



## OAK RIDGE ENVIRONMENTAL PEACE ALLIANCE

www.orepa.org • P O BOX 5743 • OAK RIDGE, TN 37831 • orep@earthlink.net

WORKING FOR NUCLEAR ABOLITION SINCE 1988



26 May 2020

Ms. Terri Slack  
P O Box 2050  
Oak Ridge, TN 37831  
NEPA.comments@npo.doe.gov

Dear Ms. Slack,

Please find below comments from the Oak Ridge Environmental Peace Alliance on the *Draft Supplement Analysis for the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Accident Analysis (DOE/EIS-0387-SA-04, April 2020)*.

These comments include attachments, also submitted here in hard copy and on-line, including comments solicited from Dr. David Jackson, Distinguished Professor Emeritus at the University of California Los Angeles.

The hard copy and on-line submissions are identical; I am submitting in both formats because NNSA has, in the past, either not received or ignored on-line submissions from my e-mail address.

If you have questions or desire more information, please don't hesitate to contact me at 865 776 5050 or by email at <orep@earthlink.net>.

Thank you.

Sincerely,

Ralph Hutchison

*Comments on the Draft Supplement Analysis for the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Accident Analysis*

submitted by the Oak Ridge Environmental Peace Alliance  
25 May 2020

SUMMARY

The Draft Supplement Analysis (SA) is carefully crafted to minimize consideration of the environmental impacts of the NNSA's "hybrid plan" for enriched uranium operations at the Y-12 National Security Complex starting with the decision to limit the SA to the analysis of earthquake risks only, and then only to three facilities engaged in enriched uranium operations, further limiting the analysis of consequences to radiation releases only, and then only to humans.

Despite the September 2019 order by the federal court, NNSA has failed to prepare an SA evaluating, at a minimum, the site-wide environmental consequences of an earthquake at Y-12. Instead, NNSA has chosen to:

- limit its consideration of impacts to the Uranium Processing Facility and Extended Life Program facilities (the 9215 Complex and the 9204-2E facilities), thereby ignoring the complications, consequences and impacts associated with other Y-12 facilities that would be also be part of any credible earthquake event; it has been more than twenty years since a true "site-wide" analysis of the environmental impacts of Y-12 operations and activities has been undertaken;
- ignore completely the possible consequences from an earthquake event in the next five years, prior to occupancy of the UPF, despite the requirement that ongoing activities be considered in an environmental analysis;
- limit its assessment of environmental impacts to radioactive contaminants, thereby ignoring the impacts of scores of other hazardous, toxic and dangerous materials, chemicals, and compounds;
- prepare an SA that falls short of a rigorous seismic hazard evaluation associated with its activities at the Y-12 National Security Complex (see attached comments by Dr. David Jackson); and
- limit its analysis of consequences to human exposures to radioactive contaminants, thereby ignoring impacts to the larger environment of the full range of contaminants likely to be released in an earthquake event, including but not limited to beryllium, mercury, lithium, anhydrous hydrogen fluoride, and other industrial materials.

The effort to minimize the impacts of the hybrid plan and to claim they are therefore adequately analyzed in the 2011 SWEIS is unsuccessful, in particular because of the dramatic difference in consequences arising from the performance of the ELP facilities.

According to the SA, this difference is measured in at least two ways: the probability of a design basis event increases five fold, from once in 2,500 in the 2011 ROD to once in 500 years for the ELP facilities in the 2020 SA; and the twelvefold increase in consequences in the 2020 SA when compared to the 2011 ROD.

The end result of the hybrid plan is a significant increase in risk to the public over the 2011 Record of Decision/UPF plan. This increase is due to NNSA's decision to press unsafe facilities into service for thirty more years coupled with the refusal to commit to bringing those same facilities into compliance with modern seismic standards for Category IV facilities as required by DOE's own orders.

This decision should be subjected to thorough public scrutiny; NNSA should hold a public hearing and provide a response to comments received. Absent that, the hybrid plan is tantamount to subjecting the public to dramatically increased risk without informed consent.

Finally, it must be noted that NNSA's decision to continue construction of the UPF and related facilities on an "interim" basis creates a heretofore nonexistent NEPA status, one that can not be reconciled with NEPA's requirement that agencies may not undertake premature actions that prejudice or predetermine the outcome of a NEPA analysis. In this instance, hundreds of millions of irretrievable resources are being invested in the enriched uranium plan that completely depends on the continued operation of the ELP facilities regardless of the outcome of analyses about the continued safe operation of those facilities. This action not only enervates NEPA, it places the NNSA's ability to carry out its national security mission at risk. It is also a perfect example of why NEPA forbids segmentation; when the entire operation is interdependent, it must remain within the same NEPA analysis—one segment may not be extracted and implemented in the "interim" without prejudicing the other or threatening the whole.

The solution to all of these deficiencies is simple, and the Supplement Analysis points to it: NNSA should prepare a Supplement to the 2011 SWEIS at a minimum, or a new SWEIS. That document should give serious consideration to a Maximum Risk Reduction Alternative.

In addition, since NEPA makes no provision for "interim action" pending the fulfillment of legal obligations, and since the continued construction of the UPF building represents resources irretrievably case in concrete, a billion dollar commitment to a plan that relies completely on the hybrid approach, this "interim action" clearly prejudices the outcome of the next SWEIS as surely as it led NNSA to wrongly limit the focus of its SA.

## INTRODUCTION

In March 2011, the National Nuclear Security Administration prepared the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex in Oak Ridge, Tennessee. In the Record of Decision that followed in July, 2011, NNSA declared it would build a new facility—the Uranium Processing Facility—to house all enriched uranium operations at the Y-12 site, replacing aging buildings that no longer met modern environmental standards, including the 9212 Complex, the 9215 Complex, and the 9204-2E facilities.

The purpose of a Supplement Analysis (SA) is not to update the 2011 Y-12 Site-Wide EIS, but to examine an EIS and determine whether a new or supplemental EIS is necessary given new information or changes in plans.

The 2020 SA appears to attempt to be a hybrid of its own making: to serve as an SA looking at the 2011 SWEIS and, at the same time, to serve as a mini-Supplement to the SWEIS by presenting a simplistic and incomplete analysis of the consequences of an earthquake on the EU program facilities. This soft look acknowledges that the basic data necessary to provide a thorough and meaningful analysis of the performance of the ELP facilities (a major difference between the 2011 SWEIS and the current hybrid plan) is not yet available and will not be for 18 months. The SA clearly demonstrates the need for, at a minimum, a formal Supplement to the 2011 SWEIS.

Given the passage of 20 years since the last full-scale evaluation of the site-wide environmental impacts of ongoing operations at the Y-12 National Security Complex (the 2001 SWEIS), and considering the other changes at the site, including plans for a new lithium facility and the findings of DOE's Inspector General about the ever-increasing risks of excess high-risk facilities, a new SWEIS should be prepared.

## BACKGROUND

In the decade since NNSA last held a public hearing on its modernization plans for Y-12, much has changed. Cost and schedule concerns, exacerbated by management failures, compelled NNSA to back away from the decision recorded in 2011. A new plan was developed over the course of several years, and NNSA took steps to implement that plan—it called for a downsizing the scope of the Uranium Processing Facility. The UPF would now be limited to housing many, but not all, of the operations in the 9212 Complex. The plan also determined that two other aging, noncompliant facilities—the 9215 Complex and the 9204-2E facilities, would continue to house enriched uranium operations for thirty more years. (An August 31, 2016, Department of Energy letter says, "...both the 9204-2E Facility and the 9215 Complex are enduring facilities, and operation through 2050 is assumed.")

During the development and early stages of implementation of this plan—NNSA spent well over a billion dollars on design work—the plan was not made public, nor was it subjected to further analysis as was required by the National Environmental Policy Act. Public interest organizations wrote to NNSA to demand compliance with NEPA, which requires an agency to revisit its original decision when plans change significantly or when new information comes to light that may result in changes to the environmental impact of the new plan.

When public interest groups filed a Freedom of Information Act request seeking the legally required environmental analysis, NNSA declined to respond. Instead, it told the media that a Supplement Analysis was in preparation. A Supplement Analysis is just what its name implies—it looks at the original EIS, compares it to the new plan and uses the analysis to decide if the original EIS should be supplemented—updated—or replaced with a new EIS, or if the original environmental analysis is adequate for the new plan.

In 2016, NNSA released a Supplement Analysis of the 2011 SWEIS, followed by a Record of Decision authorizing continuing enriched uranium operations according to the "hybrid approach"—using old and new facilities. The Oak Ridge Environmental Peace Alliance, Nuclear Watch New Mexico, the Natural Resources Defense Council, and individual plaintiffs

Jack Hoefler, Linda Ewald, Ed Sullivan, and Ralph Hutchison filed a legal challenge to the 2016 Record of Decision. The heart of their argument was that the new plan, the “hybrid approach” was a significant change to the old plan, especially the decision to use the 9215 Complex and the 9204-2E facilities for at least twenty more years. The 2016 SA indicated those facilities were not in compliance with modern environmental and safety standards, and that they would not be upgraded to meet those standards because the upgrade(s) would be “cost prohibitive.” A second key component of the plaintiff’s suit was that new information had come to light that would bear directly and significantly on the environmental analysis of the enriched uranium operations plan—in 2014 the US Geological Survey released its updated earthquake hazard maps; the maps showed the East Tennessee Seismic Zone, in which Oak Ridge resides, has the second highest increase in earthquake risk in the United States. Finally, argued the plaintiffs, by refusing to prepare a new or Supplement to the 2011 EIS, NNSA was shielding itself from public scrutiny and locking the public out of the NEPA process.

While the case was before the judge, NNSA issued a second Supplement Analysis, in 2018, in which it determined that Y-12 continuing operations were not significantly different than the operations evaluated in the 2011 SWEIS. No Record of Decision was released following that SA.

