

Center for Health, Environment & Justice* Citizens' Environmental Coalition* Coalition on West Valley Nuclear Wastes* Concerned Citizens of Cattaraugus County* Environmental Justice Action Group of Western NY, Inc. * New York Public Interest Research Group* Niagara Watershed Alliance* Nuclear Information and Resource Service* Sierra Club Niagara Group* Alliance for a Green Economy

September 6, 2012

Memo to Lee Gordon, NYSERDA, LMG@nyserda.org and Moira Maloney, US DOE, moira.maloney@wv.doe.gov

Re: The Subject Matter Expert Panel on Erosion Report & Recommendations

Background on the Present situation

During the EIS, the Agencies supported a Phased- approach, maintaining they needed to complete many studies before they could make a final decision about the major facilities at the site -- the high level waste tanks, and two disposal areas. They argued that they wanted to move forward with the clean-up of the site, while completing the additional studies. The major contamination that would be excavated under Phase I was the source area of the Strontium plume. Phase I studies were alluded to in the EIS, but not presented in any kind of specificity and/or detail. As a result, the public sought and obtained commitments from both Agencies for meaningful public participation in Phase I. That has turned out not to be the case.

No modifications to the guidance issued by the Agencies for Phase I were ever made. While two public access improvements have been made - a website and use of WebEx - the Agencies have continued to operate as the sole decision-makers regarding what information they will present or discuss with the public. The public is not allowed to be present for the scientific deliberations and scientists, as a provision of their contract, were/are constrained from talking to members of the public.

Some recent examples of the problem include:

- There has been no discussion of public recommendations for additional Phase I studies, since they were made in March of 2011. The Agencies said they would refer these recommendations to the scientific panel, but there has been no response for over one year, despite our reminders of this outstanding issue. Instead, the Agencies have chosen their own priorities for Phase I and are proceeding to form study teams.
- A major letter from the public regarding the importance of public participation was responded to in a very offhand manner. The issue was the significance and usefulness of public participation. Rather than working to improve public participation related to information content, discussions and decisions, the Agencies merely chose to dismiss the ideas presented and indicated they would proceed as they have been.

- Agencies committed to receiving public input on study areas and conveying this information to the scientific panels. However, at the August Quarterly meeting we learned that at least 2 sets of public comments on the scope of work had not been delivered to the erosion panel. (Ray Vaughan's and Barbara Warren's, but there could be others.) The contractor serving as coordinator of this panel, Mike Wolff, had not even seen the comments. It also should be noted that the Agencies provided a very vague scope of work.
- The Strontium plume was a key rationale for proceeding with a phased approach rather than committing to a complete cleanup at West Valley, in order for some work to proceed while doing additional studies. The Agencies did not inform the public that they were making a major change related to Phase I site work. The major contract issued - for close to \$500 million - will not even undertake the planning work for the excavation of the source area of the plume. This significant delay means that the work might not start for 12 or more years, thereby allowing this contamination to spread even further.

The US EPA (letter, September 1,2009 to Bryan Bower, US DOE) stated that the level of protection needed for some wastes on the site is equivalent to that for spent nuclear fuel and high level waste, and referenced the only precedent as the standard mandated by Congress in the Energy Policy Act of 1992 for the Yucca Mountain repository. The absence of a national permanent repository means that planning for the successful containment of radiation at site facilities must go beyond 10,000 years to 1 million years.

As members of the involved and interested public, we object to the Phase I process, as constructed and carried out by the Agencies. Trust has been broken and, as a consequence, we have little confidence in the eventual outcome. We have objected to the Phase I process and its goal: Consensus between the Agencies. Both of the principal agencies also are responsible parties for the existing contamination, so consensus (lowest common denominator of agreement) of the agencies is not a goal we can support.

In contrast, our highest goal is environmental and public health protection for many future generations. We believe this requires complete cleanup and permanent removal of radioactivity from the site. The permanent containment of long-lived radioactivity appears to be impossible at the West Valley site, which should never have been chosen for highly hazardous operations and waste storage.

Finally, the public unanimously supported excavation of buried waste and full clean-up at West Valley during the EIS process. Despite thousands of comments supporting this alternative, the Agencies proceeded with the Phased Alternative, making only one single change in the EIS. The current Phase I process is illegitimate and we do not consent to it. We also do not consent to the current lengthy delays in the guise of "cleaning up" the West Valley site.

We remain concerned that the science behind landscape evolution models remains "not mature enough to justify relying on these models to provide long-term predictions of erosional processes..." (Forward to EIS, NYSERDA's view, 1.) We need protection from long lived radioactivity and, since erosion models cannot provide sufficient assurance over the very long term future, one million years, we need to operate under the precautionary principle-- excavating and fully cleaning up the West Valley site.

