Nevada Site Specific Advisory Board (NSSAB)

Full Board Meeting
Wednesday, February 19, 2025

Handouts…

NSSAB FULL BOARD MEETING ATTENDANCE

October 2024 through September 2025 (FY 2024)

Name	1/15/25	2/19/25	4/16/25	6/18/25	9/10/25	Max Term
MEMBERS						
Erik Anderson	√					2028
Joycelyn Austin-Mabe	√					2028
Robert (Doug) Blackstock	√					2030
Lisa Blandi	√					2028
John Cole	√					2028
Juan Diaz III	√					2030
Gary Elgort	√					2026
Thomas Fisher	√					2030
Pam Handor	E					2030
Mark Hilton	√					2026
Tammi Odegard	√					2030
Lori Olson-Arzaga	√					2030
Anntoinette Rivera	√					2030
Brandon Schmidt	√					2030
Kevin Trainor	√					2028
Eddie Williams	√					2028
LIAISONS						
Clark County	√					
Consolidated Group of Tribes & Organizations	√					
Elko County Commission (limited)						
Esmeralda County Commission (limited)						
Lincoln County Commission	√					
Nye County Commission	√					
Nye County Emergency Management	√					
Nye Co. Natural Resources and Federal Facility	√					
State of NV Division of Env Protection	√					
U.S. Natl Park Service (limited)						
White Pine County Commission (limited)						

KEY: √ - Present E - Excused V - Vacant U - Unexcused

Annual NNSS Environmental Report (ER) – Work Plan Item #2
PROPOSED Recommendations from January Meeting

The NSSAB, from a community perspective, makes the following recommendations for enhancements to Chapter 11 of the NNSSER:

1) Provide a link to the FFACO in the reference section *(M. Hilton)*
2) Update the Navarro STEM grants information *(M. Hilton)*
3) Add a clarification of the terms “closure” and “post-closure” in the context of the FFACO *(K. Trainor)*
4) Strive for consistency in maps used in the NNSS Environmental Report Summary to match the rest of the document *(L. Olson-Arzaga)*
5) Ensure that all locations referenced are included on the maps *(T. Fisher)*
6) Make some of the maps larger by splitting up onto multiple pages so the symbols can be delineated and clearly seen *(G. Elgort)*
7) Emphasize EM Nevada Program accomplishments earlier in the chapter *(L. Olson-Arzaga)*

Chapter 11: Environmental Corrective Actions

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Environmental Corrective Action Objectives for All Sites

Characterize sites contaminated by activities related to nuclear testing. Remediate contaminated sites in accordance with Federal Facility Agreement and Consent Order (FFACO)-approved planning documents. Conduct post-closure monitoring of sites in accordance with FFACO closure documents.

The U.S. Department of Energy (DOE) Environmental Management (EM) Nevada Program is responsible for evaluating and implementing corrective actions and performing required post-closure monitoring of FFACO[1] sites located on the Nevada National Security Site (NNSS) and the adjacent Nevada Test and Training Range (NTTR). These corrective action sites (CASs) are grouped into larger, corrective action units (CAUs) according to location, physical and geological characteristics, and/or contaminants. Environmental corrective action strategies are developed and completed based on the nature and extent of contamination, the risks posed by contamination, and future land use. Since 1989, the EM Nevada Program has overseen the compliant completion of corrective actions at 99% of the more than 2,100 surface and near-surface CASs and 91% of the 878 deep subsurface CASs, including implementation of required long-term monitoring at more than 900 of the 2,943 closed CASs.

CASs are broadly organized into four categories based on the source of contamination: Underground Test Area (UGTA), Industrial Sites, Soils, and Nevada Offsites. UGTA deep subsurface sites are directly related to groundwater impacted by past underground nuclear testing. Industrial Sites are facilities and land that may have become contaminated due to activities conducted in support of nuclear research, development, and testing. These include an extensive complex of research/development/testing facilities, disposal wells, inactive tanks, contaminated waste sites, inactive ponds, muckpiles, spill sites, drains and sumps, and ordnance sites. Industrial Sites include CASs on the NNSS owned by DOE and the Defense Threat Reduction Agency. Soils CASs include areas where nuclear tests have resulted in surface and/or shallow subsurface contamination from radioactive materials and potentially from oils, solvents, heavy metals, and contaminated instruments and test structures used during testing activities. Nevada Offsites are associated with historical testing activities at the Project Shoal Area and the Central Nevada Test Area, located in northern and central Nevada, respectively. Long-term monitoring for those sites is the responsibility of the DOE Office of Legacy Management (LM) along with closed FFACO Soils and Industrial Sites on the NTTR/Tonopah Test Range (TTR) where environmental corrective actions were completed by the EM Nevada Program.

In May 1996, DOE, the U.S. Department of Defense, and the State of Nevada entered into the FFACO to address the environmental remediation of CASs. LM became a signatory to the FFACO in June 2006 after assuming responsibility for the Nevada Offsites. Appendix VI of the FFACO (1996, as amended), describes the strategy to plan, implement, and complete environmental corrective actions (i.e., to "close" the CASs). The State of Nevada Division of Environmental Protection (NDEP) provides regulatory oversight and approval throughout the FFACO closure process, and the public is kept informed of progress through the Nevada Site Specific Advisory Board (NSSAB)[2], news articles, intergovernmental stakeholder meetings, and other educational/outreach initiatives. The NSSAB is a federally chartered group of volunteer members representing Nevada stakeholders who review and provide the EM Nevada Program informed recommendations and comments that are strongly considered throughout the corrective action process.

This chapter provides an update on EM Nevada Program corrective action progress and summarizes corrective action and post-closure activities at UGTA, Industrial Sites, and Soils CASs in calendar year (CY) 2023 and summarizes the NSSAB's CY 2023 activities and recommendations. Post-closure activities at Nevada Offsites

[1] A fact sheet on the FFACO is available via https://nnss.gov/wp-content/uploads/2023/04/DOENV_964.pdf.
[2] Information on NSSAB activities can be accessed at https://nnss.gov/NSSAB/.

and FFACO Soils and Industrial Sites on the NTTR/TTR performed in 2023 are presented in LM's Annual Site Environmental Report.

11.1 Corrective Actions Progress

Figure 11-1 depicts the progress made since 1996 to complete environmental corrective actions at sites managed under the FFACO (1996, as amended). A total of 2,943 of the 3,044 CASs managed under the FFACO were closed as of December 31, 2023; this includes CASs that are currently under EM Nevada Program or LM stewardship. The number of CASs closed as of December 31, 2023, decreased from the end of CY 2022 due to previously closed CASs that were re-evaluated during 2023. These 11 CASs were regrouped into a new CAU 578 (see Figure 11-5) that underwent the corrective action process in 2023 and was approved for closure in February 2024. The last open CAS in CAU 577, disposal cell 21 at the Area 5 Radioactive Waste Management Site (RWMS), was approved for closure in October 2023. Of the remaining 90 CASs yet to be closed under the FFACO (all of which are the responsibility of EM Nevada Program), 82 (89%) are UGTA CASs and the remainder are Industrial Sites CASs.

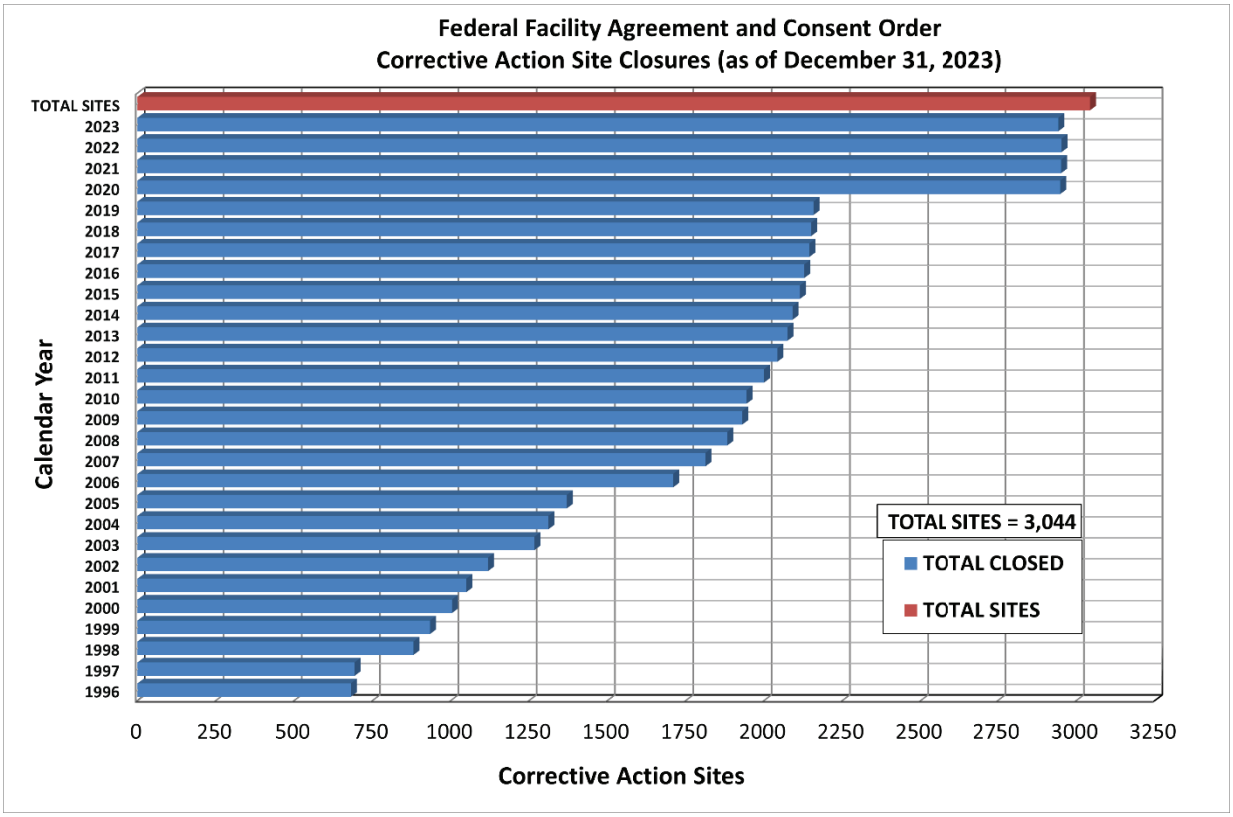

Figure 11-1. Annual cumulative totals of FFACO CAS closures

The EM Nevada Program satisfied numerous regulatory commitments in 2023, including submittal of the following reports[3] that reflect significant mission progress:

