICRP

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

So we the people of New Mexico do not trust the Department of Energy or LANL to tell us the truth or to keep our health and safety a priority.

ENVIRONMENTAL JUSTICE

The DEIS Summary Table S-3 concludes "no disproportionately high and adverse impacts on minority or low-income populations. The glossary did not include a definition of "minority." In its EA for the BSL-3, LANL lists the Hispanic population as "white" so that the surrounding population does not appear to be minority. A national survey of sites for the production, testing of nuclear weapons and disposal of radioactive waste shows that most have been located in low-income minority communities, an example of severe environmental racism.

SOCIOECONOMICS

The DEIS Summary Table S-3 considered only whether or not there was an increase in workforce. That is not the only criteria for considering socioeconomic impacts. We need to look at the total picture. Most NM citizens remain in the low-income range. We have one of the highest percentages of children living in poverty. LANL is not really helping the economy of New Mexico. On the contrary, there have been a number of studies which show that when defense industry has moved out of an area, civilian industry moved in and the general economy of the area improved. In one study conducted by the U.S. government of 100 military bases that had been closed around the country, in 98 of these areas, civilian industry had been developed and had brought an increase in the economy of the local community. Read Economics of Military Spending and Need for Conversion by Richard C. Williams, Ph.D.

The 2004 military budget is the second highest ever. Pax Christi studies show that every billion dollars spent on arms means a loss of more than 2000 civilian jobs. Our nation spends more of our tax dollars on the military than on housing, education, social welfare, food, employment, transportation, energy and environmental programs combined. As a result, one in four U.S. children now lives in poverty, and New Mexico's children rank high on the poverty scale. As Eisenhower said, the money spent on nuclear weapons production has in effect been stolen from the poor.

National security also requires economic vitality with healthy and well-educated citizens. New Mexico citizens do not feel secure when we cannot find employment,

11

6-26

6-27

6-28

Response to Commentor No. 6

regarding radiation doses and cancer induction risk factors. The methodology for analyzing the health effects from ionizing radiation is presented in Section B.2.2 of Appendix B in the *CMRR EIS*. As explained in Section B.2.2, there is currently scientific uncertainty about cancer risk in the low-dose region below the range of epidemiologic observation, and the possibility of no risk cannot be excluded.

6-26: The NNSA notes the commentor's statements regarding the lack of public trust of DOE.

6-27: Definitions of the terms "minority population" and "low-income populations" have been added to the glossary of the Summary document; the terms were defined in glossary of the DEIS and discussed in detail in Appendix D of this EIS. As described in Section D.2, all persons self-identified as Hispanic or Latino (of any race) are counted among the minority population in the *CMRR EIS* analyses. As described in Section D.4, among all counties in New Mexico, Los Alamos County has the smallest percentage of persons living below the poverty threshold and the smallest percentage of minority residents; the residents of Los Alamos County live in closer proximity to LANL than do the residents of any other New Mexico county.

6-28: The NNSA opines that the economy of New Mexico is helped by LANL. Should LANL cease to employ over 12,000 people in direct jobs, many of which are highly specialized and require advanced education, civilian industry would not readily move into the area given its location, lack of transportation (specifically, cargo jet, aircraft service, train service, or interstate highway service), and lack of readily available raw materials. A more likely scenario resulting from LANL closure would be that local communities near LANL would suffer and that the overall economy of New Mexico would diminish.

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

cannot afford health insurance, or cannot pay the rent, and when our youth who will
run our nation tomorrow cannot read or figure basic math problems.

We would feel much more secure if those millions of dollars would be spent
on the necessities of life -- affordable housing, renewable energy, high-quality
education, meaningful employment, accessible health care, and adequate
nutritional food for everyone.

CONCLUSION

In addition to nuclear weapons being illegal, they are also immoral and are
condemned by all the major religions because they murder and injure many
innocent civilians as well as harm the environment. Two thousand Catholic bishops
gathered at the Second Vatican Council published their opposition explaining that
the use of nuclear weapons "is a crime against God and humanity itself."

Each time that I speak about the evil of nuclear weapons, someone in the nuclear
industry tells me that s/he is not an evil person. I grant that the people involved are
mostly good people. But so were the Germans who cooperated with the Nazis. It is
easy for good people to get caught in an evil system.

There is one place in the Bible where Jesus tells us what we will be asked when our
personal Judgment Day comes. I challenge each of you involved in any part of the
CMRR plan to imagine your last day on this earth as you prepare to meet your
Creator. You will be asked if you fed the hungry, if you helped the poor and the
disadvantaged. Or did you participate in the use of tax moneys for expensive illegal
weapons, preventing the poor and disadvantaged from receiving the help they
needed?

The Loretto Community nationally is opposed to the new CMRR facility. Our
position is that all weapons of mass destruction should be dismantled, that the
United States needs to take the lead in promoting world-wide nuclear disarmament,
and that all peoples need to find ways to solve conflicts without resorting to killing or
damaging the earth's environment.

To use the killing of people as a means to settle disputes is uncivilized behavior.
We encourage LANL to lead the world in resolving conflicts without killing innocent
people to whom God has given life. It is time to use our great technology, funds and
brilliant scientists to find peaceful means for settling the differences among us on
this planet.

12

6-29

Response to Commentor No. 6

6-29: The opposition of the national Loretto Community to the new CMRR Facility is noted.

Commentor No. 6: Sisters of Loretto, Penelope McMullen (Cont'd)

The Los Alamos National Lab could become an exciting international center for research in such areas as medicine, mass transit systems, waste management, and alternative energy sources. I call upon you to lead our country in the development of true national security, the kind of security that comes from a thriving economy and a healthy environment.

Penelope McMullen
Sisters of Loretto

13

Response to Commentor No. 6

Commentor No. 7: Nuclear Watch, Jay Coghlan

Comments on the Draft Environmental Impact Statement For the Proposed Chemical and Metallurgical Research Building Replacement Project

July 1, 2003

Submitted by
Jay Coghlan, Director
Nuclear Watch of New Mexico

Submitted to
Ms. Elizabeth Withers
EIS Document Manager
U.S. DOE/NNSA Los Alamos Site Office

Dear Ms. Withers,

Nuclear Watch of New Mexico (NWNM) is pleased to submit the following comments on the National Nuclear Security Administration's (NNSA's) draft environmental impact statement (hereinafter the "DEIS") for its proposed Chemical and Metallurgical Research Building Replacement Project (the "CMRR") at the Los Alamos National Laboratory.

NNSA Predetermination

The NNSA has already, in our view perhaps illegally, predetermined the outcome of the CMRR NEPA process. Council on Environmental Quality Regulations, Part 1506, §1506.1 "Limitations on actions during NEPA process" states:

(a) Until an agency issues a record of decision as provided in Sec. 1505.2 (except as provided in paragraph (c) of this section), no action concerning the proposal shall be taken which would:

1. Have an adverse environmental impact, or
2. Limit the choice of reasonable alternatives.

(b) [Not applicable.]

(c) While work on a required program environmental impact statement is in progress and the action is not covered by an existing program statement, agencies shall not undertake in the interim any major Federal action covered by the program which may significantly affect the quality of the human environment unless such action: ....

3. Will not prejudice the ultimate decision on the program. Interim action prejudices the ultimate decision on the program when it tends to determine subsequent development or limit alternatives.

(d) This section does not preclude development by applicants of plans or designs or performance of other work necessary to support an application for Federal, State or local permits or assistance.

7-1

Response to Commentor No. 7

7-1: The NNSA has not predetermined the outcome of the NEPA compliance process as regards the CMRR Project. The NNSA has undertaken no associated action that would have an adverse environmental impacts nor has it limited the choice of reasonable alternatives. As required by NEPA Implementing Regulations adopted by the Council on Environmental Quality (40 CFR 1502.14(e)), the NNSA stated in the *CMRR Draft EIS* and *Final EIS* that its preferred action alternative is the construction of a new CMRR Facility at TA-55. There has been no formal decision on the acquisition strategy for the CMRR Facility Project, as the NEPA process is not yet complete and a decision concerning implementation of alternatives has not been made. Thus, NNSA could still select any of the reasonable alternatives analyzed, including the No Action or the TA-6 alternatives.

Cost is one of the factors that will be considered by decision makers in the Record of Decision. However, project costs are beyond the scope of this EIS, which focuses on evaluating potential environmental impacts of the Proposed Action and Alternatives. As the conceptual design for the CMRR Facility is developed, NNSA is investigating the advantages of design-build procurements. Based on size, complexity, and recent operational experience with design-build procurement applications on similar projects at LANL, application of the design-build approach for the Administrative Offices and Support Activities Building appears to offer cost advantages. If the NNSA decides to proceed with one of the action alternatives, final decisions regarding CMRR procurement strategies would be made through the Critical Decision 1 process (currently projected for about March 2004). The NNSA's budget projections do not predetermine the outcome of the CMRR NEPA process in violation of the NEPA compliance process.

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

The NNSA has exceeded these proscribed limits by requesting in the DOE 2004 Congressional Budget Request $1.7 million for actual construction to start in 2Q 2004 (i.e., as early as New Year's 2004) of "light lab/office buildings" for the CMRR. We have no problem with appropriations requests for design work, indeed that is standard operating procedure. What we do object to is the request for funds for actual construction, which we believe is a clear signal that the NNSA has predetermined that it will proceed with the CMRR Project in advance of the outcome of the NEPA process and its related Record of Decision. We look forward to credible explanation of this in the Final CMRR EIS.

7-1 (Cont'd)

Our conviction is further reinforced by a "Light Laboratory Office Building Request for Information" posted at the LANL Procurement website, which describes the CMRR Project. First of off all this request states that "[a] replacement facility is proposed to be constructed at Technical Area-5 (TA-55)." There is no mention of TA-6, thus making apparent the hollowness of the CMRR DEIS's strawmen Alternatives #2 (Greenfield Alternative to build at TA-6) and #4 (Hybrid Alternative at TA-6). In reality, of course, this is not surprising given that the DOE 2004 Congressional Budget Request states that one of the "major CMRR scope elements resulting from INP [Integrated Nuclear Planning] activities [is]… overflow capacity for PF-4." This is no small project, as the request indicates that "[a]pproximately seventy thousand (70,000) net square feet of office space and twenty thousand (20,000) net square feet of laboratory space will be required in a single building." Nor is it is cheap at an estimated $45 million. Nor is it somehow separate and discrete from the rest of the CMRR project, but is instead integral to it: "[t]he support structure(s) will house hot water heating, sanitary sewer, and chilled water for the entire CMRR project, not just LLOB [Light Laboratory/Office Building]."

7-2

In short, the NNSA has already effectively knocked out two of the four alternatives (TA-6 as explained above). It has effectively eliminated as well the No Action Alternative of not proceeding with the CMRR Project at all through its prejudicial action of requesting appropriations for actual construction of the LLOB and soliciting construction contractor's information in advance of a record of decision.

7-1 (Cont'd)

Mission and Need for the CMR Replacement Project

IN NWNM's view there is little in the way of mission and need for the CMR Replacement Project. This view is based, in part, on the apparent long-term stability of Pu-239 as explained below. It is also based on our reading of the 1970 NonProliferation Treaty (NPT), Article VI, in which the nuclear weapons states pledged to "pursue negotiations in good faith on effective measures relating to the cessation of the nuclear arms race at an early date and to nuclear disarmament…" In turn, Article VI of our own Constitution clearly stipulates that international treaties are to be enshrined as the supreme law of the land.

7-3

Moreover, at the 2000 NPT Review Conference, the United States and the other declared nuclear weapons powers made an "unequivocal commitment" to end the arms race and negotiate disarmament. They also agreed to institute the principle of irreversibility in nuclear disarmament and related arms control and reduction measures; make concrete measures to reduce the operational status of nuclear weapons; increase transparency regarding nuclear weapons capabilities; and create a diminishing role for nuclear weapons in security policies. The recently signed Bush/Putin Strategic Offensive Reduction Treaty, with its complete lack of scheduled dismantlements and shifting of warheads from operational status to a "responsive reserve" from

7-4

Response to Commentor No. 7

7-2: The LANL Procurement Website lists a Request for Information (RFI) for the Light Laboratory Office Building that is the same facility referred to as the Administrative Office and Support Functions Building element of the CMRR Project. This RFI solicits interest from design and construction firms that may be interested in submitting a bid should a Request for Quotation (RFQ) be issued at a later date. Such an approach is standard within DOE and NNSA.

This approach allows the overall planning and construction schedule to be compressed through the initiation of procurement concurrent with other activities such as a NEPA compliance review. As with past contract procurements, DOE and NNSA require site contractors (in this case, the University of California) to include clauses in subcontracts that prohibit proceeding through final design and initiation of construction until the completion of the NEPA compliance process. As noted in comment response 7-1, the Acquisition Strategy for CMRR is under development and there have been no formal decisions on acquisition strategies. The commentor's reference to "overflow capacity from PF-4" from the 2004 Congressional Budget Request is not related to the Administrative Office and Support Functions Building element. It only applies to a potential CMRR Facility scope element regarding storage for SNM for which final decisions have not been made. SNM storage in CMRR nuclear facility elements is included in the *CMRR EIS* analysis. Final decisions on inclusion are expected at Critical Decision 1 projected for March 2004, subsequent to completion of the subject NEPA compliance process with the issuance of a Record of Decision anticipated in January 2004.

7-3: As discussed in Section 1.3 of the *CMRR EIS*, AC and MC are fundamental capabilities required for the research and development support of the DOE and NNSA missions at LANL. CMR Building operations and capabilities are currently restricted in scope due to safety constraints. The building is not being operated to the full extent needed to meet the DOE, or NNSA requirements established in 1999. As long as the congressionally-assigned mission for NNSA stays the same, the need for a new CMRR Facility remains, regardless of the decisions made on pit aging and the size of the nuclear weapon stockpile.

7-4: See responses 6-1, 6-2 and 6-3.

which they can be withdrawn, does not meet the requirement of NPT Article VI. Further, the new Nuclear Posture Review has expanded the role of potential use of nuclear weapons by the U.S. and the number of countries to be potentially targeted.

7-4 (Cont'd)

The Federal Register 7/23/02 Notice of Intent for the CMR Replacement Project EIS states:

> Mission critical CMR capabilities at LANL support NNSA's stockpile stewardship and management strategic objectives; these capabilities are necessary to support the current and future directed stockpile work and campaign activities conducted at LANL.

Directed Stockpile Work is the largest budget category under the NNSA's Total Weapons Activities, under which extensively planned Stockpile Life Extension Programs for each of the existing weapons systems in the "enduring" stockpile are being implemented. The aim of these programs is to preserve the operational life of each weapons system for at least 30 years. Far from the stated rationale of merely maintaining the safety and reliability of the stockpile in the absence of full-scale testing, these programs are aggressively introducing major modifications and possible new designs that will improve accuracy and military effectiveness in order to meet "changing military requirements." The weapons labs themselves now describe the stockpile as "evolving," in contrast to simply "enduring." One of the stated objectives of Directed Stockpile Work is to "provide the capability to realize new weapons, if they are needed." This will now likely be realized in the near-term future give congressional approval of funding for the Robust Nuclear Earth Penetrator and the overturning of the decade-old prohibition against the development of "mini-nukes." Finally, an expanded Phase 6 [Quantity Production and Stockpile Phase] has been established by the NNSA to indefinitely extend the life of all remaining nuclear weapons systems.

7-5

With respect to "campaign activities" at LANL, it is worthy of note that the "target" stated by the lab for its plutonium pit campaign is to "[r]e-establish a robust pit manufacturing capability to produce stockpiled and *new-design pits without underground testing*." LANL FY01 Institutional Plan, p. 31, emphasis added. The express intent of the Comprehensive Test Ban Treaty, which would cut off full-scale underground testing, is to halt the continuing advancement of nuclear weapons designs. Although the U.S. has failed to ratify the CTBT, it has to date observed a testing moratorium. Apparently, through technical experimental and simulation advances, LANL now seeks to circumvent the intent of the CTBT.

It is obvious that the CMR Replacement Project will be tightly bound to both LANL's Directed Stockpile Work and to the lab's plutonium pit production campaign. Further, it will be complicit in this over the long-term given its anticipated 50-year operational life. With this in mind, the Final EIS should discuss the Project's roles in either supporting or conflicting with NPT Article VI and the intent of the CTBT. Further, the No Action Alternative, instead of being considered as merely another NEPA requirement, should be vigorously pursued. In NWNM's view, this Project has no more justification (and arguably less) than its preceding proposal, the Special Nuclear Materials Research and Development Laboratory, which was terminated over a decade ago. In combination with the potential risks involved (see risk analysis section below) the CMR Replacement project should not go forward.

7-6

7-7

7-5: Life Extension Programs are being implemented through Directed Stockpile Work (DSW) activities on some, but not yet all, weapons systems in the enduring stockpile. These Life Extension Programs are intended to preserve the operational life of these systems against current requirements. While Life Extension Programs have not yet been implemented for all enduring weapons systems, it is reasonable to assume that they will be implemented when and if necessary to support national defense requirements. Advanced Concept activities are being performed only to the extent mandated and authorized by Congress.

7-6: The need for the CMRR Facility to replace the aging CMR Building is not dependent on LANL's plutonium pit manufacturing campaign or on the decision concerning the proposed Modern Pit Facility. While the manufacture, use and testing of nuclear weapons is the subject of continuing national and international debate, this debate is beyond the scope of the *CMRR EIS*, which focuses on evaluating potential environmental impacts of the proposed action and alternatives. Chapter 4 of the *CMRR EIS* evaluates these potential environmental impacts.

