Nevada Site Specific Advisory Board (NSSAB)

Full Board Meeting

Valley Conference Center, Valley Electric Association
800 E. Highway 372, Pahrump, NV 89048
4:00 p.m. – January 15, 2020

Members Present:	Amina Anderson, Frank Bonesteel (Chair), William DeWitt, Karen Eastman, Pennie Edmond, Charles Fullen, Dick Gardner (Vice-Chair), Anthony Graham, Tanya Henderson, Donald Neill, Steve Rosenbaum, Janice Six, Richard Stephans (by phone), Richard Twiddy (by phone), Dina Williamson-Erdag
Liaisons Present:	Chris Andres (State of Nevada Division of Environmental Protection [NDEP]), Leo Blundo (Nye County Commission), Jared Brackenbury (Lincoln County Commission), John Klenke (Nye County Nuclear Waste Repository Project Office [NWRPO]), Patrick Lazenby (Nye County Emergency Management [NCEM])
Liaisons Absent:	Richard Arnold (Consolidated Group of Tribes and Organizations [CGTO]), Phil Klevorick (Clark County), Delon Winsor (Esmeralda County Commission)
Department of Energy (DOE):	Robert Boehlecke, (Deputy Designated Federal Officer [DDFO]), Bill Wilborn
Facilitator:	Barbara Ulmer (Navarro)
Contractors/Government:	Marilew Bartling, Dona Merritt and Christy Morris (Navarro), C.E. Russell (Desert Research Institute [DRI]), Mark Krauss (Mission Support and Test Services, Inc. [MSTS]), and Susan Krenzien (Inspection Experts, Inc.)
Public Signed In:	Kip Mgee, Dan Morrow, John Pawlak, Jin Tay

Open Meeting/Chair's Opening Remarks

Chair Frank Bonesteel welcomed everyone to the meeting and thanked them for their attendance. Vice-Chair Dick Gardner made a motion to accept the agenda. The motion was seconded and passed unanimously.

Public Comment

There was no public comment.

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

Mr. Robert Boehlecke opened that the spending bill was signed on December 20, 2019, that funded federal agencies through September 30, 2020. The Environmental Management (EM) Nevada Program Congressional budget request is approximately $60.7 million for fiscal year (FY) 2020, which is adequate to accomplish all planned EM activities at the Nevada National Security Site (NNSS).

Mr. Boehlecke reminded the Board that the Environmental Program Services contract with Navarro expires the end of January 2020. DOE has issued a contract extension for up to six months while the Department works through the procurement process.

Mr. Boehlecke updated that restoration and reseeding activities were completed in December 2019 at Clean Slate II and Clean Slate III on the Tonopah Test Range (TTR). In December 2019, the EM Nevada Program submitted the Closure Report (CR) to NDEP that was accepted. With the approval of the CR, Clean Slates III is now considered closed and it is a significant accomplishment as it is the last Soils site closed under the Federal Facility Agreement and Consent Order (FFACO).

Mr. Boehlecke reported that the process has begun for the transition of FFACO corrective action sites on the TTR to DOE's Office of Legacy Management (OLM). The EM Nevada Program and the OLM have initiated several preliminary activities, including a Site Transition Plan and a communication plan that considers transparent communication with stakeholders a priority. The transition is scheduled to be complete by September 30, 2020, although the actual records transfer may extend beyond. The OLM will be presenting at the March 18, 2020, NSSAB Meeting.

Regarding the Underground Test Area (UGTA) Activity (groundwater), Mr. Boehlecke stated that the EM Nevada Program is negotiating with NDEP to define the closure requirements for Yucca Flat/Climax Mine (YF/CM). The revised draft CR for Rainier Mesa/Shoshone Mountain was submitted to NDEP in December 2019 with comment response in January 2020. Three groundwater wells in Yucca Flat were sampled in December 2019 and January 2020. The UGTA Activity is currently developing the YF/CM CR that includes EM Nevada Program and NDEP agreed upon content, e.g., contaminant boundaries and monitoring. In January 2020, planning began for the fifth annual closure sampling of wells in Frenchman Flat.

Mr. Boehlecke informed the Board that closure activities continued on the mixed low-level waste (MLLW) Cell 18 with the expected completion in May 2020. The adjacent Cell 25 is operational and accepting MLLW. The flood control berm around the western expansion area is scheduled for completion in late FY 2020. In December 2019, drilling began for a new monitoring well required by the new MLLW permit and is expected to be complete in the next couple of weeks.

Mr. Boehlecke mentioned recent events/stakeholders meetings conducted by EM Nevada Program staff (time period is November 14, 2019 - present):

- November 19-21 – DOE EM Intergovernmental Meeting in Nashville, TN
  - Side-bar meeting held with EM-1, other EM Headquarters staff, and Nevada stakeholders
    - Action items included setting up an NNSS tour for Nevada Assemblymen and Senators and discussion for potentially increasing the grant funding provided through the Emergency Preparedness Working Group (EPWG) to counties for

emergency preparedness. EM-1 will entertain any input from the counties on a reasonable increase and how the funding would be used.

- Waste Coordination Leadership Group six-month update presentation to State of Nevada
  - Action item included sending EM fact sheets to attendees from the Nevada legislature

- January 7 – Secretary of Energy Dan Brouillette visited the EM Nevada Program office during his trip to speak at the annual Consumer Electronics Show in Las Vegas, NV. Discussions centered on groundwater, waste disposal/transportation, and stakeholder outreach.
- January 9 – Groundwater demonstration to Beatty High School students in Beatty, NV

Mr. Boehlecke continued with upcoming presentations/meetings/conferences of interest to be conducted by the EM Nevada Program (time period is January 15 – present):

- January 22 – Update to Nye County Commission in Pahrump, NV
- February 1 – Booth at Nevada State Science Teachers' Association Conference to distribute Operation Clean Desert educational program materials
- February 5 – Low-Level Waste Stakeholders Forum meeting in Pahrump, NV
- March 9-12 – 2020 Waste Management Symposia in Phoenix, AZ
- March 18 – Intergovernmental Liaison meeting in Las Vegas, NV
- March 18 – Full Board NSSAB meeting in Las Vegas, NV
- Week of March 30 – DOE EM Site-Specific Advisory Board (SSAB) Chairs meeting in Las Vegas, NV
- Week of April 20 – NNSS Waste Generator Workshop at the National Nuclear Security Administration (NNSA)/Nevada Field Office facility in North Las Vegas, NV
- April 29 – May 1 – Devils Hole Workshop in Furnace Creek, CA

Mr. Boehlecke continued with an update regarding the Y-12 waste event. After an investigation and substantial review of all the information regarding the shipments, the determination was made that the waste was LLW, although it did violate the NNSS Waste Acceptance Criteria (WAC). A significant amount of information has been shared with NDEP who is currently reviewing and will respond to the EM Nevada Program when its review is complete. All shipments from Y-12 have been suspended until corrective actions are complete. As these corrective actions are being completed, the Radioactive Waste Acceptance Program (RWAP) is providing feedback to Y-12. A RWAP team is scheduled to conduct a full audit, including validation of the corrective actions, of the Y-12 waste certification program. If all corrective actions have been completed and validated by RWAP, the EM Nevada Program will review to determine if Y-12 will be allowed to resume shipments to the NNSS.

The Y-12 waste event has spurred a number of assessments and reviews of the program. The EM Nevada Program is using information that has been generated from these assessments and reviews to prepare an RWAP Improvement Plan in an effort to enhance the program and to further ensure that this type of incident does not reoccur. Additional updates will be available on the Y-12 waste event as the EM Nevada Program works through the process.