- Addendum 2 to the Closure Report for CAU 577: Area 5 Chromium Containing Waste Disposal Cells
- CY 2022 Non-Resource Conservation and Recovery Act (RCRA) CAU Post-Closure Inspection Report
- CY 2022 UGTA Annual Sampling Letter Report (CAUs 101/102)
- CY 2022 Post-Closure Monitoring Letter for Closed UGTA CAUs
- CY 2022 Post-Closure Report for Closed RCRA CAUs

[3] Available through the DOE Office of Scientific and Technical Information at https://www.osti.gov/.

- FFACO, January 2023 Appendices Update
- Report of the Peer Review Panel for the Pahute Mesa Groundwater Flow and Transport Model
- Response to Report of the Peer Review Panel for the Pahute Mesa Groundwater Flow and Transport Model
- Risk Evaluation of Radionuclides in Groundwater for CAUs 101 and 102: Central and Western Pahute Mesa[4]
- Streamlined Approach for Environmental Restoration (SAFER) Plan for CAU 578: Miscellaneous Inactive Sites

The post-closure monitoring and inspection reports present the monitoring and inspection results used to verify compliance and corrective action effectiveness for the sites closed under the FFACO process. The UGTA annual sampling letter report presents sampling results for the Pahute Mesa CAUs 101 and 102, which are the only UGTA CAUs that have not yet reached closure.

11.2 Corrective Action Sites – Active Investigations

The location and status (open or closed) of UGTA, Industrial Sites, and Soils CASs as of December 31, 2023, are shown in Figure 11-2. Figure 11-2 also includes the closed CASs (Industrial Sites and Soils) on the NTTR/TTR that were transferred to LM. Investigations and, as appropriate, corrective actions were performed at 82 UGTA CASs in two CAUs and 20 Industrial Sites CASs in four CAUs during 2023.

11.2.1 Underground Test Area Sites

The agreed-upon corrective action for UGTA CASs is closure in place with institutional controls and monitoring (FFACO 1996, as amended). This corrective action is based on three assumptions: (1) groundwater technologies for removal or stabilization of subsurface radiological contamination are not cost effective; (2) because of high remediation costs, closure in place with monitoring and institutional controls is the only likely corrective action; and (3) in order for workers, the public, and the environment to be exposed to the potential risks from radiological contamination in groundwater, the contaminated groundwater must first be accessed.

The corrective action is implemented in four stages: (1) *planning*; (2) *investigation* (characterization and modeling); (3) *model evaluation*; and (4) *closure*. NDEP approval of each stage is required before advancing to the next stage. Characterization and modeling studies are evaluated throughout the *investigation stage* by a committee of scientists (preemptive review committee) specializing in the fields of geology, hydrology, chemistry, and nuclear testing. CAU-specific preemptive review committees provide internal technical review of ongoing studies to ensure work is comprehensive, accurate, consistent with the state-of-the-art modeling and data analysis methods, and consistent with CAU goals (EM Nevada Program 2019). In addition, a scientific external peer review is included in the *investigation stage*.

Environmental Corrective Action Objectives for UGTA Sites

- *Collect data (e.g., new wells, groundwater samples, groundwater levels, geologic, hydrologic testing, field and laboratory studies) to characterize the hydrogeological setting and nature and extent of contamination.*
- *Develop CAU-specific models of groundwater flow and contaminant transport.*
- *Identify **contaminant boundaries**[5] within which contaminants are forecasted to potentially (95th percentile) exceed the Safe Drinking Water Act limits at any time within a 1,000-year compliance period.*
- *Negotiate and implement **regulatory boundary** objectives and regulatory boundaries to protect the public and environment from the effects of radioactive contaminant migration.*

[4] A revision to this document (Rev. 2) was published in February 2024 to remove reference to DOE Order DOE O 458.1, "Radiation Protection of the Public and the Environment," as it is not central to the analysis or the results. The approach and results presented in Rev. 2 did not change from Rev. 1.
[5] The definition of word(s) in ***bold italics*** may be found by referencing the Glossary, Appendix B.

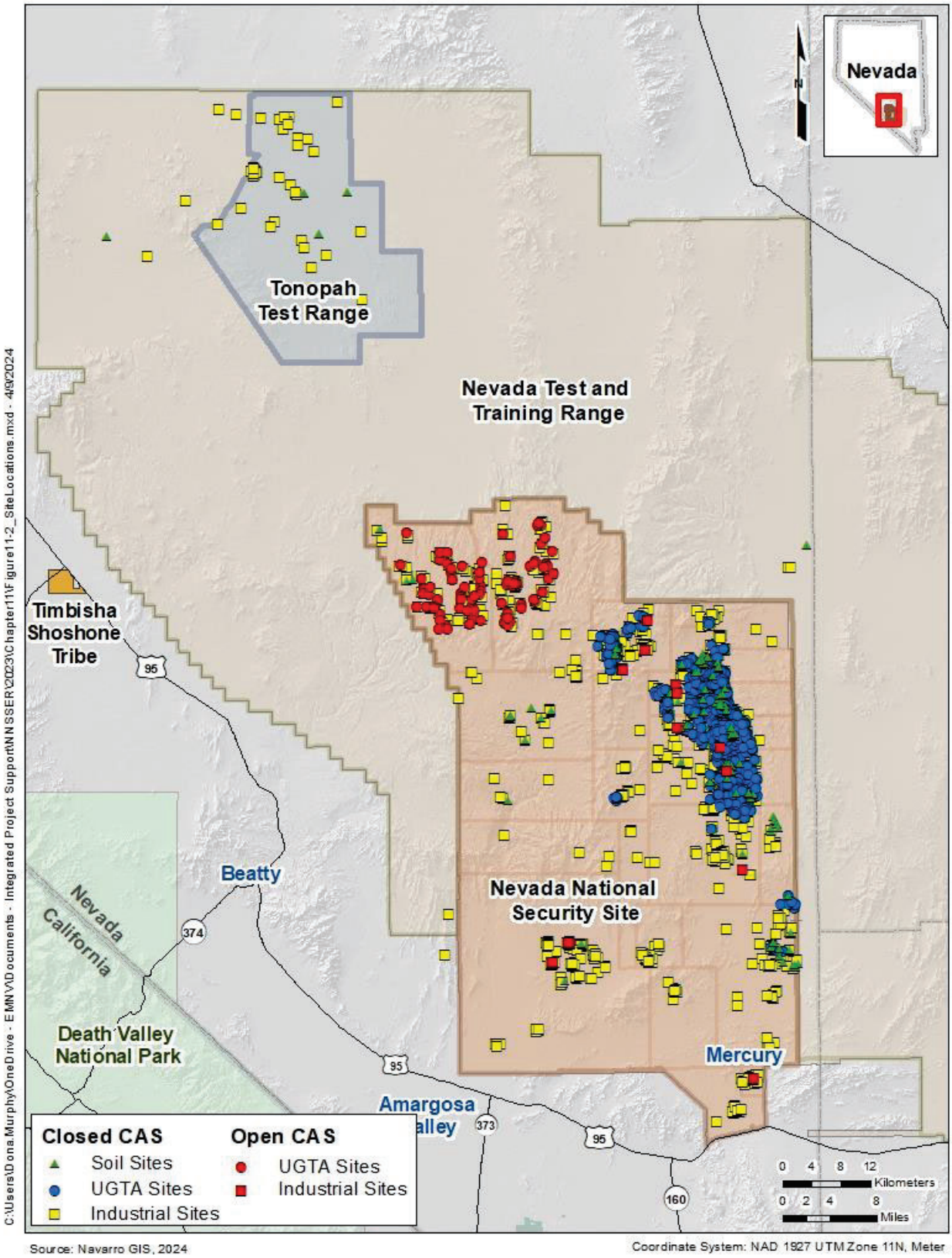

Figure 11-2. Map of FFACO closure status for UGTA, Industrial Sites, and Soils CASs as of December 31, 2023

- *Negotiate and implement **use-restriction boundaries** to restrict access to contaminated groundwater.*
- *Develop and implement a long-term closure monitoring network to verify consistency with the contaminant boundaries, compliance to the regulatory boundary, and protection of human health and the environment.*

The locations of UGTA CAUs are shown in Figure 11-3.

Central and Western Pahute Mesa CAUs (101 and 102), comprising a total of 82 CASs, are the only two UGTA CAUs remaining to be closed. The CASs are nuclear test cavities produced from the underground nuclear detonations. These roughly spherical cavities with original diameters greater than 200 meters (m) in some cases, are in complex geologic units at depths ranging from 226 to 1,450 m below ground surface (Carle et al. 2021). Most of these detonations were within 100 m of the ***water table***, or deeper, indicating potential interaction with the groundwater system (Figure 11-3).

