Nevada Site Specific Advisory Board (NSSAB)

Full Board Meeting

Amargosa Valley Community Center
821 E. Farm Road, Amargosa Valley, NV
4:00 p.m. – March 20, 2019

Members Present:	Amina Anderson, Frank Bonesteel (Chair), William DeWitt, Karen Eastman, Pennie Edmond, Charles Fullen, Dick Gardner, Anthony Graham, Tanya Henderson, Hepburn Klemm, Donald Neill, Steve Rosenbaum (Vice-Chair), Janice Six, Richard Stephans, Richard Twiddy, Dina Williamson-Erdag, Connie Wissmiller
Liaisons Present:	Leo Blundo (Nye County Commission), John Klenke (Nye County Nuclear Waste Repository Project Office [NWRPO]), Phil Klevorick (Clark County), Patrick Lazenby (Nye County Emergency Management [NCEM]) Mark McLane (State of Nevada Division of Environmental Protection [NDEP])
Liaisons Absent:	Richard Arnold (Consolidated Group of Tribes and Organizations [CGTO]), Richard Friese (U.S. National Park Service [NPS]), Carl Gregory (White Pine County Commission), Nathan Katschke (Lincoln County Commission), Delon Winsor (Esmeralda County Commission)
Department of Energy (DOE):	Robert Boehlecke, Kelly Snyder (Deputy Designated Federal Officer [DDFO]), Bill Wilborn
Environmental Management Consolidated Business Center (EMCBC):	Ken Armstrong, David Arvin, Kash Grimes
Facilitator:	Barbara Ulmer (Navarro)
Contractors/Government:	Marilew Bartling, Sharad Kelkar, Marc Klein, and Ray Mele (Navarro), Darwin Morgan (National Nuclear Security Administration/Nevada Field Office [NNSA/NFO]), Randy Paylor (U.S. Geological Survey [USGS]), Ken Rehfeldt (Navarro), Jeff Sanders (USGS), Jeff Wurtz (Navarro)
Public Signed In:	John Bosta, Dan Church, Chris Diamond, John Dyer, Joan Fewcet, Irene Hall, Kelly Houston, Bruce Jensen, Joseph LaBossiere, Bob Little, PJ Minshall, Jack Sypolt, George Tucker

Open Meeting/Chair's Opening Remarks

Chair Frank Bonesteel welcomed everyone to the meeting and thanked the community of Amargosa Valley for the use of its great facility to hold the meeting. Member William DeWitt made a motion to accept the agenda as presented. The motion was seconded and passed unanimously.

Public Comment

The following public comment was provided by John Bosta from Amargosa Valley, NV:

I welcome you here to our valley. It is wonderful to see all of you come to the valley and have your meeting here before the town of Amargosa. I think what is most important is that we are the community that is closest to Yucca Mountain. I think that it is very important that the decisions that are made by people from the test site, and how the well testing coming off of the test site affects our community. We really appreciate you being here this evening. Thank you.

The following public comment was provided by George Tucker from Amargosa Valley, NV:

Just briefly, I am assuming this is dealing mostly with tritium loss from the test site. Looking at your handout, which I haven't had time to study in any detail, I don't see any data for actual levels of tritium. Are there such data?

U.S. DOE Update (*Robert Boehlecke, DOE*)

Mr. Robert Boehlecke opened that the Environmental Management (EM) Nevada Program received just over $60 million for fiscal year (FY) 2019. This funding is adequate to accomplish all planned EM activities at the Nevada National Security Site (NNSS) for FY 2019. The FY 2020 budget was just released by the President that contains about $60.7 million for EM Nevada activities. This funding is adequate to accomplish all planned EM activities at the NNSS for FY 2020. The overall budget for EM and Legacy Management is $6.8 billion to clean up and monitor past cleanup of sites that supported development of the U.S. nuclear deterrent. The level of support demonstrated by the Administration's FY 2020 budget request is indicative of the steady and sustained cleanup progress the EM program is achieving. For EM Nevada Program, the budget supports progress on activities, including risk-informed closure of groundwater-contaminated sites, post-closure site monitoring, and continued support for State of Nevada regulatory oversight of EM activities.

Mr. Boehlecke reminded the Board that the current Environmental Program Services contract with Navarro will expire in January 2020. DOE continues its preparation of the final Request for Proposal, but no date has been set for the release.