7-7: The NNSA notes the commentor's preference for the implementation of the No Action Alternative.

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

The Need for an Integrated Technical Area-55 EIS?

In the DEIS at p. 1-10 the NNSA rejects NEPA consideration of all TA-55 and "Integrated Nuclear Planning" activities. In this commentator's view this is improper segmentation under NEPA. The DEIS states: 7-8

> Recognizing the need for CMRR to be integrated with other contemplated actions, near and long term, affecting the nuclear mission capabilities at LANL, NNSA and UC at LANL developed the Integrated Nuclear Planning (INP) process. INP is intended to provide an integrated, coordinated plan for the consolidation of LANL nuclear facility construction, refurbishment and upgrade, and retirement activities. As such, INP is a planning process, not an overarching construction project, and is a tool used by NNSA and UC at LANL to ensure effective, efficient integration of multiple, distinct stand-alone projects and activities related to or affecting LANL nuclear facilities capabilities. As individual elements or activities associated with INP become mature for decision and implementation, each element and activity moves ahead in the planning, budgeting, and NEPA compliance process on its own merits. DEIS p. 1-10.

There are many problems with the above NNSA statement:

- First, as a past baseline, the 1996 Stockpile Stewardship and Management Programmatic Environmental Impact Statement and the 1999 LANL Site-Wide Environmental Impact Statement do not capture the amount and degree of changes the NNSA is contemplating for TA-55. 7-9

- It is misleading for the NNSA to suggest in the first sentence that the perceived need for the CMRR is the primary driver for INP. The 9/26/01 LANL Ten-Year Comprehensive Site Plan (TYCSP) makes clear that big plans are afoot for Technical Area-55. The TYSCSP states: 7-10

> The INP effort is to provide an integrated, coordinated plan for the consolidation of laboratory nuclear facility construction, refurbishment/upgrade, and retirement activities. The focus is on programs and activities involving special nuclear materials. The overall plan for the INP is that it be comprehensive, incorporating considerations for all affected Laboratory sites and facilities. The developed plan will establish priorities for these types of activities based on comprehensive cost/benefit and risk evaluation considerations as well as considerations driven by programmatic requirements over the next 20 years… The INP is an overall plan; it is not in itself a construction project but a plan that will encompass major construction projects at the laboratory…
>
> Proposed INP Project elements:
> - CMR Replacement Project
> - TA-18 Relocation Project
> - TA-55 Infrastructure Investment
> - Pit Radiography
> - NMSSUP [Nuclear Materials Safeguard and Security Upgrade Project] Phase II
> - Radioactive Liquid Waste Treatment Facility (RLWTF) Upgrade
>
> 9/26/01 LANL TYCSP, pp. IV-24 through 26.

Response to Commentor No. 7

7-8: NNSA notes the commentor's opinion regarding improper segmentation pursuant to the NEPA requirements. Section 1.5 of the *CMRR EIS* describes NNSA's position on preparation of NEPA documentation for stand-alone projects located in close proximity to one another.

7-9: NEPA analyses for projects with potential siting at TA-55 have already been prepared or are in preparation. Each EIS contains information about cumulative impacts that include the other reasonably foreseeable activities.

7-10: The DOE and NNSA have projected the need for a new CMRR Facility as the existing CMR Building has continued to age. In late 2000, NNSA initiated planning activities associated with the CMRR Project, effectively turning its contemplated action into an actual project proposal. As described in the *CMRR EIS*, NNSA has more recently considered other actions (namely, the relocation of TA-18 criticality operations and the Modern Pit Facility) that could be located at TA-55. The 2001 LANL Ten-Year Comprehensive Site Plan appropriately captured the proposals for TA-55.

• The NNSA maintains that each possible project at TA-55 is "stand alone." First of all there is the simple matter that many of these facilities are likely to be connected to one another via underground tunnels. More important is the fact that they will likely have overlapping missions between the facilities. The best example that I am aware of comes from the 2004 DOE Congressional Budget Request, which states that "[t]he scope of this project was developed through joint LANL/NNSA integrated nuclear planning (INP) activities and workshops. The major CMRR scope elements resulting from INP activities are: … overflow capacity for PF-4." There are two points to be made here:
1) We believe this buttresses our argument that a TA-55 EIS is required as it all stems from "integrated planning" that demonstrates the "connectedness" of planned major federal actions at that Technical Area; and
2) There is no mention of overflow capacity for PF-4 in the CMRR DEIS, thus demonstrating the document's illegitimacy. As PF-4 is the building for plutonium pit production clearly there is a strong public interest in it. The CMRR Final EIS should clearly spell out what might be involved in "overflow capacity for PF-4" at the CMRR. Does this entail elements of actual pit production, anywhere in range from virgin fabrication to "pit rebuilds"? We maintain that the CMRR DEIS is grossly deficient by its omission of having discussed this. 7-11 7-12

• The February 2002 LANL Biosafety Level-3 Environmental Assessment mentions "the possible construction of a new building for pit manufacturing (these actions are speculative at this time but are currently under discussion)." NEPA requires forward-looking documents and consideration as early as feasible. We contend that the fact that discussions already at least a year and a half old have taken place, in combination with the other factors mentioned herein, necessitate a TA-55 EIS. 7-13

• For NEPA compliance purposes it is not material whether or not the INP is a "construction plan." NEPA bars segmentation of connected actions in its analyses and considerations. Because all of these actions appear to be in at least conceptual planning stages (therefore reasonably foreseeable) and are taking place in the same geographical and site-specific location (Technical Area-55 or in close proximity) it would seem that proper compliance with NEPA would require something tantamount to a "TA-55 EIS." When I raised this point at the 8/13/02 CMR Replacement Project public scoping meeting one DOE official responded that "construction schedules would be different and we wouldn't want construction workers tripping over each other" (paraphrased). This commentator has extensive construction experience and some familiarity with NEPA requirements. It is obvious that construction schedules and NEPA analyses are two distinctly different things. Construction schedules are a management concern and do not rise to the level of federal environmental law requirements. NWNM reasserts that if multiple projects in the same locale and within a foreseeable time period (say ten years or less), are arguably related to one other (and even possibly physically linked to each other via tunnels or piping), then those projects should be bundled together and analyzed in a common NEPA document. To do less is to skirt NEPA requirements for analyses and consideration of interconnected actions and potential cumulative effects. NWNM further asserts that the burden is on the NNSA in the Final EIS to credibly defend why an integrated "TA-55 EIS" is not required. The discussion in the DEIS does not satisfy us. 7-14

7-11: The physical connection of facilities at TA-55 via underground tunnels would depend on factors such as worker convenience, security needs, and efficient movement of materials. It has nothing to do with any interconnection of the capabilities provided by operations conducted within the individual structures.

As discussed in Section 1.5 of the *CMRR EIS*, NNSA has determined that a TA-55 EIS is neither needed or appropriate. The Council on Environmental Quality's NEPA regulations (40 CFR 1508.25 Scope) identify actions that occur at the same geographic local as being "(3) Similar actions, which when viewed with other reasonable foreseeable or proposed agency actions, have similarities that provide a basis for evaluating their environmental consequences together, such as common timing or geography. An agency may wish to analyze these actions in the same impact statement. It should do so when the best way to assess adequately the combined impacts of similar actions or reasonable alternatives to such actions is to treat them in a single impact statement" [emphasis added]. However, due to the number of alternatives that would be involved and the complexity of each project, NNSA has determined that the best way to analyze potential impacts of stand-alone actions that are similar because of their potential common geographical location at TA-55 is through individual EISs. The NNSA has chosen not to hold up individual projects that are not connected per the definition of such actions within the Council on Environmental Quality's NEPA regulations.

Individual actions identified in the 2001 LANL Ten-Year Comprehensive Site Plan each already have or will have individual NEPA compliance reviews. These actions are not "connected actions" per the Council on Environmental Quality's NEPA regulations (40 CFR 1508.25 Scope), which states: "Actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously (iii) Are interdependent parts of a larger action and depend on the larger action for their jurisdiction."

7-12: See response 7-2 regarding "overflow capacity for PF-4" (the referenced "PF-4" is also referred to as the Plutonium Facility). The *CMRR EIS* includes the vault spur that would house the "overflow capacity for PF-4" in its descriptions of the proposed CMRR Facility in Chapter 2, and

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

Costs and Schedules

The CMRR DEIS makes no mention of costs. NEPA requires discussion of irretrievable resources and informed decision making. In August 2002 costs were reported in the regional media as being as high as $955 million. Previously the LANL 2000 Comprehensive Site Plan had given a figure of $865 million. However, in the FY04 DOE budget costs are $600 million where the Total Estimated Cost "has been decreased by $40,500,000 from the original Project Engineering and Design (PED) estimate (03-D-103) due to a revised acquisition strategy, whereby a design-build approach will be utilized."

The NNSA is on very shaky ground here. First of all we have the National Ignition Facility at the Lawrence Livermore National Laboratory, another University of California-operated nuclear weapons lab, which has experienced massive cost overruns and schedule slippages (and still faces technical difficulties, perhaps unresolvable). At LANL we have the Dual Axis Radiographic Hydrodynamic Testing Facility that went from initial cost estimates of $80 million in the late 1980's to $250 million today and is not on schedule as LANL/UC claim, as the recent DOE Inspector General's audit makes clear. We also have perhaps up to $240 million put into upgrades for the now likely-to-be abandoned old CMR Building. Finally, we have the nationally publicized LANL/UC fiscal scandals currently under congressional investigation. For LANL and the NNSA to assert that this magnitude of savings can be realized through a "design-build approach" when UC and the NNSA have a demonstrated track record of constant cost overruns even when projects are reputedly thoroughly planned in advance is, we believe, highly deceiving. It would be strongly in the public's interest and respectful of taxpayers' dollars to have open discussion of both costs and strategies to constrain costs in the Final EIS. The DEIS failed to answer my questions on costs that I had submitted in scoping comments. 7-15

The DEIS says at p. 2-25 that construction of office space and light labs will begin in late 2004. The DOE FY04 Congressional Budget Request states that construction will start in the 2nd quarter of FY 2004 (i.e., as early as New Year's). Which is it? 7-16

Large Containment Vessels

The Federal Register 7/23/02 Notice of Intent (NOI) for the CMR Replacement Project EIS states that "continued support of LANL's existing and evolving missions roles are anticipated to require additional capabilities such as the ability to handle large containment vessels in support of Dynamic Experiments." 7-17

In context that statement implies that large containment vessels will be handled in the proposed facility. The EIS needs to clarify for what use. In response to my question at the August 13 public scoping meeting LANL personnel declared that Dynamic Experiments (explosive experiments involving radioactive materials, hence the need for containment) would not actually be conducted in the Replacement Building. Instead, handling of the containment vessels would involve washout and cleanup. That needs further elaboration in the Final EIS.

However, this doesn't make complete sense to this commentator. Why doesn't washout take place closer to where these tests will actually take place? Presumably these would be at the Dual Axis Radiographic Hydrotest Facility (DARHT) in Technical Area 15, the Los Alamos Neutron Science Center in TA-53 and the future Advanced Hydrotest Facility. The LANL Site-Wide EIS 7-18

Response to Commentor No. 7

carries through with the analyses of impacts in Chapter 4. The vault spur would be an underground structure for housing inventories of SNM. Since pit production reuses existing pits by putting them through a purification process, the SNM placed in the vault spur would not likely be from the pit manufacturing process.

7-13: NNSA notes the commentor's opinion. NNSA does not share this opinion (See response 7-11).

7-14: See response 7-11. The NNSA notes the commentor's opinion regarding his dissatisfaction with the text presented in the *CMRR EIS*.

7-15: Cost is one of the factors that will be considered by decision makers in the Record of Decision. However, project cost analysis is beyond the scope of this EIS, which focuses on evaluating potential environmental impacts of the Proposed Action and Alternatives. Also, see response 6-10.

7-16: Pre-construction activities regarding funding (such as materials procurement and workforce mobilization) could start as early as January 2004; actual ground breaking work, if the CMRR project is approved, would be expected after mid-year 2004.

7-17: Changes to the text of the Final *CMRR EIS* have been made regarding the description of large containment vessel handling capability anticipated for the CMRR Facility (see Section 2.4.4). The CMRR Facility would provide large containment vessel handling capabilities in support of Dynamic Experiments Program, including vessel cleanout and materials recovery. These capabilities would be selected to complement the AC and MC capabilities already housed at the CMR Building, with the floor space occupied by these capabilities sized consistent with mission capacity requirements. Dynamic Experiments would not be conducted in the CMRR Facility.

7-18: Cleanout of the vessels in question would require the construction of an appropriate facility in which to conduct the work. As the CMRR Facility could include such a facility and would become operational concurrently with the need for such a facility, NNSA may include this function within the same CMRR Facility building where the AC and MC operations would be conducted. While the debate on national nuclear weapons policy continues, this debate is outside the scope of the *CMRR EIS*, which focuses

stated that the lab's number of Dynamic Experiments (including hydrotests) was slated to triple under expanded nuclear weapons activities. More likely, in this commentator's view, the real purpose of any containment vessel washout in the Replacement Building would be for shot debris analysis. This would tie back to the NOI's statement that "[m]ission critical CMR capabilities at LANL support NNSA's and management strategic objectives; these capabilities are necessary to support the current and future directed stockpile work and campaign activities conducted at LANL." As already discussed above, directed stockpile work consists of an aggressive schedule of nuclear weapons refurbishments, a number of which arguably result in "new" nuclear weapons, and possible new designs. In this context, it makes sense that containment vessel washout would take place at the CMR Replacement Building, which will presumably be LANL's premier facility for analytical chemistry and radioassay work on special nuclear materials. Shot debris analysis there would directly aid and support the thrust of directed stockpile work, with a particular focus on pit production (by virtue of co-location). If this line of speculation is correct, the Final EIS should so disclose.

7-18 (Cont'd)

One thing that particularly alarms this commentator is the two-word phrase "vessel loading." What does this mean? In the extreme it could mean loading the containment vessel with surrogate plutonium pits ready for hydrotest detonation at the firing sites. This, of course, means the presence of high explosives in combination with special nuclear materials. At DEIS p. C-13 a risk analysis is performed for a "process explosion." However, this does not involve the possible presence of high explosives within the CMRR. The Final EIS should fully explain what is meant by and what is involved in "vessel loading." Further, the DEIS's one paragraph description of "Large Containment Vessel Handling Capability" is completely unsatisfactory and should be greatly expanded and elaborated upon.

7-19

Other related issues that the Final EIS should explore are:

- Analysis of the risk of transport of these loaded containment vessels from the CMR Replacement Project to the firing sites;

7-20

- How cleanup residues are to be treated and disposed of. What portion is liquid, what portion is mixed (both radioactive and hazardous) and therefore subject to the Resource Conservation and Recovery Act? Where would mixed wastes be disposed of (since such disposal is prohibited at LANL)? What portion would be transuranic wastes; what portion low-level wastes?

7-21

- What is the need for cleanout at the CMR Replacement Project when other cleanout facilities already exist? What are those facilities?

7-22

- What kind of floor space would be needed at the Replacement Building for containment vessel washout? The EIS should provide a generalized schematic.

7-23

The CMR Replacement Project and the Future Advanced Hydrotest Facility

The draft EIS needs to disclose and discuss any relationship between the CMR Replacement Project and the future Advanced Hydrotest Facility (AHF). That relationship (if any) should be discussed in general, and particularly in the event that the CMR Replacement Project is to "handle" any Dynamic Experiments containment vessels from the AHF. The 9/26/01 LANL Ten-Year Comprehensive Site Plan states that for the AHF "Critical Decision Zero (CD-)) documentation is currently being developed and is planned for submittal to DOE in mid-FY 2002" (p. II-13). Thus there is currency in time with this issue.

7-24

on potential environmental impacts of the proposed action and alternatives.

7-19: The statement contained in Section 2.4.4, Large Vessel Handling Capability, of the Draft *CMRR EIS* was intended to refer to the transfer of vessels from and to their transport vehicles. Operations involving large vessel handling within CMRR would be limited to material removal, cleanout and materials recovery operations and would not include vessel loading for experimental reuse. Text of the *CMRR Final EIS*, Section 2.4.4, has been clarified regarding possible containment vessel operations at the CMRR Facility. Text regarding vessel loading was removed from the document.

7-20: As discussed in the response 7-19, vessel containment loading for experimental reuse would not be conducted in the CMRR Facility.

7-21: Information about the disposition of operational wastes generated by the CMRR Project is included in Chapter 4 of the *CMRR EIS*. Cleanup residues from containment vessels would be handled in accordance to LANL's existing waste management procedures.

7-22: See response 7-19. Other existing LANL cleanout facilities are not designed to physically accommodate the subject large containment vessels.

7-23: The layout of the CMRR Facility would be planned only after the NNSA decides whether to pursue the project. The Record of Decision is scheduled for publication in 2004. The layout of the structures that would be part of the CMRR Facility would be the product of detailed design. Due to lack of sufficient information at this time and security concerns, no generalized layout of the buildings has been provided in the *Final CMRR EIS*.

