CITIZENS GUIDE

to the

UNITED STATES DEPARTMENT OF ENERGY'S

IDAHO NATIONAL LABORATORY

Compiled for

Environmental Defense Institute

By
Chuck Broscious

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EDI Board of Directors

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Dedicated in Memory of
Jeanne McClenahen Broscious
and
Gertrude Hanson

Every gun that is made, every warship launched, every rocket fired, signifies, in the final sense, a theft from those who hunger and are not fed, those who are cold and are not clothed. This world in arms is not spending money alone; it is spending the sweat of its laborers, the genius of its scientists, the hopes of its children.

Dwight David Eisenhower

Along with the possibility of the extinction of mankind by nuclear war, the central problem of our age has therefore become the contamination of man's total environment with such substances of incredible potential for harm ---substances that accumulate in the tissues of plants and animals and even penetrate the germ cells to shatter or alter the very material of heredity upon which the shape of the future depends.

Rachel Carson

The ultimate test of a moral society is the kind of world it leaves to its children.

Dietrich Bonheoffer

If you love this planet, you are going to have to change the priorities of your life. People from all walks of life, many of whom identify themselves as non-political, have discovered that hopeful action is better than hopeless inaction.

Helen Caldecott

Acknowledgements

Basic to the democratic process is the concept of informed consent. The goal of the *Citizens Guide to Idaho National Laboratory* (INL) formerly called Idaho National Engineering and Environmental Laboratory (INEEL) is to provide the reader with a candid history of INL operations, and the environmental, health, and safety impact that are the legacy of nearly six decades of nuclear activities at this nuclear site. The reader will hopefully be better prepared to make informed decisions on nuclear policy issues, cleanup activities, and new nuclear projects planned for INL by reading this Guide.

The first edition of the *Guide*, released in January 1991, would not have been possible without the ongoing support of hundreds of individual contributions that have sustained the Environmental Defense Institute (EDI) over the years. The Harder Foundation provided funding for the publishing costs of the first edition. Special credit and appreciation also go to the W. Alton Jones Foundation, the Deer Creek Foundation, the Peace Development Fund, the Norman Foundation, the Bridge Builders Foundation, Jeanne M. Broscious, Carol B. Ferry, Russell K. Broscious, P.E., Dr. Allen Benson and Tri-State Distributors for their generous financial support. EDI's Board of Directors has tirelessly worked for over a decade to ensure the organization stays on track and keeps focused on our mission.

Tami Thatcher is a former nuclear safety analyst at INL and is now a nuclear safety consultant for EDI writing our Newsletter added extensively to the *Guide's* content. Also during earlier *Citizens Guide* editions, Patricia Diaz, Ph.D. contributed indispensable editing talent to the first edition of the *Citizens Guide*. Jonathan Stoke, Karen Hallgren, and Lynn Mineur also contributed their essential editing skills through the first seven editions of the *Citizens Guide*. Elaine Broscious Dawson's creative publishing talents on the eighth and ninth editions provided the software building blocks for the tenth edition. Since each new edition builds on previous editions these editors continue to contribute. Margaret Carde contributed the section on EPA waste standards, Daniel Hirsch, Ph.D. contributed the section on breeder reactors, Daniel Horner contributed the section on pyroprocessing, and Daryl Kimball contributed the section on epidemiological research activities. Tim Connor, Keith Stormo, Arjun Makhijani, Ph.D., Philip Deutchman, Ph.D., T. Alan Place, Ph.D., Kate Schalck, Russell Broscious, P.E., Alice Stewart, M.D., Allen Benson, Ph.D., Todd Martin, Don Hancock, Michael Blaine, Ph.D., Duane Allen, Dirk Dunning, William Weida, Ph. D., and Bret Leslie, Ph.D. offered considerable technical assistance. Allan Bowles, J.D., Kellie Youmans, J.D., Kenneth Gallant, J.D., and John Norton, J.D. contributed extensive legal assistance. Daniel Jones' Anyware Computers kept EDI computers literally running. Michael Cawley, Richard Hanson, Gertrude Hanson, Mary Burkett, and Jean Dennis' willingness to share their personnel histories and litigation documents and Alan Lifton's compelling *Faces of Victims* video record ensured the prominence of the victims dominated.

The core documentation cited in this *Citizens Guide* was obtained through Freedom of Information Act (FOIA) requests to the Department of Energy. Robert Alvarez provided the inspiration and principal formulation of these FOIA requests that were first initiated in 1987. His generous guidance in subsequent years was indispensable during the DOE denials and administrative appeals for these FOIA requests. Tom Carpenter, J.D., Daniel Berger, J.D., also assisted in FOIA request formulation. Additionally, the six member organizations of the INL Research Bureau, who were the original FOIA requesters, made it ultimately possible to obtain these Department of Energy (DOE) documents because of the restrictive DOE interpretation of FOIA to meet "in the public interest" and "dissemination" requirements.