As required by the UGTA Strategy, three-dimensional groundwater flow and contaminant transport models were developed to represent the complex geologic structure underlying Pahute Mesa, as well as the complex contaminant transport processes associated with ***radionuclide*** movement through the fractured rock. Four models were constructed and calibrated, including a "base case" and three alternative models to address different geologic and recharge conditions (EM Nevada Program 2022c). Similar contaminant boundary forecasts resulted from each model. The 1,000-year contaminant boundary for the base-case model, shown in Figure 11-4, extends a few kilometers beyond the NNSS boundary but is more than 12 kilometers upgradient of the closest public receptor in Oasis Valley. These results indicate that radionuclides from underground nuclear testing on Pahute Mesa pose little to no risk to the health of groundwater users in Oasis Valley.

In 2023, the Pahute Mesa CAUs advanced to the model evaluation stage, marking a major step toward achieving regulatory closure. This advancement, which received NDEP approval, followed an extensive peer review of the groundwater flow and contaminant transport model and model results (Navarro 2023a,b). Activities planned for the model evaluation stage are identified in the Corrective Action Decision Document/Corrective Action Plan (EM Nevada Program 2024) for the Pahute Mesa CAUs, which was submitted to NDEP in October 2023 and approved in early 2024. Model evaluation activities are focused on improving confidence in the model results for use in developing a monitoring network and establishing use restrictions that ensure downgradient groundwater users remain protected.

A *Risk Evaluation of Radionuclides in Groundwater* for the Pahute Mesa CAUs (Navarro 2024) presents the potential impacts to the health of hypothetical human receptors from exposure to radiological contaminants in groundwater of the Pahute Mesa CAUs. The results of this evaluation provide additional confidence that public groundwater users downgradient of the NNSS in Oasis Valley will not be adversely impacted by the radionuclides within the 1,000-year time frame defined in the FFACO.

In addition, 11 wells were sampled in the Pahute Mesa CAUs in 2023. The sample analysis results are presented in Chapter 5. The sampling results, including samples with no radionuclides present, will continue to be used to ensure that the groundwater flow and contaminant transport model results are consistent with known levels of contamination within the Pahute Mesa CAUs

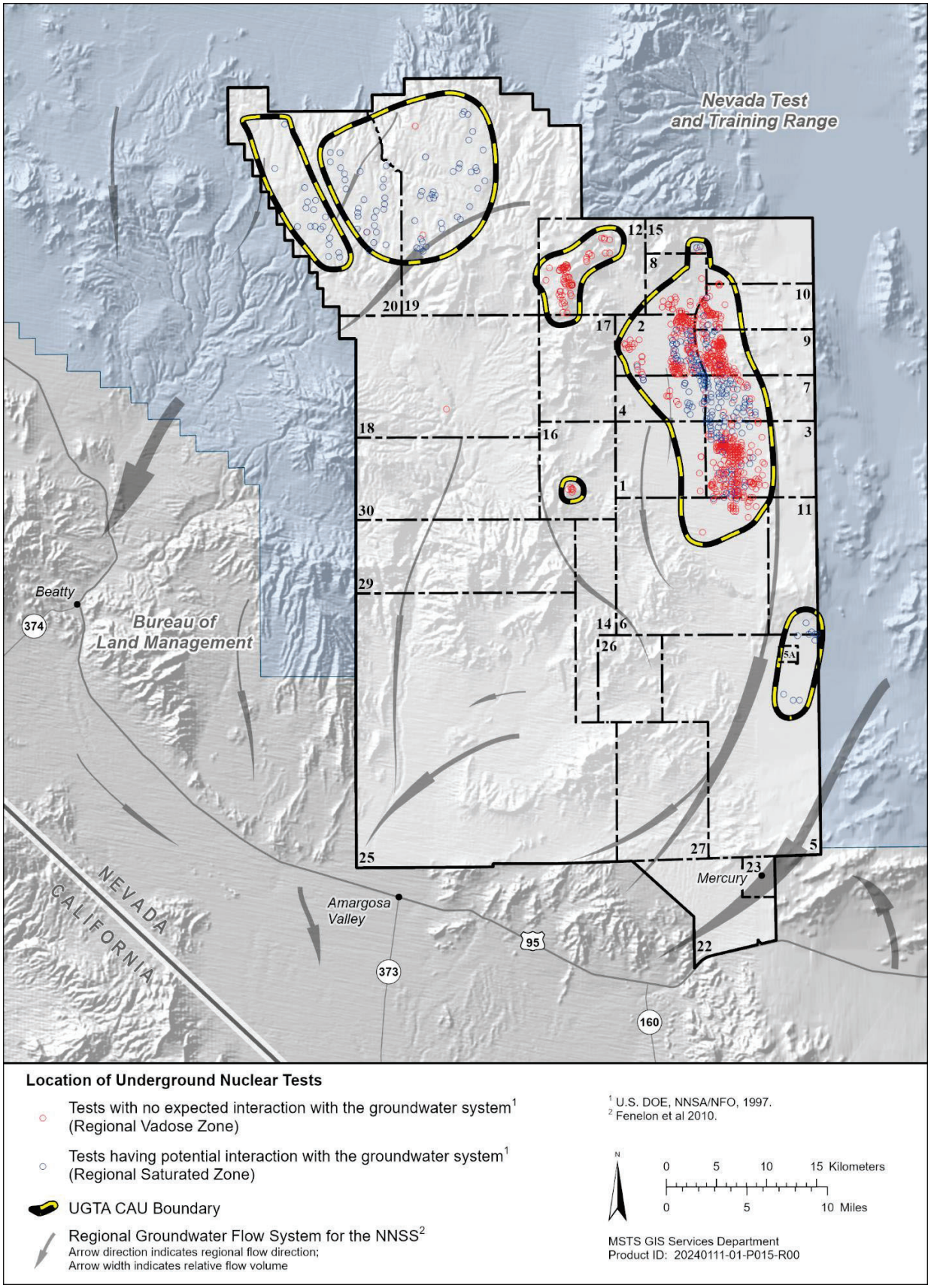

Figure 11-3. UGTA CAUs

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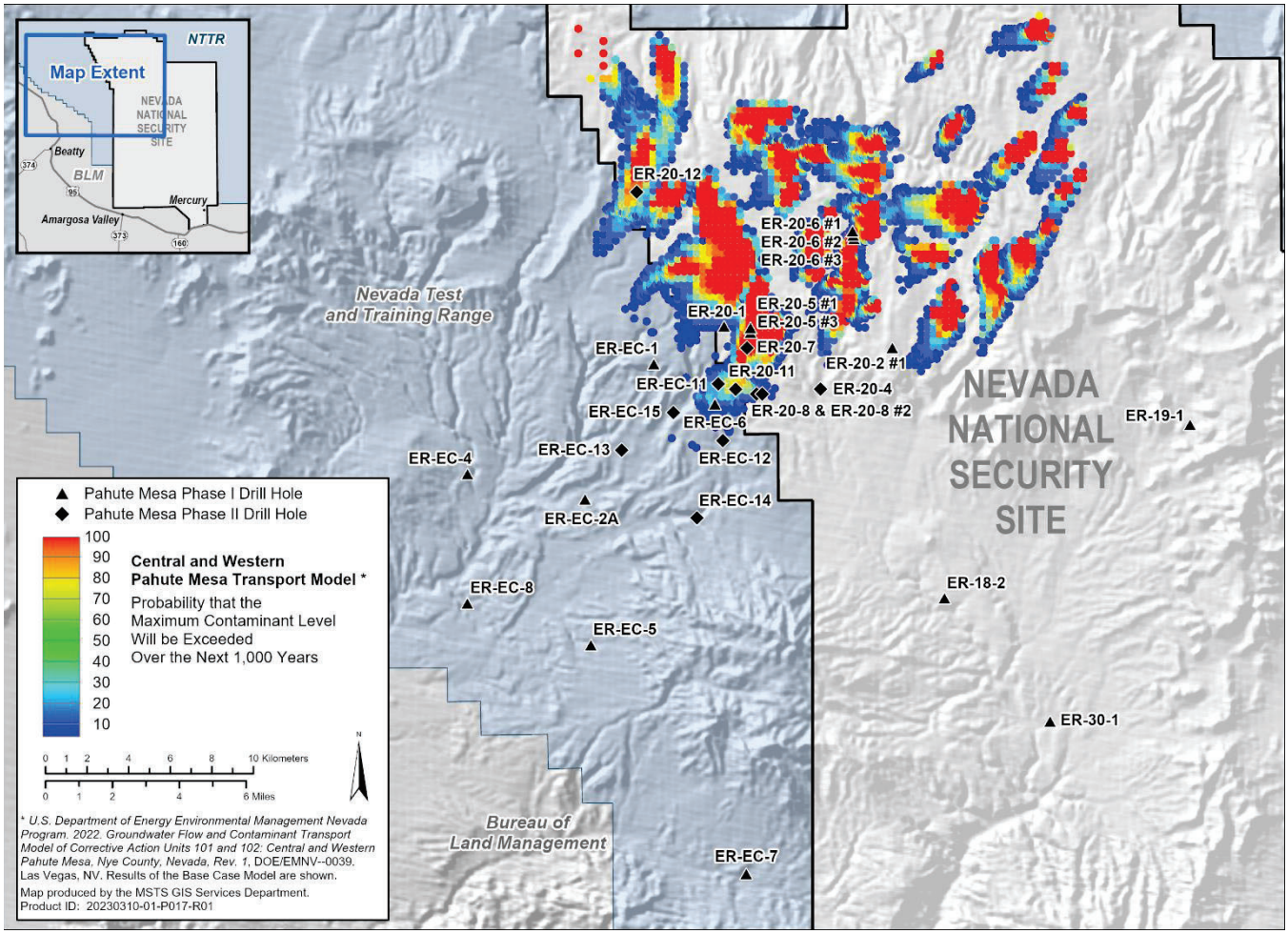

Figure 11-4. Contaminant boundary forecasted by the Pahute Mesa Base-Case Groundwater Flow and Contaminant Transport Model

11.2.2 Industrial Sites

Environmental corrective actions at 20 Industrial Sites CASs occurred in 2023. One of these CASs is within CAU 577, Chromium Containing Waste Disposal Cells, located at the Area 5 Radioactive Waste Management Complex (Figure 11-5). CAU 577 was established in the FFACO under a 2019 Settlement Agreement with NDEP and consists of five CASs. Corrective actions were previously completed for four of the CASs (EM Nevada Program 2021c, 2022a). Following completion of corrective actions (including construction and revegetation of RCRA-compliant closure covers over the remaining waste disposal cell), the fifth and final CAS was closed and approved by NDEP in 2023 (EM Nevada Program 2023b).

