

**Comments on the
U.S. Department of Energy Scoping Plans
For Consolidation of Plutonium
Production and Nuclear Operations
in Idaho**

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Introduction

The Department of Energy has proposed to consolidate operations related to the production of plutonium for Radioisotope Power Systems (RPS) to the newly annexed Argonne National Laboratory located at the Idaho National Laboratory (INL). These RPS, or “space batteries” as they are more benignly referred to, are intended to be used for National Aeronautics and Space Administration (NASA) deep space exploration, and other as of yet undisclosed, “national security” measures. These space batteries, have been used in NASA missions since the 1960’s and have been manufactured at three separate DOE sites across the country. This proposal would consolidate all operations at the Idaho National Laboratory (INL), which include the production of Plutonium-238, the purification of the Pu-238 into a fuel form, and the assembly, testing and delivery of the RPS for its intended final use in outer space.

Keep Yellowstone Nuclear Free (KYNF) was formed to oppose the illegal, unethical and poorly planned treatment of radioactive and hazardous waste at INL, formerly called Idaho National Engineering and Environmental Laboratory (INEEL). Although our primary focus and mission has centered around issues pertaining to incineration and other thermal treatments, this plan concerns us greatly for the implications it holds for the production of more deadly radioactive waste and the inherent hazards of this, and the lack of certain, viable treatment options for waste streams that will be produced. DOE historically has a bad track record of ecosystem contamination during the plutonium production, purification, assembly, and testing process and at this juncture KYNF will not stand down and accept their explanations at face value. KYNF has other concerns with this proposed plutonium consolidation at INL, but will keep its comments primarily cogent to this primary objective of waste production, treatment and long-term stewardship.

The Isotope Plutonium-238

Plutonium is a silvery white metal produced from the irradiation of natural uranium. It is primarily a man-made material produced by nuclear reactors, and exists in only minute quantities in nature. Plutonium-238 (Pu-238) is an extremely hazardous and deadly isotope, with a registered half-life of 87 years. It emits 280 times as much radiation as Plutonium-239 which was the object of concern in the incinerator the KYNF opposed and defeated back in 2000. Just one particle of Pu-238 inhaled in the lungs, can set off the insidious growth of cancer in humans. Due to the higher rate of decay of Pu-238, it has been chose to be used in the

~~generation of electricity for the RPS and other unknown space and national~~
security missions.

According to the DOE, there are 11kg. of Pu-238 presently stored at INL-Argonne. Additionally, there are 23 kg. at Los Alamos National Laboratory, and 10 g. at Oak Ridge National Laboratory. All of this is to be transferred to INL, via a “secured transportation system” which carries multiple risks, and as of yet the cost of these plutonium shipments is undetermined. There have also been, and there will continue to be, shipments of Pu-238 from Russia which have been occurring over the last 12 years. Thus far, the DOE has purchased 11 kg. from the Russians, and it should be noted that the plutonium that comes from them may only be used for NASA **civilian** related missions.

It has been one of the pursuits of KYNF to hold DOE accountable for the projected need to produce more Pu-238, given the inventory that exists, and the supply that Russia still has. Wouldn't it be prudent to continue to pay them for this volatile resource, and get it out of the hands of what they refer to as a “politically unstable” country? It has been a difficult task to discern the true motive of the DOE, given the fact that they will not fully disclose all programs related to Pu-238 production. Nonetheless, the DOE maintains that it is necessary to embark on such an ambitious and costly production path, even though the general public does not understand the calculus they are using to arrive at this decision.

Waste Production

The production of Pu-238 will generate different waste streams that will need to be treated and disposed of. Already, INL is one of the most contaminated sites in the nation, and currently has over 750,000 barrels, boxes and crates of transuranic and mixed low-level waste. DOE has shown blatant disregard for the public health and safety during the treatment, storage and disposal of plutonium waste. Although this project purports to have solid plans for expeditious treatment and shipment of the waste, so do most other initiatives like this one that invariably become bogged down in the morass of changing laws, waste definitions, permitting delays, etc.

The consolidation of all production and testing stages has multiple implications that concern KYNF. First of all, because of the extreme hazard of the substances involved, it will require the utmost planning for waste containment, treatment, storage, transportation, long-term disposal and monitoring. This calls for a type of precise planning and execution that DOE is not known for, and any delays or mishaps in these intricate stages carries huge public health risks, economic costs,

~~and potential further harm to the environment. Of further concern is the fact that~~ recent projected changes in federal laws concerning waste treatment and storage are changing and altering the final disposition of waste. Typically, the waste streams are being reclassified in a way that dilutes the stringent standards for transportation and storage that safeguard us all. By the time the multiple waste streams are produced in quantity by this project, who can really say what the viable treatment options will be?

It is projected, based on previously proposed plutonium consolidation projects with a 35 year production lifetime, that there would be around 22,152 to 221,772 fifty-five gallon drums of radioactive, hazardous, and non-hazardous waste generated. Based on the information found in the “Final Programmatic Environmental Impact Statement for Accomplishing Expanded Civilian Nuclear Energy Research & Development and Isotope Production Missions in the US” (Dept. of Energy/EIS-0310, December 2000, p. S-63), it is estimated that the plutonium production will generate 380 meters of transuranic/high level waste, 2,100-4,800 cubic meters of low level waste, 180-380 cubic meters of mixed low-level waste, 3,100-3,300 cubic meters of hazardous waste and 105,000 to 1.1 million cubic meters of non-hazardous waste.

