Section I. INL Operating History

A. Site History

The Idaho National Laboratory was originally a 173,000 acre Naval Proving Ground used mainly as a gunnery range. In 1948 the Atomic Energy Commission (AEC) made the decision to expand reactor development and spent fuel chemical processing for nuclear weapons materials. Initially, the AEC decided to expand the Argonne National Laboratory near Chicago, yet, "Any accident releasing the fission products built up in the fuel elements could be hazardous to the [then] 4 million people of the nations' second largest urban center." [Hewlett and Duncan, 1969 @187] The AEC's safety committee established citing criteria that, "Simply stated, the higher the power level the greater the area over which control was needed. Ideally a reactor location should meet three criteria: complete Commission control over the immediate area; a population of less than 10,000 in the surrounding country; and no installations vital to the nation's defense in the region." [Ibid @ 196]

Ironically, the Montana Congressional delegation was pressing the Joint Committee on Atomic Energy of Congress for designation of Fort Peck in their state as the best site for the new reactor testing station. At Congressional hearings held April 14 and May 10, 1948, Montana Congressmen challenged the AEC's decision to build the reactor site in Idaho citing that the Snake River would be more likely to be contaminated than the Missouri River. Fort Peck had solid rock under the site as opposed to Idaho's porous soil and fractured basaltic rock. The Montanans further cited evidence of coliform contamination of the Thousand Springs area that was the result of farm wastes on the Snake River Plain. Clearly, the Congressmen argued, this was an indication that water flows quickly through the Snake River Plain Aquifer. The AEC's choice of Idaho, however, prevailed.

Originally the AEC named the new Idaho reactor site the National Reactor Testing Station (NRTS), and 141,000 additional acres were acquired north and east of the NRTS (for a total of 570,000 acres) as further environmental safeguard and buffer zone for expanded operations. In 1974 the AEC split into two separate agencies because of intense criticism for its lack of concern for nuclear safety practices and overzealous promotion of nuclear power development. These two new nuclear agencies were the Energy Research Development Administration (ERDA), predecessor to DOE and the Nuclear Regulatory Commission (NRC). At this time the AEC was also terminated because of the public pressure to divide military and civilian nuclear activities into two separate agencies. Thus, the ERDA (military) and the Nuclear Regulatory Commission (civilian) were created to replace the old AEC. Also in 1974 ERDA changed the NRTS name to the Idaho National Engineering Laboratory (INEL). DOE in 1996 changed the name a third time to the Idaho National Engineering and Environmental Laboratory (INL).

INL is now 890 square miles in size and located in the north eastern section of the Snake River Plain Aquifer in southeastern Idaho. Idaho Falls lies approximately 29 miles southeast of the nearest site boundary. INL is 23 miles northwest of Blackfoot, 44 miles northwest of Pocatello, and 7 miles east of Arco. (See map in Figures) In 1977 approximately 144,000 people lived within a 50 mile radius of the site. The region of influence for the INL is a seven-county area comprising Bingham, Butte, Bonneville, Clark, Jefferson, Bannock, and Madison counties. This region had a 1990 population of 219,713. [ANL-EA@ 67] Projections based on current demographic trends indicate that about 240,000 people will live within the 50 mile radius by the year 2000. [ERDA-1552@I-2]

Under annual permits from the Bureau of Land Management, 63,600 sheep and 3,300 cattle raised for human consumption are pastured on the INL site. [ERDA-1536@III-43] In the winter as many as 4,500-6,000 pronghorn (antelope) are on the INL site. [Blain, p.35] The pronghorn is a game animal hunted off-site for human consumption. In 1992 the site employed nearly 12,000 workers that directly supported a population of 38,000 people on an annual budget of $1.2 million. In 1997, about 6,000 contract people and about 400 DOE people are employed at the site that operates on an annual budget of about $ 784 million.

