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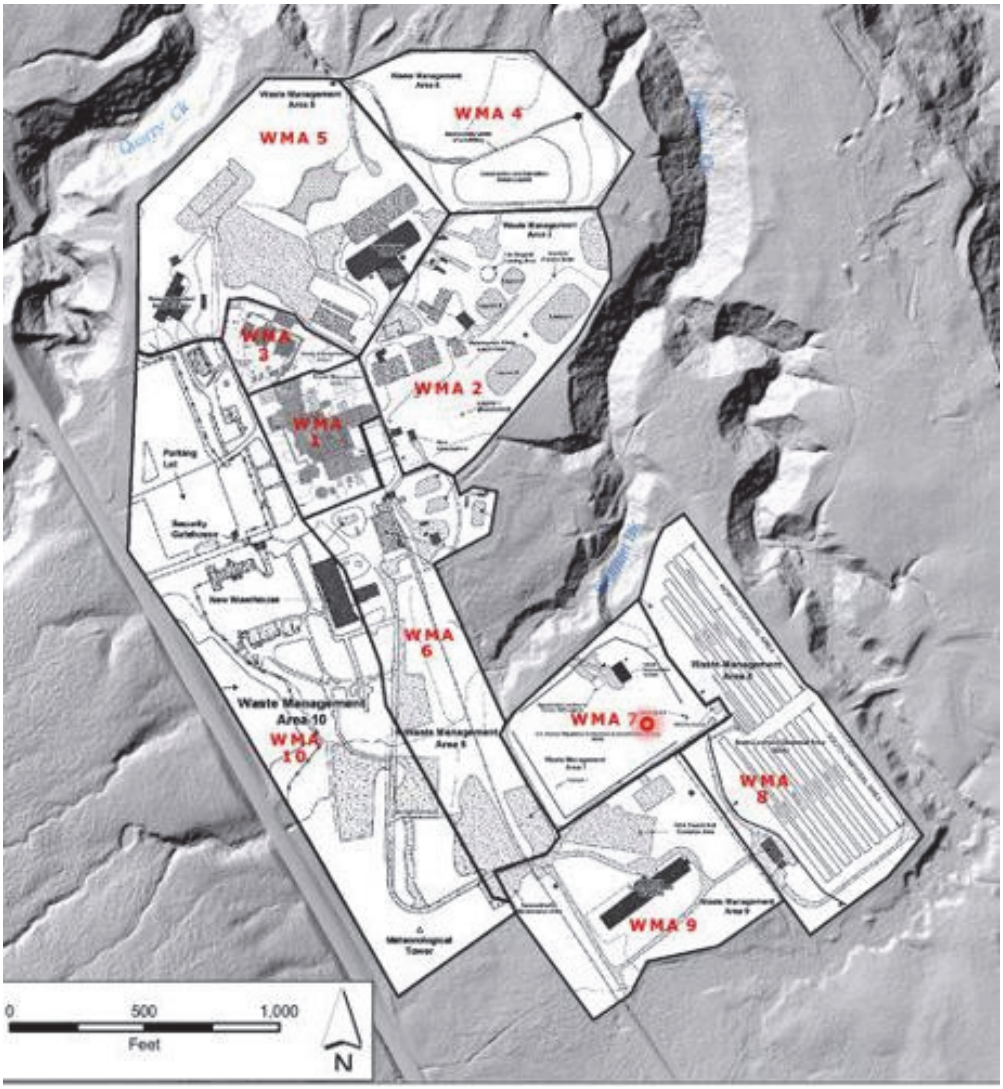
WVDP erosion modeling question at root of nuclear cleanup



This graphic by Neptune and Company shows 2015 Li Dar images around the West Valley Demonstration Project. Unchecked erosion could impact the facilities at the nuclear cleanup project.

By RICK MILLER

Olean Times Herald

WEST VALLEY — Ray Vaughan is a charter member of the West Valley Citizens Task Force, which was formed in 1978 — prior to passage of the West Valley Demonstration Project Act of 1980.

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Task force members monitor efforts of the U.S. Department of Energy, the New York State Energy Research and Development Authority and site contractors to clean up the site of the country's first commercial spent nuclear fuel reprocessing plant.

Late last month the task force heard a presentation on erosion modeling, which may not sound exciting, but it is at the root of the question about what to do with radioactive waste beneath the surface of the nuclear cleanup site on a plateau overlooking creeks that empty into Lake Erie.

Vaughan, a retired environmental scientist and geologist with the state attorney general's office, pushed for the Probabilistic Performance Assessment which is being performed by Neptune and Company.

Vaughan said different methods of calculating future erosion were used by Neptune than were used in the 1996 Draft Environmental Impact Statement on Phase 1 of the cleanup.