Mr. Boehlecke provided a status on the Supplemental Environmental Project (SEP). The SEP resulted from a Settlement Agreement with the State of Nevada due to waste sent by a generator that was not properly characterized and accepted for disposal at the NNSS. The EM Nevada Program is about ninety-five percent complete with the tasks included in the SEP and will be working on the final reporting. The SEP requires three tasks to be completed: 1) 46 of the

minimum 40 required LLW visual verifications at generator sites were performed in FY 2019, 2) 103 of the minimum 100 required containers were examined by real-time radiography (RTR) in FY 2019, 3) RWAP has completed a deep dive review of all the waste profiles. A number of these waste profiles remain that RWAP is awaiting further information from the generator. A meeting was held with NDEP yesterday on the status of the SEP that resulted in several actions for additional information. Overall, EM Nevada Program is on target to complete the SEP by the due date of April 25, 2020, with the completion of reporting within 90 days.

Liaison Updates

Lincoln County Commission (*Jared Brackenbury*)
Liaison Jared Brackenbury had nothing new to report.

Nye County Commission (*Leo Blundo*)
Liaison Leo Blundo thanked DOE for the update that he will bring forward to the commission.

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

NWRPO (*John Klenke*)
Liaison John Klenke thanked the NSSAB for holding its meeting in Pahrump, NV.

NDEP (*Christine Andres)*
Liaison Christine Andres reiterated from Mr. Boehlecke's update that NDEP approved the CR for Clean Slates III in December 2019.

DOE and U.S. Nuclear Regulatory Commission (NRC) Waste Classification Systems (*Susan Krenzien, Inspection Experts, Inc.)*

- **Contents**
  - Authority – Why We Have Two Systems
  - NRC Classifications
  - DOE Waste Classifications
  - Why the Systems are Different
  - Waste Types
  - Spent Nuclear Fuel
- **Radioactive Waste**
  - Any garbage, refuse, sludge, and other discarded material, including solid, liquid, semisolid, or contained gaseous material that must be managed for its radioactive content
  - No programmatic use
- **Atomic Energy Act as Amended**
  - *Atomic Energy Act* of 1954 (AEA)
    - Established Atomic Energy Commission (AEC)
  - *Energy Reorganization Act* of 1974
    - Divided the AEC into two separate entities
      - NRC
      - Energy Research and Development Administration (DOE – 1977)
    - *Nuclear Waste Policy Act* of 1982
    - *Low-level Radioactive Waste Policy Amendments Act* of 1985

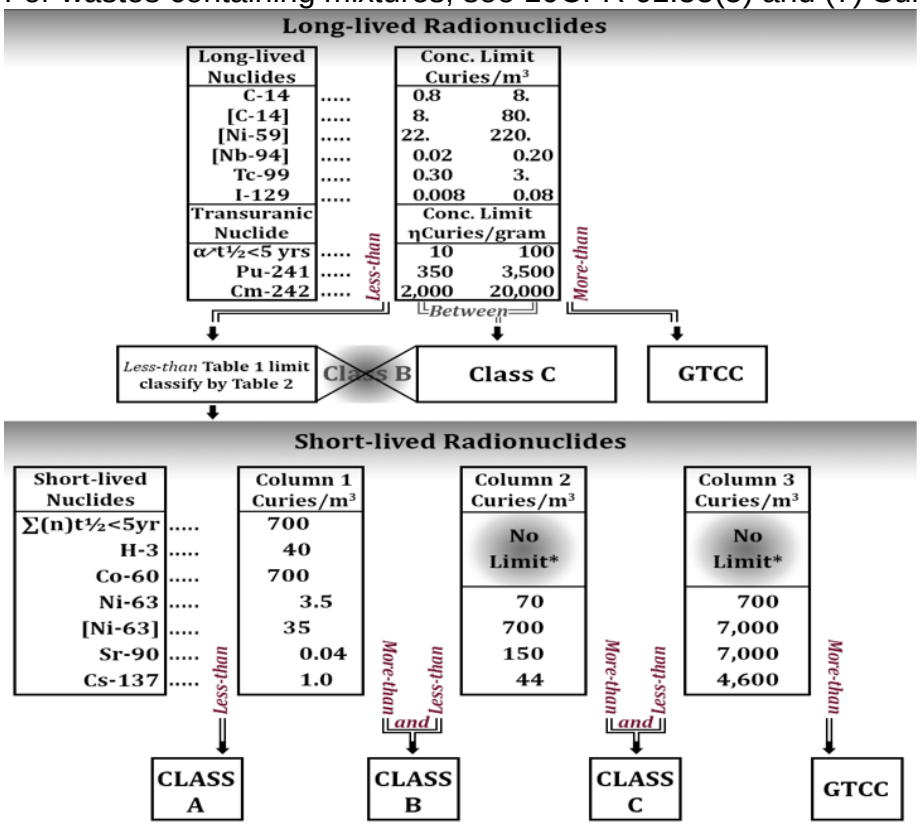
- *Energy Policy Act* of 2005

- **Waste and Responsibility**

Waste Class	Regulatory Responsibilities	Planned Disposition Path
High-Level Waste (HLW)	• DOE for disposal • U.S. Environmental Protection Agency (EPA) disposal standards • NRC licenses	Geologic repository
Greater-than-Class C (GTCC)	• DOE for disposal • NRC regulates disposal	LLW not for near-surface disposal; Geologic repository
Transuranic (TRU) Waste	• DOE for disposal • EPA certification • New Mexico permit	Waste Isolation Pilot Plant (WIPP), DOE owned/operated
Low-Level Waste (LLW)	• DOE for disposal • EPA/State permit if mixed	DOE near-surface disposal facilities
LLW Class A, B, C	• Agreement State licenses commercial facilities	Commercial near-surface disposal facilities

- **Implementation**
  - DOE
    - DOE Directives system under DOE Order 435.1, *Radioactive Waste Management*, Manual 435.1-1, Guide 435.1-1 and DOE-STD-5002-2017 D*isposal Authorization Statement and Tank Closure Documentation* technical standard
    - HLW, TRU, and LLW
  - NRC
    - Title 10 *Code of Federal Regulations* (CFR) Parts 1-199 and/or state implemented regulations
    - 37 Agreement States
    - HLW, Class A, B, C, and GTCC
- **NRC LLW Classification System**
  - 10 CFR 61.55, *Waste Classification*
    - LLW classification according to its radiological hazard
      - Waste characteristics
      - Long-lived radionuclides
      - Short-lived radionuclides
    - The classification includes Class A, B, C, and GTCC
    - As the waste class and hazard increase, the regulations require progressively greater controls
- **LLW Characteristics**
  - Both the NRC and DOE have minimum physical/chemical/stability requirements for LLW
    - DOE has five (5) physical/chemical/stability requirements
    - NRC has eight (8) physical/chemical and three (3) stability requirements
  - See handout
    - DOE (1) = NRC b(1) and (3)

        - DOE (2) = NRC a(2), a(3), and b(2)
        - DOE (3) = NRC a(4) and a(6)
        - DOE (4) = NRC a(5)
        - DOE (5) = NRC (7)
    - DOE establishes equivalence to NRC a(1) and a(8) in Waste Acceptance Criteria specific to the disposal facility
- **NRC LLW Classes**
    - Class A
        - Lowest class of radioactive waste – 96% of LLW
        - Contains radionuclides which decay to safe levels within decades – no stabilization requirements, usually segregated from other waste classes
    - Class B
        - Contains mostly radionuclides which decay to safe levels within a few decades
        - Requires shielding during handling and transport
    - Class C
        - Contains radionuclides in the highest amount suitable for shallow land burial – takes hundreds of years to decay to safe levels
    - GTCC
        - Highest level of LLW
        - Requires stringent disposal methods, although some may be appropriate for shallow land burial
- **Tables**
    - Radioactive waste with no nuclides in either tables is Class A
    - For wastes containing mixtures, see 10CFR 61.55(5) and (7) Sum of fractions

