DOE/EA-1954

U.S. Department of Energy
Idaho Operations Office

Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials

Final

February 2014

Idaho National Laboratory

Department of Energy
Idaho Operations Office
1955 Fremont Avenue
Idaho Falls, ID 83415

February 27, 2014

Dear Citizen:

The U.S. Department of Energy (DOE) has completed the Final Environmental Assessment (EA) for the Resumption of Transient Testing of Nuclear Fuels and Materials and determined that a Finding of No Significant Impact (FONSI) is appropriate for the proposed action. The draft EA was made available for a 59-day public review and comment period on November 12, 2013. DOE considered all comments received before finalizing the EA and making the FONSI determination. A Comment Response section is included as Appendix A in the final EA.

The FONSI and final EA can be accessed on the DOE website at www.id.doe.gov. Thank you for your interest in this important endeavor.

Sincerely,

Richard B. Provencher
Manager

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U.S. DEPARTMENT OF ENERGY
FINDING OF NO SIGNIFICANT IMPACT FOR THE ENVIRONMENTAL ASSESSMENT FOR THE RESUMPTION OF TRANSIENT TESTING OF NUCLEAR FUELS AND MATERIALS

Agency: U.S. Department of Energy (DOE)

Action: Finding of No Significant Impact (FONSI)

Summary: The DOE has determined there is a mission need to develop and test nuclear fuels in order to improve nuclear reactor sustainability and performance, to reduce the potential for proliferation of nuclear materials, and to advance the nuclear fuel cycle. To meet these needs, DOE proposes to re-establish U.S. transient testing research and development capability. DOE believes resuming this capability will aid in the development of new, advanced, safer, and more efficient fuels that will generate additional quantities of clean, reliable, economical electricity using nuclear power reactors. The transient testing capability will be needed for at least 40-years. The U.S. has not conducted significant transient testing on nuclear fuels in over a decade. Transient testing involves placing nuclear fuel or material samples into the core of a nuclear test reactor and subjecting it to short bursts of intense, high-power radiation. DOE prepared an environmental assessment (EA) to evaluate the potential environmental impacts of the proposed action to resume transient testing.

DOE developed a set of selection criteria, based on research and development experimental objectives, to help identify a reasonable set of alternatives to resume full-scale transient testing. DOE reviewed and analyzed two reasonable alternatives, plus a third "No Action" alternative. Several additional alternatives were considered but not analyzed because they did not meet the purpose and need criteria.

Alternative 1: DOE's preferred alternative – Restart the Transient Reactor Test Facility (TREAT) Reactor at the Idaho National Laboratory (INL).

Alternative 2: Modify the Annular Core Research Reactor (ACRR) at Sandia National Laboratories in New Mexico (SNL/NM).

Alternative 3: DOE considered a "No Action" alternative that establishes a baseline against which the environmental assessment compared the other analyzed alternatives. No action does not necessarily mean doing nothing, but rather involves maintaining or continuing the existing status or condition. As analyzed in the EA, no action means: (1) not restarting the TREAT Reactor and (2) not modifying the ACRR to expand its' capability for transient testing. Under this alternative, certain aspects of transient testing would still be pursued at facilities that have very limited operational capabilities. Specifically, transient testing at these facilities would be limited to conducting static tests of un-irradiated fuel. This alternative does not meet the mission need.

Analysis: Based on the analyses inthe EA, the preferred alternative will not significantly affect the human environment within the meaning of the National Environmental Policy Act (NEPA).

The term "significantly" and the significance criteria are defined by Council on Environmental Quality Regulations for implementing NEPA at 40 CFR 1508.27. The significance criteria relevant to Alternative 1 are addressed and the applicable corresponding analyses in the EA are referenced below.

1.) Beneficial and adverse impacts (40 CFR 1508.27 (b) (1)]: Transient tests are of extremely short duration. Radioactive air emissions are gases and their decay products that result from the activation of naturally occurring elements in cooling air and impurities in fuel cladding material. The concentrations of radioactive emissions from normal operations and accidents were calculated by modeling, and the impacts are predicted to be negligible. Potential impacts to soil, groundwater, biological and cultural resources, sustainability, waste generation, transportation, and non-radiologic air emissions were fully analyzed. The analyses demonstrated that there will be no adverse impacts from implementing the preferred alternative. (section 4)

2.) Public health and safety [40 CFR 1508.27 (b) (2)]: Potential impacts to public and worker health and safety from normal operations and accident scenarios were analyzed. The results convey that the potential radiation doses and latent cancer fatalities are well below established standards. DOE will implement engineered and administrative controls to further ensure safety and to minimize the potential for environmental consequences from TREAT operations. The TREAT Reactor is based on an inherently safe design that minimizes the potential for and impacts of reactor accidents. Design features will be augmented by operational requirements and administrative controls during reactor operations to ensure operating parameters are not exceeded during testing operations. (section 4)

3.) Unique characteristics of the geographical area [40 CFR 1508.27 (b) (3)]: The Eastern Snake River Plain Aquifer underlies the TREAT facility location at the INL. The potential for impacts to the aquifer from the proposed action during normal operations is not-credible. In the unlikely event of an accident with releases, any contaminated soil areas will be secured, remediated and mitigated. The INL is comprised of areas of pristine and protected sagebrush steppe ecosystem that provides significant habitat for large numbers of native vegetation and wildlife species, and the INL encompasses significant historic and cultural resources. Implementing the preferred alternative will not result in any direct impacts to these areas, species or resources. (section 3/section 4)

4.) Degree to which effects on the quality of the human environment are likely to become highly controversial [40 CFR 1508.27 (b) (4)]: DOE used state-of-the-art scientific methods, technology, and qualified experts to assure the accuracy and quality of the impacts analyses and to provide confidence in the results of this assessment. There are no substantive technical or scientific issues related to the preferred alternative that are not understood, quantified and validated. Since the impacts to the quality of the human environment were determined to be negligible, DOE has made a Finding of No Significant Impact. Comments received from the public challenging DOE's analysis have been substantively resolved. All comments and responses are documented in Appendix A of the Environmental Assessment.

5.) Uncertain or unknown risks on the human environment [40 CFR 1508.27 (b) (5)]: The risks associated with the preferred alternative are well-defined. The TREAT facility has an extensive history of safe operations, demonstrating limited uncertainty in relation to implementing the preferred alternative. Nonetheless, all resource areas were screened and carefully analyzed before critical areas were identified for detailed analysis in the EA. All analyses used accepted methodologies and input values and were based on conservative assumptions to ensure the results adequately bounded the potential impacts to human health and the environment.

6.) Precedent for future actions [40 CFR 1508.27 (b) (6)]: The preferred alternative does not set a precedent for future actions with significant effects nor does it represent a decision in principle about a future consideration on the INL. The proposed action was developed to meet existing mission needs. No connected or future actions or operations are being considered that rely on decisions made in this EA or the implementation of the preferred alternative. All proposed new actions undergo appropriate NEPA analysis.

7.) Cumulatively significant impacts [40 CFR 1508.27 (b) (7)]: The calculated impacts to the critical resource areas from implementing the preferred alternative were individually insignificant. The additive impacts from implementing the preferred alternative to those manifested from past, ongoing or reasonably foreseeable future projects or programs on and adjacent to the INL were evaluated and also determined to be insignificant. (section 4.1.6)

8.) Effect on cultural or historic resources [40 CFR 1508.27 (b) (8)]: The area of potential ground disturbance is very small for the preferred alternative. Field surveys demonstrated that no archaeological resources are located in the area of potential effect, so implementation poses no direct threat to any cultural resource. The TREAT Reactor Building and original Reactor Control Building are potentially eligible for listing on the National Register of Historic Places. The proposed adaptation, re-use and continued use of these historic properties are consistent with original missions related to nuclear reactor testing and are considered to be positive. (section 4.1)

9.) Effect on threatened or endangered species or critical habitat [40 CFR 1508.27 (b) (9)]: No threatened or endangered species exist on the INL. Therefore no critical habitat is impacted by the implementation of the preferred alternative. The sage-grouse is considered to be a candidate for listing by the U.S. Fish and Wildlife Service. Impacts to sage-grouse are not anticipated because of the limited amount of disturbance planned, the lack of suitable habitat in the potentially impacted area, and the long distance from TREAT to the nearest active lek (breeding area). (section 4.1)

10.) Violation of Federal, State or local law [40 CFR 1508.27 (b) (10)]: DOE is confident that implementation of the preferred alternative does not pose any potential for a violation of any law. The DOE regulatory compliance history at the INL site demonstrates a progressive and comprehensive compliance posture and the results of regulatory oversight activities affirms the existence of a strong environmental, safety and health culture. (section 5)

Determination: Based upon the analysis presented in the attached EA, I have determined that the preferred alternative would not significantly affect the quality of the human environment. Therefore preparation of an environmental impact statement is not required.

Issued at Idaho Falls, Idaho on this 26th day of February, 2014

Richard B. Provencher
Manager

Copies of the EA and FONSI are available from: Tim Jackson, Office of Communications, MS-1203, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208 526-8484.

For further information on the NEPA process contact: Jack Depperschmidt, NEPA Compliance Officer, MS-1216, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208 526-5053. For further information on the Resumption of Transient Testing , contact Julie Conner, Federal Project Director, MS-1170, Idaho Operations Office, U.S. Department of Energy, 1955 Fremont Avenue, Idaho Falls, ID 83415, or by calling 208 526-9503.

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ACRONYMS

ACRR	Annular Core Research Reactor
APE	area of potential effects
ATR	Advanced Test Reactor
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
DOE-ID	U.S. Department of Energy – Idaho Operations Office
DOT	U.S. Department of Transportation
EA	environmental assessment
ED	effective dose
EPA	U.S. Environmental Protection Agency
F/CS	filtration/cooling system
GHG	greenhouse gas
GTCC	greater-than-class C
HEPA	High Efficiency Particulate Air
HFEF	Hot Fuel Examination Facility
INL	Idaho National Laboratory
INTEC	Idaho Nuclear Technology and Engineering Center
KAFB	Kirtland Air Force Base
LCF	latent cancer fatality
LLW	low-level waste
MFC	Materials and Fuels Complex
MLLW	mixed low-level waste
NE	Nuclear Energy (DOE Office)
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NRC	U.S. Nuclear Regulatory Commission
NRHP	National Register of Historic Places
REM	roentgen equivalent man
R&D	Research and Development
SNL/NM	Sandia National Laboratories - New Mexico
SOX	Stand-Off Experimental Range
TA	Technical Area
TREAT	Transient (TR) Reactor (REA) Test (T) Facility

HELPFUL INFORMATION FOR THE READER

Scientific Notation

Scientific notation is used to express numbers that are very small or very large. A very small number will be expressed with a negative exponent, such as 1.3×10^{-6}. To convert this number to the more commonly used decimal notation, the decimal point must be moved left by the number of places equal to the exponent, in this case 6. The number thus becomes 0.0000013. For large number, those with a positive exponent, the decimal point is moved to the right by the number of places equal to the exponent. The number 1,300,000 can be written as 1.3×10^{6}.

Units

English units are used in this document with conversion to metric units given below. Occasionally, metric units are used if metric is the common usage (i.e., when discussing waste volumes or when commonly used in formulas or equations).

cal/g	calories per gram	J/g	joule per gram	mrem	millirem
cfm	cubic feet per minute	km	kilometers	MT	metric ton
cm	centimeters	kW	kilowatt	rem	roentgen-equivalent–man
ft	foot (feet)	m	meter	pCi/g	picocurie per gram
GSF	gross square ft	mi	mile	T	ton(s)
in.	inch	mi^2	square mi	yr	year

Conversions

English to Metric			Metric to English		
To Convert	Multiply By	To Obtain	To Convert	Multiply By	To Obtain
acres	4.047×10^{-1}	hectares	hectares	2.471	acres
ft/sec	3.048×10^{1}	cm/sec	cm/sec	3.281×10^{-2}	ft/sec
ft	3.048×10^{-1}	m	m	3.28084	feet
gallons	3.785	liters	liters	2.641×10^{-1}	gallons
mi	1.609334	km	km	6.214×10^{-1}	mi
square mi	2.590	square km	square km	3.861×10^{-1}	square mi
T	9.08×10^{-1}	MT	MT	1.1013	T
yards	9.144×10^{-1}	m	m	1.093613	yards

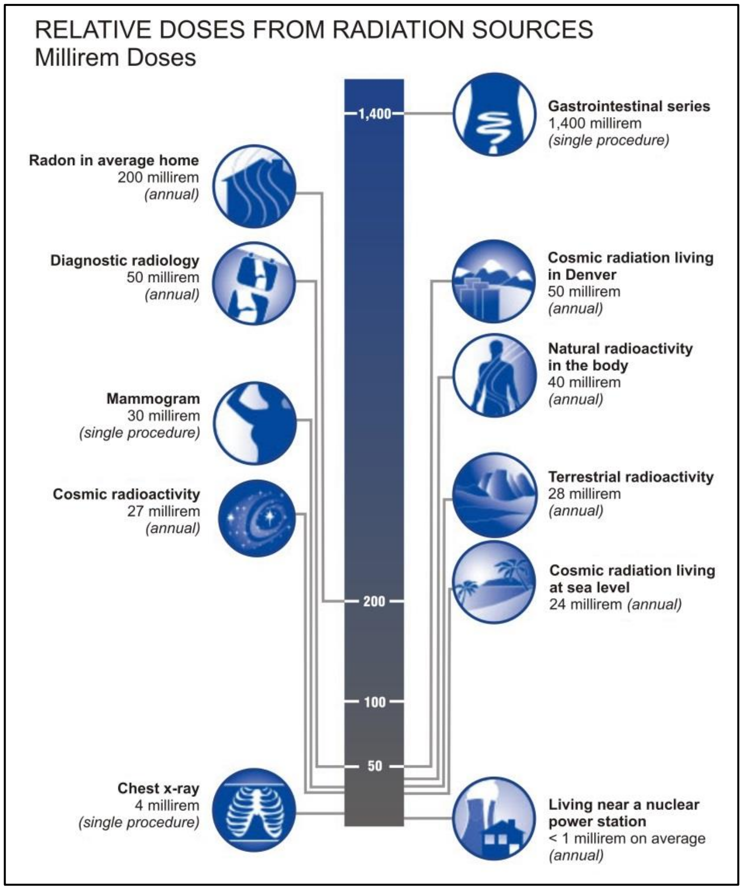
Understanding Small and Large Numbers

Number	Power	Name
1,000,000,000,000,000	$= 10^{15}$	quadrillion
1,000,000,000,000	$= 10^{12}$	trillion
1,000,000,000	$= 10^{9}$	billion
1,000,000	$= 10^{6}$	million
1,000	$= 10^{3}$	thousand
10	$= 10^{1}$	ten
0.1	$= 10^{-1}$	tenth
0.01	$= 10^{-2}$	hundredth
0.001	$= 10^{-3}$	thousandth
0.000 001	$= 10^{-6}$	millionth
0.000 000 001	$= 10^{-9}$	billionth
0.000 000 000 001	$= 10^{-12}$	trillionth
0.000 000 000 000 001	$= 10^{-15}$	quadrillionth

Understanding Dose (Millirem Doses) and Latent Cancer Fatality

Relative Doses[1]

A dose is the amount of radiation energy absorbed by the body. The United States unit of measurement for radiation dose is the *rem* (Roentgen Equivalent Man) (see Glossary). In the U.S., doses are most commonly reported in millirem (mrem). A millirem is one thousandth of a rem (1000 mrem = 1 rem). The **inset diagram** compares radiation doses from common radiation sources, both natural and man-made. Use this information to help understand and compare dose information described in this document.



Latent Cancer Fatality calculations

The consequence of a dose to an individual is expressed as the probability that the individual would incur fatal cancer from the exposure. Based on a dose-to-risk conversion factor of 0.0006 latent cancer fatality (LCF) per *person-rem* (see Glossary), an exposed worker receiving a dose of 1 rem would have an estimated lifetime probability of radiation-induced fatal cancer of 0.0006 or 1 chance in 1,700. Equivalently, out of a population of 1,700 exposed persons, one individual would be expected to get cancer.

[1] From http://www.epa.gov/radiation/understand/perspective.html

GLOSSARY

Area of potential effects (APE): The geographic area (or areas) within which a federal undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist.

Attainment area: An area considered to have air quality as good as or better than the National Ambient Air Quality Standards as defined in the Clean Air Act. An area may be an attainment area for one pollutant and a nonattainment area for others.

Burnup: For the purposes of this document, burnup is the fraction of nuclear fuel that was consumed during nuclear reactor operations.

Cladding: The outer layer of a nuclear fuel rod, which is located between the coolant or test environment and nuclear fuel. Cladding prevents radioactive elements from escaping the fuel into the coolant or test environment and contaminating it.

Clean Air Act: The Federal Clean Air Act is the basis for the national air pollution control effort. Basic elements of the act include National Ambient Air Quality Standards for major air pollutants, hazardous air pollutants, state attainment plans, motor vehicle emission standards, stationary source emission standards and permits, acid rain control measures, stratospheric ozone protection, and enforcement provisions.

Cultural resource: A broad term for buildings, structures, sites, districts, or objects of significance in American history, architecture, archaeology, engineering, or culture which are identifiable through field inventory, historical documentation, or oral evidence. Cultural resources may be, but are not necessarily, eligible for nomination to the National Register of Historic Places (NRHP) (see entry for *historic property*).

Decay Heat: For the purposes of this document, decay heat is the heat generated by a nuclear reactor following shut down.

Dose consequences: The dose is the consequence of a person being exposed to ionizing radiation. The increased chance of a person getting a cancer as a result of being exposed to the dose is a risk-based consequence. If the dose is high enough, there is a chance the dose will result in a latent cancer fatality. Collectively, dose, chance of getting a cancer, and risk of a latent cancer fatality occurrence is the dose consequence.

Effective dose (ED): The sum of the products of the dose equivalent received by specified tissues of the body and a tissue-specific weighting factor. This sum is a risk-equivalent value and can be used to estimate the health-effects risk of the exposed individual. The tissue-specific weighting factor represents the fraction of the total health risk resulting from uniform whole-body irradiation that would be contributed by that particular tissue.

The effective dose, or ED, includes the committed ED from internal radionuclides deposition and the doses from penetrating radiation sources external to the body. The ED is expressed in units of rem. The U.S. Environmental Protection Agency (EPA) regulations in 40 Code of Federal Regulations (CFR) Part 61, Subpart H specify that estimates of radiological dose to a member of the public be reported in terms of EDE or total ED equivalent, consistent with an older methodology described in International Commission on Radiological Protection (ICRP) Publication 26 (ICRP 1977) and ICRP Publication 30 (ICRP 1979–1988).

Fuel pin/fuel rod: Individual units of coated or clad nuclear fuel.

Historic property: Any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in, the NRHP.

Hodoscope: An instrument used to detect forms of radiation emitted from experiments during a transient experiment. This data is used to monitor the location of nuclear fuel as a function of time during the experiment duration.

Hot cell: Shielded containment chambers that are used to protect workers from radiation by providing a safe containment area in which workers can control and manipulate the equipment required.

Intensive archaeological survey: A field investigation completed to identify cultural resources in areas that have not been previously examined for cultural resources. Spacing between surveyors does not exceed 22 m during pedestrian walkovers.

Latent cancer fatality: The value reported as an LCF is the risk that a death will result from a dose sustained. (See Helpful Information for the Reader).

Light water reactor: A type of nuclear reactor that uses normal water as a coolant and as shielding. A light water reactor is the most common type of reactor used to generate electricity.

National Ambient Air Quality Standards: Standards established by the EPA under authority of the Clean Air Act that apply to outdoor air throughout the country. Primary standards are designed to protect human health with an adequate margin of safety, including sensitive populations (such as children, the elderly, and individuals suffering from respiratory disease). Secondary standards are designed to protect public welfare from any known or anticipated adverse effects of a pollutant.

National Emissions Standards for Hazardous Air Pollutants: The Clean Air Act requires the EPA to regulate airborne emissions of hazardous air pollutants (including radionuclides) from a specific list of industrial sources called "source categories." Each "source category" that emits radionuclides in significant quantities must meet technology requirements to control them and is required to meet specific regulatory limits.

Neutron: A subatomic particle that has no net electrical charge and mass slightly greater than a proton.

Nonattainment area: The Clean Air Act and its amendments in 1990 define a nonattainment area as a locality where air pollution levels persistently exceed National Ambient Air Quality Standards or that contribute to ambient air quality in a nearby area that fails to meet those standards. The EPA gives nonattainment areas a classification based on the severity of the violation and the type of air quality standard they exceed. EPA designations of nonattainment areas are only based on violations of national air quality standards for carbon monoxide, lead, ozone (1-hr), particulate matter (PM-10), and sulfur dioxide.

Nuclear fuel: Coated or clad nuclear material designed and fabricated to be used to power nuclear systems.

Nuclear Fuel Cycle: The full lifecycle of the materials and technologies used in the generation of nuclear energy ranging from mining and enrichment, utilization in nuclear reactors, and eventual disposition (which may consist of the permanent storage "open" fuel cycle and/or of the recycling of spent nuclear fuel "closed" fuel cycle).

Nuclear proliferation: The spread of nuclear weapons, fissionable material, and weapons-applicable nuclear technology and information to those who intend harm.

Person-rem: A person-rem is a collective radiation dose applied to populations or groups of individuals. It is the product of the average dose per person (expressed in rem) times the number of people exposed or the population affected.

Prevention of significant deterioration: This term applies to new major sources, or major modifications at existing sources, for air pollutants where the area at which the sources are located is in attainment or unclassifiable with the National Ambient Air Quality Standards. If significant impact levels (as defined in the regulation) are exceeded at any public receptor, a detailed air quality impact analysis is required to determine if controls are necessary to maintain air quality.

Receptors or receptor locations:

> *Member of the public (public receptor location or hypothetical member of the public)*: Location where a member of the public could be when the activity is taking place. "Public receptor locations" correspond to the location of either an actual or hypothetical person. These receptor locations are used because they correspond to those where the highest dose to a member of the public could occur.
>
> *Facility worker:* Person working inside a facility when the activity is taking place. These workers could be protected by technical safety requirements, administrative procedures, and personal protective equipment that would minimize their dose in event of an accident occurring inside a facility. However, doses provided here do not credit these protective measures.
>
> *Collocated worker:* Hypothetical person working outside of the facility where the activity is occurring. These workers are less likely to be protected by technical safety requirements, administrative procedures or personal protective equipment when an accident occurs. The doses provided for collocated workers do not credit any protective measures that could be put in place.
>
> *Crew member*: The driver and passenger of a transportation vehicle.
>
> *Inspector*: A collocated worker that is involved in the preparation of the shipment and who accompanies a shipment during transport.

Reconnaissance archaeological survey: A field investigation completed to identify cultural resources in areas that were originally surveyed for cultural resources more than 10 years ago. Pedestrian walkovers are focused in known areas of high archaeological sensitivity, where ground surfaces have changed appreciably (e.g., burned areas), and in the vicinity of previously recorded cultural resources.

REM: The United States unit of measurement, roentgen equivalent man (REM), is the unit used to express *effective dose (ED)* (see Glossary). It provides a measure of the biologic effects of ionizing radiation. A millirem (mrem) is one thousandth of a rem (0.001 rem), often used to express dosages commonly encountered from medical imaging (X-rays) or natural background sources.

Transient testing: Involves placing the nuclear fuel or material into the core of a specially-designed nuclear reactor and subjecting it to short bursts of intense, high-power radiation. After the experiment is completed, the fuel or material is analyzed to determine the effects of the radiation.

Transient Reactor Test Facility (TREAT): This document will use TREAT to describe the fenced area containing the TREAT Reactor Building and support facilities excluding the TREAT Reactor Control Building.

TREAT Reactor: The nuclear test reactor and reactor support systems inside the TREAT Reactor Building.

TREAT Reactor Building: The building containing the TREAT Reactor and support systems.

TREAT Reactor Control Building: The building housing the TREAT Reactor Control Room. This building is located approximately 0.45 miles southeast of TREAT.

Vadose zone: A subsurface zone of soil or rock containing fluid under pressure that is less than that of the atmosphere. Pore spaces in the vadose zone are partly filled with water and partly filled with air. The vadose zone is limited by the land surface above and by the water table below.

FINAL ENVIRONMENTAL ASSESSMENT FOR THE RESUMPTION OF TRANSIENT TESTING OF NUCLEAR FUELS AND MATERIALS

1 INTRODUCTION

1.1 Purpose and Need for Agency Action

The U.S. Department of Energy (DOE) has determined there is a mission need to develop and test nuclear fuels (see Glossary) to improve nuclear reactor sustainability and performance, to reduce the potential for proliferation of nuclear materials, and to advance the nuclear fuel cycle (DOE 2010). To meet these needs, DOE proposes to re-establish U.S. transient testing (see Glossary) research and development (R&D) capability. DOE believes this capability will aid in the development of new, advanced, safer, and more efficient fuels that will generate additional quantities of clean, reliable, economical electricity using nuclear power reactors. Transient testing capability will be needed for at least 40-years for all nuclear fuel types, including fuels for light water reactors, high-temperature gas reactors, and fast reactors such as liquid metal reactors. Additional details regarding specific transient testing needs and limitations of existing transient testing capabilities are provided in the Mission Need Statement for the Resumption of Transient Fuel Testing (DOE 2010) and the Alternatives Analysis for the Resumption of Transient Testing Program (DOE 2013b).

1.2 Background

Transient testing has been a core component of all nuclear fuels science, development and qualification efforts since the 1950s. Transient testing data obtained from testing in reactors including TREAT, ACRR, and other decommissioned transient test reactors is still used today for the current generation of fuels used in commercial power reactors. The information supports the design and operations of commercial power reactors and is also used to regulate the industry. Introduction of new fuel designs with improved performance, economics, and enhanced safety features requires the resumption of this type of testing.

The primary mission of the DOE Office of Nuclear Energy (NE) is to advance nuclear power as a resource capable of meeting the nation’s energy supply, environmental, and national security needs by resolving technical, cost, safety, and security barriers through research, development, and demonstration as appropriate. NE’s R&D activities help address mission challenges, enabling new reactor technologies that will support the current fleet of reactors and facilitate constructing new ones. Mission efforts include developing new and advanced fuels along with enhancing the predictability of fuel behavior under a broad range of abnormal conditions, including loss-of-coolant accident scenarios with fuel damage and melting.

Developing and proving the basis for safe operations of advanced reactors and nuclear fuels requires substantial transient testing. Formulating the safety basis for a reactor system requires a thorough understanding of what could happen to nuclear fuel if it were subjected to accident conditions such as large power increases and loss-of-cooling events. Transient tests are crucial in demonstrating the safety basis of the reactor and the fuel, thus establishing what constitutes safe reactor operating levels.

Advanced reactor designs will require new fuel types. These fuels could be quite different from existing fuels or those tested in the past, with changes including different shapes to enhance their cooling performance, different compositions to help significantly reduce the amount of waste generated during the production of nuclear energy, and different materials to improve their thermal and safety performance. Transient testing plays a significant role in making these determinations.

DOE is researching new fuel designs for both current and future generations of reactors. These new fuels have the potential for a variety of benefits including lowering the proliferation risk associated with these fuels by making the material less attractive for use in weapons. Many of these new fuel concepts will need to undergo transient testing before they could be licensed for operation and used.

The U.S. has not conducted significant transient testing on nuclear fuels in over a decade. There are a few limited, small-scale transient testing capabilities currently operating (DOE 2010). However the U.S. facilities that currently have operational transient testing capabilities are insufficient to develop new nuclear fuel designs. Additionally, there are few operating test facilities in the world where testing of newly designed, full-scale nuclear fuel elements can take place, that also possess necessary monitoring and examination capabilities. Therefore, the DOE has determined that it has a mission need for the resumption of a domestic transient testing capability. Transient testing is a critical component in advancing nuclear energy R&D for a new generation of reactors and nuclear fuels, which enables the future deployment of advanced nuclear power.

Material science advancements are expected to continue over the course of the next decades offering numerous opportunities for improvements to nuclear fuel and material designs. Resuming a transient testing capability that meets the mission need will ensure that these advancements make their way into the nuclear industry, providing a clean, safe, and reliable form of carbon free energy for decades to come.

1.3 Description of Transient Testing

Transient testing involves placing fuel or material, either previously irradiated or un-irradiated, contained in a test assembly (described later in this section) into the core of a nuclear test reactor and subjecting it to short bursts of intense, high-power radiation. During testing, the test assembly is monitored using specialized instruments. After the transient experiment is completed, the fuel or material is examined to determine the effects of the radiation.

In general, there are two types of transient experiments: static tests and closed loop tests. Static tests evaluate the impact of transient conditions on the physical and chemical configuration of nuclear fuel in the presence of static or non-flowing coolant. Closed loop tests evaluate the impact of transient conditions on the physical and chemical configuration of nuclear fuel in the presence of flowing coolant.

Static test assemblies are relatively simple, consisting of nuclear fuel or material sealed inside a capsule with water, helium, or another coolant. The size of a static experiment can be as small as a single test piece (or sample of nuclear fuel) that is contained in a test assembly with nominal outside dimensions of 1 in. in diameter and 6 in. in height. Larger static experiments also may be performed with test assembly dimensions of about 6 in. in diameter and 93 in. in length.

Closed loop test assemblies are more complex and include single rods, rodlets, or a bundle of *fuel pin/fuel rods* (see Glossary) sealed inside a larger test vessel charged with coolant and containing all the pumps and other equipment needed to circulate coolant past the nuclear fuel or materials. Closed loop test assemblies have dimensions of up to 6 in. in diameter and 200 in. in length. Up to 20 static and 14 closed loop tests are anticipated to be conducted annually.

The facilities essential to transient testing include:

- A *hot cell* (see Glossary) for pre-test assembly, pre-test examination, post-test disassembly, and post-test examination.
- A specially-designed transient test reactor that can accommodate the test assembly in the reactor core, operate in steady-state conditions, and provide short-bursts of high-intensity *neutrons* (see Glossary) that mimic accident conditions in a commercial nuclear reactor.

- The test reactor must include the capability for real-time fuel motion monitoring (using a radiation detection system such as a *hodoscope* [see Glossary]) and have the ability to induce specific observable changes to nuclear fuel systems.

2 ALTERNATIVES

The Council on Environmental Quality's National Environmental Policy Act (NEPA) regulations require agencies to identify and assess reasonable alternatives (40 Code of Federal Regulations [CFR] 1500.2[e]) when proposing new activities. In line with this requirement, DOE has reviewed and analyzed two reasonable alternatives, plus a third "No Action" alternative, in this environmental assessment (EA).

2.1 Alternative Selection Criteria

DOE developed a set of selection criteria, based on R&D experimental objectives, to help identify a reasonable set of alternatives to resume full-scale transient testing. Using these criteria, alternatives were identified and evaluated against the selection criteria (DOE 2013b).

A summary of the selection criteria utilized to identify reasonable alternatives included:

1. Located in the U.S. to provide the necessary access, security, and control to support DOE research activities.
2. Capable of producing transient neutron bursts able to deposit energy of up to 7,000 J/g (1,670 cal/g) into nuclear fuel within periods of less than 1/10th of a second to longer than a minute.
3. Capable of performing transient experiments on test assemblies up to 200 in. in length and 1-6 in. diameter.
4. Capable of performing real-time fuel motion monitoring using a radiation detection system during a transient experiment.
5. Capable of providing the necessary infrastructure to prepare and handle test assemblies (e.g., collocated hot cell facilities).
6. Ability to meet the programmatic timeframe.

2.2 Alternatives Selected for Analysis

Using the criteria identified in Section 2.1, the following alternatives were identified and selected for analysis in this EA (see Figure 1):

- Alternative 1: Restart the Transient Reactor Test Facility (TREAT) Reactor at the Idaho National Laboratory (INL)
- Alternative 2: Modify the Annular Core Research Reactor (ACRR) at Sandia National Laboratories in New Mexico (SNL/NM)
- Alternative 3: No action.

Figure 1. Location of the two alternatives: TREAT is located on the INL Site in Idaho (Alternative 1 DOE's Preferred Alternative, Section 2.2.1,), and the ACRR is located on SNL/NM located southeast of Albuquerque, New Mexico (Alternative 2, Section 2.2.2). (Base map courtesy of Google Earth).

Several additional alternatives were considered but not evaluated because they did not meet the selection criteria. These included construction of a new transient test reactor or the use of the High Flux Isotope Reactor at Oak Ridge National Laboratory, the Advanced Test Reactor (ATR) at INL, the Nuclear Safety Research Reactor in Japan, CABRI in France, the Impulse Graphite Reactor in Kazakhstan, and the Missouri University Research Reactor.

DOE has selected Alternative 1 as the preferred alternative. The "preferred alternative" is the alternative that DOE believes would fulfill its statutory mission and responsibilities in the best manner, giving consideration to economic, environmental, technical and other factors. It is identified to inform the public of DOE's orientation in regards to achieving the proposed action. The main factors that support DOE's choice of a preferred alternative include the remoteness of the INL and the *TREAT* (see Glossary), the resultant smaller potential radiation doses to workers and the public, the operational flexibility provided by Alternative 1 with respect to necessary facilities, the conduct of experiments, and the lower potential for impacts from transportation of experiments.

2.2.1 Alternative 1 – Restart the TREAT Reactor (Preferred Alternative)

Activities involved would include refurbishment or like-for-like replacement of systems and equipment that prepare the TREAT Reactor for restart and operations. Refurbishment will affect the TREAT Reactor Building, TREAT Reactor Control Building, and the cable corridor between them.

Supporting activities such as pre- and post-test examinations, experiment assembly and disassembly, and waste management would be conducted at onsite INL facilities. The INL facilities, other than TREAT, would remain within their current operating requirements and limitations. Transient irradiations would be conducted in the TREAT Reactor. Transportation of fuel and test assemblies would occur on the INL site using roadways controlled by INL security.

TREAT is located in the south-central portion of the INL Site in southeast Idaho (see Figures 1 and 2). Although TREAT is part of the Material and Fuels Complex (MFC), the fences that surround the MFC main facilities and TREAT are separated by about 0.6 miles (see Figure 2). TREAT was constructed at the Materials and Fuels Complex (formerly Argonne National Laboratory-West) at the Idaho National Laboratory in the late 1950s. TREAT achieved criticality and began operations on February 23, 1959. It is a small air-cooled nuclear reactor with configurable space available in the middle of its core for transient experiments. Although capable of low-power steady state operation for neutron radiography, TREAT normally operated in pulse mode to study the effects of simulated reactor overpower accidents, or transients, on nuclear fuel and materials. During its 35 years of operation, more than 2,800 transient tests were safely conducted in TREAT.

TREAT includes several buildings within a fenced property, including the TREAT Reactor Building (MFC -720), a guardhouse (MFC-722), warehouse (MFC-723) and ancillary buildings outside the fence. The TREAT Reactor Control Building (MFC-724) and the original TREAT Reactor Control Building (MFC-721) are located about 0.45 miles east (see Figure 2).

Since 1994, the TREAT Reactor has been maintained in a standby status (reactor maintained in a safe configuration).

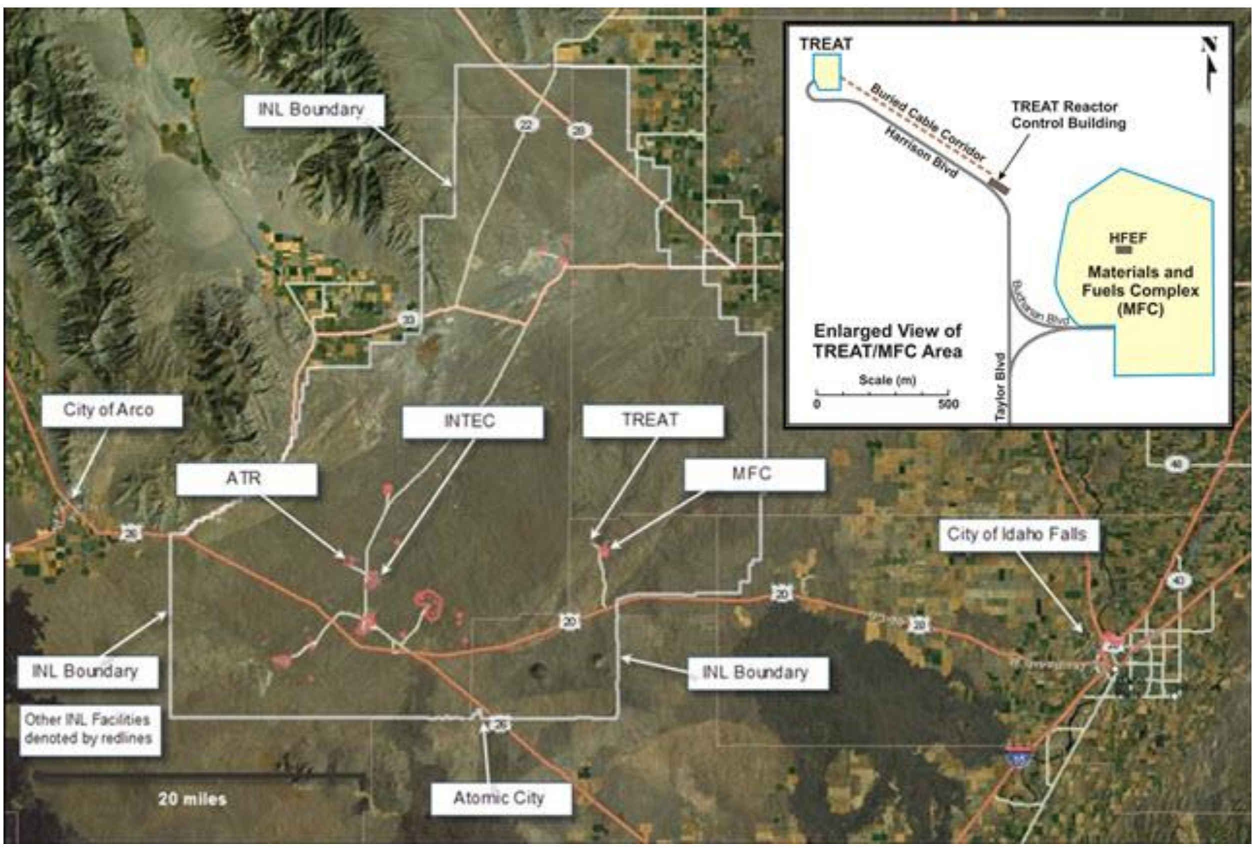


Figure 2. Location of TREAT (near center of figure) and the Materials and Fuels Complex (MFC) within the INL boundary, shown in relation to nearby facilities and cities.

Primary buildings that would support transient testing at TREAT include the TREAT Reactor Building and the TREAT Reactor Control Building. The TREAT Reactor Building contains the TREAT Reactor, and a high bay for receipt and handling of test assembles and for decontamination after irradiation. The TREAT Reactor Control Building contains computer consoles (located about 0.45 miles southeast of the Reactor Building).