7-24: The referenced Advanced Hydrotest Facility (AHF) has not reached the level of being more than a contemplated project. Sufficient details about the AHF concept are not known and therefore cannot support any suppositions about any environmental effects of the project. If it should become mature enough for a decision in the future, separate NEPA compliance would be provided. Currently, there is no connection between the CMRR Facility and the AHF. No Critical Decision Zero documentation has been developed or submitted by NNSA. This is an example of the fact that while the LANL Ten-Year Comprehensive Site

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

This future link between the CMR Replacement Project and the AHF is not just mere speculation on the part of this commentator. The 9/26/01 LANL Ten-Year Comprehensive Site Plan, at Table II-2: "Summary Missions, Alternatives and Requirements Table," under "Surveillance" identifies TA-55's plutonium facility as the functional site for plutonium pit disassembly and recovery of special nuclear materials. Under "Alternatives/Options" the table goes on to say "[i]ncreased numbers of retired weapons and increased component age will necessitate the additional diagnostic capabilities in the 'hot' laboratory space." Presumably, the CMR Replacement Project would provide much of that 'hot' laboratory space. **7-25**

Under "Facility Strategies" to be addressed the table goes on to say "[i]dentify capability and space needs to conduct surveillance program that integrate the Stockpile Stewardship needs with Stockpile Maintenance (e.g. connect to the Advanced Hydrotest Facility (AHF) program)." Thus this commentator believes that the future link between the CMR Replacement Project and the future AHF is demonstrated. The CMRR Final EIS should discuss and disclose it. **7-26**

Future CMRR Missions

- At p. S-2 the DEIS states that the Chemical and Metallurgical Research Replacement (CMRR) Facility is to be oversized by 30% for "mission contingency space." The Final EIS should expand on what anticipated future contingencies might be. **7-27**

- "Of particular interest are options for relocating and consolidating some of the Lawrence Livermore National Laboratory Hazard Category 2 operations to LANL to support long-term Defense Program needs." DEIS S-22. What are these operations? Will they come from the LLNL "Superblock"? **7-28**

- Wing 9 of the old CMR Building had a number of hot cells for particularly dangerous work with radioactive materials. The LANL Ten-Year Comprehensive Site Plan notes that one of the mission needs that the old CMP Building supplied was "[s]hielded hot-cell facility for plutonium weapons evaluation." Will the Replacement Project also have hot cells? The emissions table at DEIS p. 4-41 list emissions of the noble gases krypton and xenon, a possible signature of either reprocessing and/or hot cell activities. The Final EIS should explain what these activities, if any, are, or, at a minimum, what types of operations would result in these particular types of emissions. If the CMRR is to indeed contain hot cells the Final EIS should provide a description of them, their related activities and a generalized schematic of hot cell floor space. If hot cells are indeed to be located within the CMRR the omission of their existence can only be construed as being deliberate in the DEIS. **7-29**

- Presumably substantial work with Pu-238 would occur at the CMR Replacement Project. Given Pu-238 special hazards as a heavy gamma emitter, the draft EIS needs to discuss special precautions, such as shielding, taken with this material. This is underscored by past Pu-238 contamination and occupational doses at PF-4. **7-30**

- DEIS Table C-1 lists 27 activities conducted in the old CMR building as "CMR Activities Evaluated in the Hazards Analysis." These still do not adequately explained what "overflow capacity for PF-4" might be. **7-12 (Cont'd)**

Response to Commentor No. 7

Plan can be used effectively for planning and budgeting purposes, it is not a "cast in concrete" roadmap of LANL operations.

7-25: The "hot laboratory space" described in Table II-3 of the 2001 LANL Ten-Year Comprehensive Site Plan, Surveillance, Alternatives/Options refers to laboratory space within the existing Plutonium Facility at TA-55. The next line down in Table II-3 of the 2001 TYCSP from the one noted by the commentor lists AC and MC missions, alternatives, and requirements that would be relocated and consolidated if the CMRR Project were implemented.

7-26: The AHF is a speculative project at this point in time, hence the 2001 Ten-Year Comprehensive Site Plan's use of the term "e.g." meaning "such as", and the commentor's own use of the terms "future link" and "future AHF". The CMRR Facility, should it be constructed, might be able to accommodate any number of projects and programs that are speculative at this time. When adequate information is available about the AHF, and about any other projects that arise in the future, NEPA compliance will be provided, and any necessary disclosure of linkages between facilities would be made then.

7-27: No additional information is available at this time about what may constitute future mission activities that could be placed in the CMRR Facility. Therefore, no additional information can be added to the *CMRR EIS* about these activities.

7-28: Text regarding possible inclusion of activities currently conducted at Lawrence Livermore National Laboratory (LLNL) into the CMRR Facility has been removed from the *CMRR EIS* (See Section 2.4.6). This removal of the text reflects a decision made by NNSA not to consider any such operational movement from LLNL at this time.

7-29: The *CMRR Draft EIS* and *Final EIS* both state in Chapter 2.4.7 that the Wing 9 hot cell operations would not be included in the new CMRR Facility. The accident scenario analyses presented in Appendix C of the *CMRR EIS* for all four action alternatives evaluated the potential impacts to the public and to site workers from potential accidental radioactive releases. These accident analyses did not include any fission products, such as cesium-137, or strontium-90 because no material existing CMR Facility that would potentially produce significant quantities of fission

Potential Aging Effects on Plutonium

In this commentator's view, the rationale for the Stockpile Stewardship Program (and its associated tens of billions of dollars) largely hinges on the future effects of aging on plutonium-239. This is directly relevant to the CMR Replacement Building(s), as presumably it would be the NNSA's premier facility for analytical chemistry and assay work on special nuclear materials. Also in this commentator's view, DOE unfortunately controls the debate on what those aging effects might be, and will likely play up any tiny degree of uncertainty in order to ensure the continuing flood of appropriations. If DOE were principled in this matter, it would disclose what is known to date and what can be reasonably projected on into the future. Further, because it has much to do with the need and mission of the CMR Replacement Project, DOE would disclose that in the Final EIS. 7-31

This commentator has compiled the following from DOE documents and other sources indicating that plutonium-239 is stable over a long period of time. Therefore, the safety and reliability of the U.S. nuclear weapons stockpile is assured for the long-term, at a minimum for the next half-century.

As a baseline: "The stockpile is currently judged to be safe and reliable by DOE." 1996 Stockpile Stewardship and Management (SSM) PEIS Vol. I at p. 2-3. In all subsequent years the three lab directors have certified that the stockpile has remained safe and reliable. Potential future problems in nuclear weapons safety and reliability can be divided into problems with nuclear and nonnuclear components. However, potential problems with nonnuclear components can be ruled out as not being germane to the core debate over the SSM Program. "For nonnuclear components, a significant amount of functional test data is acquired during manufacture and is then used to begin building a statistical estimate of component reliability. Subsequent laboratory and flight testing in the surveillance program accumulates additional data that include the effects of aging and exposure to stockpile environments. Thus, over time, high confidence in the safety and reliability of nonnuclear components and subsystems can be established." SSM PEIS Summary, p. 19.

The SSM PEIS goes on: "The situation is not the same for nuclear components and the assessment of their nuclear performance... In the past, [full-scale] nuclear testing filled the gaps in basic understanding of the complex physics phenomena; it provided high confidence in the certification of nuclear safety and performance. Without nuclear testing, science-based stockpile stewardship will focus on obtaining the more accurate scientific and experimental data that will be needed for more accurate computer simulations of nuclear performance." Ibid. Hence, the overarching justification for the SSM Program lies in future uncertainty over aging effects on nuclear components. However, language in supporting documents for the PEIS indicates that there is little uncertainty for the foreseeable future. 7-32

For the SSM PEIS DOE prepared the *Stockpile Management Preferred Alternatives Report* and the *Analysis of Stockpile Management Alternatives Report*, both released in July 1996. Under "Capacity Assumptions and Contingency Options": "Only replacement of pits destroyed in routine surveillance testing is expected until a near term life limiting phenomenon is observed in stockpile pits. Most pit requirements during weapon refurbishment are expected to be satisfied by requalification and reuse of existing pits *since historical pit surveillance data and pit*

products. Even though the new CMRR Facility would not have hot cell operation capabilities, this would not eliminate the potential for receiving small quantities (gram-sized samples) of irradiated material for AC and MC activities. The gram-sized quantities could be produced at other facilities with hot cell capabilities, such as the Plutonium Facility. The AC and MC activities on this sample would lead to release of fission noble gases that are still within the fuel matrix, but in small quantities, much smaller than those considered for the analyses in the normal releases.

7-30: Appropriate and sufficient worker shielding for activities conducted within the CMRR Facility would be included into the building design and the operational equipment requirements.

7-31: Refer to DOE/EIS-0236-S2, *Supplemental Programmatic Environmental Impact Statement on Stockpile Stewardship and Management for a Modern Pit Facility* for more information about plutonium pit aging. The need for the CMRR Facility is not dependent upon work related to plutonium pit aging or on the decision concerning the proposed Modern Pit Facility.

7-32: The *CMRR EIS* mission, purpose, and need are discussed in Chapter 1 of the EIS. The need for the CMRR Facility is not dependent upon work related to plutonium pit aging or on the decision concerning the proposed Modern Pit Facility.

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

life studies do not predict a near-term problem." Stockpile Management Preferred Alternatives Report, July 1996, p.12. Emphasis added.

"Most nuclear weapons in the stockpile were designed for a minimum lifetime of 20 years. However, *experience indicates that weapons can remain in the stockpile well beyond their minimum design lifetime.* Two nuclear weapon systems remained in the stockpile for more than 30 years." Analysis of Stockpile Management Alternatives, July 1996, p. 7-8. Emphasis added. Under "Primary [the nuclear package with high explosives] Requirements": "Known aging effects of high explosive components results in an estimated stockpile life of 30 to 40 years based on current understanding of high explosive aging." Ibid, p. 7-11.

"*No age related problem has been observed in pits up to 30 years in age*, though very little data exists for pits older than 25 years. In addition, no age related problem is expected until well past the START II [the second Strategic Arms Reduction Treaty] implementation date [year 2003]." Ibid., p. 7-12. Emphasis added. Under "Conclusion": "Nuclear components (pits and secondaries) are expected to have service lives significantly in excess of their minimum design life of twenty to twenty-five years." Ibid., p. 7-17.

Senior DOE officials have hinted that the buildup of helium gas as a result of plutonium decay could affect nuclear weapons performance in the near term. Again, this is contradicted by PEIS language. During the SSM PEIS public comment period, a commentator asked, "How long can pits remain in the stockpile before buildup of decay products becomes a design or handling concern?" DOE responded: "Modern nuclear weapons are designed with a minimum design life of 20 to 25 years. Based on existing surveillance data, DOE expects the pits to last at least this long, and probably considerably longer. However, very little historical and applicable data exists beyond 30 years. *With regard to the buildup of decay products alone, DOE does not currently believe this will become a problem in less than 50 years...*" SSM PEIS, Volume IV, p. 3-84. Emphasis added.

Since the release of the SSM PEIS, Raymond Jeanios (professor of geophysics at UC Berkeley), published an article entitled "Science-Based Stockpile Stewardship" in *Physics Today*, December 2000. Some relevant quotes are:

> Perhaps the most important result from measurements is that Pu exhibits good crystalline order even after decades of aging.
>
> ...on the nanometer scale, aging appears to have the same effect as a greater Ga [gallium] concentration, in that it shifts the Pu to a more stable configuration.
>
> The overall finding from a variety of observations... is that the Pu samples not only retain long-range order but actually get closer to the ideal crystal structure with increasing age. Annealing processes, perhaps related to those countering the crystal-structure disordering, appear to counteract radiation-induced damage and mitigate the initial buildup of He [helium] quite effectively, at least for Pu in the US stockpile.
>
> Surprisingly, however, the high explosive used in US weapons has been found to improve systematically with age in key measures of performance, such as yielding characteristics and detonation-front velocities.

7-32 (Cont'd)

Response to Commentor No. 7

Thus, crucial primary-stage components that were initially subject to concern have been shown through the SSP to be robust as they age. Indeed, there is now consensus among specialists that the Pu pits in the US stockpile are stable over periods of at least 50-60 years, with the most recent studies suggesting a far longer period. More important than the indications of benign aging is the demonstration that the materials are now becoming understood in sufficient detail, and surveillance methods are becoming sensitive enough, to ensure that any signs of degradation will be observed in time to apply the necessary repairs or refurbishment.

7-32 (Cont'd)

Another point concerning the future effects of aging on plutonium:
J. Carson Mark, former head of LANL's Theoretical Division (and an ardent arms control advocate), before his death personally told this commentator that the lab had the foresight some four decades ago to set aside weapons-grade Pu-239 for the express purpose of studying aging effects. Further, while pointing to Pu-239's long half-life (approximately 24,000 years), he stated that the big news was "no news." I subsequently requested from LANL data or conclusions from these "set aside" experiments," but was denied on the basis of classification. Nevertheless, I reiterate here that those conclusions are germane to the need and mission for the CMR Replacement Project and should be generally disclosed in the draft EIS as part of the Project's need and mission. It is self-serving for LANL and the NNSA to remain silent on this subject.

The May 2003 draft environmental impact statement for the Modern Pit Facility (MPF DEIS) now states that no aging effects impairing nuclear weapons safety and reliability have ever been found in pits up to 42 years of age. The MPF DEIS's Appendix G contains the undated draft report "Plutonium Aging: Implications for Pit Lifetimes" by J. Martz of LANL and A. Schwartz of LLNL. This draft report discusses ongoing "accelerated aging" tests that are to culminate in FY06 with a pit lifetime assessment based on old pit data and the accelerated aging program. This is completely germane to the CMRR DEIS as presumably these experiments are being carried out in the old CMR Building and also presumably will be transferred over time to the new CMRR.

7-33

This commentator is concerned that these experiments could be easily skewed what with the reportedly necessary input of data and use of computer modeling. The report further says that there will be internal and external reviewers. But who are these reviewers to be and will they be truly objective? And can the resulting data really be applied to the future safety and reliability of Pu-239 pits? If these experiments are indeed conceptually credible, what is the proper blend with Pu-238 that would assure valid results? As a heavy gamma emitter, how is it that Pu-238 would not skew data results? How long of a performance baseline is the NNSA attempting to establish for plutonium pits? A half century (when, given the referenced quotes above, that already seems assured)? A full 100 years? Would the NNSA purposively reach for such a lengthy performance baseline that it would be impossible to offer guarantees of safety and reliability? What or who is to ensure the objective and dispassionate analyses of and resulting conclusions from the data, when ultimately 10's or 100's of billions of dollars are in the balance for the Stockpile Stewardship Program?

7-34

7-33: Should the NNSA decide to proceed with the construction of the CMRR Facility, it would not become operational until about 2010 and the full complement of operations would not be moved to the new facility until about 2012. Experimentation completed in 2006 would not need to be moved into the new facility.

7-34: The NNSA notes the commentor's concerns. Pit aging experiments are outside of the scope of the *CMRR EIS*, which focuses on evaluation of potential environmental impacts of the proposed action and alternatives. The draft report referenced is the product of the cited authors, who are employees of the University of California; NNSA recommends that the commentor direct his questions directly to the authors for resolution.

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

Environmental, Safety and Security Issues

- At p. 4-75 the DEIS mentions a possible "replacement facility" for the Waste Isolation Pilot Plant. 4-77. What WIPP Replacement Facility? — 7-35

- At p. 4-75 the DEIS states that over 50 years LANL could reach 142% of available water capacity. It further states that Los Alamos County is seeking additional water supplies from the San Juan-Chama Transmountain Diversion Project. The Final EIS should elaborate on this. — 7-36

- The DEIS maintains that the Radioactive Liquid Waste Treatment Facility (RLWTF) will be sufficient for the disposal of the CMRR's liquid radioactive wastes. It is already noted that upgrades or even complete replacement of the RLWTF is an integral part of NNSA/LANL/UC Integrated Nuclear Planning, as is the CMRR itself. It is noted here that discussion of the CMRR's potential impacts on the RLWTF is quite skimpy in the DEIS and should be expanded in the Final EIS. What pretreatment would take place at the Replacement Project before liquid wastes are piped to TA-50? Would the piping be double piped? What tritiated liquid wastes might there be? If so, what portion of tritium might be reactor-produced or accelerator-produced? — 7-37

- In response to citizen litigation, in 1996 a federal judge found that LANL had been in major violation of the Clean Air Act for over six years. Moreover, historic air emissions records for the CMR Building were often incomplete and often based on assumptions. This EIS needs to make clear how the Replacement Project would comply with the Clean Air Act. As part of that, the locale for the Most Exposed Individual (as defined by the Clean Air Act) should be determined and a potential dose calculated. Use of a dose model other than CAP-88 (which is realistic only for flat land topography) should also be considered, if needed with EPA approval. — 7-38

- Under the threat of the Clean Air Act litigation mentioned above LANL personnel retrofitted the CMR Building with additional radioactive air emissions monitors. For the Wing 9 hot cells LANL personnel also installed air monitors for radioactive air emissions not necessarily governed by the Clean Air Act (perhaps for xenon and argon (?)). Would similar air monitoring devices be installed at the CMR Replacement Project? — 7-39

- The NNSA should consult with the New Mexico Environment Department in order to ensure that no contaminated soils would be disturbed during construction of the CMRR. — 7-40

Decontamination and Demolition of the Old CMR Building

The NOI states that the NNSA will evaluate "the potential decontamination and demolition of the entire existing CMR Building…" This needs to be reflected in the draft EIS and any subsequent Record of Decision. The Final EIS should consider and disclose the following, at a minimum:

- The waste streams that would emanate from D&D. What volumes are to be expected? What portions are to be disposed as conventional solid waste, hazardous, low-level radioactive, transuranic and mixed? — 7-41
- With respect to conventional solid wastes, given that the Los Alamos County landfill is due to be soon closed, where would they go? With respect to mixed wastes, where will they go? — 7-42

Response to Commentor No. 7

7-35: The NNSA is already contemplating the disposal of TRU waste when the WIPP has been filled to capacity. As the planning and construction of such a facility would take a number of years, it is appropriate for NNSA to begin contemplating this eventuality now. No project plans have been developed yet regarding a WIPP replacement project.