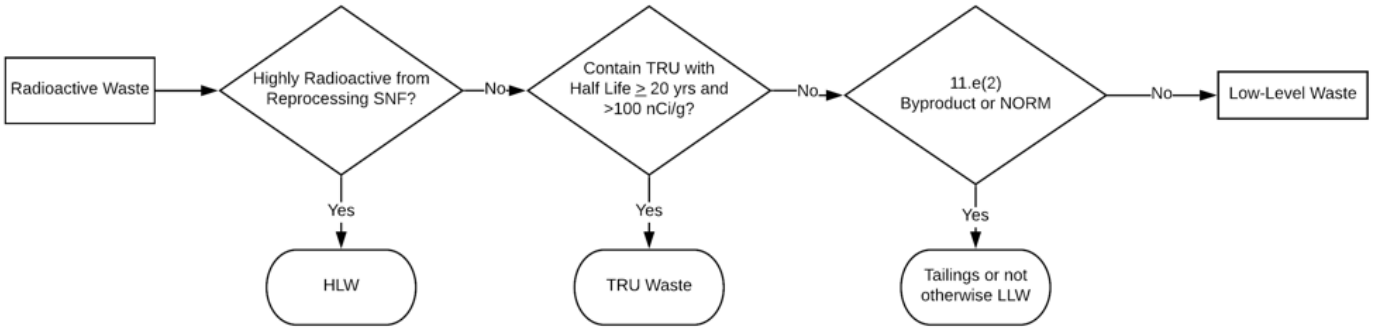


- **DOE Classification System**
    - DOE Manual 435.1-1, *Radioactive Waste Management Manual*
        - Classifies waste by source and concentration

        - HLW is defined by its source
        - TRU is defined by its concentration
- **HLW Manual 435.1-2, Chapter II, Section A**
    - Highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation. (Emphasis added)
    - Commercial reprocessing stopped in 1977, DOE stopped reprocessing in 1992
    - DOE sites in Washington, South Carolina, and Idaho have HLW
    - HLW must ultimately comply with DOE/EM-0093, *Waste Acceptance Product Specifications for Vitrified High-Level Waste Forms*, or DOE/RW-0351P, *Waste Acceptance System Requirements Document*, for non-vitrified, immobilized HLW
- **HLW Interpretation**
    - Published June 6, 2019
    - DOE interprets the statutes to provide that a reprocessing waste may be determined to be non-HLW if the waste meets either of the following two criteria:
        - I. does not exceed concentration limits for Class C low-level radioactive waste as set out in section 61.55 of Title 10 CRF, and meets the performance objectives of a disposal facility; or
        - II. does not require disposal in a deep geologic repository and meets the performance objectives of a disposal facility as demonstrated through a performance assessment conducted in accordance with applicable requirements.
    - DOE's first step in determining whether and how to implements the HLW interpretation specific to a particular waste stream is initiating a *National Environmental Policy Act* (NEPA) process which includes input from affected stakeholders (e.g., federal, state, local and tribal officials; and members of the public)
        - **https://www.energy.gov/em/high-level-radioactive-waste-hlw-interpretation**
        - **Public comment period for the Draft Environmental Assessment for the Commercial Disposal of Defense Waste Processing Facility Recycle Wastewater from the Savannah River Site extended to 2/10/2020**
- **TRU Waste Manual 435.1-1, Chapter III, Section A**
    - Radioactive waste containing more than 100 nanocuries of alpha-emitting TRU isotopes per gram of waste (100 nCi/g), with half-lives greater than 20 years, except for:
        - (1) HLW;
        - (2) Waste that DOE and EPA agree does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or
        - (3) Waste that the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61
    - Atomic number greater than 92, including neptunium, plutonium, americium, and curium
    - TRU must comply with the WIPP Waste Acceptance Criteria
- **LLW Manual 435.1-1, Chapter IV, Section A**
    - Radioactive waste that is **NOT**:
        - HLW;
        - Spent nuclear fuel (SNF)
        - TRU
        - By-product material
        - Naturally-occurring radioactive material (NORM)

- Examples of LLW (physical forms);
  - Soil, personal protective equipment (PPE), metal, tools, contaminated items, construction debris, sealed sources

- **DOE LLW**
  - But it can be:
    - Highly radioactive
    - Hazardous
  - Must meet site-specific waste acceptance criteria of disposal facility
- **DOE Classification System**

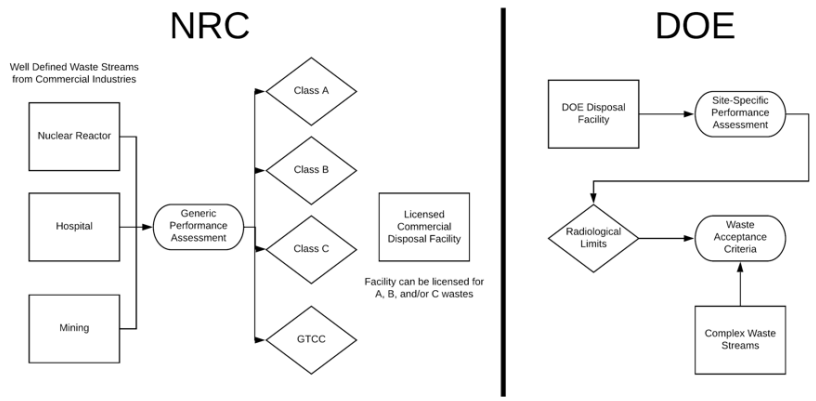


- **Why Different?**
  - NRC basis
  - DOE basis
  - LLW disposal requirement similarities
- **The Split**
  - NRC/States
    - Regulates commercial reactors, radiological laboratories, medical entities, and other federal agencies (e.g., FBI, Army)
  - DOE
    - Regulates development and production of nuclear weapons, nuclear research, and National Laboratories (22 new elements discovered)
  - The performance objectives (quantitative radiological standards) for protection of workers, the public, and the environment for 10 CFR 61 and DOE Order 435.1 are similar
  - Both systems relied on International Commission on Radiological Protection (ICRP) recommendations to develop performance criteria
  - Shallow-land burial LLW disposal facilities
- **Main Goals for Both Systems**
  - Protection of the general population and environment from radioactive releases
  - Protection of individuals from inadvertent intrusion
  - Protection of individuals during operations
  - Stability of the disposal site after closure
- **NRC LLW Basis**
  - NRC requirements were developed for generic, but unknown facilities and locations
    - Until specific location/site proposed, the geological and environmental settings are unknown
  - A performance assessment of generic disposal facilities in various locations and inadvertent intrusion generated the waste classification system – identified Class A, B, C, and GTCC categories
    - Specific and quantitative concentration limits
  - Based on a well-developed understanding of commercial LLW characteristics

- Facilities licensed to dispose of Class A, B, and/or C

- **NRC Example Wastes**
  - Hospitals use a limited number of radionuclides in defined procedures, so no matter which hospital the waste comes from, it has similar characteristics
  - Nuclear reactors built to generate power have some design differences, but the waste streams have similar characteristics
    - Typical nuclear reactor waste types:
      - Dry waste – paper, plastic, and cloth, tools, wiring, and metals
      - Wet waste – resin, charcoal, and filters
      - Irradiated hardware
- **Disposal Sites**
  - Licensed commercial disposal facility timeframes:
    - Beatty, NV (1962 – 1992)
    - West Valley, NY (1963 – 1975)
    - Maxey Flats, KY (1963 – 1977)
    - Sheffield, IL (1967 – 1978)
    - Richland, WA (1965 – present)
    - Barnwell, SC (1971 – present)
    - Clive, UT (1991 – present)
    - Andrews, TX (2012 – present)