Mr. Boehlecke noted that corrective action unit (CAU) 576 was completed in February 2019. This is a significant milestone for the EM Nevada Program is it marks the completion of all soils sites located on the NNSS.

Mr. Boehlecke updated that remediation of contaminated soil and debris continued at Clean Slate III on the Tonopah Test Range. Weather impacts of snow and rain resulted in the inability to perform work for several weeks, and excessive winds resulted in the inability to perform work for partial or entire days. This has resulted in the project being six-eight weeks behind schedule. The

shipping campaign paused in December 2018 due to the holiday and did not resume until this week due to the weather. For efficiency reasons, shipping campaigns last for three consecutive weeks, and then pause for several weeks to allow for the filling of waste bags. There are efforts underway to remove large debris comprised of concrete slabs and corrugated metal. The expected volume is over 200,000 cubic feet that will require approximately 450 shipments. Notification of shipments continue to be made to Nye County and Esmeralda County Emergency Management. To date, the number of shipments completed is 185 with a total of 370 bags with the majority disposed at the Area 3 Radioactive Waste Management Site (RWMS).

Mr. Boehlecke updated on the groundwater work conducted by the EM Nevada Program under the Underground Test Area (UGTA) Activity as follows: completed preliminary Yucca Flat model evaluation report and submitted for preemptive review, completed all Yucca Flat model evaluation simulations, completed Frenchman Flat closure monitoring sample collection, and incorporated Rainier Mesa flow and transport model addendum revisions per NDEP comments and currently preparing a final document. As a reminder, the tritium measured in wells is available in the NNSS Environmental Report at http://www.nnss.gov/pages/resources/library/ NNSSER.html.

Mr. Boehlecke commented that work continued on the expansion of the western portion of the Area 5 Radioactive Waste Management Complex (RWMC) for future waste disposal. A water line relocation was completed in November 2018. Berm construction is continuing with work performed along the entire length of the berm. The northern portion of the expansion is near completion. The location and the construction of the monitoring well that is required by the Resource Conservation and Recovery Act (RCRA) permit has been approved by NDEP. The location of the monitoring well is south of the Area 5 RWMC. Construction is planned to be initiated and completed by the end of FY 2019. Since July 2018, the new RCRA-permitted Cell 25 for mixed low-level waste (MLLW) is being used for disposal. The former MLLW Cell 18 is used for disposal, but will be nearing capacity in the next couple of months. Closure activities for Cell 18 are planned for late FY 2019, and the EM Nevada Program will work closely with NDEP for its permanent closure.

Mr. Boehlecke reminded the Board that he has provided updates for almost two years during NSSAB meetings regarding a Finding of Alleged Violation issued to the NNSS by NDEP due to a generator shipping waste containers containing MLLW that were mischaracterized as low-level waste (LLW). NDEP, NNSA/NFO and the EM Nevada Program have discussed the scope and cost of a Supplemental Environmental Project (SEP) that would be undertaken in lieu of paying a penalty. The SEP includes performing additional work that benefits and improves the ability of the EM Nevada Program to verify that waste is consistent with the generator's waste profile. The language for the formal Settlement Agreement is being finalized and upon approval will be signed by all involved parties. Additional details will be provided once the agreement has been signed.

Mr. Boehlecke reported that EM Nevada Program Federal and contractor staff are moving to a new location in downtown Las Vegas at 100 North City Parkway. The move is planned for September 2019.

Mr. Boehlecke mentioned recent events/stakeholder meetings that were conducted by EM Nevada Program staff:

- January 23, 2019 – NNSS tour for new Nevada State Assemblyman
- January 29-30, 2019 – Operation Clean Desert activity book deliveries to Clark County School District schools in Las Vegas with more than 2,500 books delivered
- March 3-7, 2019 –Waste Management Symposia (WMS) in Phoenix, AZ

- March 20, 2019 – Intergovernmental Liaison Meeting and NSSAB meeting in Amargosa Valley, NV

Mr. Boehlecke noted upcoming presentations/meetings/conferences of interest to be conducted/attended by the EM Nevada Program:

- March 26, 2019 – Mojave High School Career Day
- March 30, 2019 – Palo Verde High School International Baccalaureate Program Environmental Festival
- April 2, 2019 – LLW Stakeholders Forum quarterly meeting
- April 10, 2019 Groundwater-focused tour of NNSS
- April 18, 2019 – NNSS tour for LLW Stakeholders Forum
- April 23-25, 2019 – Annual CGTO Meeting
- April 24, 2019 – Intergovernmental Liaison Meeting and NSSAB Full Board Meeting in Las Vegas, NV

Mr. Boehlecke concluded by introducing Ken Armstrong, David Arvin, and Kash Grimes from the EMCBC located in Cincinnati, OH.