INL is a government-owned, contractor-operated (GOCO) site with the exception of the recently defrocked contractor- owned Pit-9 treatment plant and the Advanced Mixed Waste Treatment Facility. Since the beginning of the Manhattan Project, the government has contracted with private industry to operate its nuclear facilities. INL is geographically the largest of the DOE production sites. In 1994, Lockheed Martin Idaho Technologies Company[1] (LITCO) became the primary maintenance and operations (M&O) contractor on the site and assumed duties previously conducted by Westinghouse Idaho Nuclear Company (WINCO), EG&G Idaho, B&W Idaho, MK-Ferguson, and PTI. After a merger between Lockheed and Martin Marietta, the LITCO name was changed to Lockheed Martin Idaho Technologies Company (LMITCO). WINCO previously operated the Idaho Chemical Processing Plant. The Argonne National Laboratory, then owned by the University of Chicago, operates Argonne West. The Naval Reactors Facility was operated for the US Navy by Westinghouse Electric under separate but current jurisdiction of DOE's Pittsburgh Naval Reactors Office. Lockheed Martin Advanced Energy Systems previously owned and operated (new privatized operation) the waste treatment plant at RWMC Pit-9. The Advanced Mixed Waste Treatment Facility (also new privatized) was owned by British Nuclear Fuels Limited (BNFL) that subcontracts to BNFL Engineering, GTS Duratek, Manufacturing Sciences, Morrison Knudsen, Rocky Mountain Remediation Services, and Science Applications. Currently, Battelle Energy Alliance (BEA) is the current INL site-wide contractor to present;

Former ICPP contractors include:
- Phillips Petroleum Co, Atomic Energy Division 1950-1966;
- American Cyanamid Co. 1966-1971
- Allied Chemical Corp. 1971 to 1980
- Exxon Nuclear Idaho Company 1980 to 1984
- Westinghouse Idaho Nuclear Co. 1984-1994;

Former Naval Reactor Facility contractors:
- Combustion Engineering Inc., Nuclear Division 1959 to 1965
- Westinghouse Electric 1965

Miscellaneous former facility contractors:
- Aerojet General Corp. and Aerojet General Nucleonics, 1959 to 1965
- Aerojet General, 1965 to 1966
- General Electric Company, 1959 to 1968
- Idaho Nuclear Corp., (a subsidiary of Aerojet General Corp. 1966-1971
- Allied Chemical Corp.1966 - 1971
- Phillips Petroleum Co., 1969 - 1971;
- Aerojet Nuclear Co., (a wholly owned subsidiary of Aerojet General Corp., 1971 - 1976
- EG&G Idaho Inc., 1984 to 1994;
- Special Manufacturing Capability (SMC) for M1-A1/A2 tank armor
- Rockwell International Corp. 1986 to 1991
- Babcock and Wilcox 1991 to 1994. [Schwartz]
- CH2M.WG Idaho, LLC. Idaho Cleanup Program

Current INL Contractors

Three federal government contractors primarily operate facilities at the INL Site.
- Bechtel Bettis operates the Naval Reactors Facility;
- Flour Idaho manages AMWTF, Idaho Cleanup Project Core, or ICP Core, 2016 to present; the contract is valued at $1.4 billion.[2] See below for details.

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[1] Lockheed Martin Idaho Technologies Company (LMITCO) is a subsidiary of Lockheed Martin Corporation. LMITCO is a consortium including Babcock & Wilcox Idaho, Coleman Research, Duke Engineering and Services, Parsons Environmental Services, Rust International, and the Thermo Electron Corporation.

[2] LUKE RAMSETH ~1/11/17, lramseth@postregister.com

Battelle Energy Alliance, LLC (BEA) operates Materials and Fuels Complex [MFC] (formally Argonne-West), Advanced Test Reactor (ATR), Transient Reactor Test Facility (TREAT), to develop and deploy the next generation of nuclear reactors including small modular reactors (SMRs), cyber security capabilities and expertise, biofuels research, and manages national laboratory functions and operates as general manager of the INL Site services.

"The U.S. Department of Energy (DOE) announced the award of a contract to Fluor Idaho, LLC, for the performance of ongoing Advanced Mixed Waste Treatment Project (AMWTP) and Idaho Clean-up Project (ICP) work scopes in support of the DOE Office of Environmental Management's cleanup mission at the Idaho Site. The value of the contract is $1.4 billion (including options), and the contract term five years.