  Blue – operational when regulations developed
- **DOE LLW Basis**
  - Disposal locations well known, but varied and complex waste characteristics
    - Existing facilities operating for many years
  - Site-specific performance-based system
    - Site conditions considered in site-specific performance assessment to develop radiological limits for facility
    - Waste acceptance criteria for each facility
  - Permissible levels of radioactivity depend on the ability of the disposal system (i.e., the site and design) to contain the radioactive material
- **DOE Waste Examples**
  - National laboratories discovering new elements
  - Plutonium production
  - Uranium enrichment
  - Nuclear research
  - Decontamination and decommissioning waste
  - Legacy waste
- **NRC vs. DOE LLW**

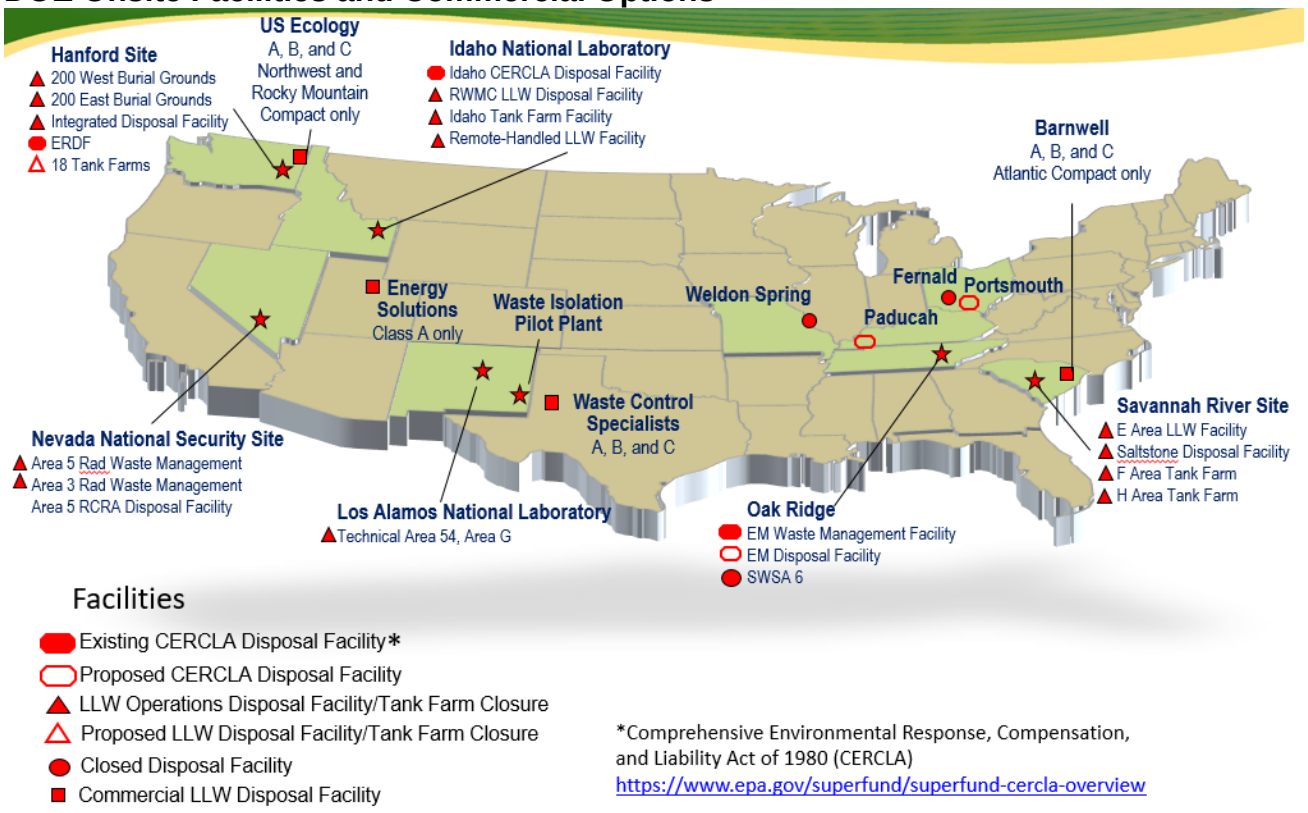


- **LLW Disposal Regulation Comparison**

Requirement	DOE Manual 435.1-1	NRC 10 CFR Part 61
Basic Requirements for performance objectives for LLW disposal facilities	DOE Manual 435.1-1 Ch. IV.P.1: LLW disposal facilities shall be sited, designed, operated, maintained, and closed so that a reasonable expectation exists that performance objectives will be met for waste disposed of after September 26, 1988	10 CFR Part 61.40: Land disposal facilities must be sited, designed, operated, closed, and controlled after closure so that reasonable assurance exists that exposures to humans are within the limits established in the performance objectives
Protection of the general population from releases of radioactivity	DOE Manual 435.1-1 Ch. IV.P.1: (a) Dose to representative members of the public shall not exceed 25 mrem in a year total effective dose equivalent from all exposure pathways, excluding the dose from radon and its progeny in air. (b) Dose to representative members of the public via the air pathway shall not exceed 10 mrem in a year total effective dose equivalent, excluding the dose from radon and its progeny. (c) Release of radon shall be less than an average flux of 20 pCi/m2/s at the surface of the disposal facility. Alternatively, a limit of 0.5 pCi/1 of air may be applied at the boundary of the facility.	10 CFR 61.41: Concentrations of radioactive material which may be released to the general environment in groundwater, surface water, air, soil, plants, or animals must not result in an annual dose exceeding an equivalent of 25 millirems to the whole body, 75 millirems to the thyroid, and 25 millirems to any other organ of any member of the public. Reasonable effort should be made to maintain releases of radioactivity in effluents to the general environment as low as is reasonably achievable.

Requirement	DOE Manual 435.1-1	NRC 10 CFR Part 61
Disposal Authorization Statement (DAS)/license	DOE Manual 435.1-1 Ch. IV.P.5: The DAS is issued by EM-4 and is based on LLW Disposal Facility Federal Review Group (LFRG) recommendation	Agreement State: The Agreement State issues a license. NRC has delegated regulatory authority to license LLW disposal facilities
Disposal Facility Operations Requirements	DOE Manual 435.1-1 Ch. IV.P.6.(a)-(e): Minimize chance for subsidence, achieve long-term stability and minimize need to maintain, meet closure/post-closure plans, install permanent markers, minimize void space, don't adversely impact other disposal onsite, document waste placement by generator, maintain buffer	10 CFR Part 61.52: Wastes must be emplaced in a manner that maintains the package integrity during emplacement, minimizes the void spaces between packages, and permits the void spaces to be filled; maintain buffer, covered in a manner that limits the radiation dose rate at the surface

- **DOE Onsite Facilities and Commercial Options**



- **Waste Types**
  - o *Resource Conservation and Recovery Act* (RCRA)
  - o *Toxic Substances Control Act* (TSCA)
  - o Classified
  - o Spent Nuclear Fuel
- **Radioactive Hazardous Waste (Mixed)**
  - o Contains both source, special nuclear, or by-product material subject to the *AEA of 1954*, as amended, and a hazardous constituent subject to the RCRA, as amended
    - ▪ Examples of hazardous constituents – chromium, lead, mercury
  - o EPA regulations 40 CFR 260-280
    - ▪ May have additional state requirements
  - o Unless demonstrated otherwise, all HLW is considered to be **mixed waste**
- **Radioactive TSCA Waste**
  - o ***Toxic Substances Control Act* – Regulated Waste:** contains polychlorinated biphenyls (PCBs), asbestos, or other such regulated toxic components identified in the waste
    - ▪ PCBs (>50 parts per million) managed per 40 CFR Part 761
    - ▪ Asbestos managed per 40 CFR part 62, Subpart M
  - o TSCA-regulated waste is not mixed waste, but has similar storage and treatment requirements
  - o May have additional state requirements
- **Radioactive Classified Waste**
  - o Radioactive waste to which access has been limited for national security reasons and cannot be declassified
  - o Regulated under:
    - ▪ DOE Order 471.6, *Information Security*

