



# NYSERDA's "View" on the DEIS Analyses and Results

Prepared for the  
West Valley Citizen Task Force Meeting

December 17, 2008

## NYSERDA's Role in the West Valley EIS

- NYSERDA serves as a joint lead agency (along with the Department of Energy [DOE]) for the preparation of the draft Environmental Impact Statement (DEIS). NYSERDA provided input on the EIS content, analyses, and results to DOE as they manage and direct the contractor preparing the EIS.
- NYSERDA is the lead New York State agency for compliance with the State Environmental Quality Review Act (SEQRA) for NYSERDA's decisions at the Western New York Nuclear Service Center (WNYNSC).
- NYSERDA holds the License (Part 50) for the 3,338-acre WNYNSC and holds title to the property on behalf of the state of New York. As such, future actions taken by DOE on the decommissioning of the West Valley Demonstration Project (WVDP) are of extreme importance to the citizens of New York State.
- NYSERDA manages the State-Licensed Radioactive Waste Disposal Area (SDA) and the balance of the WNYNSC outside the project premises (the area known as the "Retained Premises").



## NYSERDA's Input

- NYSERDA staff reviewed 11 chapters, 14 appendices and five Technical Reports (approximately 2,000 pages of text, tables and figures) during January 2008 through August 2008.
- NYSERDA, DOE, and other governmental agencies (e.g., EPA & NRC) participated in a series of DEIS comment resolution meetings at West Valley as well as in a final meeting ("Concurrence Meeting") during the week of October 6-10, 2008, in Washington, DC.
- DOE and its contractor provided written responses to all of NYSERDA's comments. While some of NYSERDA's input was incorporated in the Revised Draft EIS, a number of important concerns remain unresolved. Those concerns formed the basis of our discussion in the Foreword to the EIS (the NYSERDA "View").
- NYSERDA tasked Dr. B. John Garrick with providing a Quantitative Risk Assessment for the SDA. The results from that study are presented in Appendix P of the DEIS.

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## Independent Expert Review of the Draft EIS

- To support our review of the Draft EIS, NYSERDA convened an Independent Expert Review Team (IERT) to assess the adequacy of the analyses presented in the EIS.
- The IERT reviewed critical sections of the DEIS and summarized their findings in several topical reports:
  - Uncertainty Analysis and Transparency
  - Erosion Modeling, Assessment and Prediction
  - Exposure Locations and Scenarios
  - Groundwater Flow and Contaminant Transport
  - Engineered Barrier Performance
  - Inventory and Source Term
  - Approach and Cost of Exhumation
  - Transportation Analysis
  - Seismic Hazard Analysis
  - Intentional Destructive Acts
  - Cost Benefit Analysis
- The Final Report from the IERT was submitted to NYSERDA on September 23, 2008, and is available on the Internet at:  
<http://www.nysERDA.org/publications/westvalleyindependentreview.pdf>

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## The Preferred Alternative

- An interagency working group (the “Core Team”), established in 2006, identified a preferred cleanup alternative that would allow near-term removal actions to take place.
- NYSERDA supports the Preferred Alternative because it allows significant cleanup actions to occur.
- The alternative included deferring decisions on other key facilities for up to 30 years, or until additional data has been collected and assessed to support long-term decisions.
- NYSERDA is proposing that the SDA be managed in place, under regulatory controls, for up to an additional 30 years.

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## Areas of Concern Identified in the NYSERDA “View”

- Adequacy of Long-Term Erosion Modeling
- Analysis of Contaminant Transport by Groundwater
- Assumptions used for the Performance of Engineered Barriers
- Handling of Uncertainties in the Long-Term Performance Analyses
- Connection between the DEIS Analyses and Applicable Regulatory Framework
- Engineering Approach for Exhumation
- Adequacy of Rail Transportation Analyses
- Long-Term Performance Assessment for In-Place Closure

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## Adequacy of Long-Term Erosion Modeling

- In the Revised Draft EIS, DOE relies on a computer model to calculate changes to the existing land surface over tens of thousands of years.
- Model parameters include values for rainfall, soil type, vegetation and surface slope to make predictions well into the future.
- According to the DOE's model output, serious erosion would only occur in the vicinity of the Low-Level Waste Treatment Facility Lagoons, the SDA and the Nuclear Regulatory Commission-Licensed Disposal Area (NDA).
- According to DOE's model output, other facilities on the North Plateau with a significant radionuclide inventory (e.g., High-Level Waste Tanks) would not be affected by erosion for a period of up to 10,000 years and beyond.

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## Adequacy of Long-Term Erosion Modeling

- The model results for the North Plateau contradict observations in the field.
- The North Plateau has large, deeply incised gullies that are actively downcutting and widening.
- Significant slump features are evident on the slopes of Frank's Creek and Quarry Creek.



