NNSS Groundwater Program

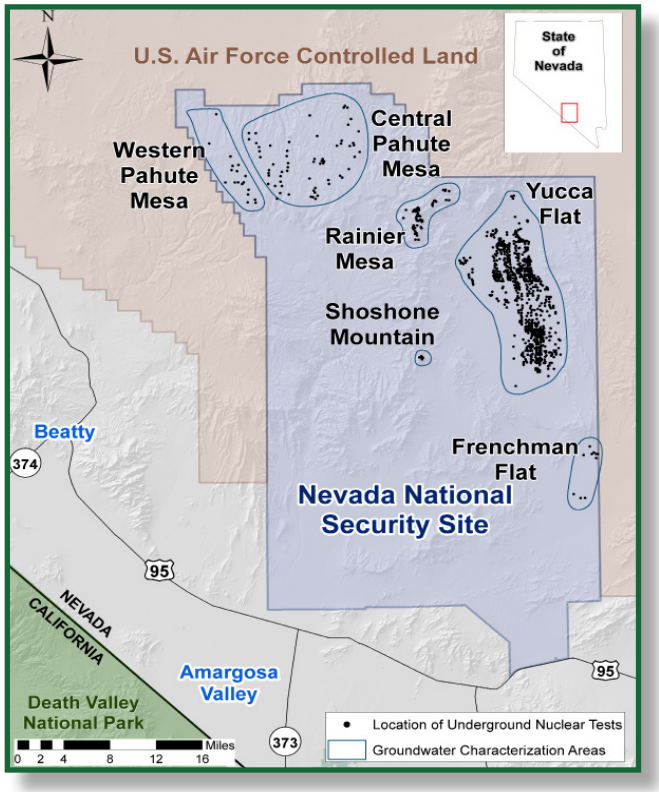
safe ❖ secure ❖ successful

Nevada National Security Site (NNSS) Groundwater Program

From 1951 to 1992, the United States government conducted 828 underground nuclear tests at the NNSS. About one-third of these tests occurred near, below, or within the water table—the very top portion of the groundwater layer. As a result, some groundwater was contaminated.

Safe and Secure

The U.S. Department of Energy (DOE) launched an intensive groundwater investigation program in 1989 to address these effects. Though contamination from underground testing at the NNSS has never been detected in a publicly accessible groundwater source, DOE is committed to developing a safe, secure, and reliable monitoring network that ensures the long-term protection of the public. Nearly 70 years of sampling, testing, and analysis have given the DOE's Environmental Management (EM) Nevada Program an expert understanding of the NNSS groundwater system.



NNSS Map

Successful

- Frenchman Flat, the first groundwater corrective action area to reach closure, completed its fifth year of long term monitoring in 2020.
- The same year, the Yucca Flat groundwater corrective action area was brought to closure.
- The Rainier Mesa and Shoshone Mountain groundwater corrective action areas reached closure three years ahead of schedule in 2020, saving $5 million in federal funding.
- Work is on schedule to complete corrective actions at the Pahute Mesa groundwater area by 2028.

Sampling being conducted at an NNSS well.

Fast Facts

- Groundwater samples are collected from **over 100** monitoring locations on and off the NNSS.
- Administrative and physical barriers are in place to prevent unauthorized access to contaminated groundwater.
- Current research and modeling forecasts show contaminated groundwater will not reach public water supplies.