Attached are our March 2011 recommendations for Additional Phase I studies and specific comments on the Report of the Erosion Panel. Some of the additional study recommendations are directly relevant to the erosion and exhumation and engineered barriers panels.

Under separate cover, we will submit our comments on the Climate Change Workshop.

Recommended Additions to Phase I Study List:

¹ From: March 24, 2011 letter to DOE and NYSERDA from 7 organizations

- During the EIS process, DOE claimed it did not have enough data to make a full cleanup decision, so collectively the studies must provide enough scientific information to help us make a decision about exhumation.
- Real actual pilot exhumation of waste, not a paper exercise
- Climate change and severe weather events could impact items a-d in unusual ways. Climate change was assumed not to occur for 10,000 years in the recent EIS. Studies need to make up for this notable deficiency during Phase I.
- Emergency Preparedness, Prevention and Response are subjects very important to public involvement, trust and protection of the public from harm. Clear and defensible plans must be developed around likely emergencies at this site. This is a study with an immediate activity—and implementation at the site.
- Characterizing site contamination, sampling and analyses must evaluate adequately major site facilities-- High Level Waste (HLW) tanks, Nuclear Regulatory Commission Disposal Area (NDA) and State Disposal Area (SDA)-- and associated contamination issues. If phase I studies are not now planned to address these facilities, this needs to be corrected.
- Improved long-term analysis of all factors that impact containment of site radioactive materials and improved exposure and dose assumptions. Costs of Cleanup Delays. Costs of early cleanup of the spill associated with the strontium plume versus ultimate actual costs of planned cleanup and long term maintenance, including useful life and replacement of permeable treatment wall.
- Analysis of the efforts needed to adequately protect the Sole Source aquifer
- Better characterization of sediment in creeks and movement of contamination off site, particularly via the Cattaraugus Creek and impacts to the Seneca nation territory.
- More realistic estimate of long term containment costs vs. early exhumation of buried wastes
- Analysis of achieving regulatory compliance with all relevant standards including 40 CRF 191.
- All modeling must be grounded using real, on-site conditions as input parameters. We need to understand the basic conceptual models and ensure that they represent likely future conditions.
- Modeling of Groundwater and contaminant transport. The significance of subsurface contamination must be better accounted for in relation to risks to the public.
- Steps or methods in developing exposure, dose scenarios and derived concentration guideline level values for radionuclides (DCGLs) must be fully described for public understanding and all assumptions documented, to support the claim that conservative assumptions have been used.
- All radionuclides and daughter products should be included in risk estimates.
- Drinking water must be given greater importance in exposure and dose scenarios.
- The lack of conservatism in analyses thus far and the underprediction of actual and future risks is a major public concern. For example we don't believe assuming zero erosion or basing risk analysis only on existing contamination are conservative assumptions.

Sincerely,

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cc. Bryan Bower, Paul Bembia, Bill Logue, Lynette Bennett and Dhananjay Rawal

Comments on the Erosion Panel Report & Recommendations

The analysis contained in the FEIS was severely and thoroughly assailed scientifically, and was not viewed as scientifically defensible.

Given the fundamental flaws in the original erosion analysis, it is extremely difficult to see how defensible analyses can be built on the previous work. We do not believe it is possible to ignore these earlier major criticisms and just proceed to fill data gaps in the earlier EIS and reduce uncertainty. We believe the Agencies should make plans to fully dig up and remove all buried radioactive waste NOW.

However, it is apparent to us that the Agencies will proceed with more studies on erosion, no matter what we say. As a result, we are submitting our views.

Scope of Work

The scope of work provided to the erosion panel by the Agencies was uninformative regarding the specific issues of relevance: the geological situation at the site, rapid erosion processes and the unique nature of the long term hazard. It also failed to describe how the erosion panel would be working with related workgroups, such as exhumation, engineered barriers and climate change. Other site work such as the data collection under the Characterization, Sampling and Analysis Plan might also inform the erosion work or avoid duplication of effort. The absence of a detailed plan for any scientific endeavor is a cause for concern, as it opens the door for altering the science to fit the conclusion some parties may seek. Given the weakness of the scope of work and the commitment of the Agencies to serving as a liaison for us with the scientific experts, it was disturbing for us to learn that the expert panel was not provided with the public recommendations for the erosion scope of work.

For example, the following is from a memo provided to the Agencies by Barbara Warren:

" The Erosion topic should include foundation stability of the site.