TREAT was specifically designed to test nuclear fuel and materials under transient high-power conditions. The TREAT Reactor is unique in that it is designed for short high power pulses, or low power operation for a limited time. The heat that is generated during reactor operation can be absorbed entirely by the mass of the fuel assemblies, and accordingly the reactor does not require an active cooling system. The TREAT Reactor is cooled by air at or near atmospheric pressure. There is insignificant *decay heat* (see Glossary), and accordingly no residual decay heat removal or emergency cooling systems are required. Because of the relatively small aggregate power generated by the TREAT Reactor, the *burnup* (see Glossary) of nuclear fuel is low. Therefore, no refueling or generation of spent nuclear fuel from the TREAT Reactor are anticipated to support this mission.

Due to the small scale, simple design, and few active systems required by the TREAT Reactor, aging and degradation concerns are a fraction of those of a typical nuclear reactor. Refurbishment and maintenance activities can be more easily accomplished at TREAT as compared to a typical reactor. Routine maintenance and refurbishment activities will enable the use of the TREAT Reactor for the 40-year timeframe of the proposed action.

The TREAT Reactor core was designed to accommodate a variety of test assemblies that contain a variety of coolants such as sodium or water. Because the core is air cooled, a test assembly can be easily inserted into the core, then observed and monitored during testing. Horizontal, line-of-sight access to the core is possible by removing shielding blocks along the sides of the reactor. Line-of-sight access to the core is required to allow real-time fuel motion monitoring of the nuclear fuel or materials during a transient test. Vertical access to the core is possible by removing shielding blocks above the reactor. Real-time fuel motion monitoring during a transient test at TREAT is accomplished with a hodoscope (see Figure 3).

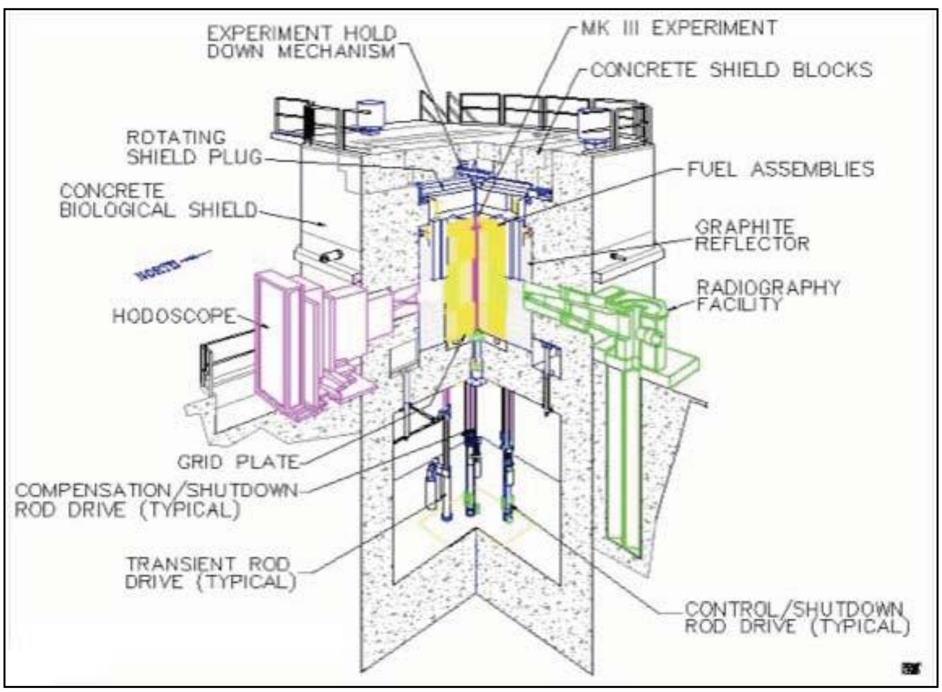


Figure 3. Diagram of the TREAT Reactor with a test assembly (MK III experiment) inserted into the center of the reactor core and showing the hodoscope (or fuel motion monitoring device) left of the reactor core.

TREAT is currently used for inspection and surveillance of nuclear material stored in the facility (including reactor fuel in storage); radioactive and nuclear material receipt, storage, and handling (e.g., radioactive sources); non-reactor training and experiments involving radioactive and nuclear material along with radiation generating devices; and maintenance of the facility structure and equipment therein. Current activities that are inconsistent with transient testing operations would not continue at TREAT if the TREAT Reactor is restarted.

Resumption of transient testing at TREAT would involve detailed evaluation of TREAT Reactor systems against applicable codes and standards, refurbishment/replacement as necessary to ensure compliance, maintenance of compliant system components, and demonstration of readiness to ensure safe operation of the reactor. Activities associated with restarting the TREAT Reactor would be conducted in accordance with Federal, state and local regulations (see Section 5) and in accordance with established best management practices to minimize the impacts of restart activities.

Normal operations of the reactor would include routine maintenance of equipment in TREAT and associated support buildings and structures and specific transient testing activities. Transient testing using the TREAT Reactor would involve the following activities:

1. Transportation of the fuel or material to MFC for pre-experiment examination and test assembly preparation; activities would occur primarily at the Hot Fuel Examination Facility (HFEF) at MFC.
2. Transportation of the test assembly to TREAT from MFC.
3. Transient irradiation(s) of the test assembly at TREAT, including pre- and post-irradiation radiography.
4. Transportation of the test assembly back to MFC.
5. Post-irradiation examination of the test assembly components at HFEF or other MFC facilities.

2.2.2 Alternative 2 – Modify the ACRR

Activities under Alternative 2 would require modification of facilities at SNL/NM, the use of existing facilities at INL, and transport of experiments between INL and SNL/NM. Activities involved would include modifying ACRR to include a real-time fuel motion monitoring device and building a hot cell adjacent to the reactor building. Preliminary experiment assembly and disassembly, pre- and post-examination, and associated waste management activities would be conducted at INL. Transient irradiations would be conducted in the ACRR. Fuel and experiments would be transported between facilities at INL and between INL and SNL/NM.

The ACRR is located within the boundary of Kirtland Air Force Base (KAFB)—southeast of the city of Albuquerque, New Mexico—and within SNL/NM's Technical Area (TA)-V (see Figures 1 and 4). The ACRR is a water-cooled, pulse-type research reactor and has been in continuous operation since 1979, logging more than 10,000 operations. ACRR can be run in steady-state mode as well as a programmed combination of steady-state and pulsed transients. Although the ACRR is water-moderated, there is a large, dry, central cavity that extends through the center of the core (see Figure 5).

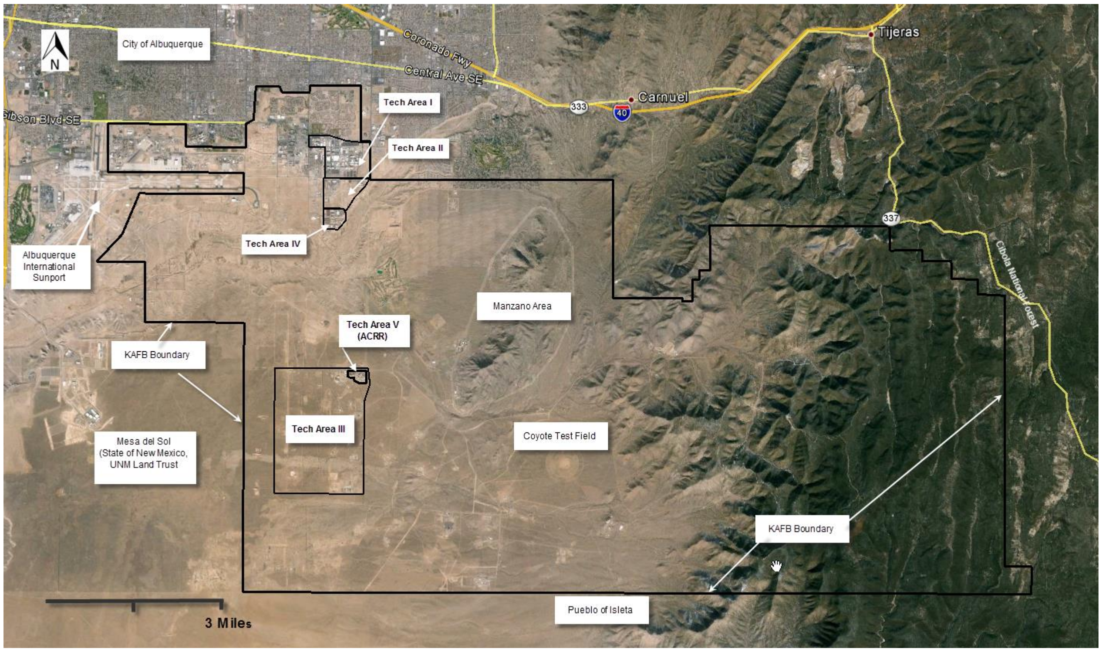


Figure 4. Location of key points of interest in and adjacent to Technical Area-V at SNL/NM. Information from DOE 1999. (Base map courtesy of Google Earth).

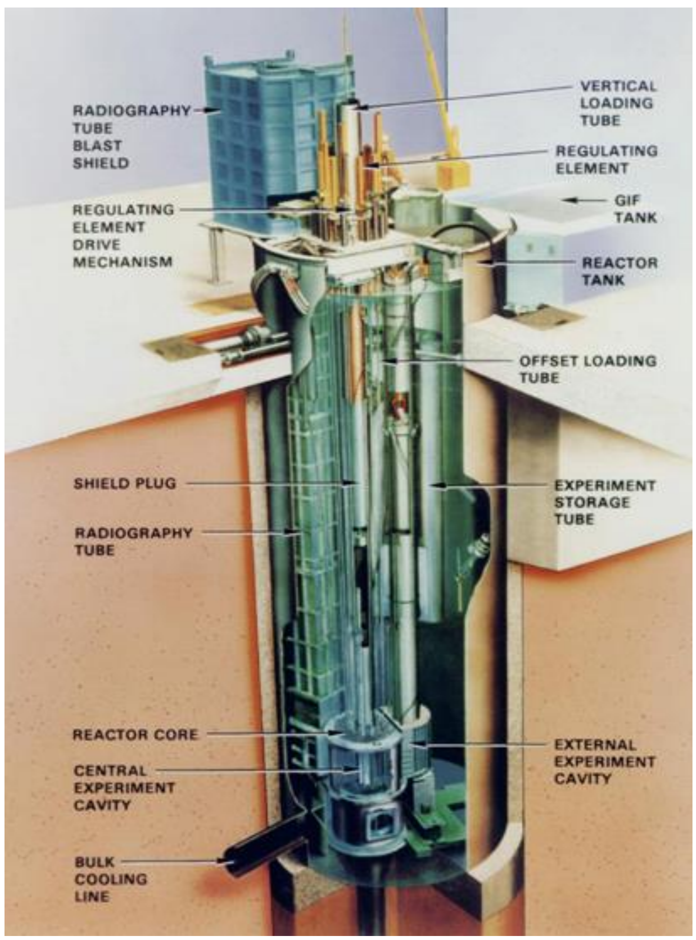


Figure 5. Diagram of ACRR.

ACRR is a unique facility that has been historically used for a wide array of research. Although the current mission is focused on supporting the DOE National Nuclear Security Administration's nuclear security and weapons mission, past missions have served the U.S. Nuclear Regulatory Commission (NRC) and DOE-NE for fuels, safety, and isotope production missions. DOE transitioned to the ACRR from the Annular Core Pulse Reactor to enable larger pulses and the ability for the driving core to bring the test specimen fuel to complete failure without the core fuel failing. In addition, a fuel motion monitoring device—the Coded Aperture Imaging System—was successfully installed and used in the reactor to monitor these fuel safety studies that included flowing steam over an array of *light water reactor* (see Glossary) fuel (Kelly and Stalker 1981). The fuel motion monitoring device has since been removed due to lack of need. As part of this Alternative, a new fuel motion monitoring device would be installed in the reactor.

Use of ACRR for the transient testing mission described in this document would include modifying ACRR to include a real-time fuel motion monitoring device and building a hot cell adjacent to the reactor building. Following construction, readiness to operate would be demonstrated through a series of readiness assessments. All activities would be conducted in accordance with Federal, state and local regulations (see Section 5) and in accordance with established best management practices to minimize construction impacts.

Transient testing activities using the ACRR would be very similar to the activities associated with conducting transient testing at TREAT and would include:

1. Transportation of the fuel or material to MFC for pre-experiment examination and test assembly preparation; activities would occur primarily at HFEF within MFC.
2. Transportation of the test assembly components to TA-V at SNL/NM.
3. Assemble test components in the new ACRR hot cell.
4. Transient irradiation(s) of the test assembly at ACRR, including pre- and post-irradiation radiography.
5. Transportation of the test assembly back to MFC at INL.
6. Post-irradiation examination of the test assembly components at HFEF or other MFC facilities.

2.2.3 Alternative 3 – No Action

DOE considered a "No Action" alternative that establishes a baseline against which this EA compares the other analyzed alternatives. No action does not necessarily mean doing nothing, but often involves maintaining or continuing the existing status or condition.

In this document, no action means: (1) Not restarting the TREAT Reactor and (2) Not modifying the ACRR to conduct transient testing as described in previous sections. Under this alternative, limited aspects of transient testing would still be pursued at a combination of U.S. and international research facilities capable of conducting the work. For example, in the U.S., transient testing would be limited to DOE utilizing the existing capabilities at operating facilities. Specifically, transient testing at these facilities would be limited to conducting static tests of un-irradiated fuel. Single fuel pins could be tested using international capabilities. However, the transient testing and its benefits that once occurred would not resume. Capabilities that would not resume include:

- The ability to perform transient tests on pre-irradiated large test specimens or full-scale fuel rods
- The ability to perform transient loop-testing of multiple un-irradiated and pre-irradiated fuels
- The ability to perform real-time in-situ imaging during transient testing.

Not resuming these capabilities would limit DOE's ability to provide critical information on fuel and material behavior, negatively impact the development and improvement of advanced nuclear fuels and fuels used in light water reactors, high temperature gas reactors, and fast reactors, and adversely affect efforts to both improve nuclear reactor sustainability and performance and efforts to minimize the proliferation potential of nuclear materials. The No Action alternative does not meet the mission need.

3 AFFECTED ENVIRONMENT

3.1 Idaho National Laboratory, Idaho

3.1.1 General Description of INL Site and Surrounding Area

The INL Site consists of several facilities, each taking up less than 2 square miles, located across an 890 square miles expanse of otherwise undeveloped, cool desert terrain. DOE controls all of the INL Site land, which is located in southeastern Idaho and includes portions of five Idaho counties: Butte, Bingham, Bonneville, Clark, and Jefferson. Population centers in the region include the cities (>10,000 people) of Idaho Falls, Pocatello, Rexburg, and Blackfoot, located further than 30 miles to the east and south; there are also several smaller cities/communities (<10,000 people), including Arco, Howe, Mud Lake, Fort Hall Indian Reservation, and Atomic City, located around the site less than 30 miles away. Craters of the Moon National Monument is less than 20 miles to the west of the western INL boundary; Yellowstone and Grand Teton National Parks and the city of Jackson, Wyoming are all located more than 70 miles northeast of the closest INL boundaries.

Populations potentially affected by INL Site activities include INL Site employees, ranchers who graze livestock in areas on or near the INL Site, hunters on or near the INL Site, residential populations in neighboring communities, travelers along U.S. Highway 20/26, and visitors at the Experimental Breeder Reactor I National Historic Landmark. There are no permanent residents on the INL Site.

The five Idaho counties that are part of the INL Site are all in an *attainment area* (see Glossary) or are unclassified for *National Ambient Air Quality Standards* (see Glossary) status under the *Clean Air Act* (see Glossary). The nearest *nonattainment area* (see Glossary) is located about 50 miles south of INL in Power and Bannock counties. INL is classified under the *Prevention of Significant Deterioration* (see Glossary) regulations as a Class II area—an area with reasonable or moderately good air quality.

Surface waters on the INL Site include the Big Lost River and Birch Creek. Both streams carry water on an irregular basis, with the majority of the flow diverted for irrigation before entering INL. Most of INL is underlain by the Snake River Plain Aquifer, which lies between 220 ft (at the north end of the Site) to 610 ft (at the south end of the Site) below the surface of the Site. The geology above the Snake River Plain Aquifer—the *vadose zone* (see Glossary)—is generally comprised of basalt (95%), with a layer of soil or sediment on top of the basalt, and thin layers of sediments (1 to 20 ft intervals) between basalt flows. The Snake River Plain Aquifer has similar geology as the overlying vadose zone and is generally 250 to 900 ft thick.

The natural vegetation of the INL Site consists of a shrub overstory with a grass and forb understory. The most common shrub is Wyoming big sagebrush, though basin big sagebrush may dominate or co-dominate in areas with deep or sandy soils. The shrub understory consists of native grasses (Shumar and Anderson 1986).

A wide range of vertebrate species are located within the Site. Several species are considered sagebrush-obligate species, meaning that they rely upon sagebrush for survival. These species include sage sparrow, Brewer's sparrow, northern sagebrush lizard, Greater sage-grouse, and pygmy rabbit (Rowland, et al. 2006).

There are currently no species that occur on the INL Site that are listed as endangered or threatened. However, several Species of Concern or Candidate Species do occur on the Site including sage-grouse, three species of bats (long-eared myotis, small-footed myotis, Townsend's big-eared), pygmy rabbit, Merriam's shrew, long-billed curlew, ferruginous hawk, northern sagebrush lizard, and loggerhead shrike. In 2010, the little brown myotis was petitioned for emergency listing under the Endangered Species Act. The U.S. Fish and Wildlife Service is collecting information on this species, as well as the big brown bat, to determine whether or not such listing is warranted.

The INL Site has a rich and varied *cultural resource* (see Glossary) inventory. Resources include:

- Prehistoric archaeological sites representing aboriginal hunter-gatherer use over a span of at least 13,500 years
- Late 19th and early 20th Century historic archaeological sites representing emigration, settlement and agricultural development, ranching, freighting, and other activities
- Historic architectural properties that tell the history of the INL Site from its beginnings as a Navy gunnery range to its many important achievements in nuclear science and technology
- Areas and natural resources of cultural importance to the Shoshone-Bannock Tribes and other local or regional stakeholders (e.g., historical societies, historic trail organizations).

Many of the cultural resources identified at the INL Site are *historic properties* (see Glossary) eligible or potentially eligible for listing on the National Register of Historic Places (NRHP). Aviators Cave is one site on the INL that is listed on the NRHP for significant archaeological deposits and cultural value to the Shoshone-Bannock Tribes. In addition, Experimental Breeder Reactor I is recognized as a National Historic Landmark for significant scientific contributions.

3.1.2 TREAT and MFC Area (Area Potentially Affected by Alternative 1)

TREAT is located a little more than 0.6 miles to the northwest of MFC, outside the main fence. A paved access road to TREAT leads from MFC past the TREAT Reactor Control Building to the TREAT Reactor Building. The TREAT Reactor Control Building is about 0.45 miles from TREAT. A fence surrounds the perimeter of TREAT and encloses about 3.5 acres (see Figure 2). The area between the TREAT reactor control buildings (MFC-721 and MFC-724) and TREAT has been previously disturbed. A wildland fire burned through the area as recently as 2010. The remaining vegetation is crested wheatgrass (a non-native species that is well adapted to thrive in localized conditions), a few localized sagebrush adjacent to the cable corridor (a soil mound structure, about 0.5 miles in length covering cables between the reactor control building and TREAT), and native species on the south and west sides of TREAT.

Archival and record searches in 2013 of the INL Built Environment (refers to buildings, structures, objects, and systems built from 1942 to present) revealed historic buildings within the direct *area of potential effects (APE)* (see Glossary) for the proposed action that are eligible for listing on the NRHP. They include the TREAT Reactor Building (MFC-720), and the original TREAT Reactor Control Building (MFC-721) located to the northwest of MFC, HFEF (MFC-785) at MFC, and ATR (TRA-670). The TREAT Reactor Control Building, original TREAT Reactor Control Building, and ATR were constructed during INL's historic period of significance (1942-1970). In 1980, the TREAT Reactor Building was modified and the original control building was remodeled into offices to support the mission of Experimental Breeder Reactor II, which transitioned to the Integral Fast Reactor (IFR) in the mid-1980s. Other facilities that could be used to support transient testing were constructed after 1970, are not exceptionally significant, and are not eligible for listing on the NRHP (Pace and Williams 2013).

Prehistoric archaeological artifacts from approximately 13,000 to 150 years old, including short-term hunting campsites, lithic scatters (relating to stone tools), and isolated artifact locations, have been identified during surveys of the area surrounding MFC. Archaeological resources dating to historic times (50-150 years old) are also present in the area and include trash scatters, field scars, rock features, and isolated artifact locations (Pace and Williams 2013).

Several species of wildlife use the area surrounding TREAT and the reactor control buildings. Sage-grouse have been documented using an area 2.3 miles to the southwest of TREAT, and the closest active lek (breeding area) is located 2.5 miles to the southwest of TREAT. Elk, pronghorn, and mule deer have been documented using water sources in this area. In addition, big brown bats, western small-footed myotis, and Townsend's big-eared bats have used the MFC wastewater ponds and the concrete bridge at MFC (Whiting and Bybee 2011).

There are no perennial or permanent surface water bodies near MFC. All facilities within the MFC fenced area are in a single local topographically closed watershed. The MFC watershed contains natural drainage channels, which can concentrate overland flow during periods of high precipitation or heavy spring runoff. TREAT is located in an adjacent local-topographically-closed watershed, which also contains no identifiable perennial, natural surface water features. The elevation of TREAT is 5,122 ft, more than 7 ft above the water level predicted to occur under the probable maximum flood event corresponding to repeated rainfall events over frozen ground; therefore, TREAT is not subject to flooding.

3.2 Sandia National Laboratories, New Mexico

3.2.1 General Description of SNL/NM and Surrounding Area

Sandia National Laboratories – New Mexico (SNL/NM) operations are conducted on about 8,800 acres of federal land on KAFB. KAFB is about 7 miles southeast of downtown Albuquerque (see Figure 4) (SNL/NM 2013). SNL/NM is located within Bernalillo County and adjacent to the Albuquerque city limits.

The local topography of the Albuquerque area is dominated by the Sandia Mountains and Rio Grande River. The Sandia Mountains rise steeply, immediately north and east of the city, with the Manzanita Mountains extending to the southeast. The Rio Grande River runs southward through Albuquerque and is the primary river traversing central New Mexico.

New Mexico has an estimated population of 2 million residents. The largest city is Albuquerque with about 552,804 metro-area residents; other neighboring metro areas include the City of Rio Rancho with 89,320 residents and Bernalillo with 8,480 residents. The population within a 50 miles radius of SNL/NM is over 882,187 residents; nine counties are contained or partially included in that radius (SNL/NM 2013). The nine counties include: Cibola, McKinley, Sandoval, Bernalillo, Santa Fe, San Miguel, Torrance, Socorro, and Valencia.

Although the area within the boundaries of KAFB is federally-owned, ownership and administrative responsibilities of the area and adjacent land is complex. KAFB shares facilities and infrastructure with several associates, including the DOE. It is comprised of approximately 51,560 acres of land, including portions of Cibola National Forest withdrawn in cooperation with the United States Forest Service. It is geographically bounded by the Pueblo of Isleta to the south, the Albuquerque International Sunport (airport) and lands held in trust by the state of New Mexico to the west, and the city of Albuquerque to the north. The eastern boundary lies within the Manzanita Mountains (Figure 4). The western portion of KAFB contains both DOE land and U.S. Air Force land, with areas permitted for DOE/Sandia use.

SNL/NM is comprised of TAs I through V on DOE land, numerous facilities on Department of Defense owned/DOE leased land, and several facilities off KAFB on non-government-owned lands (see Figure 4) (SNL/NM 2013).

SNL/NM is in the Albuquerque Middle Rio Grande Intrastate Air Quality Control Region, referred to as Region 152 (SNL/NM 2013). The U.S. Environmental Protection Agency (EPA) has classified Air Quality Control Region 152 as follows in Title 40, CFR, Section 81.332 (SNL/NM 2013), for these primary air pollutants:

- Sulfur Dioxides (SO_2): Better than national standards
- Ozone (O_3) : Unclassifiable/attainment
- Total Suspended Particulate Matter: Not meeting the primary standards or better than national standards
- Nitrogen Dioxide (NO_2): Cannot be classified or better than national standards
- Carbon Monoxide (CO): Unclassifiable/attainment
- Lead (Pb): Not designated.

The regional hydrogeologic conditions within the Albuquerque Basin are defined by the surface water and groundwater features and the geologic units present. The dominant surface water feature is the Rio Grande River, which flows through the basin generally north to south. The groundwater-bearing units of the basin are the unconsolidated deposits of the Santa Fe Group (a group of similar geologic materials), which comprise the main aquifer. Thickness of the vadose zone material (material between the ground surface and the water table) varies from about 500 ft in the western portion of the KAFB and SNL/NM area to a negligible amount in the eastern portion (SNL/NM 1998).

The general road network leading to KAFB includes Interstates 25 and 40. Interstate 25 runs north-south and is approximately 1.5 miles west of the KAFB boundary at its nearest point. Interstate 40 runs east-west through Albuquerque and is approximately 1 mile north of the KAFB boundary at its nearest point.

Access to KAFB and SNL/NM consists of an urban road network maintained by the city of Albuquerque, the gates and roadways of KAFB, and SNL/NM-maintained roads. Traffic enters SNL/NM through three principal gates: Wyoming, Gibson, and Eubank. Most commercial traffic enters through the Eubank gate because it provides direct access to the SNL/NM shipping and receiving facilities located in TA-II. An additional entrance to KAFB, the Truman gate, serves KAFB's western areas.

SNL/NM maintains approximately 20 miles of paved roads, 25 miles of unpaved roads, approximately 80 acres of paved service areas, and approximately 80 acres of paved parking (DOE 1999). The roads near SNL/NM experience heavy traffic in the early morning and late afternoon. The principal contributors are SNL/NM staff and other civilian and military personnel commuting to and from KAFB. SNL/NM and DOE commuters represent approximately 36% of commuter traffic on KAFB (DOE 1999).

Primary air service is provided for the entire region by the Albuquerque International Sunport, located immediately northwest of KAFB. Runways and other flight facilities are shared with KAFB.

Two major physiographic provinces influence the flora and fauna of the region: (1) Mesa and plains and (2) Mountains (SNL/NM 2013). The topography of the KAFB and SNL/NM area ranges from lowland grasslands to high-elevation coniferous forests. With much of the area undeveloped, there is great diversity in plant and animal communities within the KAFB and SNL/NM area. At least 267 plant species, 206 bird species, 34 reptile/amphibian species, 25 small mammal species, 2 ungulate species (KAFB 2007), 13 bat species (KAFB 2009), and 13 predator species (KAFB 2006) have been documented on KAFB. There are 25 species that are either federal or state listed as: T&E, candidate, or species of concern, occurring in Bernalillo County (SNL/NM 2013). In 2012 the U.S. Fish and Wildlife announced a petition to list the desert massasauga (a snake) as Endangered or Threatened and to designate critical habitat, which occurs in TA III and could occur in TA V.

3.2.2 Technical Area V (TA-V) (Area Potentially Affected by Alternative 2)

SNL/NM TA-V is an area of about 33 acres located in the north-central portion of KAFB (see Figure 4) and adjacent to the northeast section of TA-III. TA-V is a relatively small research area consisting of about 35 closely grouped structures where experimental and engineering research reactors are located. These facilities are used to routinely handle radioactive materials used in experimental R&D programs and include the Gamma Irradiation Facility, the ACRR, the Hot Cell Facility, and the Auxiliary Hot Cell Facility. Approximately 150 personnel work in the area. TA-V has some planned landscaping, but it predominantly consists of paved, rock, or gravel roads and parking areas and has been deemed as an urban/landscaped area.

A biological Standard Conservation Area has been proposed for the area within TA-V and adjacent TA-III. The Standard Conservation Area was established due to the heavy use of this habitat and to a higher amount of incidental use by the following bird species: eastern meadowlark, western meadowlark, loggerhead shrike, sage sparrow, and Cassin's sparrow. There are no federally-listed threatened or endangered plants or animal species present in TA-V or the surrounding area (KAFB 2006, 2007, and 2009).

Cultural resources include archaeological, traditional, and built environmental resources, including district sites, buildings, structures, or objects from both the prehistoric and historic eras of human history. TA-V has been surveyed for archeological sites (both prehistoric and historic) (DOE 1999). Aside from isolated occurrences of artifacts, no prehistoric or historic archeological sites have been identified (DOE 2006). Currently, nine buildings (including the ACRR) or structures in TA-V (referred to as the "Reactor Complex Historic District") are eligible for the NRHP (SNL/NM 2011).

The ACRR is one of several facilities at SNL/NM that is required by *National Emissions Standards for Hazardous Air Pollutants* (see Glossary) to annually report radionuclide source emissions that have the potential to produce a specific dose.

Flooding events have been evaluated to support ongoing ACRR operations. TA-V is not within the 500 year floodplain and is elevated relative to surrounding topography; therefore, significant flooding is not considered credible. Floodplains occur next to the major arroyos and are approximately 0.5 miles from TA-V.

4 ENVIRONMENTAL CONSEQUENCES

DOE uses engineered and administrative controls to ensure safety and to minimize the potential for environmental consequences for its operations. Both the TREAT Reactor and the ACRR were designed to minimize the impacts of reactor operations under normal and accident conditions. Design features will be augmented by operational requirements and administrative controls for reactor operations to ensure operating parameters are not exceeded during steady-state or transient testing conditions.

Test assemblies will be designed to contain the nuclear fuel or materials during planned tests and under all credible accident conditions. Fresh cladded fuels (unirradiated) will be in sealed containment. Irradiated fissile materials or fission products will be sealed and will have single or double containment, as appropriate, with the containment designed to retain its integrity. Pre-experiment evaluation and analysis will be conducted to ensure the experiments are within established operating parameters.

4.1 Alternative 1 – Restart the TREAT Reactor (Preferred Alternative)

The TREAT Reactor is currently maintained in a standby condition, and as such, refurbishment activities, facility commissioning, and reactor operations must be considered for purposes of determining whether there are significant environmental impacts that could result from implementing this alternative.

4.1.1 Restart and Normal Operations Activities

Activities associated with the restart of the TREAT Reactor have the potential to affect the TREAT Reactor Building, TREAT Reactor Control Building, and the cable corridor. Activities that are part of normal transient testing operations at TREAT are discussed in Section 2.2.1.

Normal transient testing operations involve activities that would be conducted at MFC, irradiation of the test assembly in the reactor, steady-state and transient operation of the reactor, transportation of the test assembly, and disposition of generated waste. The detailed analyses of the impacts of these activities are contained in Schafer et al. 2014.

Understanding Normal TREAT Reactor Operations

During the sequence of events that would take place with normal operating conditions, the TREAT Reactor is operated in steady-state and transient conditions, and heat is generated in the reactor and test assembly. The TREAT Reactor is a small test reactor, and the heat generated is low enough that it can be absorbed by the mass of the fuel assemblies or removed using an air filtration/cooling system (F/CS) as opposed to using liquid coolant, required by most commercial reactors. Two blowers operating in parallel, located downstream of the reactor, pull coolant air from the reactor high bay into the reactor core. After passing through the core, the cooling air passes through two banks of High Efficiency Particulate Air (HEPA) filters before being discharged out the reactor coolant exhaust stack.

The air F/CS for the TREAT Reactor is designed to be highly efficient. The F/CS is designed to entrain radioactive aerosols (particulates) in the clean coolant air by first providing subatmospheric pressure in the reactor cavity. The cool air stream passes through the HEPA filters where more than 99% of particulates are entrained on the HEPA filters prior to the remaining gas-phase effluent being discharged up the stack.

To ensure the reliability of the F/CS system, the blowers have historically been powered from independent power sources. One power source is the normal Site electric power; the other is an onsite diesel generator. An additional generator is used to supply redundant power to other electrical systems.

Releases to the Air

Non-Radiological Emissions—

The annual cumulative diesel fuel usage for the diesel generators is estimated to be 2,500 gallons based on historical average use and planned future testing demands. The 6-year average diesel fuel usage for all emergency diesel generators and boilers at MFC is 449,563 gallons, and the total INL diesel fuel usage is 1,114,995 gallons. Over the last few years, DOE has implemented sustainability initiatives at MFC and planned improvements at ATR to reduce these emissions. The average fuel usage is expected to continue to decline. The diesel generator fuel consumption at TREAT would represent a small percentage of INL diesel use and resultant emissions (Schafer et al. 2014).

There should be no visible trace of the cooling air at the top of the TREAT Stack. The HEPA filters will remove more than 99% of particulates entrained in the air stream. The reactor cooling air would not carry other volatile chemical pollutants.

Radiological Impacts of Atmospheric Releases—

Radioactive emissions released from the TREAT Stack are the result of activation of cooling air and fission of uranium impurities in the Zircaloy *cladding* (see Glossary) of the TREAT Reactor fuel (see Table 1). Atmospherically transported radioactive emissions were evaluated at the following three locations (see Figure 6) (Schafer et al. 2014).

1. **Atomic City:** Permanent residents at this location will receive the highest public receptor *effective dose* (ED) (see Glossary). The annual estimated ED is 2.1×10^{-3} (0.0021) mrem.
2. **Treat Reactor Control Building (MFC-721):** The location of the nearest *collocated worker* (see Glossary) would receive an annual estimated ED of 3.6×10^{-3} (0.0036) mrem.
3. **Frenchman's Cabin:** This location is located just south of the southern INL boundary, 23 miles west-southwest of TREAT and is used to show INL-wide compliance with 40 CFR 61, Subpart H. Members of the public are often at this site, but there are no permanent residents or INL workers. To show compliance, the dose at this location is summed with all other atmospheric radionuclide emissions originating at INL. The total annual estimated dose reported for INL compliance in year 2012 was 3.57×10^{-2} (0.0357) mrem (U.S. Department of Energy-Idaho Operations Office [DOE-ID] 2013c). Inclusion of the ED contribution from the TREAT Reactor (estimated to be 1.1×10^{-3} (0.0011) mrem/year) would result in a total annual estimated dose at Frenchman's Cabin of 3.68×10^{-2} (0.0368) mrem.

The EDs from normal operations at these locations are well below the 10 mrem/year federal standard set by 40 CFR 61, Subpart H – National Emissions Standards for Hazardous Air Pollutants. Cumulative doses from all INL sources would also be well below the 10 mrem/year dose standard.

Table 1. Radionuclide emissions at the top of the TREAT Stack for two air flow rates.

Parent Isotope	Parent Half-Life	Progeny[a]	Progeny Half-Life	Parent Phase	Annual Activity (Ci) 6,000 cfm	Annual Activity (Ci) 3,000 cfm
Ar-41	1.82 hr	-	-	Gas	350	350
Kr-85m	4.48 hr	Kr-85	10.73 yr	Gas	1.40	1.40
Kr-87	1.27 hr	Rb-87	4.8×10^{10} yr	Gas	8.00	8.00
Kr-88	2.84 hr	Rb-88	17.7 min	Gas	5.60	5.60
Rb-88[b]	17.7 min	-	-	Solid	0.03	0.05
Xe-133	5.24 d	-	-	Gas	0.70	0.70
Xe-135	9.1 hr	Cs-135	2.3×10^{6} yr	Gas	1.40	1.40
Xe-140[b]	13.6 sec	Cs-140	1.06 min	Gas	2,375	1,163
Cs-140[b]	1.06 min	Ba-140	12.75 d	Solid	1,028	1,120
Ba-140	12.75 d	La-140	1.68 d	Solid	0.01	0.02
La-140	1.68 d	-	-	Solid	6×10^{-7}	2×10^{-6}

a. Progeny: The decay product, daughter product, or daughter isotope produced as a (parent) radionuclide undergoes radioactive decay

b. Release not directly measured, but presence and activity inferred from other data.

Note: For this table – sec = seconds, min = minutes, hr = hours, d = days, and yr = year.

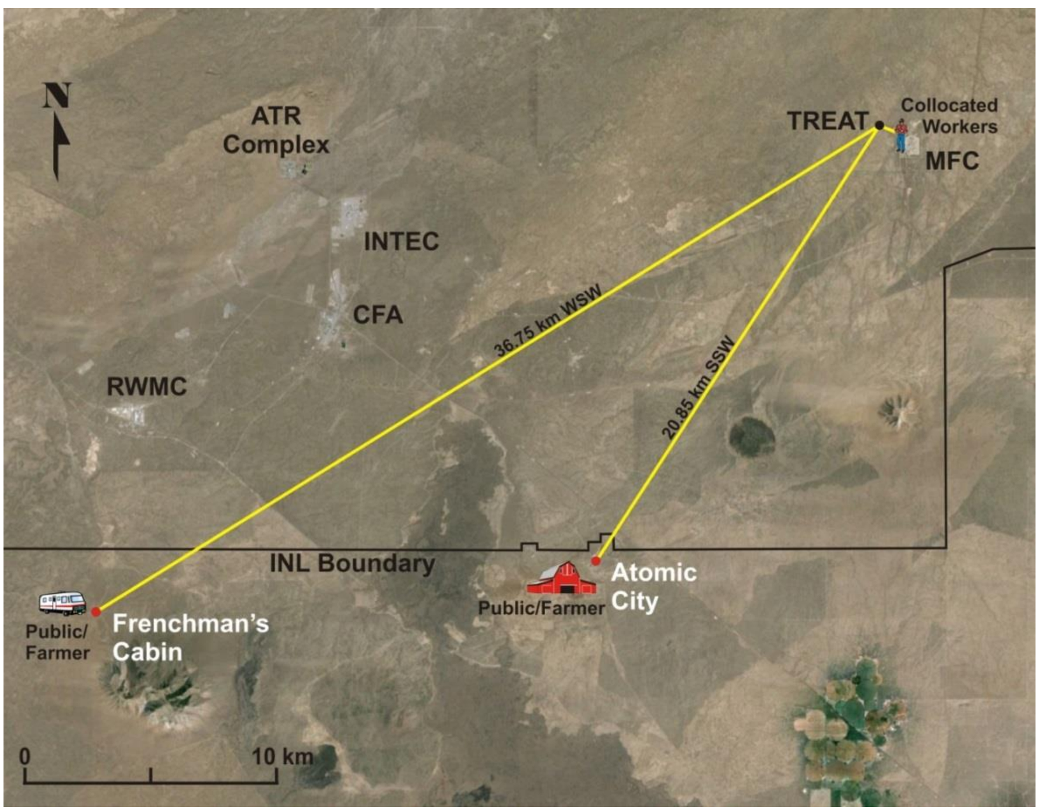


Figure 6. Receptor locations for the air pathway analysis showing distance and direction from TREAT to Frenchman's Cabin, Atomic City, and Collocated Workers (Base map courtesy of Google Earth).

Radiological Impacts of Releases to Soil—

The potential for TREAT Stack emissions to result in contamination beyond the vicinity of TREAT is unlikely based on the atmospheric pathway analysis (Schafer et al. 2014).

Radiological Impacts to Groundwater—

Radionuclide transport from potentially contaminated soils to groundwater is improbable given the short half-lives of the TREAT Stack emissions and the time necessary for a conservative tracer to travel from land surface to the aquifer (about 250 years). During the time necessary for the longest lived particulate radionuclide, Ba-140, to travel to the aquifer, negligible radiological activity would remain. The radioactive dose impact to humans would therefore also be negligible (Schafer, et al. 2014).