Another complex and very sensitive process in the RPS consolidation involves the stage of reprocessing which is necessary to extract Pu-238 from Neptunium “target” rods. The plan is to build a new Neptunium 237 “target” fabrication and processing operation that provides the raw material that eventually leads to the Pu-238 production. This stage, which takes place in a nuclear reactor, is the process whereby nuclear-grade material is extracted from an irradiated nuclear fuel rod. Once extracted, the concern is obvious for the risks it poses for proliferation, and the creation of an extremely high-level waste. Although Pu-238 is not technically “weapons grade”, reprocessing as a general policy runs counter to the US Non-Proliferation Treaty. This process has in the past been carried out at the Los Alamos National Laboratory, and currently the DOE is evaluating whether this step should be accomplished under the INL consolidation by an aqueous or pyroprocessing method. KYNF will be watching and monitoring this step very closely. By either method, the result would be the generation of high-level waste which has proven to be one of the most expensive and problematic type of waste streams at INL. The main concern that KYNF has with this multi-stage processing in the production of Pu-238 is that any method used generates significant quantities of air emissions and solid/liquid waste that must be treated. The eventual result of which is--more toxic air emissions

Air Filtration and Monitoring

The use of High Efficiency Particulate Air (HEPA) filters, are the barrier mechanism between plutonium in a contained space, and its release into the environment. The DOE has relied heavily on the use of these, and stakes high claims of safety upon their utilization and efficiency rate. Despite this, there is an ongoing debate on the true performance and reliability of this barrier mechanism which include: fire, heat and elevated temperatures, wetting of filters, filter strength, air leaks, and performance in an explosion accident scenario. DOE used a four-stage HEPA filter arrangement in their similar operation at Los Alamos National Laboratory (LANL), and proposes to use the same model in the new facility. KYNF questions and does not feel complacent about the supposed reliability of these filters to keep deadly Pu-238 molecules contained, and cites the need for further examination into this sole-source defense between pure and poison air. Not only are we concerned that containment systems are inadequate, but KYNF continues to be skeptical and unimpressed with the air monitoring systems that are in place to protect and warn the public of what we consider to be the most basic of human rights—clean air. KYNF will insist that there be continuous air monitoring of airborne emissions, along with sampling stations that cover the range of distance that fugitive molecules could travel.

Summary

In conclusion, KYNF expects that the impending Consolidation Environmental Impact Statement for the RPS will include comprehensive, verifiable information on the issues KYNF has identified. In summary, we expect that the EIS will clearly, and comprehensively address all of the following in detail:

- the type and number of facilities to be built or used at INL
- the closest approximation of costs for the total consolidation including transportation, new facilities, upgrades, security, etc
- the precise location of the facilities --superimposed on a map which includes floodplains, wetlands and seismic zones
- the exact and intended use of facilities
- upgrades needed at these facilities to ensure Resource Conservation Recovery Act (RCRA), compliance, Clean Air Act compliance and other permitting obligations
- description of all types of anticipated waste (solid, liquid, air emissions) which will result from Pu-238 production
- the treatment options, final disposition plan and timeline for final disposal of the liquid and solid waste

- specify how many different processes are involved for processing Pu-238 and the consequences of each both individually and in conjunction to the others
- the quantity of waste to remain at INL, and how much to be shipped out
- description of the plan for air filtering to ensure plutonium containment
- description of continuous monitoring mechanisms
- transportation issues pertaining to incoming plutonium, neptunium and outgoing waste
- what “on-site” transportation plan will be used
- the anticipated costs for increased security at INL
- what sort of accident or disaster response plans are in place in the event of an accident or terrorist attack
- what modeling has been done to anticipate the extent and release of airborne plutonium in such events
- what “emergency systems” will be in place for such an event
- discuss how the production of Pu-238 for space missions could lead to proliferation of space based nuclear reactors, spy satellites or other weapons containing radiation
- disclose all research pertaining to the existence and availability of alternative fuels for space travel which are not reliant on the creation of radioactive isotopes and don't create nuclear waste

Conclusion

KYNF is committed to the issue of eradicating sources of radioactive and hazardous waste emissions that pose serious threats to people and the environment. This plutonium consolidation project has caught the attention of KYNF because of the multi-stage processes involved with the production, purification and testing necessary to manufacture “space batteries” and the implications this has for producing more deadly waste. However, it still remains unclear as to the exact scale and implications of this project because there is too much missing information which remains behind the veil of “national security”. Even if such numbers and calculus were available to discern the totality of the project, there are features about the nature of this project that have given us serious pause. It would be tunnel vision on our behalf, to not extrapolate from some of the facts we have learned thus far despite the curious paucity of information, into possible future scenarios.

~~Thus, KYNF would like to add its voice to the record for another matter.~~

We are very concerned about the implications this project has for laying the groundwork for INL to become the primary site for the militarization of space. Once the physical infrastructure is in place for the production of Pu-238 for civilian space based missions powered by the radioisotope systems, one can imagine that it could grow in scale to meet the needs of what appears to be a growing initiative and collaboration between NASA and the Department of Defense for space-based military operations. The scenarios for sending nuclear based satellites, and other defense-based missions into space powered by the RPS, carries with it a payload of very serious concerns. The further prospect that INL would become the national site, or the “Fort Knox” of plutonium, carries with it very serious security and terrorism issues. It also would follow in this projection that INL would become the primary grounds for testing and launching such space-bound missions. The probable scenarios that we all have so horrifyingly seen unfold with accidental space launches, re-entries and other space missions defy the imagination due to the toxic load which is on board.

KYNF stopped the imminent construction of a hazardous and nuclear waste incinerator. As part of the legal settlement which was a result of that, a Blue Ribbon Panel was convened to find alternative technologies for treating the waste streams at issue. Several robust and viable alternatives were found, and are being utilized across DOE sites in lieu of incineration as a result. KYNF calls upon the DOE to do the same for the future of space missions which at present rely solely upon plutonium.