"In an effort to align contractor and taxpayer interests, the ICP Core contract is a performance based contract type that is primarily Cost-Plus-Incentive-Fee (CPIF) with some scope set up as Cost-Plus-Fixed-Fee (CPFF). The contract includes Cost Incentive, Schedule Milestone, Annual Milestone, and Performance Incentive fees, and will allow DOE to incentivize the contractor for meeting the contract requirements.

"At the conclusion of this contract it is anticipated that all Idaho Settlement Agreement (ISA) transuranic (TRU) waste will be dispositioned out of Idaho and all Agreement to Implement/CERCLA Record of Decision buried waste will be exhumed from the Subsurface Disposal Area.

"The base scope to be performed under this contract includes: stabilizing and storage of spent nuclear fuel and high-level waste; dispositioning transuranic waste; retrieving targeted buried waste; closing the Idaho Nuclear Technology and Engineering Center (INTEC) tank farm; maintaining Comprehensive Environmental Response Compensation and Liability Act (CERCLA) remedial actions; and operating and maintaining the INTEC, Radioactive Waste Management Complex (RWMC), and the Materials Fuels Complex (MFC) Radioactive Scrap and Waste Facility (RSWF) facility infrastructure. Option scope to be performed under this contract includes: Integrated Waste Treatment Unit (IWTU) operations. The IWTU option scope will be exercised at contract award.

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[3] DOE Office of Environmental Management Awards Contract for Idaho Clean-up Project (ICP) Core, 4/4/16

environmental legacy brought about from five decades of nuclear weapons development and government-sponsored nuclear energy research." [DOE Office of Environmental Management Awards Contract for Idaho Clean-up Project (ICP) Core, 2/4/16]

DOE's own internal "Tiger Team" report on INL concluded: "that the Field Office had not been effectively carrying out its management responsibilities over the INL. Many deficiencies were identified including; a general lack of [DOE] Idaho leadership; lack of a comprehensive, cohesive management approach; virtually no independent environmental, safety, and health oversight program; lack of an arms-length relationship with the contractors; and ineffective management of the award fee process. [Tiger @ES-2] Award fees are bonuses granted to contractors beyond cost plus contracts. INL contractors received $14.35 million in bonuses in 1995[AP (d)] and $7.96 million for 1997. Between 1994 and 1997 LMITCO received $40 million in bonuses. These bonuses are offered at the same time that the State of Idaho charged DOE with 135 hazardous waste management violations and fines of $892,725. Additionally, EPA and the State fined DOE a million dollars for missing the Pit-9 cleanup milestone.

The Government-Owned-Contractor-Operated (GOCO) system provides for an artificial oversight structure where, theoretically, the DOE is the federal regulator over private contractors who operate various areas at the INL. In practice, however, there is little or no distinction between the DOE and its contractors, and consequently, little regulation. This breakdown in oversight between the DOE and the INL contractors has resulted in massive abuse and mismanagement of nuclear materials. Additionally, as the above list shows, the frequent contractor turnover provides for abuses to be blamed on previous contractors.

The GOCO operating system at INL has resulted in a strangle hold by on-site contractors. Exorbitant administrative charges beyond actual operating expenses are routine. With respect to Superfund cleanup, what money does finally make it to Idaho is eaten up by these site contractors who charge 60% overhead for their management functions. Cleanup contractors at private (non-government owned) Superfund sites allow less than 20% overhead charges, and consequently get twice the work accomplished. Taxpayers are justifiably outraged by the systematic milking of the cleanup cow by the very polluters who caused the contamination in the first place. Additionally, multi-million dollar bonuses are granted each contractor annually without any real basis, according to the General Accounting Office.

There is a difference in how long-term the planning is carried out because of the stability of the funding at INL. There is a difference in the accountability. At a place like the INL, it's always been this shuffle. The new contractor and DOE blame the bad old contractor for "legacy problems." Then the new contractor begins to learn about all the skeletons in the closet and snakes in the basement, screws up a few times, can't get the money needed to fix problems and leave in disgrace, and the cycle begins anew. DOE usually pins the blame on the contractor as opposed to taking responsibility for its flawed contractor management.

Responding to this problem, Congress passed in 1993 the Federal Facility Compliance Act (FFCA) that removed many sovereign immunity exemptions that the DOE and its predecessors functioned under. Prior to this law, the DOE operated in a virtual self-regulated environment. FFCA, however, only applies to Resource Conservation Recovery Act (RCRA) listed hazardous wastes. Radioactive materials are not RCRA listed however, when mixed with RCRA listed hazardous wastes, FFCA applies. The State of Idaho and EPA do not agree with this legal mixed radioactive-hazardous distinction.