I think a critical time for public input is at the beginning when the issue is being framed. Rather than just throw experts in the room, each with a particular specific background, I think it is best to frame the issue with a set of questions. Joanne Hameister has also referred to this as scoping.

What are the questions that we are trying to answer?

For me, the questions begin with: Is it possible at this site, given known conditions and natural processes, for radioactive materials to be safely stored and contained over the long term, so that radioactive materials are not distributed in the environment and resulting in public exposure? Who and what are we trying to protect?

Could human activities exacerbate the situation or successfully control it?

The long term picture was not adequately analyzed in the EIS. NYSERDA criticized the absence of a long term analysis. The Full Cost Accounting study partly addressed the long term and found that it would be safer and cheaper to dig up and remove all radioactive material from the site.

What is the geologic stability for this site? There are two different types of events that need study—sudden, dramatic erosion events, like landslides and slower but inexorable progression of erosion that overtime results in the release of radioactive materials if not actively controlled.

What natural processes could exert a dramatic change in site stability and threaten to release radioactivity? Two immediately come to mind: seismic events and severe weather events. Climate change will increase the magnitude and frequency of severe weather events.

What human induced activities could affect site stability or erosion? Here, for example, the excavation, the demolition, the hydraulic barrier or groundwater flow problems could result in a deep fissure, collecting water and causing ground saturation and lateral movement—a potential landslide.

Worst case single events as well as multiple interacting events should be considered as potential scenarios.

If full removal of radioactive materials is not undertaken, what engineering controls will be needed and what will it cost? How likely is it that adequate funding will be made available over the long term? And in the event of an emergency situation? "

END of Memo

Additional Considerations

We expected that the most obvious questions would be answered in the report including:

What is the time frame that will be examined for the analysis?

What physical conditions will be included in modeling – probable maximum precipitation, widespread flooding, etc. ?

How will climate change and its effects be addressed?

While the experts addressed the studies they want to perform, we need a better discussion of the reason for all this analysis. In other words, adequate framing of erosion must be connected to the site hazard. The performance objective for the site must be permanent containment of radioactivity for a million years. We do not have objective, defensible long-term performance data on temporary containment materials, such as concrete, grout, even stainless steel. The enormity of uncertainty risks associated with long term stewardship includes continuity of government(s), regulations, even language, and these must be dealt with on behalf of future generations.

A critical factor not evaluated as part of the EIS was climate change. The assumption for the analysis was that climate change simply would not occur for 10,000 years. Climate change is already occurring with dramatic effects. Phase I must study the effects of climate change, particularly on erosion. There should be a plan for integrating climate change impacts and erosion as well as dealing with the uncertainties for both in these recommendations. Separate comments are being sent to the Agencies on Climate change.

A detailed plan is essential before the study and data collection, so that findings are not altered to fit the conclusions Agencies seek.

We support the inclusion of other significant work for the review by the expert panel, particularly "The Real Costs of Cleaning Up Nuclear Waste: A Full Cost Accounting of Cleanup Options for the West Valley Nuclear Waste site" and NYSERDA's Independent Review Team Report.

We wish to reiterate and consolidate a few of the essential points from the NYSERDA View in the Foreword to the Environmental Impact Statement. To that end we are listing them and providing some comments. *Our comments/questions are in italics.*

1. The Draft EIS Analysis of Soil Erosion Over the Long Term is Not Scientifically Defensible and Should Not be used for Long-term Decision-making

- a. There was a serious disconnect between model parameters and site characteristics, which resulted in highly questionable assumptions in the assignment of model variables.
- b. There was no verification or validation by comparing model output to actual field data. Without field verification, models may report erroneous or aberrant results.
- c. Many of the model components were unjustifiable and unsupported by current scientific evidence.
- d. No rigorous uncertainty analysis was provided. The bounds of uncertainty are expected to be very large (orders of magnitude).

The expert team made the strong point that “the science behind landscape models is not mature enough to justify relying on these models to provide long term predictions of erosional processes.” Lastly NYSERDA emphasizes that erosion modeling results are essential to making predictions of radiation doses and analyzing other site impacts. **Therefore unless a scientifically supportable erosion analysis is achievable future long term decision-making will have to focus on actions not dependent on erosion modeling.** *Is a scientifically supportable erosion analysis for the long term, even for 100,000 years, achievable?*

2. Questions were also raised about the modeling of groundwater flow in the NYSERDA View, although these primarily relate to contaminant transport. *For the purposes of the erosion analysis we would like to see discussion and analysis of the ways groundwater flow could impact erosion. (For example, climate change will increase rainfall which would increase groundwater quantities in relation to soil and its holding capacity.)*