Liaison Updates

Clark County (*Phil Klevorick*)
Liaison Phil Klevorick reported that he attended the WMS in Phoenix, AZ. He stressed the importance in raising awareness of the importance of Nevada and the disposal capabilities at the NNSS in its relationship to the DOE Complex. A topic discussed during WMS was the definition or clarity of the definitions of waste classification. Any potential changes to waste classifications could characterize the waste based on its composition and not its origin, as it is classified in other countries. This change could significantly impact disposal at the Area 5 RWMC. Liaison Klevorick will be attending DOE's National Transportation Stakeholders Forum in Washington, DC in June 2019. This conference touches on all facets of the transportation of nuclear materials and waste across the country. Liaison Klevorick concluded that he attended a WMS presentation regarding a large volume of depleted uranium from DOE's Paducah and Portsmouth sites. In 2004, the final Environmental Impact Statement (EIS) did not include decisions with respect to specific disposal locations; therefore, the State of Nevada was not included. The public comment period for the draft Supplemental EIS to identify a disposal pathway closed earlier this month. Liaison Klevorick encouraged the public to be active and focus on waste streams that may potentially impact Nevada and the disposal pathways to the NNSS.

Nye County Commission (*Leo Blundo*)
Liaison Leo Blundo stated that he will be participating in the two tours of the NNSS next month. He encouraged attendance of NNSS tours as it provides a different perspective and progress on the cleanup activities at the NNSS.

NCEM (*Patrick Lazenby*)
Liaison Patrick Lazenby had nothing new to report.

NWRPO (*John Klenke*)
Liaison John Klenke thanked the NSSAB for hosting meetings in the rural areas bordering the NNSS and especially Nye County. In the fourth quarter of 2018, the Nye County Tritium Sampling and Monitoring Program (TSaMP) conducted its sampling campaign in the areas of Beatty, Amargosa, and Crystal, Nevada. The TSaMP is in its fourth year of a seven-year program.

TSaMP consists of ten core wells that are sampled every year, plus an additional ten wells that locations change from year to year. All samples collected were analyzed by Radiation Safety Engineering, Inc. in Chandler, AZ with a minimum detection concentration for 2018 for either 282 or 289 picocuries per liter (pCi/L), which equates to two percent of the tritium limit established under the U.S. Environmental Protection Agency's Safe Drinking Water Act (SDWA). In 2018, all twenty samples were non-detect under these limits, which is the same as the previous three years results under the TSaMP. This year, sampling was conducted in private domestic wells to increase the spatial distribution of sampling sites with community involvement. Liaison Klenke thanked former NSSAB member, Jack Sypolt, and current member, William DeWitt, for access to their wells for sampling. The TSaMP is funded by a grant from the DOE EM Nevada Program. The results are available in the NNSS Environmental Report at http://www.nnss.gov/pages/resources/library/ NNSSER.html.

NDEP (*Mark McLane)*
Liaison Mark McLane commented that NDEP is scheduled to conduct a compliance evaluation inspection of the two MLLW cells and the three hazardous waste units at the Area 5 RWMC under the RCRA permit in April 2019. Liaison McLane added that NDEP also inspects the recycling sites.

Other NSSAB Business (*Frank Bonesteel, Chair*)

Vice-Chair Steve Rosenbaum informed the NSSAB that the LLW Stakeholders Forum has been successful in disseminating information among stakeholders. Based on a comment by NSSAB members and other stakeholders during a quarterly LLW Stakeholders Forum meeting, one positive result was the decision to conduct a study for widening US-95 from Mercury, NV to State Route 160 in anticipation of Interstate 11.

Chair Bonesteel noted that he and Vice-Chair Rosenbaum will be attending the spring EM Site-Specific Advisory Board (SSAB) National Chairs' Meeting in Augusta, GA in early May 2019. During the meeting, there will be an opportunity for the NSSAB Chair to make a five-minute round robin presentation to the Assistant Secretary of EM (EM-1), highlighting the board's top interest/concern and/or the board's accomplishments. Chair Bonesteel initiated Board discussion on suggested topics for Nevada's round robin presentation. NSSAB suggestions were recorded on a flipchart, and Chair Bonesteel ask members to participate in a straw poll on the suggestions that they are most interested in during the dinner break.

