

**National Ignition Facility
Draft Supplemental Environmental
Impact Statement to the SSM PEIS**

Prepared by
U.S. Department of Energy
Oakland Operations Office
Oakland, California

October 1999

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COVER SHEET

RESPONSIBLE AGENCY: U.S. Department of Energy

TITLE: National Ignition Facility Draft Supplemental Environmental Impact Statement to the SSM PEIS

CONTACT: For additional information on this statement write or call:

For general information on the NEPA process at DOE, write or call:

Mr. Richard Scott, Document Manager
U.S. Department of Energy, L-293
7000 East Avenue, P.O. Box 808
Livermore, CA 94550
Telephone: (925) 423-3022
Facsimile: (925) 424-3755
Toll-free: (877) 388-4930

Ms. Carol M. Borgstrom, Director
Office of NEPA Policy and Assistance, EH-42
U.S. Department of Energy
1000 Independence Avenue, SW
Washington, DC 20585
Telephone: (202) 586-4600
Facsimile: (202) 586-7031
Toll-free Messages: (800) 472-2756

ABSTRACT: The U.S. Department of Energy (DOE) is constructing the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL) at Livermore, California. In 1997, buried capacitors containing polychlorinated biphenyls (PCBs) were discovered during site excavation for the NIF. The capacitors and contaminated soil were cleaned up to levels protective of human health and the environment in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and its implementing regulations and in consultation with state and federal regulators. In October 1997, DOE entered into a Joint Stipulation and Order approved and entered as an order of the court on October 27, 1997, in partial settlement of the lawsuit Civ. No. 97-936 (SS) (D.D.C.), *Natural Resources Defense Council et al. v Richardson et al.* Paragraph 7 of the Joint Stipulation and Order provides that a Supplemental Environmental Impact Statement (SEIS) shall evaluate "... the reasonably foreseeable significant adverse environmental impacts of continuing to construct and of operating NIF at LLNL with respect to any potential or confirmed contamination in the area by hazardous, toxic, and/or radioactive materials." On September 25, 1998, DOE announced in the *Federal Register* the agency's intent to prepare an SEIS for the NIF portion (Volume III, Appendix I) of the *Programmatic Environmental Impact Statement for Stockpile Stewardship and Management* (SSM PEIS) (DOE/EIS-0236, September 1996). The Joint Stipulation and Order required further investigations of potential buried wastes and of soil and groundwater contamination in seven site areas. The results of these investigations are as follows. Interviews and searches of historical information indicated a low probability of finding additional buried sources of contamination. Magnetometer, electromagnetic induction, and ground-penetrating radar surveys identified no additional potential areas of concern. In December 1998, soil sampling during routine maintenance operations identified residual PCBs in soils in the East Traffic Circle Area from a previous landfill closure. The area is outside the NIF Construction Area. The cleanup of the buried capacitors; contaminated soils; and other, nonhazardous, items found in 1997 and 1998 resulted in dust emissions. However, the risks of cancer and noncancer health effects due to PCBs on inhaled dust from the cleanups are estimated to have been orders of magnitude below levels of concern established by the U.S. Environmental Protection Agency (EPA). Information from LLNL's extensive groundwater monitoring program and new information in this SEIS regarding present and potential future groundwater concentrations of PCBs in the study areas indicate that PCB contamination levels are well below concentrations that would impact human health and the environment. Concentrations of PCBs reaching the groundwater are conservatively estimated to be less than 0.5% of EPA's current drinking water guidelines for PCBs. No impacts on human health or the environment would result from this low level of potential contamination.