Impacts to Biological Resources

Potential impacts to biologic resources include those resulting from pre-operations disturbance of soils and plants during restart activities and deposition of radiologic particulates during operations. Impacts associated with refurbishment and replacement of TREAT Reactor systems would be limited to areas within TREAT, parking areas, and the cable corridor that parallels the roadway from the TREAT Reactor Control Building to TREAT (see Figure 2).

To support this EA, the potential impacts to biological resources were analyzed in the spring of 2013. The detailed results of this analysis are documented in Hafla, J. et al. 2013. This report substantiates that disturbance to habitat would be minimal and that there would be no direct or cumulative impact to sensitive plant species or wildlife. The impacts associated with the proposed action are expected to result in no increase in footprint, be of low intensity, and be located in or near areas with much larger impacts to ecological resources. Because of that, no cumulative impacts would be anticipated (Hafla, J. et al. 2013).

Plants and Soil Disturbance Impacts—

Plant populations surrounding TREAT are expected to be minimally impacted by this alternative, with the exception of activities occurring within in the cable corridor (see Figure 2), a previously disturbed area. Minimizing the area of disturbance and managing weeds would help control noxious weeds and invasive species. Reseeding and revegetating with native species would stabilize soil and, coupled with an active weed management program, would limit growth of noxious weeds and invasive species. There would be no direct impact to species of published ethnobotanical concern (plants used by indigenous cultures) or to sensitive species, as there are none present near TREAT or along the cable corridor (Hafla, J. et al. 2013).

Wildlife Impacts—

A variety of small and large mammals and birds (e.g., badgers, elk, pronghorn, bats, and sage-grouse) use the area around TREAT, including the areas near the cable corridor and TREAT Reactor Control Building. Activities that disturb vegetation and soil would have small-scale, short-term unavoidable impacts to wildlife species, including loss of certain ground-dwelling wildlife species and associated habitat. Impacts to sage-grouse are not anticipated because of the limited amount of disturbance planned, the lack of suitable habitat in the potentially impacted area, and the long distance from TREAT to the nearest active lek (breeding area) (Hafla, J. et al. 2013).

These short-term impacts would be minimized by limiting the disturbance footprint, implementing a weed management strategy, and promptly stabilizing the disturbed areas. Any activity planned to occur between May 1st and September 1st that potentially disturbs vegetation or soils would require a nesting bird survey before disturbance (Hafla, J. et al. 2013).

Radiological Impacts to Plants and Animals—

Based on the analysis of particulate emissions from the TREAT Stack, only Ba-140 poses a potential threat to plants and animals (Schafer et al. 2014). The concentration limit for Ba-140 is 7.32 pCi/g for terrestrial animals and 3.84×10^4 pCi/g for terrestrial plants. The predicted soil concentration resulting from normal operations at TREAT is 1.47 pCi/g, which is well below the concentration limits for both animals and plants. Therefore, the potential impact to biota is low (Hafla et al. 2013).

Ecological Research and Monitoring—

DOE's Ecological Service Contractor conducts yearly breeding bird surveys along a route near MFC, TREAT, and the TREAT Reactor Control Building. This survey is conducted in June (Whiting and Bybee 2013). There would be no effect from Alternative 1 on the continuity and utility of the breeding bird survey route.

Impacts to Cultural Resources

The direct APE where impacts to cultural resources could occur is limited to the buildings, parking lots, and the surrounding gravel aprons; the roadway between TREAT and the TREAT Reactor Control Building; the buried cable corridor that parallels the road; and the narrow strip of land between the buried cable corridor and the adjacent road where staging, laydown, and temporary parking areas may occur.

Field surveys in 2013 demonstrated that no archaeological resources are located in the direct APE (Pace and Williams 2013), and, based on these results, Alternative 1 poses no direct threat to archaeological resources. Adverse impacts to resources that are important to the Shoshone-Bannock Tribes are also unlikely given the absence of archaeological resources and the small area of ground disturbance associated with Alternative 1.

Although direct impacts will not occur, there is some potential for undesirable indirect impacts to archaeological resources that are located outside of the defined direct APE for Alternative 1 (i.e., Indirect APE). For example, human activity is likely to increase during soil disturbing activities and operations, and any archaeological resources or natural resources of potential concern located within the indirect APE may be subject to unauthorized collection or impact by off-road vehicle use and other small ground disturbing activities that commonly occur around active developed areas. DOE would monitor and protect the single archaeological site identified in the indirect APE, and no indirect or cumulative impacts are anticipated at this location.

Resident and migratory birds and animals of tribal concern may also be temporarily disturbed and noxious and invasive weeds may increase due to the detriment of native species (as described earlier). Visual impacts associated with soil disturbing activities (fugitive dust) and plant operations are expected to be minimal due to their temporary occurrence and consistency within the range of activities that have historically occurred within this established industrial landscape. Rehabilitation of soil disturbance would minimize adverse impacts to plants and wildlife of concern to the Shoshone-Bannock Tribes.

The TREAT Reactor Building (MFC-720) and original Reactor Control Building (MFC-721) are potentially eligible for listing on the NRHP. The proposed adaptation, re-use, and continued use of these historic properties are consistent with original missions related to nuclear reactor testing and are considered beneficial.

Activities associated with TREAT Reactor restart are consistent with routine activities that have been previously screened and determined to not pose a threat to cultural resources (DOE-ID 2013a). The proposed activities at other INL facilities are operational only, would not involve construction or modifications, and do not have the potential to impact these historic properties. Cultural resource investigations within the direct APE support a finding of no adverse effects to historic properties under the National Historic Preservation Act (NHPA) and no adverse impacts to any known resources of cultural significance based on activities associated with TREAT Reactor restart (Pace and Williams 2013).

Impacts of Waste Generation and Management

Waste would be generated during activities required to restart the TREAT Reactor, routine transient testing operations at TREAT and TREAT Reactor Control Building, and specific to the experiments at MFC.

Preparing to Restart the TREAT Reactor—

Various refurbishment and like-for-like replacement activities would be required for this alternative. These activities would generate non-radioactive electronic waste, scrap metal, and other construction-related debris. Construction debris, electronic waste, and scrap metal would be recycled to the extent possible. Other restart activities could require disposal of construction debris, concrete, coolants, and hydraulic/lubricating fluids. These wastes could be recycled or disposed at on-site facilities or sent off-site. The various non-radioactive waste volumes generated as part of the TREAT Reactor restart is expected to be less than 800 m^3, some of which can be recycled. To put this volume in perspective, the INL industrial waste landfill disposes of about 23,000 m^3 of waste and trash each year.

The two diesel generators—30 kW standby generator and the 130 kW redundant power generator—would be refurbished to meet current Clean Air regulations or replaced.

Low-level radioactive waste (LLW) generated during restart preparations may include contaminated scrap metal, HEPA filters, used personal protective equipment, wipes, rags, and decontamination fluids. Solid LLW would be sent to an off-site disposal facility permitted/licensed to accept LLW. Liquid LLW would be solidified and sent to an off-site disposal facility permitted/licensed to accept LLW. The volumes of these various LLWs generated during refurbishment and replacement activities are expected to be less than 100 m^3. During the past three years, INL sent an average of 1,300 m^3 LLW to off-site facilities for disposal each year.

No mixed low-level waste (MLLW) (waste which is both radioactive and hazardous) is anticipated to be generated during restart preparations. If MLLW were generated, it would be accumulated and stored in accordance with federal and state regulations, treated if required, and disposed at an off-site permitted/licensed facility.

Routine Maintenance and Operations at the Reactor Building and Reactor Control Building—

The waste generated at TREAT would be minimal since the test assemblies would be brought into the facility intact, irradiated, and removed from the facility as intact assemblies. Routine maintenance and operations at TREAT would generate a variety of waste streams, including both radioactive and non-radioactive wastes. Non-radioactive wastes would include trash and waste found at any industrial facility, including common trash, wastewater, hydraulic and lubricating fluids, scrap metal, and possibly small amounts of hazardous waste. Common trash would be disposed at the on-site industrial waste landfill. Hydraulic and lubricating fluids would be recycled or disposed at an off-site permitted facility. Non-radioactive scrap metal would be recycled. Hazardous waste generated at TREAT, if any, would be accumulated and stored in accordance with federal and state regulations, treated and disposed at an off-site permitted/licensed facility.

Wastewater at TREAT would be generated from sinks and floor drains. Water would be collected in a 1,000-gallon tank where it would be sampled for radioactive and chemical constituents before disposal. If no radioactive constituents are detected, then the water could be discharged to either the MFC industrial waste pond or the sanitary waste pond in accordance with DOE Orders and state regulations. Historical records indicate TREAT generated less than 1,600 gallons of wastewater a year; the current wastewater discharge rate to the industrial and sanitary waste ponds from on-going MFC activities is about 10 million gallons a year. To reduce waste volumes the water is removed by heating and evaporation and remaining solids residue are disposed of as LLW. As a result, TREAT wastewater residue would add 1 m^3 per year.

Solid LLW may include scrap metal, HEPA filters, used personal protective equipment, wipes, rags, and decontamination fluids. Solid LLW would be sent to an off-INL disposal facility permitted/licensed to accept LLW. Liquid LLW would be solidified and sent to an off-site disposal facility permitted/licensed to accept LLW. The volume of various LLW generated during routine operations are expected to be less than 2 m^3 per year. The additional LLW disposal due to these operations would represent less than a 1% increase in the volume sent to off-site disposal facilities each year.

The environmental impacts associated with disposal and transportation of LLW are addressed in the Final Waste Management Programmatic Environmental Impact Statement for Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste (DOE 1997a), the Environmental Assessment for the Replacement Capability for Disposal of Remote-Handled Low-Level Radioactive Waste Generated at the Department of Energy's Idaho Site (DOE 2011b), and the Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada (DOE 2013a).

No MLLW is anticipated to be generated during routine maintenance and operations. If MLLW were generated, it would be accumulated and stored in accordance with Federal and state regulations, treated if required, and disposed at an off-site permitted/licensed facility.

Experiment Handling and Examinations in HFEF and Other MFC Facilities—

Resuming transient testing at TREAT would result in waste generation at the facilities where the test assemblies are assembled, disassembled, and analyzed. The materials and fuel specimens proposed for TREAT experiments would not be appreciably different from past TREAT Reactor tests. Therefore, the waste streams were assumed to be similar as well (Adams, et al. 2014).

DOE estimates that up to 12 m^3 of LLW would be generated each year as a result of assembling, transporting, irradiating, disassembling, and analyzing test assemblies at MFC. Based on INL's average annual LLW generation rate of 1,300 m^3, the increase in LLW generation would represent less than 1% of the volume generated at the INL each year. MLLW may also be generated during these operations. If MLLW were generated, it would be accumulated and stored in accordance with Federal and state regulations, treated if required, and disposed at an off-site permitted/licensed facility. Transient testing activities would generate an estimated 6 m^3 of transuranic waste, greater-than-class C (GTCC) waste, GTCC-like waste, or Spent Nuclear Fuel debris over the 40-year timeframe of the proposed action. The environmental impacts associated with disposal of transuranic waste are addressed in the Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement (DOE 1997b). The increase in waste generation would have negligible environmental impacts.

INL currently has operating waste management facilities and required permits/licenses to manage all wastes that are anticipated to be generated as a result of resuming transient testing. LLW and transuranic radioactive waste would be sent to existing disposal facilities.

If generated, GTCC and GTCC-like wastes would be sent to one of the facilities DOE is currently evaluating in the Environmental Impact Statement for the Disposal of GTCC LLW and GTCC-Like Waste (DOE 2011a). Spent nuclear fuel debris would be securely stored with DOE's spent fuel and spent fuel debris inventory awaiting a future disposal facility. The environmental impacts associated with management of spent nuclear fuel debris are addressed in the Programmatic Spent Nuclear Fuel (SNF) and Idaho National Engineering Laboratory (INEL) Environmental restoration and Waste Management Environmental Impact Statement (DOE 1995).

4.1.2 Accident Consequences

Accident consequences for Alternative 1 were evaluated for events related to the operation of the TREAT Reactor, including refueling, experiment handling at TREAT and MFC (excluding transportation which is covered in Section 4.1.3), and transient testing at TREAT (Schafer et al. 2014).

Overview of Accident Analysis

The accident analysis was conducted by:

1. Identifying radiologic inventories that would be contained in the test assembly and the TREAT Reactor core that present the highest dose potential (i.e., bounding inventory).
2. Identifying potential accident scenarios that could involve operation of the TREAT Reactor, handling the TREAT Reactor fuel and test assembly, and those that could occur during the process of transient testing using the TREAT Reactor.
3. Calculating the annual frequency of occurrence for each accident scenario and calculating the probability of each accident scenario occurring during the 40-year timeframe of the proposed action.
4. Identifying receptor locations for dose calculations. Receptor locations included those for *facility workers* (see Glossary*),* collocated workers and members of the public.
5. Calculating the doses for each receptor and numbers of estimated cancer fatalities that could result from the dose (i.e., *latent cancer fatality or LCF)* (see Glossary).

Radiologic Consequences

Results of the accident analysis conducted for operations at TREAT are summarized in Table 2. The analysis of accident scenarios looked at events that could be caused by a range of natural phenomena hazards (seismic, wind, flood etc.), operator errors, and equipment failure. The highest consequence events can be summarized as follows:

- **Experiment handling event impacting the TREAT Reactor:** Higher accident-related worker doses would likely result from equipment failure or operator error as opposed to routine irradiation using the TREAT Reactor. Transient testing requires moving the experiment assembly above the reactor. A handling accident involving the experiment above the TREAT Reactor has a one in 25,000 chance of occurring in any given year. The probability of this type of accident occurring once during the 40-year timeframe of the proposed action is one in 625.

    It is improbable that dropping an experiment assembly into the reactor would result in a fire or inability to safely shutdown the reactor, but the drop could damage the fuel in the experiment and could damage the TREAT Reactor fuel cladding. If the drop resulted in a release of gas or particulates from the fuel, facility workers in the building could receive a radiologic dose from the release. In addition, it is assumed that a release occurring in the building would be transported downwind from the building eventually reaching the INL boundary, where members of the public could be affected.

Table 2. Summary of dose impacts for the highest consequence events for Alternative 1.

Receptor	Dose (rem) or Dose Rate (rem/min)	LCF[a]
Experiment handling event impacting the TREAT Reactor		
Facility Worker[b]	6 rem/min	NA[c]
TREAT Collocated Worker[d]	2 rem	1 chance in 830
Offsite *Member of the Public* (see Glossary)	0.08 rem	1 chance in 21,000
TREAT Reactor fuel clad failure		
Facility Worker[e]	7 rem	NA[c]
TREAT Collocated Worker	7 rem	1 chance in 240
Offsite Member of the Public	0.2 rem	1 chance in 8,300

a. See definition in 'Glossary' or understanding LCF under 'Helpful Information For the Reader'.

b. The TREAT facility worker is located in the TREAT Reactor Building during experiment handling. Facility worker dose rates do not credit protective actions or equipment. Administrative controls, protective actions, and equipment would be used to reduce projected worker doses.

c. Administrative controls and protective actions and equipment would be used to mitigate facility worker doses. Therefore, the LCF is not applicable as protective measures and actions have not been considered.

d. Collocated worker doses for this event were evaluated at 300 m to remain consistent with the analysis for Alternative 2.

e. The TREAT facility worker is not located in the TREAT Reactor Building during transient testing. The TREAT facility worker would be remotely located in the TREAT Reactor Control Building during transient testing. Therefore, the dose projections for the facility worker and the TREAT collocated worker are the same for this postulated scenario.

- **TREAT Reactor fuel clad failure:** The highest dose or risk of LCF (*dose consequence* [see Glossary]) for members of the public could occur if the TREAT Reactor fuel cladding is compromised. During transient testing, facility workers and collocated workers would be remotely located in the TREAT Reactor Control Building; therefore the facility worker and co-located worker dose is projected to be the same for this postulated scenario. The dose associated with this scenario represents the highest anticipated public dose analyzed. The TREAT Reactor fuel clad could be compromised if the reactor safety features failed during a transient test. There is a one-in-270,000 chance that the redundant reactor safety features would fail in any given year. The probability of the safety features failing once during the 40-year timeframe of the proposed action is one in 6,750; therefore, this accident is very unlikely to occur.

Doses and LCFs for members of the public are negligible for all scenarios. Administrative controls and protective actions and equipment would be used to mitigate worker doses. Therefore, the accident consequences for workers are also considered to be negligible.

The estimated doses and resultant health risks provided in the analysis of accidents are conservative. They are based on a bounding radiologic inventory for the experiments and a very conservative estimate of the TREAT Reactor core radiologic inventory. The dose calculations do not credit reductions in radionuclide concentrations that could occur during transport from the site of an accident to the outside environment. The estimated doses do not assume collocated workers or members of the public are evacuated. Facility workers and collocated workers are assumed to be unprotected by shielding, respirators, or other personal protective equipment. Workers are present in the TREAT Reactor Building during steady-state or low-power reactor operations. There are no credible reactor accident scenarios resulting in facility worker or collocated worker exposure from this mode of reactor operation. During transient testing, workers are located in the TREAT Reactor Control Building, about 0.45 miles southeast of the reactor building. Administrative controls and protective actions and equipment would be used to mitigate worker doses. Additional conservatisms in the dose calculation are discussed for each accident, as applicable, in Appendix F, Schafer et al. (2014).

4.1.3 Impacts of Transportation

Transportation of the test assembly components in Alternative 1 would occur between facilities on the INL Site. The route that will be followed is shown in Figure 7, and is entirely on the INL site using roadways controlled by INL security. Transportation of research fuels to MFC from commercial facilities would occur on public roadways pursuant to the NRC’s authority for the commercial reactor using commercial, NRC-certified, U.S. Department of Transportation (DOT)-compliant transport casks.

For transportation on the INL site, two types of casks would be used: a cask similar to the GE-2000 or Battelle Energy Alliance research reactor cask would be used for transportation to MFC and for transportation to TREAT, a cask specially designed to transport the MARK-III test assemblies (TREAT Loop Handling Cask HFEF-15 cask) would be used.

The assessment of transportation impacts considered all major groups of potentially exposed persons. Transportation associated with Alternative 1 would involve “out of commerce” shipments on roads located solely on the INL. As the test materials are being transported between facilities on the INL access to the route by members of the public and non-involved workers will be restricted and a transportation-related dose would not be received. Therefore, major groups of potentially exposed persons are reduced to:

- ***Collocated workers*** **(See Glossary) along the route:** Collective doses are calculated for all persons working in the facilities at INL along each side of the transportation route. The width of this band is assumed to be approximately ½ mi.
- ***Inspectors*** **(See Glossary) of the transport:** Collective doses are calculated for workers that would inspect the transport initially and that could accompany the transport along the route. Inspectors are assumed to be occupational radiation workers, are shielded, and would be monitored by a dosimetry program. Therefore, the maximum allowable annual dose would be 5 rem (2 mrem/hour).
- ***Crew members*** (see Glossary): Collective doses are calculated for the truck transportation crew members. Truck crew members are assumed to be occupational radiation workers, are shielded, and would be monitored by a dosimetry program. Therefore, during routine transport, the maximum allowable annual dose would be 5 rem (2 mrem/hour) (DOE 1994).

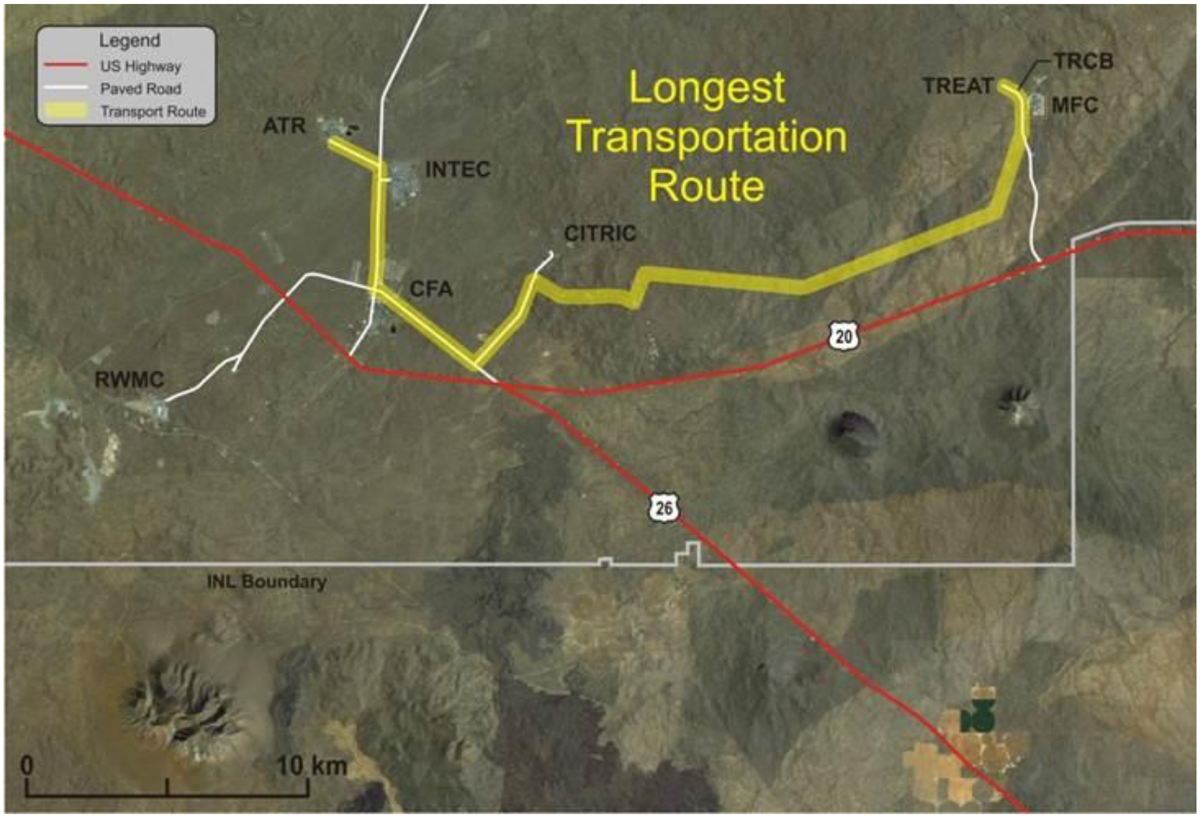


Figure 7. Longest transportation route that would be followed between INL facilities.

Routine Transportation

The transportation doses expected during routine transport on INL computed for the longest possible route are shown in Table 3. These results are provided for 34 round trips and represent annual collective population doses.

Table 3. Summary of analysis results for routine transportation for 34 onsite round trips to TREAT.

Receptor	Dose (per year)	LCF[a] (per year)
Crew (Transportation Worker)	0.3 (person-rem)	1 chance in 5,500
Collocated Workers Along Route	0.04 (person-rem)	1 chance 42,000
Maximum Collocated Worker Dose	2.6×10^{-5} (rem)	1 chance in 64 Million
Inspector/Escort (3m from Cask)	0.6 (rem)	1 chance in 2,800
a. See definition in 'Glossary' or understanding LCF under 'Helpful Information For the Reader'.		

Transportation Accidents

On-site shipments containing radiological materials undergo an extensive safety analysis and review process to ensure proper safety plans are developed and implemented. After a review of the design criteria used for the shipping casks and of the potential transportation accident scenarios that could occur on INL, it was determined that an accident that would result in the release of radioactive material from a shipping cask is not credible (Schafer et al 2014). Accidents, including minor accidents, are not likely to occur more than once in every 100,000 miles on public roadways

(NRC, 2012). Minor accidents are even less likely to occur on INL because of the low transport speeds and because access along the INL transportation route will be restricted. The total number of miles traveled on INL per year is expected to be less than 1,000. Based on mileage alone, there is very little chance that even a minor accident would occur in any year.

Type B casks such as the General Electric-2000 or the Battelle Energy Alliance Research Reactor cask are licensed for highway speeds over public roads and certified to withstand a 9 m drop onto a solid surface with impact at the most damaging point followed by a 1 m drop onto a steel bar (10 CFR 71.73). To withstand a potential accident involving a fire, they are also designed to withstand an 800°C fire for 30 minutes. These design criteria are in place to minimize the release of radionuclides during potential traffic accidents.

The HFEF-15 cask has undergone an extensive safety analysis and review process to ensure it is capable of safely transporting the test loops between the HFEF and TREAT. It is designed to protect the MARK-III loops under credible drop or impact conditions. The route between MFC and TREAT will be controlled and access will be restricted during transport.

Non-Radiological Transportation Impacts

Non-radiological impacts related to transportation for Alternative 1 occur simply as any material is transported from one location to another independent of the characteristics of the cargo. Non-radiological risks are directly related to vehicle emissions (greenhouse gases [GHGs]) and the probability of accident related fatality. Table 4 identifies the transportation characteristics for Alternative 1 and applies documented rates of occurrence or risk factors as appropriate.

Table 4. Estimated annual emissions and fatalities resulting from on-Idaho National Laboratory shipments.

Impact Type	Factor	INL Transportation
Miles/Round Trip		25.2
Trips/Year		34
Distance/Year		860 mi
Gallons/Year	6.6 mi/gallon[a]	130
Greenhouse Gases	22.2 lb/gallon[b]	1.5 ton
Accident Fatality[c]	0	0

a. State Transportation Statistics, 2005.

b. www.eia.gov/tools/faqs/faq.cfm?id=307&t=11.

c. On INL, no accidents are anticipated and there would be no accident related fatalities.

4.1.4 Impacts of Intentional and Destructive Acts

Impacts of intentional acts of destruction occurring at an INL facility or during transport on INL were considered. The potential for an act of sabotage occurring on site is mitigated by protective services. INL routinely employs a variety of measures to mitigate the likelihood and consequences of intentional destructive acts. The DOE maintains a highly trained and equipped protective force intended to prevent attacks against and entry into the facilities. The site perimeters are monitored and patrolled to prevent unauthorized entry.

Access to INL roads will be restricted during transport of radioactive materials. Security measures will be in place to mitigate the likelihood and consequences of sabotage. Transportation crew members would be screened for behavioral and substance abuse issues and would receive safety and security training. Crew members would conduct a thorough inspection of their vehicle and load prior to transport. During transport, crew members would always have in their possession a working means of communication and would be trained to immediately report suspicious activity encountered en route.

An act of sabotage for Alternative 1 would result in dose consequences similar to the highest consequence event scenarios evaluated for TREAT.

4.1.5 Accidental Contamination and Other Indirect Impacts

For Alternative 1, accidents resulting in a release of radiologic material during transportation on INL are improbable and therefore, accidental contamination and other indirect impacts would not occur. Non-transportation accidents are most likely to occur at MFC or TREAT. Accidental contamination could necessitate:

- Relocating individuals to a safe distance and prevention of reentry following an accident. In the case of onsite accidents occurring on INL, members of the public are located at distances that would allow sufficient time for notification and are far enough away that predicted doses are well below 1 rem. Therefore, in the unlikely event of an accident involving a release of radionuclides, the likelihood that members of the public would require evacuation is minimal.
- Remediation of soils between INL facilities. It is unlikely that remediation of soils would be required; however, if remediation of soils were required contaminated areas would be secured and remediated.
- Decontamination of government equipment including vehicles, buildings and land. The potential need for decontamination is small. The area needing decontamination would likely be contained within government controlled and operated property.

The potential economic consequences of an accident are expected to include costs associated with decontamination of government owned and operated property, and those incurred through the loss of property use. It is unlikely that relocation of members of the public would be required under any accident scenario, and it is unlikely that costs would be incurred to decontaminate or condemn private property.

4.1.6 Sustainability

Increases in diesel generator use, on-site transportation, and emissions from stationary combustion sources would result in an estimated 24 Metric Tons (MT) CO2 equivalent GHG emissions every year. Purchased electricity to operate TREAT would also be a contributor of GHG emissions. Although an increase in power use at TREAT is likely to have some impact on INL's GHG emissions, it would be a very small part of INL's overall GHG inventory based on estimates of similar facilities and TREAT power needs. The GHG emissions at INL in fiscal year 2012 were about 140,000 MT CO2 equivalents. The additional GHG produced by Alternative 1 represents less than 0.02% of the total INL GHG emissions.

4.1.7 Cumulative Impacts

DOE reviewed the resources at risk; their geographic boundaries; past, present, and reasonable foreseeable future actions; and baseline information in determining the significance of cumulative impacts. The review was assessed for construction, transportation, normal operations, and potential impacts of accidents. Conclusions are as follows:

- As a result of refurbishment activities, there would be no cumulative biologic or cultural resource impacts. New footprints would not be established and soil disturbance would be minimized and rehabilitated. There would be low short-term impact to INL's ecological resources, no direct impact to archaeological sites, and no adverse impacts to historically significant buildings and structures. Given the nature of the impacts, cumulative impacts are determined to be negligible.
- During normal operations, cumulative radiologic, waste generating, or sustainability impacts would be minimal. Radiologic releases during normal reactor operations, transport of test assembly components, and transient testing would not result in adverse health impacts. Additional waste volumes would be small compared to current disposal volumes at INL. Additional GHG emissions would be negligible compared to INL-wide amounts.

- The total annual estimated air emission dose reported for INL compliance in year 2012 was 3.57×10^{-2} (0.0357) mrem (U.S. Department of Energy Idaho Operations Office [DOE ID] 2013c). Inclusion of the annual estimated ED contribution from the TREAT Reactor (1.1×10^{-3} (0.0011) mrem) would result in a total annual estimated dose at Frenchman's Cabin of 3.68×10^{-2} (0.0368) mrem (see Section 4.1.1).
- There are several government and private proposed projects that DOE considers reasonable and foreseeable that would include radiological emissions that could contribute to cumulative impacts. Those that DOE reviewed include (see Table 5):
    - DOE Idaho Spent Fuel Facility
    - New DOE Remote-Handled LLW Disposal Facility
    - INL Stand-Off Experimental (SOX) Range
    - Plutonium-238 Production for Radioisotope Power Systems
    - Recapitalization of Infrastructure Supporting Naval Spent Nuclear Fuel Handling
    - Resumption of Transient Testing using the TREAT facility
    - Eagle Rock Enrichment Facility.

Table 5 Estimated annual air pathway dose (mrem) from normal operations to the maximally exposed off-site individuals from the above proposed projects, including the estimated dose from TREAT.

Reasonable Foreseeable Future Action	**Estimated Annual Air Pathway Dose (mrem)**
DOE Idaho Spent Fuel Facility (NRC 2004)	0.000063
New DOE Remote-Handled LLW Disposal Facility (DOE 2011b)	0.0[a]
INL SOX Range (DOE 2011c)	0.021
Plutonium-238 Production for Radioisotope Power Systems (DOE 2013c)	0.00000000026
Recapitalization of Infrastructure Supporting Naval Spent Nuclear Fuel Handling[b]	0.0006
TREAT (Schafer 2014)	0.0011
Total of Reasonably Foreseeable Future Actions on INL	**0.0228**
Current Annual Estimated INL Emissions[c]	0.0357
Total of Current and Reasonably Foreseeable Future Actions on INL[d]	**0.058**
Eagle Rock Enrichment Facility (NRC 2011)[e]	1.4
Cumulative radiologic air impact of all sources near INL[f]	**1.5**

a. Under normal operations, the Remote-Handled LLW Disposal Facility is not projected to have an air pathway dose

b. Preliminary Draft Environmental Impact Statement for the Recapitalization of Infrastructure Supporting the Naval Spent Fuel Handling (DOE/EIS-0453-D), In Preparation, January 2014.

d. This total represents the air impact from all current and reasonably foreseeable future actions and assumes they all occur at Frenchman's cabin.

e. Eagle Rock Enrichment Facility will be located southeast of INL and has little potential of impacting air quality at Frenchman's cabin.

f. This total represents air impact from all current and reasonably foreseeable future actions at INL plus the Eagle Rock Enrichment Facility.

As stated above, the total annual estimated dose reported for INL compliance in year 2012 was 3.57×10^{-2} (0.0357) mrem. Inclusion of the annual estimated ED contribution from all reasonably foreseeable future actions on the INL, including the TREAT Reactor equals 2.228×10^{-2} (0.0228) mrem and would result in a total annual estimated dose at Frenchman's Cabin of 5.8×10^{-2} (0.058) mrem (see Table 5). Summing doses for the current and reasonably foreseeable future actions on INL provides a conservative estimate of the total dose because the locations of the highest public receptor EDs are different. For example, the location of the highest public receptor ED for the INL SOX Range is at an offsite location near the north part of the INL Site while the location of the highest public receptor ED for the INL (including the TREAT reactor) is located at Frenchman's Cabin near the southwestern part of the INL Site. Conservatively summing all reasonably foreseeable future actions on and near the INL Site, including the Eagle Rock Enrichment Facility, which is proposed to be located offsite to the east of the INL Site, would result in an annual estimated total dose of 1.5 mrem as indicated in Table 5. This estimated dose is much lower than the 10 mrem annual dose standard.

The potential additive impacts from implementing Alternative 1 for the Resumption of Transient Testing on the INL are determined to be collectively negligible and would have no impact to reasonably foreseeable actions or current operations.

4.2 Alternative 2 – Modify the ACRR

Alternative 2 involves pre-irradiation examination at INL's MFC, transportation of the test assembly components to SNL/NM, assembly of components in the ACRR hot cell, irradiation of the test assembly in the ACRR, repackaging for transport in the ACRR hot cell, transportation of the test assembly components back to INL for post-irradiation examination, and disposal of generated waste.

This EA considers construction and normal operations activities that will occur at ACRR, transport to SNL/NM from INL's MFC, transport on INL, and accidents that could occur either on INL or at SNL/NM. The detailed analyses of these impacts are contained in Schafer et al. 2014 and summarized in this EA.

4.2.1 Construction and Normal Operations Activities

Construction and normal operations activities for Alternative 2 are discussed in Section 2.2.2. Construction activities include building a new hot cell at ACRR and adding a fuel motion monitoring device to ACRR. This analysis evaluates the impacts of putting in a hot cell to determine the potential to impact biologic, ecologic, and cultural resources.

Normal transient testing operations using ACRR involve the irradiation of the test assembly in the reactor, steady-state and transient operation of the reactor, transportation of the test assembly, and disposal of generated waste. The detailed analyses of radiologic impacts are contained in Schafer et al. 2014.

Understanding Normal ACRR Operations

During the sequence of events that would take place under normal operating conditions, the ACRR reactor is operated in steady-state and transient conditions and heat is generated in the reactor and test assembly. As previously described, the ACRR is water cooled. The cooling water entrains most fission and activation products in the pool water.

Releases to the Air

Non-Radiological Emissions—

The ACRR uses power supplied exclusively from the grid. It does not use diesel generators to provide supplementary power. Therefore, during normal reactor operations and during transient testing, only activated air surrounding and adjacent to the reactor would be released to the environment.

Radiologic Impacts of Atmospheric Releases—

ACRR is an operating reactor. ACRR is currently capable of limited transient testing. Therefore, this EA only assesses the incremental impact of conducting transient tests discussed in Sections 1 and 2 at ACRR. For the energy production required during the experiments, the annual projected emissions from the ACRR Stack for the proposed tests would be about 1.3 Ci of Ar-41. Atmospherically transported emissions were evaluated for the release of Ar-41 at the following three locations (see Figure 8) (Schafer et al. 2014).

1. **Kirtland Storage Site:** This location is occupied by workers 24 hours per day, seven days per week, and therefore represents an important worker location. It is the site most impacted by operations at ACRR. The total annual estimated ED at this site from combined SNL/NM sources is 8.6×10^{-4} (0.00086) mrem. The annual estimated ED contribution from transient testing would be 4.8×10^{-4} (0.00048) mrem.
2. **Chestnut Site:** This site is occupied by Air Force personnel workers. There are no permanent residents at Chestnut Site. The total annual estimated ED at this site from combined SNL/NM sources is 8.2×10^{-4} (0.00082) mrem. The annual estimated contribution from transient testing would be 1.1×10^{-4} (0.00011) mrem.
3. **Eubank Gate:** This is the closest location to ACRR frequently occupied by members of the public. The annual estimated ED from transient testing would be 4.8×10^{-5} (0.000048) mrem.

The EDs from normal operations at these locations are well below the 10 mrem/year federal standard set by 40 CFR 61, Subpart H – National Emissions Standards for Hazardous Air Pollutants. Cumulative doses from all SNL/NM sources and from air emitted from the ACRR would also be well below the 10 mrem/year dose standard.

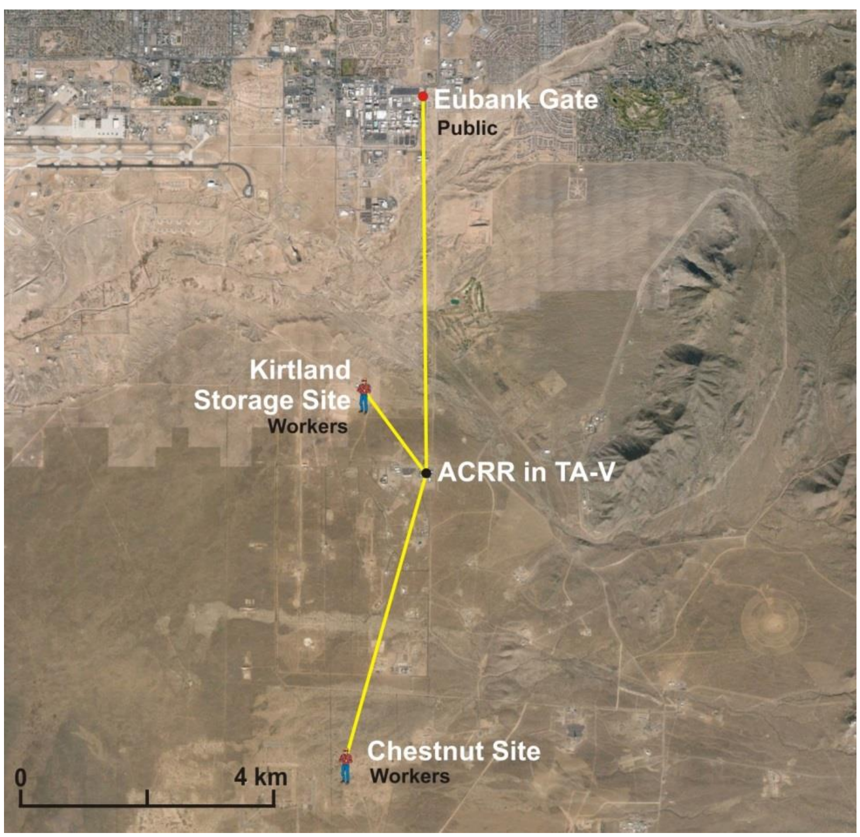


Figure 8. Receptor locations for the air pathway analysis, showing distance and direction from the Annular Core Research Reactor (ACRR) (Base map courtesy of Google Earth).

Radiological Impacts of Releases to Soils—

Atmospheric releases during normal operations from the ACRR are limited to Ar-41, a noble gas that is neither deposited on plant or soil surfaces nor subject to bioaccumulation by biota. Therefore, there are no ingestion or biotic exposure pathways from contaminated soil that need to be considered by this analysis.

Radiological Impacts to Groundwater—

Normal operations at ACRR do not result in releases of radionuclides to soil or groundwater. Therefore, there are no groundwater pathways that need to be considered by this analysis.