In September of 2019, the District court handed down an opinion and order. The court vacated the 2016 SA and ROD and the 2018 SA and sent NNSA back to the 2011 SWEIS. The court did not require NNSA to prepare a new or Supplement SWEIS outright; instead the court ordered NNSA to “conduct further NEPA analysis—including at a minimum, a supplement analysis— that includes an unbounded accident analysis of earthquake consequences at the Y-12 site, performed using updated seismic hazard analyses that incorporate the 2014 USGS map.”

On October 4, 2019, NNSA, amended its July 2011 Record of Decision with an Interim Record of Decision to say it would proceed with implementation of its hybrid approach plan, outlined in the now-vacated 2016 Record of Decision “on an interim basis.” The new ROD was not accompanied by the court required “further NEPA analysis.”

Now, six months later, in April 2020, NNSA has released a *Draft Supplement Analysis for the Final Site-Wide Environmental Impact Statement for the Y-12 National Security Complex, Earthquake Accident Analysis*, responding to the court’s “at a minimum” order with an attempt to do just that—the very least it can do.

#### THE SUPPLEMENT ANALYSIS

In fact, the April 2020 SA does even less than the minimum the court requires. Ignoring the court’s requirement for further NEPA analysis at the Y-12 site that *includes* an earthquake analysis, NNSA chose to prepare a narrowly focused SA that is *only* an earthquake analysis, and considers only the buildings involved in enriched uranium operations, the UPF and the facilities (9215 and 9204-2E) that are now called the ELP (Extended Life Program) facilities. Ignored are the other facilities at Y-12 which would also be affected by a design-basis earthquake; ignored also were the consequences arising from failures of other structures or infrastructure that would have a direct effect on the capacity to limit consequences from the failures of the ELP facilities.

According to Dr. David Jackson, Distinguished Professor Emeritus, University of California Los Angeles, NNSA fails even to achieve its modest goal. After reviewing the 2020SA and NNSA's previous work, Dr. Jackson concludes: "NNSA has conducted no rigorous seismic hazard evaluation associated with its activities at the Y-12 National Security Complex. A more thorough consideration of seismic risks is essential in light of the hazardous and nationally important work done at this Complex."

In Dr. Jackson's opinion, "NNSA's review is not an adequate scientifically based review of seismic risks. The agency's review is defective in numerous regards. It falls far short of relevant professional and scientific standards, offers a simplistic analysis of risks that fails to disclose or properly analyze critical underlying data, fails to consider adequately some highly relevant new data from the USGS, fails to employ a modern set of tools for analyzing seismic risks, chooses an arbitrary measurement of risk, and fails to respond in any coherent manner to new information furnished by the USGS and the Defense Nuclear Facilities Safety Board."

Dr. Jackson's critique suggests NNSA has taken only the softest of looks at the seismic vulnerabilities at Y-12: "NNSA's analysis of seismic risks is not well-founded scientifically. It suffers from numerous analytical defects, ignores or downplays important data, obfuscates the importance of the fact that existing buildings do not meet modern standards, and fails to employ modern tools for seismic risk analysis. NNSA has given only very cursory attention to important new information the agency obtained since 2011, including the USGS seismic hazard maps and input from the DNFSB. Moreover, NNSA has ignored altogether the most critical underlying data from the USGS's updated seismic hazard reports and has failed to even consider the USGS's 2016, 2017, and 2018 updated seismic hazard reports."

The requirements of NEPA cannot be fulfilled by an analysis and findings that are based on only partial knowledge and speculation. NNSA acknowledges that it does not understand fully the seismic status of the ELP facilities and will not until further analysis is completed at the end of 2021. Speculation about the consequences of a design-basis earthquake is premature. This is also a reason why a new or supplemental EIS is necessary: "The purpose of an EIS is to obviate the need for speculation by insuring that available data are gathered and analyzed prior to the implementation of the proposed action." *National Parks & Conservation Ass'n v. Babbitt*, 241 F.3d 722, 732 (9th Cir. 2001).

#### SITE-WIDE OR LIMITED SCOPE?

In 2001, when NNSA undertook the first comprehensive look at the environmental impact of Y-12 operations, it prepared a site-wide EIS. In that document NNSA explained that NEPA requires an EIS for major actions that could significantly affect the quality of the environment. "For certain large multiple-facility sites, such as Y-12," the 2001 SWEIS says (p. 1-11), "a SWEIS is prepared (10CFR 1021.330). The purpose of a SWEIS is (1) to provide DOE and its stakeholders with an analysis of the individual and cumulative environmental impacts resulting from both ongoing and reasonably foreseeable new operations and facilities (i.e., reasonable alternatives) at a DOE site, (2) provide a basis for site-wide decision making, and (3) improve and coordinate agency plans, functions, programs, and resource utilization." The 2001 SWEIS also says (p. 1-12): "In accordance with 10 CFR 1021.220(d), DOE shall evaluate the SWEIS at least every 5 years after its completion to determine whether it remains adequate, should be supplemented, or should be replaced with a new SWEIS."

The 2001 SWEIS, accordingly, examined, under the No Action – Planning Basis Alternative (Alternative 1B), not only historic nuclear weapons programs missions at Y-12, but also “other nondefense-related program activities at Y-12 that have been approved and would be implemented during the 10-year planning period.” Nondefense related activities include the construction and operations of a new waste disposal cell (a CERCLA cell) to accommodate wastes from environmental remediation. The 2001 SWEIS also foresaw the “potential for surplus Defense Program facilities and their possible transitioning to Environmental Management for cleanup and Decontamination and Decommissioning.” An Appendix provided details of these activities, and “estimated D&D wastes from vacated HEU storage facilities and special materials operations” were provided in Chapter 5 of the 2001 SWEIS.

Five years later, NNSA’s modernization plans compelled them to prepare a new Site-Wide EIS. A scoping meeting was held in 2005, but the actual preparation was delayed by the need to wait until the programmatic decision was finalized; under DOE/NNSA’s plan to “tier” decisions, the Y-12 site-specific EIS could not legitimately be prepared until the decision to site enriched uranium operations at Y-12 was formalized. Preparing a site-specific review before the programmatic decision was made would obviously have prejudiced the programmatic review.

The new SWEIS was published in 2011. NNSA could have conceivably prepared an EIS just for the new Enriched Uranium operations, but it did not. Instead, the 2011 SWEIS explains, NNSA looked at what the future might look like based on the 2008 Ten Year Site Plan for Y-12, and projected several projects that were included in the 2011 SWEIS. But the 2011 SWEIS was not actually “an analysis of the individual and cumulative environmental impacts resulting from both ongoing and reasonably foreseeable new operations and facilities (i.e., reasonable alternatives) at a DOE site,” as described in the 2001 SWEIS. Instead, NNSA carved out major portions of the activities at Y-12 and declared them and their environmental impacts exempt from consideration in the SWEIS. Among the prospective facilities not considered were: Consolidated Manufacturing Complex, Materials Receiving and Storage facility, Waste Management Complex, Utility System upgrade, Maintenance Facility, Protected Area Reduction Project. NNSA said in the 2011 SWEIS that “further NEPA review would be required if these facilities are formally proposed and ripe for decision.”

NNSA also provided itself a blanket exemption, not based in law, from considering the impacts of actions “addressed by other regulatory actions or analyzed in other NEPA documents.” The Integrated Facilities Disposition Program is cited as an example. The description of the IFDP in the 2011 SWEIS makes clear that it would be expected to have a significant environmental impact, both positive and negative, generating waste streams that require disposal or treatment, and reducing risks and costs for NNSA. The IFDP, in 2011, included 112 facilities at Y-12; activities were projected over the next 30-40 years (2011 SWEIS, S-8, 9). Cleanup and D&D activities conducted under the Comprehensive Environmental Response, Compensation, and Liability Act were also exempted from consideration. This is in stark contrast to the more comprehensive analysis undertaken in the 2001 SWEIS; that SWEIS was more closely aligned with NEPA requirements.

The public is left to ask: How can cumulative site-wide impacts of ongoing activities be evaluated if hundreds of actions with an acknowledged environmental impact at the site are

excluded from the study? Where is the legal basis for exempting CERCLA actions from a SWEIS? While it is clear that there is a benefit from declining to perform repetitive or duplicative analyses in depth, there is no benefit from refusing to include data developed during CERCLA or other activities in the evaluation of consequences from on-going activities at Y-12, especially in the event of a critical event like an earthquake which will involve the entirety of Y-12 in its devastating impact.

Example: There are significant quantities of mercury trapped in the floors, subfloors, and in the soils underneath buildings that used mercury, particularly the Alpha buildings. As operations at Y-12 expanded, Alpha buildings were added one by one in a line along East Fork Poplar Creek, to provide more space. In one instance, a building was built adjacent to its neighbor even though the building site contained a stream with a flow subject to rainfall. The decision was made to fill the stream bed with rock and other fill and to construct the building on top of it. The result, over time, is that mercury is now trapped in the sediments and the rock formation/streambed beneath that building. In periods of heavy rainfall, the stream swells, flushing mercury into East Fork Poplar Creek. During conversations about the Y-12 National Pollution Discharge Elimination Permit (NPDES, or water permit) one regulator said the contribution of mercury resulted in East Fork Poplar Creek exceeding its permit limits during heavy rainfall periods.

This situation rightly falls under the purview of the remedial activities covered by CERCLA. But if an earthquake happens, the people, turtles, fish, biota and other wildlife downstream don't care if what regulatory structure governs the release of the mercury that is impacting them, being deposited on the floodplain that children will play in, that canoes will be launched from, that anglers will stand on. An analysis of the effect of an earthquake in Bear Creek Valley is incomplete—and fails to meet NEPA's standard for a SWEIS—if it exempts significant impacts.