7-36: As stated in Section 4.8 of the *CMRR EIS*, DOE transferred ownership of 70 percent of its water rights to Los Alamos County and leases the other 30 percent. The County's efforts to obtain additional water under the San Juan-Chama Transmountain Diversion Project do not involve NNSA.

7-37: Separate NEPA compliance would be undertaken by NNSA when, and if, a RLWTF replacement project becomes ripe for decision, which will occur when sufficient information about the proposal is developed such that analyses of impacts could be considered in the decision making process.

7-38 The methodology used to determine potential impacts on air quality is described in section A.3.2 of Appendix A. As indicated in Sections 4.3.3.1, 4.4.3.1, 4.5.3.1, and 4.6.3.1 of the *CMRR EIS*, non-radiological air quality concentrations from the CMRR Facility would be at least a factor of three below the most stringent standard or guideline for short averaging periods and several orders of magnitude below the most stringent standard or guideline for annual or 8 hour averaging periods. Potential dose to a maximally exposed individual (MEI) is presented in Sections 4.2.9.1, 4.3.9.1, and 4.4.9.1, Construction and Normal Operations, Radiological Impacts. The MEI is a hypothetical member of the public assumed to live at a location along the boundary of LANL where the radiological impact from air emissions is greatest. Potential MEI doses were calculated using the GENII computer code. Although the reported dose results show that the Clean Air Act dose limits would be met, their purpose is for comparing environmental impacts among the alternatives. Demonstration of compliance with regulatory limits would be performed as part of the permit application and compliance process.

7-39: Monitoring devices specific to the conduct of operations within hot cells would not be a part of the systems equipment planned for installation within the new CMRR Facility, as that facility would not contain hot cells. Chapter 2.4.7 of the CMRR EIS identifies existing CMR Building operations that would not be transferred to the CMRR Facility.

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

What is to be the expected impact, including volumes, upon the lab's "low-level" waste dump at TA-54 Area G? How might Area G's operating life be foreshortened by CMR wastes? 15-43

- The CMR Building surely contains significant amounts of special nuclear materials. Where do those inventories go? What are related transportation and security risks? 15-44

Some Specific Deficiencies in the Draft Environmental Impact Statement

- On potential criticality accidents, at page C-5 the DEIS makes the assertion that "[f]or the CMRR EIS alternatives, the likelihood of an unsafe configuration and criticality is sufficiently small enough to exclude it from detailed consideration in the EIS." LLNL, the other UC-operated nuclear weapons laboratory, has had documented criticality safety infractions, and these have involved lesser amounts of special nuclear materials than LANL has historically handled. We also note the recent criticality safety infractions at LANL's own Technical Area-18. In the accident analyses beginning at DEIS page C-6 it states that "[t]he material at risk is estimated to be approximately 13,228 pounds (6,0000 kilograms) of plutonium…" Also, as an obvious matter the CMRR is classified as a Hazard Category 2 nuclear facility, meaning that there is the potential for significant onsite consequences in the event of an accident. To categorically assert that the "likelihood [of an criticality incident] is sufficiently small" without explanation and justification is to simply sweep this critical (pun intended) issue under the rug. The CMRR Final EIS should correct this serious deficiency with a cogent criticality risk analysis. 7-45

- Under "Airplane Crash" the DEIS states that the "probability of an airplane crash during over flight is less than 10^{-6} and under DOE NEPA guidelines does not have to be considered in the EIS." For the sake of discussion here we accept it as true that the probability of an *accidental* crash is that low. However, the problem, as we see it, is not with accidental crashes but rather with intentional crashes. That TA-55, as the sole current site for U.S. plutonium pit production would be an attractive terrorist target for attack by a highjacked plane is undeniable. As the DEIS states "NNSA's overall concept for TA-55 would have it contain all or at least most of the Security Category 1 nuclear operations needed for LANL operations" (p.1-10). Security Category 1 is the category that has the greatest mounts of sensitive materials. The TA-55 materials are presumably the most "attractive" type to would-be saboteurs precisely they involve plutonium and highly enriched uranium. The attractiveness of TA-55 as a target can only be enhanced by the co-location there of the CMRR Project and its future Security Category 1 activities. The Final EIS must correct the DEIS's failure to discuss the risks of an intentional airplane crash. Its failure to do so is especially ironic given that the NNSA profits in appropriations while attempting to meet new proclaimed terrorist threats, but avoids including those potential terrorist threats in risk analyses of its own facilities. We respectfully suggest that the NNSA can't have it both ways. 7-46

The CMRR DEIS Risk Analyses

It is extraordinary that the NNSA proposes to replace a 50-year old facility with a modern facility and that the replacement facility will have more than 40 times the amount of potential risk in the case of the most severe postulated accident (and, for that matter, three times the amount of transuranic waste generation). For the No Action Alternative, i.e. continuing operations at the old CMR Building, the DEIS predicts two latent cancer fatalities in the event of "fire in the main vault." For the preferred alternative, construction and operation of the CMRR at TA-55, the DEIS predicts 83.9 latent cancer fatalities in the event of a "facility-wide spill" 7-47

Response to Commentor No. 7

7-40: If the NNSA decides to proceed with construction of the new CMRR Facility, all appropriate consultations with the New Mexico Environment Department will be conducted.

7-41: Currently available information on D&D is provided in Sections 2.7.7 and 4.7.2 of the *CMRR EIS*.

7-42: As discussed in Section 1.6.1.14 of the *CMRR EIS*, alternatives providing for solid waste disposal after the existing landfill is closed are being considered through the NEPA compliance process. As stated in Section 3.12.5, mixed low-level waste would be disposed of at offsite facilities according to LANL's current waste management program.

7-43: Information regarding the disposal of low-level waste at LANL is included in Section 3.12.4 the *CMRR EIS*. The exact amount of low-level waste that the disposition of the CMR Building would generate is not currently known. All disposition of wastes in Area G shorten its operating life.

7-44: Information regarding the movement of existing operations into the new CMRR Facility is provided in the *CMRR EIS* in Section 2.3. SNM inventories from the CMR Building would be included in the movement of operations into the new CMRR Facility and would be placed in the underground storage vault.

The transportation impact assessment as explained in Sections 4.7.1 and 2.9.3 of the EIS analyzes the one-time movement of SNM and equipment from the existing CMR Building to the new CMRR Facility. The one-time transport of these materials would occur on the DOE controlled roads. Under the current LANL security procedures, the roads used to transport SNM and other radioactive materials under this EIS would have limited public access capability, and would be closed to the public during transport activities. Once a shipment is prepared for low speed and controlled movement onsite, the likelihood and consequence of any foreseeable accident are considered to be small and bounded by the analyses provided in the *CMRR EIS* for facility accidents.

7-45: Criticality accidents are extremely unlikely and have small consequences relative to the low-frequency, high consequence accidents evaluated in the *CMRR EIS*. Text has been added to Section C.3.3 of Appendix C to clarify the reasons that criticality accidents were not included among the radiological accidents evaluated in detail.

Commentor No. 7: Nuclear Watch, Jay Coghlan (Cont'd)

(DEIS p. C-13). This is indicative of the increased special nuclear materials inventory to be held in the CMRR and more generally indicative of the risks posed by expanding nuclear weapons operations at LANL. It also far exceeds the predicted latent cancer fatalities for the Modern Pit Facility, which has just been issued its own draft environmental impact statement (and calls into question the risk analyses in that document).

7-47 (Cont'd)

It is also interesting that the DEIS risk analysis chooses a somewhat arbitrary 50-mile radius for the "off-site population" for the purpose of calculating both person-rems and latent cancer fatalities. That 50 miles gives a population base of 302,130 people. If that radius were extended another 10 miles (why not?: fallout doesn't recognize an arbitrary radius) the population base would be more than 800,000 people because of including Albuquerque and other communities. The potential latent cancer fatalities would go up accordingly.

7-48

It astonishes that in the CMRR DEIS the risk analyses are limited to hypothetical events internal to the proposed facility (with the exception of an earthquake). Nowhere to be found is the risk that wildfire would pose to the facility, a mere three years after the catastrophic Cerro Grande Fire. Apparently the NNSA needs reminding that the draft LANL Site-Wide EIS lacked any wildfire analysis whatsoever and that it was public comment that compelled DOE to include it in the 1999 Final SWEIS. Lab officials have repeatedly stated how valuable that analysis was when the real thing broke out approximately a half year later. Given this history it is inexcusable, shortsighted and just plan wrong for the CMRR NEPA process to have no reference to the threat posed by wildfire. The Final EIS should so correct this with substantial discussion and consideration.

7-49

Questions concerning the presence or not of hot cell operations at the CMRR have been previously asked in these comments. The DEIS gives estimates of krypton and xenon emissions. This begs the question of, if indeed there are to be CMRR hot cell operations, will there be other gaseous fission products (for example, but not limited to, iodine)? And then, if so, are the DEIS's risk analyses proper and correct? If not, the Final EIS should so correct.

7-29 (Cont'd)

Dr. Arjun Makhijani of the Institute for Energy and Environmental Research has submitted comments on the CMRR DEIS' risk analyses. I refer the NNSA to them and also incorporate them by reference here.

- End of comments -

Respectfully submitted,

Jay Coghlan
Director

Response to Commentor No. 7

7-46: While it is not possible to determine terrorists' motives and targets with certainty, NNSA and LANL give high priority to safety and security. The *CMRR EIS* bounds the consequences of severe accidents regardless of the initiator for such accidents. Security and potential acts of sabotage are integral considerations in NNSA and LANL designs and operating procedures for new and existing facilities. The allegation that NNSA uses threats posed by terrorism to profit in appropriations is without merit. NNSA and LANL consider the threat of terrorist attack to be real, and both are making all efforts to reduce any vulnerability to this threat.

7-47: Operations performed at the CMR Building and the CMRR Facility would be separate and different from those performed at the MPF. As a result of these differences, the material at risk and accident spectrum appropriate for analyses of accidents during CMR activities differs from those appropriate for accidents at the MPF. The analyses are not directly comparable. Both analyses examine radiological consequences and risks for potentially severe, unmitigated accidents. However, severe and unmitigated accidents with high consequences would be unlikely to occur at either facility. As indicated in Chapter 4 of the *CMRR EIS*, no risk of excess latent cancer fatalities at LANL would be expected for radiological accidents under any of the alternatives. As indicated in Chapter 5 of the *MPF Draft SPEIS*, radiological accidents under the LANL alternative for siting the MPF would not be expected to result in the risk of excess latent cancer fatalities.

7-48: The accident analyses performed for the *CMRR EIS* considered impacts to LANL's surrounding population out to a distance of 50 miles from the accident site because the concentration of radioactive materials decreases with increasing distance from the release point. For example, for an accident at TA-55 (fire in the main vault), increasing the distance used in the calculation of radiological impacts from 50 miles to 80 miles increases the population under consideration from approximately 309,000 persons to over 1,021,000 persons. However, the corresponding radiological impacts on the population that could result from a fire in the main vault were found to increase from 8.7×10^{-6} to 9.3×10^{-6} (about 7 percent). Conclusions concerning the radiological impacts of accidents on the population surrounding LANL would be the same whether the 50-mile distance or the 80-mile distance is used in the calculation.

7-49: Although a regional forest fire would likely have a much higher frequency of occurrence than the postulated internal fire at the CMRR Facility, the consequences of a regional fire on plutonium facilities such as the proposed CMRR Facility would be considerably lower because of the actions that would be taken to protect plutonium in main vaults and the actions taken recently at LANL in forested areas to reduce the potential for high intensity crown fires, such as the Cerro Grande Fire of 2000. (The LANL Site-Wide EIS addresses the effects of a forest fire on existing LANL facilities at TA-55 as conditions existed in 1999; the area forest conditions have since been modified both by the Cerro Grande Fire and by subsequent forest thinning projects conducted over a widespread area of the Pajarito Plateau, including LANL itself). See responses 9-7, 5-11, 5-12, and 5-13.

Commentor No. 8: Richard Johnson

Comments on the Chemical and Metallurgical Research Building Replacement Project

I am pleased to submit these summary comments on the draft environmental impact statement (DEIS) for the Chemical and Metallurgical Research Building Replacement Project (the "CMRR").

Mission need: The DEIS purports that "these capabilities [that the CMRR will provide] are necessary to support the current and future directed stockpile work and campaign activities conducted at LANL [the Los Alamos National Laboratory]." This work is for the indefinite preservation of nuclear weapons, including the increasing likelihood of new-designs such as "mini-nukes" and the Robust Nuclear Earth Penetrator. This is contrary to the U.S.'s 1970 NonProliferation Treaty's obligation to "enter into serious negotiations leading to total nuclear disarmament…", repledged in 2000 as an "unequivocal commitment." Further, it sets a terrible example of weapons of mass destruction to the rest of the world. As a key facility in this wrong direction the CMRR should be rejected. 8-1

Operations: The CMRR's primary role will be to directly support plutonium pit production at LANL through analytical chemistry and material characterization of special nuclear materials. The "No Action Alternative" of maintaining these operations at the existing CMR Building (with minimal repairs), and by extension conducting only limited pit production at LANL, is the best alternative action (as far as alternatives are given by the DEIS). DOE claims that expanded pit production is necessary, even though aging effects impacting nuclear weapons safety and reliability have never been found in pits up to 42 years of age. Further, the U.S. and Russia recently signed a treaty to reduce their deployed nuclear weapons to 2,200 each or under by 2013. Given the lack of aging effects and future reduced nuclear stockpiles expanded pit production is not necessary. It logically follows that the CMRR is not needed as well. 8-2 8-3

A TA-55 EIS: Some half dozen projects are planned in the near future for LANL's Technical Area-55, which is the site of the lab's pit production facility and the preferred location for the CMRR. Nevertheless, the DOE has rejected preparing a "TA-55 EIS." This is improper segmentation under the National Environmental Policy Act that the DOE should correct. 8-4

Costs: The DEIS fails to provide construction costs for the CMRR. In the past lab officials have stated that these costs could be up to $955 million. These costs were revised down to $600 million in the FY04 DOE budget, with a "savings" of some $400 million due to a planned "design-build approach." DOE is notorious for overruns even when projects are thoroughly planned in advance, while the lab has been under intense scrutiny for alleged fiscal mismanagement. The CMRR final EIS should consider and disclose both construction and operational costs. 8-5

Risk analyses: The DEIS is deficient because of its failures to include risk analyses for wildfire (the Cerro Grande Fire!); terrorist incidences, including hi-jacked airplanes (pit production would be an attractive target!), criticality accidents; and the arbitrary use of a 50-mile radius for calculating accidental population doses (a 60-mile radius would more than double the population to some 700,000 potentially affected people). 8-6

The New CMRR Will be Riskier: DOE states that the most severe theoretical accident in the old CMR Building, a fire in the main plutonium vault, would result in two potential cancer deaths. The same scenario in the new CMRR would result in 7 potential cancer deaths, and its most severe theoretical accident (a building-wide spill in the event of an earthquake) would result in 84. This is a function of the 30-fold increase in the amount of plutonium to be stored in the new CMRR (around 13,200 lbs.) compared to the old CMR Building. This is in part due to the continuing consolation at LANL of plutonium operations from across the country that the CMRR will help enable. 8-7

Conclusion: The CMRR should be rejected due to lack of mission need and the risks inherent to the facility. Further, the monies saved should be diverted from the continuing expansion of LANL's nuclear weapons programs to environmental restoration. Cleanup, not build-up! 8-8

Sincerely,

Richard Johnson

Date 6/27/03

Response to Commentor No. 8

8-1: The NNSA notes the commentor's concerns about violations of the Non-Proliferation Treaty and his opposition to the CMRR Project. Continuing to provide the physical accommodations for CMR capabilities at LANL violates none of the terms of the referenced treaty. See response to Comment No. 6-3.

8-2: The NNSA notes the commentor's preference for implementing the No Action Alternative. As discussed in Sections 1.1 and 1.3 of the *CMRR EIS*, the CMRR Facility would support a broad spectrum of research and development programs at LANL, including plutonium pit production

8-3: As discussed in Section 1.3 of the *CMRR EIS*, AC and MC are fundamental capabilities required for the research and development support of DOE and NNSA missions at LANL. CMR Building operations and capabilities are currently being restricted in scope due to safety constraints; the building is not operated to the full extent needed to meet DOE/NNSA requirements established in 1999. The need for a new CMRR Facility exists, regardless of the decisions made about the size of the nuclear weapons stockpile, as long as the congressionally-assigned mission for NNSA remains the same.

8-4: As discussed in some detail in Section 1.5 of the *CMRR EIS*, Integrated Nuclear Planning for facilities potentially located at TA-55 is a planning tool for effectively coordinating design and construction of distinct, stand-alone projects within the limited space available at TA-55. Each of these stand-alone projects moves through the NEPA compliance process on its own merits. Cumulative impacts of foreseeable activities at TA-55 and elsewhere at LANL are described in Section 4.8 of the *CMRR EIS*.

8-5: As discussed in the response to Comment 6-10, cost is one of the factors that will be considered by decision makers in the Record of Decision. However, project costs are beyond the scope of this EIS, which focuses on evaluating potential environmental impacts of the Proposed Action and Alternatives.