Impacts to Biological Resources

Potential impacts to biologic resources would consist of those resulting from pre-operations construction disturbances.

Plants and Soil Disturbance Impacts—

TA-V is a developed area. Construction impacts would be limited to areas within TA-V. Impacts to biological resources would be short-term, occurring during construction.

Wildlife Impacts—

Two major physiographic provinces influence the flora and fauna of the region: (1) Mesa and plains and (2) Mountains (SNL/NM 2012). The topography of the KAFB and SNL/NM area ranges from lowland grasslands to high-elevation coniferous forests. With much of the area undeveloped, there is great diversity in plant and animal communities within the KAFB and SNL/NM area. At least 267 plant species, 206 bird species, 34 reptile/amphibian species, 25 small mammal species, 2 ungulate species (KAFB, 2007), 13 bat species (KAFB 2009), and 13 predator species (KAFB 2006) have been documented on KAFB. There are 25 species that are either federal or state listed as threatened or endangered, candidate, or species of concern, occurring in Bernalillo County (SNL/NM 2012).

Construction and operation of the ACRR for transient testing would not result in increased disturbance to the already developed industrial setting and would have negligible impacts on local wildlife and plant species.

Radiological Impacts to Plants and Animals—

The only radionuclide released during normal operations (including the transient tests), is airborne Ar-41. Argon-41 does not form particulates, and therefore is not subject to ingestion. Accordingly, the dose from radiological emissions to biota would be negligible.

Impacts to Cultural Resources

The proposed new hot cell footprint would pose no threat to cultural resources. Although the area includes contributing elements to a proposed historic district, the purpose and design of the new hot cell are in keeping with the functions of the existing buildings in the area. Archaeological surveys in SNL/NM's TA-V indicated the ground has been previously disturbed and revealed no archaeological sites or the likelihood of them. Should construction reveal any archaeological remains, work would be stopped and the site would be assessed appropriately (Ullrich, R. A., et al. 2010a and b and 2012).

Impacts of Waste Generation and Management

Waste would be generated at SNL/NM during construction activities in TA-V, during modification of ACRR to accept the fuel motion monitoring device, and when handling the experiments in the ACRR hot cell. Alternative 2 would also use the facilities at INL, with most waste generation occurring at MFC where pre- and post-irradiation examination of the test assembly components would be conducted. The final disposition of waste associated with the test assemblies would occur at INL.

Modification of ACRR and Construction of New Hot Cell—

Wastes and effluents generated during hot cell construction are expected to be of standard industrial types and quantities. Installing a fuel motion monitoring device into ACRR can be accomplished in the current facility and is not expected to result in significant impact. Wastes generated would include normal construction debris (e.g., wood crates, cardboard, plastic, and concrete) and sanitary wastewater. Recyclable material would be separated, and the remaining waste transported to the KAFB landfill or other appropriate construction waste landfills for disposal. Less than 765 m^3 of waste is expected to require disposal.

No radioactive waste is anticipated to be generated during modification and construction. If radioactive waste were generated, it would be accumulated and stored in accordance with federal and state regulations, treated if required, and disposed at an off-site permitted/licensed facility.

Routine Maintenance and Operations at ACRR and New Hot Cell—

LLW would be generated during unpackaging and preparation of the test assembly in the hot cell, during decontamination of the irradiated test assembly, and during disassembly and packaging of the test assembly and any associated materials into DOT-approved casks for transport to the MFC facilities at INL. MLLW may also be generated during these operations. These wastes are expected to be similar to wastes generated during current reactor operations at SNL/NM; such wastes include used personal protective equipment, filters, and other debris. LLW and MLLW would be managed in accordance with existing waste management procedures at SNL/NM prior to off-site treatment or disposal. MLLW requiring treatment in accordance with Federal and state regulations would be treated using on-site treatment capabilities or shipped off-site for treatment at a permitted/licensed commercial facility prior to off-site disposal at a facility permitted/licensed to accept the waste. The operations would result in the generation of less than 2 m^3 LLW and MLLW per year. During the past three years, SNL/NM sent an average of 69 m^3 LLW and treated MLLW to off-site facilities for disposal each year. The additional waste requiring disposal due to these operations would represent less than a 3% increase in the volume sent to off-site disposal facilities each year. The environmental impacts associated with management of LLW and MLLW at SNL/NM were evaluated in the 1999 Site-Wide Environmental Impact Statement for SNL/NM (DOE/EIS-0281).

Experiment Handling and Examination at INL Facilities—

In Alternative 2, pre- and post-irradiation examination of transient testing experiments would be performed at INL MFC facilities. INL would manage LLW and MLLW generated by post-irradiation examination in accordance with DOE policies and procedures.

The projected waste streams generated at MFC would be the same as in Alternative 1. Estimates for the amount and types of radioactive waste generated under Alternative 2 at MFC would be equal to those generated under Alternative 1 plus the amount that would be generated during packaging and receipt of waste from SNL/NM. The environmental impacts associated with disposal of the projected waste streams at INL are addressed in Alternative 1.

In Alternative 2, DOE estimates that the volume of radioactive waste generated is approximately the same as generated in Alternative 1 and that the total increase in waste generation would have negligible environmental impacts at either site in this alternative.

4.2.2 Accident Consequences

Accident consequences for Alternative 2 were evaluated for events related to test assembly and material handling operations at INL, test assembly and material handling operations at SNL/NM, and irradiation of the test assembly in the ACRR (Schafer et al. 2014). Transportation impacts are discussed in Section 4.2.3. The analysis generally followed the approach used for accidents at INL (summarized in Section 4.1.2). The analysis was conducted by:

1. Using the test assembly radiologic inventory identified for Alternative 1 (i.e., the bounding inventory) and identifying the ACRR radiologic inventory that poses the highest dose potential.
2. Identifying potential accident scenarios that could involve handling the test assembly at INL, handling the test assembly at SNL/NM, and irradiating the test assembly in ACRR.
3. Calculating the annual frequency of occurrence for each accident scenario and calculating the probability of each accident scenario occurring during the 40-year timeframe of the proposed action.
4. Identifying receptor locations for dose calculations. Receptor locations included those for facility workers, collocated workers and members of the public. These receptor locations are in Idaho for accidents that could occur on INL and in New Mexico for accidents that could occur at SNL/NM.
5. Calculating the doses for each receptor and numbers of estimated cancer fatalities that could result from the dose (LCF).

Radiologic Consequences

The results of the highest consequence events expected to occur either at INL or SNL/NM are shown in Table 6. The consequences of these events can be summarized as follows:

- **Accidents at INL.** Accidents occurring at INL under Alternative 2 are most likely to result from fuel handling operations at HFEF. Mechanical damage could be caused by equipment failure or by operator error. There is one chance in 200 in any given year that a mishandling event severe enough to result in a release of radiologic material would occur. There is one chance in 5 that this type of accident would occur once during the 40-year timeframe of the proposed action.
- **Accidents at SNL/NM.** The highest consequence event at SNL/NM would occur if the test assembly failed while in the ACRR central cavity. The engineering design requirements of an experiment assembly make it unlikely that a failure would occur. There is one chance in 500 that a test assembly would fail in any given year. There is one chance in 12 that this type of accident would occur once during the 40-year timeframe of the proposed action.

Table 6. Summary of dose (rem) or dose (rem/min) impacts for highest consequence events for Alternative 2.

Receptor	Dose (rem) or Dose Rate (rem/min)	LCF[a]
Accidents at INL		
Facility Worker[b]	3 rem/min	NA[c]
HFEF Collocated Worker	0.1 rem	1 chance in 17,000
Offsite Member of the Public	0.007 rem	1 chance in 240,000
Accidents at SNL/NM		
Facility Worker[b]	75 rem/min	NA[c]
ACRR Collocated Worker	4 rem	1 chance in 410
Offsite Member of the Public	0.4 rem	1 chance in 4,200

a. See definition in 'Glossary' or understanding LCF under 'Helpful Information For the Reader'
b. Facility worker doses do not credit protective actions or equipment. Administrative controls and protective actions and equipment would be used to mitigate worker doses
c. Administrative controls and protective actions and equipment would be used to mitigate facility worker doses. Therefore, the LCF is not applicable as protective measures and actions have not been considered.

As a result of these accidents, consequences for members of the public and for collocated workers would be negligible without additional protective measures. Administrative controls and protective actions and equipment would be used to mitigate worker doses. Administrative procedures that could be implemented at ACRR have not been factored into the dose estimates provided in Table 6.

The estimated doses and resultant health risks provided in this analysis are conservative. They are based on a bounding radiologic inventory for the experiments. The estimated doses assume receptors are evacuated after 2 hours. Facility workers and collocated workers are assumed to be unprotected by shielding, respirators, or other personal protective equipment. Additional assumptions made in the dose calculation are discussed for each accident as applicable in Appendix F, Schafer et al. 2014.

4.2.3 Impacts of Transportation

Transportation on INL for Alternative 2 would impose the same restrictions for non-involved workers and members of the public. The route would exclude the route segment between MFC and TREAT; this route segment is short relative to the total route length and passes fewer facilities. Therefore, the impacts of transportation on the INL for Alternative 2 are approximately equal to those presented in Section 4.1.3.

Transportation between INL and ACRR is discussed below. Transportation impacts between INL and ACRR were analyzed along two routes running between INL and ACRR: the most direct route, which goes through Idaho, Utah, Colorado, and New Mexico; and a longer route, which goes through Idaho, Wyoming and Colorado, bypassing Utah (see Figure 9). For routine transportation, all major groups of potentially exposed persons were considered. They include the following population groups:

- Persons along the route
- Persons at stops
- Vehicle occupants sharing the route
- Crew members.

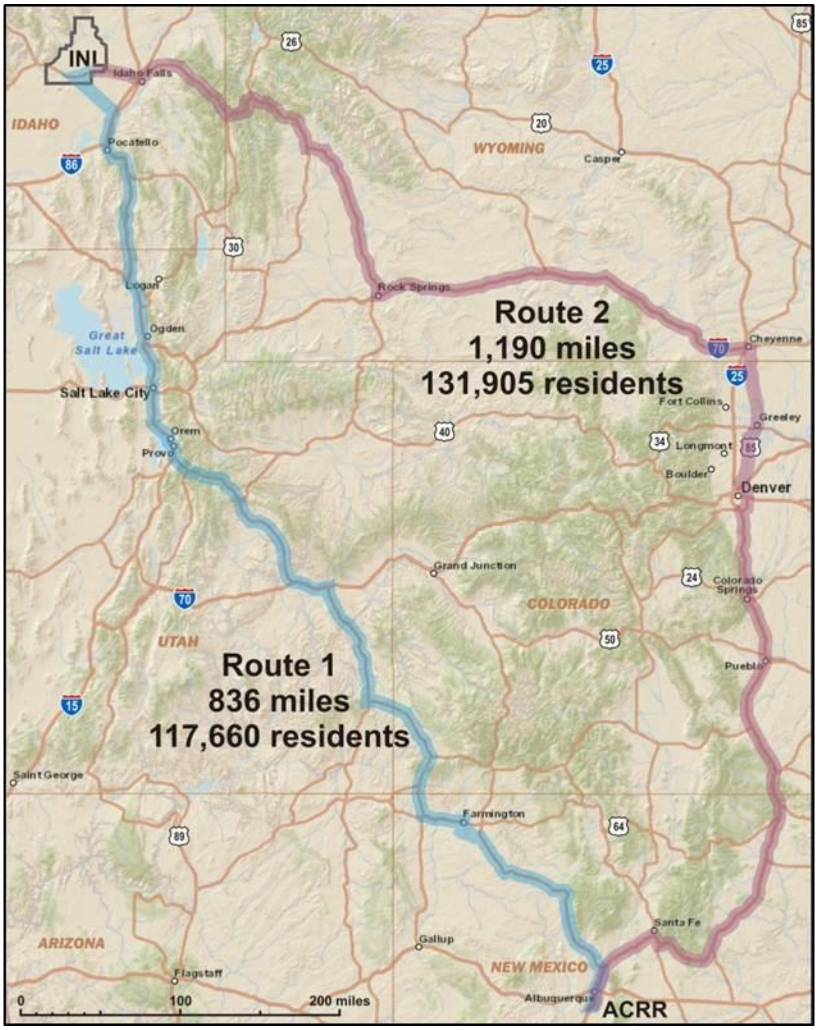


Figure 9. Map of transportation routes evaluated between the INL and ACRR.

Routine Transportation

For Alternative 2, the routine transportation impacts include those shown in Table 3 for transport on INL and in Table 7 for transport from INL to ACRR. Transportation of test assembly components to ACRR from INL would use commercially available, NRC-certified, DOT-approved transportation casks. The values shown in Table 7 represent the maximum exposure occurring on any segment of the two transport routes. The values shown represent annual cumulative doses and LCFs for 34 roundtrip shipments from INL to ACRR.

Table 7. Summary of annual routine transportation dose impacts for transport between the INL and ACRR.

Receptor	Dose (person-rem)	LCF[a]
Crew	11	1 chance in 150
Population Along Route (residents)	0.1	1 chance in 16,700
Vehicle Occupants Sharing Route	1.5	1 chance in 1,100
Persons at a Stop	0.5	1 chance in 3,300
a. See definition in ‘Glossary’ or understanding LCF under ‘Helpful Information For the Reader’.		

Transportation Accidents

Transportation accidents severe enough to result in the release of radioactive materials on INL are not credible. As discussed in Section 4.1.3, the type of cask that will be used, limited miles traveled per year, and the ability to restrict access to the transportation corridor all combine to make transportation accidents extremely unlikely.

The different types of accidents that can interfere with routine transportation of radioactive materials on public roadways between INL and SNL/NM are as follows:

- Accidents in which the transportation cask is not damaged or affected. The probability of this type of accident is on the order of 1 in 10,000. These include:
    - Minor traffic accidents (e.g., fender-benders or flat tires), resulting in minor damage to the vehicle
    - Accidents that damage the vehicle or trailer enough so that the vehicle cannot move from the scene of the accident under its own power, but do not result in damage to the cask
    - Accidents involving a death or injury, or both, but do not result in damage to the cask.
- Accidents in which the cask is affected. The probability of an accident resulting in a release of radiological material from the DOT approved Type B casks is on the order of 1×10^{-10}. These include:
    - Accidents resulting in the loss of lead gamma shielding or neutron shielding (or both), but no radioactive material is released
    - Accidents in which radioactive material is released.

Results of the transportation accident analysis are provided in Table 8. Because of the robust design of the Type B cask that will be used for interstate transport, the resulting doses for both types of accidents are negligible.

Table 8. Summary of transportation accident dose impacts for Alternative 2 transport between INL and ACRR.

Impact Types	**Accident Not Involving a Release from the Cask or Loss of the Lead Shield**		**Accident Involving a Release**	
	Person-rem	LCF[a]	Person-rem	LCF
Overall Maximum Dose per Accident	1.7×10^{-2}	1 chance in 98,000	2.8×10^{-1}	1 chance in 6,000
Overall Maximum Dose Risk per Accident	1.0×10^{-6}	1 chance in 2 Billion	1.2×10^{-14}	1 chance in 144 Quadrillion

a. See definition in 'Glossary' or understanding LCF under 'Helpful Information For the Reader'.

Non-Radiological Transportation Impacts

Non-radiological impacts related to transportation for Alternative 2 include those that could occur on INL and those that could occur between INL and ACRR. Non-radiological impacts are directly related to vehicle emissions (GHGs) and the probability of accident related fatalities. Table 9 identifies the transportation characteristics and consequences for the onsite and offsite transport route segments. For Alternative 2, the total impact includes impacts occurring on INL added to the impact occurring between INL and ACRR.

Table 9. Summary of annual emissions and accident fatalities for Alternative 2.

Impact Type	Factor	Route 1	Route 2
Total Miles/Round Trip[a]		2,720	3,853
Trips/Year		34	34
Total Distance/Year		92,400 mi 149,000 km	131,000 mi 211,000 km
Total Gallons/Year	6.6 mi/gallon[b]	13,900	20,000
Total Greenhouse Gases	22.2 lb/gallon[c]	155 T	220 T
Accident Fatalities between INL and ACRR	3.53×10^{-3} fatalities/accident	1.3×10^{-5}	2.3×10^{-5}
Accident Fatalities on INL[d]	0 accidents	0	0
Total Accident Fatalities		1.3×10^{-5}	2.3×10^{-5}

a. Total miles per round trip includes 25.2 miles associated with onsite transportation at INL. Between INL and SNL/NM, there are 1346.5 miles on Route 1, and 1914 miles on Route 2; distances are based on transportation routing for hazardous material and are therefore longer than those shown in Figure 6.

b. State Transportation Statistics, 2005.

c. www.eia.gov/tools/faqs/faq.cfm?id=307&t=11.

d. On INL no accidents are expected to occur.

4.2.4 Impacts of Intentional and Destructive Acts

Impacts of an intentional destructive act on INL were considered in Section 4.1.4. The potential for an act of sabotage occurring at SNL/NM will be mitigated by protective services. SNL/NM routinely employs a variety of measures to mitigate the likelihood and consequences of intentional destructive acts. The DOE maintains a highly trained and equipped protective force intended to prevent attacks against and entry into the facilities. Access to facilities on SNL/NM is controlled, with only those persons performing official business and presenting the proper credentials being allowed onsite. The site perimeters are monitored and patrolled to prevent unauthorized entry.

Transport of radioactive materials would routinely employ a variety of measures to mitigate the likelihood and consequences of sabotage. Crew members would be screened for behavioral and substance abuse issues and would receive safety and security training. Crew members would conduct a thorough inspection of their vehicle and load prior to transport. During transport, crew members would always have in their possession a working means of communication and would be trained to immediately report suspicious activity encountered en route.

4.2.5 Accidental Contamination and Other Indirect Impacts

For Alternative 2, accidental contamination and other indirect impacts could occur during transportation or as a result of non-transportation accidents. Accidents resulting in a release of radiologic material during transportation on INL are improbable. Similarly, the probability of a radiologic release occurring from a Type B cask, while enroute between INL and SNL/NM, is 1×10^{-10}. Therefore, accidental contamination and other indirect impacts associated with transportation activities are highly unlikely.

Non-transportation accidents could occur at INL facilities, in the ACRR hot cell, and in the current ACRR facility. Consequences of accidental contamination occurring on INL were discussed in Section 4.1.5. The consequences of accidental contamination occurring on SNL/NM are similar and could necessitate:

- Relocating individuals to a safe distance and prevention of reentry following an accident. In the case of onsite accidents occurring at SNL/NM, members of the public are located at distances far enough away such that predicted doses are below 1 rem. Therefore, in the unlikely event of an accident involving a release of radionuclides, the likelihood that members of the public would require evacuation is minimal.

- Remediation of soils on Kirtland Air Force Base not owned by DOE. It is unlikely that remediation of soils would be required; however, if remediation of soils were required contaminated areas would be secured and remediated.
- Decontamination of government equipment including vehicles, buildings and land. For accidents occurring at a facility, the dose calculations suggest that there could be a need for decontamination. The area needing decontamination would very likely be contained within DOE controlled and owned property.

The potential economic consequences of an accident on SNL/NM are expected to include costs associated with decontamination of government owned and operated property, and those incurred through the loss of property use. It is unlikely that relocation of members of the public would be required under either transportation or on-site accident scenarios, and it is unlikely that costs would be incurred to decontaminate or condemn private property.

4.2.6 Sustainability

The ACRR uses power supplied exclusively from the grid. Although an increase in power use at the ACRR is likely to have some impact on SNL/NM's GHG emissions, it would continue to be a very small part of SNL/NM's overall GHG inventory. SNL/NM's ongoing site-wide initiatives for reductions in energy intensity would continue on the path of reducing overall electricity purchases.

Sustainability impacts related to transportation are provided in Section 4.2.3. Alternative 2 would consume between 54,400 and 77,000 gallons of fuel per year, depending on the route followed. This would generate between 84 and 118 MT of GHGs. The additional GHG produced during operations at ACRR would have minimal impact on the SNL/NM GHG reduction goal established by SNL/NM's Site Sustainability Plan (SSP). However, increased use of electricity during operations at ACRR may impact SNL/NM's SSP energy intensity reduction goal.

4.2.7 Cumulative Impacts

Cumulative impacts for transient testing activities conducted under Alternative 2 must consider those that could occur at INL, those enroute to SNL/NM, and those that could occur at SNL/NM. The ACRR is an operational facility; and therefore, cumulative impacts must consider current operations. DOE reviewed the resources at risk. The review was assessed for construction, normal operations, potential impacts of accidents, and potential impacts outside immediate facility areas. Conclusions are as follows:

- As a result of building the new hot cell at ACRR, there would be a slight increase in building footprint. The impacts of the construction on resources would be minimal because the new hot cell would be constructed on an already disturbed area within TA-V.
- During operations, there would be no significant cumulative radiological or waste generating impacts. Radiologic impacts during normal reactor operations, transport of test assembly components, and transient testing would not result in adverse health impacts and the likelihood of LCF occurrence is extremely low. Additional waste generation during normal operations is small compared to current disposal volumes at INL and SNL/NM. Sustainability impacts are disperse and associated with transportation. Additional GHG emissions that could occur on INL or SNL/NM are negligible compared to site-wide amounts. Additional GHG emissions that would occur along the transportation route from INL to SNL/NM would be additive to the location at which they occurred.

4.3 Alternative 3 – No Action

No action would mean that none of the impacts described in Alternative 1 or Alternative 2 would occur. DOE would have to rely on sites (domestic and international) that already carry out limited transient testing activities, which would not meet DOE's purpose and need as described in Section 1 or the criteria described in Section 2.1. The environmental impacts occurring at sites currently conducting transient testing would not change.

4.4 Summary of Environmental Impacts

A summary of impacts to wildlife resources, cultural resources, human health, waste management, and sustainability goals are summarized in Table 10. These impact statements are generalizations summarized from the analyses presented in Sections 4.1 and 4.2. The assessment of impacts for both action alternatives were conducted using similar evaluation approaches and criteria. Assessment of wildlife resources and cultural resources included a review of historical data and site-specific surveys where applicable. Computer codes and evaluation processes applied to assess atmospheric impacts for both alternatives were parameterized with site-specific data, and results are comparable to annual reports generated at INL and SNL/NM in compliance with 40 CFR 61 Subpart H. DOE has an extensive sitewide environmental monitoring program that assesses DOE's environmental impacts. DOE prepares annual sitewide environmental reports that explain the program and evaluate performance (DOE-ID 2013b and SNL/NM 2013).

The analysis of dose consequences resulting from accidents adopted slightly different approaches based on differences in the reactors that would be used by each Alternative. Scenarios identified for both alternatives provide the bounding dose consequences. Differences in the dose assessment approaches were determined to be acceptable and appropriate. The dose assessment approach applied for each scenario is conservative and resultant doses should be viewed as upper-bound screening-level values. Therefore, the summary of impacts assessed in this EA and summarized in Table 10 provides a reasonable basis for comparison between the analyzed alternatives. Based on the analysis provided in this EA, potential impacts from either alternative would be small.

Table 10. Summary of environmental impacts.[a]

Resource	Alternative #1 Restart the TREAT Reactor (Preferred Alternative)	Alternative #2 Modify ACRR
Impacts – Normal Operations		
Non-Radiologic Atmospheric Impacts – chemical pollutants	• Annual cumulative diesel fuel usage for the two generators is estimated at 2,500 gallons. The diesel generator fuel consumption at TREAT would represent a small percentage of INL diesel use and resultant emissions.	None
Atmospheric Pathway	• The annual estimated INL-wide air emissions dose at Frenchman's Cabin is about 3.68×10^{-2} mrem, equal to about 0.37% of the annual 10 mrem dose limit • The annual estimated ED for the closest public receptor (at Atomic City) is about 2.1×10^{-3} mrem, equal to about 0.02% of the annual 10 mrem dose limit • The annual estimated ED for the nearest worker (at the TREAT Reactor Control Building) is 3.6×10^{-3} mrem, equal to about 0.04% of the annual10 mrem dose limit.	• The annual estimated ED for the public receptor (at the Eubank Gate) is about 4.8×10^{-5} mrem, is less than 0.0005% of the annual 10-mrem dose limit • The annual estimated cumulative SNL/NM air emissions dose at the Kirtland Storage Site, affecting workers, is about 8.6×10^{-4} mrem, equal to about 0.01% of the annual 10 mrem dose limit • The annual estimated cumulative SNL/NM air emissions dose (at the Chestnut Site), affecting workers, is about 8.2×10^{-4} mrem, equal to about 0.01% of the annual 10 mrem dose limit.
Soil/Surface Pathway	• The potential for exposure via contaminated soils is negligible based on a review of historical data and projected particulate releases.	• Since the only emissions from the tests (which are similar to the tests already conducted at the ACRR) would be gaseous Ar-41 (a noble gas), there would be no environmental exposures via the soil pathway.
Groundwater Pathway	• Radionuclide transport from potentially contaminated soils is improbable given the short half-lives of the TREAT Stack effluents and the distance to the aquifer.	• Since the only emissions from the tests would be gaseous Ar-41, there would be no environmental exposures via the groundwater pathway.

Resource	Alternative #1 Restart the TREAT Reactor (Preferred Alternative)	Alternative #2 Modify ACRR
Biological Resources	• Impacts to biological resources would be short-term, occurring during refurbishment and replacement activities • No impact to federally listed endangered or threatened species would occur • Impacts from radiological emissions to biota at the INL from the proposed transient tests are negligible • No direct impact to species of ethnobotanical (plants used by indigenous cultures) concern or to sensitive species would occur, as there are none present near TREAT or along the cable corridor.	• Impacts to biological resources would be short-term, occurring during construction • There are no federally listed endangered or threatened plant or animal species present in TA-V • Impacts from radiological emissions to biota at the ACRR from the proposed transient tests are negligible.
Cultural Resources	• There would be no direct impact to cultural or tribally important resources from refurbishment and replacement activities and minimal potential indirect impacts to archaeological resources • No visual impacts from refurbishment/replacement or operational activities would occur • No adverse effects to historic structures would occur.	• Little, if any, impact to cultural or historic resources would occur within TA-V; the ground is previously disturbed and the likelihood of archaeological sites is low.
Waste Generation	• The estimated LLW generated during refurbishment would be less than 100 m^3, about 7.7% of INL's annual LLW disposed of off-site • TREAT will likely generate less than 2,000 gallons of wastewater annually, accounting for 0.04% of MFC's annual waste water • LLW generated during routine operations at TREAT are expected to represent less than 1% increase annually • The LLW generated from pre- and post-examination, experiment packing, and routine handling would be about 12 m^3 per year and represent less than 1% of the volume of LLW generated at the INL each year. Transient testing activities would generate an estimated 6 m^3 of transuranic waste, greater-than-class C (GTCC) waste, GTCC-like waste, or Spent Nuclear Fuel debris over the 40-year timeframe of the proposed action.	• The estimated waste from modifying and constructing ACRR would be 765 m^3 • The additional waste from routine maintenance and operations from transient testing would represent an increase of 3.0% LLW generation • The waste generated at the INL as a result of doing transient testing at ACRR would be approximately the same as INL. **Note**: Waste from experiment and handling would occur at MFC under this alternative (see description on the left).

Resource	Alternative #1 Restart the TREAT Reactor (Preferred Alternative)	Alternative #2 Modify ACRR
	Impacts – Potential Accidents	

	• The highest consequence event that could affect TREAT facility workers has one chance in 25,000 of occurring in any given year.
	  ○ The dose-rate for facility workers is projected to be 6 rem/min. Facility worker doses would be further reduced by administrative procedures and use of protective equipment.
	• The highest consequence event that could affect collocated workers and members of the public have one chance in 270,000 of occurring in any given year
	  ○ Doses for collocated workers would be 7 rem and would result in 4×10^{-3} (or 1 chance in 240) LCF
	  ○ Doses to members of the public would be about 0.2 rem, and would result in 1.4×10^{-4} (or 1 chance in 8,300) LCF.
		• Highest consequence events that could occur for pre-test and post-test examinations at INL have one chance in 200 of occurring in any given year.
		  ○ Doses for collocated workers would be 0.1 rem and would result in 5.9×10^{-5} (or 1 chance in 17,000) LCF
		  ○ The dose-rate for facility workers not protected by administrative controls or equipment would be 3 rem/min. Facility worker doses would be further reduced by administrative procedures and use of protective equipment.
		  ○ Doses to members of the public would be 0.007 rem, and would result in 4.2×10^{-6} (or 1 chance in 240,000) LCF.
		• Highest consequence event that would occur for pre-test, post-test, and irradiation activities at SNL/NM have one chance in 500 of occurring in any given year.
		  ○ Doses for collocated workers would be 4 rem and would result in 2.4×10^{-3} (or 1 chance in 410) LCF
		  ○ The dose-rate for facility workers not protected by administrative controls or equipment would be 75 rem/min. Protective equipment and administrative procedures would be used to limit worker doses, allowing them to safely evacuate the building before significant exposure.
		  ○ Doses to members of the public would be 0.4 rem, and would result in 2.4×10^{-4} (1 chance in 4,200) LCF

	Impacts -- Transportation	
	• Transportation accidents on INL severe enough to result in a release from the transportation casks are non-credible.	• Transportation accidents in Alternative 2 would be limited to those occurring on the roadway between INL and SNL/NM • Accidents would result in doses less than 0.28 person-rem, and fewer than 1 chance in 6,000 LCF and are

Resource	Alternative #1 Restart the TREAT Reactor (Preferred Alternative)	Alternative #2 Modify ACRR
		therefore considered negligible.
Intentional and Destructive Acts		
	• Intentional destructive acts would result in doses bounded by scenarios considered in the accident analysis • Resultant health impacts to members of the public would be minimal. Resultant health impacts to workers would be mitigated by normal response actions and would also be minimal.	• Intentional destructive acts involving the test components would be bounded by scenarios considered in the accident analysis and analysis of transportation accidents • Resultant health impacts to members of the public would be minimal. Resultant health impacts to workers would be mitigated by normal response actions and would also be minimal.
Sustainability		
	• Increases in diesel generator use, transportation, and emissions from stationary combustion sources would result in an estimated 24 MT CO2 equivalent GHG emissions; total yearly scope 1 and 2 at the INL were 140,000 MT CO2 equivalents GHG in fiscal year 2012 • Increase would not impact the INL GHG reduction goals.	• Although an increase in power use at the ACRR is likely to have some impact on SNL/NM's Scope 2 GHG emissions, it would continue to be a very small part of SNL/NM's overall GHG inventory.

a. Alternative #3 'No Action' results in no change to environmental impact from current operational activities at domestic and international activities conducting transient testing.

5 PERMITS AND REGULATORY REQUIREMENTS

Each alternative would be required to adhere to federal, state, and local regulations and obtain appropriate permits before constructing, modifying, or operating facilities, equipment, or processes. Below is a list of federal, state, and local regulations and permits that either of the alternatives may be required to adhere to or to obtain. The 'No Action' alternative complies with existing permits and applicable regulatory requirements. DOE would be responsible for identifying a comprehensive list of applicable regulations and permits for the selected actions. Activities that affect, or may affect, the safety of DOE nuclear facilities must also comply with the requirements of 10 CFR 830, *Nuclear Safety Management*.

Air, Soil, and Groundwater

- Diesel generator emissions are regulated by the EPA's Clean Air Act Requirements. If resuming transient testing using TREAT is selected as a result of the NEPA process, the diesel generators put in use will meet all applicable regulatory requirements before beginning operations. (Applies to Alternative 1).
- Radiologic air emissions must meet the EPA limit of 10 mrem/year for demonstration of compliance with "National Environmental Standards for Emissions of Radionuclides Other Than Radon from Department of Energy Facilities" (40 CFR 61, Subpart H). (Applies to Alternatives 1 and 2).

Biological

- Soil and vegetation disturbing activities, including those associated with mowing, blading, and mechanically removing vegetation, have the potential to increase noxious weeds and invasive plant species that would be managed according to 7 USC § 2814, "Management of Undesirable Plants on Federal Lands" and Executive Order 13112, "Invasive Species." INL would follow the applicable requirements to manage undesirable plants. (Applies to Alternatives 1 and 2).
- In analyzing the potential ecological impacts of the action alternative for the proposed action, DOE has followed the requirements of the Endangered Species Act (16 USC §1531 et seq.) and has reviewed the most current lists for threatened and endangered plant and animal species. Other federal laws that could apply include: the Fish and Wildlife Coordination Act (16 USC § 661 et seq.), Bald Eagle Protection Act (16 USC § 668), and the Migratory Bird Treaty Act (16 USC § 715–715s). (Applies to Alternatives 1 and 2).

Cultural

- Cultural resources are managed at the INL Site according to a tailored approach outlined in the INL Cultural Resource Management Plan (DOE-ID 2013a) and corresponding Programmatic Agreement executed among DOE, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation. Shoshone-Bannock tribal interests in INL resources and activities are addressed in an Agreement in Principle between DOE and the Shoshone-Bannock Tribes. DOE has complied with the NHPA Section 106 process by identifying historic properties and evaluating impacts following the protocols outlined in the INL Cultural Resource Management Plan (DOE-ID 2013a). (Applies to Alternative 1).
- Cultural resources at SNL/NM are managed through the NEPA Program. Properties are assessed by the Corporate History Program as changes (modifications or demolition) are proposed. Resulting recommendations are submitted to the Sandia Field Office for review and determination, and if necessary, consultation with the New Mexico State Historic Preservation Officer, in compliance with Section 106 of the NHPA. In 2010, a complete historic building survey and assessment was undertaken for the SNL/NM site to support DOE compliance with Section 110 of the NHPA (Ullrich, R. A., et al. 2010a and 2010b). In 2013, the survey and

assessment were reviewed and updated based on the results of consultations between SFO and the New Mexico State Historic Preservation Officer on individual building renovations and demolitions, as well as changes in the built environment.

- SNL/NM TA-V was included in the 2010 SNL/NM survey and assessment, with the resulting recommendation that nine buildings in the area are potentially eligible for the NRHP as a historic district. Although consultation on the 2010 survey is not complete, the evaluation of the impact of Alternative 2 proceeded as though the buildings had already been found eligible. Archaeological surveys in SNL/NM's TA-V indicated the ground has been previously disturbed and revealed no archaeological sites or the likelihood of them. Should construction reveal any archaeological remains, work would be stopped and the site assessed appropriately (Ullrich, R.A., et al. 2010a and 2010b and 2012). (Applies to Alternative 2).
- Section 106 of the NHPA directs any federal agency undertaking or licensing any activity, to "prior to the approval of the expenditure of any federal funds on the undertaking or prior to the issuance of any license, as the case may be, [to] take into account the effect of the undertaking on any district, site, building, structure or object that is included in or eligible for inclusion in the National Register." To assess the impact of such an undertaking, an agency must know whether any affected district, site, building, structure, or object is eligible for the NRHP. (Applies to Alternatives 1 and 2).
- Section 110 of the NHPA requires a federal agency to assume responsibility for historic properties it owns or controls. Historic properties must be identified, evaluated, documented, and nominated to the NRHP, if appropriate. Thus, Section 110 obliges an agency to preserve its historic properties and manage those properties in compliance with Section 106—that is, if something the agency is going to do or authorize to be done would have a potential impact on a property that is on, or eligible for, the NRHP, the agency must engage in consultation regarding that impact. (Applies to Alternatives 1 and 2).

Sustainability

- Executive Order 13514 "Federal Leadership in Environmental, Energy, and Economic Performance:" DOE's 2012 Strategic Sustainability Performance Plan; and DOE Order 436.1, "Departmental Sustainability" provide requirements and assign responsibilities for managing sustainability within DOE to ensure that missions are carried out in a sustainable manner. These requirements also include provisions to institute wholesale cultural change to factor sustainability and GHG reductions into all DOE decisions, and to ensure that DOE achieves the sustainability goals established in its Strategic Sustainability Performance Plan. (Applies to Alternatives 1 and 2).
- In accordance with DOE's 2012 Strategic Sustainability Performance Plan Goal 2.5, alterations or renovations of existing buildings greater than 5,000 GSF must comply with the Guiding Principles. There are 26 Guiding Principles required for a building to meet compliance. Some are at no cost (e.g., non-smoking policy) and others require investments (e.g., water, gas, electricity meter installations). These requirements would be incorporated and addressed, where applicable. (Applies to Alternatives 1 and 2).

Nuclear Safety

- 10 CFR 830 establishes requirements that must be implemented in a manner that provides reasonable assurance of adequate protection of workers, the public, and the environment from adverse consequences, taking into account the work to be performed and the associated hazards. Nuclear safety analyses would be conducted and implemented for the selected test reactor to establish a safe operating envelope. Safety analyses will also be conducted for the test assemblies and test procedures will be developed that clearly identify the limits and requirements of test conditions and components. (Applies to Alternatives 1 and 2).

6 COORDINATION AND CONSULTATION DURING EA PREPARATION

6.1 Alternative 1

The INL Cultural Resource Management Plan (DOE-ID 2013a) guides the identification and management of cultural resources on lands under DOE jurisdiction. The plan is legitimized through programmatic agreement between DOE, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation. All parties to the agreement have reviewed the plan and agree upon the strategies and procedures outlined therein. Cultural resource investigations completed at INL for the proposed action included archival and records searches to identify and evaluate historic structures and previously recorded archaeological resources, *intensive* and *reconnaissance level archaeological surveys* (see Glossary), field examination and evaluation of previously recorded cultural resources, and communication with representatives from the Shoshone-Bannock Tribes Heritage Tribal Office. On April 17, 2013, the Heritage Tribal Office representatives toured TREAT and the surrounding area and the defined areas of direct and indirect effect for cultural resources. The cultural resource investigations are summarized in a technical report (Pace and Williams 2013).

6.2 Alternative 2

No coordination or consultation on cultural or biological resource matters was completed during EA preparation on the use of ACRR for the resumption of transient testing with other federal or state agencies. The analysis results indicate negligible potential impacts and no sensitive issues of concern that would have required contacts or for which contacts would be beneficial or informative. The New Mexico Environmental Department (NMED) and the Isleta Pueblo were notified and offered briefings on the proposed action and the preparation of this EA. A briefing was conducted for the NMED Director. Coordination was completed with the DOE Sandia Field Office NEPA Compliance Officer and other environmental program officials to ensure an effective exchange of information during the EA preparation process.

7 REFERENCES

7 USC § 2814, "Management of Undesirable Plants on Federal Lands," United States Code.

16 USC § 661 *et seq.*, "Fish and Wildlife Coordination Act," United States Code.

16 USC § 668, *et. seq.,* "Bald Eagle Protection Act," United States Code.

16 USC § 715, *et. seq.,* "Migratory Bird Treaty Act," United States Code.

16 USC, § 1531, *et seq.*, "Endangered Species Act," United States Code.

Adams, B.A., R. Black, R. Grant, and L. Nelson, 2013, Projected Radioactive Waste Streams Generated from the Resumption of TREAT Operations, Idaho National Laboratory Environmental Management System Technical Interpretation, TI-058, January 2014.

Hafla, J., J. C. Whiting, M. Case, and R.D. Blew, 2013, "Ecological Resources Assessment for the Resumption of Transient Testing of Nuclear Fuels and Material Environmental Assessment," Gonzales-Stoller Surveillance, LLC, Prepared for U.S. Department of Energy-Idaho Operations Office; Environmental Surveillance, Education, and Research Program, Contract No. DE-NE-0000300, June 2013.