**The result of NNSA's 2011 decisions is that no comprehensive site-wide evaluation of the environmental impact of "ongoing and reasonably foreseeable new operations and facilities" at Y-12 has been undertaken for twenty years.** The current SA fails in every respect to examine the impacts of ongoing operations, even as it acknowledges significant changes have been made since 2011. The Material-At-Risk reduction program, for instance, has involved moving some hazardous operations out of the 9212 Complex in order to reduce risk in the event of building failure. Where have those operations moved to, and for how long? They were moved into the 9215 Complex and the 9204-2E facilities; the move is considered permanent. These operations, which NNSA acknowledges pose significant risks, are now newly situated in buildings that do not meet DOE's own standard for safety. The SA does not provide the public with details about the move, what risks are involved, or the differences arising therefrom; this is precisely the kind of new circumstance that is contemplated in the requirement of a 5-year review of the adequacy of a Site-Wide EIS, and the kind of change that compels a preparation of a new EIS. The SA does not explain how moving material-at risk from one unsafe facility into another represents a significant improvement in risk. Perhaps it does; it is incumbent upon NNSA to explain that to the public. The place to do it is in an EIS.

This change, along with others, is also the reason why NNSA cannot claim the impacts in 2020 are covered by the "No Action Alternative" or any of the other alternatives in the 2011 SWEIS. Significant changes on the site warrant a new EIS. The court imagined this might be the case when it required a new SA, at a minimum, that included (not limited to) earthquake

analysis. NNSA chose not to prepare an SA that took a hard look at its 2011 SWEIS; instead it tried to narrow the scope of its analysis even further. But absent any other SA—and the 2016 and 2018 SAs were vacated by the court—the 2020 SA must either examine the full slate of environmental impacts from on-going and reasonably foreseeable activities, or it must default to the preparation of a new SWEIS.

A site-wide EIS must take a real-time, real-world look at the entirety of the site. A site-wide EIS is especially valuable because it provides broader analysis of all the environmental issues at a particular location. This level of analysis is especially critical for Y-12, due to the sprawling nature of the Complex, the interrelated work that is done at its numerous facilities, the history of extensive contamination across the entire site, and the presence of highly contaminated legacy facilities that are even more vulnerable to earthquakes than the particular facilities analyzed in this limited draft SA.

In a large and complex site like Y-12, where one small creek carries off the effluent from multiple operations spread over a number of buildings, as well as significant quantities of residual mercury and other contaminants released in times of high rainfall, a site-wide assessment is the only way to get a true picture of the insult borne by the environment and potentially transferred off-site.

This is even more true of an earthquake analysis. The question that must be asked and answered is not “How will this building, or these select buildings, perform in a design basis earthquake and what will be the consequences to humans off-site?” This is the question the current SA asks and tries without success to answer. But the value derived from a site-wide analysis, such as the analysis required by the court’s remand for further consideration under NEPA, is that it answers the question that actually matters: “What would happen in Bear Creek Valley were it to be subjected to a massive earthquake, and what would be the consequences to the environment, workers and the public?”

The answer to that question in 2020 is not the same as the answer was in 2011. A few facilities at Y-12 have been improved since 2011; some have been removed; others have degraded. Information about risks and hazards—including but not limited to the 2014 earthquake hazard maps—is different. That is why the court stopped short of ordering a limited analysis of earthquake consequences on the EU facilities at Y-12; instead, the court sent NNSA back to the 2011 SWEIS and said it must start at square one, with a new SA to look at the Y-12 site, at a minimum, with particular attention to the new information provided by the USGS hazard maps.

Continued operation of the 9212 Complex for at least five more years is clearly included in “ongoing and reasonably foreseeable” activities. The SA is silent on impacts should an earthquake strike before the UPF is built. Since the 2011 SWEIS was judged deficient in its consideration of earthquake impacts, and since the bounding accident scenario used by NNSA was explicitly forbidden by the federal court, we strenuously object to NNSA’s attempt to leapfrog over risks in the next five years to consider only a post-9212 scenario.

Continuing construction of the UPF, absent sufficient NEPA analysis and a legitimate Record of Decision, violates not only the letter of NEPA, but its spirit. The NNSA is devoting hundreds of millions of dollars—irretrievable resources—on a plan that is completely dependent on the forced operation of unsafe facilities for twenty to thirty more years. This continuing investment/construction predetermines the outcome of NNSA’s decision on the

continued use of the ELP facilities in precisely the way that NEPA forbids. There is no legitimate Plan B—NNSA’s commitment to the Hybrid Approach is concrete, literally, no matter the outcome of the current and future assessments of the structural viability of the ELP facilities.

NNSA is, admittedly, in a hard spot. It wants to continue enriched uranium operations—in particular the production of components for thermonuclear weapons—at a site that is deeply compromised environmentally. Y-12 was listed on the Environmental Protection Agencies National Priorities List (Superfund) in 1989; since that time, site characterization has documented serious environmental damage along with large and ongoing environmental risks. Three of the Department of Energy’s top ten “Excess High Risk Facilities” reside at Y-12, including Building 9201-05, also known as the Alpha-5 facility, that tops the list. These facilities were described, in 2015, by the DOE’s Inspector General as posing “ever-increasing levels of risk” to workers and the public.

Here is what the Inspector General’s report said about Alpha-5:

The 9201-05 Alpha 5 Facility (Alpha 5 Facility) at the Y-12 National Security Complex (Y-12) has been described by NNSA as "the worst of the worst." This facility was built in 1944 and supported a number of missions that used materials such as uranium, mercury and beryllium. Since it ceased operations in 2005, this highly contaminated facility has experienced significant degradation. In particular, during a 2008 Environmental Management assessment, it was noted that the facility had substantial flooding, exterior piping and associated supports were corroding, and reinforced concrete roof panels had deteriorated. The assessment concluded that the combination of the large facility size, rapidly deteriorating conditions, and vast quantity of items requiring disposition made this facility one of the greatest liabilities in the Department's complex. Further compounding the issue, the facility houses a hub of utilities that serves operational production facilities at the site, which could affect national security mission work as further degradation occurs. Since this facility was evaluated in 2008, the site has spent more than \$24 million in operating and maintenance costs.

To accelerate the cleanup effort, Environmental Management provided Recovery Act funding to NNSA to remove a portion of the legacy waste from the Alpha 5 Facility. However, since cleanup efforts were performed, officials informed us that the facility has degraded at an increasingly alarming rate. In particular, a 2014 NNSA site assessment indicated that roof degradation continues to be widespread throughout the facility with varying levels of severity. This has resulted in significant water intrusion and the spread of radiological and toxicological contamination. Additionally, the assessment identified the potential for an explosion or reaction associated with remaining contaminants and personnel safety issues related to the degraded condition as high-risk areas. Overall, the assessment concluded that this facility presents a high risk to the workers and environment and should not be accepted. The assessment noted that demolition remains the only viable risk accepted standard. Further, it noted that funding will need to be diverted from mission work to prevent the realization of imminent risks and mitigate the consequences of realized risk events. (DOE/IG 0931, January 2015)

The information provided by the Inspector General's report is new information. The report makes clear the direct connection between Alpha 5 and ongoing EU operations; it also makes the economic connection, one that has direct implications for the environment. This new information must be considered in an EIS.

What's more, scores of buildings at Y-12 contain hazardous materials, residue of decades of weapons production and other industrial activities. Past environmental practices—the direct application of PCB contaminated oils as a dust-control/waste disposal measure for instance—have resulted in deep subsurface contamination. And past “disposal” practices have resulted in large land areas used as burial grounds that contain radiologic and hazardous contaminants buried with shock sensitive (explosive) materials—all in the Bear Creek Valley that is home to Y-12.

This is not speculative. In the process of constructing a haul road to connect the UPF construction site with a concrete batch plant, workers uncovered significant quantities of “construction/demolition debris, including...radioactively-contaminated debris and mercury contaminated concrete.” The report filed later said “due diligence conducted as part of the pre-construction activities indicated no documentation of disposal sites or manufacturing operations in the construction area.” It is highly unlikely this is a one-time anomaly; many disposal actions in the early years were undocumented. Regulatory oversight was nonexistent, and the ultra-prioritization of the production mission during the forty years of the Cold War often led to an out-of-sight, out-of-the way, out-of-mind mindset.

These facilities are connected to the operations missions analyzed in the SA, despite the NNSA's failure to consider them in the Supplement Analysis to a site-wide EIS. As the Inspector General's report notes: “Alpha-5 houses a hub of utilities that serves operational facilities at the site, which could affect national security mission work as further degradation occurs.”

But the connection runs deeper. The IG also says that demolition is the only viable risk reduction option, and that “*funding will need to be diverted from mission work* to prevent the realization of imminent risks and mitigate the consequences of realized risk events. (emphasis added)”

In other words, imminent environmental threats (“the spread of radiological and toxicological contamination...the potential for an explosion or reaction...”) posed by Alpha-5, a building which would undoubtedly fail in a design-basis earthquake event, are both operationally and economically dependent on budget and programmatic decisions made by NNSA in the enriched uranium plan. The facility, its performance, and the consequences to the environment of its failure must be included in a Supplement to the Site-wide EIS, or a new Site-wide EIS.

Alpha-5 is not uniquely situated. In 2015, an Excess Contaminated Facilities Working Group was formed; the working group is consolidating information from throughout the DOE enterprise and is developing priorities and budgetary requirements. Y-12 said it would work with the Excess Contaminated Facilities Working Group to ensure there is a continued focus on both the risks presented by the excess facilities at Y-12 and the actions required to safely and effectively mitigate those risks. The SA includes no results of the findings of this working group; their conclusions regarding excess contaminated facilities at Y-12, like the Intermediate Assay Complex (where operations have been discontinued, but threats include

RCRA hazardous wastes, strong and weak acids, and various organics), must be included in any credible assessment of environmental risks, especially during a massive, site-wide event like an earthquake.

Earthquakes are not like other natural phenomena. It is not unusual, after a tornado or a wildfire devastates a community, to hear among the tragic stories of loss, a remarkable tale—one house left standing while the rest of the neighborhood was destroyed or consumed—that makes nature seem almost capricious. Earthquakes are not inclined to such selectivity. Earthquakes are more like floods, subjecting everything in their path to the same irresistible assault. They shake everything equally. The difference between collapse and survival is not due to the vicissitudes of the tremor or a difference of thrust; it is the design of the structure, and the capacity of the structural members to withstand the force of the tremor.