        - National Nuclear Security Administration Policy Letter NAP-70.4, *Information Security*, and/or
        - DOE Order 476.2A, *Identifying Classified Information*
- **Spent Nuclear Fuel (SNF)**
    - SNF: fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing
        - Material in storage; still has possible programmatic use; can recover valuable constituents
    - DOE Order 435.1, *Radioactive Waste Management*, Section 3, Applicability, subsection d, exemptions, (6) states "This Order does not apply to either spent nuclear fuel or non-waste materials."
    - DOE responsible for SNF disposal in deep geologic repository; NRC responsible for licensing facility
- **Review**
    - Authority – Why We Have Two Systems
    - NRC Classifications
    - DOE Waste Classifications
    - Why the Systems are Different
    - Waste Types
    - SNF
- **Key Messages**
    - **NRC LLW classification system** developed for generic unknown facilities and locations based on well-known waste characteristics
    - **DOE classification system** developed with site-specific conditions for complex waste characteristics
    - **The systems have different basis, but** both developed for the protection of workers, the public, and the environment
    - **The systems have many similar requirements**
- **References**
    - RL32163, *Congressional Research Service (CRS) Report to Congress, Radioactive Waste Streams: Waste Classification for Disposal,* 12/13/06
        - https://www.everycrsreport.com/reports/RL32163.html
    - DOE Order 435.1, *Radioactive Waste Management* and 435.1-1 *Manual*
        - https://www.directives.doe.gov/
    - 10 CFR 61.55, *Waste Classification*
        - https://www.nrc.gov/reading-rm/doc-collections/cfr/
    - General Safety Guide No GSG-1, *Classification of Radioactive Waste*
        - https://www-pub.iaea.org/MTCD/Publications/PDF/Pub1419_web.pdf
    - NWP-REP-134-October 2016, *International Approaches to Radioactive Waste Classification*
        - https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/697667/NWP-REP-134-International-Approaches-to-RW-Classification-Oct-2016.pdf
- **Questions**

In response to a Board question, the following clarification was provided:

- HLW is defined by its source and is a result of the reprocessing of spent nuclear fuel. This waste cannot be considered HLW in one instance and LLW in another.

Update to Evaluation of the Audit Determination Process from FY 2019 *(Marilew Bartling, Navarro)*

- **NSSAB Work Plan Item from FY 2019**
  - From a community perspective, provide a recommendation regarding if the existing RWAP risk-informed process for scheduling facility evaluations is supported and how it could be enhanced
- **History of Work Plan**
  - January 2019 – NSSAB received work plan briefing
    - NSSAB requested more detail on the risk score calculations contained in the RWAP risk-informed spreadsheet
  - March 2019 – NSSAB received a white paper with the risk attributes and detail on the calculation of the risk score and a follow-up briefing
  - March 2019 – NSSAB provided recommendations
  - June 2019 – U.S. Department of Energy (DOE) provided response
    - NSSAB requested update on the status of recommendations
- **NSSAB Recommendation #1**
  - **NSSAB Recommendation**: Use a per unit score for risk attributes in place of assigning point values to the top generators.
  - **DOE Response (June 2019):** The RWAP team will be reviewing the protocols previously used for the FY 2019 ranking and will consider the NSSAB recommendation during the development of the FY 2020 risk-informed facility evaluation scheduling.
  - **Update:** The scoring was reviewed and in consideration of the NSSAB recommendation, unit scores per risk attributes have been used. There is no allowance for subjective rankings. A copy of the rankings methodologies used for FY 2020 are being provided for your information, including a white paper describing the mechanism for assigning the points.
- **NSSAB Recommendation #2:**
  - **NSSAB Recommendation:** Conduct facility evaluations with no prior notice to the generators.
  - **DOE Response (June 2019):** This recommendation remains under consideration at this time. As discussed during NSSAB meetings, pre-scheduling facility evaluations may be necessary due to what is going to be observed and/or reviewed. Access to some areas of material can require time periods that are not conducive to "surprise" visits. This recommendation will be considered if a pre-visit notification is not warranted due to access constraints.
  - **Update:** The DOE response is maintained in that logistics for travelling, waste production schedules, and accessing controlled sites impedes visits with no prior notice. Commencing in FY 2021, it is recommended that surveillances be scheduled based on input from the generators on scheduled projects and work on a quarterly basis. Audits will continue to be scheduled on an annual basis. DOE is considering the feasibility for on-site Federal staff stationed at the generator sites to conduct on-the-spot checks.
- **NSSAB Recommendation #3:**
  - **NSSAB Recommendation**: Add the generator's overall ranking to the RWAP facility evaluation schedule.
  - **DOE Response (June 2019):** There are sensitivities with this information and the potential for misinterpretation, so distribution would require control. DOE will work with the NSSAB to share pertinent information regarding rankings for transparency while protecting sensitive information.

- **Update:** No new information.
- **NSSAB Recommendation #4:**
  - **NSSAB Recommendation**: Include historical information for DOE's Occurrence Reporting and Processing System (ORPS) regarding near-miss incidents, primarily in transportation, although more study could be done to determine if other areas would also apply.
  - **DOE Response (June 2019):** DOE agrees with the NSSAB that the ORPS is a key source of information regarding issues across the complex. The RWAP team will look at the feasibility for performing an ORPS search prior to each facility evaluation to determine any issues that require review and to ensure generators are making notifications as required per the NNSSWAC.
  - **Update:** Based on the NSSAB recommendation, the risk rankings for the FY 2020 scheduling effort included information obtained from ORPS. For all DOE generators, the ORPS reporting system was queried from August 2018 through August 2019 for any ORPS entry pertaining to regulatory violations regarding offsite waste management or transportation issues. Identified issues were assigned points to the waste generator site and contributed to their overall score and ranking.
- **Questions**

In response to a Board question, the following clarification was provided:

- In regard to the update for NSSAB recommendation #2 above, the process, including applicable checklists, for the on-site Federal staff to use is being developed before on-the spot checks will be put in place.

Other NSSAB Business (*Frank Bonesteel, Chair*)

The next EM SSAB National Chairs Meeting will be hosted by the EM Nevada Program on April 1-2, 2020 at the Golden Nugget. The meeting on April 1 will be a full day and includes the round robin for each of the eight advisory boards to present topics to EM-1 that highlight the top interest/concerns and accomplishments of each of the boards. On April 2, the meeting will be held in the morning and adjourns around noon. The NSSAB is encouraged to attend the meeting. Member Donald Neill informed the Board that he attended the last meeting in Idaho in October 2019, and he found the discussions informative and encouraged members to consider attending at minimum the first day (April 1). Representing the NSSAB, Chair Bonesteel and Vice-Chair Gardner will participate with the other EM SSAB chairs and vice-chairs at the head table and will also attend the NNSS tour specifically for the EM SSAB on March 31, 2020.