International Commission on Radiological Protection (ICRP), 1977, "Recommendations of the International Commission on Radiological Protection," ICRP Publication 26, Annals of the ICRP, Vol. 1, No. 3, Pergamon Press, Elmsford, NY.

International Commission on Radiological Protection (ICRP), 1979–1988, "Limits for Intakes of Radionuclides by Workers." ICRP Publication 30, Parts 1–4 (and supplements), Annals of the ICRP, Vol. 2 (No. 3/4), Vol. 4 (No. 3/4), Vol. 6 (No. 2/3), Vol. 8 (No. 4), and Vol. 19 (No. 4), Pergamon.

Kelly, J. G. and K.T. Stalker, 1981, "The CAIS Fuel Motion Monitoring Detection System – Development, System Design and Proof Tests," NUREG/CR-2140 and SAND81-1112*,* Albuquerque, NM.

Kirtland Air Force Base (KAFB), 2006, "Final Predator Survey Report for Kirtland Air Force Base," Kirtland Air Force Base, Albuquerque, NM, April 2006.

Kirtland Air Force Base (KAFB), 2007, "Baseline Natural Resources Inventory," Final Report. Kirtland Air Force Base, Albuquerque, NM, December 2007.

Kirtland Air Force Base (KAFB), 2009, "Bat Diversity and Maternity Roost Study," Interim Report. Kirtland Air Force Base, Albuquerque, NM, June 2009.

NERAC (Nuclear Energy Research Advisory Committee), 2000, Long-Term Nuclear Technology Research and Development Plan, Subcommittee on Long-Term Planning for Nuclear Energy Research, Washington, DC, June.

Nuclear Regulatory Commission (NRC), 2004, "Environmental Impact Statement for the Proposed Idaho Spent Fuel Facility at the Idaho National Engineering Laboratory in Butte County, Idaho." NUREG-1773, U.S. Nuclear Regulatory Commission, Washington, D.C. January 2004.

Nuclear Regulatory Commission (NRC), 2011, Vol. 1. "Environmental Impact Statement for the Proposed Eagle Rock Enrichment Facility in Bonneville County, Idaho." NUREG-1945. U.S. Nuclear Regulatory Commission, Washington, D.C. February 2011.

Nuclear Regulatory Commission (NRC), 2012, "Spent Fuel Transportation Risk Assessment," NUREG-2125, Rockville, MD.

Pace, B. R. and J.B. Williams, 2013, "Cultural Resource Investigations for the Resumption of Transient Testing of Nuclear Fuels and Material," *INL/EXT-13-29097*, May 2013, Idaho Falls, ID. November 2013.

Rowland, M.M., M.J. Wisdom, L.H. Suring, and C.W. Meinke, 2006, "Greater sage-grouse as an umbrella species for sagebrush-associated vertebrates," Biological Conservation 129:323-335.

Sandia National Laboratories/New Mexico (SNL/NM), 1998, "SNL/NM Site-Wide Hydrogeologic Characterization Project, Calendar Year 1995 Annual Report," revised February 1998, Environmental Restoration Program, Sandia National Laboratories, Albuquerque, NM.

Sandia National Laboratories/New Mexico (SNL/NM), 2010, "Seismic Assessment of Technical Area V (TA-V), SAND2010-0163 (redacted for public release)", Sandia National Laboratories, Albuquerque, NM, January 2010.

Sandia National Laboratories/New Mexico (SNL/NM), 2011, Operational Area Environmental Evaluations, SAND2011-6097, Sandia National Laboratories, Albuquerque, NM, September.

Sandia National Laboratories/New Mexico (SNL/NM), 2013, "Calendar Year 2012 Annual Site Environmental Report for Sandia National Laboratories, New Mexico," SAND2013-6009P, Sandia National Laboratories, Albuquerque, NM, September 2013.

Schafer, A. L., L. C. Brown, D. C. Carathers, B. D. Christensen, J. J. Dahl, M. L. Miller, C. Ottinger Farnum, S. Peterson, A. Jeffrey Sondrup, P. V. Subaiya, D. M. Wachs, R. F. Weiner, 2013, "Impacts Analyses Supporting the National Environmental Policy Act Environmental Assessment for the Resumption of Transient Testing Program." INL/EXT-13-29397, Revision 1, Idaho National Laboratory, Idaho Falls, ID, February 2014.

Shumar, M.L. and J.E. Anderson, 1986, "Gradient Analysis of Vegetation Dominated by Two Subspecies of Big Sagebrush, Journal of Range Management," Vol. 39, No.2, pp. 156-160.

Ullrich, R. A., M.A. Sullivan, C. Martin, and D. Gerdes, 2010a, "Sandia in the Cold War and Post-Cold War Periods: A Statement of Historic Context for Sandia National Laboratories/New Mexico," SAND2010-4971 P, August 2, 2010.

Ullrich, R.A., C. Martin, and D. Gerdes, 2010b, "Historic Building Survey and Assessment Sandia National Laboratories New Mexico Site, Albuquerque, New Mexico," Volume II: Appendices SAND2010-5646P, August 2, 2010.

U.S. Department of Energy (DOE), 1994, "DOE Radiological Control Manual," DOE/EH 0256T, Revision 1, U.S. Department of Energy, April 1994.

U.S. Department of Energy (DOE), 1995, "Programmatic Spent Nuclear Fuel (SNF) and Idaho National Engineering Laboratory (INEL) Environmental Restoration and Waste Management Environmental Impact Statement," DOE/EIS-0203-F, U.S. Department of Energy, April 1995.

U.S. Department of Energy (DOE), 1996, "Background Dose Equivalent Rates and Surficial Soil Metal and Radionuclide Concentrations for the Idaho National Engineering Laboratory," INEL-94/0250, Revision 1, Idaho National Engineering Laboratory, Lockheed Idaho Technologies Company, Chemical and Radiological Risk Assessment Department, Idaho Falls, Idaho, August 1996.

U.S. Department of Energy (DOE), 1997a, "Final Waste Management Programmatic Environmental Impact Statement For Managing Treatment, Storage, and Disposal of Radioactive and Hazardous Waste," DOE/EIS-0200-F, U.S. Department of Energy, May 1997.

U.S. Department of Energy (DOE), 1997b, "Waste Isolation Pilot Plant Disposal Phase Final Supplemental Environmental Impact Statement," DOE/EIS-0026-S-2, U.S. Department of Energy, September 1997.

U.S. Department of Energy (DOE), 1999, "Final Site-Wide Environmental Impact Statement for Sandia National Laboratories/New Mexico," DOE/EIS-0281, U.S. Department of Energy-Albuquerque Operations Office, Albuquerque, NM, October 1999.

U.S. Department of Energy (DOE), 2000, "Final PEIS for Accomplishing Expanded Civilian Nuclear Energy Research and Development and Isotope Production Missions in the United States, Including the Role of the Fast Flux Test Facility" DOE/EIS-0310, U.S. Department of Energy, December 2000.

DOE (U.S. Department of Energy), 2000, Nuclear Science and Technology Infrastructure Roadmap, Summary, Draft, rev. 1, Office of Nuclear Energy, Science and Technology, Washington, DC, March.

U.S. Department of Energy (DOE), 2004, "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements," Second Edition, U.S. Department of Energy, December 2004.

U.S. Department of Energy (DOE), 2006, "Final Supplement Analysis for the Final Site-Wide Environmental Impact Statement for Sandia National Laboratories/New Mexico, Albuquerque, New Mexico," DOE/EIS-0281-SA-04, U.S. Department of Energy, National Nuclear Security Administration, Sandia Site Office, Albuquerque, NM, August 2006.

U.S. Department of Energy (DOE), 2010, "Mission Need Statement for the Resumption of Transient Fuel Testing (MNS)," December 3, 2010.

U.S. Department of Energy (DOE), 2011a, "Draft Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste," DOE/EIS-0375-D, U.S. Department of Energy, Office of Environmental Management, April 2011.

U.S. Department of Energy (DOE), 2011b, "Environmental Assessment for the Replacement Capability for Disposal of Remote-Handled Low-Level Radioactive Waste Generated at the Department of Energy's Idaho Site," DOE/EA-1793, U.S. Department of Energy, December 2011.

U.S. Department of Energy (DOE), 2011c, "Idaho National Laboratory Stand-Off Experiment (SOX) Range Environmental Assessment," DOE/EA-1822, U.S. Department of Energy, March 2011.

U.S. Department of Energy (DOE), 2013a, "Final Site-Wide Environmental Impact Statement for the Continued Operation of the Department of Energy/National Nuclear Security Administration Nevada National Security Site and Off-Site Locations in the State of Nevada," DOE/EIS-0426D, U.S. Department of Energy.

U.S. Department of Energy (DOE), 2013b, "Idaho National Laboratory, Alternatives Analysis for Resumption of Transient Testing Program," INL/EXT-13-28597, Revision 2, Idaho National Laboratory, October 2013.

U.S. Department of Energy (DOE), 2013c, "Supplemental Analysis for the Nuclear Infrastructure Programmatic Environmental Impact Statement for Plutonium-238 Production for Radioisotope Power Systems." DOE/EIS-0310-SA-02, U.S. Department of Energy, Washington, D.C. September 2013.

U.S. Department of Energy – Idaho Operations Office (DOE-ID), 2013a, "Idaho National Laboratory Cultural Resource Management Plan," DOE/ID-10997, Revision 5, Idaho Falls, ID February 2013.

U.S. Department of Energy – Idaho Operations Office (DOE-ID), 2013b, "Idaho National Laboratory Site Environmental Report, Calendar Year 2012," DOE/ID-12082(12), September 2013.

U.S. Department of Energy – Idaho Operations Office (DOE-ID), 2013c, "National Emission Standards for Hazardous Air Pollutants—Calendar Year 2012 INL Report for Radionuclides," DOE/ID-11441, June 2013.

Whiting, J.C. and B. Bybee, 2011, "Ecology and management of bats on the INL Site." U.S. Department of Energy-Idaho Operations Office; Environmental Surveillance, Education, and Research Program, Gonzales-Stoller Surveillance, LLC., Idaho Falls, ID. Report GSS-ESER-156." December 2011.

Whiting, J.C. and B. F. Bybee, 2013, "2012 Breeding Bird Surveys on the Idaho National Laboratory Site", Environmental Surveillance, Education, and Research Program Report, Gonzales-Stoller Surveillance, LLC., Idaho Falls, ID. Report GSS-ESER-169, June 2013

Appendix A – Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials

Comment Responses

The formal comment period for the Final EA for the Resumption of Transient Testing of Nuclear Fuels and Materials ended on January 3, 2014. The comment period was extended to January 10, 2014, because DOE's website was down for several days during the comment period. DOE received several comments from interested parties and groups. The comments have been reprinted verbatim as received by DOE. The following pages contain DOE's responses to the comments. This document is being prepared as an appendix to the Final EA and will be provided to those individuals and groups who provided comments. It also will be available online and to other interested parties upon request. Comments have been organized by commenter in alphabetical order (see Table A-1).

Furthermore, DOE added Sections 4.1.5 and 4.2.5 to the EA to address accidental contamination and other indirect impacts. Additional language and a new table were also added to Section 4.1.7 to better address the annual estimated air emission dose from reasonably foreseeable government and private proposed projects that could contribute to cumulative impacts for Alternative 1.

Commenters

Table A-1. List of commenters, commenters affiliation (if any), and page number of comment response.

Commenter (*Affiliation*, if any)	Page Number for comment and comment response
1. Lane Allgood (*Partnership for Science and Technology*)	A-57
2. Anonymous #1	A-58
3. Anonymous #2	A-58
4. John Bailey (*ConnectShare Idaho*)	A-61
5. William C. Barker (*AREVA Federal Services*)	A-62
6. Robert W. Barnes	A-64
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Table A-2. DOE's response to comments on the draft EA sorted by commenter.

Comment #	Comment	Response
Lane Allgood (Partnership for Science and Technology)		
1	The Partnership for Science & Technology (PST) submits the following comments on the Draft Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials. PST is an Eastern-Idaho-based nonprofit organization advocating for the advancement of science, energy, and environmental initiatives that are in the public interest. PST has fully supported the mission of transient testing, knowing that this work is vital to improving current and future nuclear power plant performance and sustainability and therefore America's energy future. Because of our proximity to the Idaho National Laboratory (INL), Eastern Idaho communities have a long history of supporting the peaceful uses of atomic energy, and our members, and stakeholders understand its potential as a source of clean, sustainable energy. We believe that the set of criteria developed by the Department of Energy to identify reasonable alternatives to resume full-scale testing are both appropriate and thorough. The PST would like to go on record in supporting restarting the Transient Reactor Test Facility (TREAT) because the Idaho National Laboratory already has the necessary facilities giving consideration to economic, environmental and technical factors. These unique capabilities represent a substantial financial investment on the part of American taxpayers. • Hot cells for test assembly, disassembly and examination • Availability of the Advanced Test Reactor • Location and availability of TREAT Reactor • Transportation on public highways is not an issue The fact that the INL is the nation's lead nuclear energy laboratory should be a significant factor when siting any nuclear energy R&D projects. We appreciate the opportunity to provide input and look forward to the final report.	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
Anonymous Letter #1		
2	First of all I'm wondering why the nuclear experts at this facility are not in place at Fukushima to help with that situation as their fallout regularly spreads over Idaho. http://radiationnetwork.com/ http://www.netc.com/ I'm sure you are aware of the ongoing attempt to cleanup the Hanford site, that's been what...50 years or so now? And hasn't there been confirmation that your facility has contaminated some of the Snake River Aquifer? And didn't some of your workers recently get exposed to radioactive items? Hasn't this expensive and dangerous technology caused enough problems for now? There are already enough cancer causing threats to us with out exacerbating the problem. This industry needs to stop contaminating people. Your thyroid will thank you. http://www.enviroreporter.com/investigations/	DOE prepared this EA to determine whether the proposed action and reasonable alternatives for reestablishing transient testing as described in the EA had the potential for significant environmental impacts. DOE acknowledges your comments and notes that they are outside the scope of this EA. DOE remains committed to its cleanup obligations, permit requirements for active facilities, and safe and effective management of nuclear materials.
Anonymous Letter #2		
3	Comment 1: Page 3, subsection 2.1 and subsection 2.2, second paragraph, "Several alternatives were considered but not evaluated because they did not meet the selection criteria. These included construction of a new transient test reactor or the use of the High Flux Isotope Reactor at Oak Ridge National Laboratory, the Advanced Test Reactor (ATR) at the INL, the Nuclear Safety Research Reactor in Japan, CABRI in France, the Impulse Reactor in Kazakhstan, and the Missouri University Research Reactor." The Draft Environmental Assessment does not provide specific data regarding the basis for determining that these test reactors did not meet the Alternative Selection Criteria. No specific data was provided to differentiate between capabilities determined to be acceptable for alternative 2, the Annular Core Pulsed Reactor (ACPR) and the other identified reactors. The ATR has a significant record of providing fuel element property fatigue analysis studies for both domestic reactor and foreign fuel studies using its high flux capabilities. Restarting a "clean" reactor area with the potential for contamination events rather than modifying existing facilities does not demonstrate a concern for good environmental stewardship. Only a broad mention of the specific fuel element	Alternative selection criteria were developed by a team of subject matter experts from across the DOE Complex based on the required transient testing capabilities outlined in the mission need statement. Both TREAT and ACRR were selected as reasonable alternatives for analysis in the EA, based on an evaluation of each of the potential alternatives against the established selection criteria identified in Section 2.1 of the EA. The statements in the EA relative to the alternative selection criteria summarize the information presented in the alternatives analysis reference document (DOE 2013b). Additional specific information regarding the comments is provided below. The Impulse Graphite Reactor and CABRI were eliminated from further consideration because the reactors are located outside the United States. The High Flux Isotope Reactor, Advanced Test Reactor, and Missouri University Research Reactor were screened out because these reactors are not capable of providing the specified neutron bursts required to certify fuel. Both TREAT and a modified ACRR are capable of meeting all the identified selection criteria.

Comment #	Comment	Response
	types to be studied is identified in this document. It can only be assumed that the fuel element design would primarily consist of loose fuel pellets contained in fuel rods. This type of fuel is more prone to bowing and fuel cladding failures associated with hot spots. Therefore, it must be assumed that the potential for failure, contamination, and reactor area cleanup is greater. If plate type fuel elements are the types envisioned to be studied, it makes sense to use facilities that normally operate/handle these fuel types reducing the potential for accidents to occur. Environmentally, it makes more sense to conduct these studies at facilities that currently handle nuclear material fuel elements and have procedures in place to address levels of contamination and radiation already existent. This environmental impact concern is identified as a under section 4.1.2 "Accident Consequences" 'Radiologic Consequences ' the first and second bullet discussions. Secondly, the high flux capabilities of the ATR could reduce the proposed forty year project study time reducing both the cost of the study and the potential for negative impacts on the environment. Third, handling irradiated materials at existing facilities familiar with the policies and procedures designed to provide safe material movement reduces the potential for events to occur which might negatively impact the clean environment resident at the Transient Reactor Test Facility (TREAT). Costs associated with writing new reactor operating procedures, waste handling procedures, and reactor operator training are mitigated through using existing operational facilities where well defined procedures and training programs are already in place	Tests are proposed for a number of different fuel types (see Appendix B in DOE 2013b). As stated in the EA (Section 2.2.1), fuel to be tested is loaded into a test assembly that is designed to contain the fuel. Once the test assembly is assembled in a hot cell, it is shipped to the test reactor, loaded into the reactor, exposed to the specified neutron burst, removed from the reactor intact, and transported back to the hot cell for disassembly and subsequent post-irradiation testing. Since the test assemblies are sealed, the reactor facilities typically remain radiologically clean. The bounding accidents are presented in the EA and meet required standards. The high flux capabilities of the ATR are recognized, but this reactor cannot provide the flux required to fulfill the capability gap. The scope and cost associated with TREAT restart includes updating existing procedures to current standards and training operations staff to applicable DOE standards.
4	Fourth, "DOE has selected Alternative 1 as the preferred alternative. The 'preferred alternative that DOE believes would fulfill its statutory mission and responsibilities in the best manner, giving consideration to economic, environmental, technical and other factors'. If this Environmental Assessment is going to mention that economic determinations regarding the proposed alternatives impact location alternatives for this project, then it must also provide an economic cost analysis for the alternatives. The data should be included for review and it should include construction, training, security, reactor startup costs, waste removal, measurement and fuel analysis costs etc. This document is not complete.	DOE considered many factors in identifying alternatives that would fulfill the mission need for transient testing. These considerations included the technical selection criteria identified in section 2.1 of the EA, as well as cost estimates and other factors that DOE considered when screening alternatives. Results of the alternatives screening is provided in *"INL Alternatives Analysis for the Resumption of Transient Testing Program"* (DOE 2013). Based on the alternatives analysis, DOE identified two reasonable alternatives for further evaluation of the potential for environmental impacts under NEPA. These alternatives included restart of the TREAT reactor and modification of the ACRR to support transient testing. Restarting the TREAT reactor was identified as DOE's preferred alternative in the EA since it ranked highest among all the alternatives and represented the best value to the government in the alternative analysis. Both of the reasonable alternatives were further evaluated in accordance with NEPA to determine if they have

Comment #	Comment	Response
		the potential for significant environmental impacts. Cost is not a criterion for evaluating the significance of environmental impacts.
5	Comment: Page 18, "Radiologic Impacts of Releases to Soil-" "The potential for TREAT Stack emissions to result in contamination beyond the vicinity of TREAT is unlikely based on the atmospheric pathway analysis (Schafer et al. 2013)" The Schafer analysis data is not provided. To summarily determine that contamination is unlikely beyond the "vicinity" of TREAT requires inclusion of all basis data for this statement. What area does "the vicinity" encompass? Having experienced significant dust storms carrying particulate matter in the "vicinity" of the Materials and Fuel Complex, the potential of loose contamination being spread across wide areas of the environment exists.	The Schafer A.L., et al. 2014 reference was provided in the administrative record for review. To determine the 'vicinity' potentially impacted by the accumulation of radiological aerosol emissions in soil and potential for human impact, doses were calculated at various distances (up to 6,000 m) from TREAT as discussed in Appendix C. Potential impacts to plants and animals were evaluated at various distances by Hafla J, et al, 2013. Impacts to humans are much lower than the 10 mrem/yr regulatory limit imposed by 40 CFR 61, Subpart H, and the potential impacts to plants and animals are low compared to the biota concentration guidelines. Historical wind velocity data were considered in the analysis.
6	Comment: Page 20, "Routine Maintenance and Operations at the Reactor Building and Reactor Control Building-" "The waste generated at TREAT would be minimal since the test assemblies would be brought into the facility intact, irradiated, and removed from the facility as intact assemblies." Having a long history associated with spent fuel elements from domestic and foreign test and operational reactors, to assume that the fuel elements will be intact when they leave the reactor is not necessarily the case. Cleanup from events are costly and generate significant quantities of contaminated waste. No mention was made regarding whether the tests would be using Low Enriched Uranium (LEU) or High Enriched Uranium (HEU). Recovery from incidents is more complicated using HEU materials. Either fuel type, when irradiated, generates other nuclear material types e.g. Plutonium and Neptunium. These present increased hazards for recovery, waste disposal, and potential damage to the environment. Safeguard's requires the nuclear material generated through irradiation be calculated prior transfer from material balance area (MBA) to another MBA or transferred to a waste disposition area. Whether this calculation is determined through destructive analysis or non destructive analysis (requiring fuel measurement standards to be made), it must be performed to determine loss following an incident and to accurately transfer material quantities. Waste streams will need to be measured and quantities of nuclear material determined prior to removal as waste. Non-performance of these Department of Energy (DOE) required functions would lead to disposition of unknown quantities of nuclear material into the environment. This is contrary to the mission conducted the last fifteen years by of the Office of Environmental Management (EM) to reduce/remove the amount of	As described in the EA, the fuel to be tested will be contained in test assemblies that are designed to remain intact during the transient test (see Section 1.3 of the EA). Test assemblies will be radiographed before and after testing to confirm the condition of the test specimens and the integrity of the assembly prior to shipment. Assembly and disassembly of test assemblies will be performed in hot cells in accordance with DOE safeguards and security requirements and standards. DOE will manage all waste and special nuclear materials in accordance with all applicable laws, regulations, and DOE Orders, including accountability of nuclear materials.

Comment #	Comment	Response
	nuclear material and facilities resident at the Idaho National Laboratory (INL).	
7	Will the proposed casks used for this project be required to have Nuclear Regulatory Certifications (NRC)? Since the nuclear fuel type, quantities, form, material matrix have not been identified, what are the cask certification criteria for on site shipments? In other words, has the NRC determined that these casks can be used and are licensed for this project.	On-site transportation casks do not require an NRC license but do require DOE official transportation safety plans. As described in the EA, four casks have been identified for potential use on the INL site. The GE-2000 and BEA Research Reactor Cask are licensed by the NRC. The HFEF-15 cask and the TREAT loop handling cask will require a DOE transportation safety plan for on-site transport. On-site transportation between Sandia National Laboratory facilities is not required for Alternative 2.
8	Final Comment: The focus of EM has been to significantly decrease the environmental foot print of the INL for the past fifteen years. Nuclear material fuel items, waste, and facilities have been removed from the INL, and structures deactivated, decontaminated, and destroyed as part of this long term effort. TREAT does not have a robust containment structure and the potential for negative impacts to the environment exist for failures due to multiple types of events occurring. It is a relatively clean facility in its current configuration. The EM mission should continue this process by removing nuclear material currently stored in this facility, remove the out dated structures, further reducing the environmental impact of the INL.	Based on the accident analysis performed for this EA that used the current configuration of TREAT, no significant environmental impacts were identified (Schafer et al. 2014). DOE remains committed to the Environmental Management cleanup mission at the Idaho site.
9	I support Alternative 3. Section 4.3 , "The environmental impacts occurring at sites currently conducting transient testing would not change". I believe this statement is incorrect. Currently, TREAT is inactive with no testing being conducted. It is a storage area.	The TREAT Reactor is currently being maintained in safe standby and would remain so under Alternative 3. The statement "[t]he environmental impacts occurring at sites currently conducting transient testing would not change[.]" is correct and refers to limited capabilities at domestic and international facilities as stated in the EA.
10	This assessment is incomplete. It does not address/provide data supporting the identified concerns. It makes more sense to continue program funding by increasing the sustainability of the ATR and adapting its existing nuclear material activities as new projects, e.g. next generation nuclear fuels, are proposed.	DOE acknowledges your comment; however, the EA provides a complete analysis of the potential for significant environmental impacts of the proposed action per DOE requirements. Increasing the sustainability of ATR and adapting its existing nuclear material activities would not meet the mission need for transient testing. Also see the response to Comment #3 (Page A-58) regarding ATR capabilities as related to the transient testing mission need.
Jon Bailey (ConnectShare Idaho)		
11	I own and facilitate a group of business leaders in East Idaho of over 110+ members, and just starting in Boise of about 30 members. ConnectShare is it's name, and we are made up mostly of CEOs, Presidents, Business Owners, and Executive Level decision makers from various industries that help and serve one another to accelerate business by providing solutions and	DOE acknowledges your comment related to the need to resume transient testing.

<table>
<tr><th>Comment #</th><th>Comment</th><th>Response</th></tr>
<tr><td></td><td>connections to one's core business needs.

When I learned of the need from the DOE for Public Comment, I want to make sure I raised my voice in favor of Alternative 1: Restart the Transient Reactor Test Facility (TREAT) Reactor at Idaho National Laboratory.

We want this opportunity here in Idaho. This is a part of our economy and we don't want to loose it. Besides, I have always believed that the INL is the nation’s lead nuclear energy laboratory. It is my understanding that "TREAT" has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions. Therefore why look anywhere else, Let INL continue to lead the way in the field of nuclear energy.

Being fairly connected in the community, I can honestly say that there are hundreds (if not 1000s) of other voices that own businesses here in East Idaho that may not take this opportunity to vote with their comment but that feel just the same. We all favor the Alternative #1.</td><td></td></tr>
<tr><td colspan="3">William C. Barker (AREVA Federal Services)</td></tr>
<tr><td>12</td><td>AREVA Federal Services LLC supports Alternative 1 -Restart the Transient Reactor Test Facility (TREAT) at the Idaho national Laboratory (preferred alternative) as referenced in DOE/EA-1954 - Draft Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials.

Transient testing of nuclear fuels is needed to support a carbon-free safe and secure energy future for the United States.

Outcomes from transient testing include:
• To develop nuclear fuels that last longer, produce more power and are even safer
• To improve current nuclear power plant performance and sustainability
• To expand use of fuels that can't be as easily diverted for use in making weapons
• To support development of advanced reactor designs requiring new fuel types, different from the ones tested in the past. These new fuels need to be proof-tested in a controlled environment and researched extensively in order to learn how they respond to accident conditions to help guide fuel designs of the future</td><td>DOE acknowledges your comment related to the need to resume transient testing.</td></tr>
</table>

Comment #	Comment	Response
	• To return energy industry jobs to the United State • To improve U.S. posture for energy independence. AREVA agrees that Option 1 for the TREAT at Idaho National Laboratory meets DOE Selection Criteria, which were: • Located in the U.S. to provide necessary access, security and control to support DOE research activities • Capable of producing transient neutron bursts • Capable of producing transient experiments on test assemblies • Capable of performing real-time fuel motion monitoring • Capable of providing the necessary infrastructure to prepare and handle test assemblies • Ability to meet schedule requirements. AREVA agrees that Alternative 1, restarting the Transient Reactor Test Facility (TREAT) is the preferred alternative. It is the alternative that would fulfill DOE's statutory missions and responsibilities in the best manner, giving consideration to economic, environmental, technical and other factors. The main factors that support Idaho National Laboratory as the preferred alternative • Remoteness of the Idaho National Laboratory and the Transient Reactor Test Facility (TREAT) • Smaller potential radiation doses to workers, public and environment • Operational flexibility with respect to necessary facilities and the conduct of experiments. • Lower potential for impacts from transportation of experiments AREVA agrees with the EA report showing: • Consequences of radiological releases to air during normal operations are negligible • Consequences of radiological releases to air during normal operations are negligible • Consequences of radiological releases to air during normal operations are negligible • • Greenhouse gas emissions are not substantial	

Comment #	Comment	Response
Robert W. Barnes		
13	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. I have been a resident of Idaho Falls for over 25 years and I am confident in the INL's ability to safely handle transient waste. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions. I feel that TREAT testing is critical to the development of new and better fuel designs, which are critical to meeting this country's clean energy needs.	DOE acknowledges your comment related to the need to resume transient testing.
Samuel E. Bays		
14	My name is Samuel E. Bays. I am a reactor physicist employed by Idaho National Laboratory. I have a BS in Mechanical Engineering from Kansas State University (2002) and a MS and PhD in Nuclear Engineering from University of Florida (2004,2008). I am writing to you during my personal time to express my support for resumption of transient testing of the TREAT reactor at INL. I personally know many friends and colleagues at INL that are well qualified to safely carry out the mission of modernizing and maintaining the TREAT reactor facility. To give a few examples, INL has recruited and grown world experts in advanced simulation software for modeling time dependent reactor and fuel behavior such as the case with the MOOSE code system. Not only does INL lead new method development, but we also maintain the world standard of reactor transient behavior simulation software, RELAP5-3D. Furthermore, INL is a leader in material science and Post Irradiation Examination. All of these experts are currently engaged in non-transient (i.e., steady-state) advanced fuel qualification in the ATR, another world class asset. Resumption of TREAT would allow the INL workforce to leverage what they know about steady state systems into the realm of time-dependent physics. I could speak even more verbosely endorsing our support service organizations, e.g., RadControl, Training, Quality Assurance, etc. I work in the Nuclear Science and Technology Directorate but have come to know many safety analysts in the Applied Engineering Directorate, working to modernize safety analysis reactor physics	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
	software for the ATR. These types of collaborations were relatively unheard of during the last days under EG&G, or so I'm told. However, BEA has made a concerted effort to cross-pollinate expertise and experience to ensure that all our employees know what and where the safety envelope is. We ask the right questions, bring solutions to the table and have the drive to make TREAT restart a success. Thank you for the opportunity to speak to you about this topic.	
Beatrice Brailsford (Snake River Alliance)		
15	The current EA should be withdrawn and both the transient test program and TREAT refurbishment, restart, operation, and decommissioning be analyzed in a full environmental impact statement. This major federal action falls squarely within the "Classes of Actions that Normally Require EISs" according to the DOE's own NEPA Implementing Procedures (10 CFR 1021 Appendix D to Subpart D): "Siting, construction, operation, and decommissioning of power reactors, nuclear material production reactors, and test and research reactors."	Appendix D of 10 CFR 1021 lists the types of actions for which DOE "normally requires the completion of an EIS." Included in that list is "the siting, construction, operation, and decommissioning of power reactors, nuclear material production reactors, and test and research reactors." The listing of an action in Appendix D does not require the preparation of an EIS at all times. DOE is not looking at establishing a new capability, but rather at resuming the capabilities that it previously had related to transient testing. TREAT operated from 1959 to 1994 and ACRR has been in continuous operation since 1979. While operating, TREAT served as the Department's primary source for transient testing operations. In 1994, DOE made the decision to suspend transient testing activities. Now, DOE has identified a need to resume its transient testing operations. Based on the selection criteria, both TREAT and a modified ACRR fit the mission need. DOE has a considerable body of operating history on both reactors. This information demonstrates a lack of environmental impact from previous operations. DOE determined that the potential for significant environmental impacts of the proposed action are low. In addition, because the TREAT and ACRR reactors are small with unique operating parameters, the reactors will not need refueling and thus will not be continually generating spent nuclear fuel. The fuel in the existing cores is anticipated to last beyond the 40 year life of the proposed action. In accordance with the NEPA implementing regulations, a federal agency can prepare an EA at any time for a proposed action. If potential significant environmental impacts are identified, an environmental impact statement (EIS) can always be pursued. Conversely, if no significant environmental impacts are identified, the EA is the appropriate level of documentation and no further evaluation is necessary. DOE ensures the level and quality of analysis and data compiled for the EA is suitable for use in an EIS if it is decided that an

Comment #	Comment	Response
		EIS should be prepared. This course of action is appropriate for use when an agency has a basis for the belief that the proposal will not manifest significant environmental impacts.
16	Furthermore, the transient test program has never been evaluated as a whole, and DOE has not conducted a transient test for more than a decade. The program itself must undergo NEPA evaluation.	In 2000, DOE published the Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Energy R&D and Isotope Production Missions in the United States, including the Role of the Fast Flux Test Facility (NI PEIS). In the NI PEIS, DOE examined its existing nuclear infrastructure capabilities and projected its future needs to support R&D testing, including the overall environmental impacts of conducting limited transient testing R&D. At that time, DOE, in the Nuclear Science and Technology Infrastructure Roadmap identified a future infrastructure gap in transient testing capabilities to support reactor fuel systems that could not be addressed by currently operating DOE facilities. Since that point in time, the need for more comprehensive transient testing to support a wider range of experiments was realized, and this NEPA action was initiated to resume transient testing at the TREAT Reactor or to modify the ACRR Reactor. At the time of the NI PEIS, DOE did not propose or analyze restarting TREAT or the use of another reactor to fulfill this larger scope or transient testing need as the fuels research program was in its preliminary phases. DOE has determined that the nuclear operations and infrastructure analyzed in the NI PEIS will not fulfill the current need. As a result, when evaluating whether to conduct an EIS or an EA for this action, DOE considered the past analysis that had been done to support the existing DOE nuclear infrastructure for R&D as well as its history of operations and impacts of the TREAT and ACRR reactors. A reference to the NI PEIS has been added to Section 7 of the Final EA. There are no broad generic issues or broad technology changes contemplated by this EA. DOE is analyzing whether it wants to resume a previously operational capability at TREAT, a facility in safe standby status, or at ACRR, with appropriate modifications to perform transient testing. Language clarifying that DOE is not reviewing a broad or generic program but instead is looking at resuming operations of transient testing capabilities has been added throughout the Final EA.
17	The current EA does not adequately analyze the purpose and need for the proposed action. The statement of purpose and need is a cornerstone of the analysis of a proposed major federal action under the National Environmental Policy Act. Furthermore, clearly delineating the purpose and need for federal actions is key to prudent decisions regarding the deployment of public resources. Some information about the purpose and need is available in this	The EA provides a summary of the mission need for transient testing. Additional information is provided in the Mission Need Statement (DOE 2010) and Alternatives Analysis (DOE 2013b), primary reference documents of the EA, regarding specific transient testing needs in support of the DOE Office of Nuclear Energy’s research programs and limitation of existing operational capabilities. This information was used to identify reasonable alternatives for meeting the identified mission that were analyzed in the EA. For clarity, Section 1.1 – Purpose and Need for Agency Action, has been

Comment #	Comment	Response
	EA, the Mission Need Statement (2010), and in the Alternatives Analysis (2013). It's probably understandable that the three discussions differ in emphasis. Most certainly, the full discussion should have been included in the EA. It is notable that none of the documents mentioned here include any attempt to substantiate the asserted role of transient testing in reducing the potential for proliferation of nuclear materials.	modified to include specific reference to the Mission Need Statement and Alternatives Analysis, as well as clarify the applicability of transient testing to all nuclear fuel types. DOE is researching new fuel designs for both current and future generations of reactors. These new fuels have the potential for a variety of benefits including lowering the proliferation risk associated with these fuels by making the material less attractive for use in weapons. Many of these new fuel concepts will need to undergo transient testing before they could be licensed for operation and used.
18	The DOE shut down the Transient Reactor Test Facility in early 1994 because "there were no customers for the facility at that time." And today? In April the DOE asked itself – and then did not answer: "Are there specific, identified customers who are willing to pay to use transient testing capability? If so, who?" Here the DOE did at least refer to efforts to develop accident tolerant fuel. But according to a presentation made the same month by the DOE Director for Fuel Cycle Research and Development, that office is already overseeing six accident tolerant fuel projects. Two of those projects involve the INL; none seem to hinge on the availability of either of the current EA's alternative facilities. Instead, they seem to call for using currently operating research reactors.	The purpose of the EA is to determine if any of the alternatives have the potential for significant environmental impacts. Discussion of cost sharing and potential customer base is outside the scope of this EA.
19	In fact, it's not even clear what is actually going to happen if the proposed action is approved. For instance, the Alternatives Analysis for the Resumption of Transient Testing Program and the current EA were both published in November 2013. But the facility operations costs presented in the Alternatives Analysis are based on 10 transient tests per year. The discussion in the current EA, on the other hand, anticipates up to 20 static and 14 closed loop tests annually.	The alternatives analysis included a baseline level of support for 10 DOE-funded transient experiments per year. The EA was performed with a more conservative assumption for the number of tests that corresponds with the maximum possible number of transient tests that are anticipated to be conducted annually (up to 20 static tests and 14 closed loop tests).
20	The current EA does not adequately cover any potential challenges involved in restarting a 65-year old reactor, nor does it discuss decommissioning, including its cost, in any way.	DOE prepared the EA to determine whether the proposed action and reasonable alternatives had the potential for significant environmental impacts. DOE understands that this NEPA decision will not convey all of the challenges prior to the resumption of transient testing; however, DOE will ensure that it reviews all documentation, makes necessary updates to documents, and performs refurbishments and like-for-like replacements needed for the TREAT reactor prior to resuming transient testing operations. The timing of future D&D activities for TREAT is unknown and estimates of the impacts from D&D are too speculative to quantify. D&D analysis will be done at the appropriate time consistent with requirements. Once the decision is made to D&D, the TREAT reactor core will be managed consistent with the 1995 Spent Nuclear Fuel Management and

Comment #	Comment	Response
		Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs EIS (DOE 1995).
21	For all impact analyses, it would be useful to see a discussion of the first 3½ decades of TREAT operation (1959-1994).	TREAT was constructed at the Materials and Fuels Complex (formerly Argonne National Laboratory-West) at the Idaho National Laboratory in the late 1950s. TREAT achieved criticality and began operations on February 23, 1959. It is a small air-cooled nuclear reactor with configurable space available in the middle of its core for transient experiments. Although capable of low-power steady state operation for neutron radiography, TREAT normally operated in pulse mode to study the effects of simulated reactor overpower accidents, or transients, on nuclear fuel and materials. During its 35 years of operation, more than 2,800 transient tests were safely conducted in TREAT. See Section 2.2.1 of the EA.
22	The spent fuel produced by the operation of TREAT and the tests conducted there will be added to the considerable spent fuel inventory already stored at the Idaho National Laboratory. A full discussion of that cumulative impact is needed.	Because of the relatively small aggregate power generated by the TREAT Reactor, the burn up of nuclear fuel is low. Therefore, no refueling or generation of spent nuclear fuel from the TREAT Reactor is anticipated to support this mission. The TREAT Reactor facility fuel inventory is included in the Programmatic Spent Nuclear Fuel (SNF) and Idaho National Engineering Laboratory (INEL) Environmental Restoration and Waste Management Environmental Impact Statement (DOE/EIS-0203-F). Spent nuclear fuel debris is addressed in Section 4.1.1 of the EA.
23	The disposal pathway for all waste created by this proposed program should be discussed.	The waste generated by the proposed action will be disposed of at a combination of on-site and off-site facilities as described in Section 4.1.1 and 4.2.1 of the EA. Additional details are available in the backup document (see Adams, et. al. 2014). References to existing NEPA coverage for INL waste management activities have been added to the Final EA (see Section 4.1.1 under the heading 'Impacts of Waste Generation and Management' and Section 7).
24	In fact, the DOE's true focus for TREAT may be on far more distant prospects than developing safer fuel for currently operating reactors. For instance, much is made of a cooperative effort with France and Japan to develop sodium-cooled fast reactors. Such reactors have been around for decades but have never been extensively deployed because they are so much more dangerous and hard to operate than other designs. In a real reach, the Mission Need Statement for transient testing posits a research need to develop fuel for the second generation of advanced small modular reactors (SMRs), even though the first generation of SMRs hasn't even been designed.	The Mission Need Statement accurately reflects the need for transient testing of fuels and materials.