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Acronyms

AEC	U.S. Atomic Energy Commission (ERDA and later DOE's predecessor)
AFSR	Argonne Fast Source Reactor
ALARA	As-low-as-achievable
AMWTP	Advanced Mixed Waste Treatment Project at RWMC
ANL-W	Argonne National Laboratory-West on INL site now called Materials and Fuels Complex
ANP	Aircraft Nuclear Propulsion
ANSI	American National Standards Institute
APS	Atmospheric Protection System
ARP	Accelerated Retrieval Project at RWMC
ARA	Auxiliary Reactor Area on INL site
ARFM-1	Advanced Reactivity Measurement Facility No. 1
ARVF	Army Reentry Vehicle Facility
ASME	American Society of Mechanical Engineers
ASTM	American Society for Testing and Materials
ATR	Advance Test Reactor
ATRC	Advanced Test Reactor Critical
ATSDR	Agency for Toxic Substances and Disease Registry
BAE	Battelle Energy Alliance
BLR	Big Lost River on INL Site
BORAX	Boiling Water Reactor Experiment
BBWI	Bechtel/BWXT Idaho
BWR	Boling Water Reactor
CDC	(National) Centers for Disease Control and Prevention
CERCLA	Comprehensive Environmental Response, Compensation, and Liabilities Act
CERT	Controlled Experimental Release Test
CEQ	Council of Environmental Quality
CFA	Central Facilities Area on INL site
CFRMF	Coupled Fast Reactivity Measurement Facility
CFR	Code of Federal Regulations
CH	Contact Handled
CLOFA	Complete Loss of (coolant) Flow Accident
CLOHS	Complete loss-of coolant sink
CIC	Core Integral Changeout
CITRC	Critical Infrastructure Test Range
CPP	Chemical Processing Plant (now INTEC)
CRR	Carbon Reduction Reformer
CTF	Core Test Facility
CWI	CH2M-WG Idaho, LLC
DEQ	Idaho Department of Environmental Quality - primary state regulator
DEIS	Draft Environmental Impact Statement
DMR	Denitration and Mineralization Reformer
DOB	Daily Operations Brief for Secretary of Energy
DOD	U.S. Department of Defense
DOE	U.S. Department of Energy
DOE/ID	U.S. Department of Energy Idaho Operations Office
EBR-I	Experimental Breeder Reactor Number 1
EBR-II	Experimental Breeder Reactor Number 2
ECF	Expended Core Facility
EDF	Engineering Design File
EDI	Environmental Defense Institute

EDE	effective dose equivalent
EFIS	emergency firewater injection system
EG&G	Edgerton, Germeshausen & Grier (DOE Contractor)
EIS	Environmental Impact Statement
EMS	Environmental Management System
EOCR	Experimental Organic Cooled Reactor
EPA	U.S. Environmental Protection Agency
ERDA	Energy Research and Development Administration (DOE's predecessor)
ESRPA	Eastern Snake River Plain Aquifer
ESER	Environmental Surveillance, Education and Research (Program)
ETR	Engineering Test Reactor
ETRC	Engineering Test Reactor Critical
ETS	Evaporator Tank System (INTEC Tank Farm)
EXCES	Experimental Cloud Exposure Study
FAST	Flourinel and Fuel Storage Facility
FCF	Fuel Cycle Facility
FECF	Fuel Element Cutting Facility
FEET	Fuel Element Effluent Test
FEIS	Final Environmental Impact Statement
FFCA	Federal Facilities Compliance Act
FOIA	Freedom of Information Act
FONSI	Finding of No Significant Impact
FPFRT	Fission Product Field Release Test
FMF	Fuel Manufacturing Facility
FR	Federal Register
GAO	U. S. Congress General Accounting Office
GCRE	Gas-Cooled Reactor Experiment
GOCO	Government Owned Contractor Operated
GPM	Gallons per minute
GTCC	Greater Than Class-C Low-Level Waste
HEDR	Hanford Environmental Dose Reconstruction Project
HEPA	High efficiency particulate air
HFEF	Hot Fuel Examination Facilities
HTRE	Heat Transfer Reactor Experiment
HWMA	Hazardous Waste Management Act
ICDF	Idaho CERCLA Disposal Facility
ICRP	International Commission on Radiological Protection
ICPP	Idaho Chemical Processing Plant (now called INTEC)
ICP	Idaho Cleanup Project
IDAPA	Idaho Administrative Procedures Act (primary Idaho Laws)
IEMP	Idaho Environmental Monitoring Program
IDHW	Idaho Department of Health and Welfare
LDR	Land Disposal Restrictions
IET	Initial Engine Test (ANP Reactor Program)
IFSF	Irradiated Fuel Storage Facility (CPP-603)
ILWMS	INTEC Liquid Waste Management System
ILTSF	Intermediate-level Transuranic Storage Facility
IHES	INL Health Effects Subcommittee (CDC Dose Reconstruction Study)
INEL	Idaho National Engineering Laboratory (now Idaho National Laboratory)
INEEL	Idaho National Engineering and Environmental Laboratory (now INL)
INTEC	Idaho Nuclear Technology and Engineering Center (formerly ICPP)
IRB	INEL Research Bureau
IFR	Integral Fast Reactor
IWTU	Integrated Waste Treatment Unit at INTEC
LDDT	Long Distance Diffusion Test