Chair Bonesteel initiated discussion regarding a draft recommendation on infrastructure improvement written by Vice-Chair Rosenbaum to bring forward to the EM SSAB at the national meeting in May 2019. Vice-Chair Rosenbaum explained the background and the intent of the draft recommendation letter that was included in the meeting packet. After the NSSAB had their questions answered and concerns expressed, Chair Bonesteel asked members and liaisons to direct further input, concerns, or comments to Vice-Chair Rosenbaum for his consideration in making potential modifications to the draft recommendation before the April 24, 2019 NSSAB meeting.

Chair Bonesteel announced that he and Vice-Chair Rosenbaum would be visiting a meeting of the Savannah River Site SSAB in late July 2019. This is in result of a suggestion by an NSSAB member in order to bring back any ideas for improvements locally.

Chair Bonesteel requested an update from the two ad hoc committees formed in September 2018 to research liaison participation. Committee Chair Dina Williamson-Erdag elaborated on the committee report included in the meeting packet. The committee proposed the following options for a path forward for the number of liaisons: 1. Current liaison representation on the NSSAB is sufficient in both number and the information shared, 2. Current members and liaisons could identify community stakeholders whose voices are not currently heard at the Board table, i.e. Chamber of Commerce, volunteer emergency management organizations, or 3. Another solution formulated by the Full Board. Committee Chair Williamson-Erdag noted that the activities of the other committee might need to be finalized before moving forward.

Committee Chair Richard Twiddy elaborated on the committee report included in the meeting packet. The committee visited with the majority of the liaisons to determine what their needs are in order to participate in NSSAB meetings and if there was sufficient resources in the future to continue attendance of NSSAB meetings. Committee Chair Twiddy noted that the NSSAB has more liaisons than other EM SSAB local boards. The committee found that funding resources were lacking in the outlying counties for travel to NSSAB meetings. Committee Chair Twiddy made a motion that further discussion in regard to both ad hoc committee reports be added and discussed at the April 24, 2019 Full Board Meeting. The motion was seconded and passed unanimously.

In November 2018, DDFO Kelly Snyder and Bill Wilborn presented on the Offsite Groundwater Contamination Plan ~ Work Plan #6. At that time, the NSSAB provided a recommendation in support of the Offsite Groundwater Communication Plan. Due to the partial government shutdown, the NSSAB could not take further action on this work plan item at the January 2019 NSSAB administrative meeting. Members Twiddy and Richard Stephans requested that the Full Board further discuss the specific communication plan for notifications when the SDWA standard is exceeded in public, private, and Bureau of Land Management locations. DDFO Snyder reminded the NSSAB that at the current rate of migration, tritium above the SDWA standard will not extend beyond Federal land, and if anything changes, this portion of the plan would be written at that time. After further discussion, Members Twiddy and Stephans agreed that no further action is required and the standing NSSAB recommendation can remain unchanged.

Follow-up to the Evaluation of the Audit Determination Process ~ Work Plan #4 (*Marilew Bartling, Navarro)*

Ms. Bartling provided a short synopsis of the information that she presented at the January 16, 2019 NSSAB meeting. The Radioactive Waste Acceptance Program (RWAP) consists of three main activities: to provide technical support to generators who want to become an NNSS-approved generator, to evaluate profiles prior to waste being accepted for disposal at the NNSS, and to conduct facility evaluations. A facility evaluation may be an audit that is an onsite comprehensive review conducted on all five program elements: quality assurance, traceability, radiological characterization, chemical characterization, and transportation. A facility evaluation can also be a surveillance that is an onsite review conducted on two of the five program elements or a table-top assessment that is a remote review of program elements. At the January 16, 2019 meeting, Ms. Bartling reminded the Board that she presented a risk-informed spreadsheet used by RWAP to determine the risk for each generator program in order to schedule facility evaluations. Based on a request by the NSSAB, a white paper was developed to provide more detail on the risk score calculations used in the RWAP risk-informed spreadsheet. Ms. Bartling added that the risk-informed spreadsheet is useful in making decisions on the type of facility evaluation to

conduct, although RWAP has retained flexibility to make schedule changes in order to be responsive to new information, stakeholder and regulator concerns.