A Supplemental Draft Environmental Impact Statement for Phase 2 is currently being prepared by the DOE, its contractors and NYSERDA. It will make recommendations on the final cleanup — whether to remove everything from the site or leave some radioactive wastes — over the next two years.

Vaughan, who emphasized he was speaking for himself and not the task force, recalled that "very severe erosion was predicted by agencies and contractors" in the 1996 report. Initial findings by Neptune do not appear to agree with earlier estimates, he said.

"The huge difference in officially issued results are not encouraging," he added. "We need a convergence of the different results of the rate of erosion. We need some very clear explanations."

One problem, Vaughan said, is that the Landscape Evolution Model used in the 2010 Environmental Impact Statement is almost impossible to check because it painted the erosion problem in "broad brush strokes."

There are questions about whether the amount of rainfall that goes to runoff versus that which recharges the aquifer is based on valid assumptions or not, Vaughan added. The violent storm that struck the West Valley area in 2009 caused significant erosion which required mitigation measures and continued monitoring.

The new model put forth by Neptune and Company looks at the growth of gullies and the overall rate of stream bank erosion. "It's good to see them continue to work," Vaughan added.

He said he has respect for Neptune's work, but still has concerns. He believes the different erosion models need to be reconciled or that the difference be explained very clearly. The erosion modeling will be used to examine cleanup alternatives in phase 2.

Vaughan said the Task Force has been clear in its concern over the cleanup from the start: Nothing less than a complete cleanup is acceptable. The last time a price tag was put on complete removal of all radioactive contamination it was $10 billion. That's on top of the $3 billion DOE and NYSERDA have already paid since 1980.

The task force has maintained from the start that leaving radioactive contamination in the ground risks future catastrophe with the facilities virtually surrounded by creeks that empty into the Great Lakes.

Of great concern are two low-level radioactive waste burial grounds which include wastes from off-site as well. Both the State Disposal Area operated by NYSERDA and the NRC Disposal Area are long-closed and covered by heavy

rubber membranes and surrounded by drainage structures designed to keep water from further infiltrating the underground trenches.

The disposal areas are on the South Plateau, which overlooks a creek. There have been some instances of slides on the slope, which is being watched closely.

Vaughan indicated he thought the DOE would be gambling if they proposed to leave radioactive material buried in the disposal areas or in the underground tanks containing significant amounts of radioactivity — "especially with all the heavy rain events all over the world" linked to climate change.

"Huge storms dump a lot of rain in a short amount of time," Vaughan said. The site's soil is largely glacial till, which is susceptible to erosion.

One question posed at last week's Quarterly Public Meeting on the West Valley cleanup was would the DOE consider digging up just parts of the state and federal burial grounds.

Vaughan said that option had two risks: whether the disposal records are accurate and whether radioactivity was redistributed in the trenches by water infiltration.

One task force member said it was hard to believe the DOE could find and remove 14 pounds of plutonium reported buried among the trenches of low-level waste.

Such a targeted removal would pose challenges and uncertainty, Lee Gordon, who manages the erosion modeling efforts for NYSERDA, told people attending the Quarterly Public Meeting

The DOE has also spoken about "engineered barriers" to protect facilities from erosion. Still, Vaughan said the site is "very erodable" and since the engineered barriers would not be on bedrock they could be circumvented by waters from a heavy rain event.

Vaughan noted the task force's report from 1990 when members agreed the site was not suitable for leaving radioactive waste on the site.

"The task force has revisited that question and reached the same conclusion," he added.

The risk of leaving underground tanks containing radioactive sludge is that groundwater will be able to infiltrate the tank over decades, maybe centuries, releasing contamination that finds its way to area creeks. Grouting the tanks would not solve the erosion problem completely, Vaughan indicated

"Advancing gully heads might reach the tanks too," Vaughan said. "That is the fastest way the erosion might reach facilities" — including the burial grounds and underground tanks. "The tanks are at risk from long-term erosion."

The 70-foot diameter carbon steel tanks were capable of holding 600,000 gallons of highly-radioactive liquid waste. The interior of the tank was used during production and retained a "bathtub ring" of radioactive residue clinging to the sides and interior support structure. The other was held in reserve and later held ion exchangers critical in reducing the amount of radioactive liquid from the other tank that needed to be sent to the melter to be mixed with glass. Those radioactive glass logs are now sitting in 275 concrete containers waiting to be shipped off-site to a national repository that doesn't exist yet.

The Department of Energy is aware that institutional control — like what the DOE and NYSERDA are doing to monitor and respond to conditions at the site — cannot be assumed indefinitely.

The half-life of some of the radionuclides can be thousands of years. That means in thousands of years, some of the radioactivity will only have been cut in half.

“The agencies are certainly responsible enough at the present time,” Vaughan said. What about in 100 years?

Meanwhile, crews have continued to remove radioactive material from the Main Plant process Building prior to the beginning of demolition later this month. The project is expected to take 30 months to complete.

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