3. The Draft EIS Assumptions used for the Performance of Engineered Barriers have not been Substantiated and may be Overly Optimistic. *While we understand that there is a separate expert panel that will focus on engineered barriers, it is not clear how the work can be done without the results of the erosion analysis.*

4. The Uncertainties in the Draft EIS Long- Term Performance Analyses are not Adequately Presented or Discussed. *Erosion, along with underground migration through sand strata and fissures and cracks, is the primary site factor that influences the long-term performance of radioactive containment. It is not clear from the erosion draft study proposal that the planned studies will address the long term at all. Under Section 3.3 there is discussion of identifying current rates of erosion/deposition and projecting rates for the near term-- the next 10-20 years. There is no discussion in the draft proposal related to the essential performance objective-- containment of long-lived radioactivity over the long term.*

The transparency of methodology is essential. Without transparency, independent reviewers cannot understand fully what DOE did to arrive at its conclusions. For example, a close review by the NYSERDA Independent Expert Review Team (IERT) was done of how DOE used

STOMP modeling to assess groundwater flow. The IERT review noted that DOE did not use the modeling capabilities of the STOMP model and instead computed some results by hand based on their own idea. Obviously, this is a highly questionable practice and we need to understand that erosion models are used appropriately.

It is critically important for this expert panel to understand exactly what was done by DOE to come up with the erosion analysis contained in the FEIS.

The scientists on the erosion panel will be studying issues in their field of expertise, however, they must be fully cognizant of the nature of the hazards at this site and the radiological risks that we must protect the public from over the long term.

For example, the NRC Disposal area is described in the Decommissioning Plan for Phase I (p.2-44 to 2-45) as follows:

Prior to 1972, the NDA was used exclusively for the disposal of highly radioactive solid wastes generated by the reprocessing plant. Wastes routinely buried in the area included spent fuel hulls, fuel assembly hardware, failed process vessels and large equipment, degraded process solvent absorbed on suitable solid medium, and miscellaneous packaged trash including laboratory wastes, small equipment, ventilation filters, and other process-related debris.

Also buried in the NDA are 42 ruptured spent fuel elements from the Hanford NReactor. According to records, the total radioactive waste volume in the NDA is approximately 361,000 cubic feet. The estimated total activity present in 2000 was approximately 299,000 curies (Wild 2000).

Table 2-21. Estimated Radioactivity in the NDA⁽¹⁾

Nuclide	Estimate (Ci)	Nuclide	Estimate (Ci)	Nuclide	Estimate (Ci)
Am-241	2,000	Np-237	0.17	Tc-99	10
C-14	520	Pu-238	350	U-233	11
Co-60	7,000	Pu-239	580	U-234	0.59
Cs-137	29,000	Pu-240	400	U-235	0.12
H-3	35	Pu-241	9,100	U-238	1.5
I-129	0.022	Ra-226	<0.01	-	-
Ni-63	110,000	Sr-90	22,000	-	-

NOTE: (1) From Wild 2000, radionuclide totals corrected for decay and in-growth to 2011 and rounded to two significant figures.

The validity of the erosion analysis is critical to predicting human exposure and future dose scenarios that reflect likely future radiological risks to the public. We hope the panel understands the importance of their work to protection of public health.

Proposals of the Erosion Panel

The entire Erosion report apparently was not the product of the scientific experts on erosion. The Study proposal consists of four studies, which seek to obtain and use West Valley site-specific data and other data to complete a very different and more comprehensive erosion analysis than was completed earlier in the EIS. Those experts were actually proposing independent new work. Nothing in the scientists' presentations on August 22nd suggested using the data or the modeling from the FEIS.

However, introductory text describes scientists engaging in work to just fill data gaps and reduce uncertainty associated with the FEIS analysis. There is an obvious disconnect between what the scientists are recommending in the four studies and the introduction to the report which has apparently been written by other parties. We believe a report prepared by the scientists should reflect only their views and not be altered by others. This study/presentation process is not a legitimate one.

Consensus poses an additional problem and this concept does not work well with science. Scientific experts even in the same field disagree. Provision is usually made for majority and minority or dissenting reports so a full presentation of the issues can be provided. Consensus destroys this opportunity and is inappropriate given the seriousness of the possible outcomes.

We want to be absolutely clear that it would take an extraordinary burden of proof at this point in time, given the considerable documentation, to convince the public that the science now supports leaving long-lasting, intensely radioactive material at this highly erodible site. The public unanimously supported full excavation and complete cleanup of this site largely based on the Full Cost Accounting Study.