Comment #	Comment	Response
George B. Brunt (BiologiQ Inc.)		
25	As a local businessman in southeast Idaho, we would welcome the transient testing project in this part of Idaho. We are equipped and friendly to nuclear energy. Being raised in southeast Idaho, we have always been proud of our association with nuclear energy and unlike many places in our country we have been sad to see decreasing activity here over the years. We want to contribute to our countries energy resources. With Arco being the first city powered by nuclear energy and the forecast showing rapid decline in fossil fuels over the next 200 years, it is imperative that we continue to test and understand nuclear.	DOE acknowledges your comment related to the need to resume transient testing.
Gregory C. Calder (Beard St. Clair Gaffney)		
26	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions. It is almost unconscionable that such testing has not been continued for the past many years when such a proven facility as TREAT was available. The resumption of transient testing in a facility located almost adjacent to the examination facilities, resulting in minimal transportation requirements also tends to maximize the flexibility of testing capability as well as reducing any hazards connected with transportation to almost zero. It is conceivable that rapid turnaround between transients and examinations could be crucial to finding information that otherwise would be lost with a long period between the transient and examinations/retesting. Anti-nuclear groups, if honest, should note that the long history of success with the TREAT testing and the translation of data to new and better fuel designs have led to much better fuel types that would have otherwise been possible. Therefore, option 1 should not only be preferable, but mandatory.	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
A. Ladd Carter (Bingham County Commissioners)		
27	This letter is written in support of the INL Resumption of Transient Testing. The Transient Reactor Test (TREAT) Facility has a long history of safe and successful performance of transient testing of nuclear power reactor fuels. During its decades of operation, Transient Reactor Test provided transient testing of nuclear fuels to help the industry design even more durable fuels, establish performance limits, validate design codes, and help regulators define safety limits. The Idaho National Laboratory has everything needed on one site to safely and properly do Transient Testing. Please consider selecting the Idaho National Laboratory for the Resumption of Transient Testing.	DOE acknowledges your comment related to the need to resume transient testing.
Boyd Christensen		
28	Nuclear power has been widely recognized as a viable long-term source of energy, capable of producing a significant portion of the nation's power requirements for the foreseeable future. The benefits of nuclear power include high power density, relatively low costs, little or no carbon emission, and a stable base load production. Especially when compared to other energy resources such as fossil fuels or renewables, nuclear power has the greatest potential to contribute significantly to the growing energy needs of our society. Recently, the benefits of nuclear power have been highlighted as a major contributor to the energy portfolio of our nation as well as meeting world-wide energy production increases. The sustainability of this energy source is in large part dependent on the ability to develop safer fuels and structural material. The 104 operating reactors in the United States are aging and rely on old technology. The DOE Resumption of Transient Testing (RTT) proposal at the Idaho National Laboratory (INL) Transient Reactor Test Facility (TREAT) is intended to provide an excellent research facility at the lowest possible cost to the taxpayer with a mission of developing safer fuel and reactor material thereby helping restore the U.S. to a prominent position in nuclear science and technology and helping private utility companies develop power production capabilities which are safer	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
Ralph D. Clovis		
29	After review of the subject document (DOE/EA-1954), I strongly recommend the Department of Energy (DOE) NOT restart the Transient (TR) Reactor (REA) Test (T) Facility (TREAT) and instead, use the Annular Core Research Reactor (ACRR) located at Sandia National Labs (SNL) for the transient testing of nuclear fuels and materials. The TREAT reactor has not been in operation (that is, been critical) in >30 years. If DOE complex history has taught us anything, the estimated $75M to restart this facility will be at least two to three times that (or $150-225M). As a taxpayer, this is appalling to me because the ACRR at SNL has been used for the transient fuel testing. The ACRR has in the past easily adjusted its neutron spectrum to be identical to TREAT and successfully perform the fuel testing that TREAT did with the same results. The EA leads the reader to believe that the ACRR would need to be modified to perform fuel testing. This is inaccurate. The 9 inch inner diameter, dry cavity that is centerline with the reactor has provided sufficient room in the past to accommodate the fuel test experiments. ACRR offers locations for storage of irradiated fuel test articles to decay prior to shipment back to Idaho National Labs (INL) for further post-irradiation examination. A Hot Cell would not need to be constructed at Sandia National Labs (SNL). You can ship a lot of fuel samples from SNL to INL for <$10M (including cask design, construction, and use). That is much less that the TREAT restart cost. Again, a successful practice of the past was to irradiate at ACRR and ship test articles back to INL. Today, ACRR is fully operational and performs hundreds of experiments per year, most of them are power transients in nature (the type of testing you are proposing to do at TREAT). The reactor power transient can be adjusted for energy, power (currently licensed higher than that of TREAT), and neutron spectrum. ACRR can perform numerous transients per day whereas TREAT's former operational tempo was limited to 1 transient per day. TREAT has no containment or confinement for this air-cooled reactor. Formerly, TREAT power transient would send a plume of irradiated material, such as dust, into the atmosphere that would be detected and shutdown the EBR-II reactor when it was	Alternative selection criteria were developed by a team of subject matter experts from across the DOE Complex based on the required transient testing capabilities outlined in the mission need statement. Both TREAT and ACRR were selected as reasonable alternatives for analysis in the EA, based on an evaluation of each of the potential alternatives against the established selection criteria. The scope of each alternative was defined based on actions necessary to re-establish a transient testing capability that would meet the identified mission need. For the TREAT reactor, this includes refurbishment and like-for-like replacement of systems and equipment necessary to prepare the TREAT reactor for restart. For ACRR this includes modifying ACRR to include a real-time fuel motion monitoring device and building a hot cell adjacent to the reactor building. Estimated costs for the identified work scope have been assessed and will be considered by the Department as part of a decision regarding whether and how to proceed with the resumption of transient testing of nuclear fuels and materials. As described in the EA, the scope of activities identified for ACRR to fully meet the identified mission need include 1) modifying ACRR to include a real-time fuel motion monitoring device (re-build, install, test, and verify operation of the coded aperture imaging system) and 2) building a hot cell adjacent to the reactor building to assemble and disassemble large pre-irradiated loop-type test assemblies. Based on subject matter expert historical experience with transient testing of large-scale complicated loops, test assemblies could not be assembled remotely and transported significant distances without causing major upsets to the test assembly. Consequently, a nearby hot cell is required at ACRR to fully satisfy the identified mission need. In particular, a hot cell is needed to assemble and disassemble large-scale loop test assemblies. Loop test assemblies include all cooling (e.g., water, sodium, or helium), pumps/circulators, containment, test materials, and sensors. Radionuclide releases resulting from routine TREAT operations and postulated bounding accidents are presented in the analysis included in the EA (see Table 1 and Table 2). The releases presented in the EA bound the impacts of a fuel test experiment failure. The results of the bounding accidents are below established standards.

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	operational. What would happen if the fuel test experiment had a breach? I hardly think this operational philosophy of the past will go over well in today's regulatory environment. In summary, I strongly urge the Department of Energy to NOT restart the TREAT Facility, but request that INL and SNL work together to use the ACRR in New Mexico and the HFEF in Idaho to perform the next generation of nuclear power reactor fuel testing.	
Clay Condit (Idaho Science Center)		
30	I strongly support the Department of Energy's proposal to reopen Idaho National Laboratory's Transient Reactor Test Facility. I congratulate the DOE for having kept the TREAT Facility on standby for the past decades, rather than disposing of It ("CLEAN UP" can become a raging, infectious plague.). I spent the winter before last at my daughter's place in Richmond, Virginia, and while there attended meetings of the Virginia Section of the American Nuclear Society. At one meeting the speaker was a member of the U. S. Nuclear Regulatory Commission. During his question period I asked him where one could go now to test a new kind of nuclear reactor. He puzzled about that for a few moments then answered, "Maybe China?" With a dozen or so new concepts for reactors already visible it is time for the United States to look away from two decades of computer modeling - for a while - and resume physical experimentation. We have already heard the thousand reasons for not doing that. To start doing it would itself be the bravest experiment. Over fifty then-new, different, experimental nuclear reactors were tested - in a thousand ways – on the 900 square miles of INL's desert, over a period of fifty years. The ground at the INL is about the same. The air is about the same. The surrounding towns are about the same. The results of that testing have benefited our local region, the United States, and much of the rest of the world, greatly. We could do that again for those new dozen reactor concepts. It could again benefit greatly our local region, the United States, and the rest of the world. We could again learn new things, and learners make the world better. Reopen TREAT. Welcome and accelerate NUSCALE by loaning it the EBR-II dome to test in. Use INL's fifty years of successful experimental and environmental history to realistically readdress	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
	environmental requirements for new testing. Try very hard to recognize that efforts made to date to educate the American public on the vast positive merits of nuclear energy have not worked – and find other ways to do that.	
Stephanie Cook		
31	It's high time to up the ante on nuclear energy investments in the United States to meet the need for our growing electricity demands. We can start by investing in the resumption of transient testing at the Transient Reactor Test Facility (TREAT) at the Idaho National Laboratory (INL). The TREAT facility at INL has logged over 2,800 experiments in a 35-year history of safe and secure transient testing. From an environmental standpoint nuclear energy is the only energy source today which provides a safe and reliable carbon-free base load solution. We need to support the continued development in renewables solar, wind and hyrdro to diversify our energy portfolio. While renewables are gaining traction, they have a ways to go to replace the 10% reduction of fossil fueled capacity which is expected to be taken off line within the decade due to stricter environmental requirements. We cannot be swayed by short term market conditions in the natural gas market. The discovery of new methods to recover natural gas may have bought us time. However we need to stay focused on the long term energy needs of our nation and to date the only zero emissions solution with a strong safety record is nuclear energy. For this reason, I am in support of the DOE preferred recommendation as outlined in the draft environmental assessment to re start the TREAT facility at INL.	DOE acknowledges your comment related to the need to resume transient testing.
Cleve Davis (Shoshone-Bannock Tribes)		
32	DOE could do more to support tribal economic growth and provide opportunities for tribal youth in STEM education and experience. Although this type of testing may be of interests to the DOE, the project and continued generation of nuclear waste within the aboriginal homelands of the Shoshone-Bannock Tribes does not provide any clear benefits to the Shoshone-Bannock Tribes - only risks. We also cannot provide support for the extremely dangerous and non-biodegradable generation of nuclear waste. Furthermore, the DOE could do more in regard to supporting economic growth on the reservation, providing opportunities to our Tribal youth in STEM education and experience, and promote technological	Although outside the scope of this EA, DOE is committed to working with the Tribes as documented in the DOE/Tribal Five-Year Agreement in Principal (AIP).

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	advancement on the reservation, as done in non-Indian communities off the Reservation. Nuclear research and development at the INL also contributes to weapons development, which poses a serious and grave risks to the entire planetary ecosystem. Because of these factors, we cannot provide support for this project.	
33	The need for testing and materials used is vague. Will there be testing be done on biological organisms? The EA should more clearly identify the ethical considerations/guidelines utilized to identify testing materials and purpose for testing.	As described in the EA, (Section 1) the purpose of transient testing is to improve the safety of nuclear reactors by developing nuclear fuels and materials that can better withstand accident conditions. There is no identified mission need to test biological materials. Testing is limited to nuclear fuel and other materials such as metals.
34	The cumulative impacts section should identify how the nuclear waste generated will cumulatively contribute to waste being generated on a National scale. What are the capacities of existing storage facilities, and can they handle additional nuclear waste? What is the potential for ground water contamination? How much land has been loss for to support these storage facilities, and what are the security costs of maintaining these storage facilities? Will there be additional storage facilities being built? If so, where? As time goes on additional nuclear waste is cumulatively generated and this increases the risks for environmental contamination and potential for theft or sabotage. These issues need to be addressed and considered in the analysis.	As described in the EA (Sections 4.1.1 and 4.2.1) the impacts of waste generation and management under both alternatives are negligible. Additional detailed information would not aid the decision maker in determining whether there is a significant environmental impact. Disposal paths have been evaluated and are covered by other NEPA documentation. Existing storage capacity is sufficient at the INL for the waste that will be generated as part of the proposed action. There are no planned additional storage facilities being built at the INL to support the transient testing mission. The cost of maintaining the existing storage facilities, the potential for ground water contamination at these storage facilities, and risks of theft or sabotage are outside the scope of this EA.
35	There should be a socio-economic analysis within the EA identifying the upfront costs of refurbishment and maintaining the project, as well as the costs associated with long-term storage of nuclear waste.	DOE prepared the EA to determine whether the proposed action and reasonable alternatives had the potential for significant environmental impacts. While cost is an important component of the federal decision making process, it is outside the scope of this EA.
36	There are only two back-up strategies for the reactor, the existing power grid and diesel generators. There should be at least one additional back-up measure to prevent accidental reactor meltdown.	The TREAT Reactor is unique in that it is designed for short high power pulses, or low power operation for a limited time. The heat that is generated during reactor operation can be absorbed entirely by the mass of the fuel assemblies, and accordingly the reactor does not require an active cooling system. The TREAT Reactor is cooled by air at or near atmospheric pressure. There is insignificant decay heat, and accordingly no residual heat removal or emergency cooling systems are required. As a result, no additional back up measures are necessary.
37	Although, the preferred alternative implies that radioactive waste would be deposited at the onsite INL facilities, it is not clear if all radioactive waste will also be deposited at the INL facilities or transported to other facilities? There should also be a definition of “fuel” and what environmental risks it may pose. Where is this fuel coming from and how is a connected action to this project? Is it being mined? If so, where and how is connected to this project?	Wastes will be disposed in INL and off-site facilities in accordance with applicable laws, regulations, and DOE Orders as described in Section 4 of the EA. Additional details are available in Adams, et al. 2014. A definition of nuclear fuel is provided in the glossary. The potential impacts of long-term storage/disposal of waste are addressed under existing NEPA documentation and in Section 4.1.1 of the EA. Specific references to existing NEPA coverage for INL waste management

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	Potential environmental impacts that could result during long-term storage/disposal should also be analyzed.	activities have been added to the Final EA (see Section 4.1.1 under the heading 'Impacts of Waste Generation and Management'). Nuclear fuels and materials to be tested may originate from INL, nuclear fuel development companies, other DOE facilities, and NRC-licensed facilities. Mining of raw materials and manufacturing of nuclear fuel and materials are outside the scope of the EA. The environmental impacts of transportation of fuels and materials to INL from off-site NRC-licensed facilities are analyzed separately as part of the NRC licensing process. As described in the EA, transportation would occur on public roadways pursuant to the NRC's authority for commercial reactors using commercial, NRC-certified, U.S. DOT-compliant transport casks. (Also see response to Comment #34, Page A-74). As described in the EA the impacts of waste generation and management under both alternatives are negligible. Additional detailed information would not aid the decision maker in determining whether there is a significant environmental impact. Disposal paths have been evaluated and are covered by other NEPA documentation. (Also see response to Comment #34 (page A-74). DOE added specific references to existing NEPA coverage for INL waste management activities to Section 4.1.1 and the reference section of the Final EA under the headings 'Routine Maintenance and Operations at the Reactor Building and Reactor Control Building' and 'Experiment Handling and Examinations in HFEF and Other MFC Facilities' and placed in Section 7.
38	Transportation of dangerous radiative fuel/materials across the Fort Hall Indian Reservation should absolutely not occur.	DOE and the Shoshone-Bannock Tribes have worked cooperatively for the last 15 years to faithfully implement the DOE/Tribal Five-Year Agreement in Principle (AIP) provisions regarding safety, emergency management, funding and monitoring of hazardous materials shipments using the I-15 corridor through the Fort Hall Reservation. These shipments occur with full Tribal knowledge and all have been completed safely. DOE will continue the working relationship and established protocols for any future hazardous materials shipments in coordination with appropriate Tribal officials.
39	The air filtration/cooling system for the TREAT Reactor entraps 99% radioactive aerosols. What environmental consequences does the remaining 1% of radioactive aerosols pose to human health and the ecosystem? What is the potential for these contaminates to be assimilated by plants and subsequently into the food chain?	All radiological aerosol emissions were discussed in detail in Appendix C of Schafer A.L., et al, 2014. Based on that analysis, it was determined that only Ba-140 has the potential to accumulate in soils. The impacts of Ba-140 on plants and animals were analyzed in Hafla, J. et al, 2013. Results of the analysis were provided in Section 4.1.1 of the EA. The concentration limit for Ba-140 is 7.32 pCi/g for terrestrial animals and 38,400 pCi/g for terrestrial plants. The conservative (screening-level) predicted soil concentration from normal operations at TREAT assuming deposition of all Ba-140 within 120 m of TREAT is 1.47pCi/g, which is

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		well below the limit for both animals and plants. Therefore, the potential impact to biota and to the subsequent food chain is low.
40	Throughout the EA, conclusions are reached about there being no effect or low effects. How these determinations were made needs to be summarized.	The basis for the conclusions related to the potential for significant environmental impacts is provided in the EA. A summary of the impacts is found in Section 4.4, Table 10 of the Final EA and a determination of significance is described in Section 4 under each discipline.
41	The EA does not specify radiological impacts of atmospheric releases to the Fort Hall Indian Reservation. A surface modeling map that shows does levels at varying distances from pollution sources should be included under the "Radiological Impacts of Atmospheric Releases" and "Radiologic Consequences" that result for accidents.	Doses were provided for normal operations at Atomic City in Section 4.1.1 of the EA in the section entitled "Radiological Impacts of Atmospheric Releases". The annual dose was 0.0021 mrem for comparison to 10 mrem specified by 40 CFR 61 Subpart H. For accident conditions, doses were provided in Table 2 for the nearest offsite member of the public corresponding to the INL boundary nearest TREAT. These doses were less than 0.2 rem for the highest impact event. Doses decrease with distance from TREAT, and would therefore be much less within the Fort Hall Indian Reservation.
42	The EA states that there would be no direct impacts to species of published ethnobotanical concern. However, it does not list which species are being considered and how this conclusion was reached. The EA should summarize how this conclusion was made and who made the conclusion.	A description of impacts to plant species in the area around TREAT, including those of ethnobotanical concern, is found in Section 4.1.1 of the EA under the heading 'Impacts to Biological Resources'. The detailed evaluation was incorrectly referenced in the text and should have been Hafla, J., et al. 2013 (see Section 4.1.1 under the same headings as above).
Kit DesLauriers (Keep Yellowstone Nuclear Free)		
43	Keep Yellowstone Nuclear Free is highly concerned about the plan to restart the Transient Test Reactor (the so-called TREAT Reactor) at Idaho National Laboratory (INL). This is a reactor that began operating in 1959—some 55 years ago—and has lain dormant for almost 20 years. The Department of Energy (DOE) acknowledges that for a restart to happen, significant upgrades (notably upgrades in instrument and electric systems) and further analyses (particularly a safety analysis) will be required. The DOE also acknowledges that little to none of this work has been done pending funding and approval of the Environmental Assessment. This means there is not a current design basis for risk assessment in the Environmental Assessment and it calls into question the validity of any Environmental Assessment at this point in the proposed project. If the DOE approves the Environmental Assessment and secures funding to do the upgrades and safety analysis, when will the public have the opportunity to "weigh in" as provided for by the National Environmental Policy Act (NEPA)?	DOE cannot make an irretrievable or irreversible commitment of resources to a specific action until the appropriate NEPA analysis is completed. The purpose of the EA is to assess the potential for significant environmental impacts associated with the resumption of transient testing. In the case of the Alternative 1, the TREAT Reactor operated for more than 35 years and safely conducted more than 2,800 transient experiments before it was placed in a safe-standby mode of operation in 1994. DOE proposes to restore the TREAT Reactor to its original functionality to fulfill the capability gap identified for transient testing. The reactor and its supporting systems will be evaluated and refurbished as necessary with like-for-like replacements to ensure it can safely operate prior to resuming transient testing operations. No upgrades are planned to change or alter the design basis of the reactor. The safety basis will be revised as necessary to incorporate applicable DOE Orders and Standards. Therefore, the information presented in the EA is both consistent with the TREAT design basis and representative of the future reactor operations. The EA is the NEPA document DOE is using to obtain public comment on

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	Keep Yellowstone Nuclear Free represents citizens living in close proximity to INL and to its TREAT Reactor. An accident at the TREAT Reactor can, INL admits, have an impact on people who live and work offsite. Before any restart of this aged reactor— and running it, as DOE is considering, for another 40 years, bringing its operating lifetime to 75 years—the most careful and realistic assessment must be done, and there must be full public participation in the decision to restart.	the proposed action. NEPA evaluations are prospective and give the public a chance to comment on proposed federal actions early in the process.
Stuart Draper		
44	I am in favor of resuming TREAT. As a resident of Idaho Falls that is trying to raise a family and run a business of my own, I feel that it is not only smart to resume, but silly that it was ever shut down. I feel that the risks, which are almost non-existent, are far out-weighed by the many benefits. Please know that as a concerned citizen, I am in favor of resuming TREAT at the INL.	DOE acknowledges your comment related to the need to resume transient testing.
Clarke Farrer		
45	I endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. The activation of an additional facility to test new nuclear fuel design would be helpful in achieving more efficient use of nuclear power, by enabling longer fuel life, higher operating temperatures, and less frequent shutdown for fuel changes. Of the two alternatives proposed, the restart of the TREAT reactor at the INL offers the advantage that TREAT already possesses a hot cell, and an in reactor fuel observation device, both of which would need to be constructed in case restart of the ACRR were selected. Use of the ACRR would also require the transportation of fuel samples and waste because of facilities at the INL, which are not present at the location of ACRR. These are expenses which the use of TREAT can avoid. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials. Therefore, option 1 should be preferable.	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
Joanie Fauci		
46	I have lived in Idaho over 25 years. It is a great place to live. Part of what makes it so great is the lack of pollution. Nuclear waste has great potential to contaminate our ground water. Too often I hear politicians say how inexpensive nuclear power is. This is not true if they were to take into account the cost of long term storage and/or disposal of the waste that comes with the energy. Their views are very narrow. We do not need any additional nuclear waste in Idaho. At this time we don't know how to handle it, we should not create any more.	DOE acknowledges your comment related to the need to resume transient testing.
47	Besides waste, another reason the TREAT reactor should not be restarted is that there is no customer or need for it. Until there is a need or market for this product, it is unwise to implement it. No other business model would do so. It seems like some in the nuclear industry are just trying to save their jobs.	DOE acknowledges your comment related to the need to resume transient testing.
48	Lastly, besides waste/pollution and the lack of need, it should not be restarted because it just costs too much. Nuclear reactors are a dying industry. Rather than spending $900 million dollars on this unneeded project, $900 million could be spent on cleaning up and closing down some of the existing DOE sites. With all the budget wars going on in Congress right now, it would be ridiculous for them to authorize $900 million on this pipe dream project.	The preliminary estimate for developing and conducting transient testing and the associated examinations over the 40 year timeframe of the proposed action is $900,000,000 (reference DOE 2013b). Although cost is an important component of the federal decision making process, it is outside the scope of this EA. Cost will be evaluated by DOE decision makers and Congress. The cost estimate will continue to be refined and efficiencies implemented over time.
Paul Fife (Sperry Van Ness High Desert Commercial)		
49	I would like to express my support of resuming transient testing at INL's Transient Reactor Test Facility reactor approximately 38 miles west of Idaho Falls, Idaho	DOE acknowledges your comment related to the need to resume transient testing.
Jackie Flowers		
50	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions. It is almost unconscionable that such testing has not been continued for the past many years when such a proven facility as TREAT was available. The resumption of transient testing in a facility located almost adjacent to the examination facilities, resulting in minimal transportation requirements also tends to maximize the flexibility of testing capability as well as reducing any	DOE acknowledges your comment related to the need to resume transient testing.

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	hazards connected with transportation to almost zero. It is conceivable that rapid turnaround between transients and examinations could be crucial to finding information that otherwise would be lost with a long period between the transient and examinations/retesting. Anti-nuclear groups, if honest, should note that the long history of success with the TREAT testing and the translation of data to new and better fuel designs have led to much better fuel types that would not have otherwise been possible. Therefore, option 1 should not only be preferable, but mandatory.	
Form Letter 1 (Multiple Names)		
51	My name is ____________ and I reside in ________, ID. I have reviewed the Draft Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials. I support alternative 1: To restart the Transient Reactor Test Facility Reactor at the Idaho National Laboratory. Thank you for providing this opportunity to comment. 'Signed' Andy ? (cannot read last name), Blackfoot, ID, Harvey Gerber, Blackfoot, ID Patricia Gerber, Blackfoot, ID Heidi Gerber, Blackfoot, ID Todd Johnson, Ammon, ID David Marcino, Shelley, ID (Associated with Partnership for Science & Technology) Kevin McCusker, Pocatello, ID Rollie J. Murray, Pocatello, ID June Harris, Island Park, ID Matt Gerber, Blackfoot, ID Roger Cox, Idaho Falls, ID Travis Woolsy, Idaho (included 13 additional signatures) Lawrence Barnes, Nampa, ID Ricardo Gariby, Boise, ID Ryan Albers, Nampa, ID Ron Jones, Horseshoe Bend, ID Stephanie Kramer, Star, ID Dennis Ziemann, Meridian, ID Stephen Krammer, Star, ID Tony Garibay, Boise, ID Antonio Garibay, Boise, ID	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
	Felly Garibay, Boise, ID Harry Tucker, Nampa, ID Kenneth Maderaz, Boise, ID Ponte Eaton, Boise, ID Chad Lacas, Boise, ID Jason Brown, Boise, ID Jacob ?, Nampa, ID Owen Danes, Caldwell, ID Tim Hix, Nampa, ID Luis Roger Garcia, Boise, ID Josefins-Mobley, Boise, ID Milbry Garcia, Boise, ID Jim Scouter, Moore, ID Larry Wright, Blackfoot, ID Joe Ybarra, Idaho Falls, ID Tim C. Williams, Arco, ID Michael Nylen, Blackfoot, ID	
Mary Jane Fritzen		
52	As a resident of Idaho Falls who appreciates the benefits for the city from the INL workers, I will comment on the resumption of transient testing of nuclear fuels at materials at the site. I am not a site employee but a retired teacher and homemaker. Because Idaho Falls residents benefit in many ways by interacting with INL workers, I appreciate having the INL here. I have read over the draft assessment and admire the technical writing. We benefit not only scientifically but also in the arts--opera, symphony, and visual arts. In addition the INL improves our local education and economy. We residents generally do not fear an accident, but rather feel comfortable that nuclear scientists are providing a safe environment for us. We hope further research at INL, including the transient testing of nuclear fuels and materials, will be conducted here. We also hope that nuclear power can be generated safely with less waste products than in the past because of the difficulty of nuclear waste storage.	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
Laurence P. Gebhardt		
53	I write in support of transient testing of nuclear fuels and related structural or control materials at the Idaho National Laboratory. I have reviewed DOE information on resumption of transient testing including http://energy.gov/ne/articles/resumption-transient-testing and DOE/EA-1954 Draft Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials. The rationale for re-start of the INL TREAT reactor as a preferential choice over modifying the Sandia National Laboratory ACRR or no transient testing is clear and compelling. I believe that the INL site offers the best environmental safety, technical support, expertise and historic experience options for nuclear power R&D. I believe that the SNL ACCR choice for power reactor transient testing could adversely distract from or dilute important ongoing national security work (nuclear weapons programs). The USA must continue power reactor R&D and lifecycle assessments for safety, reliability, and performance reasons. Continuity or expansion of current commercial (electrical power) and government (naval nuclear propulsion) is important for the nation's economy and security. The choice of transient testing at INL has additional benefits to be achieved by synthesizing research with other government, commercial, and university related R&D at the INL and collaborating organizations such as Idaho State University, Center for Advanced Energy Studies and others. The expansion of physical and laboratory facilities in relative proximity and the talent base or community of practice can be an important factor in facilitating innovative R&D and related entrepreneurial activity. My qualification to comment in this matter include engineering education, career experience with nuclear reactors and weapons, past work experience at INL and SNL and residence in Idaho. I offer to provide additional technical, economic, and organizational rationale support so that DOE can resume transient testing of nuclear related materials at the Idaho National Laboratory.	DOE acknowledges your comment related to the need to resume transient testing.

Comment #	Comment	Response
Kevin Gray		
54	After review of the subject document (DOE/EA-1954), I strongly recommend the Department of Energy (DOE) NOT restart the Transient (TR) Reactor (REA) Test (T) Facility (TREAT) and use the Annular Core Research Reactor (ACRR) located at Sandia National Labs for the transient testing of nuclear fuels and materials. The TREAT reactor has not been in operation (that is, been critical) in 20 years having been placed in a cold standby status in 1994. This lack of recent reactor operations calls into question the following topics for which the subject document does not appear to take into account: • The lack of qualified reactor operators and supervisors capable of safely operating the reactor is in question. Are there any remaining previously qualified operators/supervisors from 1994 available to begin restart activities? • The operating and maintenance procedures used 20 years ago mostly likely do not meet today's standards and will have to be developed/validated. This is not a trivial effort. • Conduct of operations principles and safety culture attributes since 1994 has improved/changed dramatically since the TREAT reactor last operated. Establishing these principles and improving the culture to ensure safe operations will be difficult without a cadre of qualified operators/supervisors. • Safety and/or safety-significant equipment will have to be replaced and/or refurbished in order to meet today's standards. This will not be an inexpensive task with today's standards. Also, since the reactor has not been operated in 20 years, how does DOE know what equipment will be capable of performing its design function? Does DOE have the required design documentation proving all safety and safety-related equipment will be capable of performing their design function? Have System Design Descriptions for all the safety related and safety-signification equipment been developed? Has any of the safety and safety-related equipment been operated since 1994? If not, DOE does not have an accurate picture of the extent of effort necessary for this restart. • If the documented safety analysis has not been maintained since 1994, upgrading this document, the Technical Safety Requirements and other safety basis	While the TREAT Reactor was placed in a safe standby condition in 1994, the TREAT facility remains an active nuclear facility and many systems have been maintained and remain operational to support current activities within the facility. Specific topics identified in the comment are addressed as follows: As described in the EA, readiness assessment will be completed prior to resuming transient testing at TREAT to demonstrate that there is a reasonable assurance that operations are performed safely and provide adequate protection of workers, the public, and the environment. This assessment includes, but is not limited to, an evaluation of: safety management programs; operational interfaces; selection, training, and qualification of operations and support personnel; implementation of facility safety documentation; programs to confirm and periodically reconfirm the condition and operability of all safety and support systems; procedures; emergency management; and conduct of operations processes. Activities associated with updating operating and maintenance procedures to meet current standards are included within the scope of the TREAT alternative and have been taken into consideration. Conduct of operations principles and safety culture attributes have improved/changed drastically since 1994. INL and Sandia National Laboratories both employ highly qualified nuclear and reactor operations personnel. DOE assessment criteria specifically address selection, training, and qualification of operations and support personnel and implementation of conduct of operations processes. As described in the EA, activities associated with resuming transient testing at TREAT include a detailed evaluation of all reactor systems, including safety systems, and completion of maintenance and refurbishment activities necessary to ensure equipment operability and compliance with applicable codes and standards. Activities to ensure all required documentation and analyses are complete and that systems comply with current applicable standards have also been considered as part of the scope of work necessary to successfully resume transient testing at TREAT. Activities to revise and/or update nuclear safety documentation to establish a safe operating envelop for the transient testing activities described in the EA have been considered for both TREAT and ACRR and are included within the scope of each alternative.

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	documentation to today's standards/requirements will be costly. Reconstituting the design basis, if required, will add years and untold millions of dollars to this restart effort. • TREAT being an air-cooled reactor, and without a primary containment, will call into question its inherent ability to protect the public from fuel melt or reactor accident. With Idaho Falls located approximately 25 miles east of TREAT, the public will not be assured of their safety once it is known that the facility lacks a primary containment. Also, once the Graphite Reflector is identified as an integral reactor component, the public will have in their mind a potential Chernobyl located nearby. Will fuel transient testing involve melting fuel assemblies? If so, try telling the public operations with a reactor of such design will be safe. These above topics, and many more, will be included in the required DOE Operational Readiness Review (ORRs). From my review of the subject document and my direct involvement in several DOE & Contractor ORRs for restart of nuclear reactors (for example, the Sandia Pulsed Reactor (SPR)-III, SPR Facility Critical Experiments, and several ACRR readiness reviews), the ORR for TREAT will be costly and could take several months to complete. The SNL ACRR Facility has a highly skilled and qualified cadre of reactor operators/supervisors and support personnel such as Radiological Control Technicians and System Engineers, all documentation including procedure's, System Design Descriptions and safety basis documentation are approved and meet today's standards/requirements, their conduct of operations and safety culture is excellent, and all safety and safety-significant equipment is operable. The ACRR and facility have been modified throughout the last 10 years to improve safety and reliability. The stated modifications, if necessary, to the ACRRF for transient testing will be inconsequential compared to the efforts necessary to restart the TREAT reactor. In summary, ACRR is the best option for the DOE and American Taxpayer to conduct fuel transient testing. Attempting to restart the TREAT reactor will become another DOE nightmare as the costs increase several-fold and the schedule extends for year's as currently is the case in many such DOE construction activities, for which the TREAT restart will become.	Radionuclide releases resulting from routine TREAT operations and the postulated bounding accidents are presented in the analysis included in the EA (see Table 1 and Table 2). The releases presented in the EA bound the impacts of a fuel test experiment failure. The results of the bounding accidents are below established standards. As described in the EA, test assemblies will be designed to contain the nuclear fuel or materials during planned tests and under all credible accident conditions. Fresh cladded fuels (unirradiated) will be in sealed containment. Irradiated fissile materials or fission products will be sealed and will have single or double containment, as appropriate, with the containment designed to retain its integrity. Pre-experiment evaluation and analysis will be conducted to ensure the experiments are within established operating parameters. As described in the EA, a demonstration of readiness will be completed prior to the resumption of transient testing utilizing either the TREAT Reactor or ACRR. The scope of these operational readiness activities have been factored into the scope for each alternative.

Comment #	Comment	Response
Brian J. Gross		
55	I am writing to express my full support for resuming transient testing at TREAT. The Idaho National Laboratory is a vital economic engine for eastern Idaho and restarting the TREAT reactor would allow INL to be more competitive on a global scale in nuclear fuels research. As a resident of Idaho Falls, I believe expanding the INL's capabilities is highly beneficial to our community.	DOE acknowledges your comment related to the need to resume transient testing.
Greg Hansen (Rockwell Homes)		
56	In regards to public comment regarding the resumption of transient testing of nuclear fuels and materials, I have reviewed portions of the information provided and feel that this would be a good and logical opportunity. It seems only natural to conduct more of this type of work in our area because of the resources that are available. It is my option that we should want this type of work in our area, and we should be encouraging any type of Nuclear testing, storage or disposal because of the high level of trained professionals in our area as well as an amazing facility in our back yard.	DOE acknowledges your comment related to the need to resume transient testing.
Mike Hart (Partnership for Science and Technology)		
57	Thank you for providing a briefing to the Partnership for Science and Technology. It was very helpful to understand the full breadth of issues DOE considered and the bases for the proposed action. We believe that the purpose and need was well established and the set of criteria developed by the Department of Energy to identify reasonable alternatives to resume full-scale testing are both appropriate and thorough. After touring the facility (as part of NEI’s visit this summer), reviewing the EA, and participating in the DOE briefing, I can say that DOE did an outstanding job of making this proposed action open and transparent in full spirit of NEPA. PST strongly supports the rationale for the proposed action. To maintain leadership in the nuclear industry and play a significant ongoing role, the U.S. must have and active nuclear fuels testing program to test and certify new and improved fuels and to validate performance of existing fuel designs to identify potential improvements. New reactor technologies like small modular reactors will need rigorous testing as will new reactor designs including HTGRs and other Generation IV reactors.	DOE acknowledges your comment related to the need to resume transient testing.

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	Transient testing is a critical mission that supports DOE's ongoing missions and the specific mission of the DOE-NE to ensure safe and pro-active development of the nuclear industry both domestically and internationally. Critics that argue that testing is not needed, fail to understand the importance of U.S. global leadership, the economic value of new manufacturing opportunities created by the emergence of small modular reactor technology. If we fail to lead, other countries will take our place and the result will be a world that is less secure. The purpose for this action is therefore underpinned by strong scientific, economic, and national security needs. Additionally, facilities like the Transient Reactor Test Facility (TREAT) are irreplaceable national assets. I would like to thank the DOE for having the foresight and fiduciary responsibility to pursue the proposed action. With respect to the alternative considered. DOE did an excellent job of identifying and evaluating a full range of alternatives. Clearly, however, the option to resume testing at the Transient Reactor Test Facility (TREAT) stands out as meeting the criteria driven by the need while minimizing environmental risk, project risk and public safety. We concur with the finding the resuming operations at TREAT can be done safely with no significant environmental impacts. The PST would like to go on record in supporting restarting the Transient Reactor Test Facility (TREAT) because the Idaho National Laboratory already has the necessary facilities giving consideration to economic, environmental and technical factors. These unique capabilities represent a substantial financial investment on the part of American taxpayers. • Hot cells for test assembly, disassembly and examination • Availability of the Advanced Test Reactor • Location and availability of TREAT Reactor • Transportation on public highways is not an issue The fact that the INL is the nation's lead nuclear energy laboratory should be a significant factor when siting any nuclear energy R&D projects. Given the significant cost to build TREAT and the much larger replacement cost I would like to point out that a decision to pursue	

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	the No Action alternatives as a proposed action would require an EIS due to the environmental consequences. Loss of such significant infrastructure would be a significant federal action that would represent an "irreversible and irretrievable commitment" of federal resources. At this time, for this EA, this concern does not apply because the proposed action is to resume testing not eliminate the capability. A decision to eliminate the capability represented by TREAT would definitely be a much larger and more signiciant decision than the current proposed action to resume testing. I definitely would like to thank DOE for having the vision to resume this capability. It is a low cost investment with significant potential pay off for future generations. I appreciate the opportunity to provide input and look forward to the final report.	
Steve Herring		
58	I am writing in favor of the resumption of transient testing of nuclear fuels in the TREAT facility at INL. The TREAT reactor has a unique capability for the observation and measurement of the performance of nuclear fuel elements under transient overpower conditions. Such a capability is vital to the design of future fuels that will be able to consume long-lived radionuclides and that will be able to operate for extended periods. The presence of adjacent fuel examination facilities at MFC and of a wide range of nuclear expertise are also critical to the successful execution of a fuel testing campaign. Both of these are available at the INL.	DOE acknowledges your comment related to the need to resume transient testing.
Richard Hobbins		
59	As an environmentally conscious person, I realize that nuclear power is key to reducing greenhouse gas emissions. I also believe that nuclear power reactors must be operated safely. It seems to me that the development of accident tolerant fuel has the potential to improve reactor safety. I understand that testing improved fuel designs under transient power conditions is an important aspect of demonstrating fuel performance under accident conditions. The track record of 35 years of previous transient testing in TREAT at INL without impact to the surrounding land or population convinces me that transient testing in TREAT can be resumed without environmental impact. Therefore, I support the resumption of	DOE acknowledges your comment related to the need to resume transient testing.