In response to Board questions, the following clarifications were provided:

- Some U.S. Department of Defense NNSS-approved generators have different security protocols than DOE sites; therefore, RWAP is responsive to their needs by conducting an onsite visit rather than a table-top assessment as some of the information reviewed is classified.
- As FY 2019 was the first year that the risk-informed spreadsheet has been used, the RWAP team along with DOE have begun discussions on enhancements and improvements for scheduling FY 2020 facility evaluations.
- A deviation is a request by the generator to deviate from an administrative or operational criteria within the NNSS Waste Acceptance Criteria (WAC). A deviation is not granted for a regulatory requirement or for fundamental controls, such as, performance assessments, environmental or radiological controls. The most common example of a deviation is a request to use a tarp rather than a Conastoga or closed transport. Using tarps is considered not as effective from protection from the weather as a Conastoga or closed transport, although generators can place drums on a flatbed as long as the primary containment meets U.S. Department of Transportation (DOT) requirements. Another example of a deviation is a request by the generator to have a shorten timeframe to submit paperwork to the NNSS before shipping. Another example of a deviation is a request to use waste packages that do not meet the NNSSWAC strength requirement as the NNSS often double or triple stacks containers in the waste cell. These waste containers meet all DOT requirements, but with an approved deviation these containers would not be placed on the bottom of a stack of waste containers.
- The RWAP is limited in its staff and resources, although the facility evaluation schedule is designed to provide an adequate review of generator sites on a frequent basis. The RWAP's goal is to conduct a full comprehensive audit on each generator every four years. The RWAP follows up with table-top assessments and surveillances to review all five program elements in the off-years. There are exceptions, for example, a generator may not be planning to ship waste to the NNSS for several years, then the RWAP program will consider conducting a table-top assessment rather than an onsite visit.
- The RWAP does not currently conduct unannounced facility evaluations for several reasons. One of the reasons is that some generators have very strict site access requirements due to the nature of the mission. Another reason is it is critical to have access to the right personnel and paperwork to effectively audit the five program elements. Lastly, DOE and NDEP accompany the RWAP team to the facility evaluations, which requires prior coordination and scheduling.
- On the risk-informed spreadsheet, two generators were identified with the potential of shipping U-233 waste to the NNSS. In 2012-2013, there was public interest with a U-233 shipping campaign due to safety and transportation concerns. During public meetings, DOE announced that there would be follow-on campaigns of U-233 waste. DOE has put into place lessons learned from this experience to identify potential sensitive waste streams from a public perception and to initiate additional dialogue with NDEP early in the process prior to any approval to accept these wastes for disposal at the NNSS.
- Professional judgements were used in developing the amount of points received for each of the attributes in the risk-formed spreadsheet. Since this was the first fiscal year using the spreadsheet, RWAP has started discussions on lessons learned and potential enhancements to the process for future fiscal years.

Chair Bonesteel stated that this work plan will be discussed in two parts: 1) does the NSSAB have any enhancements for the existing RWAP risk-informed process for scheduling facility evaluations, and 2) does the NSSAB support the process.

After deliberation, the NSSAB suggested the following enhancements be considered by DOE:

- Use a per unit score for risk attributes in place of assigning point values to the top generators.
- Conduct facility evaluations with no prior notice to the generators.
- Add the generator's overall ranking to the RWAP facility evaluation schedule.
- Include historical information from DOE's Occurrence Reporting and Processing System regarding near-miss incidents, primarily in transportation, although more study could be done to determine if other areas would also apply.

Member Charles Fullen made a motion that the NSSAB recommend that DOE consider the enhancements listed above for the RWAP risk-informed process for scheduling facility evaluations. The motion was seconded and passed unanimously. Member Fullen made a motion that the NSSAB support the existing RWAP risk-informed process with consideration of the enhancements listed above. The motion was seconded and passed unanimously.