Eight of the remaining active Industrial Site CASs are the Test Cell C Ancillary Building and Structures (CAU 572) and the Engine Maintenance, Assembly, and Disassembly (EMAD) (CAU 114) sites (Figure 11-5), which are undergoing decontamination and demolition (D&D). Test Cell C Ancillary Building and Structures and EMAD were part of a larger complex of facilities constructed to support the historical Nuclear Rocket Development Station that was jointly administered by the Atomic Energy Commission (predecessor to DOE) and the National Aeronautics and Space Administration's Space Nuclear Propulsion Office between 1958 and 1971.

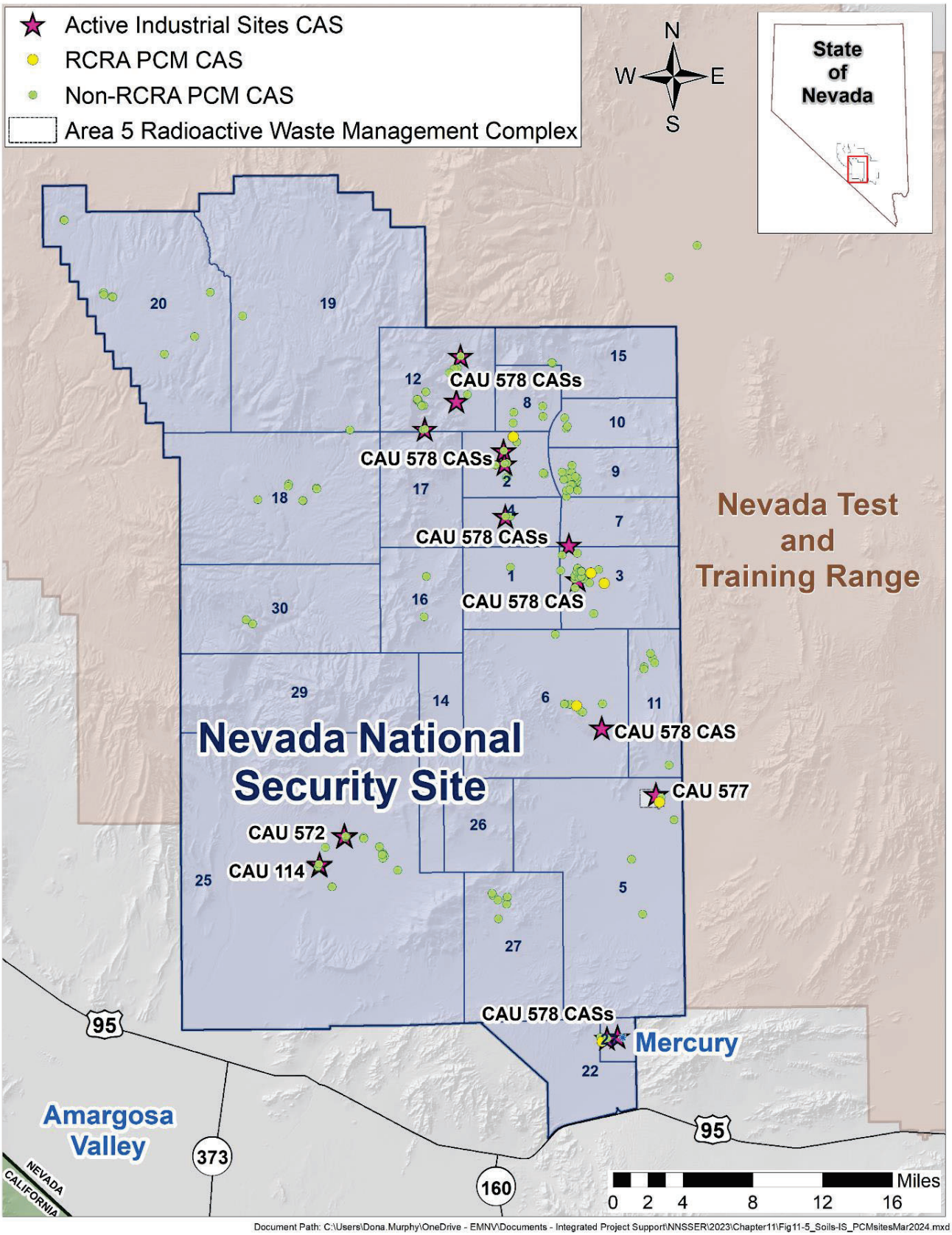

Figure 11-5. CASs undergoing active investigation and post-closure monitoring during 2023

Test Cell C Ancillary Building and Structures (CAU 572) consists of a 6,800-square-foot (ft^2) single-story masonry building with multiple rooms (e.g., cryogenic bench lab, pump and electric shops, control room); a large steel-framed building containing three large electric motors; a 750-ft^2 single-story concrete-framed pump house; a 1,700-ft^2 light steel-framed building used for cryogenic experiments and storage; and 10 large ancillary structures (i.e., dewars for storing liquid hydrogen, cooling towers, storage tanks, and piping). The EMAD facility (CAU 114) encompasses a 100,000-ft^2, 80-foot (ft)-tall, four-story building with 6-ft-thick concrete walls and the largest "hot cell" in the world; a steel-framed building that was used for railcar maintenance and treatability tests on plutonium-contaminated soil; a 32-ft-long, 107-ton manned control car; and a 60-foot long, 70-ton engine installation vehicle.

FFACO closure of both facilities will be accomplished through the SAFER process (EM Nevada Program 2021d,e). The goal of D&D is to reduce risks to site workers, the public, and environment; and to limit the long-term cost of surveillance and maintenance. D&D also includes proper disposal of the generated waste. During 2023, four ancillary structures at Test Cell C were safely demolished. At EMAD, considerable progress was made in 2023 to prepare for demolition through decontamination, dismantlement, removal of contaminated materials and hazardous items, and asbestos abatement. In support of these activities, radiological surveys and sampling were also performed.

11.3 Corrective Action Sites – Post-Closure Activities

11.3.1 Underground Test Area Sites

Three UGTA CAUs – Frenchman Flat (CAU 98), Rainier Mesa/Shoshone Mountain (CAU 99), and Yucca Flat/ Climax Mine (CAU 97) – are in the *closure stage*. During the *closure stage*, contaminant, regulatory, and use-restriction boundaries are identified and agreed upon by DOE and NDEP. The boundaries for each CAU are presented in Figure 11-6. If radionuclides exceeding the agreed-upon level reach the regulatory boundary, the EM Nevada Program is required to submit to NDEP a plan that meets the CAU's regulatory boundary objectives.

Closure reports for these CAUs were developed at the beginning of the *closure stage* to document these boundaries and describe the monitoring well network and land-use restrictions. Three types of monitoring are performed during closure: water quality, water level, and institutional control. The monitoring objective is to determine whether use-restriction boundaries remain protective of human health and the environment. Additionally, water-quality and water-level monitoring are used to evaluate consistency with the groundwater flow and contaminant transport conceptual and numerical model. Such consistency is important because the models are the primary basis for use-restriction boundaries.

In 2023, a letter report was submitted to NDEP that summarized post-closure monitoring activities completed for the closed UGTA CAUs (97, 98, and 99) in 2022 (EM Nevada Program 2023a). Institutional control monitoring confirmed that use restrictions are recorded in land management systems maintained by the DOE National Nuclear Security Administration Nevada Field Office (NNSA/NFO) and the U.S. Air Force (for the Frenchman Flat CAU) and that no activities are occurring that could potentially affect the contaminant boundaries of the closed UGTA CAUs. A survey of groundwater resources in basins surrounding the CAUs similarly identified no current or pending development that would indicate the need to increase monitoring activities or otherwise cause concern for the closure decision. Use restrictions continue to prevent ***exposure*** to the public, workers, and the environment from contaminants of concern by preventing access to potentially contaminated groundwater.

11.3.1.1 Frenchman Flat Corrective Action Unit 98

The closure report for the Frenchman Flat CAU (comprising 10 CASs) was approved by NDEP in 2016 (NNSA/NFO 2016) and describes the monitoring program for the first 5 years post-closure (2016 through 2020). An evaluation of the 5-year monitoring data was published in 2023 (EM Nevada Program 2022b). This evaluation showed the 5-year radionuclide concentrations in groundwater samples and water-level monitoring data to be consistent with the current understanding of the groundwater flow as well as the forecasted contaminant boundaries for this CAU (Figure 11-6). A rapid water-level drop in well ER-5-3-2, which is the only well in the Frenchman Flat basin completed in the regional lower carbonate aquifer (LCA), required further investigation by the U.S. Geological Survey, a participant in the UGTA process. This investigation identified well-construction

effects as the reason for the earlier elevated water levels and determined that samples collected from well ER-5-3-2 are representative of the carbonate system (Jackson and Frus 2023). Future monitoring requirements, based on these evaluation results, will be documented in an addendum to the closure report, which will require NDEP approval before implementation.