Chair Bonesteel facilitated brainstorming of potential topics for the round robin, as follows:

1. Enhance and continue open communication with community members and stakeholders program based on recent communication program. (top issue/concern)
2. NSSAB recommendation on Audit Determination Process. (accomplishment)
3. Conduct transportation infrastructure improvement briefings at high levels for impact on other agencies, such as U.S. Department of Transportation, Federal Emergency Management Agency, Department of Homeland Security, etc. (top issue/concern). Chair Bonesteel assigned Members Steve Rosenbaum and William Dewitt the responsibility of writing a narrative.
4. Balance between the mission for cleanup with the preservation of landscapes at the NNSS with significant cultural, historical, or community importance (top issue/concern). Chair Bonesteel assigned Member Anthony Graham the responsibility of writing a narrative.

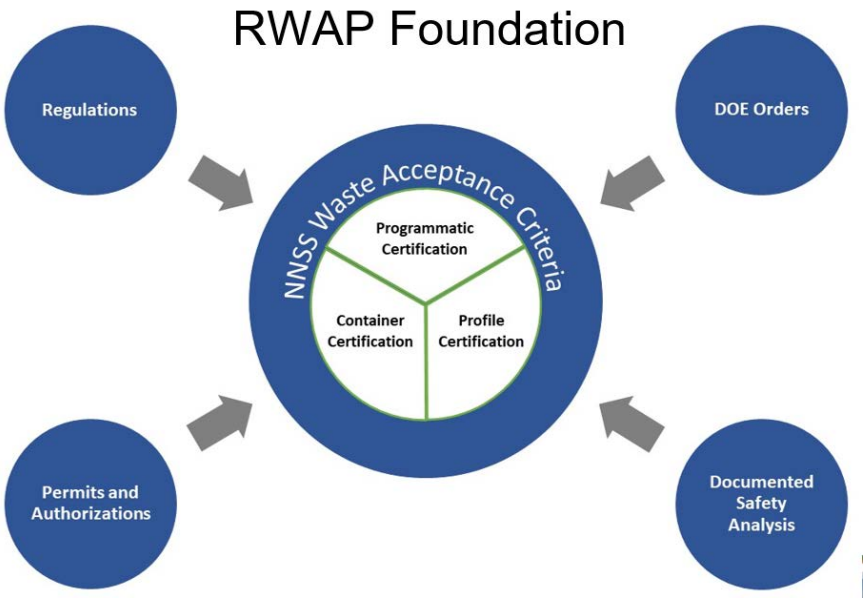
5. Support the increase of the EPWG grant funding to the counties (top issue/concern). Chair Bonesteel to contact NSSAB liaisons for narrative.
6. NSSAB recommendation on Revegetation at Corrective Action Unit 111 from FY 2016 regarding use of tribal knowledge (accomplishment).

Member DeWitt made a motion to adopt the preceding round robin topics for the next EM SSAB National Chairs Meeting. The motion was seconded and passed unanimously. Chair Bonesteel requested that members with assignments provide the narrative as soon as possible in order to complete the round robin slide and presentation.

Waste Verification Strategy ~ Work Plan #1 (Marilew Bartling, Navarro)

- **NSSAB Work Plan Item #1**
  - Provide a recommendation, from a community perspective, on the potential verification strategies identified and/or how these strategies may be implemented
  - NSSAB recommendation is due no later than July 2020
- **Outline**
  - Waste Verification Purpose and Objectives
  - Strengthening Verification
  - Evaluating Verification Activities
  - Verification Elements
    - Programmatic
    - Profile
    - Container
  - Disposal Sites Verification Comparisons (Benchmarking)
  - Verification Planning of Forecasted Waste
    - Historical Analysis of Waste Categories and Containers
  - Path Forward
- **Verification Purpose**
  - Verification is the monitoring of the NNSSWAC compliance
  - NNSSWAC provides the criteria to ensure protection of workers and the public
    - Prescribes regulatory, health and safety, technical, and administrative requirements for programmatic, container, and profile certification
    - Generator programs and profiles are reviewed by RWAP for NNSSWAC compliance
    - Generators are required to certify that the wastes submitted to NNSS are compliant with the NNSSWAC

- **RWAP Foundation**



- **Verification Objectives**
  - Assess generator programs to determine that:
    - Radionuclides present are correctly identified with the correct concentrations for proper radioactive categorization
    - Chemical constituents are sufficiently evaluated wo that waste is correctly categorized as LLW or MLLW
    - Other hazards, such as, polychlorinated biphenyls o asbestos are correctly identified
    - No prohibited items are present
    - Waste conforms to the waste profile as approved
- **Strengthening Verification**
  - In early 2019, Navarro was tasked with evaluating effectiveness of the verification strategy and recommending enhancements informed by safety, effectiveness, reliability, and cost considerations
    - In July 2019, the waste generator at Y-12 notified the EM Nevada Program that classified waste components previously shipped to NNSS were discovered to be inadequately characterized
    - Several reviews were undertaken as a result of the Y-12 classified waste issue, including formal causal analysis reviews by Y-12 and at NNSS (both RWAP and disposal operations) and by DOE Headquarters (HQ)

This presentation reflects information collected from the Y-12 reviews and the information previously collected by Navarro.

- **Evaluating Current Verification Activities**
  - Identified verification practices used by the industry, both programmatic and for individual containers
  - Benchmarked to five (5) disposal facilities:
    - Two (2) commercial facilities
    - One (1) DOE facility that accepts waste from other DOE sites
    - Two (2) DOE facilities dedicated for the disposal of on-site generated waste
  - Obtained preliminary implementation cost information for verification activities
  - Performed a data call to identify major types of waste through FY 2030 for determining the most applicable waste verification activities

- **Programmatic Verification**
  - Verification checks of generator waste certification programs before waste is shipped to the NNSS include:
    - RWAP Facility Evaluations (e.g., audits, surveillances) that monitor the implementation of policies and procedures
    - Independent Waste Certification Official (WCO) at the generator site
  - Waste certification declarations require that compliance be verified with documented processes and procedures
  - Waste Acceptance Review Panel (WARP) process which requires a detailed review of each waste stream proposed for disposal at NNSS

Methodology	Primary Use	Current NNSS Capability	Effectiveness/ Limitations	Costs*	Other Factors
Facility Evaluation Program	Evaluation of programmatic systems used by the waste generator	RWAP maintains staff to conduct facility evaluations in core areas	Identifies issues prior to shipment and receipt Programmatic function - limited review of individual containers	Capital expenditures **minimal** Operational costs **moderate**	Funded by DOE EM Nevada Program
Independent Waste Certification Program	Evaluation of programmatic systems and review of each individual waste package	NNSS requires each waste generator to have an Independent WCO and requisite resources	Provides for review of each individual container as well as programmatic elements	Capital expenditures **none** Operational costs **minimal**	Ownership and cost assumed by the generator
Defined Profile Submission and Review Program	Provides detailed technical basis for the characterization and categorization of each waste stream	WARP chartered to review all profiles	Programmatic function - no review of individual containers	Capital expenditures **minimal** Operational costs **moderate**	Reviews funded by DOE EM Nevada Program
***Capital Costs**: "high" is more than $10 million, "moderate" ranges from $1 million to $10 million, and "minimal" is less than $1 million **Operational Costs**: "high" is more than 10 full-time equivalent employees (FTE), "moderate" is 2 to 10 FTE, and "minimal" is less than or equal to one (1) FTE					