LIME	Limited Melt Experiment (Reactor)
LESAT	Lockheed Environmental Services and Technologies (now LMAES)
LITCO	Lockheed Idaho Technologies Company (now LMITCO)
LMITCO	Lockheed Martin Idaho Technologies Company
LMAES	Lockheed Martin Advanced Energy Systems
LOC	Limiting Condition of Operations
LOCA	Loss of coolant accident
LOFT	Loss of Fluid Test (Reactor)
LPT	Low Power Test (Reactor)
LWR	Light Water Reactor
MEI	maximally exposed individual
MCL	maximum contaminate level
M&O	Maintenance and Operations
MFC	Materials and Fuels Complex (formerly ANL-W)
MLLW	Mixed low-level Waste
MPF	Mixed Fission Product (generally now called mixed-transuranic waste)
MTR	Materials Test Reactor (at ATRC)
MW	megawatts
NA	not applicable
NAAQS	National Ambient Air Quality Standard
NCEH	National Center for Environmental Health (Division of CDC)
NDRP	Design Basis Reconstruction
NDPS	National Pollution Discharge Elimination System
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NE-ID	Department of Energy Idaho Operations
NIOSH	National Institute for Occupational Safety and Health (Division of CDC)
NOV/CO	Notice of Violation/Consent Order
NOI	Notice of Intent
NPDES	National Pollution Discharge Elimination System
NRC	U.S. Nuclear Regulatory Commission
NRAD	Neutron Radiography Facility
NRF	Naval Reactors Facility
NRTS	National Reactor Testing Station (Currently called INL)
NWCF	New Waste Calcine Facility
OMRE	Organic-Moderated Reactor Experiment
OTA	U.S. Congress Office of Technical Assistance
PAAA	Price-Anderson Amendment Act
PBF	Power Burst Facility (Reactor)
PCB	polychlorinated biphenyl
PCP	Primary Coolant Pump
PCS	Primary Coolant System
PEL	permissible exposure limit
PEIS	Programmatic Environmental Impact Statement
PSD	Prevention of Significant Deterioration
PGA	Peak Ground Acceleration
PLN	Plan
PM-2A	Portable Medium Nuclear Power Plant
PISA	Potential Inadequacy in Safety Analysis
PRA	Probabilistic Risk Assessment
PREPP	Process Experimental Pilot Plant
PWR	Pressurized Water Reactor
QA	quality assurance
R&D	research and development
RCRA	Resource Conservation Recovery Act

RDT	Relative Diffusion Test
RESL	Radiological and Environmental Sciences Laboratory
RH	Remote Handled
RI/FC	Remedial Investigation/Feasibility Study
RIA	Reactivity Insertion Accident
ROD	Record of Decision
RSS	Reactor Shutdown System
RTC	Reactor Technology Center (formerly Test Reactor Area now Advanced Test Reactor Compex)
RWMC	Radioactive Waste Management Complex on INL site
SAR	safety analysis report
SARA	Superfund Amendments and Reauthorization Act
SCRC	Special Cavity Reactor Critical Experiment
SCS	secondary
SDA	Subsurface Disposal Area at RWMC
SDIO	Strategic Defense Initiative Organization
SER	Safety Evaluation Report
SEIS	Supplemental Environmental Impact Statement
SL-1	Stationary Low-Power Reactor No. 1
SMC	Specific Manufacturing Capability at Test Area North
SMCL	Secondary maximum contaminate level
SMN	Special Nuclear Materials
SNF	Spent Nuclear Fuel
SNAPTRAN	Special Nuclear Auxiliary Power Transient
SPERT	Special Power Excursion Reactor Tests I, II, III, and IV
SWEEP	Stored Waste Examination Pilot Plant
SNF	Spent (used) nuclear reactor fuel
SSC	Structures, systems, and components
SSE	safe shutdown earthquake
SST	stainless steel
SSC	structures, systems and components
STD	standard
STP	Site Treatment Plan
STR	Submarine Thermal Reactor (S1W) at Naval Reactor Facility
TAN	Test Area North on INL site
TBT	to be determined
TEDE	Total Effective Dose Equivalent
TLD	thermaluminescent dosimeter
TRA	Test Reactor Area on INL site (formerly Reactor Test Complex now Advanced Test Reactor)
TREET	Transient Reactor Test Facility
TRU	Transuranic Waste
TRUPACT	Transuranic Package Transorter
TSF	Transuranic Storage Facility at the RWMC
TSR	Technical Safety Requirements
URSF	Upgraded Final Safety Analysis Report
USAEC	U.S. Atomic Energy Commission (preceded DOE)
USGS	United States Geological Survey
USGS-BRD	United States Geological Survey – Biological Resources Division
USQ	Unreviewed Safety Questions
VCO	Voluntary Consent Order
VVE	Vapor Vacuum Extraction
WAG	Waste Are Group
WCF	Waste Calcine Facility at INTEC
WERF	Waste Experimental Reduction Facility
WIPP	Waste Isolation Pilot Plant in New Mexico
WINCO	Westinghouse Idaho Nuclear Company

WM	Waste Management
WMPEIS	Waste Management Programmatic Environmental Impact Statement
WRC	Waste Reductions Operations Complex
WRRTF	Water Reactor Research Test Facility
ZPPR	Zero Power Physics Reactors (I, II, and III)

Introduction

The *Citizens Guide to INL* is intended as a resource tool for individuals and public interest groups seeking information on the U.S. Department of Energy's (DOE) historical, current, and planned operations in Idaho. DOE owns and operates the Idaho National Laboratory (INL) formerly (and hereafter referred interchangeably) as the Idaho National Engineering and Environmental Laboratory (INEEL) 35 miles northeast of Idaho Falls, Idaho as a nuclear weapon materials production and reactor testing site. INL has gone through four name changes. The original site name bestowed by the U.S. Atomic Energy Commission in 1949 was the National Reactor Testing Station (NRTS). In the mid 1970's the site name was changed to the Idaho National Engineering Laboratory, in 1996, the name was changed again to Idaho National Engineering and Environmental Laboratory, and currently the name was changed to INL.