Gully Formation on Frank's Creek



Unstable Slope along Frank's Creek

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## Adequacy of Long-Term Erosion Modeling

- The IERT offered the following opinion with respect to the erosion models presented in this EIS:

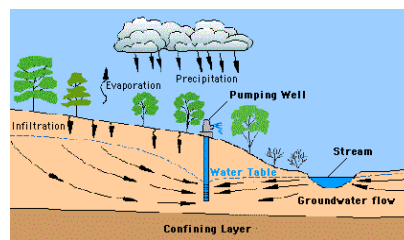
*“...these models cannot be accepted or ratified at this time. This opinion is based on the following four assessment criteria: First, there remains a serious disconnect between model parameterization and the hydrologic and geomorphic characteristics of the site,.....second, no verification or validation of any model was presented in the context of comparing model output to actual field data. Third, many of the model components, especially with regard to gully erosion and landscape evolution....are unjustifiable and unsupported by current scientific evidence. Fourth, no rigorous uncertainty analysis in any model predictions was provided...”*

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## Analysis of Contaminant Transport by Groundwater

- Appendix E presents three-dimensional groundwater flow-and-contaminant transport models used to estimate flow through the soils and bedrock beneath the site.
- Models were also used to assess the release and transport of contaminants by groundwater from facilities that may be closed in-place.
- To assess impacts to the public, DOE and its consultants employed simpler, one-dimensional flow and transport models as described in Appendix G of the DEIS.



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## Analysis of Contaminant Transport by Groundwater

- While the three-dimensional modeling presented in Appendix E is generally sound, some areas of the modeling could be improved-- those areas are documented in the IERT report.
- It is unclear why the three-dimensional models were not used to assess radiation dose and impacts. Instead, the modelers chose to use simpler one-dimensional flow tubes. With respect this decision, the IERT noted that they could:

*"Identify no clear rationale for replacing the improved, three-dimensional models with one-dimensional models for the purpose of conducting the long-term dose calculations."*

- To address uncertainty in the Groundwater Flow models, the DEIS presents a sensitivity analysis of the base case model. According to the IERT:

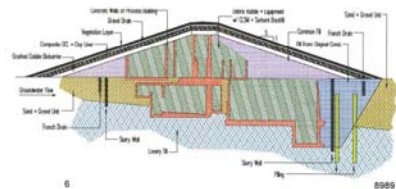
*"the sensitivity analyses (in the DEIS) present a small subset of the potentially important analyses and do not provide a comprehensive evaluation of uncertainty in groundwater flow and transport."*

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## Assumptions used for the Performance of Engineered Barriers

- To account for subsidence, cracking and clogging, the engineered barriers are assigned a level of performance that is said to represent a degraded condition.
- The barriers are assumed to perform at that level for the next 10,000 years.
- The barriers are not assumed to be affected by erosion on the North Plateau and, essentially, remain physically stable for up to 10,000 years.



Multilayered Engineered Cap

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Slurry Wall Construction



## Assumptions used for the Performance of Engineered Barriers

- The assumption that the chemical properties of man-made engineered barriers will remain constant over tens of thousands of years has not been demonstrated.
- Natural materials may be stable in one geologic environment, but performance may vary in other environments.
- The IERT found the information on engineered barriers to be poorly supported and cited several examples:
  - Lack of support for the assumption that the barriers would not be impacted by erosion.
  - Lack of support for the parameter values used for chemical retention of contaminants.
  - Permeability of shallow soils under slurry walls.
  - Lack of consideration of the performance history of erosion control structures in southwestern New York.
- Sensitivity Analysis in Appendix H shows the importance of engineered barrier performance to the outcome of facilities closed in-place (in one of the sensitivity cases presented for slurry wall degradation a dose of 11,090 mrem/yr is estimated for the Close-In-Place Alternative).

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## Handling of Uncertainties in the Long-Term Performance Analyses

- The long-term analyses in the Revised Draft EIS are deterministic, relying on single models and values for model parameters.
- Impacts of uncertainties are handled through a selection of “conservative” parameter choices and a series of sensitivity analyses.
- The last section of Appendix H (Section H.3) presents the sensitivity discussion for a limited number of conditions and parameters:
  - Amount of Precipitation
  - Degree of Degradation of Engineered Caps
  - Retention of Technetium (high mobility/long-lived radionuclide)
  - Rate of Gully Erosion
  - Erosion Damage to Groundwater Flow Barriers
  - Degradation of Slurry Walls

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## Handling of Uncertainties in the Long-Term Performance Analyses

- The revised draft DEIS does not demonstrate that the deterministic analysis is either conservative, or that it has appropriately incorporated or bounded uncertainty.
- The IERT noted that

*"the multiple sources of uncertainty inherent in this analysis are largely unacknowledged, and there is no systematic discussion of how uncertainty has been characterized."*
- The limited sensitivity analyses in Appendix H show that varying the values for crucial parameters can have a dramatic effect on the performance of certain facilities over the long term; therefore, a more comprehensive and transparent analysis of uncertainty is needed to support long-term decisionmaking.