Approach for Pahute Mesa Completion ~ Work Plan #2 (*Bill Wilborn, DOE)*

- **NSSAB Work Plan Item #2**
  - From a community perspective, provide a recommendation to the EM Nevada Program on if the more pragmatic approach for closure of Pahute Mesa is supported by the NSSAB and/or how it could be improved
  - The NSSAB recommendation is due by April 2019
- **Key Messages**
  - Current research shows the public water supply in Oasis Valley is safe from the impacts of historic underground nuclear testing
  - Groundwater contamination affected by historic NNSS activities has not gone beyond restricted Federal land
  - Groundwater models will use current monitoring data to provide output that is key to enhancing current and developing future monitoring strategies
- **Outline**
  - Groundwater background
  - Pahute Mesa CAU background
  - Approach to closure in Frenchman Flat, Yucca Flat, and Rainier Mesa CAUs
  - A more pragmatic approach for closure to Pahute Mesa and why it is being considered
- **Outline**
  - Groundwater background
  - Pahute Mesa CAU background
  - Approach to closure in Frenchman Flat, Yucca Flat, and Rainier Mesa CAUs
  - A more pragmatic approach for closure to Pahute Mesa and why it is being considered
- **Historic Nuclear Testing Impacts on the Groundwater**
  - 828 underground nuclear tests conducted at the NNSS from 1951 to 1992
  - Underground tests conducted at depths ranging from approximately 90 to 4,800 feet below the ground surface
  - One-third of these tests occurred near or below the water table

        - Much of the contaminants are trapped in the test cavity
        - Radioactive contamination has not been detected above the Safe Drinking Water Act (SDWA) standard in groundwater beyond the NNSS and the Nevada Test and Training Range (NTTR)
- **Underground Test Area (UGTA) Activity**
    - Complex geology and hydrology of the NNSS presents unusual challenges in understanding boundary conditions, velocity, and direction of groundwater flow
        - Challenges addressed in UGTA strategy through drilling, well sampling, characterization, and computer model development
    - No practical technology for clean-up
        - Natural processes occur that reduce and remove contamination
- **Why Monitor NNSS Groundwater?**
    - Helps protect the public by providing a system of monitoring detection
    - Provides baseline to establish existing conditions
    - Identifies trends and verifies compliance with regulatory standards
- **CAUs**
    - There are five CAUs that make up the UGTA activity
        - CAUs are determined by location and geologic conditions
- **Groundwater Flow on the NNSS**
    - 60 years of data collected indicate that groundwater:
        - In the eastern portion, eventually discharges to the Ash Meadows/Devils Hole or Death Valley areas
        - In the northwestern portion, locally discharges to springs in Oasis Valley
        - Estimated velocities (speed) range from a few feet up to 300 feet per year dependent on geology, hydraulic properties (i.e., ability of water to flow through rock), and elevation of the water table
            - Measured velocities on Pahute Mesa are no larger than 300 feet per year
        - Model forecasts show contaminants above the SDWA standard would not reach publicly accessible water supply
- **Groundwater Flow on the NNSS Video -** https://www.youtube.com/watch?v=wJG-S0rMcms
- **Outline**
    - Groundwater background
    - Pahute Mesa CAU background
    - Approach to closure in Frenchman Flat, Yucca Flat, and Rainier Mesa CAUs
    - A more pragmatic approach for closure to Pahute Mesa and why it is being considered
- **Background Information for Pahute Mesa**
    - 82 of the 818 underground nuclear tests covered under UGTA Activity were conducted on Pahute Mesa
        - Ten were shallow tests that were addressed under the Soils Activity
    - Represents ~ 60% of the total radionuclide inventory
    - Underground tests conducted at depths ranging from approximately 740 to 4,800 feet below the ground surface
    - All but two of these tests occurred near or below the water table
    - Much of the contaminants are trapped in the test cavity
    - Radioactive contamination has not been detected above the SDWA standard in groundwater beyond the NNSS and the NTTR
- **Pahute Mesa Data Approach**
    - Data from groundwater samples collected from wells provides the best way to understand what is really happening

- UGTA has drilled 11 new wells on Pahute Mesa since 2007
  "*Overall, citizens of the communities of Oasis Valley, Beatty, and Amargosa Valley express support for more real data and less modeling. If modeling must be used, then validation of those models must be provided using data from wells located between residents and the contaminant sources*." Community Advisory Board for Nevada Test Site Programs (2007)