The *Citizens Guide to INL* is published by the Environmental Defense Institute (EDI), a non-profit public interest organization dedicated to promoting responsible public policy concerning Idaho's human and natural environment. EDI was the sponsor and coordinator of a coalition of six organizations called the INL Research Bureau (IRB), which functioned between 1988 and 1995. The IRB coalition focused on accessing documents through the Freedom of Information Act on the operating history of the INL. These INL documents are used by IRB member organizations as part of their on-going analysis of the health and safety impact of INL operations.

Periodically, the *Citizens Guide* is updated to reflect new information, disclosures, and changes in the issues that the *Guide* addresses. Since the last update to the *Citizens Guide*, INL Superfund cleanup activities have been initiated, and additional information has come to light challenging DOE's "no action" decision at some waste sites. Also, public participation initiatives have developed in an attempt to implement substantive public involvement in the health study decision making process.

Initially in the 1940's Congress established the Atomic Energy Act and the Atomic Energy Commission (AEC) that was involved with the production and testing of nuclear weapons. The AEC was completely shrouded in secrecy accountable only to the President and granted sovereign immunity. In the 1990's under significant public pressure, Congress passed the Federal Facilities Compliance Act that forced all federal agencies (including DOE) to comply with all applicable environmental regulations. Congress also passed the Nuclear Waste Policy Act, that further provided more detailed regulations to management and disposal of radioactive waste. Former Idaho Governor Andrus to his credit initiated the 1995 INL Settlement Agreement that was formalized in a Federal Court Order and Consent Order that further forced DOE/INL to comply with Federal Facilities Compliance Act, Nuclear Waste Policy Act and CERCLA. Tragically, all the gains these laws and legal efforts produced has been undermined by later and current conservative Presidents, Congress, Governors and Idaho State legislatures.

Citizens of Idaho are facing important choices concerning the DOE's Idaho operations. For over seventy years, INL operations were conducted in secret. The public had no choice but to accept decisions made by the federal government. Today, the public has the opportunity to participate in current policy decisions concerning the INL that include:

* Expansion of INL pyro-processing of reactor fuel to recover plutonium and highly enriched uranium;
* Expansion of INL as a national radioactive waste storage and treatment center;
* Expansion of INL burial grounds for permanent disposal of radioactive wastes;
* Superfund cleanup of radioactive and chemical wastes from past and present nuclear programs;
* Health studies of affected populations to determine impact of INL releases on workers and off-site residents;
* Development, promotion and construction of new nuclear reactor designs.

Due to safety and environmental violations at many DOE sites across the country, the government has been forced to close some facilities. In an effort to revive its breeder reactor program, DOE is funding Materials Fuels Complex (formerly called Argonne National Laboratory-West) spent nuclear fuel pyro-processing plant. This process recovers plutonium and enriched uranium that is then refabricated into new reactor fuel. This fissile material can also be used for nuclear weapons posing significant issues related to the proliferation and violation of nuclear proliferation treaty agreements.

This planned expansion of INL will increase the already significant negative impact on Idaho's environment and the health and safety of its residents. The fall of the Soviet Union and Nuclear Weapons Treaties has significantly changed the arsenal requirements. However, U.S. government recent funding for development and production of new nuclear weapon systems is increasing by $1 Trillion over the next decade. Despite a surplus of plutonium and highly enriched uranium that are the primary components of nuclear bombs, the nuclear alchemists still want to build reserve production

capacity in case it is needed in the future.

INL's expansion proposal says Idaho is best because it "provides added safety by virtue of a distance shield to protect the public in case of a low probability, high consequence event."[NWCRS/INL @ 1-6] In plain English, this means that DOE still believes that; when another accident releases radiation, there will be no "significant" impact on Idahoans. DOE assesses risk to public as low because Idaho is a state with a low population density. Population growth in Idaho and surrounding states (Utah, Wyoming and Montana) now challenge the "low population density" determination.

Resistance to addressing INL's environmental contamination problems are rooted in protecting the site's image and ability to attract new nuclear projects. Resistance to owning up to decades of mismanagement of the INL site's nuclear waste streams is another factor not to mention the government's reluctance to pay the $6-7 billion/yr. INL Superfund cleanup bill for 2020 is $553,225,000; total between 2003-2020 is $10,995,412,000. (See Section IV.A)

Former INL site manager John Wilcynski believed that a site mission composed largely of environmental cleanup work is a certain road to shut-down. The nuclear culture has sunk deep roots into the socioeconomic consciousness of southeastern Idaho. As the single largest employer in the State, INL's political clout cannot be underestimated.

In order for the *Guide* reader to be able to make informed decisions concerning INL's present and future activities, it is essential to have an understanding of the site's operating history. Section I of this *Guide* offers as candid a view of INL's history as current publicly available information allows. Unfortunately, much of INL's operating history still remains secret and documentation classified. Hundreds of thousands of pages of DOE and other government source documents gained through Freedom of Information Act requests were reviewed to provide a fully referenced *Guide*. Citations are placed in [brackets] in abbreviated form that are also listed in alphabetical order in the Reference Section at the end of the *Guide*. The reason for this unconventional reference format is to facilitate the updating process with each new edition of the *Guide*. Additionally, footnotes have been added as further references.