This is understood by NNSA. As described in their SA, high hazard facilities (Risk Category IV) require the most stringent earthquake design. The SA described the process by which the UPF and ELP facilities were evaluated—the increase in predicted ground motion based on the 2014 USGS seismic hazard maps was approximately 56%.

A critical problem is that the UPF and the other category IV facilities will not respond identically to the same earthquake. The UPF is designed to withstand a design-basis earthquake: hundreds of thousands of cubic yards of dirt were excavated at the UPF site, replaced with concrete, in order to provide a firm and stable foundation for the UPF. Even these measures do not guarantee the UPF will withstand an earthquake—but they do provide for a high degree of predictability should the structure fail; this allows for a design to maximize safety in the event of an even greater-than-expected catastrophic earthquake.

The ELP facilities are a different story. It would not take a massive earthquake to collapse one of them; in fact, both of the facilities would suffer significant structural damage and probably collapse in an earthquake half the magnitude of the worst-case scenario.

If such an event were to occur today, or anytime in the next twenty-five years, the 9212 Complex would also collapse. The SA provides no timeline for the decontamination, decommissioning and demolition of the 9212 Complex, a task that would be hindered by its proximity (they are conjoined) to the 9215 Complex. Y-12 has a history of walking away from excess facilities when they no longer serve a production mission; that history is complicated by a persistent refusal to fund cleanup operations, even when facilities pose an “ever-increasing level of risk” to workers and the public. The Inspector General’s report states that cleanup of Alpha-5 is currently projected to begin no earlier than 2025, and may be pushed out to 2035.

#### A CASCADE OF CATASTROPHE

Since NNSA is analyzing a Site-Wide EIS to determine whether or not the 2011 SWEIS should be updated or supplemented, it must ask the broad question: What will happen if a design-basis earthquake shakes Bear Creek Valley?

In answering that question on a site-wide basis, NNSA must consider not only the information in the current SA—the expected performance of the UPF and the ELP facilities

and the consequences arising therefrom—but also the complications and impacts from the upheaval of the very earth itself on the entirety of NNSA and DOE operations in the valley.

For instance—assuming a large earthquake would not only collapse what is left of Building 9212 (the SA does not propose its decontamination or demolition), but also the 9215 Complex in which active HEU operations are underway, and the 9204-2E facilities. The Alpha-5 building, the highest-risk excess facility in the entire DOE complex would also collapse. Access to the site from the northeast could easily be limited or prohibited outright by the destruction of roadbeds and bridges. Safe access from the southwest could also be limited if the Bear Creek Burial grounds were disturbed and volatile materials were in an unstable state—including explosive materials and pyrophoric radionuclides that are buried there.

If the earthquake happens in the next five years, a boiling cloud of earth-hugging hydrogen fluoride would likely greet any responders able to access the site; in the presence of moisture, AHF forms hydrofluoric acid which will burn skin and cause blindness; it is highly corrosive and penetrating; it is highly toxic to aquatic and terrestrial life. It eats paint off of metal and etches glass on contact. A concentration of 30 parts per million is considered immediately life threatening; a concentration of 3 parts per million will cause significant injury. Neither the cylinders that hold AHF nor the piping that carries AHF at Y-12 are likely to withstand ground realignment by an earthquake.

In 1995, the Department of Energy prepared a secret Environmental Assessment for the replacement of the existing AHF facilities at Y-12. That EA contemplated completion of the replacement by the end of 1999 and estimated the design life of the replacement system to be 20 years (expiring in 2019). The actual construction of the AHF replacement was delayed by the discovery of faulty welds, but eventually it was completed. The 1995 EA states that a separate NEPA document would be prepared at the end of its design life to discuss the impacts of decommissioning or future use of the equipment and facilities. (DOE/EA-1049 *Environmental Assessment Proposed Replacement and Operation of the Anhydrous Hydrogen Fluoride Supply and Fluidized-Bed Chemical Processing Systems at Building 9212, Y-12 Plant, Oak Ridge, Tennessee*, p. 2-1). However, no such NEPA document has been prepared, and the impacts of an earthquake on an aging AHF facility are not included in the 2011 SWEIS or the 2020 SA. Instead, NNSA is apparently ignoring the risks just as it ignores its previous determination.

As the AHF system is an integral part of Y-12 mission operations, and its sole purpose is the processing of enriched uranium, its environmental impacts should be analyzed in any site-wide EIS, particularly one that focuses on the EU mission.

The SA contemplates small fires and a possible nuclear criticality. In all likelihood, small fires would quickly become large fires given the ready availability of fuel. Smoke and off gasses would be highly toxic, most likely including radioactive particles. Responders to the partially or completely collapsed ELP facilities would not know if a nuclear criticality event was underway—neither of the facilities has qualified modern criticality alarm systems.

The threat to workers cannot be contained by a calculation of doses—it must take into account forces as blunt as collapsing structures and as invisible as airborne toxic materials.

Across the valley, the disruption of the earth would likely lead to considerable releases of mercury currently trapped in the floorboards of old buildings or the soils beneath them into the surface and ground water—the SA does not address this possibility, or the impacts on wildlife and people on site or downstream, though it is almost certain to occur.

The SA does not address what impacts an earthquake occurring several kilometers beneath the surface might have on Dense Non Aqueous Phase Liquids (contaminated sludge) currently semi-contained in situ under areas of Y-12. Nor does it describe the impact on monitoring wells that surround Y-12 and are scattered about the site—wells that would be used to document the transport of contamination across and off site.

By limiting its analysis to the UPF and the ELP facilities, and narrowing the scope of its damage estimates, NNSA fails to analyze the full, site-wide impacts of a design-basis earthquake at Y-12 as ordered by the court.

#### HUMANS ONLY

In preparing the SA, NNSA and its contractor made a decision to put on blinders of convenience. They not only limited the physical scope of their analysis, choosing to look only at the UPF and the ELP facilities, they also decided to ignore all consequences to the environment that were non-human. The SA contains no analysis of releases to water and the effect on fish and biota; the SA contains no analysis of releases to the air and subsequent deposition on and off-site that will impact wildlife and flora. This short-sighted analysis is not permitted by NEPA, nor can it be claimed that the analysis in the 2011 SWEIS was sufficient—it was precisely the finding of the court that it was not sufficient with regard to earthquakes.

#### RADIOACTIVE RISKS ONLY?

The Y-12 National Security Complex is just that, a complex. It is a major industrial site with a unique purpose. Operations at Y-12 have had a profound impact on the environment—Y-12 was named to the National Priorities (Superfund) List in 1989. The list of contaminants released into the environment is not confined to radioactive materials; in fact, the contamination of greatest concern from Y-12 operations has been mercury.

Other contaminants of concern are typical of major industrial operations—polychlorinated biphenyls (PCBs) for example—and incidents requiring remedial activity have included spills of diesel fuel into East Fork Poplar Creek.

Weapons operations, including some conducted in the UPF and ELP facilities, involve unusual or unique non-radioactive contaminants; the list includes anhydrous hydrogen chloride, beryllium, lithium and other materials with the potential for serious environmental impacts, especially if released in the chaos of an earthquake. In the 2011 Site-Wide EIS, NNSA tacitly acknowledges ongoing risks from beryllium, noting that it has taken steps to provide health care for affected workers. Instead of the standard language about “within acceptable limits,” NNSA only says that beryllium exposure will be limited “to the extent practicable.”

Also present in industrial quantities and in the groundwater (on-site and off) are chlorinated solvents, including carbon tetrachloride, a known carcinogen, and

trichloroethylene. These solvents are used for degreasing, cleaning, in painting and for other purposes. Previous environmental screens for carcinogenic materials known to be present at Y-12 list 18 different chemicals or compounds in use at Y-12.

The SA is silent on the environmental impacts of these contaminants, focusing instead solely on the impact from radiologic releases.

Bear Creek Valley, home of Y-12, also hosts burial grounds that contain materials disposed of in years past. In at least one of those burial grounds, radioactive and hazardous materials are buried along with shock sensitive materials that could explode if jarred. This is part of the Y-12 site (not remote to current operations) and could have a significant impact on conditions at the site in the event of an earthquake. Any analysis looking at the environmental consequences of an earthquake must consider not only the immediate effect on the burial grounds, but the way in which those effects will impact the larger context of response/recovery/containment efforts in the event of a significant earthquake at Y-12.

This points to the difference between an SA and an actual Supplement to the 2011 SWEIS (or a new SWEIS). An SA is a quick look, not intended to be comprehensive. In this case, it overlooks contaminants of significance, and is deficient. But the deficiency points us to the requirement of NEPA that NNSA take a “hard look” at environmental impacts from its hybrid approach; that hard look belongs in a Supplement or a new SWEIS that considers the impacts of the full range of environmental hazards in the event of an earthquake in Bear Creek Valley.

#### NEPA AND PUBLIC PARTICIPATION

The Oak Ridge Environmental Peace Alliance was founded in 1988; it is a grassroots, public interest organization that draws the majority of its membership from East Tennessee and is sustained almost solely by public contributions. In the first year of its existence, OREPA undertook an unprecedented research project, interviewing numerous DOE officials and reviewing voluminous reports. The result was *A Citizen's Guide to Oak Ridge*, published in 1989 and updated in 1992. *A Citizen's Guide* was the first publication ever to provide a comprehensive overview of the environmental practices employed by DOE and its predecessor agencies across the Oak Ridge Reservation and to present that information in a format easily accessible to a non-professional member of the public.

Since that time, OREPA has been a full and active participant in every major public NEPA review conducted on the Oak Ridge Reservation and has participated in many other significant environmental decision-making processes. At times OREPA was the only public representative in environmental oversight meetings—a hearing on the renewal of the K-25 NPDES (water) permit in the early 2000's comes to mind.

The first NEPA document prepared for Y-12 was an Environmental Assessment prepared in 1994 to evaluate the impact of enriched uranium storage beyond the maximum historical capacity at Y-12. During that process, OREPA made the case for a Site-Wide Environmental Impact Statement, DOE proposed an informal agreement—we didn't challenge the 1994 EA and DOE committed to prepare a Site-Wide EIS. That SWEIS was prepared in 2001.