"The National Nuclear Security Administration (NNSA) was established by Congress in 2000 as a separately organized agency within the U.S. Department of Energy, responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. In 2002 NNSA reorganized, removing a layer of management by eliminating its regional operations offices in New Mexico, California and Nevada. NNSA headquarters retained responsibility for strategic and program planning, budgeting and oversight of research, development and nonproliferation activities.

"NNSA is responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. It also responds to nuclear and radiological emergencies in the United States and abroad. Additionally, NNSA federal agents provide safe and secure transportation of nuclear weapons and components and special nuclear materials along with other missions supporting

the national security.

"In 2002 NNSA reorganized, removing a layer of management by eliminating its regional operations offices in New Mexico, California and Nevada. Contract and project management oversight responsibility for NNSA's labs, plants and special facilities was given to the site offices. NNSA headquarters retained responsibility for strategic and program planning, budgeting and oversight of research, development and nonproliferation activities.

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* Managing the Stockpile: Maintaining the safety, security and effectiveness of the nuclear deterrent without nuclear testing – especially at lower numbers – requires increased investments across the nuclear security enterprise;

* "Preventing proliferation: Keeping weapons of mass destruction (WMD) out of the hands of state and non-state actors requires a coordinated effort on the part of suppliers of proliferation-sensitive materials, equipment, and technologies;

* "Powering the Nuclear Navy: The Naval Nuclear Propulsion Program provides militarily effective nuclear propulsion plants and ensures their safe, reliable and long-lived operation. This mission requires the combination of fully trained U.S. Navy men and women with ships that excel in endurance, stealth, speed, and independence from supply chains;

* "Emergency Response: NNSA ensures that capabilities are in place to respond to any NNSA and Department of Energy facility emergency. It is also the nation's premier responder to any nuclear or radiological incident within the United States or abroad and provides operational planning and training to counter both domestic and international nuclear terrorism;

* "Recapitalizing Our Infrastructure: The FY2011 Budget Request increase represents the investment need to transform a Cold War nuclear weapons complex into a 21st century Nuclear Security Enterprise;

* "Continuing Management Reform: NNSA is responsible for the management and security of the nation's nuclear weapons, nuclear nonproliferation, and naval reactor programs. It also responds to nuclear and radiological emergencies in the United States and abroad. Additionally, NNSA federal agents provide safe and secure transportation of nuclear weapons and components and special nuclear materials along with other missions supporting the national security." [4]

So, is the difference that NNSA just needs a way for DOE safety regulations to go away, because the smoke screen is too troublesome to bother with? The intent of 10 CFR 830 was to force DOE to come into a higher level of safety – yet, it was ambiguous on back-fit. DOE retains tons of wiggle room and the ability to formally ask the DOE secretary permission to be excluded from any requirement deemed too onerous. Yet, even this is not enough for the NNSA facilities. But, is the charade to act like 10 CFR 830 is being met actually accomplishing anything at those facilities? Basically, NNSA only adds another ineffective layer of bureaucracy much the same as Home Land Security provided ineffective coordination with the many national security and emergency response agencies.

Over its 60+ year history, 52 nuclear reactors were built at INL – as of 2017, 2 (ATR, ATRC) are operating and another 3 (NRF, IFR, TREAT) are shutdown but operable. This represents the largest concentration of reactors in the world. [DOE/EH/OEV-22-P,p,2-8] In addition to these reactors are facilities that process large quantities of radioactive and chemical materials. The INL is also the birthplace of the Nuclear Navy Propulsion Program (NNPP) initiated under Admiral Hymand Rickover. The Navy, single largest radioactive dumper at INL, passes its responsibilities on to DOE as its nuclear garbage collector.

Primary operation areas include the Idaho Chemical Processing Plant (ICPP) that (up until 1993) reprocessed spent reactor fuel from around the country and the world to extract isotopes and enriched

[4] http://NNSA.energy.gov/

uranium for the US nuclear military programs. DOE announced termination of reprocessing at the ICPP.