- **Groundwater Sampling Locations on Pahute Mesa**
  - 36 wells have been drilled since 1992
  - Several thousand samples have been collected to monitor the groundwater
  - Sampling results available in the NNSS Environmental Report at: http://nnss.gov/pages/resources/library/NNSSER.html
- **Tritium**
  - Most common radionuclides found in groundwater at the NNSS
  - Most mobile in groundwater; therefore, a leading indicator that other contaminants may be present, making it a primary contaminant of study
  - SDWA standard for tritium is 20,000 pCi/L
  - One half-life* of tritium is around 12.3 years
  - Rule of thumb – takes ten half-lives for tritium to decay below the regulatory standard
    - Approximately three-four half-lives have occurred for early tests with approximately two half-lives for later tests
      *Definition: half-life of a radioactive substance is the amount of time required for half of its atoms to decay
- **Tritium Measurements on Pahute Mesa**
  - For all samples from wells not located in cavities, only tritium has been measured above the SDWA standard
- **Outline**
  - Groundwater background
  - Pahute Mesa CAU background
  - Approach to closure in Frenchman Flat, Yucca Flat, and Rainier Mesa CAUs
  - A more pragmatic approach for closure to Pahute Mesa and why it is being considered
- **UGTA Closure Strategy**
  - Outlined within the Federal Facility and Consent Order (FFACO)
    - Pahute Mesa closure strategy **will follow** the FFACO process
  - Corrective Action Investigation (some CAUs may require a Phase I and II)
    - Corrective Action Investigation Plan (CAIP)
    - Data collection
    - Modeling
    - Contaminant boundary
    - Peer review
  - Corrective Action Decision Document/Corrective Action Plan (CADD/CAP)
    - Model evaluation
    - Use restriction boundary
    - Regulatory boundary negotiations with NDEP
  - Closure
    - Closure Report
    - Address regulatory boundary changes if necessary
    - Closure in place with long-term monitoring
    - Institutional controls

- **Approach for Frenchman Flat, Yucca Flat, and Rainier Mesa CAUs**
  - The risk to the public was expected to be small because one or more of the following were true: small radionuclide inventory, slow groundwater movement, or large distance to the NNSS site boundary
  - Model "worst case" radionuclide transport based on ranges of parameter values
    - This approach overestimates the actual radionuclides movement
    - Even in the worst case, modeling showed contamination above the SDWA standard will not reach any off-site public water supply wells
  - Used selected monitoring wells to ensure that real radionuclide movement was less than the worst case
- **What Have We Learned?**
  - External Peer Reviews of modeling results in Frenchman Flat, Yucca Flat, and Rainier Mesa have been successfully completed with lessons learned from each CAU
  - Groundwater samples confirm that the model is conservative; therefore, the results are protective of human health and the environment
  - DOE recognized that additional data collection was necessary for Pahute Mesa due to its proximity to public land, higher groundwater velocities, and overall higher risk
- **Outline**
  - Groundwater background
  - Pahute Mesa CAU background
  - Approach to closure in Frenchman Flat, Yucca Flat, and Rainier Mesa CAUs
  - A more pragmatic approach for closure to Pahute Mesa and why it is being considered
- **Considerations in the Approach for Pahute Mesa**
  - Larger inventory, closer proximity to public lands, and higher groundwater velocity for Pahute Mesa
  - Worst case results unnecessarily raise concerns
  - Real data preferred by stakeholders
  - Model must be consistent with data, not just worst case
  - DOE has invested in new wells for more than 20 years
  - Real data shows the location of contamination, and therefore provides information on past and potential future migration
  - Models support the monitoring network design
- **What the Data Tells Us**
  - From radionuclide measurements in wells downgradient of cavities, only tritium concentrations are above the SDWA standard; all other radionuclides are measured at concentrations below the SDWA standard
  - After nearly 50 years since the tests were conducted, contamination above the SDWA standard has moved just about 2.5 miles and has not been observed above the SDWA standard in any wells outside of the NNSS boundary
  - The distance between the contamination near the outer NNSS boundary and the NTTR boundary is about 12 miles
    - At the current rate of migration, the models show that tritium above the SDWA standard will not transport beyond Federal lands
    - Risk-Informed Spreadsheet was developed to determine the relative risk for each
  - Tritium will decay below the SDWA standard in about ten half-lives
- **Pragmatic Approach for Pahute Mesa**
  - Use the additional measured contaminant data to the fullest extent possible
    - Evaluate models against measured data (water levels, tritium, aquifer parameters) to eliminate inaccurate predictions to reduce uncertainty
    - Model must be consistent with the data with acceptable tolerance

