January 15, 2014

Memo to Moira Maloney, DOE & Lee Gordon, NYSERDA

From Barbara Warren, Citizens' Environmental Coalition; Diane D'Arrigo, Nuclear Information and Resource Service; and Joanne Hameister, Coalition on West Valley Nuclear Waste

Re: Erosion and Exhumation Working Group Reports

With this memo, we are addressing the Erosion and Exhumation Working Group reports and presentations. We request that these comments be forwarded to the working group and the Scientific Panel (ISP) members.

Overarching Comment on Studies

Scientific truth and integrity are critical to all of the studies undertaken at West Valley and by the expert panels. It is not possible for this work to have a credible foundation when it is guided by the sole goal of the Agencies – to reach Agency consensus between DOE and NYSERDA. Agency consensus could mean that poorly considered agency administrative and budget concerns can trump environmental and public health protections, as well as scientific fact.

The scientific panel (ISP)in a Jan. 2, 2013 letter addressed the consensus goal saying that consensus may be a consequence of achieving the main objective, rather than being the objective itself. As a result, the ISP recommended carefully articulating the main objective as this would avoid wasting time and resources on unproductive areas.

It also seems that the Agencies have not endeavored to address the points that the scientific panel made concerning the Data Quality objectives. Instead of carefully articulating the objectives and scope of the studies planned, the Agencies and the subject matter teams are not responding appropriately to the input of the ISP or to that of the public.

We are stalled and not making sufficient progress in the study process.

A. Erosion Working Group

1. The Public asked key questions at the meeting: What is your worst-case scenario for erosion at West Valley ? Alternatively, if more than one, what are they?

Several versions of these questions were asked by the public including ones that incorporated the problem and uncertainties associated with climate change impacts such as abrupt excusionary events. Reference also was made to the extreme rainfall and flooding experienced recently in Boulder, Colorado and the region. One person said the assumptions used should be stated clearly as well as the outcomes and multiple persons spoke on worse case scenarios. Incredibly, the Erosion team representatives had not evaluated worst-case scenarios.

Rare events have the greatest potential to cause catastrophic loss of containment of radioactive materials at this site with steep slopes and highly erodible soil. It is essential that this group develop and consider its worst-case scenarios. This is not optional.

2. The Erosion report appears to focus on slow, uniform and long term erosive processes and fails to include adequate consideration of sudden, acute or severe events.

We are dealing with a very high hazard situation with hundreds of thousands of curies of radioactive materials that could be released to the Great Lakes, affecting the drinking water of millions of people and a critically important natural resource.

3. We are dealing with a situation in which there are NO defensible erosion models that can predict accurately the future, particularly over long time periods.

This definition is provided by Wikipedia on "Erosion Prediction": "Because there is a wide discrepancy between predicted and observed erosion rates, models are better as research tools than as public policy and regulatory instruments or for prescriptive design measures for constructed landforms. But some models may provide useful guidance for the design engineer if adequately calibrated and verified for local conditions and if the design accounts for the uncertainty."

Note the last sentence – "some models may provide useful guidance **IF**:

Adequately calibrated and
Verified for local conditions and
Uncertainty is accounted for.

Key points in the Scientific Panel's (ISP) Jan. 2, 2013 letter have also not been addressed. In their letter, the scientific panel noted that the study recommendations should discuss the ability of the CHILD model to address the erosion threat over long time periods, thousands to millions of years. The erosion workgroup must compare a performance objective that specifies long term containment of long-lived radionuclides with rigid consideration of the uncertainty associated with existing models.

The scientific panel indicated that the uncertainty over the time periods necessary may be irreducible and unacceptable, regardless of contributions from additional studies. The panel recommended a data quality objective approach of identifying the questions that need to be answered with the level of precision and accuracy necessary before any studies begin. The public has talked about this as improving the scope of work for the studies.

4. It is difficult, if not impossible, to separate the erosion analysis from other related work that is now assigned to other workgroups, but has not been launched-- slope stability and slope failure, seismic hazard and catastrophic release of contamination.

It is important to construct a whole picture of the problem that needs to be analyzed and identify all the relevant questions. We are very concerned about the piecemeal approach thus far. In the end, all of the individual pieces must be assembled into a coherent whole.

What has been needed from the outset is a comprehensive timeline that addresses the integration of the work of all the related Study workgroups including the expected start and completion dates.

5. The interface of climate change to severe weather events and erosion needs to be thoroughly studied. This interface contributes a significant measure of uncertainty. The preparation of a Climate Adaptation Plan for West Valley is essential and must begin now.

Climate Change is expected to have significant impacts in the United States. Scientists and many public officials at all levels of government have acknowledged that it is to late to halt climate change even though efforts are underway to mitigate or lessen the impacts of climate change by reducing greenhouse gas emissions. As a result a substantial amount of effort is being undertaken at the local level to anticipate and prepare for the impacts of climate change, especially by preparing Adaptation Plans. Coastal communities are preparing adaptation plans to address rising sea levels. At West Valley extreme weather events are likely to exacerbate erosion at the vulnerable West Valley facility. Under the President's Executive Order, federal agencies must prepare for and plan adaptation measures -- specifically as related to particular agency missions, infrastructure and responsibilities. Assessing vulnerabilities to climate change and preparing an adaptation plan for the vulnerable nuclear waste facility at West Valley is exactly the purpose of the President's EO. See highlighted portions of the Executive Order attached. Included in the federal mandate is the requirement of working with state and local partners, and other organizations on adaptation planning.