8-6: The *CMRR EIS* considered a facility-wide fire in its accident analyses (see Section C.4.1 of Appendix C for details). The consequences of such an accident occurring would be the same whether the initiator of such a fire was a wildfire, a process related fire, or a fire started for the purpose of terrorizing people. The NNSA has considered a terrorist act performed with a hi-jacked commercial jetliner and of a smaller plane crash due to

nonterrorist related reasons such as engine failure (see response 6-9 and 1-15). The probability of an event that would maximally engage all structures at TA-55 occurring is extremely small and, as NEPA analyses do not look to worst possible case accident scenarios, such an accident scenario has not been included in the *CMRR EIS*. However, potential wildfires and terrorists attacks are part of the considerations given to the security and safeguards analyses that facilitate building design specifications.

Criticality accidents are extremely unlikely and have small consequences relative to the low-frequency, high consequence accidents evaluated in the *CMRR EIS*. Text has been added to Section C.3.3 of Appendix C to clarify the reasons that criticality accidents were not included among the radiological accidents evaluated in detail.

The accident analyses performed for the *CMRR EIS* considered impacts to LANL's surrounding population out to a distance of 50 miles from the accident site because the concentration of radioactive materials decreases with increasing distance from the release point. For example, for an accident at TA-55, increasing the distance used in the calculation of radiological impacts from 50 miles to 80 miles increases the population under consideration from approximately 309,000 persons to over 1,021,000 persons. However, the corresponding radiological impacts on the population that could result from a fire in the main vault increase by only 7 percent. Conclusions concerning the radiological impacts of accidents on the population surrounding LANL would be the same whether the 50-mile distance or the 80-mile distance were used in the calculation.

8-7: The new CMRR Facility would be operated at the expanded level decided upon for LANL operations through the Record of Decision issued based on the *LANL SWEIS* in 1999. The existing restricted operation of the CMR Building is reflected in the potential consequences of an extreme accident at that building, while the expanded level of operations proposed for the CMRR Facility is reflected in the potential consequences of an extreme accident occurring at the new facility. The CMRR Facility is not intended to enable consolidation of plutonium operations from across the DOE complex. It is intended to provide for ongoing AC and MC

Commentor No. 8: Richard Johnson (Cont'd)

Response to Commentor No. 8

capabilities at LANL. A small amount of laboratory space would be provided for incidental use by non-LANL entities.

8-8: The NNSA notes the commentor's remarks regarding the rejection of the CMRR Project and diversion of funds for environmental restoration. The purpose and need for the Proposed Action are described in Sections 1.1 and 1.3 of the *CMRR EIS*. Funds allocated for the CMRR Project would not reduce funding for environmental restoration at LANL.

Commentor No. 9: Cathie Sullivan

From: Chris Mechels
Sent: Monday, June 30, 2003 8:27 AM
To: *CMRR EIS*
Subject: cmrr comments

Hello,
Please open the attached file for comments on the *CMRR EIS*. As you will note if you receive several copies of the same comments, they are the technical analysis of another person, Jay Coghlan, who is more knowledgable on this particular issue than most of us.

My own comment relates to process on public EIS input. How discouraging it is to feel your input is entirely pro forma and without weight... like voting in the old USSR...one party on the ballot and victors decided before ballots are printed. For the present exercise, where nuclear policy comes to the public fully formed without benefit of public input I feel participation matters so that future decision-makers will know the size of the pile of bodies produced by their previous decision and moderate their pro nuclear goals. With Senator Domenici impervious to arguments against nuclear programs we who study this issue have never faced a playing field so steep. US nuclear policy grinds ahead with no regard for our own nuclear proliferant policies, treaties, health issues, or environmental impact. Surely this decision-making system is badly broken. **9-1**

Cathie Sullivan

Response to Commentor No. 9

9-1: The NNSA notes the commentor's discouragement with the NEPA compliance process and with the process by which national nuclear policy is made. The NEPA compliance process comprises progressive steps undertaken by a Federal agency to meet legal requirements of the law, while the process for establishing national nuclear policy is a political one conducted by duly elected officials. Public participation in both processes occurs in different fashions. Public comments on the Draft *CMRR EIS* resulted in the revisions described in Section 1.9 and shown throughout the EIS by sidebars.

Commentor No. 9: Cathie Sullivan (Cont'd)

Comments on the Chemical and Metallurgical Research Building Replacement Project

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Mission need: The DEIS purports that "these capabilities [that the CMRR will provide] are necessary to support the current and future directed stockpile work and campaign activities conducted at LANL [the Los Alamos National Laboratory]." This work is for the indefinite preservation of nuclear weapons, including the increasing likelihood of new-designs such as "mini-nukes" and the Robust Nuclear Earth Penetrator. This is contrary to the U.S.'s 1970 NonProliferation Treaty's obligation to "enter into serious negotiations leading to total nuclear disarmament…", repledged in 2000 as an "unequivocal commitment." Further, it sets a terrible example of weapons of mass destruction to the rest of the world. As a key facility in this wrong direction the CMRR should be rejected. 9-2

Operations: The CMRR's primary role will be to directly support plutonium pit production at LANL through analytical chemistry and material characterization of special nuclear materials. The "No Action Alternative" of maintaining these operations at the existing CMR Building (with minimal repairs), and by extension conducting only limited pit production at LANL, is the best alternative action (as far as alternatives are given by the DEIS). DOE claims that expanded pit production is necessary, even though aging effects impacting nuclear weapons safety and reliability have never been found in pits up to 42 years of age. Further, the U.S. and Russia recently signed a treaty to reduce their deployed nuclear weapons to 2,200 each or under by 2013. Given the lack of aging effects and future reduced nuclear stockpiles expanded pit production is not necessary. It logically follows that the CMRR is not needed as well. 9-3 9-4

A TA-55 EIS: Some half dozen projects are planned in the near future for LANL's Technical Area-55, which is the site of the lab's pit production facility and the preferred location for the CMRR. Nevertheless, the DOE has rejected preparing a "TA-55 EIS." This is improper segmentation under the National Environmental Policy Act that the DOE should correct. 9-5

Costs: The DEIS fails to provide construction costs for the CMRR. In the past lab officials have stated that these costs could be up to $955 million. These costs were revised down to $600 million in the FY04 DOE budget, with a "savings" of some $400 million due to a planned "design-build approach." DOE is notorious for overruns even when projects are thoroughly planned in advance, while the lab has been under intense scrutiny for alleged fiscal mismanagement. The CMRR final EIS should consider and disclose both construction and operational costs. 9-6

Risk analyses: The DEIS is deficient because of its failures to include risk analyses for wildfire (the Cerro Grande Fire!); terrorist incidences, including hi-jacked airplanes (pit production would be an attractive target!), criticality accidents; and the arbitrary use of a 50-mile radius for calculating accidental population doses (a 60-mile radius would more than double the population to some 700,000 potentially affected people). 9-7

The New CMRR Will be Riskier: DOE states that the most severe theoretical accident in the old CMR Building, a fire in the main plutonium vault, would result in two potential cancer deaths. The same scenario in the new CMRR would result in 7 potential cancer deaths, and its most severe theoretical accident (a building-wide spill in the event of an earthquake) would result in 84. This is a function of the 30-fold increase in the amount of plutonium to be stored in the new CMRR (around 13,200 lbs.) compared to the old CMR Building. This is in part due to the continuing consolation at LANL of plutonium operations from across the country that the CMRR will help enable. 9-8

Response to Commentor No. 9

9-2: The NNSA notes the commentor's concerns about violations of the Non-Proliferation Treaty and opposition to the CMRR Project. Continuing to provide the physical accommodations for CMR capabilities at LANL violates none of the terms of the referenced treaty. See response to Comment No. 6-3.

9-3: The NNSA notes the commentor's preference for implementing the No Action Alternative. As discussed in Sections 1.1 and 1.3 of the *CMRR EIS*, the CMRR Facility would support a broad spectrum of research and development programs at LANL, including plutonium pit production.

9-4: As discussed in Section 1.3 of the *CMRR EIS*, AC and MC are fundamental capabilities required for the research and development support of DOE and NNSA missions at LANL. CMR Building operations and capabilities are currently being restricted in scope due to safety constraints; the building is not operated to the full extent needed to meet DOE, NNSA requirements established in 1999. The need for a new CMRR Facility exists, regardless of the decisions made about the size of the nuclear weapons stockpile, as long as the congressionally-assigned mission for NNSA remains the same.

9-5: As discussed in some detail in Section 1.5 of the *CMRR EIS*, Integrated Nuclear Planning for facilities potentially located at TA-55 is a planning tool for effectively coordinating design and construction of distinct, stand-alone projects within the limited space available at TA-55. Each of these stand-alone projects moves through the NEPA compliance process on its own merits. Cumulative impacts of the foreseeable activities at TA-55 and elsewhere at LANL are described in Section 4.8 of the *CMRR EIS*.

9-6: As discussed in the response to Comment 6-10, cost is one of the factors that will be considered by decision makers in the Record of Decision. However, project costs are beyond the scope of this EIS, which focuses on evaluating potential environmental impacts of the Proposed Action and Alternatives.

9-7: The *CMRR EIS* considered a facility wide fire in its accident analyses (see Section C.4.1 of Appendix C for details). The consequences of such an accident occurring would be the same whether the initiator of such a fire was a wildfire, a process related fire, or a fire started for the purpose of terrorizing people. The NNSA has considered a terrorist act performed with a hi-jacked commercial jetliner and of a smaller plane crash due to

Conclusion: The CMRR should be rejected due to lack of mission need and the risks inherent to the facility. Further, the monies saved should be diverted from the continuing expansion of LANL's nuclear weapons programs to environmental restoration. Cleanup, not build-up! **9-9**

Sincerely,
Cathie Sullivan

Date 30 June, 2003

nonterrorist related reasons such as engine failure (see response 6-9 and 1-15). The probability of such an event occurring that would maximally engage all structures at TA-55 is extremely small and, as NEPA analyses do not look to worst possible case accident scenarios, such an accident scenario has not been included in the *CMRR EIS*. However, potential wildfires and terrorists attacks are part of the considerations given to the security and safeguards analyses that facilitates building design specifications.

Criticality accidents are extremely unlikely and have small consequences relative to the low-frequency, high consequence accidents evaluated in the *CMRR EIS*. Text has been added to Section C.3.3 of Appendix C to clarify the reasons that criticality accidents were not included among the radiological accidents evaluated in detail.

The accident analyses performed for the *CMRR EIS* considered impacts to LANL's surrounding population out to a distance of 50 miles from the accident site because the concentration of radioactive materials decreases with increasing distance from the release point. For example, for an accident at TA-55, increasing the distance used in the calculation of radiological impacts from 50 miles to 80 miles increases the population under consideration from approximately 309,000 persons to over 1,021,000 persons. However, the corresponding radiological impacts on the population that could result from a fire in the main vault increase by only 7 percent. Conclusions concerning the radiological impacts of accidents on the population surrounding LANL would be the same whether the 50-mile distance or the 80-mile distance is used in the calculation.

9-8: The new CMRR Facility would be operated at the expanded operational level decided upon for LANL operations through the Record of Decision issued based on the *LANL SWEIS* in 1999. The existing restricted operation of the CMR Building is reflected in the potential consequences of an extreme accident at that building, while the expanded level of operations proposed for the CMRR Facility is reflected in the potential consequences of an extreme accident occurring at the new facility. The CMRR Facility is not intended to enable consolidation of plutonium operations from across the DOE complex; it is intended to provide for

Commentor No. 9: Cathie Sullivan (Cont'd)

Response to Commentor No. 9

ongoing AC and MC capabilities at LANL. A small amount of laboratory space would be provided for incidental use by non-LANL entities.

9-9: The NNSA notes the commentor's remarks regarding the rejection of the CMRR Project and diversion of funds for environmental restoration. The purpose and need for the Proposed Action are described in Sections 1.1 and 1.3 of the *CMRR EIS*. Funds allocated for the CMRR Project would not reduce funding for environmental restoration at LANL.

Commentor No. 10: Antonio Perez

Withers, Elizabeth

From: Antonio Perez
Sent: Thursday, May 22, 2003 3:08 PM
To: CMRR EIS
Subject: New CMR building

To Whom it may concern,

I work in Los Alamos for LANL, and I belive that a new CMR building is a good idea. As you probally already know the old building is over 50 years old. It was upgraded in the 90's but age has taken its toll. In my oppinon a new build would increase the safety of the employees who work in the CMR. It would also increase the security of the material used and stored there. A new facility will also be cheaper and eaiser to maintain and operate. 10-1

On a side note I read and article on the LANL web site where a gentleman said something to the effect of "There wasn't a mission need" for a new CMR before and there is not one now. I strongly disagree. I belive a new building would increase safety, security and productivity at a building whose mission is very important to this country. Thank you very much for the chance to express my ideas on this subject. 10-2

Sincerely,
Antonio Perez

1

Response to Commentor No. 10

10-1: NNSA acknowledges the commentor's support for replacement of the existing CMR Building with a new facility.

10-2: NNSA acknowledges the commentor's recognition of the national need for a structure to house mission critical actinide chemistry and materials characterization work.

Commentor No. 11: Eva Marie Salas

Withers, Elizabeth

From: Eva Marie Salas
Sent: Friday, June 20, 2003 1:52 PM
To: CMRR EIS
Subject: LANL

Dear Ms. Elizabeth Withers:
I would like to express my opposition in relation to the chemistry and Metallurgy Research Replacement Project at Los Alamos National Laboratory, which would work with plutonium and uranium for nuclear weapons. **11-1**

The continuation of the development of nuclear weapons violates the Nuclear Non-Proliferation Treaty which the U.S. renewed in 1995. The United States Constitution recognizes ratified treaties as "the supreme law of the land." **11-2**

The numerous security breaches at Los Alamos National Laboratory renders the buildings and waste sites vulnerable to terrorists. This area is one of seismic activity as well, and at risk for an earthquake. Consequently, this is not a safe place to build and store nuclear weapons. **11-3**

Thank you for giving my requesst your consideration.

Eva Marie Salas

Response to Commentor No. 11

11-1: NNSA notes the commentor's opposition to the CMRR Project.

11-2: See responses to comments 6-1 through 6-3.

11-3: NNSA notes the commentor's concern's about LANL's vulnerability to terrorists and earthquakes. Nuclear weapons would not be built or stored at the existing CMR Building or the new CMRR Facility, although CMR activities would support maintenance of the nuclear arsenal. Security is a vital concern at LANL. As identified within a text box located in Section 1.1 of the *CMRR EIS*, NNSA provides a graded approach to safeguard SNM. Security systems employed at LANL include perimeter security and security fences, entry check-points for secure areas, building security (both intrusion and occupancy), and closed circuit television.

Commentor No. 12: Ann P. Ware

From: Ann P Ware
Sent: Friday, June 20, 2003 9:13 AM
To: *CMRR EIS*
Subject: The Chemistry and Metallurgy Research Replacement Project

To: Elizabeth Withers

Dear Ms. Withers,

This is not my first letter to you. As in earlier correspondence I am still strongly opposed to the continuing development of nuclear weapons. I do not know how effective the Nuclear Non-Proliferation Treaty is, but we have ratified it and renewed our ratification, and in my view our integrity depends on observing it. It is my understanding that the CMRR Project (despite its benign-sounding name) facilitates working with plutonium and uranium needed for developing nuclear weapons. **12-1**

I deplore the increasing militarization of our nation and the enormous expenditures of public moneys that could be better spent on enhancing human life, not destroying it. **12-2**

The production of nuclear weapons has proved to be disastrous to the health of workers, to say nothing of those affected by the environmental hazards this production and waste disposal cause. **12-3**

Please count this letter as a strong objection to the CMRR Project. **12-4**

Sincerely,

Ann P. Ware
590 East Lockwood
St. Louis, MO 63119

Response to Commentor No. 12

12-1: The NNSA notes the commentor's continuing opposition to the development of nuclear weapons. See Response to Comment 6-3.

12-2: The NNSA notes the commentor's opinions regarding militarization and money expenditures. However, the policies of the U.S. Armed Forces and the national defense budget are outside of the scope of this EIS, which focuses on evaluating environmental impacts of the Proposed Action and Alternatives. Chapter 4 of the *CMRR EIS* evaluates these potential impacts.

12-3: The NNSA notes the commentor's beliefs that the production of nuclear weapons has been disastrous to worker health and those exposed to attendant environmental hazards. Potential environmental impacts that could result from implementation of the action alternatives are described in Chapter 4 of the *CMRR EIS*. Although nuclear weapons would not be produced under any of the alternatives evaluated in this EIS, activities under these alternatives would support maintenance of the Nation's nuclear arsenal. As discussed in Chapter 4, radiological risks and other environmental impacts expected under any of the alternatives would be small.

12-4: The NNSA notes the commentor's objection to the CMRR Project.

Commentor No. 13: Concerned Citizens for Nuclear Safety, Joni Arends

concerned citizens for nuclear safety

107 Cienega St.
Santa Fe, NM 87501
505-986-1973 Tel
505-986-0997 Fax
ccns@nuclearactive.org
www.nuclearactive.org

June 30, 2003

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

Enclosed please find 117 signed comment letters about the Draft Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project (CMRR) at Los Alamos National Laboratory.

Concerned Citizens for Nuclear Safety (CCNS) has forwarded ten emails to you regarding the CMRR. We would appreciate your confirmation of receipt of these emails.

Thank you for your full consideration of these comments.