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	transient testing of new fuel designs in TREAT at INL.	
Michelle M. Holt (Greater Idaho Falls Chamber of Commerce)		
60	The Greater Idaho Falls Chamber of Commerce is a voluntary organization made up of individuals and businesses that have joined together to advance the commercial, financial, industrial, civic and social interests of the greater Idaho Falls area. We are dedicated to improving the quality of life for all citizens in the area. One way we work to accomplish this is through advocacy; representing our members interests on public policies. As such, we recognize that the resumption of transient testing of nuclear fuels and materials is a positive opportunity for Department of Energy (DOE) Idaho Operations missions now and in the future, particularly if the existing facilities in our community can be fully utilized. Therefore, we support these activities under the Preferred Alternative #1: Restarting the Transient Reactor Test Facility (TREAT) at the Idaho National Laboratory (INL). It is our understanding that the TREAT facility has been on standby status since 1994, and the resumption of testing at the INL would be the best technical and budgetary decision among the three alternatives. We support Preferred Alternative #1, which allows DOE to accomplish their research goals to test the future efficiency of fuels and materials for use in the nuclear power industry while saving taxpayer funds through the utilization of Idaho's existing infrastructure and, skilled, experienced workforce. We appreciate your having provided the information in the "Summary of the Results of the Resumption of Transient Testing of Nuclear Fuels and Material Environmental Assessment" document to us for review, as well as links to the official draft document. It appears that the extensive examination of the many varied environmental aspects has been thoroughly explored, and we agree with the results for Alternative #1.	DOE acknowledges your comment related to the need to resume transient testing.
Brad Hudson (Red, Inc. Communications)		
61	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels	DOE acknowledges your comment related to the need to resume transient testing.

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	and materials in upset conditions. It is almost unconscionable that such testing has not been continued for the past many years when such a proven facility as TREAT was available. The resumption of transient testing in a facility located almost adjacent to the examination facilities, resulting in minimal transportation requirements also tends to maximize the flexibility of testing capability as well as reducing any hazards connected with transportation to almost zero. It is conceivable that rapid turnaround between transients and examinations could be crucial to finding information that otherwise would be lost with a long period between the transient and examinations/retesting. Anti-nuclear groups, if honest, should note that the long history of success with the TREAT testing and the translation of data to new and better fuel designs have led to much better fuel types that would have otherwise been possible. Therefore, option 1 should not only be preferable, but mandatory. Thank you.	
Matthew J. Hunter (Greater Pocatello Chamber of Commerce)		
62	I am writing on behalf of the Board of Directors for the Greater Pocatello Chamber of Commerce to support the resumption of transient testing of nuclear fuels and materials at the Idaho National Laboratory's TREAT facility. With over 35 years of experience performing transient tests on thermal and fast reactor fuels the Idaho National Laboratory (INL) is the facility to do this testing safely and successfully. The facility at INL has already been extensively upgraded several times. Resuming this testing would enable the development of longer lasting nuclear fuels that produce more power and are safer. It would also expand the use of fuels that can't be as easily used in making weapons. Transient testing at INL would also support the development of improved reactor designs requiring new fuel types, return energy industry jobs to the United States and improve U.S. energy independence. Some of the main factors that support INL as DOE's preferred choice are that there are smaller potential radiation doses to workers, the public, and the environment. There is operational flexibility with respect to necessary facilities and the execution of experiments. There is also lower potential for impacts from transportation experiments. Resumption of the transient testing of nuclear fuels and materials	DOE acknowledges your comment related to the need to resume transient testing.

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	at INL would also have a positive economic impact in the Northwest United States, and Southeastern Idaho. It would sustain INL and its critical role as the lead nuclear lab for the U.S. DOE and expand research for the U.S., NW region, and regional industries. The talent base required to perform the critical functions are already present and provides good jobs to Southeast Idaho. Industrial research at INL assists businesses regionally and nationally to enhance high-tech employment. These are some of the many reasons why the Board of Directors for the Greater Pocatello Chamber of Commerce supports the resumption of transient testing of nuclear fuels and materials at the Idaho National Laboratory. We hope you will too.	
Russell Johnson		
63	Please include this message as part of your public comments in reference to the Draft Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials dated November 2013. I wholeheartedly endorse the resumption alternative #1 at the INL. It makes sense that Idaho is the preferred alternative, because the Idaho National Laboratory is the Department of Energy's “lead” nuclear energy research and development facility. As such we should use the expertise, infrastructure and strategic partnerships already in place at the INL.	DOE acknowledges your comment related to the need to resume transient testing.
Dave Kendall		
64	I understand there is an open comment period for the intended resumption of transient testing at INL. I do not especially see this as a productive use of public funds. I would prefer to see work done along the lines indicated by the papers and research exhibited at ICCF-18. This looks to be much more promising, and certainly more cost effective. If you have not read any of the papers presented, you should. You might start with Dr. Yasuhiro Iwamura’s work (Mitsubishi Heavy Industries –since replicated at Toyota). His tests were extremely clean, detailed and well instrumented. The follow-up analysis was not done on the cheap. These are not crack-pots in a garage. Take an hour and watch. http://www.youtube.com/watch?feature=player_embedded&v=VefCEaLAkRw	DOE acknowledges your comments and notes that they are outside the scope of this EA.

Comment #	Comment	Response
E. A. Krantz		
65	The activation of an additional facility to test new nuclear fuel design would be helpful in achieving more efficient use of nuclear power, by enabling longer fuel life, higher operating temperatures, and less frequent shutdown for fuel changes. Of the two alternatives proposed, the restart of the TREAT reactor at the INL offers the advantage that TREAT already possesses a hot cell, and an in reactor fuel observation device, both of which would need to be constructed in case restart of the ACRR were selected. Use of the ACRR would also require the transportation of fuel samples and waste because of facilities at the INL, which are not present at the location of ACRR. These are expenses which the use of TREAT can avoid.	DOE acknowledges your comment related to the need to resume transient testing.
Amy Lientz		
66	Our current US reactor fleet provides a stable carbon free source of electricity. As the reactors age more information and testing is warranted to ensure the reactors are operating safely. Also, transient testing can be used to guide the development and improvement of advanced nuclear fuel designs, and to validate computer models of fuel and core behavior required for U.S. Nuclear Regulatory Commission (NRC) evaluation of nuclear power reactor design and safety evaluations. Transient testing of nuclear fuels is needed to improve current nuclear power plant performance and sustainability, to make new generation reactors more affordable, to develop nuclear fuels that are easier to recycle, safer and more efficient, and fuels that can't be as easily diverted for use in making nuclear weapons. The preferred option of restarting TREAT in Idaho, is the most economical and most reasonable choice.	DOE acknowledges your comment related to the need to resume transient testing.
Richard Lindsay		
67	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions. It is almost unconscionable that such testing has not been continued for the past many years when such a proven facility as TREAT was available. The resumption of transient testing in a	DOE acknowledges your comment related to the need to resume transient testing.

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	facility located almost adjacent to the examination facilities, resulting in minimal transportation requirements also tends to maximize the flexibility of testing capability as well as reducing any hazards connected with transportation to almost zero. It is conceivable that rapid turnaround between transients and examinations could be crucial to finding information that otherwise would be lost with a long period between the transient and examinations/retesting. Anti nuclear groups, if honest, should note that the long history of success with the TREAT testing and the translation of data to new and better fuel designs have led to much better fuel types that would have otherwise been possible. Therefore, option 1 should not only be preferable, but mandatory.	
Linda K Martin (Grow Idaho Falls, Inc.)		
68	Grow Idaho Falls Inc. is the economic development agency for the cities of Idaho Falls, Ammon, Ucon, and the county of Bonneville. We support the creation and/or retention of jobs, the diversification of the economy and/or tax base, and the enhancement of the quality of life in our community for all citizens. As such, we realize the great opportunity the resumption of transient testing of nuclear fuels and materials can mean to the Department of Energy (DOE) missions now and in the future, particularly if the existing facilities in our community can be fully utilized. Therefore, we support these activities under the Preferred Alternative #1: Restarting the Transient Reactor Test Facility (TREAT) at the Idaho National Laboratory (INL). It is our understanding that the TREAT facility has been on standby status since 1994, and the resumption of testing at the INL would be the best technical and budgetary decision among the three alternatives. We believe the Preferred Alternative #1 allows DOE to accomplish their research goals to test the future efficiency of fuels and materials for use in the nuclear power industry. In addition, we already have an existing, skilled, and experienced workforce that is available for this alternative. Thank you for providing the information in the "Summary of the Results of the Resumption of Transient Testing of Nuclear Fuels and Material Environmental Assessment" document to us for	DOE acknowledges your comment related to the need to resume transient testing.

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	review, as well as links to the official draft document, and other resources for information. We believe the extensive examination of the many varied environmental aspects has been comprehensive, and the results for Alternative #1 are very satisfactory.	
Romelia Martinez (Shoshone-Bannock Tribes)		
69	It is stated in the draft that this site will be monitored: however, it also states that the site may be subjected to "...unauthorized collection or impact by off-road vehicle use..." Unresolved Issues of unauthorized collection and destruction of sites significant to the Shoshone and Bannock Tribes currently exist. Construction involving "small" ground disturbance is a significant contributor to this problem because it is labeled "small ground disturbing activities" and thus is often taken for granted. Field surveys have been conducted within the direct and indirect APE; however, this does not completely eliminate the presence of subsurface materials. Precautions to preserve these sensitive areas that are of significance to the Shoshone and Bannock Tribes must be enforced and not in any sense taken lightly.	DOE is committed to protection of INL cultural resources through an ongoing, active, and robust cultural resource management program, as outlined in the INL Cultural Resource Management Plan (DOE/ID-10997 rev. 5). Critical components of the Plan for protection of cultural resources include survey, identification, and monitoring as well as employee awareness and procedures to handle any discovery of cultural resources. Under the DOE/Tribal Five-Year Agreement in Principle (AIP) that DOE has with the Tribes, Shoshone-Bannock Tribal representatives are encouraged to participate in all these activities. DOE has an active monitoring program for cultural resources. As stated in the EA (Section 4.1.1 under 'Impacts to Cultural Resources'), DOE is committed to ongoing monitoring of existing cultural resources in and around the TREAT site. All site employees and subcontractors are required to complete site access training which includes a reminder that disturbance of INL cultural sites is prohibited and may result in disciplinary actions, up to and including, termination. In addition, the INL Stop Work Authority empowers all employees and subcontractors to stop work if discoveries of cultural materials are found. The INL Cultural Resource Management Plan includes specific response and communication protocols that include timely notification to the Shoshone-Bannock Tribes. In partnership with the Tribes, DOE strives to improve protection of cultural resources from impacts from all ground disturbing activities.
Roger Mayes (Idaho Section American Nuclear Society)		
70	Thank you for the opportunity to review the Draft Environmental Assessment (EA). As a former "NEPA practitioner", I believe the EA meets the intent of the National Environmental Policy Act (NEPA), and the requirements of the Council on Environmental Quality Regulations (40 CFR Part 1500-1508) and the Department of Energy Implementing Procedures (10 CFR Part 1021). The EA adequately assesses the environmental impacts of the proposed action and reasonable alternatives, including the "No Action" alternative. I also appreciate DOE's decision to extend the public comment period after the web site was unavailable for a short period, thus demonstrating the DOE's desire to maximize the	DOE acknowledges your comment related to the need to resume transient testing.

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	opportunity for public involvement. The IANS believes that the DOE's selection of resumption of transient testing at the INL as its preferred alternative is a prudent and timely decision for INL, the State of Idaho and the nation.	
David B. McCoy (Citizen Action New Mexico)		
71	Operation of DOE reactors historically and up to the present have lacked adequate safety systems, controls and upgrades. DOE has not analyzed the full potential for accident consequences to the public in the Draft EA.	This EA analyzes the impacts of conducting transient testing utilizing the TREAT Reactor at INL or the ACRR at Sandia National Laboratories, New Mexico. A rigorous analysis of the impacts was performed for both alternatives. Because the TREAT Reactor is currently maintained in a standby condition, the EA analyzes the impacts associated with refurbishment activities, facility commissioning, and reactor operations. The cumulative impacts for transient testing activities utilizing the TREAT Reactor are addressed in Section 4.1.7 of the Final EA. The EA addresses the impacts of conducting transient testing at ACRR, including necessary modifications to support the transient testing mission; the operational impacts of operating the ACRR are analyzed separately in the Sandia National Laboratories, New Mexico Final Site-Wide Environmental Impact Statement, October 1999. The cumulative impacts for transient testing activities utilizing the ACRR, with appropriate modifications, are addressed in Section 4.2.7.The ACRR also has an approved Documented Safety Analysis (DSA) as listed in the Safety Basis Report. (http://www.hss.doe.gov/sesa/Analysis/sbis/index.html) A Seismic assessment of the ACRR has been completed and is found in the Sandia National Laboratories/New Mexico (SNL/NM), 2010, "Seismic Assessment of Technical Area V (TA-V), SAND2010-0163 (redacted for public release)", Sandia National Laboratories, Albuquerque, NM, January 2010. A new Site-Wide Environmental Impact Statement (SWEIS) is currently being prepared for the ongoing operations at Sandia National Laboratories, New Mexico (DOE/EIS – 0466) and includes the operational impacts of the ACRR. The Draft SWEIS is scheduled to be released for public comment in Calendar Year 2014. DOE estimated the dose rates and resultant health risks for a number of accident scenarios for the TREAT and ACRR alternatives in the EA. DOE looked at events that could be caused by a range of natural phenomena hazards, operator errors, and equipment failure. It included the highest doses associated with those accidents. The estimated doses were highly conservative, did not credit reductions in radionuclide concentrations that could occur during transport from the site of an accident to the outside environment, did not assume that any members of the public were evacuated, or that facility workers and collated workers wore any protective equipment at the time of the accident.

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		Nonetheless, the doses and latent cancer fatalities for members of the public were negligible under all scenarios. In evaluating this information, DOE found that the doses did not create a potential for significant environmental impacts. DOE has added language to the Final EA to address accidental contamination and other indirect impacts in Sections 4.1.5 and 4.2.5.
72	A full Environmental Impact Statement (EIS) is required as a matter of law to be performed for both the TREAT reactor and the ACRR. DOE is incorrect to use an EA for the ACRR or the TREAT. 10 CFR 1021 (Appendix D at D4) requires that reactors, even test or research reactors must have an EIS.	See response to Comment #15 (Page A-65).
73	The TREAT reactor research was used for Japan's Monju fast reactor fuel. Monju started operation in 1994 but following a serious liquid sodium leak in 1995 the reactor has basically been unable to return to operation due to a series of problems ever since. Monju's restart was unsuccessfully attempted in 2010 and its future is in doubt. is the poster child for the unsuccessful TREAT reactor goal of advancing the nuclear fuel cycle.	Although the comment is outside the scope of the EA, please note that information obtained from transient testing at TREAT did not contribute to the referenced accident at the Monju Reactor. Transient experiments previously conducted at the TREAT reactor were used to design EBR-II and Fast Flux Test Facility fuels. The fuel designed for the Monju reactor was developed considering this information and was incorporated in the reactor's safety system design. In the case of the Monju reactor, the sodium leak occurred in the plant's secondary cooling system (non-radioactive) and was not related to fuel performance.
74	The DOE Draft EA does not take into account the Nuclear Regulatory Commission's recent generic Waste Confidence Environmental Impact Statement (NUREG-2157). The NRC included in its EIS estimates not only the public radiation doses (in rem) but also the economic impact of the accident including estimates of evacuation costs, relocation costs for displaced persons, property decontamination costs, loss of use of contaminated property through interdiction, crop, and milk losses. Estimates for NRC onsite property damage costs also include onsite cleanup and decontamination and repair of facilities. The DOE has chosen to pretend that only the radiation doses conveyed in a passing airborne plume are adequate to discuss for the consequences of potential accidents.	In its accident analyses, DOE estimated the dose rates and resultant health risks for a number of accident scenarios. DOE looked at events that could be caused by a range of natural phenomena hazards, operator errors, and equipment failure. It included the highest doses associated with those accidents for each of the receptors. The estimated doses were highly conservative, did not credit reductions in radionuclide concentrations that could occur during transport from the site of an accident to the outside environment, did not assume that any members of the public were evacuated, or that facility workers and collated workers wore any protective equipment at the time of the accident. Nonetheless, the doses and latent cancer fatalities for members of the public were negligible under all scenarios. In evaluating this information, DOE found that the doses did not create a potential for significant environmental impacts. While cost is certainly one consideration that agencies can use in evaluating the proposed action and deciding among alternatives, DOE prepared the EA to determine whether the proposed action and reasonable alternatives had the potential for significant environmental impacts. Because the calculated impacts of the alternatives are negligible, detailed economic consequences of the proposed action and its alternatives would not substantively add to the information for making that determination. As a result, it was not included in DOE's

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		evaluation of the human health impact. DOE has added language to the Final EA to address accidental contamination and other indirect impacts in Sections 4.1.5 and 4.2.5.
75	Non-conservative assumptions have been applied to the calculations of dose consequences for workers and the public.	As described in the EA and associated support documents DOE applied conservative assumptions consistent with the "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements" (U.S. Department of Energy, Environment, Safety and Health Office of NEPA Compliance, 2004). This guidance requires development of realistic scenarios allowing comparison of doses and event likelihoods between each analyzed alternative.
76	The reliability of the safety-significant protection and control systems are inadequate.	As described in the EA, activities associated with resuming transient testing at TREAT include a detailed evaluation of all reactor systems, including safety systems, and completion of maintenance and refurbishment activities necessary to ensure equipment operability and compliance with applicable codes and standards. A readiness assessment will also be completed prior to restart of the TREAT reactor to demonstrate that there is a reasonable assurance that operations are performed safely and provide adequate protection of workers, the public, and the environment. This assessment includes, but is not limited to, an evaluation of: safety management programs; operational interfaces; selection, training, and qualification of operations and support personnel; implementation of facility safety documentation; programs to confirm and periodically reconfirm the condition and operability of all vital safety systems; procedures; emergency management; and conduct of operations processes.
77	Spending over $900,000,000 , on new fuels research is typical mindset of the DOE as the industry promoter so that preference is given to new research over the analysis of and cleanup of its existing waste problems. Difficult and unattractive problems are left for the next management team and for future generations.	See response to Comment #48 (Page A-78).
Gary McDannel		
78	For the general public, it is not readily apparent why the alternative selection criteria are so narrowly defined. This precludes other alternatives from consideration, some of which are currently conducting transient/accident condition testing of advanced fuel types (e.g. ATR). Further explanation why these other alternatives are not acceptable would be beneficial and improve credibility for the alternatives selected. For example, an explanation of why such a rapid high energy burst is absolutely essential would be informative. Other international test reactors are currently being used by the US and it is not evident why the criteria precludes them from further consideration. While I don't necessarily disagree with the conclusion, we certainly don't want to	The alternative selection criteria were developed by a team of subject matter experts from across the DOE Complex based on the required transient testing capabilities outlined in the mission need statement. Specific evaluation criteria were defined to provide an objective measure as to how well each identified alternative satisfies the identified transient testing goals. While limited transient testing capabilities currently operate at a combination of U.S. and international research facilities, operating capabilities do not support all of the transient testing needs identified in the mission need. Additional alternatives considered, but not evaluated in the EA are summarized in Section 2.2. A brief explanation for the issues raised by the comment is provided below.

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	leave the public with the perception that the selection criteria were chosen with the preferred alternative in mind.	A rapid energy burst is required to support testing of advanced fuels. These rapid energy bursts are experienced in a nuclear reactor during nuclear reactor accidents. Nuclear fuel researchers are interested in developing fuels that are capable of withstanding such rapid energy bursts. In order to develop these fuels, the conditions experienced in a nuclear reactor need to be reproduced in a transient test reactor. Steady-state materials test reactors such as ATR or the High Flux Isotope Reactor are not capable of providing these rapid energy bursts and as a result cannot support the mission need. For additional information, please review the Alternatives Analysis report (DOE 2013b).
Harold McFarlane		
79	During the past decade I have led three international nuclear energy organizations and toured most of the major civil nuclear energy development installations in the world. I have participated in several evaluations of nuclear R&D capabilities available for international participation. While there are shortfalls in infrastructure for several important areas of research, the capability for transient testing of advanced nuclear fuel is particularly sparse. Asia, Europe and the US each have one capable facility--IGR (Kazakhstan), CAPRI (France), and TREAT (USA). However each of the reactors is designed for a different fuel type and has different pulsed characteristics. TREAT is far and away the best choice for most advanced reactor fuel transient testing. ACRR, a weapons testing facility, cannot realistically be modified to test civilian nuclear fuel due to the differences in pulse width, energy deposition, fuel length, neutron spectrum, diagnostic capability, hot cell support, etc. I strongly support the preferred alternative of resuming testing in TREAT.	DOE acknowledges your comment related to the need to resume transient testing.
Nampa Girl		
80	I am writing today in opposition to the restart of the reactor. If 900 million dollars would become available, it seems to me the DOE could think of better ways to spent it. I would digress to the alliance on this because of their good information on nuclear issues in Idaho. The small article on this that was in the newspaper was the first I heard of this & it angered me that the DOE was not more forth coming about this since it was conceived in 2010. It seems a little	DOE acknowledges your comment related to the need to resume transient testing. Also see response to Comment #48 (Page A-78).

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	deceptive to me. I believe it is madness for man to keep messing with dangerous nuclear. We still do not know what to do with the waste. Perhaps the DOE & Congress could invest in Clean Coal Technology as I believe it has a place in our nation's energy needs. I have many more questions of the DOE & will be looking to get the answers.	
Catherine Nelson		
81	Are you crazy? Don't we have enough radiation in our environment? WE HAVE KILLED THE PACIFIC OCEAN!! ..and that is just the start. I do not want anymore nuclear testing of any kind. You are destroying our species and every living thing on this planet. Here in Spokane, WA, we are already off the charts with rads regularly. This idea is irresponsible to life.	DOE acknowledges your comment.
William C. Phoenix		
82	TREAT operated with great success. It is near MFC with its post-irradiation facilities. It fits with INL's mission of furthering the development of nuclear fuels. INL should be the premier national laboratory for this mission. Surely it would cost less to restart TREAT than decommission it and build a new facility sometime in the future at another lab. I believe that DOE has never restarted a reactor. Restarting TREAT would provide valuable information and lessons learned in project management, material condition assessment, permitting, and other aspects of successfully bringing a mothballed facility into useful service. The information and lessons learned could help DOE better manage other facilities, with potential cost and job savings. Please contact me if you have questions or comments.	DOE acknowledges your comment related to the need to resume transient testing.

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Willie Preacher (Shoshone-Bannock Tribes)		
83	In regards to this EA, the Tribe feels the Department of Energy (DOE) that if Alternative 1 Restart the TREAT Reactor is the preferred method. There is a safety issue we are concerned with due to the fact that this reactor has not been run for a number of years and what guarantee is there equipment may malfunction when operation. We are looking at the safety of the operators and others that are in close vicinity to the operation.	DOE is committed to conducting operations in a manner that protects workers, the public, and the environment. While the TREAT Reactor was placed in a safe standby condition in 1994, the TREAT facility remains an active nuclear facility and many systems have been maintained and remain operational to support current activities within the facility. As described in the EA, activities associated with resuming transient testing at TREAT include a detailed evaluation of all reactor systems, including safety systems, and completion of maintenance and refurbishment activities necessary to ensure equipment operability and compliance with applicable codes and standards. A readiness assessment will also be completed prior to restart of the TREAT reactor to demonstrate that there is a reasonable assurance that operations are performed safely and provide adequate protection of workers, the public, and the environment. This assessment includes, but is not limited to, an evaluation of: safety management programs; operational interfaces; selection, training, and qualification of operations and support personnel; implementation of facility safety documentation; programs to confirm and periodically reconfirm the condition and operability of all safety and support systems; procedures; emergency management; and conduct of operations processes.
84	Does the startup of the TREAT Reactor require a EIS instead of an EA and how it is justified. The reactor was built 1959 before the EIS was initiated. NEPA Later came into existence some years later therefore we question this issue.	See response to Comment #15 (Page A-65).
85	We also are concerned with existing culture and archaeological issues in and around this reactor site. Training of personnel in respecting these sites is a requirement when following the American Indian Policy. Early communication is a key factor with the Tribes in such cases as new discoveries or ground disturbance. DOE Order 144.1 provides direction to all Departmental officials, staff, and contractors regarding fulfillment of trust obligations and other responsibilities arising from Departmental actions which may potentially impact American Indian and Alaska Native traditional, cultural, and religious values and practices; natural resources; treaty and other federally recognized and reserved rights Personnel whose work has, is likely to have, or could potentially have an impact on tribal governments, entities, officials and/or representatives, must receive training including: (1) the Indian Policy and its principles; (2) sensitivities in working with American Indian tribes; (3) the federal government-to-government obligation; and (4) the requirements of this Order, and any other	As stated in the EA (Section 4.1.1 under 'Impacts to Cultural Resources'), DOE is committed to ongoing monitoring of existing cultural resources in and around the TREAT site. All site employees and subcontractors are required to complete site access training which includes a reminder that disturbance of INL cultural sites is prohibited and may result in disciplinary actions, up to and including, termination. In addition, the INL Stop Work Authority empowers all employees and subcontractors to stop work if discoveries of cultural materials are found. The INL Cultural Resource Management Plan includes specific response and communication protocols that include timely notification to the Shoshone-Bannock Tribes.

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	relevant tribal guidance etc.	
86	Lastly it is the concern from the Shoshone-Bannock Tribes that if alternative 1 is the choice then the safety of the TREAT reactor which has laid idle for years would be regarding safety issues for those who may operate it. What type of training would these operators need to complete or will you use operators that have run the reactor before. The operability of the facility and the components would have to be tested to see if they can still operate in a safe mode.	See response to Comment #83 (Page A-98).
Sumit Ray (Westinghouse Electric Company LLC)		
87	The Westinghouse Electric Company LLC is fully in favor of the re-activation of the Transient Testing of Nuclear Fuels and Materials Reactor at the Idaho National Laboratory site. This reactor will be a key facility for testing and performance verification of accident-tolerant fuels and for improving the performance of current fuels during transients. This reactor test facility is complemented by the existing capabilities at the Idaho National Laboratory to perform post-irradiation examinations, and the people and computer analysis capability that is required to analyze the results. The results of this testing will be valuable to the industry to evaluate the response of various accident-tolerant fuel designs and optimize their response during transient conditions. This data is crucial to the design and licensing any new fuel.	DOE acknowledges your comment related to the need to resume transient testing.
R. Scott Reese (Bingham Economic Development Cooperation)		
88	Bingham Economic Development Corporation is supportive of the resumption of Transient Testing and believes that the Idaho National Laboratory is the best site for this important and much needed project. BEDC is the principle organization tasked with the responsibility of developing economic growth in Bingham County. The board is made up of government, business, civic, and citizen leaders who represent a broad spectrum of interest. We believe that Transient testing of nuclear fuels is needed to support a carbon free, safe and secure energy future for the United States. This research will help the United States achieve energy independence and create good paying jobs. Our board also feels that nuclear energy is critical to reducing carbon issues not only in the U.S. but worldwide. The Transient Reactor Test Facility reactor already located at the INL has a long history of safe and successful performance of	DOE acknowledges your comment related to the need to resume transient testing.

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	transient testing of nuclear power reactor fuels. The 35 years of this testing that was done at the site gives the INL valuable knowledge that will save time and money. The INL has everything needed on one site which will also be a major cost saving to this project. The research done at the lab is world class and the safety record is second to none. Community support is strong for the INL and the people of our area are positively involved with the INL every day. Bingham Economic Development Corporation strongly supports the resumption of Transient Testing at the INL and will do all we can to help make this important project succeed.	
John Regetz (Bannock Development Corp.)		
89	The Bannock Development Corporation is writing to support the resumption of transient testing of nuclear fuels and materials at the Idaho National Laboratory (INL). INL has 35 years of experience performing transient tests on thermal and fast reactor fuels safely and successfully. The facility at INL has already been extensively upgraded several times. Resuming this testing would enable the development of longer lasting nuclear fuels that produce more power and are safer. It would also expand the use of fuels that can't be as easily diverted for use in making weapons. Transient testing at INL would also support the development of improved reactor designs requiring new fuel types, return energy industry jobs to the United States and improve U.S. energy independence. In addition, INL meets several DOE selection criteria. The DOE has also chosen the Transient Reactor Test Facility (TREAT) at INL as their preferred alternative. It's the alternative that DOE believes would fulfill its statutory missions and responsibilities in the best manner, giving consideration to economic, environmental, technical, and other factors. Some of the main factors that support INL as the preferred choice are that there are smaller potential radiation doses to workers, the public, and the environment. There is operational flexibility with respect to necessary facilities and the execution of experiments. There is also lower potential for impacts from transportation experiments. INL also already has everything needed on one site, including: hot cells for test assembly, disassembly and examination; a co-located	DOE acknowledges your comment related to the need to resume transient testing.

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	transuranic test reactor; availability of the Advance Test Reactor; advanced material science capability; transportation on public highways is not an issue; and the lead nuclear energy laboratory for the U.S. Department of Energy. Resumption of the transient testing of nuclear fuels and materials at INL would also have a positive economic impact in the Northwest United States, and Southeastern Idaho. It would sustain INL and its critical role as the lead nuclear lab for the U.S. DOE and start research for the U.S., NW region, and regional industries. The talent base required to perform the critical functions are already present and provides good jobs to Southeast Idaho. Industrial research at INL assists businesses regionally and nationally to enhance advanced employment. These are some of the many reasons why we support the resumption of transient testing of nuclear fuels and materials at the Idaho National Laboratory. We hope you will too.	
Christine B. Reichgott (U. S. Environmental Protection Agency)		
90	The draft EA should clearly identify the purpose and need to which DOE is responding to in proposing the alternatives, including the broader public interest and need. The purpose of the proposed action would typically be the specific objectives of the EA, while the need for the plan may be to eliminate a broader underlying problem or take advantage of an opportunity. Thus, the purpose and need should be a clear, objective statement of the rationale for the proposed action, as it provides the framework for identifying project alternatives. Data in the draft EA is not clear about answers to the following key questions: • Has there been similar research in the US or elsewhere? What were the results and how would they influence this project? • Why are 40 years necessary to implement the proposed project? • What would be the total estimated public cost of this effort compared to a No Action and is this investment worth undertaking?	Transient testing has been a core component of all nuclear fuels science, development and qualification efforts since the 1950s. Transient testing data obtained from testing in reactors including TREAT, ACRR, and other decommissioned transient test reactors are still used today for the current generation of fuels used in commercial power reactors. The information supports the design and operations of commercial power reactors and is also used to regulate the industry. Introduction of new fuel designs with improved performance, economics, and enhanced safety features requires the resumption of this type of testing. DOE proposed that transient testing as described in the EA be conducted over 40-years based on currently projected R&D needs and objectives. Material science advancements are expected to continue over the course of the next decades offering numerous opportunities for improvements to nuclear fuel and material designs. Resuming a transient testing capability that meets the mission need will ensure that these advancements make their way into the nuclear industry, providing a clean, safe, and reliable form of carbon free energy for decades to come. The above language was added to Section 1.2 of the Final EA. DOE prepared the EA to determine whether the proposed action and reasonable alternatives had the potential for significant environmental

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		impacts. The preliminary estimate for developing and conducting transient testing and the associated examinations over the 40 year timeframe of the proposed action is $900,000,000 (reference DOE 2013b). Although cost is an important component of the federal decision making process, it is outside the scope of this EA. Cost will be evaluated by DOE decision makers and Congress. The cost estimate will continue to be refined and efficiencies implemented over time.
91	Information in the draft EA indicates that because of the proposed project, there would be generation of about 6 m3 of transuranic waste, greater-than-class C (GTCC) waste, GTCC-like waste, or Spent Nuclear Fuel debris over the life of the program. The draft EA also states that the project would send those wastes to one of DOE's facilities under evaluation and that spent nuclear fuel debris would be securely stored with DOE's spent fuel and spent fuel debris inventory awaiting a future disposal facility. We recommend the final EA specify the waste receiving facilities and location(s); discuss regulatory requirements for shipping such wastes to other states; and impacts related to handling and transportation of the wastes to disposal sites. Similarly, the final EA should identify where the low-level radioactive waste would be disposed.	See response to Comments #34 (Page A-74) and #37 (Page A-74).
92	The EA indicates that the proposed project implementation would be consistent with the Executive Order 13514, Federal Leadership in Environmental, Energy, and Economic Performance and related DOE plans. We also encourage DOE to consider use of Low Impact Development (LID) techniques in managing the project site because of their potential to reduce stormwater volumes and discharges to local waterways. Use of these techniques can also provide energy and other utility savings. More information on LID practices is online at http://www.lowimpactdevelopment.org/ and http://www.epa.gov/smartgrowth/stormwater.htm.	DOE will consider the use of Low Impact Development techniques, where applicable. In addition, TREAT is located in a local topographically closed watershed, which also contains no identifiable perennial, natural surface water features. (INL/EXT-10-20572, INL MFC Natural Phenomena Hazards Flood Assessment)
93	The proposed project area may be susceptible to seismic events and other natural disasters e.g., earthquakes. Therefore, we recommend the final EA include information on geologic resources in the analysis area, nature of the subsurface soil and bedrock materials, seismic risks, and approaches to evaluate, monitor, and manage the risks. Please also attach a seismic map or include a reference to it.	Site characteristics and natural phenomena including seismicity are well understood and documented in the proposed areas of impact. Impacts of seismic events that could result in radiologic releases are reviewed in Schafer A.L. et al, 2014 and summarized in Section 4.1.2 of the Final EA. Additional references are available on request. See response to Comment #71 (Page A-93).
94	The draft EA discusses the project's potential impacts to vegetation and wildlife resources. While we appreciate the avoidance measures of limiting the project footprint and using existing and previously disturbed areas, we note that the draft EA does not	A statement of impact for sensitive plants and wildlife has been added to the Final EA (see Section 4.1.1). The citation for supporting information was also added to the Final EA.

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	currently quantify impacts to these habitat and wildlife resources, making it difficult to understand this project's impacts (direct, indirect, cumulative and unavoidable) on biological resources in the analysis area and vicinity. Under NEPA, the EA document should contain supporting data and references that convincingly show the proposed action would not significantly affect environmental and other resources within and around the analysis area. Because of potential usage of the project area by sage-grouse, pygmy rabbits and other sensitive wildlife species and a lack of current survey data for the species; we recommend DOE work with the U. S. Fish and Wildlife Service and the Idaho Department of Fish and Game to determine the level of risk to the species and identify effective ways to reduce the risks. The final EA should include outcomes of that work and, if possible, a summary of available biological resources monitoring data for the project area over the period of TREAT existence.	
95	The EA should include a list of all permits/authorizations that the proposed project will need including modification(s) to any existing permit or authorization, what activity and/or facility is regulated by the permit or authorization, entities that will issue each permit and authorization, when each will expire, and conditions to assure protection of resources. We noted that the proposed project would require the EPA authorizations under 40 CFR 61.05(a) and 40 CFR 61, Subpart H. The EPA Region 10 contact person for that is Zhen Davis who can be contacted at (206) 553-7660 or Zhen.Davis@epamail.epa.gov.	As per 40 CFR 61 an 'Approval to Construct' is only required when the unabated dose to the MEI is >10% of the standard. The estimated dose for Alternative 1 does not exceed this criterion. A list of permits/authorizations for the proposed action is identified in Section 5 of the EA. Additional permitting details would not aid in determining the potential for significant environmental impacts.
96	Termination of TREAT operations and Decommissioning At some point, TREAT will terminate operations and undergo decommissioning. Yet, the draft EA does not currently include any information on TREAT decommissioning and predicted impacts. We recommend the final EA include detailed information on decommissioning plans and funding for TREAT and associated facilities, related waste management and pollution prevention, handling of spent nuclear fuels including issues that could affect the storage of the fuel (safety and security), and monitoring.	The timing of future D&D activities for TREAT is unknown and estimates of the impacts from D&D are too speculative to quantify. D&D analysis will be done at the appropriate time consistent with requirements. Once the decision is made to D&D, the TREAT reactor core will be managed consistent with the 1995 Spent Nuclear Fuel Management and Idaho National Engineering Laboratory Environmental Restoration and Waste Management Programs EIS (DOE 1995).
97	The EA indicates that DOE coordinated with the Idaho State Historic Preservation Office, the Advisory Council on Historic Preservation, and the Shoshone-Bannock Tribes during the EA preparation process. We recommend expanding public involvement to other potentially interested and affected entities such as Idaho Department of Fish and Game, US Fish and Wildlife Service and private citizens. As an example, the EA could include a list of	Before releasing a draft EA for public comment, DOE offered briefings summarizing the EA's purpose, need and scope to Idaho Department of Environmental Quality senior staff, and the Shoshone-Bannock Tribes leadership. Because the resumption of transient testing EA includes Sandia National Laboratories as an alternative, DOE also offered briefings to New Mexico Environment Department senior staff and the Isleta Pueblo leadership. DOE also mails postcards to all entities on a

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	organizations (public and private) and individuals contacted to inform them of the project and solicit their inputs. The final EA should include a summary of approaches used to foster public participation in this project planning process, issues raised by the entities about the project, and a discussion on how DOE would address the issues.	general NEPA mailing list (email and paper mail) totaling more than 400 citizens and groups that have previously expressed interest in DOE EAs. This postcard notifies recipients that DOE is preparing an EA and that when the draft EA is available it will be posted on the external DOE. Website. It provides the website address and asks if the postcard recipient would like a paper copy of the draft. In addition, DOE issues a news release announcing that the draft or final EA is available for public review and comment; posts the EA on the DOE external website and on the DOE NEPA web site for at least a 30-day period; and mails paper copies of the EA to all requesters see http://energy.gov/nepa/office-nepa-policy-and-compliance). Briefings are given to non-governmental stakeholders on request. Documents in the reference section of the EA are given to non-governmental and governmental stakeholders on request. All comments received are addressed by DOE staff in the Final EA in a Comment Resolution section.
98	The proposed action has the potential to impact a variety of resources for an extended period (40 years). Because of that, we recommend the final EA include an environmental inspection and mitigation-monitoring program to ensure compliance with all mitigation measures and assess their effectiveness. The final EA document should describe the monitoring program and how it would be used as an effective feedback mechanism so needed program adjustments are made to meet environmental objectives throughout the life of the program.	No significant environmental impacts were identified for either alternative; therefore, no mitigation plans are necessary. DOE has an extensive sitewide environmental monitoring program that assesses the environmental impacts of DOE activities. DOE prepares annual sitewide environmental reports that explain the program and evaluate performance (DOE ID 2013b and SNL/NM 2013). These references have been added to Section 4.4 of the Final EA.
99	As TREAT has been in operation since 1959, it would be beneficial to discuss environmental monitoring results from that time to present, and discuss implications for the proposed program. We would expect that lessons learned from past practices and adaptive management efforts, combined with the need to account for new challenges, such as climate change, would influence management of the proposed program.	Historical information was used in the preparation of the EA and is documented in Schafer, A. L. et al. 2014. Lessons learned from historical operations have been evaluated and will continue to be considered as the proposed action is advanced.
100	For example, we are interested in knowing whether existing monitoring systems would meet the American National Standards Institute (ANSI)/Health Physics Society (HPS) N13.1-1999 requirements or if modifications will be necessary.	Environmental monitoring of the TREAT stack is not performed because it is not required. According to 40 CFR 61 Subpart H 61.93, monitoring is not required if an analysis estimates the effective dose at the maximally exposed individual (MEI) location from an unabated release is less than 1% of the 10 mrem/yr standard. The air assessment for the EA estimated the unabated maximum annual dose at the nearest MEI was 2.1E-03 mrem indicating monitoring is not required. If future assessments indicate monitoring is required, a monitoring system meeting ANSI/HPS 13.1-1999 requirements will be installed.