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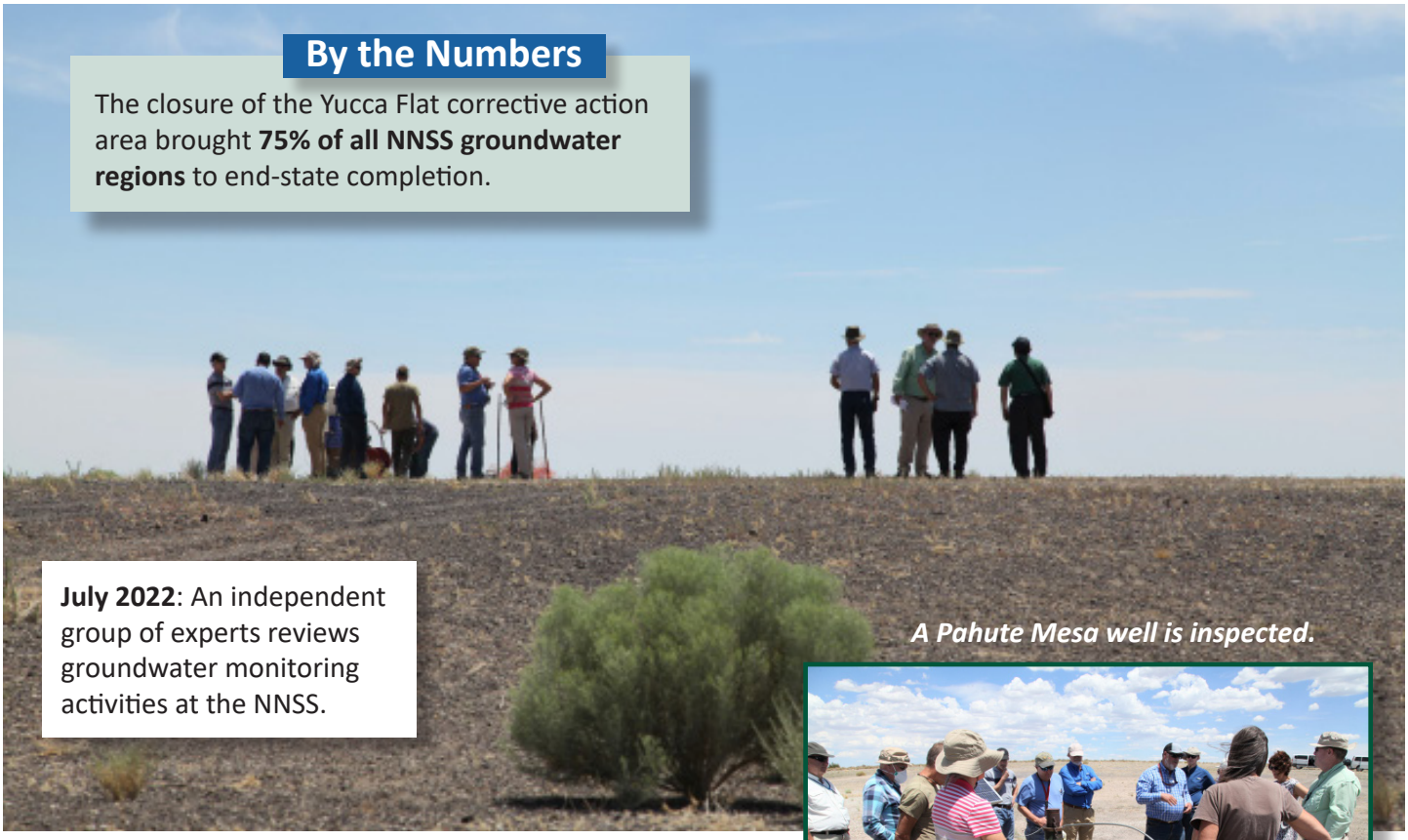
By the Numbers

The closure of the Yucca Flat corrective action area brought **75% of all NNSS groundwater regions** to end-state completion.



July 2022: An independent group of experts reviews groundwater monitoring activities at the NNSS.

A Pahute Mesa well is inspected.

Program Approach

Understanding contaminant movement at the NNSS is a challenge, given the geologic complexity and sheer magnitude of the site. Risks associated with contamination remain low due to the remoteness of the site, immobility of some contaminants, and slow movement of others.

- **Drilling and sampling**: A total of 125 characterization wells have been drilled throughout the site.
- **Data interpretation**: Samples are sent to certified independent laboratories for analysis. Results become data points in a highly sophisticated database.
- **Computer modeling**: When experts gather enough data points from sampling, the database is used to build a computerized model— a three-dimensional representation of the NNSS subsurface.
- **Monitoring**: Groundwater characterization wells supplement an existing network of more than 100 water supply locations on and off the site that are part of routine monitoring activities.

How is a region closed?

1. *Investigation Stage - Drill wells; gather new data to build transport models for each of the underground corrective action areas, review results, and supplement as necessary.*
2. *Decision/Action Stage - Develop an evaluation plan to challenge and refine model projections; use model evaluation plan to identify location for new wells.*
3. *Closure Stage - Negotiate use restrictions and regulatory boundary; establish institutional controls and requirements; and initiate long-term closure monitoring.*

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