Sincerely,

Joni Arends
Executive Director

Enclosure

cc: Senator Jeff Bingaman, 119 East Marcy Street, Santa Fe, NM 87501
Representative Heather Wilson, 625 Silver Avenue, Albuquerque, NM 87102
Senator Pete Domenici, 120 South Federal Place, Santa Fe, NM 87501
Representative Tom Udall, 811 St. Michael's Drive, Santa Fe, NM 87505
Representative Steve Pearce, 400 North Telshore, Suite E, Las Cruces, NM 88011

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Response to Commentor No. 13

Commentor No. 13: Concerned Citizens for Nuclear Safety

June 21, 2003

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

I submit the following comments on the Draft Environmental Impact Statement (Draft EIS) for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL), released by your agency in May 2003.

- NNSA claims that contaminated debris resulting from the disposition of the existing Chemistry and Metallurgy Research (CMR) Building will be stored or disposed of at either Technical Area-54 (Area G) or at an offsite commercial facility. However, the 1999 Site-wide EIS for LANL (LANL SWEIS) states that Area G likely will have reached capacity by 2009. Although NNSA does not intend to release a project-specific work plan for the disposition of the CMR for at least 15 years, a work plan should be drafted as soon as possible accounting for this discrepancy, specifying an offsite commercial waste facility, estimating the cost for disposition, estimating related air and water emissions, and occupational effects from disposition activities. This data should be included in the Final CMRR EIS. **13-1**
- Although NNSA claims that the design/build approach may save upwards of $450 million in construction costs, the Draft EIS includes neither a definition of the approach, nor provides actual cost estimates. This information should be included in the Final CMRR EIS. **13-2**
- According to the Draft EIS, waste generation doubles, triples or even quadruples for the four Action Alternatives that NNSA is considering. This increase violates the Department of Energy's policy on pollution prevention, which requires facilities to reduce the volume of waste they create. **13-3**
- NNSA argues that the CMRR is necessary to accommodate expanded CMR operations, which were selected as the Preferred Alternative for CMR operations in the Record of Decision for the LANL SWEIS. However, the LANL SWEIS specifies that more training in support of nuclear nonproliferation be included in expanded operations at the CMR. Nevertheless, the Draft EIS indicates that training for nonproliferation will be eliminated from LANL operations altogether. Should the CMRR project continue, nonproliferation training must be reinstated as an operations priority. **13-4**

Thank you for your consideration of my comments.

Sincerely,

Signature John R. Acker

Name

Address

Response to Commentor No. 13

13-1: The NNSA notes the commentor's concern that Area G would not accommodate waste from demolition of the existing CMR Building. The LANL SWEIS analyzed the expansion of the Area G footprint to allow for adequate LLW disposal capacity beyond the year 2009, and the associated Record of Decision issued in 1999 identified DOE's decision to proceed with the expansion of Area G accordingly. DOE also issued a Record of Decision in 2000 based on the *Waste Management Programmatic EIS (WM PEIS)* that stated that DOE had decided to continue to dispose of LLW onsite at LANL, to the extent practicable. Given the Area G expansion potential, waste generation reduction efforts of LANL, and judicious augmentation with offsite disposal at commercial sites when appropriate, it should be practicable to dispose of LLW at LANL for a long time into the future. As discussed in Section 3.12.4 of the CMRR EIS, LANL will expand disposal capacity sites for low-level waste in Area G to provide onsite disposal for an additional 50 to 100 years. Solid low-level waste can alternately be packaged for disposal at off-site licensed commercial facilities. It is unlikely that NNSA would wait up to 15 years to prepare a project specific work plan for the disposition of the CMR Building; but there is no urgent need to do so now, as any speculative estimates made prior to more thorough analyses would be of limited value when the time came to actually engage in the action. To the extent possible, bounding analyses of environmental impacts for the disposition of the CMR Building have been included in Section 4.7.2 of the CMRR EIS.

13-2: See response 6-10.

Simplistically, the design/build approach to construction projects is one by which a single company is selected from those that submit bids to provide both the design for a building and then proceeds to actually construct that building. Project cost savings can be realized with this approach over the classic contracting approach having individual firms bid for the design of a building, with the selected firm then providing the design, and then having individual firms bid again for the construction of the designed structure, with the selected firm actually doing the building of the structure.

13-3: The apparent jump in waste quantities (listed in Table S-3 of the Summary document) between the No Action Alternative and the action alternatives are a reflection of the status quo of the CMR Buildings

Commentor No. 13: Concerned Citizens for Nuclear Safety (Cont'd)

Individuals submitting this form letter:

John R. Acker
Matt Alexander
Denise Arthur
Linda Aspenwind
Leslie Behn
Shama Beach
Julie Bechko
Michael Bechko
Kathryn S. Becker
Deborah Beleff-Raynor
Shirley A. Belz
James T. Berny
Stanley Beyrle
A.D. Bittson
Peter Botting
Jan Boyer
Keri Boynt
Bill Brimijoin
Mary Bronsteter
Sarah Brooke Bishop
Mark W. Bundy
Janet Burstein
Aaron B. Czerny
Clark Case
Karen Cohen
Myles Courtney
Kathy & Phil Dahl-Bredine
Steve D. Dees
Michele Desgroseilliers
Jody C. Donaldson
Ann Eberlein
M. Jane Engel
Jay Ertel
Barbara Ford
Bernadette Fernandez
Sierra Fernandez
Raymond Finck
Dee Finney
Bobbie Fleming
Kimberly A. Foree
John & Diane Forsdale
Antoinette Fox
Colby Friend
Graciela Garcia
Jade Garcia
Myra Garcia
Percyne Gardner
David R. Genth
Janice Gildea
Joe Gildea
Beth Ann Gillian
Kathleen Ann Gonzalez
Sally Goodknight
Matthew Goodro
Abraham J. Gordon
Patricia Griffin
Irena Grygorowicz
Linda H. Hardman
Jonathan Hare
Bob Harris
Barry Hatfield
Ann Hendrie
Leah Hobgood
Nathan Houchin
Douglas Hughes, M.D.
Tiffany Hunter
Dorothy Jensen
Marge Johnson
Alison Jones
Miles Jones
Kate Keely
Joy Kincaid
Kim A. Kirkpatrick
Sheri Kotowski
Tom Krozik
Alice K. Ladas
Leslie LaKind, D.D.S.
Brad Landers
Shaphan Laos
Jack Larson
Rick Lass
James Latorie
Lisa Law
Pilar Law
Patricia A. Leahan
R. Leland Lehrman
Andy Lilley
Susannah H. Lippman
Becky Lo Dolce
Ashana Lobody
Dale Lock
Jane Lumsden
Sue Shen Lyons
Michael Mandell
Tor Matson
Dominique Mazeaud
Kristina McCarthy
M. Rachel McCarthy
Karen McClaren
& Marcia Naveau
Anne McConnell
Beverly A. McCrary
Rita McElmury
Eric McEuen
Amy McFall
Caitlin McKee
Christine McLorrain
Lesley A. Michaels
Celeste Miller
Larry Miller
Ian Mioh
Ignacio Montano
Phyllis Montgomery
Carlos Mora
Ramona Morino
Amanda Murchison
Frank E. Murchison
Linda Naranjo-Huebl
Margaret Nes
David Nesbit
Renze Nesbit
Shel Neymark
Francesca Oldeni-Neff
Dennis Overman
Eileen Overman
Michael T. Pacheco
Claudia Parker
Robert E. Pearson
Giselle Piburn
Dave Pierce
Steve Piersol
Peter Prandoni
Jean Porteus
Robert Raynor
Adam Read
Matthew Reen
Alan Reis, II
Robert Romeo
A. Ronew
Stanley Rosen
Lara A. Schwartz
Paula Seaton
Robert Seton
Michael Shorv
Raymond Singer, Ph.D.
Wendy Singer
Shannyn Sollitt
J. Thea Spaeth
Jeff Spicer
Sonia Stromberg
Martin Suazo, Sr.
Cathy Swedlund
Michael Thebo
Stephanie Thebo
Laura Thompson
Elizabeth Blythe Timken
Aileen Torres-Hughes
Patrick L. Travers
Robin Urton
Jason P. Walsh
Sally J. Warnick
Deanna M. Watson
Mark L. Watson
Kimberly Webber
Melonie Weishuhn
Michael Wiese
Michael Wiggs-West
Amy Williams
Dean Williamson
Natasha Williamson
Keith R. Wuertz
John F. Young
Nina Zelenunsky
Tiffin Zellers
Cecile J. Zeigler
Alice Zorthian

Response to Commentor No. 13

restricted operations and the Expanded Operations Alternative that DOE would pursue for LANL operations over the foreseeable future.

The projected waste generation volumes are bounding projections and do not take credit for pollution prevention reductions that would be expected to occur in the new CMRR Facility. Operation of the CMRR Facility would not violate the DOE's pollution prevented policy.

13-4: Non-proliferation training would not be eliminated from LANL operations. As discussed in Section 2.4.7 of the CMRR EIS, not all capabilities either previously or currently conducted at the CMR Building, would be transferred into a new CMRR Facility. The activities identified in the CMRR EIS that would not move to the new CMRR Facility, including non-proliferation training, could continue to be conducted in the existing CMR Building if the necessary portions of that building are not decommissioned and demolished, or these activities could cease to be conducted anywhere at LANL. Other non-proliferation training activities and exercises conducted at various LANL facilities would not be affected by either the construction and operation of a new CMRR Facility or the decommissioning of the existing CMR Building. Many of these activities are planned for consolidation into a new building that was the subject of a 1999 environmental assessment (the Non-proliferation and International Security Center) identified as an action then under consideration in the LANL SWEIS referenced by the commentor (Chapter 1.6.3.1 of the SWEIS).

Commentor No. 14: Andy Brokmeyer

June 29, 2003

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

I submit the following comments on the Draft Environmental Impact Statement (Draft EIS) for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL), released by your agency in May 2003.

- NNSA claims that contaminated debris resulting from the disposition of the existing Chemistry and Metallurgy Research (CMR) Building will be stored or disposed of at either Technical Area-54 (Area G) or at an offsite commercial facility. However, the 1999 Site-wide EIS for LANL (LANL SWEIS) states that Area G likely will have reached capacity by 2009. Although NNSA does not intend to release a project-specific work plan for the disposition of the CMR for at least 15 years, a work plan should be drafted as soon as possible accounting for this discrepancy, specifying an offsite commercial waste facility, estimating the cost for disposition, estimating related air and water emissions, and occupational effects from disposition activities. This data should be included in the Final CMRR EIS. **14-1**
- Although NNSA claims that the design/build approach may save upwards of $450 million in construction costs, the Draft EIS includes neither a definition of the approach, nor provides actual cost estimates. This information should be included in the Final CMRR EIS. **14-2**
- According to the Draft EIS, waste generation doubles, triples or even quadruples for the four Action Alternatives that NNSA is considering. This increase violates the Department of Energy's policy on pollution prevention, which requires facilities to reduce the volume of waste they create. **14-3**
- NNSA argues that the CMRR is necessary to accommodate expanded CMR operations, which were selected as the Preferred Alternative for CMR operations in the Record of Decision for the LANL SWEIS. However, the LANL SWEIS specifies that more training in support of nuclear nonproliferation be included in expanded operations at the CMR. Nevertheless, the Draft EIS indicates that training for nonproliferation will be eliminated from LANL operations altogether. Should the CMRR project continue, nonproliferation training must be reinstated as an operations priority. **14-4**

Thank you for your consideration of my comments.

Sincerely,

Signature

Name ANDY BROKMEYER

Address

P.S. WE DONT NEED ANY MORE WEAPONS. YOU PEOPLE ARE INSANE! HOW CAN YOU SLEEP AT NIGHT? **14-5**

Response to Commentor No. 14

14-1: See Response to Comment 13-1.

14-2: See Response to Comment 13-2.

14-3: See Response to Comment 13-3.

14-4: See Response to Comment 13-4.

14-5: The NNSA notes the commentor's opposition to construction of additional nuclear weapons. While the manufacture and use of nuclear weapons is a subject of continuing national and international debate, this debate is beyond the scope of the CMRR EIS, which focuses on evaluating potential environmental impacts of the proposed action and alternatives. Chapter 4 of the CMRR EIS evaluates these potential environmental impacts.

Commentor No. 15: Linda Hibbs

June 10, 2003

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

I submit the following comments on the Draft Environmental Impact Statement (Draft EIS) for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL), released by your agency in May 2003.

- NNSA claims that contaminated debris resulting from the disposition of the existing Chemistry and Metallurgy Research (CMR) Building will be stored or disposed of at either Technical Area-54 (Area G) or at an offsite commercial facility. However, the 1999 Site-wide EIS for LANL (LANL SWEIS) states that Area G likely will have reached capacity by 2009. Although NNSA does not intend to release a project-specific work plan for the disposition of the CMR for at least 15 years, a work plan should be drafted as soon as possible accounting for this discrepancy, specifying an offsite commercial waste facility, estimating the cost for disposition, estimating related air and water emissions, and occupational effects from disposition activities. This data should be included in the Final CMRR EIS. **15-1**
- Although NNSA claims that the design/build approach may save upwards of $450 million in construction costs, the Draft EIS includes neither a definition of the approach, nor provides actual cost estimates. This information should be included in the Final CMRR EIS. **15-2**
- According to the Draft EIS, waste generation doubles, triples or even quadruples for the four Action Alternatives that NNSA is considering. This increase violates the Department of Energy's policy on pollution prevention, which requires facilities to reduce the volume of waste they create. **15-3**
- NNSA argues that the CMRR is necessary to accommodate expanded CMR operations, which were selected as the Preferred Alternative for CMR operations in the Record of Decision for the LANL SWEIS. However, the LANL SWEIS specifies that more training in support of nuclear nonproliferation be included in expanded operations at the CMR. Nevertheless, the Draft EIS indicates that training for nonproliferation will be eliminated from LANL operations altogether. Should the CMRR project continue, nonproliferation training must be reinstated as an operations priority. **15-4**

Thank you for your consideration of my comments.

Sincerely,

Linda Hibbs
Signature

Linda Hibbs
Name

Address

Note: I have been speaking at DOE hearings since the early 1980's. I believe our country's lead in developing nuclear weapons will now play out in a tragic way. Our current policy now encourages proliferation of nuclear weapons in other countries, and there is no way we can protect ourselves from their eventual use. Our country's power should be setting standards for their elimination. U.S. moral leadership is abysmally absent here, and I do not see it coming into our politics in the foreseeable future. **15-5**

Response to Commentor No. 15

15-1: See Response to Comment 13-1.

15-2: See Response to Comment 13-2.

15-3: See Response to Comment 13-3.

15-4: See Response to Comment 13-4.

15-5: The NNSA notes the commentor's opposition to developing nuclear weapons. While the manufacture and use of nuclear weapons is a subject of continuing national and international debate, this debate is beyond the scope of the CMRR EIS, which focuses on evaluating potential environmental impacts of the proposed action and alternatives. Chapter 4 of the CMRR EIS evaluates these potential environmental impacts.

Commentor No. 16: Norma Jetté

June 29, 2003

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

I submit the following comments on the Draft Environmental Impact Statement (Draft EIS) for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL), released by your agency in May 2003.

- NNSA claims that contaminated debris resulting from the disposition of the existing Chemistry and Metallurgy Research (CMR) Building will be stored or disposed of at either Technical Area-54 (Area G) or at an offsite commercial facility. However, the 1999 Site-wide EIS for LANL (LANL SWEIS) states that Area G likely will have reached capacity by 2009. Although NNSA does not intend to release a project-specific work plan for the disposition of the CMR for at least 15 years, a work plan should be drafted as soon as possible accounting for this discrepancy, specifying an offsite commercial waste facility, estimating the cost for disposition, estimating related air and water emissions, and occupational effects from disposition activities. This data should be included in the Final CMRR EIS. **16-1**
- Although NNSA claims that the design/build approach may save upwards of $450 million in construction costs, the Draft EIS includes neither a definition of the approach, nor provides actual cost estimates. This information should be included in the Final CMRR EIS. **16-2**
- According to the Draft EIS, waste generation doubles, triples or even quadruples for the four Action Alternatives that NNSA is considering. This increase violates the Department of Energy's policy on pollution prevention, which requires facilities to reduce the volume of waste they create. ; if it does not compromise national defense ? **16-3** **16-5**
- NNSA argues that the CMRR is necessary to accommodate expanded CMR operations, which were selected as the Preferred Alternative for CMR operations in the Record of Decision for the LANL SWEIS. However, the LANL SWEIS specifies that more training in support of nuclear nonproliferation be included in expanded operations at the CMR. Nevertheless, the Draft EIS indicates that training for nonproliferation will be eliminated from LANL operations altogether. Should the CMRR project continue, nonproliferation training must be reinstated as an operations priority. **16-4**

Thank you for your consideration of my comments.

Sincerely,

Signature Norma Jetté

Name Norma Jetté

Address

Response to Commentor No. 16

16-1: See Response to Comment 13-1.

16-2: See Response to Comment 13-2.

16-3: See Response to Comment 13-3.

16-4: See Response to Comment 13-4.

16-5: The projected waste generation volumes are bounding projections and do not take credit for pollution prevention reductions that would be expected to occur in the new CMRR Facility. Operation of the CMRR Facility would not violate the DOE's pollution prevention policy. Implementation of DOE's pollution prevention policies would not compromise the national defense.

Commentor No. 17: Ross Lockridge and Ann Murray

June 29, 2003 petition of two

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

I submit the following comments on the Draft Environmental Impact Statement (Draft EIS) for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL), released by your agency in May 2003.