With this understanding of the site, the reader will be better able to evaluate the cumulative impacts of nuclear activities as opposed to a snap shot of a new project taken out of the context of existing contamination. As of this printing, the reader must understand that this is only what we know now about INL, and that new revelations occur on a daily basis. Even other government agencies such as the Centers for Disease Control with a Congressional mandate to study the INL radioactive releases, is blocked from using classified documents that DOE and the Department of Defense refuse to declassify. This classified information is nearly seven decades old and has no credible national security implication. Rather, it represents an embarrassment to the government's mismanagement of its operations in Idaho.

DOE's internal documents record massive radioactive and chemical contamination resulting from releasing tens of millions of curies of radioactive material into the atmosphere and dumping of millions of cubic feet of solid hazardous/radioactive waste containing millions of curies into Idaho's soil that eventually migrate into the underlying Snake River Aquifer used by hundreds of thousands of Idahoans. To put these releases of radioactivity into perspective, the Environmental Protection Agency (EPA) sets maximum concentration standards for radionuclides in drinking water. See Section IV.A for details. These standards are expressed in pico curie units, or one trillionth of one curie, or one part per trillion. In short, radionuclides are biologically extremely hazardous so that the regulations only allow minuscule amounts in the environment. INL, operating in secret and without outside regulatory oversight, used Idaho's southeastern desert as a dumping ground for the most hazardous materials known to humankind.

Public pressure and previous Congressional mandates gave EPA and the host of states jurisdiction over some of DOE cleanup activities, but has not generated the needed change in recent years due to the conservative political climate. Because of the federal government's dumping of radioactive and chemical wastes, the EPA put INL on its Superfund cleanup National Priority List. Concern over the health effects from these radioactive releases spurred the Congressional General Accounting Office (GAO) to conduct an investigation of INL's emissions and accidents. The GAO report (discussed in Section I.I) was released in February 1992 by then Senator John Glenn who concluded that an independent health study was needed, "These [GAO] results raise key questions about the health effects of radiation exposure on both the workers and residents near the facility at INL. I certainly hope this report will open some eyes and get such a study underway."[Glenn (b)] This *Citizens Guide* discusses in some detail the short comings of the INL health studies for which Senator Glenn was instrumental in gaining Congressional research funding. Centers for Disease Control initiated a full scale INL Environmental Dose Reconstruction Health Study in 1992. Section VI of the *Guide* offers an analysis of this health study's Phase II of a four phase process.

The Congressional Office of Technology Assessment (OTA) released a report in February 1993 that declared that DOE was unprepared to protect tens of thousands of workers involved in hazardous activities at its production sites. "The DOE and its contractors continue to operate under an organizational structure that presents serious obstacles to progress in safeguarding worker health and safety," the report said. OTA further found that DOE's managers, employees and contractors were not convinced that occupational health and safety is truly a top priority. [OTA-BP-O-85] DOE's lack of protection for its workforce extends past the site boundary to affected populations living in INL's shadow. A September

1997 Notice of Violation for Work Deficiencies under the Price Anderson Act leveled at INL primary contractor Lockheed Martin for six Severity Level III violations by workers suggests that the problems OTA identified in 1993, still persist. Regular turnover of INL contractors ensures that accountability is never applied.

Cleanup of DOE's whole Complex is the most expensive single public works effort in the history of the United States. Cleanup costs for the DOE Complex in over 20 states is at between $6 and $7 billion/yr. These cleanup estimates are not for complete environmental restoration (return to original condition); but rather for designation of nuclear sacrifice zones that will require institutional control to prevent public access for perpetuity. DOE's declaration of fenced off sacrifice zones is a deliberate ploy to excuse them from cleanup obligations. This literally shifts the costs and hazards on to future generations and away from the perpetrators. In view of the fact that these wastes will be lethal for tens of thousands of years, the reliance on fences to keep people and animals out is ludicrous at best. This *Guide* reviews ten waste area group remediation decisions in Section IV made by DOE, the State, and the Environmental Protection Agency (EPA) under the Federal Facility Agreement and Consent Order. Generally speaking, there is more cover-up than cleanup in these remediation decisions. A typical decision is to put a soil cap over the waste dump to reduce the radiation field at the surface, put a fence around it, and call it "cleaned up". The government simply will not pay the cost of exhuming the waste and vitrifying it to create a stable waste form that will not pose an environmental hazard. This vitrified waste could then be safely stored on-site until a safe permanent geologic repository is built for its final internment. Unfortunately, the State and EPA as regulatory agencies are acquiescing to DOE's cleanup shortcuts.

Bob Alvarez's DOE 2017 Budget Assessment notes**; "**Military nuclear activities take up about 58% of the DOE's budget, with nuclear weapons activities having the single largest proposed expenditure ($9.243B or 28%). The Weapons Activities budget is increased by 5% from FY 2016 - and is larger on an annual basis then spent during the cold war 30 years ago.