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SUMMARY

This Supplemental Environmental Impact Statement (SEIS) is being prepared pursuant to a Joint Stipulation and Order approved and entered as an order of the court on October 27, 1997, in partial settlement of the lawsuit Civ. No. 97-936 (SS) (D.D.C.), *Natural Resources Defense Council [NRDC] et al. v Richardson et al.* The Joint Stipulation and Order is reproduced at the end of this document as Attachment 1. In the Joint Stipulation and Order, the U.S. Department of Energy (DOE) agreed to prepare an SEIS to the Programmatic Environmental Impact Statement for Stockpile Stewardship and Management (SSM PEIS) (DOE/EIS-0236, DOE 1996a) to evaluate the reasonably foreseeable significant adverse environmental impacts of continuing to construct and of operating the National Ignition Facility (NIF) at Lawrence Livermore National Laboratory (LLNL) in Livermore, California, with respect to any potential or confirmed contamination in the area by hazardous, toxic, and/or radioactive materials. On September 25, 1998, DOE announced in the *Federal Register* the agency's intent to prepare this SEIS for the NIF portion (Volume III, Appendix I) of the SSM PEIS. DOE's need for preparation of this SEIS, consistent with the previously established need for NIF (DOE 1996a, Appendix I), is to determine how the results of characterization studies completed pursuant to the Joint Stipulation and Order should affect the manner in which DOE proceeds with the construction and operation of NIF. On August 5, 1999, DOE issued an amended Notice of Intent to prepare this SEIS, which incorporated changes in schedule resulting from new relevant information.

The SSM PEIS addressed alternative plans for DOE's defense program activities related to nuclear weapons stockpile issues at several DOE laboratories, including LLNL. The environmental consequences of construction and operation of NIF were addressed in detail in SSM PEIS Volume III, Appendix I, entitled *National Ignition Facility Project Specific Analysis* (NIF PSA). The Record of Decision (ROD) for the SSM PEIS was published in the *Federal Register* on December 26, 1996 (61 FR 68014). In the ROD, DOE announced its decision to construct and operate NIF at LLNL. The start of physical construction of NIF was authorized on March 7, 1997, and groundbreaking for the NIF occurred on May 29, 1997. Construction of the NIF is ongoing and is expected to be completed by October 2003.

On September 3, 1997, excavation activities at the NIF site uncovered capacitors containing polychlorinated biphenyl (PCB) oil, as well as some nonhazardous items. Continued excavation was cordoned off from the rest of the site, and construction activities in this area were halted from September 3 through September 12, 1999. Several of the capacitors had leaked, contaminating the surrounding soil. Analysis of composite soil samples collected in the vicinity of the capacitors indicated that soil contained PCBs at concentrations up to 66 parts per million (ppm). This level is greater than the U.S. Environmental Protection Agency (EPA) Region 9 preliminary remediation goal (PRG) of 1.3 ppm for general PCBs in soils of an industrial site. The PCB-containing capacitors and PCB-contaminated soils were removed from the NIF Construction Area on September 12, 1997. This cleanup was conducted under the oversight of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Remedial Project Managers (RPMs) for the Livermore Site. Under the CERCLA process, the RPMs for the Livermore Site (consisting of the EPA, the California Regional Water Quality Control Board-San Francisco Bay Region, and the California Department of Toxic Substances

Control) review remedial or response actions resulting from releases of hazardous substances into the environment. The CERCLA RPMs agreed to a soil cleanup level of 1 ppm for soils in the NIF Construction Area. This level was based on the reporting limit used for soil analysis, which represents a cleanup level more stringent than the EPA Region 9 Preliminary Remediation Goal (PRG) of 1.3 ppm for unspecified PCBs in soils of an industrial site. All soils having PCBs above 1 ppm were removed and disposed of as hazardous waste.

On September 22, 1997, the plaintiffs in *NRDC v. Richardson* filed a motion under Rule 60(b) of the Federal Rules of Civil Procedure in which they alleged that DOE knew but did not adequately analyze and disclose the risk of building the NIF in an area that might contain buried hazardous, toxic, or radioactive materials or waste. DOE denied the allegations in the plaintiffs' motion. In the Joint Stipulation and Order of October 27, 1997, which settled all claims in the plaintiffs' Rule 60(b) motion, DOE agreed to conduct an assessment of "... the reasonably foreseeable significant adverse environmental impacts of continuing to construct and of operating NIF at LLNL with respect to any potential or confirmed contamination in the area by hazardous, toxic, and/or radioactive materials" and to present the results in an SEIS.