- NNSA claims that contaminated debris resulting from the disposition of the existing Chemistry and Metallurgy Research (CMR) Building will be stored or disposed of at either Technical Area-54 (Area G) or at an offsite commercial facility. However, the 1999 Site-wide EIS for LANL (LANL SWEIS) states that Area G likely will have reached capacity by 2009. Although NNSA does not intend to release a project-specific work plan for the disposition of the CMR for at least 15 years, a work plan should be drafted as soon as possible accounting for this discrepancy, specifying an offsite commercial waste facility, estimating the cost for disposition, estimating related air and water emissions, and occupational effects from disposition activities. This data should be included in the Final CMRR EIS. 17-1
- Although NNSA claims that the "design/build" approach may save upwards of $450 million in construction costs, the Draft EIS includes neither a definition of the approach, nor provides actual cost estimates. This information should be included in the Final CMRR EIS. No! 17-5 17-2
- According to the Draft EIS, waste generation doubles, triples or even quadruples for the four Action Alternatives that NNSA is considering. This increase violates the Department of Energy's policy on pollution prevention, which requires facilities to reduce the volume of waste they create. 17-3
- NNSA argues that the CMRR is necessary to accommodate expanded CMR operations, which were selected as the Preferred Alternative for CMR operations in the Record of Decision for the LANL SWEIS. However, the LANL SWEIS specifies that more training in support of nuclear nonproliferation be included in expanded operations at the CMR. Nevertheless, the Draft EIS indicates that training for nonproliferation will be eliminated from LANL operations altogether. Should the CMRR project continue, nonproliferation training must be reinstated as an operations priority. 17-4

Thank you for your consideration of my comments.

Sincerely, Ross Lockridge & Ann Murray

Signature Ross Lockridge & Ann Murray

Name

Address

* Response Requested

Response to Commentor No. 17

17-1: See Response to Comment 13-1.

17-2: See Response to Comment 13-2.

17-3: See Response to Comment 13-3.

17-4: See Response to Comment 13-4.

17-5: While cost is one of the factors considered by decision makers in the Record of Decision, a cost analysis is beyond the scope of the CMRR EIS, which focuses on evaluating potential environmental impacts of the proposed action alternatives. See Response to Comment No. 6-10.

Commentor No. 18: Elliott Skinner

June 8, 2003

Elizabeth Withers
EIS Document Manager
Los Alamos Site Office
National Nuclear Security Administration
U.S. Department of Energy
528 35th Street
Los Alamos, NM 87544-2201

Dear Ms. Withers,

I submit the following comments on the Draft Environmental Impact Statement (Draft EIS) for the Chemistry and Metallurgy Research Building Replacement (CMRR) Project at Los Alamos National Laboratory (LANL), released by your agency in May 2003.

- NNSA claims that contaminated debris resulting from the disposition of the existing Chemistry and Metallurgy Research (CMR) Building will be stored or disposed of at either Technical Area-54 (Area G) or at an offsite commercial facility. However, the 1999 Site-wide EIS for LANL (LANL SWEIS) states that Area G likely will have reached capacity by 2009. Although NNSA does not intend to release a project-specific work plan for the disposition of the CMR for at least 15 years, a work plan should be drafted as soon as possible accounting for this discrepancy, specifying an offsite commercial waste facility, estimating the cost for disposition, estimating related air and water emissions, and occupational effects from disposition activities. This data should be included in the Final CMRR EIS. 18-1
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Thank you for your consideration of my comments.

Sincerely, Elliott Skinner 18-6

Signature Elliott Skinner

Name

Address

Hence, eliminate all CMR activities. Put all resources to (1) non-proliferation and (2) a short-time frame elimination of all nuclear weapons in the entire world, which of course, includes the U.S.A.

I oppose all nuclear weapons. The CMR facility must be closed, as Rocky Flats was. LANL must be converted to work on non-proliferation (the example beginning at home) and elimination of all nuclear weapons. Environmental restoration must have a high priority. Elliott Skinner 18-7

Response to Commentor No. 18

18-1: See Response to Comment 13-1.

18-2: See Response to Comment 13-2.

18-3: See Response to Comment 13-3.

18-4: See Response to Comment 13-4.

18-5: The NNSA notes the commentor's opposition to all CMR activities except those that support nuclear non-proliferation. As discussed in Sections 1.1 and 1.3 of the CMRR EIS, AC and MC capabilities support a wide range of research and development activities at LANL, including non-proliferation training. Elimination of all CMR activities, except support for non-proliferation, would not fulfill NNSA's mission at LANL. The NNSA notes the commentor's opposition to nuclear weapons. Nuclear weapons would not be manufactured at the CMR Building or the new CMRR Facility.

18-6: The NNSA notes the commentor's opposition to nuclear weapons. Although no nuclear weapons would be constructed in the existing CMR Building or the new CMRR Facility, CMR activities support maintenance of the nation's nuclear stockpile. The purpose and need for NNSA's Proposed Action is described in Section 1.3 of the CMRR EIS. Revision of the LANL mission to include only support for nuclear non-proliferation is outside of the scope of this EIS, which focuses on the evaluation of the environmental impacts that could result from implementation of the alternatives.

18-7: The NNSA notes the commentor's support for environmental restoration at LANL. Implementation of the alternatives described in Chapter 2 of the CMRR EIS would not impact restoration efforts at LANL.

DEPARTMENT OF ENERGY

National Nuclear Security Administration; Notice of Intent To Prepare an Environmental Impact Statement for the Proposed Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, NM

AGENCY: Department of Energy, National Nuclear Security Administration.

ACTION: Notice of intent.

SUMMARY: Pursuant to the National Environmental Policy Act ((NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*), and the DOE Regulations Implementing NEPA (10 CFR part 1021), the National Nuclear Security Administration (NNSA), an agency within the U.S. Department of Energy (DOE), announces its intent to prepare an environmental impact statement (EIS) to assess the consolidation and relocation of mission critical chemistry and metallurgy research (CMR) capabilities at Los Alamos National Laboratory (LANL) from degraded facilities such that these capabilities would be available on a long-term basis to successfully accomplish LANL mission support activities or programs. DOE invites individuals, organizations, and agencies to present oral or written comments concerning the scope of the EIS, including the environmental issues and alternatives that the EIS should address.

DATES: The public scoping period starts with the publication of this Notice in the **Federal Register** and will continue until August 31, 2002. DOE will consider all comments received or postmarked by that date in defining the scope of this EIS. Comments received or postmarked after that date will be considered to the extent practicable. Public scoping meetings will provide the public with an opportunity to present comments, ask questions, and discuss concerns regarding the EIS with NNSA officials. The locations, dates and times for the public scoping meetings are as follows:

August 13, 2002, from 4–8 p.m., Cities of Gold Hotel, Pojoaque, New Mexico

August 15, 2002, from 4–8 p.m., Fuller Lodge, Los Alamos, New Mexico

The DOE will publish additional notices on the dates, times, and locations of the scoping meetings in local newspapers in advance of the scheduled meetings. Any necessary changes will be announced in the local media. Any agency, state, pueblo, tribe, or units of local government that desire to be designated a cooperating agency should contact Ms. Elizabeth Withers at the address listed below by August 16, 2002.

ADDRESSES: Written comments or suggestions concerning the scope of the CMRR EIS or requests for more information on the EIS and public scoping process should be directed to: Ms. Elizabeth Withers, EIS Document Manager, U.S. Department of Energy, National Nuclear Security Administration, Office of Los Alamos Site Operations, 528 35th Street, Los Alamos, New Mexico, 87544; facsimile at (505) 667–9998; or E-mail at *ewithers@doeal.gov.* Ms. Withers may also be reached by telephone at (505) 667–8690.

In addition to providing comments at the public scoping meetings, all interested parties are invited to record their comments, ask questions concerning the EIS, or request to be placed on the EIS mailing or document distribution list by leaving a message on the EIS Hotline at (toll free) 1–877–491–4957. The Hotline will have instructions on how to record comments and requests.

FOR FURTHER INFORMATION CONTACT: For general information on NNSA NEPA process, please contact: Mr. James Mangeno (NA–3.6), NNSA NEPA Compliance Officer, U.S. Department of Energy, 1000 Independence Ave, SW., Washington, DC 20585, or telephone 202–586–8395. For general information about the DOE NEPA process, please contact: Ms. Carol Borgstrom, Director, Office of NEPA Policy and Compliance (EH–42), U.S. Department of Energy, 1000 Independence Avenue SW, Washington, DC 20585, (202) 586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION: Los Alamos National Laboratory (LANL) is located in north-central New Mexico, 60 miles north-northeast of Albuquerque, 25 miles northwest of Santa Fe, and 20 miles southwest of Española in Los Alamos and Santa Fe Counties. It is located between the Jemez Mountains to the west and the Sangre de Cristo Mountains and Rio Grande to the east. LANL occupies an area of about 27,800 acres or approximately 43 square miles and is operated for DOE NNSA by a contractor, the University of California. It is a multidisciplinary, multipurpose institution engaged in theoretical and experimental research and development. LANL has been assigned science, research and development, and production NNSA mission support activities that are critical to the accomplishment of the NNSA national security objectives (as reflected in the Stockpile Stewardship and Management Programmatic EIS (DOE/EIS–0236). Specific LANL assignments for the foreseeable future include production of War-Reserve (WR) products, assessment and certification of the stockpile, surveillance of the WR components and weapon systems, ensuring safe and secure storage of strategic materials, and management of excess plutonium inventories. In addition, LANL also supports actinide (actinides are any of a series of elements with atomic numbers ranging from actinium-89 through lawrencium-103) science missions ranging from Plutonium-238 heat-source program for the National Aeronautics and Space Administration (NASA) to arms control and technology development. LANL's main role in NNSA mission objectives includes a wide range of scientific and technological capabilities that support nuclear materials handling, processing and fabrication; stockpile management; materials and manufacturing technologies; nonproliferation programs; and waste management activities.

The capabilities needed to execute the NNSA mission activities require facilities at LANL that can be used to handle actinide and other radioactive materials in a safe and secure manner. Of primary importance are the facilities located within the CMR Building and the Plutonium Facility (located at Technical Areas (TAs) 3 and 55, respectively), which are used for processing, characterizing and storage of special nuclear material. Most of the LANL mission support functions previously listed require analytical chemistry, material characterization, and actinide research and development support capabilities and capacities that currently exist at facilities within the CMR Building and are not available elsewhere. Other unique capabilities are located at the Plutonium Facility. Work is sometimes moved between the CMR Building and the Plutonium Facility to make use of the full suite of capabilities that these two facilities provide.

Mission critical CMR capabilities at LANL support NNSA's stockpile stewardship and management strategic objectives; these capabilities are necessary to support the current and future directed stockpile work and campaign activities conducted at LANL. The CMR Building is over 50 years old and many of its systems and structural components are in need of being upgraded, refurbished, or replaced. Recent studies conducted in the late 1990s have identified a seismic fault trace located beneath the CMR Building, which greatly enhances the level of structural upgrades needed at the CMR

Building to meet current structural seismic code requirements for a Hazard Category 2 nuclear facility. Performing the needed repairs, upgrades and systems retrofitting for long-term use of the aging CMR Building to allow it to adequately house the mission critical CMR capabilities would be extremely difficult and cost prohibitive. Over the long-term, NNSA cannot continue to operate the assigned LANL mission critical CMR support capabilities in the existing CMR Building at an acceptable level of risk to public and worker health and safety without operational restrictions. These operational restrictions would preclude the full implementation of the level of operation DOE decided upon through its Record of Decision for the 1999 LANL Site-wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory (DOE/EIS–0238). CMR capabilities are necessary to support the current and directed stockpile work and campaign activities at LANL. The currently estimated end-of-life for the existing CMR Building is about 2010. The CMR Building is near the end of its useful life and action is required by NNSA to assess alternatives for continuing these activities for the next 50 years.

Currently, NNSA expects that the CMR Building Replacement Project EIS (CMRR EIS) will evaluate the environmental impacts associated with relocating the CMR capabilities at LANL to the new buildings sited at the following alternative locations: (1) Next to the Plutonium Facility at Technical Area 55 (TA–55) at LANL (the Proposed Action), or (2) a ''greenfield'' site(s) at or near TA–55. NNSA will evaluate performing minimal necessary structural and systems upgrades and repairs to portions of the existing CMR Building and continuing the use of these upgraded portions of the structure for office and light laboratory purposes, as well as evaluating the potential decontamination and demolition of the entire existing CMR Building as disposition options coupled with the alternatives for construction and operation of new nuclear laboratory facilities at the two previously identified locations. The EIS would also consider the performance of minimal necessary structural and systems upgrades and repairs to the existing CMR Building as a no-action alternative with continued maintenance of limited mission critical CMR capabilities at the CMR Building. It is possible that this list of reasonable alternatives may change during the scoping process.

The CMR Building contains about 550,000 square feet (about 51,100 square meters) of floor space on two floors divided between a main corridor and seven wings. It was constructed to 1949 Uniform Building Codes in the late 1940s and early 1950s. DOE has maintained and upgraded the building over time to provide for continued safe operations. In 1992, DOE initiated planning and implementation of CMR Building upgrades intended to address specific safety, reliability, consolidation and safeguards issues (these were the subject of DOE/EA–1101). These upgrades were intended to extend the useful life of the CMR Building an additional 20 to 30 years. However, in 1997 and 1998, a series of operational, safety and seismic issues surfaced regarding the long-term viability of the CMR Building. In the course of considering these issues, the DOE determined that the originally planned extensive upgrades to the building would be much more expensive and time-consumptive than had been identified. Furthermore, the planned upgrades would be marginally effective in providing the required operational risk reduction and program capabilities to support NNSA mission assignments at LANL. As a result, in January 1998, the DOE directed the down-scope of the CMR Building upgrade projects to only those upgrades needed to ensure safe and reliable operations through about the year 2010. CMR Building operations and capabilities are currently being restricted in scope due to safety and security constraints; it is not being operated to the full extent needed to meet the DOE NNSA operational requirements established in 1999 for the foreseeable future over the next 10 years. In addition, continued support of LANL's existing and evolving missions roles are anticipated to require additional capabilities such as the ability to handle large containment vessels in support of Dynamic Experiments.

In January 1999, the NNSA approved a strategy for managing operational risks at the CMR Building. The strategy included implementing operational restrictions to ensure safe operations. These restrictions are impacting the assigned mission support CMR activities conducted at the CMR Building. This management strategy also committed NNSA to developing long-term facility and site plans to relocate the CMR capabilities elsewhere at LANL by 2010, as necessary to maintain continuing LANL support of national security and other NNSA missions.

Purpose and Need: NNSA needs to provide the physical means for accommodating the continuation of the CMR Building's functional, mission-critical CMR capabilities beyond 2010 in a safe, secure, and environmentally sound manner at LANL. At the same time, NNSA should also take advantage of the opportunity to consolidate like activities for the purpose of operational efficiency, and it is prudent to provide extra space for future anticipated capabilities or activities requirements.

Proposed Action and Alternatives: The Proposed Action (Preferred Alternative) is to construct a new facility at TA–55 composed of two or three buildings to house the existing CMR Building capabilities. One of the new buildings would provide space for administrative offices and support activities; the other building(s) would provide secure laboratory spaces for research and analytical support activities. Construction of the laboratory building(s) at above ground level would be considered. Tunnels may be constructed to connect the buildings. At a minimum, the buildings would operate for the next 50 years. A parking lot or structure would also be constructed as part of the Proposed Action.

Reasonable alternatives to the proposed action have not been definitively identified, but could include construction of a new CMR facility at a nearby location to TA–55 within an undeveloped ''greenfield'' area. Another alternative could consider continuing use of portions of the existing CMR Building with the implementation of minimal necessary structural and systems upgrades and repairs for office and light laboratory purposes, together with the construction of new nuclear laboratory facilities at the two previously identified locations. If either of the two alternatives were chosen that would completely remove CMR activities from the existing CMR Building, options for the disposition of the existing CMR Building could include an option for continuing use of the existing CMR Building with the implementation of minimal necessary structural and systems upgrades and repairs for offices or other purposes appropriate to the condition of the structure, and an option for complete decontamination and demolition of the entire CMR Building with subsequent waste disposal. As required by the Council on Environmental Quality NEPA regulations, a No Action alternative will also be evaluated. The No Action alternative would be to continue the current use of the CMR Building for CMR operations with minimal structural and equipment component replacements and repairs so that it could continue to function,

although the CMR capabilities would likely be restricted to minimal levels.

Potential Issues for Analysis: NNSA has tentatively identified the following issues for analysis in this EIS. Additional issues may be identified as a result of the scoping process.

1. Potential human health impacts (both to members of the public and to workers) related to the proposed new facility and anticipated LANL nearby activities during normal operations and reasonably foreseeable accident conditions.

2. Potential impacts to air, water, soil, visual resources and viewsheds associated with constructing new buildings, relocating and continuing CMR operations.

3. Potential impacts to plants and animals, and to their habitats, including Federally-listed threatened or endangered species and their critical habitats, wetlands and floodplains, associated with constructing new buildings, relocating and continuing CMR operations.

4. Potential impacts from geologic site conditions and land uses associated with constructing new buildings, relocating and continuing CMR operations.

5. Potential impacts from irretrievable and irreversible consumption of natural resources and energy associated with constructing new buildings, relocating and continuing CMR operations.

6. Potential impacts to cultural resources, including historical and prehistorical resources and traditional cultural properties, from constructing new buildings, relocating and continuing CMR operations.

7. Potential impacts to infrastructure, transportation issues, waste management, and utilities associated with constructing new buildings, relocating and continuing CMR operations.

8. Potential impacts to socioeconomic conditions from constructing new buildings, relocating and continuing CMR operations.