The Frenchman Flat CAU regulatory boundary objective is to protect receptors downgradient of the Rock Valley fault system from radionuclide contamination. Although contaminants resulting from underground nuclear tests are not forecasted to migrate out of the basin within the next 1,000 years, the Rock Valley fault system is the expected groundwater migration pathway. The negotiated regulatory boundary is established at the interface of the alluvial/volcanic aquifer and the Rock Valley fault (Figure 11-6). All monitoring results indicate that the regulatory boundary objective has been met (EM Nevada Program 2022b).

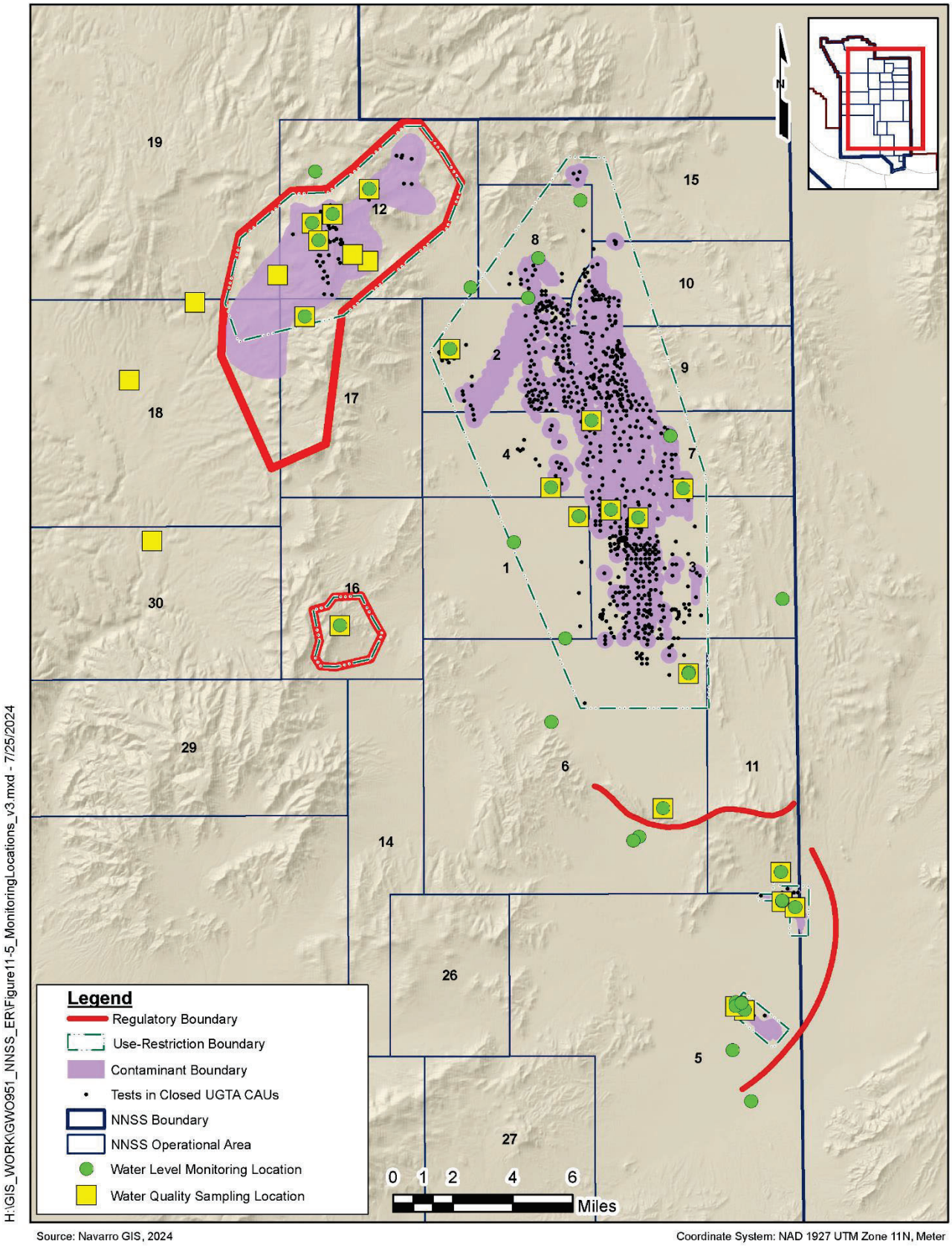

Figure 11-6. Boundaries and monitoring wells for closed UGTA CAUs

11.3.1.2 Rainier Mesa/Shoshone Mountain Corrective Action Unit 99

The closure report for the Rainier Mesa/Shoshone Mountain CAU (comprising 66 CASs) was approved by NDEP in 2020 (EM Nevada Program 2020b). The regulatory boundary objective for Rainier Mesa is to protect receptors of groundwater from radionuclide contamination within the three downgradient groundwater basins that receive recharge from Rainier Mesa (Pahute Mesa-Oasis Valley, Ash Meadows, and Alkali Flat-Furnace Creek). The regulatory boundary objective for Shoshone Mountain is to verify that radionuclide contamination does not reach the LCA (i.e., the regional aquifer) below Shoshone Mountain.

The monitoring network includes 16 locations, of which seven are sampled for radionuclides and measured for water levels, seven for sampling only, and two for water levels only. Sampling for ***tritium*** is required every 6 years at all locations and for additional radionuclides at three locations that access the tunnels where testing took place. Water-level measurements are required annually. Sampling results, presented in Chapter 5, are consistent with the current understanding of the groundwater flow as well as the forecasted contaminant boundaries for this CAU (Figure 11-6). All monitoring results indicate that the regulatory boundary objective has been met (EM Nevada Program 2021a).

11.3.1.3 Yucca Flat/Climax Mine Corrective Action Unit 97

The closure report for the Yucca Flat/Climax Mine CAU (comprising 720 CASs) was approved by NDEP in 2020 (EM Nevada Program 2020a). The regulatory boundary objective for the Yucca Flat/Climax Mine CAU is to verify that radionuclide contamination from this CAU is contained within the Yucca Flat basin, thus not impacting the LCA beneath Frenchman Flat or downgradient receptors. The regulatory boundary aligns with the southern extent of the Yucca Flat hydrographic basin (Basin 159; Nevada Division of Water Resources 2024) and supports the regulatory boundary objective.

The post-closure monitoring network for this CAU includes 26 locations, nine of which are sampled for radionuclides (i.e., tritium) and water levels, one for sampling only, and 16 for water levels only. Eight wells in Yucca Flat and one well in Frenchman Flat are sampled every 6 years, and one well in Yucca Flat will be sampled annually for 6 years (2020 through 2025). These wells access the LCA, which is a regional aquifer and the only pathway out of Yucca Flat (Navarro 2019). Water-level measurements are made annually. Sampling results, presented in Chapter 5, are consistent with the current understanding of the groundwater flow as well as the forecasted contaminant boundaries for this CAU (Figure 11-6). All monitoring results indicate that the regulatory boundary objective has been met (EM Nevada Program 2021b).

11.3.2 Industrial Sites and Soils

As of December 31, 2023, environmental corrective actions are complete at 2,104 Industrial Sites and Soils CASs on the NNSS, NTTR, and TTR. Characterization and closure of these CASs were completed in accordance with the FFACO (1996, as amended). Closure strategies include removal of debris, excavation of soil, decontamination and decommissioning of facilities, and ***closure in place*** with subsequent monitoring. The contaminants of concern include hazardous chemicals/materials, unexploded ordnance, and low-level radiological materials. Clean closures are those where pollutants, hazardous materials, radiological materials, and ***solid wastes*** have been removed and properly disposed, and where removal of all contaminants to concentrations agreed upon between DOE and NDEP is verified in accordance with corrective action plans approved under the FFACO. Closure in place entails the stabilization or isolation of pollutants, hazardous materials, radiological materials, and solid wastes – with or without partial treatment, removal activities, and/or post-closure monitoring – in accordance with corrective action plans approved under the FFACO. Radioactive materials removed from sites were either disposed as ***low-level waste*** or ***mixed low-level waste*** at the Area 5 Radioactive Waste Management Site (Section 10.1). Solid waste (e.g., demolition debris) containing asbestos is disposed at the Area 9 U10c Solid Waste Landfill. ***Hazardous waste*** removed from CASs is shipped to approved offsite treatment and disposal facilities or recycled. Post-closure monitoring requirements are established as needed to provide for the long-term protection of the public and the environment.

During 2023, 134 CASs within 67 FFACO Soils and Industrial Sites CAUs on the NNSS had post-closure inspection requirements and 13 CASs (in seven CAUs) were inspected as required by the RCRA Part B Permit (NNSA/NFO 2023). Inspection frequencies (such as annually, every 5 years, or following a rain event) for non-RCRA CAUs are identified in the Use Restriction for each CAU and requirements for RCRA CAUs are detailed in the RCRA Part B Permit. In 2023, the EM Nevada Program conducted 94 inspections of closed non-RCRA CASs managed under the FFACO, and 35 inspections in total were performed at CASs within the seven CAUs identified in the RCRA Part B Permit. In 2023, annual inspection reports for FFACO (EM Nevada Program 2023c) and RCRA Permit (EM Nevada Program 2023d) post-closure sites on the NNSS were prepared and submitted to NDEP.