But OREPA's concerns about the environmental impacts of earthquakes on the facilities at Y-12 predate the introduction of NEPA to the site. In the comments submitted by OREPA on the Draft 2001 SWEIS, we wrote:

"Since 1993, when the Oak Ridge Environmental Peace Alliance first raised concerns about the structural integrity of weapons production buildings at Y-12 (our concerns were drawn from DOE's own Defense Programs Safety Survey Report, Volume 3, Appendix B, Uranium Facilities, November 1993), DOE has steadfastly worked to amass a reassuring body of documentation asserting the safety of Y-12 buildings.

"These safety assurances, according to the Defense Nuclear Facilities Safety Board, May 5, 1994 Memo...incorporate refinements which ostensibly reflect 'increasingly realistic' conditions. The Safety Board's memo states: 'The Board's staff is concerned that the combined uncertainties of these 'increasingly realistic' refinements do not appear to be well understood and may actually exceed the overall seismic margin available in these structures.' The Safety Board memo includes specific criticisms of Y-12's reassuring studies.

"The continued operation of Y-12 production facilities, contemplated for the foreseeable future in the Y-12 SW-EIS by the preferred alternative, in a run-to-failure mode, ignores significant environmental, safety and health risks which will result in the event of a moderate to severe earthquake.

"Such an earthquake event is not unlikely. The journal *Science*, in April 1994, evaluated seismic activity in the region which includes the Y-12 Nuclear Weapons Plant and concluded that this region has the second highest level of seismic activity in the country. Researchers from the University of North Carolina at Chapel Hill also concluded in their study that the small size of the current activity is not only not an indicator that future activity should be expected to be equally small, but, quite the contrary: 'The model indicates that the potential for a large, damaging earthquake in the Eastern Tennessee Seismic Zone may be higher than the available historical record suggests.' The frequent tremors of today may well herald a more significant temblor in the future. (*A Seismotectonic Model for the 300 Kilometer-Long Eastern Tennessee Seismic Zone*, Powell, C, et al, *Science*, Vol. 264, 29 April 1994).

"The consequences of such an earthquake are almost unthinkable—the loss of control of nuclear inventory, the loss of workers' lives, the release of contamination into the atmosphere, the likely potential for multiple catastrophic failures of structures, or fire and water control systems—these are very realistic possibilities which we must think about precisely because they are so unthinkable...

"The Y-12 SW-EIS must address the impact of natural phenomena, including earthquakes, on the current operating facilities which will continue to be used under all of DOE's alternatives." (DOE/EIS-0309, Vol. II)

OREPA has participated in NEPA processes for the past twenty-five years because we share the values of NEPA; we believe the best decisions are made when environmental impacts are thoroughly considered and when they are subjected to the widest possible scrutiny. We also believe, as does NEPA, that public contributions, especially by those who live in the

affected area, provide added value to federal agencies and make the decision-making process better.

We have consistently raised concerns about the risks of earthquake activity at Y-12 over the last twenty-seven years: in every appropriate NEPA setting, in public meetings and workshops, at public hearings, and in meetings and correspondence with Administration officials and oversight agencies.

The value of public participation is a cornerstone of NEPA; it is required because both the public and the agency benefit from an open process. Evidence of the value of public input is the SA itself—it would not exist were it not for public pressure, first in the form of multiple petitions to the government and then, in the face of unfortunate NNSA unresponsiveness, in the form of litigation.

Neither NEPA nor the public, and presumably not even NNSA, believes that the long and expensive process of litigation is the most efficient or desirable path to the best outcome.

In the current instance, NNSA has prepared an SA and released it to the public with a thirty-day comment period. The publication occurred during a time of national emergency due to the COVID-19 pandemic. The chairs of fourteen committees in the House of Representative and twenty-four Senators wrote to the Administration calling for a suspension of all public comment periods and delay of public hearings until the national pandemic emergency was lifted and life had returned to “normal.” Their concerns reflected an understanding that the pandemic not only diverted the public’s attention away from bureaucratic matters, no matter how important, but also that the relentless uncertainty, the collapse of the economy, and the disruption of all normal patterns of life, make it impossible for the public to continue “business as usual.”

Echoing the members of Congress, the Oak Ridge Environmental Peace Alliance and many members of the public petitioned NNSA for an extension of the comment period and a public hearing on the SA. It was and is our belief that the significant increase in risk to the public noted in the SA (more than 10 times the risk to the public than estimated under the approach selected in the 2011 Record of Decision) warrants a public hearing.

NNSA’s initial response was to extend the comment period by 15 days—still well within the pandemic national emergency. Our request for a public hearing was ignored; when we pressed, NNSA perfunctorily (within the hour) denied the request for a public hearing.

This is yet another argument for the preparation of a Supplement to the 2011 SWEIS, or a new SWEIS; it would require the NNSA to do what NEPA expects—engage the public on an issue of significant interest, in this instance the huge increase in risk to which the public is to be exposed under the Hybrid Approach. NNSA says this risk is still insignificant and therefore “acceptable,” but that is not a decision NNSA should be allowed to make without consulting with the impacted public. And the widely recognized forum for that consultation is a public hearing.

[I note as a sidebar that I objected strongly to NNSA’s decision to hold a “virtual” public hearing on the Savannah River Site EIS on a plutonium pit fabrication facility. NNSA’s reply consisted of sending me a copy of a draft letter they had prepared for another person who had requested an extension of the comment period. They proceeded to hold the virtual

public hearing—a number of members of the public were unable to attend because of technical challenges. In my case, I attempted to join the hearing 30 minutes in advance, followed the guidance provided by NNSA and was unsuccessful. After clicking through several screens—a treasure hunt!—I found a number for technical assistance (not by NNSA, but the company that owns the software being used). The person was very courteous and diligent as we sorted through, for twenty more minutes, the technology—a software incompatibility that required changing settings on my computer. In the end, I joined the hearing late. There is no way of knowing how many people were frustrated by technical challenges, not to mention people who simply did not have access to the technology required to join the meeting. “Virtual” public hearings are not a satisfactory substitute for in-person hearings, especially when a reasonable alternative exists—delay the process until an in-person hearing can be held. Despite the claims of national security demands by NNSA personnel, the agency’s chosen schedule for these NEPA processes is entirely arbitrary.]

The SA concludes that the Hybrid approach results in a **five-fold increase** in the probability of a devastating accident over the UPF plan in the 2011 Record of Decision. The SA also concludes **the consequences to the public are twelve times greater** than the 2011 ROD. These numbers represent significant changes from the Record of Decision presented to the public; significant not only because of their difference from the old numbers, but significant because they represent threats to the public health and safety.

NNSA may not expose the public to these increased risks without providing full disclosure in a public hearing and accepting feedback from the public. NNSA must get informed consent from the public.

A new SWEIS or a formal Supplement would require NNSA to hold public hearings in which this information would be disclosed and public comments could be solicited.

#### ENVIRONMENTAL JUSTICE

The SA says no communities of color or low-income communities would be disproportionately impacted by an accident at Y-12. The Scarborough and Woodlawn communities, both located within a mile of Y-12, represent a concentration of people of color and low-income residents. The assertion in the SA is not true.

#### NEW INFORMATION

New information may take the form of previously unknown data, newly published reports, or new understandings about already existing information or circumstances.

The COVID-19 pandemic, for example, sheds new light on the dangers of dismissing high-consequence/low-probability events—when one happens, the low probability is of no consolation and provides no relief or protection to those caught in the event itself. If the ELP facilities are unsafe, they must be retired immediately; all material-at-risk should be removed, and workers should be provided safe working conditions.

The SA inaccurately, or perhaps wistfully, says “To ensure those future operations are conducted safely, the ELP extends the life of these facilities through refurbishments which reduce risk and ensure the continued reliability of operations in the future.” Presently, though, these goals are only aspirational. NNSA admits that it will not even fully understand

the full extent of risks until after the end of 2021, not will it know what actions may be required to mitigate those risks, or even the extent to which mitigation is possible. Furthermore, NNSA says it might choose not to undertake some mitigation efforts if they are not feasible or are “cost prohibitive.” The declarative statement in the SA, absent qualification, is a lie.

Efforts to reduce risk have included, according to NNSA, a program to remove material-at-risk (MAR) from the 9212 complex and the ELP facilities, relocating it to safer facilities and leaving only those materials that are in process. The SA singles out the ELP facilities and says “it is important to not only determine the amount of seismic risk and the feasibility of upgrades, but to also explore risk reduction methods beyond structural upgrades. Ongoing efforts to reduce the inventory of nuclear materials at these locations by transferring them to other locations as appropriate...also reduce nuclear safety risks.” (SA, p.9)

Although this promised program has some appeal at first glance, it cannot withstand scrutiny. The public, without access to the facilities, cannot know what materials are present, the level of risk posed, what has been or is being relocated, or where it is being put. What little information is available is gleaned from indirect sources. So, for instance, when the public learns that one of the efforts to reduce material-at-risk in Building 9212 is to move specific operations to Building 9215, it sounds as though the risk is not so much being reduced as being shifted. Or when the Defense Nuclear Facilities Safety Board reports, in its April 10, 2020 weekly resident inspector report that “Several two-cylinder chip dollies were found in Building 9215 with small amounts of liquid around a weld that suggest leakage had occurred....Two cylinder chip dollies are used to store uranium chips generated by machining operations...The disposition paths for processing uranium chips have not been operational for an extended period of time (since November 2018) resulting in loaded chip dollies in Building 9212 and 9215 that have been stored for significantly longer than prior practice.”

This information calls into question the actual merit of any promise to reduce consequences of an accident or event by removing “material-at-risk;” these dollies, with cylinders containing radioactive, pyrophoric uranium chips, are sitting, neglected, in the facilities, with no prospective disposition in sight.

Other assurances are equally uninspiring. The April 17, 2020 weekly report of the DNFSB Resident Inspectors describes revision of the Safety Strategy for the ELP buildings. One might think, given the concerns about the buildings’ integrity and the need to minimize risks, that NNSA would be putting in place revisions to the Safety Strategy that would tighten controls and result in higher safety protocols as a matter of procedure. Instead, the discussion focuses on “describing anticipated exemptions to nuclear safety rules” and the process for dealing with exemption requests.