- Between FY 2015 and 2025 the U.S. Government Accountability Office estimates that spending on the nuclear stockpile and the weapons complex is $103.5 Billion.
- Nuclear weapons dismantlement receives a low priority. The Obama Administration plans to refrain from dismantling weapons retired under the New Start Treaty until the nuclear weapons complex is refurbished sometime in the 2030s.
- Funding for the Mixed Oxide fuel plant to blend plutonium from weapons into reactor fuel is being cut by 20%.
- Nuclear site cleanup takes up ~$6.2 billion for FY 2017- with a total estimated life-cycle cost spanning the next several decades of $341.5 billion.

"The nuclear weapons complex is over-sized and antiquated. The costs of "keeping the lights on" in terms of Infrastructure and indirect costs consistently take up 40% of the Weapons Activities budget. Approximately $961 million is to be spent in FY 2017 on repair and maintenance. The National Security Administration within DOE as of 2011 had about 86% of all the DOE's excess facilities with an estimated liability for decontamination and decommissioning of $8.6 billion. It now appears that the price for the New START Treaty to pay for modernization of the U.S. nuclear arsenal is greater than the treaty itself. " [1]

Congressional appropriations for DOE's FY-2017 nuclear energy programs are twice what previous Administrations requested. These programs include a broad range of commercial and military nuclear reactor development and construction - many of which are slated for INL. Congressional intransigence in perpetuating these questionable projects while cutting environmental restoration is a testament to DOE nuclear reactor development contractors' ability to influence the purse strings. This funding brings into question this nation's commitment to the nuclear weapon reduction treaties. Additionally, more nuclear waste will be generated at a time when we have no permanent internment site.

Funding for Superfund cleanup at DOE sites is found in the Department's environmental management budget category. The relative degree of commitment to environmental restoration and paying off the nuclear mortgage legacy can be best seen in the budget. The Clinton Administration's DOE FY-94 budget for INL showed a temporary shift from defense production programs to environmental management. DOE's Complex-wide FY-94 nuclear weapons activity budget request was only 17.5% lower than that appropriated for 1993. For FY-95 and 96 however, the nuclear weapons appropriations increased 10% each year while environmental restoration decreased. In 1997 DOE launched a five year program to reduce environmental restoration by 4.4 billion over five years while increasing nuclear weapon development by over $10 billion. Considerable uncertainty exists in the budget primarily due to DOE's creative accounting shifts of defense program allocations to environmental management accounts. Hundreds of millions of dollars in INL projects that support defense programs have turned up in environmental management accounts. The net effect of this creative

[1] Robert Alvarez slides prepared analyzing the U.S. Department of Energy's Atomic Defense budget for FY 2017.

accounting is to make the defense budgets appear artificially lower and the environmental restoration budgets appear artificially higher. It's important that we understand the historical issues in order to understand how we got here.

DOE's commitment to move ahead with its Materials Fuel Complex - reactor fuel pyro-processing capability may contain a hidden agenda. Nuclear weapons materials are produced by processing reactor spent fuel rods and extracting highly enriched uranium and plutonium. Currently, DOE's old production facilities including the Idaho Chemical Processing Plant (ICPP) – now called INTEC - violate environmental laws and must be either shut-down or extensively upgraded. DOE's hidden agenda in this Plan is to rebuild its nuclear weapons materials production capacity under the guise of waste processing for final disposal. Yet, reactor fuel rods do not require processing prior to internment in a repository other than in some cases re-canning (putting the fuel into stainless canisters).

Spent (used) Nuclear Fuel Pyroprocessing

DOE has enlisted University of Idaho Nuclear Energy Program based at UI Idaho Falls Center for Advanced Energy Studies a collaboration that includes UI and Idaho National Laboratory. The project intends to "ensure that plutonium used in future pyroprocessing facilities never falls into the wrong hands. Pyroprocessing is a way to recycle nuclear reactor waste into fuel. It's not yet happening on a commercial scale, but is developing globally. UI's Barretlli and Tolman are writing computer code that would track the amount and location of plutonium in pyroprocessing facility, ensuring that nuclear material can't be diverted for non-fuel purposes – like bomb-making. The code will be customizable so it can be incorporated into the design process of the facility. Around the world, safeguards are really strong. No one has built a nuclear weapon from nuclear civilian nuclear power plant program." [2]

This is an old refrain DOE and nuclear enthusiasts use to justify reprocessing despite being a clear violation of the Non-proliferation Treaty. The small foot-print of these pyroprocessing facilities make it extremely difficult to detect and claims that "No one has built a nuclear weapon from nuclear civilian nuclear power plant program" is ludicrous given the proliferation of nuclear power reactors owned/operated by non-compliant rogue countries that simply will use the technology without the tracking codes.

Former Idaho Governor Andrus challenged DOE's erroneous assumption of the need to process spent nuclear fuel to meet waste repository acceptance criteria. Andrus' concerns are well founded due to the significant radioactive emissions that result from fuel processing. Congressional funding and public acceptance will be radically different if DOE is candid about its true mission for the INL/MFC pyro-processing of spent nuclear fuel. Therefore, DOE's subterfuge may be a well-planned ploy to build new nuclear materials production capacity that involves reactor fuel processing, while publicly the Department claims it is a waste management project. Former President Obama announced DOE will spend $1 trillion on "upgrading its nuclear weapon arsenal in the next decade."