The Naval Reactor Facility (NRF) has three (non-operating) reactors for its nuclear navy training, and also spent reactor fuel testing facility. The Navy has not announced what it intends to do with its training reactors at NRF.

The Advanced Test Reactor Complex (ATRC) formerly called Test Reactor Area (TRA), had 4 experimental reactors and process facilities. At this time only the Advanced Test Reactor and Advanced Test Reactor Critical is operating.

Material Fuels Complex formerly called Argonne National Laboratory - West (ANL-W) has several experimental breeder reactors including the Integral Fast Reactor (IFR) (EBR-II, ZPPR , TREAT and fuel reprocessing reactor fuel manufacturing facilities. Currently only TREAT is operational.

Auxiliary Reactor Area (ARA) has had several Army experimental reactors but currently only the Power Burst Reactor is operable.

Test Area North (TAN) formally conducted open air reactor tests, but currently only has Abrams tank uranium armor and radioactive materials process facilities.

Radioactive Waste Management Complex (RWMC) is INL's main radioactive dump site and where Advanced Mixed Waste Treatment Project for packaging waste for shipment to WIPP in NM is located. For a complete listing of facilities by area, and operational status see Appendix B.

Most of INL's airborne radioactive releases occurred during the early reactor testing years. Between 1952 and 1989 contained 18,564,868 curies were released. [DOE-ID-12119@A-190] Total discharge to the environment for the period 1952 to 1992 was 39,597,934 curies. See Section I(E)(2). [ID-10054-81@12][DOE/ID-10087-85@5][DOE/RW-0006,rev 7][RWMIS]

A curie (Ci) is a unit of measurement of radioactivity in a given material. Safe drinking water standards for radioactive contaminates are expressed in pico curies (pCi), or one trillionth of one curie. Because radioactive contaminate standards are in pCi's it is the best way to explain how extremely toxic and biologically damaging these pollutants are to the human body. This environmental insult from the radioactive dumping at INL is of enormous proportions.

Additionally, 35,550 cubic meters containing 371,200,000 curies of high-level liquid wastes have been generated over the ICPP's operating history. This waste is stored in old corroded underground tanks, or calcined in INL's ICPP high-level calcine waste incinerator. The Calciner is an incinerator that volatilizes the liquid portion of the waste and mixes the residue with a granular calcine. The calcine in storage as of 1981 accounted for 64,120,000 Ci. [IDO-10054-81 @ 19] What distinguishes INL from other DOE production sites is its calcine incineration of liquid high-level wastes. The Integral Waste Treatment Unit (IWTU) is the new incinerator intended for the remaining high-level liquid waste at INTEC tank farm. The IWTU - if DOE can ever get it to operate - however will not produce a waste form that can be sent to a permanent repository. Consequently, INL had only 11 high-level liquid waste tanks (currently reduced to 3 tanks) containing ~900,000 gal. Hanford by contrast put all its waste in 177 underground tanks.

One of many unanswered questions is the mass balance discrepancy between the number of curies that went into the incinerator and the number of curies that DOE acknowledges in the calcine ash after incineration and INTEC/ICPP stack monitoring of curies that were released to the atmosphere. Radioactive material does not lose its activity during incineration - only by gradual decay. Radioactive elements are basic elements as opposed to compounds that are made up of two or more elements.

Emissions to the environment from the totality of the nuclear operations at INL significantly impact the health of the surrounding human and wildlife populations. The long-term impacts are not fully characterized. The Dose Reconstruction study of INL started in 1992 by the Centers for Disease Control never offed an accurate assessment of how much radiation was released, and what the probable radiation dose was to affected populations around INL. However, the commitment to adequately clean up the massive contamination generated over seven decades remains an open question. Recently, "no action" decisions on major INL cleanup sites by DOE are an indication that the government's commitment to environmental restoration continues to be in name only. Only continued public pressure will force the federal government to own up to its responsibilities.