#### THE QUALITY OF THE SA ANALYSIS

NNSA’s estimate of consequences of an earthquake rely on computer models and data sets that are drawn from observations, measurements, and other computer models. At each point, uncertainties are introduced into the equations that ultimately churn out an estimate of risk.

On page 9 of the SA, NNSA says, “NNSA has extensively evaluated the existing facilities, identified and analyzed the hazards, and implement controls (such as administrative controls that limit Material-at-Risk)...” This is problematic for two reasons. First, on page 11, NNSA says updated seismic evaluations on the ELP facilities are “currently being performed,” and, on page 12, describes the analysis as “currently underway,” and “anticipated by the end of 2021.” NNSA owes the reader an explanation: why the claim on page 9 that is belied just three pages later?

This unfinished analysis, NNSA says, will incorporate the USGS 2014 seismic hazard maps. It is only at that time, “by the end of 2021,” that NNSA will be able to fully satisfy the explicit directive of the court’s order of September 2019. OREPA believes that future seismic analysis should incorporate the most recent information of the USGS; NNSA should not be locked by the court’s order into a 2014 time warp; already the USGS has updated its hazard maps, and it is likely to issue another update before the end of 2021.

Dr. David Jackson notes:

“Following recent dramatic increases in earthquake occurrence in the Central and Eastern United States, USGS has since issued three updated sets of seismic hazard estimates in 2016, 2017, and 2018 that in my opinion are relevant to the risks at Y-12 and should be considered by NNSA. However, NNSA appears unaware of these publicly available estimates and maps. Of particular significance, the 2018 seismic hazard calculations indicate even greater hazard than that represented in the 2014 map. In particular, my review of the data indicates that, even within the “2 percent in 50 years” probability standard (which, again, is not the only standard NNSA should consider), the peak ground acceleration in the area of Y-12 could reach 0.6g. This is far greater than the levels that the aging buildings at Y-12 could likely withstand...The recently updated USGS seismic hazard estimates are important and constitute new information that NNSA should carefully consider.”

Meanwhile, the DNFSB weekly report of April 17, 2020 notes that “a few of the ELP activities that were planned for fiscal year 2019 have shifted into fiscal years 2020 and 2021.” It is unlikely that the Safety Board has information more current than NNSA. But the conflicting reports are enough to justify a request from the public (and the court) for a commitment to a schedule with consequences for failure to meet the schedule. While Consolidated Nuclear Services and NNSA made a decision to ignore state COVID-19 orders and continued construction of the UPF, it has, according to the DNFSB’s May 1, 2020 weekly report, sought relief for “safety basis deliverables,” requesting that the schedules for submitting required documents be adjusted. The public is unable to rely on NNSA’s schedule projections or promises of future deliverables.

While the court ordered NNSA to incorporate the USGS 2014 hazard calculations in its analysis, NNSA continues, throughout its SA, to rely on data points and estimates that predate 2014, reducing to nearly zero its consideration of the 2014 USGS data.

The claim of limitations on material-at-risk falls flat in the face of reports from the DNFSB that document two truths: NNSA does not fully understand where all Material-at-Risk is (accumulations in process equipment, ventilation ducts or other containers are regularly

discovered), and it has not managed to relocate MAR that it does know about (DNFSB weekly report, April 10, 2020).

Despite these undeniable facts, the seismic analysis of risk from a design-basis earthquake in the ELP facilities takes credit for dramatic reductions in risk due to the removal and/or relocation of MAR. In Appendix B, the remarkable claim is made that the risk in the ELP facilities is not significantly different from the estimated risk in the original UPF plan, where all materials and operations would take place in a new, modern, seismically qualified structure; this improvement is all put down to the “aggressive MAR reduction program” that was not only implemented but codified in the formal safety analysis documents. This program limits MAR to “the minimum needed for efficient operations,” the codification assures “that these lower inventory levels will be maintained.”

But the credit NNSA seeks is hard to give when considered in light of the DNFSB reports that there is considerable, dangerous unaccounted for HEU, and discoveries are still being made (April 2020) of unexpected quantities of HEU in unapproved containers or unauthorized locations to the extent that criticality safety standards are breached.

The bottom line, both from the standpoint of guaranteeing maximum safety and from the standpoint of validating the data points being used to calculate consequences, is that NNSA is not reliable.

Understanding seismic analysis is difficult for a layperson. The language quickly becomes technical and dense. It should be possible to use some language with which the public is familiar, if only for the purposes of comparison. How large is a design-basis event, for instance? When calculating the effects of an earthquake in Bear Creek Valley, what magnitude of earthquake are we talking about? There is no reference in the SA or the appended documents to a specific size earthquake which makes it hard to calculate the site-wide impacts of the design-basis event.

When the USGS estimated maximum magnitude predictions for eight cities in the United States, they surveyed twenty experts who used a variety of models, many of them using more than one model to arrive at their calculations. Knoxville, TN was one of the cities chosen. The panel of experts predictions ranged from 5.9 – 7.5, with the median prediction of maximum magnitude at 6.6. This exceeds the maximum earthquake contemplated in previous NNSA analyses; it is impossible to compare this to the earthquake scenarios in the SA because no specific magnitude is assigned to the design-basis earthquake. The word magnitude appears four times in the SA and Appendices; it is never accompanied by a number.

## THE UNNERVING RESULTS

There is nothing in NEPA that compels an agency to choose, at the conclusion of its analysis, the path that would provide maximum protections to the environment, workers, or the public. NEPA only requires a “hard look.” But it requires the results of that look to be presented to the public in various fora; this guarantees not only that the public is informed about impacts of operations happening in its neighborhood, but also that the public has a chance to respond.

In the SA, NNSA acknowledges that it is currently conducting dangerous operations with enriched uranium in substandard facilities (p.12: “Some portions of the facilities meet [modern nuclear standards] and other portions do not.”) This is not something the general public is aware of, but it is also not a secret NNSA has tried to hide; it just hasn’t made an effort to fully inform the public.

Of greater concern is what follows this admission. NNSA says it will eventually understand weaknesses and potential fixes for the ELP facilities. The catch is that “Upgrading both structures to fully meet modern seismic standards for new facilities may not be feasible or practical.” This echoes earlier admissions by NNSA that bringing the Category IV ELP facilities into compliance is not going to happen—in 2016 NNSA said it was “cost prohibitive.”

Since NNSA has declined to hold a public hearing, and proposes to move forward with no further accountability (through a Supplement to the SWEIS or a new SWEIS), commenting on the SA provides the public its last—and wholly inadequate—opportunity to formally object to this plan.

Insofar as the Hybrid Approach acknowledges that it will include the conduct of enriched uranium operations in substandard facilities, facilities that fail to meet DOE’s own safety standards for Category IV facilities, and given that NNSA will not only not commit to bringing the facilities into compliance but admits outright that it will not do so, we object in the most strenuous possible terms to the continued use of the ELP facilities, the 9215 complex and the 9204-2E facilities, for production operations at Y-12. It is not acceptable for the government to expose workers, the public and the environment to catastrophic levels of danger.

#### POTENTIAL ENVIRONMENTAL IMPACTS

The SA declares that the design basis earthquake accident probability is estimated to be once every 2,500 years. This number of course, is pulled out of thin air, as is its partner, the estimate that a beyond-design-basis accident would probably occur once every million years.

While these numbers sound scientific, especially when written with exponents, their purpose is not to express any certain knowledge; they are really only a guess meant to console the public. An EPA official once asked if I understood how the agency arrived at a one-in-a-million estimate as a standard for acceptable risk. I confessed I did not and prepared myself for a brief science/math lecture. He smiled and said, “A million sounds like a very large number.”

NNSA further calculates that the probability of a design-basis accident for the ELP facilities is likely to be two in a thousand, or once every 500 years. This number is arrived at by a calculation that takes into account the probability of an earthquake and a criticality event happening at the same time.

The consolation bestowed by these estimates is tempered somewhat by the experience the public has in the real world. It matters little to the public in Fukushima Prefecture if the estimate of a design-basis earthquake is one in a thousand or one in a million; those are calculations on paper. On Friday, March 11, 2011, the probability was once in one day.

Three of the reactors at Fukushima were said to have been built to tolerances that would withstand the ground forces generated by the Tohoku earthquake. In the end, though, the earthquake and resulting tsunami caused the catastrophic failure of the reactors and their containment and cooling systems. Nine years later, the damage is unremediated and releases are not fully contained.

The truth is that a design-basis earthquake in Bear Creek Valley would result in chaos of the most dangerous kind that would persist for many years, if not decades. Some contamination would pose risks for hundreds of millions of years. First responders would be subject to a wide variety of unknowns, not least of which is the list of materials to which they would be being exposed.

And, since NNSA justified their entire operations in the SA as being required by national security, it might be worth noting that under the hybrid approach being validated in this SA, a design-basis earthquake would cause an immediate and, for all intents and purposes, permanent halt to production of nuclear weapons secondaries and cases in Bear Creek Valley. Since no other facility exists in the US nuclear weapons complex with the capacity to carry out this mission, the US nuclear weapons modernization program would come to a prolonged halt, if not a permanent end.

#### CRITICALITY SAFETY

It is not possible to be sanguine about the deficiencies already recorded and those yet-to-be-discovered, nor is it possible to be confident that NNSA will operate in the safest manner possible, placing a high priority on worker and public safety. That is not the historical record in Oak Ridge, and it is not the current case.

The SA includes, in its worst case accident event scenario, the possibility of a nuclear criticality. This is not a remote possibility; it is much closer to quite likely than it is to hard to imagine.

Perhaps most important for the purposes of an SA that intends to calculate the consequences of an event that includes release of radioactive material as a result of a criticality event is the fact that Y-12 does not currently have any way of expressing with confidence the likelihood or nature of such an event. An untold amount of highly enriched uranium is unaccounted for at Y-12; the majority of it is believed to be “accumulated” in processing equipment and lines—exactly where is unknown.