11.3.3 Environmental Management Nevada Program Public Outreach

In 2023, the EM Nevada Program conducted many public outreach activities in partnership with its Environmental Program Services contractor, Navarro Research and Engineering, Inc. This includes a variety of community outreach events designed to educate and inform the public. Emphasis was placed on fostering science, technology, engineering, and math (STEM) learning for local students. The EM Nevada Program partnered with Clark County schools and the Atomic Museum to provide a demonstration at a 'STEM Saturday' event. The demonstration featured an interactive display of groundwater movement for youth participants. The EM Nevada Program also hosted a groundwater demonstration for 90 students at Sunrise Acres Elementary School in Las Vegas, an educational groundwater booth for a Star Wars-themed May the Science Be With You event at the Atomic Museum, and a similar educational demonstration in Pahrump, Nevada, for Earth Day.

A major highlight for 2023 was the awarding of Navarro Education Grants. The grant program, in its third year, was created to support educational activities related to STEM learning in communities near the NNSS. Navarro received a record number of applications in 2023 and, of the grants selected, four of the five were fully funded for the requested amounts. In total, Navarro awarded nearly $16,000 in CY 2023 for the advancement of STEM learning throughout Nevada. This brings the total investment since the inception of this grant to more than $37,000. Navarro representatives visited two past grant winners in 2023, including 2022 grant recipient Walter Bracken STEAM Academy, which used its funding to purchase Spheros robots to learn coding skills[6]. Navarro also visited a farmers market attended by students from Lied STEM Academy. Students sold produce grown using a hydroponics system purchased with grant funding[7].

The EM Nevada Program successfully hosted four Low-Level Waste Stakeholders Forum meetings, six Intergovernmental Liaison meetings, and six NSSAB public meetings. The NSSAB provided informed recommendations in 2023 on topics covered during public meetings that included enhancements to the Groundwater Open House; revegetation of EM sites; improvement and refinement of the groundwater sampling plan; developing Radioactive Waste Acceptance Program facility evaluation schedules; and improvements to the annual update presentation for CAUs at the Pahute Mesa groundwater region. NSSAB meeting agendas, handouts, minutes, and recommendations are posted on the NNSS website[8].

The NSSAB also held an extensive membership recruitment drive for new Board members. This included efforts to attract applicants from Pahrump, Alamo, Amargosa Valley, the Las Vegas Valley, Goldfield, Tonopah, and Beatty, Nevada, as well as from the communities of Shoshone and Tecopa in California. The EM Nevada Program produced a variety of print and media advertising distributed in these regions and posted on social media for months to bolster recruitment. Navarro representatives also advertised recruitment efforts at numerous events, making two appearances each at Amargosa Valley and Beatty town boards and Nye County Commission meetings. One of the Nye County visits was featured in the *Pahrump Valley Times*[9]. In addition, Tiffany Gamero with the EM Nevada Program was interviewed about the NSSAB on the Nye County television news station, KPVM TV channel 25[10].

[6] https://youtu.be/uLt8x_YlnH8
[7] https://youtu.be/xwmX95jB2zM
[8] https://nnss.gov/NSSAB/
[9] https://pvtimes.com/news/how-to-get-involved-with-former-test-sites-clean-up-126664/
[10] 01/02/2024 U.S. Department of Energy's Nevada Site Seeking Volunteers (youtube.com)

Throughout 2023, EM Nevada Program also facilitated multiple tours of the NNSS. EM Nevada Program scientists made numerous presentations, both virtually and in person, as part of the ongoing effort to share the details of the EM Nevada Program mission to stakeholders throughout the region.

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Opportunities to Observe Low-Level Waste (LLW) Facility Evaluations – Work Plan Item #4 and Real Time Radiography – Work Plan #5

Jhon Carilli, LLW Activity Lead
U.S. Department of Energy (DOE)
Environmental Management (EM) Nevada Program
February 19, 2025

NSSAB - Work Plan Item #4

- From a community perspective, the Nevada Site Specific Advisory Board (NSSAB) will provide recommendations for how the Radioactive Waste Acceptance Program (RWAP) facility evaluations could be enhanced

RWAP team conducting facility evaluation in West Valley, NY

NSSAB Path Forward - Work Plan Item #4

- Background: RWAP conducts facility evaluations at generator sites throughout the country. These facility evaluations evaluate the generator's waste certification program to verify continued implementation of the Nevada National Security Site Waste Acceptance Criteria (NNSSWAC).
- NSSAB will be provided with detailed briefing on facility evaluations during the April 16, 2025, NSSAB meeting
- Two NSSAB members are invited to observe RWAP conducting a facility evaluation and present their observations to the Full Board during the NSSAB Meeting on June 18, 2025
- NSSAB recommendation is due in June 2025

Proposed RWAP Facility Evaluations for NSSAB Observations

- To foster NSSAB understanding of waste generator missions and the depth of RWAP facility evaluations, EM Nevada is offering an opportunity for two NSSAB members to observe RWAP conducting a facility evaluation:

Date	Generator	Location
March 10-14	TWPC – United Cleanup (UCOR) – audit**	Oak Ridge, TN
March 24-28	Fluor/BWXT Portsmouth (FBP) – audit**	Piketon, OH
April 21-24	Sandia National Laboratories – surveillance*	Albuquerque, NM
May 5-9	University of TN-Battelle (ORNL) - audit**	Oak Ridge, TN
June 2-5	Perma-Fix-DSSI – surveillance*	Oak Ridge, TN

  - Selected modules assessed: quality assurance, radiological characterization, chemical characterization, traceability, and transportation
  - Time commitment:
    - Two days for surveillances* plus two days travel (Mon. – Thurs.)
    - Three days for audits** plus two days travel (Mon.- Fri.)

NSSAB - Work Plan Item #5

- From a community perspective, the NSSAB will provide recommendations for how the RWAP real time radiography (RTR) operations could be enhanced

NSSAB receives briefing in the RTR control room

NSSAB Path Forward - Work Plan Item #5

- Background: RWAP conducts RTR (essentially x-ray technology) on waste containers received by generators across the DOE complex at the Area 5 RWMC. RTR evaluations are used to verify that waste matches the profile description, and no indeterminate items are identified prior to disposal at the NNSS.
- NSSAB will be provided with a detailed briefing on RTR evaluations during the April 16, 2025, NSSAB meeting
- Two NSSAB members are invited to observe RWAP conducting an RTR evaluation and present their observations to the Full Board during the NSSAB Meeting on June 18, 2025
- NSSAB recommendation is due in June 2025

Proposed RWAP RTR Evaluations for NSSAB Observations

- To foster NSSAB understanding of waste generator missions and the depth of RWAP RTR evaluations, EM Nevada is offering an opportunity for two NSSAB members to observe RWAP conducting an RTR evaluation
  - Location will be at the Area 5 Radioactive Waste Management Complex (RWMC) on the NNSS
  - Time commitment: one full day
  - Scheduled in April – May 2025 to ensure that weather is favorable based on availability of the NSSAB members who observe

Fiscal Year (FY) 2027 Prioritization Work Plan Item #1

U.S. Department of Energy (DOE)
Environmental Management (EM)
Nevada Program
February 19, 2025

Tonight's Path Forward

- **Overview**
- Ranking process explanation
- Briefing of each task (five [5] tasks total)
  - Waste management disposal
  - Post-closure monitoring
  - Industrial Sites
  - Stakeholder support
  - Groundwater characterization
- Group discussion
- Individual rankings
- Prioritization tallying
- Vote on final recommendation

Overview

Andrew Weber
Lead Project Controls Specialist
EM Nevada Program

EM Nevada Program Baseline

Utilized by EM Nevada Program to support life-cycle planning to execute its mission

- Three (3) major components make up the baseline
  - **Scope of work**: Description of all work elements that must be accomplished
  - **Cost**: Estimated cost to accomplish scope of work
  - **Schedule**: Timeline and prioritization of scope of work

Elements identified in EM Nevada Program baseline are fully integrated

EM Nevada Program Baseline Planning Considerations

- Annual funding
  - Scope is prioritized to maximize amount of work that can be accomplished
- Scope uncertainties
  - Risk analysis performed to account for cost and schedule impacts associated with unknowns, such as: extreme weather, subsurface conditions, extent of contamination, etc.