  - Programmatic controls emphasize consistent waste characterization and management to ensure compliance <u>prior to shipment</u>
    - Deviates from commercial sites with large numbers of generators
  - Advantages include:
    - Opportunities to identify issues prior to transport
    - Generators required to establish documented systems with evidence of implementation
    - Generators know they will be held accountable through on-site evaluations
    - On-site evaluations can be rapidly implemented based on issues or special wastes
  - Potential weaknesses include:
    - Generator gaps in the flow of information to WCOs
    - Security/classification requirements may impede the transfer of critical data
  - Recommended improvements include:
    - Improving the tools used for facility evaluations
    - Ensuring empowerment of the WCO at each site
    - Shadowing with the DOE HQ Office of Enterprise Assessment also provides opportunities to strengthen the facility evaluation program
- **Profile Verification**
  - Profiles, prepared by generators for each waste stream proposed for NNSS disposal, contain pertinent details, including:
    - Radionuclides and concentration amounts
    - Chemical characteristics and regulatory categorization

        - Generating description and physical form
        - Packaging and shipping specifications

Methodology	Primary Use	Current NNSS Capability	Safety Considerations	Effectiveness/ Limitations	Costs*
Visual Verification	Detect prohibited items; evaluate void space; confirm profile description	None, currently performed at generator by RWAP staff	Opening waste containers has inherent risks; requires appropriate engineering and administrative controls and personnel protective equipment	No chemical or radiological information	Capital expenditures **moderate** Operational costs **moderate**
RTR	Detect prohibited items; evaluate void space; confirm profile description	Full capabilities to perform RTR on drums and boxes	Minimal with standard controls	Visuals may be indeterminate due to the resolution limitations; No chemical or radiological information	Capital expenditures **minimal** Operational costs **minimal**
Fingerprinting via Analytical Sampling	Confirming chemical and or radiological categorization of waste	None, NNSSWAC allows for splits to be collected at generator site	Same as Visual Verification when performed at NNSS	Chemical and radiological information obtained; Effective for particulates; Limited effectiveness for debris	Capital expenditures **moderate** Operational costs **moderate**
Radiological Scanning	Radiological data indicator	Full capability	Minimal with standard controls	Gross indications on radiological activity or contamination	Capital expenditures **minimal** Operational costs **moderate**
Non-Destructive Assay	Radiological data confirmation	None	Minimal with standard controls	To be effective must be calibrated to expected radionuclides	Capital expenditures **moderate to high** Operational costs **moderate**
*Capital Costs: "high" is more than $10 million, "moderate" ranges from $1 million to $10 million, and "minimal" is less than $1 million Operational Costs: "high" is more than 10 FTE, "moderate" is 2 to 10 FTE, and "minimal" is less than or equal to one (1) FTE					

    - Profiles are submitted for review by WARP and for approval by EM Nevada Program
    - Waste profiles are used by all radioactive waste disposal sites, DOE and commercial
    - Advantages include:
        - Profile review process allows for EM Nevada Program, WARP (inclusive of RWAP and Disposal Operations), NNSA, and NDEP to submit comments that the generator reconciles before the profile can be approved
    - Potential weaknesses include:
        - Current profile template has resulted in inconsistent level of detail among generators
    - Recommended enhancements include:
        - Requiring generators to use the new Lines of Inquiry to collect additional documentation to strengthen the profile
        - Targeting on-site verifications as part of the profile review process prior to approval
- **Container Verification**
    - Tools or techniques used to verify individual containers conform to the waste profile, most common include:
        - Visual verification
        - Real-time radiography (RTR)
        - Waste sampling and analysis (fingerprinting)
        - Non-destructive radiological analysis
        - Radiological scanning
- Techniques are used for waste categorization by waste generators and RWAP
    - Advantages include:
        - Scalable to risk
        - Validates effectiveness of generator processes and procedures
        - Flexibility for some approaches to be executed prior to shipment
    - Potential weaknesses include:
        - Non-conformances potentially not detected until receipt

- Some waste is not amenable to sampling, such as large metal components
- RTR use is limited for dense materials
- Security/classification requirements inhibit visual verification at generator sites and no current capabilities upon receipt at NNSS
- RTR not currently executed on classified material

- **Benchmarking**

Disposal Facility	Verification Approach
DOE On-site Disposal	• Waste generators are **restricted** • Program verification varies • No chemical verification of container contents at disposal • No services for treatment • Limited nuclides; radionuclide activity varies
Commercial	• Waste generators **not restricted or limited** • Limited or no program verification • Containers routinely verified upon receipt via fingerprint sampling • Services maintained for treating non-conforming waste • Diverse nuclides; lower radionuclide activity • Generator is held responsible by the State for non-compliant waste

Disposal Facility	Verification Approach
DOE Limited-Access Facilities (NNSS)	• Waste generators are **limited** • Verification of program controls through facility evaluations • On-site verification of profiles • Limited container verification upon receipt via RTR • No treatment services at site • Diverse nuclides; higher activity
DOE Limited-Access Facilities (Waste Isolation Pilot Plant [WIPP])	• Waste generators are **more limited** • Verification of profiles • Container verification for prohibited items prior to receipt • Independent container verification for radioactivity prior to receipt • Transuranic nuclides; higher activity

Facility	Programmatic Verification Strategies				Container Verification Strategies							
	Generator Access Limitations*	Waste Generator Limitations	Generator Waste Certification Program Required	On-Site Facility Evaluation Program	Visual Verification		RTR		Sampling and Analysis		Radiological Scanning	
					Pre-Ship	Receipt	Pre-Ship	Receipt	Pre-Ship	Receipt	Pre-Ship	Receipt
NNSS	Limited	Limited	Yes	Yes, 5 core areas	Yes	No	No	Yes %	No	No	Yes	Yes
WIPP	Limited	Limited	Yes (independent)	Yes	Yes	No	No	No	No	No	Yes - Verified Non-Destructive Analysis	Yes
DOE	Restricted	Restricted	Yes/No	No	No	No	No	No	No	No	No	Yes
Commercial Facility (1)	None	None	No	No	No	Yes %	No	No	Yes % except debris	Yes % except debris	No	Yes
Commercial Facility (2)	None	None	No	Limited	No	Yes %	No	No	Yes % except debris	Yes % except debris	Varies	Yes

*Limitations: Limited: DOE Nexus/Department of Defense only; Restricted: Only on-site disposal facilities/wastes; None: All generators/wastes that meet Site License and Waste Acceptance Criteria

- **Verification Planning**
  - Assessing wastes forecasted for disposal at the NNSS facilitates identification of the best verification techniques
  - In March 2019, generators provided forecasts of waste to be shipped to the NNSS through FY 2030
  - Four (4) years of NNSS waste receipts were reviewed to determine the percentage of waste container types received
  - Information used to assess the applicability of container verification strategies
- **Analysis of Waste Received by Category**
  - Approximately 70% of waste is equipment, debris, or compactable
    - Waste is not amenable to sampling due to representativeness; amenable to RTR based on container type
  - Approximately 25% of waste described as particulate, sludge, or solid
    - Amenable to sampling but, due to density, is not a good RTR candidate
  - Sources, asbestos, and classified wastes all have issues for sampling and RTR

Categories of Waste	Percentage of Total by Volume
Equipment, Compactable, and Debris	70
Soils, Particulates, Filters	***20***
Sludges, Solidified Waste	***5***
Sources	Less than 1
Asbestos	Less than 1
Classified	5
Source, March 2019 data call: approximate based on projections; does not include MLLW	

- **Analysis of Waste Received by Container Type**
  - Approximately 65% of containers are amenable to RTR
  - Approximately 22% are soils predominately packaged in soft-sided containers
    - Not amenable to RTR due to container restrictions
  - About 3% of LLW arrives in cargos, visual verifications have been focused on cargo containers with debris and compactable wastes

Container Type	Disposal Volume (cubic meters)	Percentage of Waste Containers
Misc. - casks, self-contained equipment	7,020	7
Cargo	3,443	3
Soft-sided	22,979	22
RTR eligible drums	40,499	38
RTR eligible boxes	28,525	27
Other drums/boxes	1,583	3
Source: FY 2018 and FY 2019 year-to-date information		