Mitigation is absolutely necessary to reduce greenhouse gas emissions. **Adaptation** is also necessary to prepare for and avoid the worst impacts of climate change on the most vulnerable facilities and populations.

6. Real world data collection should be maximized.

Detailed evaluation of the August 2009 extreme rainfall event and the real world erosion outcomes on the West Valley site should be done as it will yield information grounded by reality. Other regionalexcursionary weather events should also be utilized to gain additional information on local site- specific impacts.

The 2009 event was, by no means, the maximum event possible for the Cattaraugus Creek watershed. For example, according to records of The Pennsylvania State Climatologist (a service of Penn State University): "On July 17, 1942, a great flood developed over the Smethport area, resulting in an estimated 34.50" of rain--in just one day, including 30.60" in only six hours, setting a world record. The official observing site, Smethport Highway Shed, reported only

13.08" for the entire month, because the flood consumed the guage [sic] after 6.68" of rain. The total results from the substitution of the official estimated amount for the amount measured.

B. Exhumation Working Group

1. Complete waste removal is supposed to be considered. This working group is supposed to assess both partial and complete waste removal, however most of the questions listed on p. 1 of the November 2013 document relate to selective removal of contamination.

We recommend returning to the original scope for the workgroup:

- Alternate approaches for, costs of, and risks associated with complete waste and tank exhumation.
- Viability, cost and benefit of partial exhumation of waste and removal of contamination.
- Exhumation uncertainties and benefit of pilot exhumation activities.

We submitted earlier comments on the scope of work for this workgroup, which were not accepted. Now we see that both agencies and the study team are ignoring the outline of the Agency scope of work. Given the questions on p. 1, how can the workgroup ever address complete waste and tank exhumation?

Based on the Agency's own outline for the areas of study, the subject matter expert team must examine complete waste and tank exhumation, not just partial or selective removal.

There are obvious relationships between the work of the erosion workgroup and the work of the exhumation workgroup. If the erosion uncertainties are large and containment of radionuclide inventories cannot be guaranteed, then complete exhumation is essential.

2. The basis of the order or sequence of the planned studies is not logical and should be reconsidered. We recommend that Study #3 be conducted first with important additions.

A Literature review is frequently done at the beginning of a study. Here it is proposed to be done as Study #3 after extensive work in Study 1 & 2.

Study 3 will be looking at work done at other nuclear waste sites. Study 3 is the one with the most importance to the gathering of essential information necessary for all other aspects of the work by the exhumation team. Beginning with a literature search and subsequent interviews and investigation the team will evaluate state of the art exhumation and treatment technologies, methods of protecting workers, the public and the environment, lessons learned at other sites, special problems encountered and what uncertainties are important. Previous exhumation work done at West Valley should also be evaluated. A detailed report of the West Valley exhumation

activity at the NDA(1986) to remove kerosene and plutonium waste should be made available to this workgroup and to the public.

Important additions to Study 3 would be to gather information about potential investigation methods and intrusive and non-intrusive techniques (rather than in Study 2).

We also believe that the review of other exhumation work has the potential to yield information about the accuracy of predicted radionuclide inventories in comparison to actual inventories found as a result of exhumation. This could be more fruitful than increasing the generation of more uncertainty as planned in Study 1 & 2.

We recommend that Study 3 be moved to first place and that a report be produced for the Agencies and the public about everything that was learned and its relevance to West Valley.

3. The report should also plan next steps by preparing a qualitative (descriptive) assessment of the existing information pertaining to the radionuclide inventories and identification of the expected sources of uncertainty and their likely magnitude based on professional judgment.

Careful evaluation of the existing inventories and a descriptive assessment of the uncertainties is more useful than performing another complicated calculation on the inventory by updating the inventory -- which can introduce additional uncertainties. Failure to evaluate the uncertainties and fully describe them could lead to significant errors in subsequent quantitative analyses.

Next steps should also include goals and objectives for the work and a clear decision tree. Further statistical analysis or quantitative assessments should only be done if they are deemed to provide useful information. The ISP recommended a data quality objective approach of identifying the questions that need to be answered with the level of precision and accuracy necessary before any studies begin. This point needs to be addressed before proceeding with extensive statistical analysis. The consensus goal is continually cited with little description and no technical support for its use. On p. 7 some sort of bizarre decision-tree is advanced with consensus inserted in addition to cost-reasonableness. No description of these two goals and how they would be used here is provided.

A qualitative assessment should also endeavor to identify all hidden or unstated Agency assumptions that may underlie the notion that successful containment of radionuclides can be achieved over thousands of years in degrading containers in an unlined dump on an erosion prone plateau. The studies should be designed to separate unsupported beliefs from scientific facts.