In July, 2019, the Defense Nuclear Facilities Safety Board expressed its concern about the extent of Y-12’s knowledge in a letter to the Secretary of Energy. After a surprise discovery of HEU in 2017, Y-12 personnel conducted a review. According to the Safety Board’s report to Congress, that review “continued to find unexpected uranium accumulation in various process areas and pieces of equipment through 2018.” As recently as the April 10, 2020, the Resident Inspectors reported an unauthorized storage of pyrophoric HEU Highly Enriched Uranium Materials Facility. “This situation was not discovered during the previous extent of condition reviews [in November 2018]” according to the Safety Board.

In April 2020, NNSA presented a Preliminary Notice of Violation to the Y-12 contractor for failure to exercise adequate criticality safety controls. The notice characterized the safety deficiencies “of high safety significance.”

The picture painted by the Safety Board, and finally validated by NNSA's effort to hold its contractor accountable, is of a site-wide failure to account for HEU in all the processing facilities, a systemic lack of safety controls, and no commitment to resolving safety issues in a timely and satisfactory manner. In other words, the risks of criticality safety can not be quantified, because Y-12 does not know where and in what form HEU is present on the site, and, while it knows that there are criticality safety violations and material is stored in unsafe, unauthorized, or undocumented containers, arrays and location, it does not know exactly the extent of the danger.

If a design-basis earthquake were to strike Y-12 now or in the next several years, it is quite possible that building collapse and release of hazardous and radioactive materials would be accompanied by multiple criticality events. First responders could be subject to risks that were not understood or even identified at the time.

#### DILUTING DOSES

Now let us imagine a reality-based worst-case accident event in Bear Creek Valley in 2028. As the federal court noted, it is "hard to imagine a more dramatic hypothetical than this, where [one] must consider what might occur if a major earthquake struck a nuclear weapons manufacturing facility located in a major population center." The draft SA fails to do any credible job genuinely contemplating such a frightening scenario—despite the fact that the court has directed the agency to do so and that NEPA specifically requires the agency to consider "impacts which have catastrophic consequences, even if their probability of occurrence is low." 40 C.F.R. § 1502.22.

Late in the afternoon of November 17, 2028, an earthquake of magnitude 6.6, with an epicenter located near Wartburg, TN, shakes the ground in East Tennessee. The tremor is larger than any recorded in East Tennessee, but well within range of the US Geological Survey's predicted maximum magnitude earthquake (twenty experts using multiple models provided a range of 5.9 – 7.5, with the median prediction of maximum magnitude at 6.6).

The quake is felt as far west as Jackson, Tennessee, and as far east as Roanoke, Virginia.

In Bear Creek Valley, in Oak Ridge, Tennessee, the result is catastrophic. The recently vacated 9212 Complex collapses, releasing a cloud of dust containing highly enriched uranium. The dust rises in the atmosphere and disperses according to size—larger particles return to earth in the valley and surrounding vicinity; smaller particles ascend higher and are carried off to the southeast by the prevailing winds. An abandoned cylinder of hydrogen fluoride is breached, releasing a cloud of gas.

Several other structures also collapse—the 9215 complex is reduced to rubble as roof supports give way and two exterior walls crumble. The 9204-2E facilities are partially destroyed.

The Alpha-5 facility collapses completely, as do several other excess high-risk facilities.

Access by road to Y-12 is disrupted; both entrances at the east end of Y-12 are rendered impassible as the bridges over East Fork Poplar Creek collapse. On the west end, a bridge over Bear Creek is destroyed, and the Bear Creek Road bridge over the construction haul

road collapses, rendering both roads impassible. The liquefaction of soils on the ridge between Bear Creek and Bethel Valley makes entrance over the ridge treacherous and impossible for heavy emergency response and rescue equipment.

Fires break out, at least three kinds. The hydrogen fluoride breach sends a roiling cloud of hydrofluoric acid across the valley, peeling paint off cars, etching glass on contact, searing the lungs and blinding anyone found in its path. The criticality alarm in Building 9204-2E sounds approximately thirty-seven minutes after the first tremor, when an aftershock estimated at 4.3 magnitude occurs.

In the 9215 Complex, highly enriched uranium chips fall from a ruptured cylinder and ignite. Water from the now disabled fire suppression system begins to flood the floor, threatening a nuclear criticality.

Electrical towers crumple, and cell phone service is disrupted, throwing the Emergency Response Command Center into chaos. Command is transferred to facilities at K-25, several miles away, where visual access to conditions at Y-12 is impossible. Three drones are launched to attempt a visual survey of the valley, but clouds of smoke and the descent of evening make visuals impossible. No other criticality alarm sounds, but some emergency management personnel know the alarm system at 9215 is not seismically qualified, so the silence is not definitive.

In the city of Oak Ridge, the fire department and emergency response personnel are overwhelmed with calls from residents and alarms from hundreds of businesses. It is impossible in the moment to know which calls are emergencies and which are just malfunctioning equipment. Power lines are down across the city, a long crease of upturned earth split the city in two, South Illinois Avenue buckles, and the Oak Ridge Turnpike erupts near the federal building as half the road falls away, as if in a sinkhole, creating a six foot drop in both lanes.

Three and a half hours after the initial shock, shelter-in-place orders are issued for all of Oak Ridge, Knoxville, and all towns and communities within a fifty mile radius of Y-12.

White Oak Dam collapses, and along with it, Route 95 crumbles. Heavily contaminated waters from White Oak Lake are released, the flood overruns the weir at the end of the embayment area; radioactive and hazardous contaminants from more than sixty years ago are released into the Clinch River.

Across Scarboro Road, four huge cylinders of compressed natural gas, each the size of four tanker trucks, await the cloud of hydrofluoric acid that hugs the ground as it rolls down the valley. Six hours after the initial tremor, the first of the tanks erupts, followed in quick succession by the other three tanks. The fire gains speed as it spreads up the side of the hill overlooking Y-12 and begins to move toward the town.

For eighteen hours, fires burn at Y-12; it is impossible to know what contamination was carried off site in the smoke; later sampling will indicate that beryllium, vaporized mercury and uranium were among the contaminants deposited along the pathway of the plume.

East Fork Poplar Creek washes over the collapsed road and begins to chart a new course in the floodplain, avoiding impediments created by the earthquake. It now carries a new and

heavy burden of mercury released from the soils underneath the Alpha buildings.

The collapse of the Solway Bridge into the Clinch River/Melton Lake on Highway 162 eliminates a primary escape route for the people of Oak Ridge who are able to get into vehicles and attempt to escape the smoke and ash raining down on the town. Traffic diverting onto Edgemoor Road is stopped by the collapse of the bridge over Melton Lake; Melton Lake Drive is impassible because large sections have slid into the lake.

This kind of catastrophic event is unpleasant to contemplate, but it is precisely what NEPA requires and what the federal court has explained is necessary here.

Eight hours into the event, physicists from Oak Ridge National Lab warn of the possibility of a nuclear explosive event at the 9215 facility. “While we hope and believe it is highly unlikely, we can not guarantee that an explosion will not happen. If enough Highly Enriched Uranium accumulates in one spot under pressure and is then covered with water, which is a very effective neutron reflector, it could cause a reaction similar to the Little Boy bomb.”

Ten hours into the event, the Governor declares a state of emergency for East Tennessee and urges citizens who “are not under threat of smoke inhalation” to evacuate the area immediately. “If you can see smoke, stay inside,” says the Governor.

#### NOT JUST A GAME: THE MICHIGAN FLOOD OF MAY 2020

When the waters of the Tittabawassee River in Michigan reached 34 feet in 1986, ten feet above flood stage, experts declared it a 500-year flood event. It turned out to be a 34-year event. On May 19, 2020, it took 2.5 inches of rain, on top of the rain that had been falling over the past week, for the Tittabawassee to breach the Edenville Dam. Eighteen miles downstream, the town of Midland was at risk. That risk turned into reality when floodwaters reached 34.28 feet, ten feet above flood stage, and the Sanford Dam, a hydroelectric station, gave way. More than 10,000 people are evacuated as of this writing, and the other 30,000 residents around Midland on alert. The Dow Chemical plant, which has already spawned a Superfund site downstream, was placed on safe shutdown status with all but essential maintenance crews evacuated.

It was not an unimaginable scenario; concerns about the dam’s integrity were raised by federal officials in 1999; the dam was placed on the Federal Energy Regulatory Commissions list of “high hazard” dams, meaning its failure could damage property and threaten lives. The owner of the dams was cited for failure to maintain the spillways to relieve pressure on the structure, but the warnings went unheeded. Instead, the owner, Boyce Hydro, commissioned a study that, in 2018, put the odds of a “probable maximum flood” event in the next five to ten years at “5-10 in one million.”

This real-world-right-now example has lessons for us. First, it tells us that probability estimates are only guesses—they may be overestimates or underestimates or right on the mark. We don’t know until we know. Saying the probability of a design-basis earthquake event is 1 in 2,500 years means what? If the last big earthquake was in 2003, does it mean we are in the clear for 2,483 more years? Of course not—it means that computers have been fed data and experts have applied their judgment and come up with a number. Same data, same judgment applied to a weaker building and the guess is 1 in 500. When was the last earthquake of that size? Four hundred and ninety-seven years ago? Would that mean we

could be pretty sure of an ELP design-basis event in the next three years? Or thirty years? Clearly that is nonsense. The numbers, which reflect the data fed into the models, are intended to give a sense of assurance or a warning of danger; they are not predictive in any real-world way. The floods in Michigan show us—when the company wanted to justify continued operations, it fed its models data and it paid experts to opine, and it came up with 5-10 in a million. We know now what they had no way of knowing in 2018; the actual probability of such an event in the next two years was 1 in 1.