- **Review**
  - The NNSS Program has built in verification to the three (3) key areas:
    - Programmatic
    - Profile
    - Container
  - All three (3) key areas are critical to ensuring NNSSWAC compliance
  - Program and Profile Verification improvements discussed will be implemented
  - Future enhancements will be focused on Container Verification
- **EM Nevada Program Path Forward**
  - Collect input from NSSAB and NDEP
  - Navarro to finalize and submit verification strategy report to EM Nevada Program
  - EM Nevada Program makes a determination on the NNSS waste verification strategy
- **Questions**
- **NSSAB Path Forward**
  - Provide a recommendation, from a community perspective, on the potential verification strategies identified and/or how these strategies may be implemented
  - NSSAB recommendation is due no later than July 2020
- **Navarro Recommendations: Program Verification**
  - Continue with current NNSS programmatic controls approach to assess generator compliance early
  - Enhance the risk-based approach that focuses **Facility Evaluation** resources on a generator's recent compliance performance, complexity of operations, and other special considerations (e.g., new generator or new operation)
    - More surveillances focused on targeting specific wastes prior to profile approval
  - Continue requirement for generators to fund waste certification operations
    - More emphasis on assessing how well WCOs are empowered

        - Review requirements for site senior management regarding waste information ownership
- **Navarro Recommendations: Profile Verification**
    - Implement a waste characterization hierarchy that prioritizes **sampling and analysis** for waste types that are amenable to sampling (e.g., soils, particulates, filters)
        - Will allow NNSS to increase the collection of split samples for independent verification
        - Sampling and analysis is effective for identifying chemical hazards not detectable by other verification methods, such as visual and RTR
        - While costs are high, placing the requirement on the generator does not impact NNSS funds
    - Strengthen profile verification through the following mechanisms:
        - Enhanced lines of inquiry for reviewing profiles to ask more probing questions
        - On-site verification of profile information prior to approval
        - Expand use of subject matter experts (such as for classified waste) through WARP for **Profile Reviews**
- **Navarro Recommendations: Container Verification**
    - Commit to continued funding for RWAP to conduct **LLW Visual Verifications** at generator sites
        - Continue to coordinate with on-site facility evaluations to minimize costs to NNSS
        - Explore strengthening the program through coordination with the DOE site offices
        - Explore expanding timing to allow for moving 'up stream' to the actual point of generation at the generator sites
    - Commit to continue funding **RTR** to be performed at the NNSS upon receipt of containers
        - Explore potential upgrades to enhance the current capabilities (e.g., shaker table to detect liquids)
        - Explore systems to manage RTR of classified waste containers
        - Explore costs for establishing the systems and controls for opening and inspecting containers that have indeterminate items viewed during RTR
- **Navarro Recommendations: Overall Approach**
    - Maintain a balanced verification approach that builds confidence into the system throughout waste generation, characterization, packaging, shipment, and receipt
    - Several opportunities to enhance systems currently in place
    - Use risk analysis to best direct resources

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

- For classified waste, key controls are required for the management of the information; therefore, some generators have a national security need to limit the number of RWAP auditors that have access to classified waste during a facility evaluation. These RWAP auditors, including NDEP staff, hold the appropriate security clearances and the need to know. For RTR, NNSA and EM have determined that processes and procedures are needed and will work on directives with its contractors to protect any images of classified waste created during RTR.
- Per the NNSSWAC, free liquids are restricted for disposal at the NNSS, either in a sludge or thick liquid, and would require solidification prior to disposal if the waste is capable of releasing liquids. Sludge and thick liquid wastes are amenable to sampling. Currently, the NNSSWAC is not specific that generators are required to sample as they are permitted to use process knowledge of its systems. The RWAP is currently reviewing for a potential revision to the NNSSWAC.

- The WCO is a key element of each generator's waste certification program. RWAP has reviewed the tools that are provided to the WCOs in two key areas: 1. providing additional training and tools to ensure a more consistent implementation across the 25 generators, and 2. ensuring that, for each site, the WCO has the support of senior management and their roles are not compromised by schedule or budget. The WCO is involved with the profiles that are submitted by their generator. RWAP relies heavily on the WCO to ensure that the appropriate information is available to RWAP regarding classified wastes where key information transfers are complex.
- RWAP recognizes the challenges the WCO encounters with the diversity of the wastes at the sites. An outcome of the Y-12 event is that RWAP is in the unique position to facilitate the sharing of information, lessons learned, and opportunities for improvement across groupings of generators in an effort to make the program as robust as possible.
- All generator personnel who come in contact with waste being packaged for disposal at the NNSS are required to be trained and briefed on NNSSWAC requirements. RWAP verifies this training during facility evaluations by reviewing the training records for various operators. Due to the Y-12 event, the Office of Enterprise Assessment (OEA) is conducting a review at the direction of DOE Headquarters. One of the challenges issued by the OEA is that RWAP staff conduct interviews with generator staff to understand the difficulties they encounter in their jobs and their comfort level with the controls and requirements.
- There are a limited number of transporters that are certified to transport radioactive LLW. The drivers are vetted and have Class 7 endorsement on their commercial driver's license. Prior to transport of any shipment to the NNSS, each driver is thoroughly briefed on the U.S. Department of Transportation and DOE requirements for transportation of radioactive waste. Drivers are also briefed on the requirements for the shipping of waste and arrival at the NNSS, e.g., the prohibited areas for travel and notification above and beyond what is required by law.
- Under the NNSSWAC, waste that is reactive is a prohibited item. Reactive waste is required to be deactivated and treated before disposal in any disposal facility in this country.
- Radioactive waste is characterized for its radionuclides, the level of activity, the chemicals and its concentrations, as well as other prohibited items. The waste characterization drives the packaging and the container used for transport. The characterization also drives the proper shipping name that provides the controlled mechanism for loading a container, what can and what cannot be put on the same conveyance, and if any separation of the waste is required for that conveyance.
- In terms of radioactivity, the NNSS Performance Assessment Group (PAG) reviews the level of radioactivity of the waste. Based on its review, the PAG can specify a separation between containers and how close that the containers may be placed together during the emplacement of the waste in the cell.

After all Board questions were answered and comments shared, Chair Bonesteel asked that the Board review the presentation and Navarro's recommendations; ponder comments from DOE, other NSSAB members, and the liaisons; and carefully consider before the next NSSAB meeting in order to provide a future recommendation. Mr. Boehlecke noted that the NSSAB's recommendation is important to the EM Nevada Program, although process improvements will continue to be screened and implemented in the meantime. In developing its strategy, the EM Nevada Program and Navarro are considering the balancing of risks with costs, and whether costs will be incurred by the NNSS or the generators. Mr. Boehlecke committed to providing updates on the waste verification strategy until the NSSAB provides its recommendation and beyond.

Meeting Wrap-Up and Adjournment

Upcoming calendar of events:

- Low-level Waste Stakeholders Forum meeting in Pahrump, NV (invite only) – February 5, 2020
- NSSAB Full Board meeting in Las Vegas, NV – March 18, 2020
- Intergovernmental Meeting with NSSAB liaisons in Las Vegas, NV – March 18, 2020
- EM SSAB National Chairs Meeting in Las Vegas, NV – April 1 – 2, 2020 (tour for EM SSAB Chairs and Vice-Chairs on March 31, 2020)
- Devils Hole Workshop in Furnace Creek, CA – April 29 – May 1, 2020

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

Member Tanya Henderson made a motion to adjourn the meeting. The motion was seconded and passed with a majority. The meeting was adjourned at 8:28 p.m.