DOE's 1996 State air pollution permit application for the ICPP (INTEC) describes the assigned objectives as "the safe and economical receipt, storage, and recovery of highly enriched uranium from fuel elements discharged from Naval Nuclear Propulsion Reactors, Research and Test Reactors (foreign and domestic as well as from other unique fuels) that cannot be processed elsewhere." This State permit is prima-fascia evidence that the Department's public rhetoric about discontinuing nuclear weapons material production is therefore inaccurate.

DOE's abuse of Idaho's open spaces and relatively sparse population is a continuation of the misguided notion that "dilution is the solution to pollution." The hundreds of billions of gallons of radioactive waste dumped via injection wells directly into the Snake River Plain Aquifer and dumped into unlined percolation ponds may never be cleaned up.

According to sweetheart deals between DOE, the State, and EPA, groundwater contamination exceeding 176,000 times the regulatory limits for radionuclide's in drinking water is not bad enough to warrant a pump and treat cleanup action. DOE stubbornly contends that: "The large size and remote nature of the INL enables the Super-Site to be several miles from existing INL facilities, thus lowering the risk to the public of combined radionuclide emissions."

This is yet another example of DOE's disregard for radioactive contamination in the Snake River Plain Aquifer that underlies the INL site. This sole source aquifer provides water to more than 270,000 Idahoans. The previous use of radioactive waste injection wells and continued use of unlined percolation ponds for INL process wastes contaminates the aquifer at a staggering rate.

Radioactive and hazardous chemical wastes are dumped in unpermitted, unlined pits/trenches at the Radioactive Waste Management Complex that would not even meet current municipal garbage landfill standards. This illegal dumping continues today violating the Recourse Conservation Recovery Act (RCRA). The Environmental Protection Agency (EPA), as early as 1987, identified these waste ponds among the 368 sites at INL that are to be reviewed for cleanup under Superfund. Unfortunately, EPA and the State are reluctant to force INL to comply with environmental laws because INL is the single largest employer in the state; thus using its lobbying effectively in the Legislature.

The public is demanding that the State of Idaho take a more critical oversight role of INL. However, changing

[2] "Keeping an Eye on Plutonium," by Tara Roberts, www.uidsaho.edu/idahofalls/cares, Fall 2016.

decades of laissez-faire oversight of DOE will require continued public involvement and pressure. The Environmental Defense Institute (EDI) supported former Governor Andrus's ban on additional nuclear waste shipments to INL. The ban is based upon decades of broken DOE promises on waste disposal that has turned INL into a defacto nuclear dump. According to Andrus, "It's pretty clear they [DOE] never intended to keep their word. You just can't do business with those lying so-and-so's." Idaho's then Governor Batt pressured by public opposition to more radioactive waste shipments to the state, initially appeared to take a hard stand against DOE and the Navy. Unfortunately, the agreement signed by Batt on October 1995, will eventually increase waste shipments because it allows INL to be a national radioactive waste treatment center. Emissions from these waste incinerators are a crucial issue to Idahoans, and the Department's refusal to conduct the legally required Environmental Impact Statements on these plants demonstrates the government's lack of commitment to full disclosure.

Of particular concern today is the nearly 900,000 gallons of high-level radioactive liquid waste currently stored in three tanks at INTEC formerly called Idaho Chemical Processing Plant (ICPP) tank farm at INL. Three-fourths of this volume was generated in the 1950s and 60s; the original 11 (now reduced to 3) volume stored in tanks that have since corroded and that do not meet current RCRA earthquake, structural, or containment standards. Though DOE is required under a court order to solidify the liquid portion in the tanks (which it has only solidified/incinerated ~ 1 million of the original 2 million gallons produced), the Department has left the seven equally radioactive tank sediments permanently using grout dumped on top of the sediments. This grout/sediment will eventually deteriorate and migrate into the aquifer before the nuclide half-life is over. Additionally, numerous reactors spent fuel storage facilities at INL are old and too decrepit to safely store this hazardous material. Nuclear reactors operating at INL do not meet current containment and safety regulations imposed on commercial nuclear plants by the Nuclear Regulatory Commission because DOE is exempt from Nuclear Regulatory Commission regulations.

Continued public pressure is needed to convince the State of Idaho and the Environmental Protection Agency to exercise their full enforcement authority to ensure that DOE complies with all applicable environmental laws. Environmental Defense Institute, together with other public interest groups, was instrumental in the creation of two INL "Citizen Advisory Boards," [3] one for INL Superfund cleanup and one for Centers for Disease Control's INL health studies. [4] Originally it was thought that these advisory bodies had the potential to expand public participation and to hold all agencies accountable. Unfortunately, these advisory boards were packed with INL boosters that are more interested in preserving INL's good name so that the site will continue to attract new nuclear missions.

The citizen advisory board concept evolved out of intense frustration with the lack of response by the enforcement agencies to address critical compliance issues. Sites where advisory boards are working are those where it is in an undeniable shutdown mode – like Hanford. Production sites, like INL, Oak Ridge and Savannah River, that still vie for new nuclear missions remain in denial of the massive environmental contamination at the site. DOE continues to obfuscate this nation's environmental, health, and safety laws. Only an active and involved citizenry will change decades of intransigence to outside oversight and regulation.