A second lesson is that warnings should be heeded. The Michigan flood, again, is a brilliant teacher. Twenty years ago warnings were issued; the dam was placed on a “high hazard” list; attempts were made to address the risks over the years. But no action was taken to compel changes, and the company, absent compelling pressure, did the math and it came out in their favor. It was not cost effective to take risk-reductive actions. So a dam built in 1924 was left to do what it had always done, weather whatever storms came its way. Except its capacity for weathering was deteriorating; its safety-valve spillways were not maintained, and the weather had a surprise coming. Compare this to the warnings delivered by members of the public at Los Alamos about the danger of wildfires. In public comments, it was suggested that a fire safety zone should be created to reduce the chance of catastrophic wildfires. The zone was created—although who could know when a major wildfire would threaten the lab? No one. But a lot of people understood it was quite possible to happen, and if it did, there were places it could not be allowed to go. In the end, the fires came, raging out of control, and the safety zone was later credited for keeping the fire from reaching Area G where thousands of barrels of plutonium laced waste were stored. Catastrophe averted, for now, because action was taken in the face of warnings.

A third lesson: some catastrophic events are discrete events, contained unto themselves. Some set a domino series of failures in motion. The failure of the Edenville Dam was not a direct threat to the Dow Chemical plant twenty miles away. But the failure of the Edenville Dam was the direct cause of the failure of the Sanford Dam, which did place the chemical plant in the path of the flood. Hopefully, the quick action of the plant operators to effect a safe shutdown will prevent spills or the spread of new contamination. But it cannot prevent the redistribution of dioxin laced sediments in the riverbed downstream from the plant. The impacts of the redistribution of contaminated sediments was set in motion by a chain of events that began decades before the flood of 2020, twenty miles away, and it required a specific series of events, a series most of us would consider unlikely, but very real nevertheless.

The Michigan flood story reminds us that natural disasters arrive with a force of their own, and they wreak havoc as they will. But reducing the risks and ultimately limiting the damage are not completely out of our control. They depend on making decisions when warnings are sounded and threats are recognized.

Weapons production activities in Bear Creek Valley over the past 70 years have set a table piled with risks upon risks. Buried wastes pose different kinds of risks, some of them very high. Decisions to abandon facilities and to defer maintenance, the unwavering choice to prioritize funding for production operations over cleanup and safety—all of these have contributed to a heightened risk in the event of a severe natural event. Warnings—the Oak Ridge Reservation was placed on the Superfund List thirty years ago, the Inspector General and the Safety Board have raised flags and issued reports, the public has been highlighting seismic concerns since 1993—have been treated primarily as irritants. Efforts to compel

cleanup by regulators have seen modest, intermittent success—timelines and cleanup strategies are talked through, but actual cleanup at active sites like Y-12 has been modest at best. More than thirty years after the disclosure of mercury releases, DOE is only now constructing a mercury treatment center to attempt to limit the off-site transport of mercury. As DOE's Inspector General pointed out, high risks remain because of conscious decisions made to prioritize mission operations and new construction. Each year a small budget decision is made to defer funding until next year—but the small decisions eventually become a big one. In the decade since the Alpha-5 building was determined to be a serious hazard, billions of dollars have been spent at Y-12 and the NNSA has failed to direct even a tiny percentage of that money to work (and jobs!) that would reduce or eliminate the risk of the catastrophe waiting to happen.

This is why Y-12 needs a Site-Wide Environmental Impact Statement rather than a narrowly targeted SA aimed at minimizing risks and hazards and placating a court, an analysis whose main purpose is to justify new programs and expensive new construction. The 2020 Supplement Analysis says what it says on paper, but the underlying message is “safety be damned; we'll do as we please and no one can stop us.” How else to interpret their continued implementation, sans proper NEPA documentation, of the enriched uranium plan? How else to account for their creation of a new NEPA category—on an “interim basis”—that thumbs its nose at NEPA's requirement that agency actions may not prejudice the outcome of decisions yet-to-be-made? How else to explain the investment in concrete of hundreds of millions of dollars—irretrievable resources in NEPA terminology—two full years before completion of the studies needed to provide the necessary data to prepare a valid and credible assessment of the impact and consequences of a massive earthquake in Bear Creek Valley?

NEPA's purpose is not the creation of paperwork. Although an agency is not compelled to take the path of least impact, it is required to subject its findings to public scrutiny, to take seriously the response of the public, and to demonstrate that it has taken that comment into account. NEPA imagines that transparency and disclosure will prevent an agency from undertaking dangerous activities. That expectation may be misplaced in a company town, like NNSA's weapons communities, where the economic impact often overrides other considerations, and where concerns about security clearances (employability) often inhibit full involvement by the public. Nevertheless, NEPA structures a chronology of decision-making that requires patience and compliance—the pay-off is decisions that have broad support, have been looked at hard and thought out thoroughly, and are likely to produce better outcomes.

Those better outcomes are not what we are getting if the current SA is allowed to wipe away the legitimate concerns arising from the hybrid plan, and to pretend that the ten-year-old Site-Wide Environmental Impact Statement is sufficient to respond to public concerns. We have learned a lot in the last ten years, and things have changed on the ground at Y-12. This should be taken into account—any NEPA document prepared now should be integrating the current state of knowledge and activity, contemplating the enriched uranium plan in the context of the entire site, including risks and consequence estimates. To do otherwise is to take NEPA out of the real environment; it is as though the design-basis accident event is being played out on a scale model in a sterile conference room rather than in the messy and very dirty world that is Bear Creek Valley.

## A MODEST PROPOSAL: PRIORITIZE SAFETY/PRESERVE MISSION CAPACITY

The accident event analyzed in the SA provides information in cold numbers. Those numbers are unable to capture the totality of the catastrophe occasioned by an earthquake. And they don't try—they just reflect the estimated impact of radiologic releases on human beings from an earthquake that shakes only the UPF and the ELP facilities. Even at that, they downplay risks.

The public does not know what kinds of scenarios NNSA roleplays in their security exercises, but if they are realistic, the kind of scene described above has already been acted out, sans danger, and NNSA understands the almost incalculable level of danger and disruption.

It does not have to be. NNSA could, in its Site Wide EIS, consider an alternative not heretofore considered: a Maximum Risk Reduction/Mission Capacity Preservation Alternative. This alternative would prioritize eliminating legacy threats to workers, the public, the environment, and even NNSA's mission capabilities by fully funding the decontamination, decommissioning, and demolition of excess (no longer used) facilities. It would prioritize high risk facilities, including those in the high security/production areas. If necessary, production operations would be halted and maintained in a secure standby to allow remediation to take place. This activity would not harm US national security, despite NNSA's claims. It would simply shift the calendar of activities, none of which are being undertaken on an urgent basis. We have and would continue to have 4,500 thermonuclear weapons of mass destruction deployed or stored in a safe, secure, reliable, ready-to-use state.

The Maximum Risk Reduction/Mission Capacity Preservation Alternative would be built on a thorough and complete understanding of the reliability of ELP facilities—most likely, when actual on-the-ground evaluations were concluded at the end of 2021, the facilities would be moved into cold standby and plans for replacing those operations would begin.

Reducing materials at risk would prioritize not just relocating materials, but advancing them toward their final disposition—or at least toward long-term storage in the HEUMF. To that end, Y-12 would invest in a dedicated dismantlement facility, built to withstand maximum predicted seismic events.

Considering the Maximum Risk Reduction/Mission Capacity Preservation Alternative would include suspension of construction at the UPF; NEPA does not contemplate or countenance activities on an "interim basis." This might require a slight expansion of Y-12's mission to include not only weapons production schedules but also a commitment to worker, public and environmental safety and health—as co-equal missions, equally worthy of funding.

It may be difficult for NNSA to imagine a safety stand down, but it is not unprecedented. In 1994, when the Department of Energy discovered 1,377 criticality safety violations or non-conformances at Y-12, then under the management of Lockheed Martin, the plant was placed on a standby status while workers were retrained and safety issues were addressed and resolved; special protocols were put in place to support minimal work required for required stockpile stewardship and maintenance activities and to support work at Pantex in order to avoid a backup there. Over the next four years, various operations came back on line, one at a time; the 2001 SWEIS states that even then some EU mission operations were

had not returned to full capacity operations. Clearly, everything is safe until the moment it isn't, and everything is an urgent national security requirement until the moment it isn't.

NNSA can be expected to argue that its national security mission cannot be interrupted by safety concerns. But NNSA should be reminded of the lesson of Rocky Flats. The mission there—the production of plutonium pits for nuclear weapons—was considered sacrosanct up until the minute it wasn't, when federal agents conducted a raid and the plant was closed. Failure to act earlier, to exercise authority over a renegade contractor, and to prioritize responsible environmental behavior, coupled with intolerance of short-term interruptions to production operations led to long-term loss of mission capabilities and the permanent closure of the Rocky Flats facility.

Even then, remarkably, the nation's nuclear stockpile and its ability to project a deterrent force has endured for more than thirty years without the capacity for full scale production of plutonium pits; the essential Rocky Flats mission turned out not to be essential at all. In fact, it will be at least ten more years before the United States again has the capacity for full-scale production of plutonium pits, if even then. Still, the stockpile is secure, reliable, and its projection of a deterrent threat undiminished.

NNSA is not required to adopt a Maximum Risk Reduction/Mission Capacity Preservation Alternative, but since it is a reasonable alternative and could be crafted to permit limited national security activities for the maintenance of a safe and secure stockpile, and since there is precedent in the recent past, and since the alternative provides considerable long-term safety and mission reliability benefits, it should be considered in a Supplement to the 2011 Site-Wide Environmental Impact Statement or a new SWEIS.

Submitted 26 May 2020  
Ralph Hutchison, coordinator  
Oak Ridge Environmental Peace Alliance  
P O Box 5743  
Oak Ridge, TN 37831  
orep@earthlink.net

Attachments:

Comments of Dr. David D. Jackson, Distinguished Professor Emeritus, University of California Los Angeles

DNFSB letter to Secretary of Energy re: criticality safety deficiencies at Y-12, July 2019

DNFSB Weekly Resident Inspector's Report, April 10, 2020

DNFSB Weekly Resident Inspector's Report, April 17, 2020

NNSA letter to Consolidated Nuclear Services, Preliminary Notice of Violation, April 8, 2020