Over the period October 7-12, 1998, workers uncovered debris while conducting routine drainage maintenance operations in the center of the East Traffic Circle (ETC), the known location of a LLNL landfill remediated in 1984. These maintenance activities were not related to NIF construction and were physically separated from the NIF construction site. However, the ETC Area is one of the seven areas of concern identified in the Joint Stipulation and Order and is addressed in this SEIS. The ETC landfill was known to have contained the PCB Aroclor 1254, and tests determined that soil removed from the ETC Area contained this specific PCB compound. The RPMs were immediately notified, and subsequent actions, such as soil disposal, geophysical surveys, and soil sampling, were determined and implemented with the regulatory agencies' concurrence. Analysis of composite samples from soils excavated at the ETC Area indicated that the soil contained Aroclor 1254 at 98 and 120 ppm. With CERCLA RPM concurrence, the excavated PCB-contaminated soil was removed and sent to Enviro-Safe, Inc., an off-site hazardous waste disposal facility in Idaho. The cleanup level agreed upon by the CERCLA RPMs was less than 18 ppm, which is the EPA Region 9 PRG for Aroclor 1254 in soils at an industrial site. This cleanup level differed from the cleanup level for the NIF site because the contaminant at the ETC Area was known to be Aroclor 1254. After cleanup, the areas where the soil was stored before disposal were sampled to verify that no residual PCB contamination remained.

The seven areas at LLNL designated for additional investigation under terms of the Joint Stipulation and Order occupy a large portion of the northeastern corner of the Livermore Site. Site characterization activities required by the Joint Stipulation and Order consisted of two phases. Phase I included review of all available information and interviews with workers and retirees who were reasonably known to have knowledge of the potential existence and location of buried materials in the stipulated areas. Phase II included geophysical surveys of locations suspected of containing buried material, followed by soil boring and/or soil vapor studies where potential burial sites were identified. The progress of characterization was described in seven

quarterly reports issued in November 1997; February, May, August, and November 1998; and March and June 1999 (DOE 1997, 1998a-d, 1999b-c).

Phase I examination of records, interviews of employees and retirees, and examination of aerial photographs narrowed the area for geophysical studies for buried materials to the Helipad Area, the Northern Boundary Area, and the NIF Construction Area. In the NIF Construction Area, magnetometer, electromagnetic induction, and ground-penetrating-radar surveys did not identify any additional locations of potential hazardous waste, while the digging of test holes identified the presence of debris (concrete, asphalt, wood, and cuttings). Other boreholes indicated the presence of nails and wire. Electromagnetic induction and magnetometer surveys of the Helipad Area also did not identify any buried objects of potential concern. A magnetometer survey was performed at the Northern Boundary Area, and no objects of potential concern were found.

Similarly, review of information on the ETC Area, including interviews and historical searches, indicated that there was a low likelihood of finding any additional buried sources of contamination. In addition, a magnetometer survey and subsurface investigations were conducted in the area under the oversight of the CERCLA RPMs. These investigations failed to locate any additional buried hazardous objects.

Phase II activities included additional sampling and analysis of soils and groundwater and examination of existing data. The Livermore Site has an extensive subsurface soil and groundwater monitoring program. Since 1986, an integrated sample and data management program has supported the collection, validation, interpretation, and use of the soil and groundwater data. A highly concentrated groundwater monitoring network within the 1-mi² Livermore Site consists of more than 1,000 boreholes and about 450 regularly monitored wells. Potential source areas were investigated during the CERCLA Remedial Investigation for the Livermore Site. Source investigations, including use of new sampling wells, were conducted on known or suspected landfills on the basis of anecdotal information and aerial photographs. Soil and groundwater were sampled for PCBs near the NIF construction site where PCB contamination was suspected. PCBs in soils are relatively immobile, and no analytical data have identified PCBs in groundwater. At the ETC Area, downgradient groundwater monitoring wells were installed to evaluate groundwater for PCBs. None were detected.