        - Models **can** show contamination where data shows there is none
        - Use the data fully to eliminate bad model forecasts
    - Focus on the monitoring of contaminants that are moving offsite toward Oasis Valley
    - Use the model to help figure out if new monitoring wells should be drilled, and if so, where to drill
        - Modeling will identify and fill in gaps in the current well/monitoring network
    - Develop a robust monitoring well network that is protective of human health and the environment
- **How the Pragmatic Approach for Pahute Mesa is Different**
    - Robust monitoring well network with more wells than other CAUs
    - Greater reliance on measured data
    - Probabilistic modeling kept consistent with observed data to avoid overly conservative (unrealistic) results
- **Yucca Flat Model Animated Graphic**
- **Key Messages (Reiterated)**
    - Current research shows the public water supply in Oasis Valley is safe from the impacts of historic underground nuclear testing
    - Groundwater contamination affected by historic NNSS activities has not gone beyond restricted Federal land
    - Groundwater models will use current monitoring data to provide output that is key to enhancing current and developing future monitoring strategies
- **Path Forward**
    - From a community perspective, provide a recommendation to the EM Nevada Program if the more pragmatic approach for closure of Pahute Mesa is supported by the NSSAB and/or how it could be improved
    - The NSSAB recommendation is due by April 2019
- **Questions**

In response to Board questions, the following clarifications were provided:

- The UGTA Activity uses 60 years of data from models that indicate contaminants in groundwater will not reach publicly accessible water supply and most likely will not extend off federally-controlled NTTR land. Tritium does naturally occur in the atmosphere; so there likely could be naturally-occurring tritium in surface waters or groundwater that has recharged from the surface. The majority of the waters on Pahute Mesa at depth is paleo or older waters that would not contain naturally-occurring tritium due to decay.
- The UGTA Activity annually conducts water level measurements in wells to monitor trends and changes resulting from seismic activity. There have been no significant changes noted to the water table or groundwater movement based on this monitoring.
- The sampling activities that are conducted by the UGTA Activity is not at a volume large enough to change the groundwater flow at the NNSS.

Chair Bonesteel initiated discussion whether the NSSAB wanted to develop a recommendation on the Approach to Pahute Mesa Completion – Work Plan #2 tonight. Several members requested to first participate in the tour of Pahute Mesa and Rainier Mesa on April 10, 2019; thereby giving them the opportunity to ask additional questions and view the geologic formations of the area. Member Twiddy made a motion that the NSSAB table developing a recommendation on this work plan item until the next NSSAB meeting on April 24, 2019. The motion was seconded and passed unanimously.

Development of Round Robin Topics (continued)

After reviewing results of the straw poll and after further dialogue, the NSSAB decided on the following round robin topics:

- Board interests/concerns:
  - Infrastructure improvement
  - Historic preservation and other benefits of the NNSS to the local community

- Board accomplishments:
  - NSSAB involvement with the LLW Stakeholders Forum and tours of the NNSS
  - Increased public attendance at Full Board meetings

Chair Bonesteel will be presenting these round robin topics to EM-1 on behalf of the NSSAB at the EM SSAB National Chairs' Meeting in May 2019.

Facilitator Ulmer informed the NSSAB that the agenda for the April 24, 2019 Full Board meeting is full with the briefing and recommendation development for FY 2021 Baseline Prioritization – Work Plan #7, and the additions of agenda items for further discussion of liaison participation and the draft EM SSAB recommendation on infrastructure improvement. Member Fullen made a motion to begin the April 24, 2019 Full Board meeting at 3 p.m. The motion was seconded and passed with a majority. The Intergovernmental Meeting with NSSAB liaisons and EM Nevada Program management will begin at 2 p.m.

Meeting Wrap-Up and Adjournment

Upcoming calendar of events:

- LLW Stakeholders Forum in Las Vegas, NV – April 2, 2019
- NSSAB Tour of Rainier/Pahute Mesa – April 10, 2019
- LLW Stakeholders Forum Tour of NNSS – April 18, 2019
- NSSAB Full Board meeting in Las Vegas, NV – April 24, 2019
- EM SSAB National Chairs' Meeting in Augusta, GA – May 7-9, 2019
- LLW Visual Verification in Portsmouth, OH – June 4, 2019
- Visit to SRS SSAB meeting in North Augusta, GA – July 29-30, 2019

Any questions on the calendar of events, please contact the NSSAB Office at 702-523-0894.

Member Dick Gardner made a motion to adjourn the meeting. The motion was seconded and passed unanimously. The meeting was adjourned at 8:06 p.m.