9. Potential environmental justice impacts to minority and low-income populations as a result of constructing new buildings, relocating and continuing CMR operations.

10. Potential cumulative impacts from the Proposed Action and other past, present, and reasonably foreseeable actions at LANL.

NNSA anticipates that certain classified information will be consulted in the preparation of this CMRR EIS and used by decision-makers to decide where and how to relocate the CMR capabilities from the existing CMR Building. This EIS may contain a classified appendix. To the extent allowable, the EIS will summarize and present this information in an unclassified manner.

Related NEPA Reviews: Following is a summary of recent NEPA documents that may be considered in the preparation of this EIS and from which this EIS may be tiered, and of future EISs that may be in preparation simultaneously with the CMRR EIS. The CMRR EIS will include relevant information from each of these documents.

- The Final Stockpile Stewardship and Management Programmatic Environmental Impact Statement (SSM PEIS) (DOE/EIS–0236). The SSM PEIS addressed the facilities and missions to support the stewardship and management of the U.S. nuclear stockpile. The Record of Decision (ROD) was issued in 1996 and identified stewardship and management mission support activities assigned to LANL, in particular, the reestablishment of DOE's plutonium pit production capability.
- The Final Los Alamos National Laboratory Site-Wide Environmental Impact Statement (SWEIS) (DOE/EIS–0238). The SWEIS analyzed four levels of operations alternatives for LANL to meet its existing and potential future program assignments: The No Action Alternative, the Expanded Operations Alternative, the Reduced Operations Alternative, and the Greener Alternative. The SWEIS also provided project specific analysis for two proposed projects: The Expansion of TA–54/Area G Low Level Waste Disposal Area; and Enhancement of Plutonium Pit Manufacturing. The SWEIS Record of Decision identified the Expanded Alternative with reduced pit manufacturing capabilities as the level of operations DOE would undertake at LANL over the next ten years.
- The Draft Environmental Impact Statement for the Proposed Relocation of Technical Area 18 Capabilities and Materials at Los Alamos National Laboratory (TA–18 EIS) (DOE/EIS–0319). The TA–18 EIS considers relocating the TA–18 criticality mission activities to another location at LANL; to the Nevada Test Site near Las Vegas, Nevada; to Sandia National Laboratory at Albuquerque, New Mexico; or to the Argonne National Laboratory—West near Idaho Falls, Idaho. If retained at LANL, the TA–18 activities could be housed in new buildings constructed next to the Plutonium Facility at TA–55; could remain in the current facilities without any upgrades; or could remain in upgraded facilities at TA–18.
- The NNSA is considering initiation of the preparation of an EIS on the proposed Modern Pit Facility. As the analysis for this new facility progresses it will be incorporated, if applicable, into the CMRR EIS to the extent practicable.

Public Scoping Process: The scoping process is an opportunity for the public to assist the NNSA in determining the alternatives and issues for analysis. The purpose of the scoping meetings is to receive oral and written comments from the public. The meetings will use a format to facilitate dialogue between NNSA and the public and will be an opportunity for individuals to provide written or oral statements. NNSA welcomes specific comments or suggestions on the content of these alternatives, or on other alternatives that could be considered. The above list of issues to be considered in the EIS analysis is tentative and is intended to facilitate public comment on the scope of this EIS. It is not intended to be all-inclusive, nor does it imply any predetermination of potential impacts. The CMRR EIS will describe the potential environmental impacts of the alternatives, using available data where possible and obtaining additional data where necessary. Copies of written comments and transcripts of oral comments will be available at the following locations: Los Alamos Outreach Center, 1350 Central Avenue, Suite 101, Los Alamos, New Mexico, 87544; and the Zimmerman Library, University of New Mexico, Albuquerque, New Mexico 87131.

Issued in Washington, DC, this 15th day of July, 2002.

Linton Brooks,

Acting Administrator, National Nuclear Security Administration.

[FR Doc. 02–18552 Filed 7–22–02; 8:45 am]

BILLING CODE 6450–01–P

[FR Doc. 03–12161 Filed 5–14–03; 8:45 am]
BILLING CODE 6450–01–P

DEPARTMENT OF ENERGY

National Nuclear Security Administration

Notice of Availability of the Draft Environmental Impact Statement for the Proposed Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, NM

AGENCY: U.S. Department of Energy, National Nuclear Security Administration.

ACTION: Notice of availability and public hearings.

SUMMARY: Pursuant to the National Environmental Policy Act (NEPA) of 1969, as amended (42 U.S.C. 4321 *et seq.*), and the DOE Regulations Implementing NEPA (10 CFR part 1021), the National Nuclear Security Administration (NNSA), an agency within the U.S. Department of Energy (DOE), announces the availability of the *Draft Environmental Impact Statement for the Chemistry and Metallurgy Research Building Replacement Project at Los Alamos National Laboratory, Los Alamos, New Mexico* (the Draft CMRR EIS), and the dates and locations for the public hearings to receive comments on the Draft CMRR EIS. The present Chemistry and Metallurgy Research (CMR) Building at Los Alamos National Laboratory (LANL) houses mission critical analytical chemistry, material characterization and actinide (actinides are any of a series of elements with atomic numbers ranging from actinium-89 through lawrencium-103) research and development capabilities. The Draft CMRR EIS considers the potential environmental impacts that could result due to the consolidation and relocation of these CMR capabilities from the existing aged CMR Building to a new facility such that these capabilities would be available on a long-term basis to successfully accomplish LANL mission support activities or programs. The Draft CMRR EIS also considers the no-action alternative of maintaining the CMR capabilities at the CMR Building.

DATES: The NNSA invites members of Congress, American Indian Tribal Governments, state and local governments, other Federal agencies, and the general public to provide comments on the Draft CMRR EIS. The comment period runs through June 30, 2003; the NNSA will consider all comments received or postmarked by that date. Comments postmarked after June 30, 2003, will be considered to the extent practicable. As part of the public comment period for the Draft CMRR EIS, pubic hearings will be held on June 3rd and 4th, 2003, to provide the public and stakeholders with an opportunity to present comments on the draft document, ask questions, and discuss concerns with DOE and NNSA officials regarding the Draft CMRR EIS. The dates, times, and locations for these public hearings are as follows:

June 3, 2003, 6:30 p.m.–9 p.m., Fuller Lodge, 2132 Central Avenue, Los Alamos, NM.

June 4, 2003, 6:30 p.m.–9 p.m., Cities of Gold Hotel, Highway 84/285, Pojoaque, NM.

ADDRESSES: A copy of the Draft CMRR EIS or its Summary may be obtained upon request by writing to: U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Site Office, Attn: Ms. Elizabeth Withers, Office of Facility Operations, 528 35th Street, Los Alamos, New Mexico, 87544; by facsimile ((505) 667–9998); or by E-mail (CMRR *EIS@doeal.gov*). Please mark all envelopes, faxes and e-mail: ''Draft CMRR EIS Comments''. Copies of the Draft CMRR EIS are also available for review at: the Los Alamos Outreach Center, 1619 Central Avenue, Los Alamos, New Mexico, 87544; and the Zimmerman Library, University of New Mexico, Albuquerque, New Mexico 87131.

Specific information regarding the public hearings can also be obtained by the means described above. Comments concerning the Draft CMRR EIS can be submitted by the means described above or by leaving a message on the EIS Hotline at (toll free) 1–877–491–4957. The Hotline will have instructions on how to record comments.

FOR FURTHER INFORMATION CONTACT: For general information on NNSA NEPA process, please contact: Mr. James Mangeno (NA–3.6), NEPA Compliance Officer for the National Nuclear Security Administration, U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585, (202) 586–8395. For general information about the DOE NEPA process, please contact: Ms. Carol Borgstrom, Director, Office of NEPA Policy and Compliance (EH–42), U.S. Department of Energy, 1000 Independence Avenue SW., Washington, DC 20585, (202) 586–4600, or leave a message at 1–800–472–2756.

SUPPLEMENTARY INFORMATION: Mission critical CMR capabilities at LANL support NNSA's stockpile stewardship and management strategic objectives. CMR's analytical chemistry, materials characterization, and actinide research and development capabilities are necessary to support the current and future directed stockpile work and campaign activities conducted at LANL. The CMR Building is over 50 years old and approaching end of life. Studies conducted in the late 1990s identified a seismic fault trace located beneath the CMR Building, which greatly increases the level of structural upgrades needed for the building to meet current structural seismic code requirements for a Hazard Category 2 nuclear facility. The CMR Building has been upgraded such that operations can continue, on a restricted basis, in support of national security missions. The CMR Upgrades project was designed to extend the life of the CMR Building through approximately 2010. It would be cost prohibitive to perform the needed repairs, upgrades, and systems retrofitting for long-term (beyond 2010), unrestricted use of the CMR Building.

NNSA cannot perform the assigned LANL mission critical CMR capabilities in the existing CMR Building at an acceptable level of risk to public and worker health and safety without operational restrictions. These operational restrictions preclude the full implementation of the level of operation DOE decided upon through its Record of Decision for the 1999 LANL Site-wide Environmental Impact Statement for the Continued Operation of Los Alamos National Laboratory (DOE/EIS–0238). CMR capabilities are necessary to support the current and directed stockpile work and campaign activities at LANL. By 2010, operations will have been conducted in the existing CMR Building for 60 years; this is the estimated operational life span for nuclear operations at the existing CMR Building. Given that the CMR Building is near the end of its useful life, action is now required by NNSA to assess alternatives for continuing these activities for the succeeding 50 years.

The CMRR EIS evaluates the environmental impacts associated with relocating the CMR capabilities at LANL to new buildings sited at the following alternative locations: (1) Next to the Plutonium Facility at Technical Area 55 (TA–55) at LANL (the Proposed Action), and (2) a ''greenfield'' site near TA–55 within TA–6. The NNSA also evaluated performing minimal necessary structural and systems upgrades and repairs to portions of the existing CMR Building and continuing the use of these upgraded portions of the structure for administrative offices and support function purposes, as well as evaluating the potential decontamination and

demolition of the entire existing CMR Building as disposition options coupled with the alternatives for construction and operation of new nuclear laboratory facilities at the two previously identified locations. The EIS considers the performance of minimal necessary structural and systems upgrades and repairs to the existing CMR Building as a no-action alternative with continued maintenance of limited mission critical CMR capabilities at the CMR Building. NNSA expects to complete the Final CMRR EIS by November 2003. A Record of Decision would be completed no sooner than 30 days after the Final CMRR EIS is issued.

Signed in Washington, DC this 28th day of April, 2003.

Everet H. Beckner,

Deputy Administrator for Defense Programs, National Nuclear Security Administration.

[FR Doc. 03–12164 Filed 5–14–03; 8:45 am]

BILLING CODE 6450–01–P

FEDERAL COMMUNICATIONS COMMISSION

Notice of Public Information Collection(s) Being Reviewed by the Federal Communications Commission

May 7, 2003.

SUMMARY: The Federal Communications Commission, as part of its continuing effort to reduce paperwork burden invites the general public and other Federal agencies to take this opportunity to comment on the following information collection(s), as required by the Paperwork Reduction Act of 1995, Public Law 104–13. An agency may not conduct or sponsor a collection of information unless it displays a current valid control number. No person shall be subject to any penalty for failing to comply with a collection of information subject to the Paperwork Reduction Act (PRA) that does not display a valid control number. Comments are requested concerning (a) Whether the proposed collection of information is necessary for the proper performance of the functions of the Commission, including whether the information shall have practical utility; (b) the accuracy of the Commission's burden estimate; (c) ways to enhance the quality, utility, and clarity of the information collected; and (d) ways to minimize the burden of the collection of information on the respondents, including the use of automated collection techniques or other forms of information technology.

DATES: Written comments should be submitted on or before July 14, 2003. If you anticipate that you will be submitting comments, but find it difficult to do so within the period of time allowed by this notice, you should advise the contact listed below as soon as possible.

ADDRESSES: Direct all comments to Les Smith, Federal Communications Commission, Room 1–A804, 445 12th Street, SW., Washington, DC 20554, or via the Internet to *Leslie.Smith@fcc.gov*.

FOR FURTHER INFORMATION CONTACT: For additional information or copies of the information collection(s) contact Les Smith at 202–418–0217 or via the Internet at *Leslie.Smith@fcc.gov.*

SUPPLEMENTARY INFORMATION:

OMB Control Number: 3060–0249.

Title: Section 74.781, Station Records.

Form Number: N/A.

Type of Review: Extension of a currently approved collection.

Respondents: Business and other for-profit entities; not-for-profit institutions; State, Federal or Tribal Governments.

Number of Respondents: 7,400.

Estimated Time per Response: 0.75 hours.

Frequency of Response: Recordkeeping; annual reporting requirement.

Total Annual Burden: 5,735 hours.

Total Annual Costs: $666,000.

Needs and Uses: 47 CFR Section 74.781 requires licensees of low power television, TV translator and TV booster stations to maintain adequate records. FCC staff in field inspections used the records to ensure that reasonable measures are taken to maintain proper station operations and to ensure compliance with the Commission's rules.

Federal Communications Commission.

William F. Caton,

Deputy Secretary.

[FR Doc. 03–12058 Filed 5–14–03; 8:45 am]

BILLING CODE 6712–01–P

FEDERAL RESERVE SYSTEM

Change in Bank Control Notices; Acquisition of Shares of Bank or Bank Holding Companies

The notificants listed below have applied under the Change in Bank Control Act (12 U.S.C. 1817(j)) and § 225.41 of the Board's Regulation Y (12 CFR 225.41) to acquire a bank or bank holding company. The factors that are considered in acting on the notices are set forth in paragraph 7 of the Act (12 U.S.C. 1817(j)(7)).

The notices are available for immediate inspection at the Federal Reserve Bank indicated. The notices also will be available for inspection at the office of the Board of Governors. Interested persons may express their views in writing to the Reserve Bank indicated for that notice or to the offices of the Board of Governors. Comments must be received not later than May 29, 2003.

A. Federal Reserve Bank of San Francisco (Maria Villanueva, Consumer Regulation Group) 101 Market Street, San Francisco, California 94105-1579:

1. James Patrick Koehler, Aberdeen, South Dakota; to acquire additional voting shares of Valley Bancorp, Henderson, Nevada, and thereby indirectly acquire additional voting shares of Valley Bank, Henderson, Nevada.

Board of Governors of the Federal Reserve System, May 9, 2003.

Robert deV. Frierson,

Deputy Secretary of the Board.

[FR Doc. 03–12056 Filed 5–14–03; 8:45 am]

BILLING CODE 6210–01–S

FEDERAL RESERVE SYSTEM

Formations of, Acquisitions by, and Mergers of Bank Holding Companies; Correction

This notice corrects a notice (FR Doc. 03-11424) published on pages 24742 and 24743 of the issue for Thursday, May 8, 2003.

Under the Federal Reserve Bank of Boston heading, the entry for Citizens Financial Group, Inc., Providence Rhode Island, is revised to read as follows:

A. Federal Reserve Bank of Boston (Richard Walker, Community Affairs Officer) 600 Atlantic Avenue, Boston, Massachusetts 02106-2204:

1. Citizens Financial Group, Inc., Providence, Rhode Island; Royal Bank of Scotland, PLC, Theedinburgh; Royal Bank of Scotland Group PLC, Theedinburgh; and RBSG International Holdings Limited, Edinburgh, all in Scotland; to acquire 100 percent of the voting shares of Port Financial Corp., Brighton, Massachusetts, and its subsidiary, Cambridgeport Bank, Cambridge, Massachusetts, and to acquire up to 9.9 percent of the voting shares of Cambridge Bancorp, Cambridge, Massachusetts, and thereby indirectly acquire voting shares of Cambridge Trust Company, Cambridge, Massachusetts.

Comments on this application must be received by June 2, 2003.

NEPA DISCLOSURE STATEMENT FOR PREPARATION OF AN EIS FOR THE CHEMISTRY AND METALLURGY RESEARCH BUILDING REPLACEMENT PROJECT AT LOS ALAMOS NATIONAL LABORATORY

CEQ regulations at 40 CFR 1506.5(c), which have been adopted by DOE (10 CFR 1021), require contractors who will prepare an EIS to execute a disclosure specifying that they have no financial or other interest in the outcome of the project. The term "financial interest or other interest in the outcome of the project," for the purposes of this disclosure, is defined in the March 23, 1981 guidance "Forty Most Asked Questions Concerning CEQ's National Environmental Policy Act Regulations," 46 FR 18026-18038 at Question 17a and b.

"Financial or other interest in the outcome of the project 'includes' any financial benefit such as a promise of future construction or design work in the project, as well as indirect benefits the contractor is aware of (e.g., if the project would aid proposals sponsored by the firm's other clients)." 46 FR 18026-18038 at 18031.

In accordance with these requirements, the offeror and any proposed subcontractors hereby certify as follows: (check either (a) or (b) to assure consideration of your proposal)

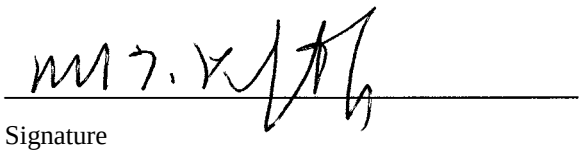
(a) ___X___ Offeror and any proposed subcontractor have no financial interest in the outcome of the project.

(b) _____ Offeror and any proposed subcontractor have the following financial or other interest in the outcome of the project and hereby agree to divest themselves of such interest prior to award of this contract.

Financial or Other Interests:

1.
2.
3.

Certified by:



Signature

Richard T. Profant
Name

Corporate Vice President
Energy Solutions Group

August 2003
Date

Science Applications International Corporation