Groundwater activities

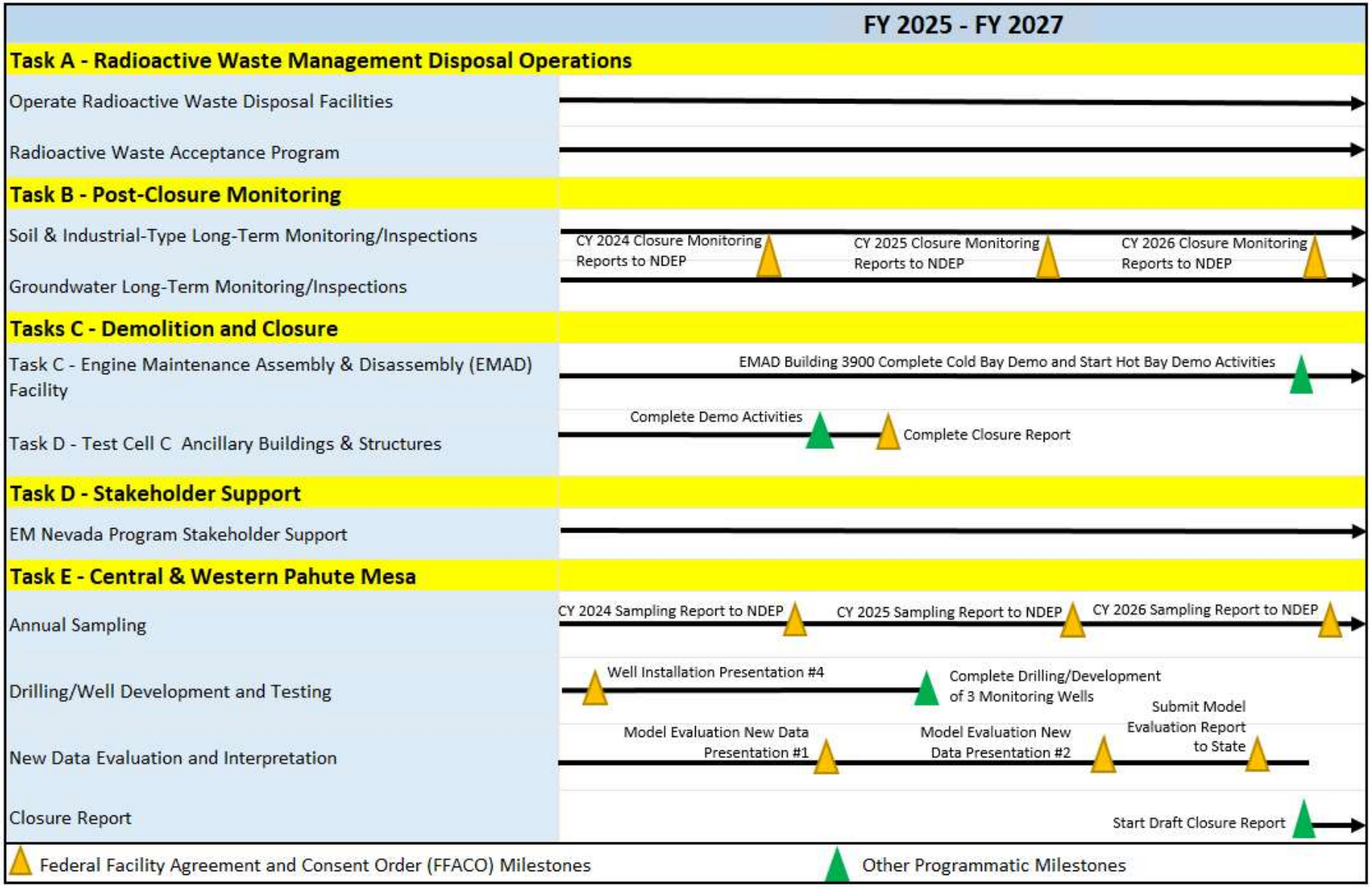
EM Nevada Program Baseline Maintenance

- Performance against the baseline
  - Contractors report monthly performance to EM Nevada Program, where it is integrated and analyzed, then compared against the EM Nevada Program baseline plan
- Baseline changes
  - Changes to baseline are required periodically to account for addition or deletion of scope, scientific strategy changes, or contract modifications

Federal Budget Process

Example of DOE budget planning timeline

EM Nevada Program Baseline Schedule



Calendar Year (CY)
State of Nevada Division of Environmental Protection (NDEP)

Questions on the Overview

Tonight's Path Forward

- Overview
- **Ranking process explanation**
- Briefing of each task
- Group discussion
- Individual rankings
- Prioritization tallying
- Vote on final recommendation

NSSAB Prioritization Worksheet

Name_____

Individual Ranking*	Task	Title	Notes
	A	Radioactive Waste Management Disposal Operations	
	B	Post-Closure Monitoring	
	C	EMAD Facility	
	D	Stakeholder Support	
	E	Central & Western Pahute Mesa	

***Rank from 1 - 5 with 1 as your highest priority and 5 being your lowest priority**
Note: Use each number only once

Tonight's Path Forward
(continued)

- Overview
- Ranking process explanation
- **Briefing of each task (five [5] tasks total)**
- Group discussion
- Individual rankings
- Prioritization tallying
- Vote on final recommendation

Waste Management Disposal Task

Jhon Carilli
Low-Level Waste (LLW) Activity Lead
EM Nevada Program

Task A – Radioactive Waste Management Disposal Operations

- Descriptions:
  - Maintain capability to safely receive and dispose approximately 800,000 cubic feet per year of LLW, mixed LLW, and classified waste from on-site and off-site generators
  - Continue environmental monitoring activities

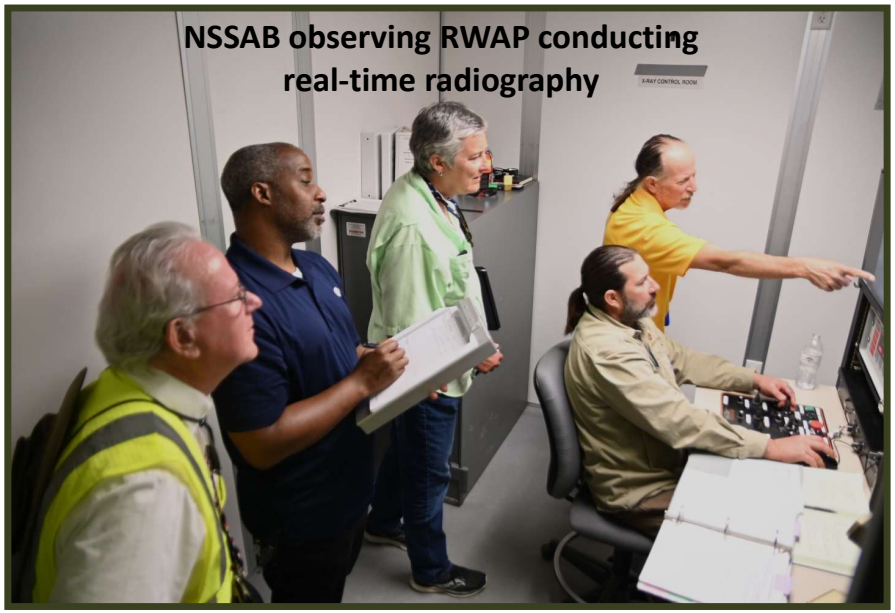
Task A – Radioactive Waste Management Disposal Operations (continued)

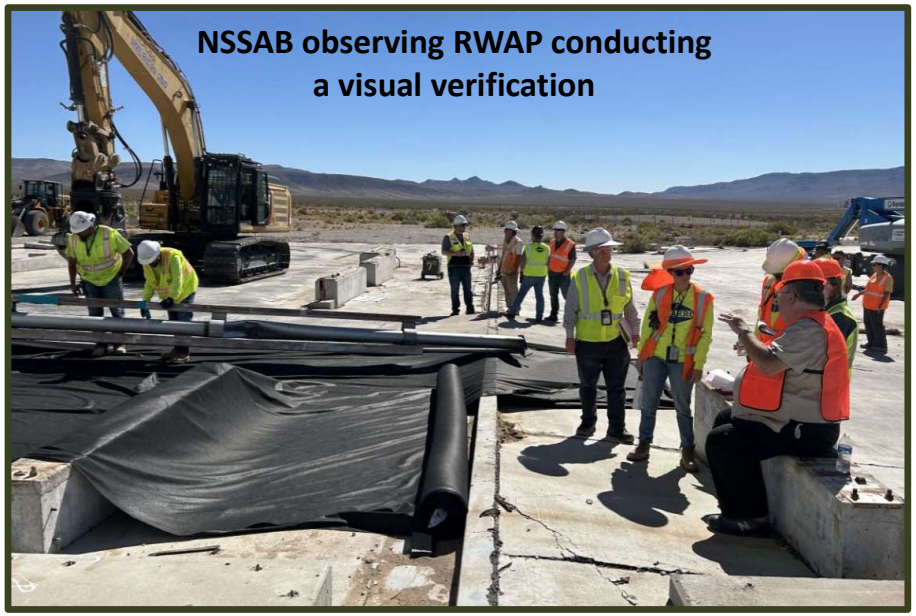
– Construct and close waste cells in Area 5 Radioactive Waste Management Complex (RWMC), as necessary

- Cells 29 and 30 are in use for LLW
- Seeding and outplants on several closure covers to begin in February 2025

Waste disposal at Area 5 RWMC

Task A – Radioactive Waste Management Disposal Operations (continued)


NSSAB observing RWAP conducting real-time radiography


NSSAB observing RWAP conducting a visual verification

- Maintain safe and compliant waste disposal in accordance with applicable regulations
- Continue generator facility evaluations and waste verifications conducted by Radioactive Waste Acceptance Program (RWAP) per Nevada National Security Site (NNSS) Waste Acceptance Criteria

Task A – Radioactive Waste Management Disposal Operations (continued)

- Risk/consequences of delay:
  - Public and environment
    - NNSS-specific: Potential inability to dispose of NNSS wastes resulting in additional costs for off-site disposal
    - Waste stored at other DOE sites may not have a safe and secure disposal path, potentially impacting the public and environment

Waste disposal activities

Waste disposal activities

Task A – Radioactive Waste Management Disposal Operations (continued)

  - Project
    - DOE complex: additional costs; inability to dispose of some wastes
  - Regulatory
    - DOE agreements and schedules with NDEP could be impacted
- Milestone:
  - Could impact EM Nevada Program demolition and closure activities

Questions for Waste Management Disposal Task

Post-Closure Monitoring Task

Tiffany Gamero
Regulatory/FFACO Lead
EM Nevada Program

Task B – Post-Closure Monitoring

- Description:
  - Conduct post-closure monitoring of closed FFACO sites on the NNSS
    - Post-closure inspections and maintenance
    - Groundwater sampling and analysis
    - Water level monitoring
    - Groundwater monitoring network maintenance
    - Reporting
  - Continue work on pre-transition activities
    - Formal transition activities to begin in earnest in FY 2028