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## Connection Between DEIS Analyses and Applicable Regulatory Framework

- The Revised Draft EIS identifies several regulations that were used to develop the framework for the Long-Term Performance Assessment Analysis (e.g., 10 CFR 61).
- NYSERDA believes that NRC's License Termination Rule (LTR) is the applicable regulatory framework for WVDP Decommissioning, and we cite the following excerpt from NRC's West Valley Policy Statement:

*"The environmental impacts from the application of the criteria will need to be evaluated for the various alternative approaches being considered in the process before NRC decides whether to accept the preferred alternative for meeting the criteria of the LTR. NRC intends to rely on the DOE/NYSERDA EIS for this purpose."*
- DOE plans to conduct an LTR compliance analysis in the Decommissioning Plan (DP); a logical approach for the DEIS would be to analyze long-term site performance using criteria from the LTR (as envisioned by NRC).

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## Engineering Approach for Exhumation

- The SDA and NDA exhumation approaches are described as using primary containment structures inside larger, hard-walled concrete secondary containment buildings.
- The High-Level Waste Tank Farm (WTF) exhumation approach includes the construction of a 60,000 square foot Waste Processing Facility to support the dismantlement of the WTF.
- Costs for exhumation includes demolition costs for removal of the newly constructed buildings and structures, and assumes that all of the demolition waste will be managed as low-level radioactive waste.

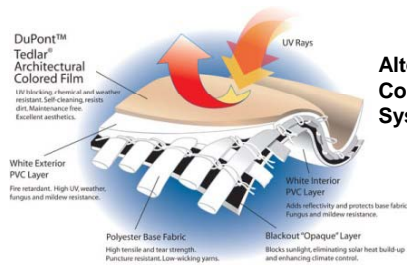


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## Engineering Approach for Exhumation

- The assumption that 100% of the waste from demolition of the massive containment structures will be managed as low-level radioactive waste is too conservative and leads to unrealistically high disposal costs.
- Containment building designs are likely over-engineered leading to unnecessary construction, demolition and disposal costs.
- The DEIS assumes that 150,000 cubic feet of waste exhumed from the SDA and NDA will be classified as GTCC waste, and disposed at Yucca Mountain at a rate of \$20,000 per cubic foot. This single conservative assumption added \$3 billion to the Sitewide Removal Alternative costs.



### Alternate Containment Systems



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## Adequacy of Rail Transportation Analyses

- In its evaluation, the DEIS uses the metric “railcar-kilometers” to assess the number of expected traffic accident fatalities.
- Published state-specific accident rates (for both rail and truck transportation) were applied against the estimated total miles travelled.
- The DEIS predicts 30 fatalities from rail transportation during the 64-year timeframe to execute the Sitewide Removal Alternative.
- Although twice as many shipments are planned by truck than by rail, the DEIS estimates only seven fatalities from truck transportation for the same time period under the Sitewide Removal Alternative.



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## Adequacy of Rail Transportation Analyses

- NYSERDA believes that the number of fatalities from rail transportation are overestimated in the DEIS.
- The DEIS makes the assumption that there will be only one railcar per train; the average train can carry 68 railcars.
- A better measure of impacts would be “train-kilometers,” which assumes that a single shipment consists of multiple railcars. The risk would then be assigned to the entire train, rather than each individual railcar.



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## Long-term Performance Assessment for In-Place Closure

- Many of the issues identified by the IERT and NYSERDA (e.g., problems with erosion and groundwater modeling, engineered barrier assumptions, and handling of uncertainty, etc.) relate to the long-term Close-In-Place Alternative analyses.
- NYSERDA believes that the long-term performance assessment presented in this DEIS for the Close-In-Place Alternative is flawed and indefensible.
- Any future decisions to close facilities in-place will require a revised long-term performance assessment that is scientifically defensible.

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## Summary

- NYSERDA would like to acknowledge DOE for the considerable effort and resources that they expended in completing the modeling and analyses presented in this DEIS.
- NYSERDA does not believe that a defensible long-term performance assessment exists today. Absent such an assessment, important decisions regarding the in-place closure of facilities cannot be made. The Preferred Alternative provides an opportunity to collect the requisite information necessary to improve long-term analyses.
- NYSERDA supports the Preferred Alternative, which allows for removal of significant contamination, while further studies can be undertaken to improve our long-term analyses in support of future decisions (i.e., Phase 2).

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