4. The benefits of pilot exhumations are supposed to be explored according to the scope.

Pilot exhumations can be used to:

- test the accuracy of radionuclide inventory estimates
- evaluate several different methods of safely accomplishing exhumation
- assess the spread of contamination from the unlined disposal facility

Given the high value of such real world information, too little emphasis is placed on evaluating and planning for pilot exhumations. Instead, the Agencies' seven questions bias the direction of the inquiry away from pilot exhumations.

5. The Exhumation workgroup should be commended for identifying the significance of landslides to the integrity of the SDA and NDA disposal areas and as an underlying purpose for the exhumation analysis.

We agree that landslides should be a study item, but unfortunately the Agencies have not included this topic as part of the Erosion workgroup and have also not assigned this topic to another workgroup. The Agencies need to address this unassigned subject area in the near future.

Two enclosures:
Portions of the President's Executive Order related to preparing for the Impacts of Climate Change (enclosed below)
Scientific Panel Letter 1-2-13 (separate attachment)

Selected Portions of Executive Order only

Released November 01, 2013

Executive Order -- Preparing the United States for the Impacts of Climate Change

EXECUTIVE ORDER

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PREPARING THE UNITED STATES FOR THE IMPACTS OF CLIMATE CHANGE

By the authority vested in me as President by the Constitution and the laws of the United States of America, and in order to prepare the Nation for the impacts of climate change by undertaking actions to enhance climate preparedness and resilience, it is hereby ordered as follows:

Section 1. Policy. The impacts of climate change -- including an increase in prolonged periods of excessively high temperatures, more heavy downpours, an increase in wildfires, more severe droughts, permafrost thawing, ocean acidification, and sea-level rise -- are already affecting communities, natural resources, ecosystems, economies, and public health across the Nation. These impacts are often most significant for communities that already face economic or health-related challenges, and for species and habitats that are already facing other pressures. Managing these risks requires deliberate preparation, close cooperation, and coordinated planning by the Federal Government, as well as by stakeholders, to facilitate Federal, State, local, tribal, private-sector, and nonprofit-sector efforts to improve climate preparedness and resilience; help safeguard our economy, infrastructure, environment, and natural resources; and provide for the continuity of executive department and agency (agency) operations, services, and programs.

A foundation for coordinated action on climate change preparedness and resilience across the Federal Government was established by Executive Order 13514 of October 5, 2009 (Federal Leadership in Environmental, Energy, and Economic Performance), and the Interagency Climate Change Adaptation Task Force led by the Council on Environmental Quality (CEQ), the Office of Science and Technology Policy (OSTP), and the National Oceanic and Atmospheric Administration (NOAA). In addition, through the U.S. Global Change Research Program (USGCRP), established by section 103 of the Global Change Research Act of 1990 (15 U.S.C. 2933), and agency programs and activities, the Federal Government will continue to support scientific research, observational capabilities, and assessments necessary to improve our understanding of and response to climate change and its impacts on the Nation. .....

Sec. 5. Federal Agency Planning for Climate Change Related Risk. (a) Consistent with Executive Order 13514, agencies have developed Agency Adaptation Plans and provided them to CEQ and OMB. These plans evaluate the most significant climate change related risks to, and vulnerabilities in, agency operations and missions in both the short and long term, and outline actions that agencies will take to manage these risks and vulnerabilities. Building on these efforts, each agency shall develop or continue to develop, implement, and update comprehensive plans that integrate consideration of climate change into agency operations and overall mission objectives and submit those plans to CEQ and OMB for review. Each Agency Adaptation Plan shall include:

(i) identification and assessment of climate change related impacts on and risks to the agency's ability to accomplish its missions, operations, and programs;

(ii) a description of programs, policies, and plans the agency has already put in place, as well as additional actions the agency will take, to manage climate risks in the near term and build resilience in the short and long term;

(iii) a description of how any climate change related risk identified pursuant to paragraph (i) of this subsection that is deemed so significant that it impairs an agency's statutory mission or operation will be addressed, including through the agency's existing reporting requirements;

(iv) a description of how the agency will consider the need to improve climate adaptation and resilience, including the costs and benefits of such improvement, with respect to agency suppliers, supply chain, real property investments, and capital equipment purchases such as updating agency policies for leasing, building upgrades, relocation of existing facilities and equipment, and construction of new facilities; and

(v) a description of how the agency will contribute to coordinated interagency efforts to support climate preparedness and resilience at all levels of government, including collaborative work across agencies' regional offices and hubs, and through coordinated development of information, data, and tools, consistent with section 4 of this order.

(b) Agencies will report on progress made on their Adaptation Plans, as well as any updates made to the plans, through the annual Strategic Sustainability Performance Plan process. Agencies shall regularly update their Adaptation Plans, completing the first update within 120 days of the date of this order, with additional regular updates thereafter due not later than 1 year after the publication of each quadrennial National Climate Assessment report required by section 106 of the Global Change Research Act of 1990 (15 U.S.C. 2936).