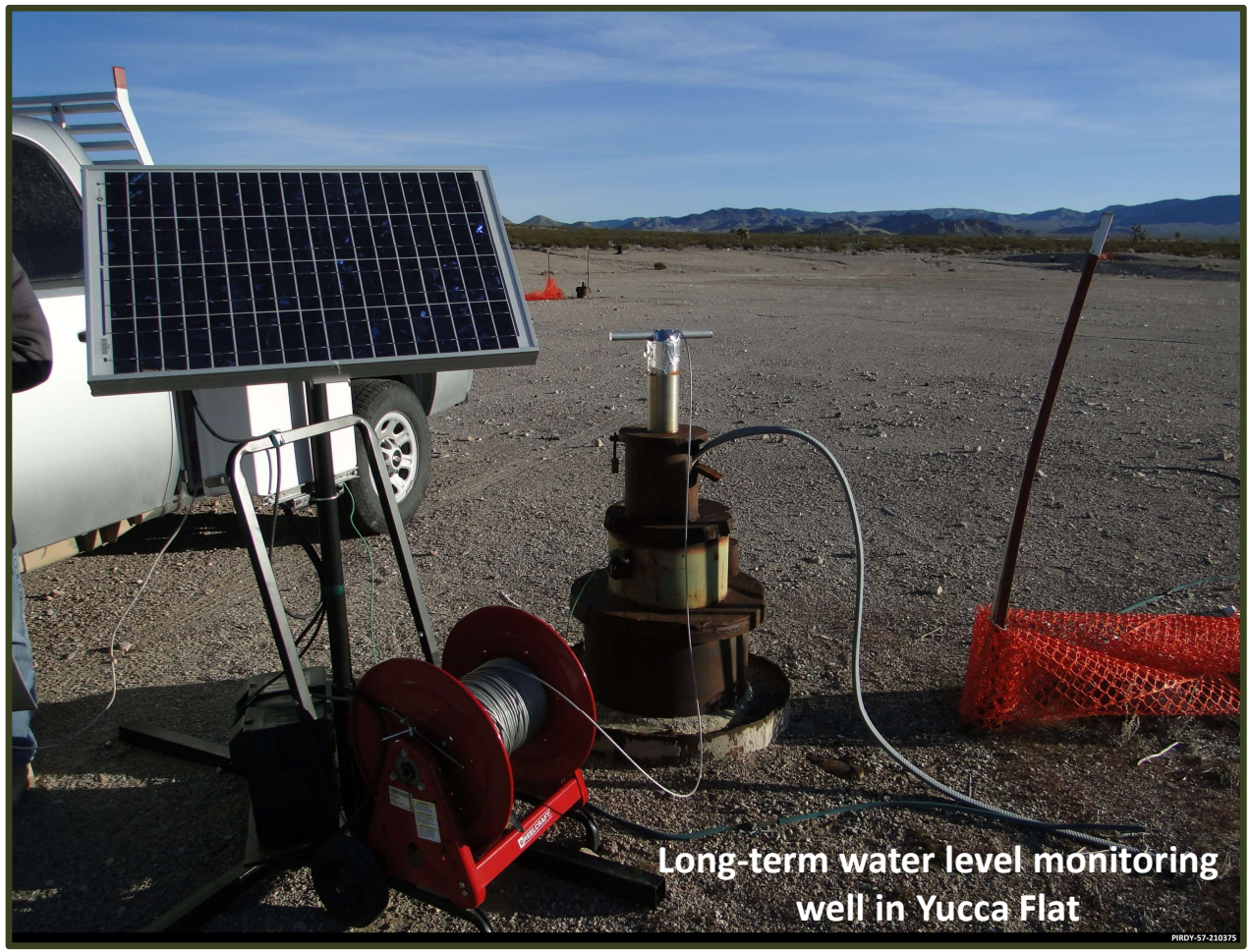

Sampling activities

Task B – Post-Closure Monitoring (continued)

- Risk/consequences of delay:
  - People and environment
    - Potential delay in identification of changes to implemented controls at closed sites
    - Increased risk that potential contaminant movement and/or exposure pathways may not be immediately recognized
  - Project
    - Delayed ability to monitor radionuclide migration
  - Regulatory
    - DOE agreements and schedules with NDEP could be impacted
- Milestone:
  - Submit annual closure monitoring reports to NDEP

Closed site requiring post-closure surveillance and maintenance

Questions for Post-Closure Monitoring Task



Industrial Sites Task

Tiffany Gamero
FFACO/Regulatory Lead
EM Nevada Program

Task C – Engine Maintenance Assembly and Disassembly (EMAD) Facility

- Description
  - Complete demolition of Building 3900 (cold portion)
  - Start demolition of Building 3900 (hot portion)

Task C – EMAD Facility (continued)

- Risk/consequences of delay:
  - People and environment
    - Any corrective actions would be delayed
  - Project
    - Delayed completion of Environmental Restoration mission
  - Regulatory
    - DOE agreements and schedules with NDEP could be impacted

- Milestones:
  - Any FFACO milestones (TBD) could be impacted

Questions for Industrial Sites Task

Stakeholder Support Task

Glenn Puit
Strategic Communications Manager
Navarro

Task D – Stakeholder Support

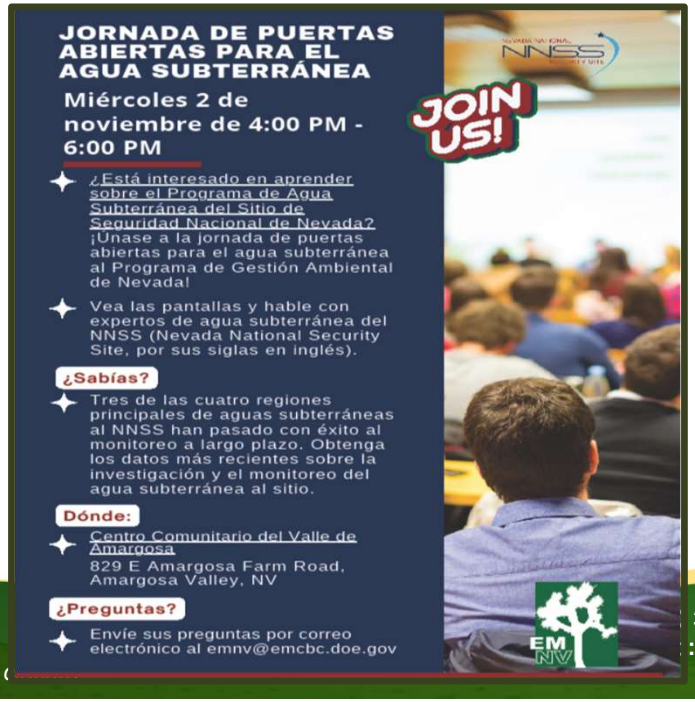
- Descriptions:
  - Develop and disseminate information on EM Nevada Program activities to diverse stakeholder groups
    - General public; NSSAB; intergovernmental liaisons; other local and regional government leaders; waste generator community; technical peers; and DOE headquarters


NSSAB tour of Sedan Crater at the NNSS – October 2024

Task D – Stakeholder Support (continued)

- Outreach and related products planned and prepared in coordination with technical projects, such as: Underground Test Area (UGTA), RWAP, etc.
  - NSSAB, LLW Stakeholders Forum, and other intergovernmental meetings (local and national), NNSS tours of EM sites
  - Community and educational outreach events, STEM grants
  - Website content, presentations, fact sheets, articles, videos, and social media posts

STEM Saturdays event at Atomic Museum



Ground-water Open House flyer in Spanish

Questions for Stakeholder Support Task

EM Nevada took part in a panel discussion at Intergovernmental Conference 2024

Groundwater Characterization Task

John Myers
UGTA Activity Lead
EM Nevada Program

Task E – Central and Western Pahute Mesa

- Descriptions:
  - Model Evaluation
    - Annual Sampling
      - Groundwater sampling
      - Water level measurements
      - Develop Annual Sampling Report
    - Complete New Data Evaluation and Interpretation and Model Evaluation Report
  - Start draft Closure Report preparation


Sampling activities

Task E – Central and Western Pahute Mesa (continued)

- Risk/consequences of delay:
  - People and environment
    - Low risk that potential contaminant movement and/or exposure pathways may not be immediately recognized
  - Project
    - Delayed completion of Environmental Restoration mission
  - Regulatory
    - DOE agreements and schedules with NDEP could be impacted


Sampling activities

Task E – Central and Western Pahute Mesa
(continued)


Sampling activities

- Milestones:
  - Submit CY 2026 Annual Sampling Report to NDEP
  - Complete Status Presentation to NDEP
  - Submit Model Evaluation Report to NDEP

Questions for Groundwater Characterization Task

Tonight's Path Forward

- Overview
- Ranking process explanation
- Briefing of each task (five [5] tasks total)
- **Group discussion**
- Individual rankings
- Prioritization tallying
- Vote on final recommendation

Tonight's Path Forward
(continued)

- Overview
- Ranking process explanation
- Briefing of each task
- Group discussion
- **Individual rankings**
- Prioritization tallying
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NSSAB Prioritization Worksheet

Name_____

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Tonight's Path Forward
(continued)

- Overview
- Ranking process explanation
- Description of each task
- Group discussion
- Individual rankings
- **Prioritization tallying**
- Vote on final recommendation

Round Robin Guidelines

- During the EM SSAB National Chairs' Meeting, each of the 8 local boards has five (5) minutes and one (1) slide to present to EM Headquarters leadership as part of the Round Robin agenda item
- Things to remember/consider:
  - This is your opportunity to speak directly to leadership regarding what is important to the Board
  - Leadership is already aware of the site's accomplishments
  - Highlight the Board's top interest/concern and/or Board's accomplishment