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Ann Riedesel		
101	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions. This option furthers the DOE mission while making the best use of resources already available in the DOE system -- a win for the industry and a win for taxpayers! Thank you for the opportunity to comment.	DOE acknowledges your comment related to the need to resume transient testing.
Ann Rydalch (Bonneville County Heritage Association)		
102	Whereas developing and proving safe operations of more advanced reactors and nuclear fuels requires transient testing, I agree with the DOE proposal to re-establish a comprehensive transient testing program. And, I agree with the preferred alternative #1 – Restart the TREAT Reactor at the Idaho National Lab (INL). Resuming transient testing with the TREAT Reactor makes safe, economical, and environmental sense as well, rather than going to a different location. Your analysis clearly points out, for example, that INL has current operating waste management facilities and the required permits already in place to manage all wastes that are anticipated from the transient testing. Originally, TREAT was specifically designed to test transient nuclear fuel and materials. And, it is clearly evident that any activities associated with restarting the TREAT Reactor would be conducted in accordance with Federal, state and local requirements and regulations. I was also impressed with the coordination and consultation during the environmental assessment preparation with the INL Cultural Resource Management Plan. It is important to point out that this plan is prepared through program agreements between DOE-ID, the Idaho State Historic Preservation Office, and the Advisory Council on Historic Preservation, and these groups have reviewed this assessment with satisfaction. I am a member of the Foundation for Idaho History with the Idaho State Historical Society. The Idaho State Historic Preservation Office plays an important role, as do the other groups, and the preservation of these things that are important to Idaho. The Bonneville County Heritage Association recently honored the Idaho National Lab during its 2011 County Centennial celebration program.	DOE acknowledges your comment related to the need to resume transient testing.

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Natalie D. Schmidt		
103	As a private citizen, I feel it is in the Nation's best interest to continue to develop new and improved nuclear fuels. Our reliance on foreign oil continues to put us in a precarious spot. We cannot survive on a long term basis solely on our oil and gas deposits with our rising energy needs, not to mention the consequences of the resulting carbon footprint from the consumption of fossil fuels. The INL has been designated the Nation's preemptive nuclear reach laboratory, and it needs to be able to perform the type of testing that restarting the Transient Reactor Test Facility would allow. In addition, the INL has most if not all of the supplementary testing facilities required to handle and analyze these types of fuel samples. Restarting the Treat Reactor would also create additional high paying jobs locally. This would be good for Idaho and the Lab. I would like to see the INL continue to add to their capabilities. Sincerely, Natalie D Schmidt	DOE acknowledges your comment related to the need to resume transient testing.
Tami Sherwood		
104	I strongly endorse the proposed action to resume the transient testing of nuclear fuels and materials. In particular, I endorse Option 1 to resume transient testing at the Idaho National Laboratory's (INL's) Transient Reactor Test Facility and conduct post-irradiation examination activities at facilities on the INL site. The unique air-cooled design of the Transient Reactor poses little risk of release of fission products to the environment or radiation exposure to the public during operation, and the associated post-irradiation examination activities are consistent with the INL mission and current ongoing activities. Option 1 relies upon proven and tested technology and is clearly the most cost effective solution to acquire the capability to test the advanced nuclear fuels that are needed to improve the safety and performance of commercial nuclear reactors.	DOE acknowledges your comment related to the need to resume transient testing.
Carolyn Smith (Shoshone-Bannock Tribes)		
105	Page 19. Impacts to Cultural Resources, 3rd Paragraph Statement reads: "Although direct impacts are unlikely, there is some potential for undesirable indirect effects to archaeological resources that are located within about 330 ft of the defined direct APE for Alternative 1." The statement should not include the number of feet from the Defined Direct APE. But could read, for	The text of the Final EA has been revised to remove the number of feet the archaeological site is located outside of the direct Area of Potential Effects (APE) for Alternative 1. The discussion in the Final EA has been clarified to explain that no indirect or cumulative impacts are anticipated because of DOE's monitoring efforts.

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	example: "… there is some potential for undesirable indirect effects to archaeological resources that are located outside of the defined direct APE for Alternative 1." This paragraph should also state the following: Cumulative impacts may occur to Cultural Resources outside of the direct APE and it is important that Education, Information and Enforcement of the ARPA laws is necessary to protect the Cultural Resources important to the Shoshone Bannock Tribes.	DOE revised Section 4.1.1 under the heading of 'Impacts to Cultural Resources' to clarify that no direct impacts to cultural resources will occur as a result of the proposed action and that the single archaeological site identified in the indirect APE would be monitored and protected. The EA includes specific reference to INL's Cultural Resource Management Plan.
106	Shoshone-Bannock Tribes HeTO requests that all transportation workers while en route between facilities on the INL site remain within the authorized roadway as this route holds cultural resources important to the Tribe	DOE recognizes the importance of cultural resources and the need to protect them. As described in the EA, transportation activities will utilize established roadways and no impacts to cultural resources from transportation activities are anticipated.
John R. Snyder		
107	I support DOE's mission to develop and test advanced nuclear fuels. I support DOE's assertion that transient tests are crucial in demonstrating the safety basis of reactor and fuel systems, thus establishing what constitutes safe reactor operating levels. I agree with DOE's determination of a mission need for the resumption of domestic transient testing as a critical component in advancing nuclear energy research and development for a new generation of reactors and nuclear fuels, which enables the future deployment of advanced nuclear power. I also strongly support DOE's preferred alternative (Alternative #1) for resumption of domestic transient testing, i.e., to restart the TREAT Reactor at the Idaho National Laboratory (INL). I am a private citizen (retired from INL, 2009) who is concerned about poverty, global warming, environmental stewardship, political instability abroad, national security at home and domestic economic development. The resumption of domestic transient testing at INL addresses all of these concerns.	DOE acknowledges your comment related to the need to resume transient testing.
Alexander Stanculescu		
108	I wish to endorse the resumption of Transient Testing of Nuclear Fuels and Materials. In particular, I favor Option 1, the resumption of the use of the TREAT reactor facility on the INL. TREAT has a long and successful history of performance and has demonstrated the safety and efficacy of the facility for scientific study of fuels and materials in upset conditions.	DOE acknowledges your comment related to the need to resume transient testing.

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	It is almost unconscionable that such testing has not been continued for the past many years when such a proven facility as TREAT was available. The resumption of transient testing in a facility located almost adjacent to the examination facilities, resulting in minimal transportation requirements also tends to maximize the flexibility of testing capability as well as reducing any hazards connected with transportation to almost zero. It is conceivable that rapid turnaround between transients and examinations could be crucial to finding information that otherwise would be lost with a long period between the transient and examinations/retesting. Anti-nuclear groups, if honest, should note that the long history of success with the TREAT testing and the translation of data to new and better fuel designs have led to much better fuel types that would have otherwise been possible. Therefore, option 1 should not only be preferable, but mandatory.	
Glen Tait		
109	I strongly support the TREAT restart. Transient testing is needed to qualify new, accident resistant fuels and TREAT operated safely for many years with no problems. [A] great use of an existing capability.	DOE acknowledges your comment related to the need to resume transient testing.
John Tanner		
110	The activation of an additional facility to test new nuclear fuel design would be helpful in achieving more efficient use of nuclear power, by enabling longer fuel life, higher operating temperatures, and less frequent shutdown for fuel changes. Of the two alternatives proposed, the restart of the TREAT reactor at the INL offers the advantage that TREAT already possesses a hot cell, and an in reactor fuel observation device, both of which would need to be constructed in case restart of the ACRR were selected. Use of the ACRR would also require the transportation of fuel samples and waste because of facilities at the INL, which are not present at the location of ACRR. These are expenses which the use of TREAT can avoid.	DOE acknowledges your comment related to the need to resume transient testing.

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Tami Thatcher / Chuck Broscious (Environmental Defense Institute)		
111	The Draft Environmental Assessment for the Resumption of Transient Testing of Nuclear Fuels and Materials1 starts off entirely on the wrong track from the start because DOE regulations require reactor facilities, including research or test reactors, to have an Environmental Impact Statement rather than an abbreviated Environmental Assessment (See 10 CFR 1021). The truncated document and comment opportunity are not in the public's interest and do not adequately evaluate the impact of an accident. The EA is also less than forthcoming about the inadequate and irresponsible approach being taken to shortcut safety for essential safety issues including natural phenomena hazards (NPH) hazard mitigation, fire hazards and criticality safety.	The TREAT facility and safety structures, systems and components are being reviewed for compliance with the Natural Phenomena Hazards and criticality safety requirements of DOE O 420.1, Facility Safety. Facility or procedural modifications, if required, are part of the scope of the proposed action and will be completed prior to resumption of transient testing operations. The TREAT Facility fire hazards analysis will be updated and any required actions implemented prior to resuming transient testing operations of TREAT. See response to Comment #15 (Page A-65).
112	The Department of Energy sticks to arguments narrowly focused on radiation doses during plume passage following an accident. It is apparent from this EA that DOE has not learned from the Nuclear Regulatory Commission's recent experience with its generic Waste Confidence Environmental Impact Statement. The NRC has included in its EIS estimates not only the public radiation doses (in rem) but also the economic impact of the accident including estimates of evacuation costs, relocation costs for displaced persons, property decontamination costs, loss of use of contaminated property through interdiction, crop, and milk losses. Estimates for NRC onsite property damage costs also include onsite cleanup and decontamination and repair of facilities. The DOE has chosen to pretend that plume passage radiation doses convey adequately the consequences of potential accidents. The amount of soil contamination matters to Idahoans. The public, even in Idaho, deserves complete disclosure of the economic and important long term contamination considerations even if the TREAT reactor consequences are less than a full sized nuclear reactor. DOE's longstanding approach to rely on dilution of airborne released fission products and actinides while ignoring the long-term effects of radioactive contamination from accidents must not be allowed to continue.	See response to Comment #74 (Page A-94).
113	The Resumption of Transient Testing Will Offer Little Benefit: The reasons for resumption of transient testing of reactor fuels are described in the EA as needed to "improve nuclear reactor sustainability and performance, to reduce the potential for proliferation of nuclear materials, and to advance the nuclear fuel cycle."	DOE acknowledges your comment.
114	TREAT reactor research was used for Japan's Monju fast reactor fuel. Monju started operation in 1994 but following a serious liquid	See response to Comment #73 (Page A-94).

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	sodium leak in 1995 the reactor has basically been unable to return to operation due to a series of problems ever since. Monju's restart was unsuccessfully attempted in 2010 and its future is in doubt. Monju is the poster child for the TREAT reactor goal of advancing the nuclear fuel cycle.	
115	Spending money, over $900 million on new fuels research at TREAT is typical of the mindset of an industry that prefers new research over the analysis of and cleanup of its existing waste problems. Difficult and unattractive problems are left for the next management team and for future generations.	See response to Comment #48 (Page A-78).
116	Resumption of Transient Testing Takes Money Away from Cleanup New missions at INL's MFC will, however, obscure the magnitude of the radiological mess that already exists there and will further "kick the can down the road" and delay the needed cleanup at MFC including MFC's Radioactive Scrap and Waste Facility that contains spent fuel and high level waste in inadequately monitored buried metal containers. Disposition plans for 4 metric tons (4.4 tons) of surplus plutonium in the form of Zero Power Physics Reactor (ZPPR) fuel at its Idaho National Laboratory remain to be developed. DOE no longer has a programmatic use for this material.	DOE acknowledges your comment.
117	Transient Testing Accident Consequences Inadequately Assessed The accident consequences of restarting MFC's TREAT reactor following extensive replacement of control and other plant equipment and examination of existing TREAT fuel for adequacy, are significantly less than 1000 MWe nuclear plants or the INL's Advanced Test Reactor that can cause accidents of catastrophic proportions. However, despite the EA's limited focus on two bounding accidents, TREAT is vulnerable to many very high likelihood accidents according to DOE's own report. These accidents include sodium fires are incorrectly described as "extremely unlikely" on page F-37 of INL/EXT-13-29397. The report states that a sodium fire has a likelihood of 1.1E-2/yr which makes the accident "anticipated" by the reports own table below. Table F-5 The sodium fire yields a 25 rem worker dose and 0.027 rem dose to the public at the nearest site boundary, 6000 m away. The two bounding accidents yield 0.08 and 0.24 rem doses to the public, but their annual probability is much lower than the sodium fire accident. The EA hides the fact that TREAT is highly accident prone. The	DOE prepared the accident dose analysis following the "Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements" (U.S. Department of Energy, Environment, Safety and Health Office of NEPA Compliance, 2004). Consistent with DOE accident analyses guidance a number of postulated accidents representing a range of event likelihood and dose consequence were evaluated including the sodium fire as summarized in Table F-20 of Schafer, et al. 2014. The accidents representing the highest doses are presented in the EA to evaluate the potential for significant environmental impacts. As described in Section F-4.7.1 of Schafer et al. (2014), the experiment assembly that would be used at TREAT is robustly designed and anticipated to result in an event that is extremely unlikely to occur. However, to ensure the reported likelihoods were not understated, the most conservative likelihood of 1.1E-2 per year (consistent with the ACRR likelihood for a similar event) and conservative dose results for the Sodium Fire in the TREAT Reactor Core were used. Footnote '2' of Table F-17 and footnote 'a' of Table F-20 stating a facility worker dose of 25 rem is incorrect for the sodium fire accident. A

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	accident analysis presented in the EA is inscrutable and supporting documents appears to be arbitrary in the selection of dose reduction factors. The analysis may define the material-at-risk adequately, but accident progression is far from certain and the analysis proceeds to whittle down the dose indefensibly with various reductions. This raises the doubt that the presented 0.2 rem dose to the public should be more reasonably assessed as a 2 rem or a 20 rem dose. Table F-3 of INL/EXT-1328597 presents various factors and formulas that do not combine to achieve the resulting "ADJnet" result for fire scenarios. Rather, ADJnet is a factor of 10 below what is indicated by the table data. Also in Table F-3, Uranium and fission products apparently would include cesium but the semi-volatile cesium airborne released fraction is not bounded by the airborne release fraction the analysts have selected (1.0E-4) and should more reasonably be closer to 1.75E-1 according the another DOE report."	correction has been made to the reference document (Schafer et al. 2014). The doses provided in the tables for facility workers are correctly presented as 0.63 rem. Dose reduction factors used in the analyses are consistent with published DOE recommended values. The reported value of 0.2 rem for collocated workers at 300m is correct as is the value of 0.027 rem for members of the public. Thank you for noting the typographical error in Table F-3. The ADJnet value was provided to illustrate the use of reduction factors in the determination of source term for both alternatives (see Section F-2.3, Schafer A.L., et al. 2014) rather than being directly applied in any calculations. The correction to Table F-3 in INL/EXT-13-29397, Schafer A.L., 2014 has been made to eliminate the typographical error. This correction does not impact the results or conclusions of the EA. During its 35 years of operation, more than 2,800 transient tests were safely conducted in TREAT.
118	And finally, the plume passage radiation dose, which has been subject to numerous reductions beyond a typical analysis, does not provide an adequate depiction of the short term and long term contamination effects, nor does it address special populations including children, the elderly, and the unborn developing child.	The dose analysis applied dose conversion factors from the International Council on Radiation Protection (ICRP) publication 68 for adult workers as required by 10 CFR 835. For members of the public, dose coefficients for an adult were used from ICRP publication 72 using the methodology outlined in Federal Guidance Reports 12 and 13. Both analyses are consistent with DOE Order 458.1 which requires use of DOE approved dose conversion factors.
119	The accident analyses limit accidents to portions of the facility, never including the entire facility such as in a truck fire in the building with failure to suppress the fire and does not address fire protection actions that may be needed to limit the accident consequences.	The dose consequences of a facility fire would be bounded by the sodium fire scenario analyzed in Section F-4.7 of Schafer A.L., et al. 2014. This scenario is bounding because it assumes all of the experiment inventory in addition to 5 TREAT fuel elements would be released as a result of a fire.
120	The historically poor seismic qualification of facilities at MFC began with inadequate design decades ago, and limited upgrades since. MFC is another example of the footdragging of DOE to address seismic issues comprehensively. Seismic deficiencies at MFC identified in 1994 (DOE/EH0415) have still not been fully addressed and are supposedly still being analyzed. TREAT is described as perhaps meeting PC-2 seismic design, while full sized reactors need to meet more stringent PC-4 criteria. If you cannot meet PC-2 seismic criteria, not only will the structures fail during an infrequent but large seismic event, the structures will also fail during more likely modest seismic events. Frankly, structures that cannot withstand PC-2 seismic criteria are seismically fragile. It is unacceptable for DOE to be excusing itself from performing adequate seismic performance assessment for TREAT needed to	The TREAT facility and safety structures, systems and components are being reviewed for compliance with the Natural Phenomena Hazards and criticality safety requirements of DOE O 420.1, Facility Safety. Facility or procedural modifications, if required, are part of the scope of the proposed action and will be completed prior to resumption of transient testing operations.

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	assure that at least PC-2 seismic criteria are met for all systems, structures and components.	
121	Efforts to update the fire hazards analysis at MFC are no doubt influenced by a need to justify existing fire protection systems and to continue to minimize the appearance of any offsite release rather than to rigorously analyze and mitigate the hazards. The level of quality of DOE fire hazards assessments has traditionally been variable and generally inadequate to support the safety analysis. There is no evidence that this is not the case in the TREAT facility. The fire protection systems also require seismic qualification adequate to protect nuclear materials and there is no evidence of actions to assure this.	The TREAT Facility fire hazards analysis will be updated and any required actions implemented prior to resuming transient testing operations at TREAT.
122	Worst case transportation accident results are not provided, particularly for offsite transportation of TREAT experiment fuel.	Analysis of transportation accidents involving transport of the bounding experiment inventory between INL and SNL/NM were conducted following the Resource Handbook on DOE Transportation Risk Assessment (2002) (see Section G-6 of Schafer A.L. et al, 2014). Worst case accident analysis is not required under NEPA. The CEQ specifically rescinded this requirement in 1986 (51 Fed. Reg. 15625).
123	While some aspects of the accident analysis may be reasonable and bounding, various other aspects do not appear to be reasonable or bounding with the limited information provided. The full impact, including economic impact, of accidents at TREAT (and alternate action ACRR) must be disclosed to the public.	See response to Comment #74 (Page A-94).
124	The EA states that 10 CFR 830 establishes requirements that must be implemented in a manner that provides reasonable assurance of adequate protection of workers, the public, and the environment from adverse consequences, taking into account the work to be performed and the associated hazards. This is supposed to be reassuring.	DOE acknowledges your comment.
125	The INL safety strategy for the resumption of transient testing at the TREAT reactor is inadequate because it explicitly accepts the avoidance of clear and coherent NPH performance assessment, fire hazard assessment and criticality safety required by DOE Order 420, "Facility Safety" which is essential for meaningful compliance with 10 CFR 830. So unimportant is worker and public safety that "no betterment functionally-equivalent replacement" has been created to argue that the ignorance of seismic safety that existed in 1958 when the facility was first built should dictate that no upgrades or corrections are needed now in 2014. This is despite the project being determined to be a major modification of broad and ambiguous scope.	See response to Comment #111 (Page A-109).
126	Insight into INL's environmental monitoring can be gained from a report by the independent branch of DOE, health safety and security which reviewed INL's environmental monitoring programs in 2010. The HSS report[34] states that INL consider having a	The DOE-HQ/HSS report on the Independent Oversight Assessment of Environmental Monitoring at the Idaho National Laboratory Site dated May 2010 concluded that, overall, environmental monitoring and surveillance activities at the INL Site are comprehensive and meet basic

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	technical basis for its placement and use of monitoring equipment. The report gave the example that monitors for an evaporation pond at TRA, a very significant source of radiological emissions, should have been relocated when the pond was relocated. Four years after the 2010 HSS report was issued, the DOE says that they are responding to the HSS report but that the public will have wait until DOE documents its response and will have to obtain information about their response by Freedom of Information Act (FOIA) request. The fact is that much of the reported INL emissions are estimates and not measurements of emissions and there is insufficient effort being made to reduce or minimize emissions. Environmental emissions from TREAT are predicted to produce only a small mrem dose to the public. Yet, historical data for soil sampling around TREAT includes various radionuclides that the EA says will not be emitted. No explanation of this is provided. And INL's traditional dose receptor for routine emissions at Frenchman's Cabin, miles from MFC is used by INL to satisfy environmental reporting requirements. This is an extremely poor way to express the emission doses to MFC's boundaries which as so near to public land.	objectives of applicable DOE requirements. The Assessment also did not identify any program vulnerabilities that would affect the ability of the INL Site to detect significant site impacts. The full report can be accessed at http://energy.gov/hss/downloads/independent-oversight-assessment-idaho-national-laboratory-site-may-2010. The report did identify program enhancements. One of these program enhancements noted that there was not a complete definition of the technical basis for all environmental monitoring and surveillance at the INL Site and recommended development of this document. The INL Site Environmental Monitoring Technical Basis document has been developed. DOE acknowledges that historical data for soil samples taken from the area near TREAT show detections of Cs-137 (2 of 23 samples) and Sr-90 (1 of 3 samples) slightly above the statistically determined background levels at the time of the report (1995). The reported values are below maximum regional background levels and are indistinguishable from the conservative background level used at INL (INEL-94/0250 (Executive Summary Revisions 1, 1996; 1.28 pCi/g for Cs-137 and 0.76 pCi/g for Sr-90). In interpreting the Cs-137 and Sr-90 data, it is important to note: 1) because of the relatively long-half lives of radionuclides shown in Table C-8 of Schafer A.L. et al, 2014, the soil data would maintain a nearly permanent record if any releases had occurred, and 2) if the source of Cs-137 and Sr-90 shown had been TREAT, positive detections of other radionuclides such as Am-241, Pu-239, and U-235 should also be present above background levels. Based on both the TREAT radiological inventory as well as the current INL background levels, the positive detections of the radionuclides Cs-137 and Sr-90 are from global nuclear weapons testing conducted over the last half century. The projected future emissions from TREAT are in accordance with low levels documented in the EA, and reflect modern radiological control equipment and practices. As discussed in Schafer A.L., 2014, the volatile stack emissions, and resultant formation of particulates as they decay, were determined by a combination of monitoring and model calibration to measurable particulates obtained from the filtration system. Radiologic doses for these volatile atmospheric emissions were provided at locations important to assessing impacts to the closest permanent receptor (0.0021 mrem/yr) (Atomic City), closest collocated worker (0.0036 mrem/year) (TREAT Reactor Control Building – MFC-721), and Frenchman's Cabin (0.0011 mrem/year) (highest cumulative dose from all INL atmospheric emissions) as noted in Section 4.1.1 of the EA. The

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		public receptor doses at the nearest INL boundary were not provided in the EA because there are no permanent residents there, but were calculated as 0.025 mrem/yr as reported in Table C-5 of Schafer A.L. et al, 2014. All of the atmospheric doses are well below the 10 mrem/yr dose standard set by 40 CFR 61 Subpart H 61.93). The impacts analysis document has been updated to clarify the relationship between soil sampling results and emissions from TREAT.
127	The second reason given "to reduce the potential for proliferation of nuclear material" is destined to be as ineffective as various existing schemes supposedly to make plutonium unattractive by various contaminants.8 If DOE cared about reducing the proliferation threat it would not be sharing the Idaho National Laboratory (INL) Materials and Fuel Complex pyroprocessing technology (also known by other names such as electrorefining) with other countries, including the South Korea.9 Some experts fear that pyroprocessing will allow the separation of plutonium virtually undetected.10 Pyroprocessing treats spent fuel by removing the extremely radioactive but relatively short-lived constituents, such as strontium and cesium, and storing these separately from the spent fuel. The remaining material, including the comparatively long-lived transuranic elements plutonium and other actinides, can then be burned in fast-neutron reactors or used in nuclear weapons. However, high level and spent fuel waste problems are not solved by operating fast reactors as determined by the Blue Ribbon Commission report.	Transient testing is required to develop and test new nuclear fuels. To reduce the potential for proliferation of nuclear material, those fuels may offer a variety of advantages over traditional fuels including changes to form and composition that make them less attractive to those wishing to divert the material to harmful purposes.
Michael Tonks		
128	I am writing in response to the draft environmental assessment for the resumption of transient testing. I would like to start by saying that I feel that it is clear that we need a resumption of the development and construction of new nuclear power plants in this country to reduce the negative impact on the environment and to secure our energy future. To accomplish that, transient testing is critical and must be resumed. That being said, I feel that the most natural site to resume such testing would be in Idaho at Idaho National Laboratory. This would be a critical asset to the nation and the many of the necessary resources are already in place at INL.	DOE acknowledges your comment related to the need to resume transient testing.

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Roger Turner		
129	I support a full Environmental Impact Statement (EIS) Review for this large, controversial, expensive nuclear project. The new energy marketplace in the United States has changed, such that commercial nuclear reactors, even with the most optimistic results of TREAT testing, will not compete with the combination of natural gas, solar and wind power. New nuclear plants are not likely to be built. But even if some are built, the draft EA for TREAT is missing some key assessments and analyses leaving the document incomplete and does not follow NEPA regulations.	See response to Comment #15 (Page A-65).
130	One of the three purposes of the TREAT project was to "reduce the potential for proliferation of nuclear materials". However, the draft E.A. did not expand on this vague purpose. Listing this purpose as one of the three goals of the project, then never returning to discuss it, or address it in the alternative section, violates the NEPA laws. This omission forms a valid reason for carrying out a full EIS review of this project. Further, "Nuclear Proliferation" was not defined in the document, yet this term is not one that is generally familiar to the public (10 CFR 1021.301 requires that: Wherever feasible, DOE NEPA documents shall explain technical, scientific, or military terms or measurements using terms familiar to the general public, in accordance with 40 CFR 1502.8.) No explanation or definition was provided to meet the above-referenced regulation. A full EIS is needed to correct this. One of the three primary goals of the TREAT project is to "advance the nuclear fuel cycle". However, the term "nuclear fuel cycle" is not defined in the draft EA, nor is it explained in a way to be understood by the general public. Yet such technical jargon is required to be explained to the general public under NEPA rule 10 CFR 1021.330. If the project is to be advanced by DOE, a full EIS could address this deficit.	Definitions for 'Nuclear proliferation' and 'Nuclear Fuel Cycle' have been added to the glossary of the Final EA. The objective of an EA is to determine the potential for significant environmental impacts. In the purpose and need section of the EA, DOE defines in general terms what it hopes to accomplish with the proposed action. Also see response to Comment #15 (Page A-65).
131	Several of the purposes of the proposed TREAT Reactor are already funded by DOE, or DOE-funded contractors/research institutes. The apparent redundancy of adding the TREAT reactor is not described in the draft E.A., and a full EIS is therefore needed. That is: The DOE already has the Advanced Test Reactor, the Fast Flux Reactor, in Oakridge; many research facilities and studies that have worked on modular reactor designs, including fuel assemblies, light water reactor designs, FAST reactors; SNL's Annular Core Research Reactor in Albuquerque, New Mexico. The DOE recently awarded $226, million for the NuScale project to analyze and test new reactor designs. The University of Wisconsin at Madison was recently funded millions of dollars to test an	While there are existing reactors that can expose a test specimen to a given intensity of neutrons for R&D purposes, there is no operating capability that can subject a full size pre-irradiated test specimen to the level of short bursts of intense, high-power radiation necessary to mimic accident conditions in a commercial nuclear reactor. In addition, to achieve the data required for fuel certification, the capability must include real-time fuel motion monitoring. Since those capabilities are currently not available, there is no redundancy in capability. DOE is also funding various other R&D activities such as reactor designs but those efforts are not being funded to develop a capability to test fuel specimens.

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	advanced reactor design. The DOE has funded the low energy nuclear reaction (LENR) technology. These are projects that overlap the TREAT project ad should be reviewed more clearly, should be compared with TREAT. Why is full scale testing required now?	
132	The draft EA does not separate the commercial nuclear testing from Department of Defense, DOE, or Navy programs. Since cost sharing should be considered as part of any TREAT testing for customers, the final EA (or EIS) needs to address the anticipated customer base, use of the TREAT, and cost sharing of the project.	See response to Comment #18 (Page A-67).
133	NRC Duplication with DOE's TREAT- The U.S. Nuclear Regulatory Commission (NRC) regulates 42 research and test reactors of which 31 are currently operating. This regulatory function includes "safety", a purpose that is included in the TREAT project, however the draft E.A. does not address the apparent duplication of safety analyses between these Agencies. The "safety" aspect of new reactors, if needed, may best be funded through NRC. Hence a full EIS is needed to fully examine the role of nuclear reactor safety by both DOE and NRC. (Likewise for any final EA).	The Nuclear Regulatory Commission (NRC) is responsible for regulation and oversight of the civilian nuclear industry and is charged with assuring its safe implementation. As such, the NRC provides independent review of new technology and establishes the regulatory limits that ensure its safe utilization. However, it is not the NRC's responsibility to develop advanced technology or to develop the safety analyses required to use it. As such, the DOE is responsible for maintaining the enabling capabilities, including transient testing, to conduct the R&D required to design and perform safety analyses for new nuclear technologies. None of the operating 31 reactors are capable meeting the mission need.
134	The need for TREAT not addressed in terms of customers – The original TREAT reactor at the INL was shut down because there were no customers. Since that time, DOE has funded hundreds of millions of dollars on new reactor designs. But the Draft EA does not adequately address realistic customer participation/needs, over and above the testing results from recent DOE reactor research contracts. The draft EA does not answer the question of who will use the testing. Will these customers pay part or all of the testing costs?	See response to Comment #18 (Page A-67).
135	The bigger picture is not addressed in the draft EA. That is, the cost of building and operating new commercial reactors may be so high, that the TREAT project may not result in new reactor design deployment, regardless of successful testing via the TREAT project. Lower and lower natural gas costs, wind and solar power, and conservation techniques may have rendered commercial nuclear reactors uneconomical, even with the most optimistic TREAT results. Because the draft EA did not adequately address, comprehensively, customer relationship, cost sharing, or the current and near future energy marketplace, the TREAT project may be a waste of money. At the very least, a full EIS is needed to clarify the customer base for such a questionable, expensive	As outlined in the EA, DOE's Office of Nuclear Energy mission related efforts include developing new and advanced fuels along with enhancing the predictability of nuclear fuel behavior under a broad range of abnormal conditions, including loss-of-coolant accident scenarios with fuel damage and melting. Transient testing plays a crucial role in these efforts. While cost is certainly one consideration that agencies can use in evaluating the proposed action and deciding among alternatives, DOE prepared the EA to determine whether the proposed action and reasonable alternatives had the potential for significant environmental impacts. Because the calculated impacts are negligible, detailed

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	project. Any final EA should address the above issues.	economic consequences of the proposed action and its alternatives would not substantively add to the information for making that determination. In accordance with National Environmental Policy Act requirements, the EA describes alternative actions that meet the identified mission need and analyzes the potential environmental impacts associated with each alternative. Other considerations as identified by the commenter will be considered, as appropriate, by DOE when deciding how to proceed with the resumption of transient testing of nuclear fuels and materials.
136	A Programmatic EIS is needed before TREAT Analysis- The changes in the energy marketplace has changed so dramatically in the last few years, that a new programmatic EIS is needed, at least for the commercial side of the TREAT project. Dramatically lower natural gas prices have “beat out” the costs of commercial nuclear option. Much more efficient solar energy, huge investments in wind and many successful conservation measures have resulted in a completely changed marketplace for energy. Given these recent Energy changes in the United States, the DOE, may need new, broad changes in its mission. Consequently, before the TREAT is considered, a programmatic EIS is needed, especially for the commercial reactor part of the TREAT mission. The NEPA laws at 40 CFR 1502.4(c), support a programmatic EIS when there are broad generic issues, or broad technology changes, which is the case in the new energy market.	Evaluating nuclear energy’s place in the energy market is out of the scope of this effort. Also see response to Comment #16 (Page A-66).
137	Alternative Selection Incomplete- The draft EA for the TREAT project does not adhere to NEPA, with respect to the requirement to include reasonable alternatives. The NEPA and court cases are clear in their prohibition of Federal projects that are carried out in small steps, which if combined into a single project, would require NEPA review. The No-Action Alternative proposed likely exceeds that threshold. That is, the practice over the years, of granting hundreds of millions of dollars to various research groups and contractors for nuclear testing, and new reactor designs that are clearly related to the same goals as the TREAT project, should not be considered a “no action alternative”. The alternatives need to be expanded to address any piecemeal projects that over the next 40 years would achieve some of the same goals as a large, single, TREAT project. Please, in the final EA or EIS include cost estimates for each nuclear material testing project anticipated and take it out of the “No Action Alternative”.	The capabilities to perform limited transient testing, including preparing samples and post-irradiation examination, currently exist and are in use. In the EA, DOE is not analyzing the entire transient testing program, but instead proposing resuming its transient testing operations by either restarting the TREAT Reactor or modifying ACRR to enable DOE to obtain specific capabilities that are not currently operational. That capability is placing the nuclear fuel or material into the core of a specially-designed nuclear reactor and subjecting it to short bursts of intense, high-power radiation with real-time monitoring. As described in the EA, the “No Action Alternative” would involve the continuation of limited transient testing, preparing samples, and post irradiation examination at operating facilities. DOE would not be able to obtain the data needed to qualify new nuclear fuels. There are currently no reactors that can do the level of transient testing on nuclear fuels and materials contemplated by the EA in either the U.S. public or private sector. DOE had this capability until it put the TREAT Reactor in safe standby status in 1994. Resuming this capability is consistent with DOE’s existing R&D mission.

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	The draft EA does not address commercial nuclear testing in the private sector. While, the NEPA review can focus on the Federal government's role in testing, it should also describe private sector testing coordination and contribution. Private companies in the commercial nuclear industry are multi-million dollar companies. Corporations like Babcock & Wilcox, Westinghouse, Holtech International, Rolls Royce, Fluor Corporation, General Electric, and Tennessee Valley Authority, could cost-share some of the studies and testing proposed by TREAT. A new alternative should be added to address this. If companies are unwilling to cost-share the project …is it because none will be building nuclear reactors, regardless of TREAT goals (due to costs)?	
138	A separate alternative needs to address nuclear proliferation. There are likely several alternatives to reduce or package Uranium, especially U-235, and Plutonium, and/or blend it with other fuels; some with TREAT-type applications, but some with alternative means. Any benefit of nuclear proliferation minimization must be described in some detail, and various alternatives compared if the EA (or EIS) is to adhere to NEPA.	A separate alternative is not needed because transient testing of nuclear non-proliferation fuels is included in the scope of this federal action.
Troy Unruh		
139	I wish to express my support for Alternative 1, Restart of the TREAT Reactor. As discussed in the report, the TREAT reactor has already operated for 35 years and provided important data for validating reactor fuel designs. Pursing restart of the TREAT reactor is an investment into our energy future and security. Please restart the TREAT reactor.	DOE acknowledges your comment related to the need to resume transient testing.
Steve and Kathy Vucovich (Apple Athletic Club)		
140	My wife and I have lived in Idaho Falls since 1976 and we have started and owned two businesses since 1980. We fully understand the positive economic impact that INL and DOE have on the local and state economy. One of the businesses we owned and operated for 15 years was a solar energy/waste heat recovery/geothermal heat pump business. Consequently, you can see we have had an interest in clean energy sources for some time. Our country has many issues to solve. One important issue is to develop a long term energy policy that ensures a continual and inexhaustible supply of electricity while reducing dependence of foreign supplies of all energy related resources, all the while, lowering environmental impacts. Nuclear energy is truly the only science able to do this.	DOE acknowledges your comment related to the need to resume transient testing.

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	Our country's nuclear program has been stalled for many years primarily from environmental groups worried about the safety hazards of nuclear power plants and storage of spent fuels and reactor parts and by-products. Add to these concerns the recent nuclear failure in Japan, one can see that confidence levels for nuclear energy production in the U.S. have dropped. The only way to bolster the confidence levels is to continue to develop additional safe guards in the industry which will negate some of the previous disasters. Ultimately, this will keep us from "freezing in the dark" after a terrorist attack. When reading about transient testing, I can see that the continuation of testing, on a large scale, is critical to the development of the nuclear industry. It makes no sense to me why the TREAT program was shut down in the first place. That being said, the reactivation of transient testing in our nuclear program is a positive thing. With our nation's current state of budgetary concerns and obvious necessary cuts in government spending, developing affordable long term energy resources becomes even more important. One way to keep it affordable is do the initial research in the most efficient way. Researching the information of the TREAT facility versus the only other alternative (Las Alamos), it would seem to be a no brainer: The INL has the facility (it just needs to be activated); it has a great record of safety, transportation issues are less of a concern compared to Los Alamos; additional testing on products can be done close at other INL facilities; and on all other environmental concerns, it seems the INL has much better logistics/demographics. Given the state of our national energy policy, the state of our national economy as well as the TREAT facility history and shear lack of issues, there shouldn't be any case for the testing to be located anywhere but at the INL. Let the resumption of the TREAT facility be the common sense approach to the continued development of the world's main source of power.	

Comment #	Comment	Response
Kelly Wright (Shoshone-Bannock Tribes)		
141	From a quick glance at the NEPA and understanding the INL having worked previously there, I would ask the question about the Ba-140 emissions from the TREAT stack being a bioaccumulator. Has any studies been documented to ensure that biological (animals and plants) would not be impacted.	See response to Comment #39 (Page A-75).
142	Other question involves Carolyn about cultural aspects in this area and what sort of vegetation has been used for these assessments?	The impacts to cultural resources are addressed in the responses to Comment #73 (Page A- 94) and #74 (Page A-94). Vegetation species are found in the EA in Section 3.1.1.
143	Based on my limited knowledge of the Argonne facilities, I'm sure some sort of documentation or studies have been completed. They had a test site were vegetation was grown and contaminates were being evaluated for uptake for remediation efforts.	The EA used the best data available to determine the potential environmental impacts. This was detailed in Hafla et al. 2013 and summarized in the EA in Section 4.1.1.