It is important to keep in mind that INL nor the INL Naval Reactor Facility is not an anomaly when

viewed within the context of US military nuclear operations contamination resulting from gross miss-management of radioactive/hazardous waste. Robert Alvarez reports the following in *A primer: Military nuclear wastes in the United States:*

"Research, development, testing, and production of US nuclear weapons occurred at thousands of sites in nearly every state, as well as Puerto Rico, the Marshall Islands, Johnston Atoll, and Christmas Island in the Pacific. Between 1940 and 1996, the United States spent approximately $5.8 trillion dollars to develop and deploy nuclear weapons. [5] As a result, the nuclear weapons program created one of the largest radioactive waste legacies in the world—rivaling the former Soviet Union's.

"US nuclear weapons sites—many of them under the aegis of the Energy Department—constitute some of the most contaminated zones in the Western hemisphere, and attempts to remediate those sites are now approaching their fifth decade. It is the most costly, complex, and risky environmental cleanup effort ever undertaken, dwarfing the cleanup of Defense Department sites and the Environmental Protection Agency's Superfund program. Long-term liability estimates range from approximately $300 billion to $1 trillion. Site remediation and disposition of radioactive detritus are expected to continue well into this century. After that, long-term stewardship of profoundly contaminated areas will pose a challenge spanning hundreds of centuries.

"A CLEANUP: TREASURE ISLAND [6]

"Research, development, testing and production of nuclear weapons by the United States created:

- More than 3 billion metric tons of uranium mining and milling wastes.
- More than 1 million cubic meters of transuranic radioactive wastes.
- Approximately 6 million cubic meters of low-level radioactive wastes.
- Approximately 4.7 billion cubic meters of contaminated soil and groundwater (according to an Energy Department document unavailable online).
- More than 10,000 radiation-contaminated structures such as uranium processing and enrichment plants, radiochemical processing and storage facilities and laboratories.
- About 100 million gallons of high-level radioactive wastes, considered among the most dangerous, left in aging tanks larger that most state capitol domes. More than a third of some 200 tanks have leaked and threaten groundwater and waterways such as the Columbia River.
- Areas contaminated by more than 1,054 nuclear weapons tests, 219 of which involved aboveground detonations. As of 1992, underground shots released about 300 million curies of radioactive materials at the Nevada Test Site—making it the most radioactively contaminated area in the United States. Areas in the Republic of the Marshall Islands remain uninhabitable from US aboveground tests in the 1940s and 1950s. [7]
- More than 700,000 metric tons of excess nuclear weapons production materials, in addition to hundreds of tons of weapons-usable plutonium and highly enriched uranium.

"The human health legacy of the US nuclear weapons program is also quite significant. As of February 2014, more than 100,000 sick nuclear weapons workers have received more than $10 billion in compensation following exposure to ionizing radiation and other hazardous materials.

"Even today, the radioactive waste from the dawn of the nuclear age remains a significant challenge to public health in highly populated areas. For instance, in 1973 a large amount of uranium processing wastes, generated to make the first nuclear weapons at the Mallinckrodt Chemical Works in St. Louis, was illegally dumped in a municipal landfill in a nearby suburb. The landfill is experiencing the latest of

[5] President Obama and Trump have added an additional $10 trillion (over 10 years) to the nuclear weapons budget.

[6] https://thebulletin.org/2014/02/treasure-island-cleanup-exposes-navys-mishandling-of-its-nuclear-past/

[7] According to the American Academy of Sciences study on the Nevada bomb test releases, many of the highest downwind areas were in southern Idaho and Montana.

at least two subsurface fires over the past 21 years and lies on a floodplain approximately 1.2 miles from the Missouri River.

"The dump contains the largest single amount of thorium 230 in the country and possibly the world. With a half-life of more than 75,000 years, it is comparable in toxicity to plutonium. Even though these concerns were repeatedly raised with the US Environmental Protection Agency, the agency issued a Record of Decision in 2008 that allows for "in place disposal" of these wastes, subject to institutional controls and with a cap over radiologically contaminated areas. Lost in this process is an important warning by a panel of the National Academy of Sciences in 2000 that "engineered barriers and institutional controls—are inherently failure prone.

"The radiological legacy of nuclear weapons will be with us for a very long time." [8]

[8] Robert Alvarez, A primer: Military nuclear wastes in the United States and is a senior scholar at the Institute for Policy Studies, Robert Alvarez served as senior policy adviser to the Energy Department's secretary and deputy assistant secretary for national security and an EDI Board member.