This SEIS addresses the potential environmental impacts on human health from inhalation of PCB-contaminated dust and potential contamination of groundwater resulting from the cleanup of the capacitors and contaminated soils from the NIF site and of residual contamination in the ETC Area. Excavation and removal resulted in brief periods of emissions of dust containing PCBs. The resulting risks of cancer and noncancer health effects on the public and workers are estimated to have been orders of magnitude below levels of concern established by the EPA. The cleanup levels of 1 ppm PCBs in soils of the NIF Construction Area and of 18 ppm in soils of the ETC Area, established in coordination with the CERCLA RPMs, would be protective of human health and the environment.

Projected levels of groundwater contamination in the NIF Construction Area and the ETC Area now and in the future are estimated to be well below levels considered to present a risk to the public. Ongoing remediation activities will continue to improve groundwater quality regardless of continued construction and operation of the NIF. None of the activities for construction and operation of the NIF would affect groundwater quality in the areas studied.

Impacts on the environment of both alternatives — (1) continue to construct and then operate the NIF at LLNL and (2) cease construction of the NIF — would be similar, except as noted below. Ceasing construction of NIF, whether for an alternative use or demolition, would prolong construction- or construction-like impacts. Radionuclide releases could occur during reuse, but would not occur during demolition. Demolition would also result in temporary dust releases above state standards and would generate approximately 4,400 m³ (about 5,800 yd³) of nonhazardous waste. Truck traffic from transportation of fill and wastes might temporarily disturb a state-protected bird species. Concentrations of PCBs in soil or groundwater originating from buried material would be below any level of regulatory concern for all alternatives.

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NOTATION

The following is a list of the acronyms, abbreviations, and units of measure used in this report. Notation used only in equations and tables is defined in those equations and tables.

ACRONYMS AND ABBREVIATIONS

1,1-DCA	1,1-dichloroethane
1,2-DCA	1,2-dichloroethane
1,1-DCE	1,1-dichloroethylene
1,2-DCE	1,2-dichloroethylene
BTEX	benzene, toluene, ethylbenzene, and xylene
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
DOE	U.S. Department of Energy
EMI	electromagnetic induction
EPA	U.S. Environmental Protection Agency
ETC	East Traffic Circle
ETCL	East Traffic Circle Landfill
FHC	fuel hydrocarbon
FR	<i>Federal Register</i>
Freon 11	trichlorofluoromethane
GPR	ground-penetrating radar
HSU	hydrostratigraphic unit
LLNL	Lawrence Livermore National Laboratory
MCL	maximum contaminant level
NEPA	National Environmental Policy Act
NIF	National Ignition Facility
NOI	Notice of Intent
NRDC	Natural Resources Defense Council
OEHHA	Office of Environmental Health Hazard Assessment (California)
PCB	polychlorinated biphenyl

PCE	perchloroethylene
PEIS	Programmatic Environmental Impact Statement
PM ₁₀	particulate matter with an aerodynamic particle diameter equal to or less than 10 µm
PRG	preliminary remediation goal
PSA	Project Specific Analysis
ROD	Record of Decision
RPM	Remedial Project Manager
SEIS	Supplemental Environmental Impact Statement
SNL	Sandia National Laboratories
SSM	Stockpile Stewardship and Management
SVS	soil vapor survey
TCE	trichloroethylene
VOC	volatile organic compound

Units of Measure

cm	centimeter(s)	m	meter(s)
cm ³	cubic meter(s)	µm	micrometer(s)
d	day(s)	mm	millimeter(s)
ft	foot (feet)	mi	mile(s)
g	gram(s)	mi ²	square mile(s)
µg	microgram(s)	pCi	picocurie(s)
mg	milligram(s)	ppb	part(s) per billion
gal	gallon(s)	ppm	part(s) per million
in.	inch(es)	s	second(s)
km	kilometer(s)	yd ³	cubic yard(s)
L	liter(s)	yr	year(s)