The INL radiation release data offered in this *Citizens Guide,* though fully documented, must be interpreted as extensively understated. The reason for these understatements is that the DOE (and its predecessors) often created the illusion to successive Presidents that their operations were safe and functioning within guidelines in force at the time. Therefore, publicly available summary documentation is less than accurate about radioactive releases and the impacts of those releases. These inconsistencies in federal documents and regulatory agency documents are reflected in this *Citizens Guide*. The intent is not to confuse the reader, but to give the reader the opportunity to decide for themselves which data is more reliable.

The reader must never conclude that information herein offered is conclusive nor anywhere near what was actually released to Idaho's environment. Considerable analysis of INL's operating history, industrial processes, emission system efficiencies (or lack thereof), reactor meltdown experiments, etc. must be conducted before the whole truth will be known. Significant political will is needed to force declassification of currently secret operating history documents and financial resources will be required to uncover these past activities. Due to the liability implications of such revelations, resistance continues for a full disclosure to the citizens of Idaho. It is a sad commentary on the state of democracy here in the United States when the federal government refuses to declassify seventy-year old environmental, health, and safety information on the grounds of national security.

The US District Court Ordered DOE to conduct a site specific INL Environmental Restoration Waste Management Environmental Impact Statement (EIS). Even this 4,200 page document lacks the waste stream characterization required by the National Environmental Policy Act. Also the INL High-level Waste EIS shares the same

[3] See Section IV.O for details on INL Environmental Management Citizens Board.
[4] See Section VI.A for details on CDC's Citizens Board

flaws. One of many fundamental flaws of these EIS's is there lack of consideration of where DOE intends to put all its waste that has been piling up over the past seventy years. Reliance on the Waste Isolation Pilot Project in New Mexico to solve INL's transuranic waste constipation problem is unrealistic due to the limited capacity of WIPP. Recent accidents at WIPP are putting new INL waste shipments in jeopardy. The only deep geologic high-level waste (HLW) that was attempted at Yucca Mt, Nevada in the 1980's responding to the Nuclear Waste Policy Act never opened because of flaws in the site selection process that did not take into account groundwater contamination. Since Congress has failed to appropriate finding for a new permanent HLW repository, means the crisis has ballooned as commercial nuclear reactors are forced to close because they have aged far beyond their design life, DOE has opted to enter into private interim HLW storage sites for commercial HLW and leaving the DOE's accumulating HLW at DOE sites like INL. Most knowable observers believe these "interim" sites will – by default – become permanent. DOE's INL planning reflects this recognition of the waste staying on site even though they will not state it outright.

DOE has changed the definition of transuranic and HLW so it can leave more of it dumped on its sites. [5] EPA and the Nuclear Regulatory Commission are - as faithful executive branch agencies - gone along with DOE. [6] The commitment of former Idaho Governor Cecil Andrus to prevent DOE from turning Idaho into another nuclear sacrifice zone is not shared by current leadership. Andrus and his successor Governor Batt were able to convince the Idaho Federal District Court to issue a Consent Order forcing DOE to agree to milestones to remove the waste out of the state. DOE appealed this ruling to the Federal Court of Appeals that failed to rule because the case was not "ripe" enough because DOE lied about its intensions.

This *Citizens Guide* discusses national policy issues such as cleanup standards, radiation exposure standards, regulatory oversight, secrecy, transportation of waste, and budget priorities because these policy issues directly affect if and how problems at INL will be addressed. The issues at INL must be seen within the greater context of the national agenda so that the reader will have a more accurate understanding of the scope of these problems. Through this understanding, the reader will hopefully be able to interact more effectively with their elected officials and enforcement agency representatives. The *Guide* also chronologically lists INL accidents and unusual occurrences as a graphic portrait for individuals needing to correlate their own experiences with incidents on the site.

This nation cannot afford to continue to operate its nuclear weapons complex as it has in the past seventy+ years. Already huge areas of our country are now nuclear sacrifice zones for perpetuity. Large segments of our population have been exposed to intentional radioactive emissions that have caused serious health effects and death. These populations were not informed nor were they given the opportunity to give informed consent. Remember, INL's original name was National Reactor Testing Station whose mission was to test new reactor designs. [7] This is not the democratic process that we agreed to in our Constitution. If we as a country are to meet the challenges before us on nuclear issues, we must immediately reevaluate how public policy is formulated and start developing a truly equitable and democratic process free of secrecy and deploying appropriate accountability. Public interest groups can only advocate for change. Real substantive change will only occur if everyday citizens make the commitment to be activists on these issues of health and safety. This we must collectively do this for the sake of our children and future generations.

The victims are acknowledged in this *Citizens Guide* because ultimately, they are the real issue. [8] Millions of curies of radiation released to Idaho's environment are just another statistic and relatively meaningless without being in the context of the impact on the biosphere. To their credit these individuals were willing to come forward and share their experiences out of their own personal commitment to setting the record straight. The human element to this tragedy will likely take decades to be fully revealed as it was for the Cold War American human radiation experiments to finally surface. "Only the truth can make us free."

Current information about Guide updates and DOE's operations at INL can be found at EDI monthly newsletter available at: http://environmental-defense-institute.org

[5] See Section IV.B for more discussion on DOE's changes to waste definitions.
[6] See Section IV.A for more discussion on EPA's changes to exposure and waste disposal standards.
[7] See Section I.A & B & C Experimental Reactors and Atmosphere Releases for more details.
[8] See Section VIII.B for more details on INL Radiation Victims. Also see Section V.A for details on independent health studies.