Response to NSSAB Questions from the 11/2/10 Industrial Sites & Soils Committee Meeting

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December 13, 2010

CAU 547 – Question 1

- *Are there examples of geotextile material in place?*
  - Geocellular systems have been used in many applications:
    - Repair of 60-100 foot embankment above the BNSF track near Castle Rock, WA
    - On-site containment of 88,000 cubic yards of mine tailings, contaminated soil, and waste rock at the Moon Creek Reclamation Project, Idaho Panhandle National Forest
    - Stabilization of 1h:1v slope with vegetative cover at Jefferson County Solid Waste Transfer Site, Bessemer, AL

  - Following are photos/ examples of Presto Geotextile material use

CAU 547 Question 1 (continued)

Engineered geocellular systems:

- Improve earth retention/slope protection
- Use “cellular confinement system”
- Textured cell walls confine and reinforce fill material
- Honeycomb-like geocells are filled with gravel, crushed rock, or other aggregate
- Enhances performance/ improves slope resistance to erosion
- Confinement prevents down-slope migration of particles

Moon Creek Reclamation Project
Late fall 1999 during construction of the containment.


Jefferson County Solid Waste Transfer Site

CAU 547 – Question 1 (continued)

BNSF track near
Castle Rock, WA,

CAU 547 – Question 2

What is the estimate for rate of decomposition of the steel pipe if no action is taken?

- Atmospheric corrosion rates on carbon steel range from 13-1070 micrometer per year (µm/yr) (0.5-42 millimeter per year [mil/yr]). Corrosion rates in a rural, arid setting are estimated at 500 µm/yr (0.18 mil/yr)
- A 1995 study performed by Westinghouse Hanford Company for the U.S. Department of Energy (DOE) concluded:
  - Soil corrosion rates on bare carbon steel proceed at a constant rate
  - Corrosion rates range from 15-35 µm/yr (0.6 to 1.4 mil/yr)
  - Carbon steel corrosion rate decreases with increasing depth

CAU 547 – Question 2
(continued)

- Four inch (4”) schedule 40 pipe is 0.237” wall thickness (237 mils)
- Based on anticipated atmospheric corrosion rates of 0.18 mil/yr, it would take approximately 1,316 years to fail
- Based on the anticipated maximum soil corrosion rate of 1.4 mil/yr, it would take approximately 169 years to fail

CAU 547 – Question 3

Would a crimper/cutter mounted on a bobcat work to cut the pipe?

- Yes, however due to the more energetic nature of the cutting/crimping process, it would be beneficial for the internal radioactive material to be fixed to the interior of the pipe with an adhesive or expanding insulation.
- In addition, a more complex and larger glovebox configuration would be required due to the size and weight of the bobcat-mounted system.
- Using a bobcat-mounted crimper/cutter is less practical if a large number of cuts have to made, but may be the correct application if only a small number of cuts are made.

CAU 547 – Question 4

What is being done at other sites across the DOE complex?

- DOE report published in June 2000 presents a summary of "Buried Transuranic-Contaminated Waste Information for U.S. Department of Energy Facilities"
  - A total of 126,000 cubic meters of transuranic (TRU) waste has been disposed
  - Disposal occurred at the Idaho National Engineering and Environmental Laboratory, Hanford, Los Alamos National Laboratory, Savannah River Site, Oak Ridge National Laboratory, and Nevada National Security Site (NNSS)

CAU 547 – Question 4
(continued)

- Idaho National Laboratory
  - TRU Waste disposed at the Radioactive Waste Management Complex in unlined pits, trenches, and soil vaults prior to1970
  - Risk assessment performed to determine if risk to inadvertent intruder would be unacceptable
  - Results of risk assessment identified installation of an additional surface barrier was necessary to reduce the risk to the future inadvertent intruder

CAU 547 – Question 4
(continued)

- Oak Ridge National Laboratory
  - TRU Waste disposed in Melton Valley in landfills, trenches, liquids waste tanks and piping, surface structures, and impoundments prior to 1970
  - Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) criteria used to develop a variety of remediation methods
  - Results of CERCLA evaluation include hydraulic isolation (caps and diversion trenches), in situ vitrification, monitoring, and land use controls

CAU 547 – Question 4
(continued)

- Savannah River Site
  - 76 acre disposal facility comprised of earthen trenches where TRU waste was disposed prior to 1970
  - DOE, Environmental Protection Agency, and State of South Carolina agreed that leaving the waste buried would be equally or more protective to human health than removal
  - Low permeability, geosynthetic cover system constructed along with intruder barriers and institutional controls

CAU 547 – Question 4
(continued)

- Hanford
  - Disposal in trenches on a 272 acre disposal site prior to 1970
  - DOE is still evaluating options for cleanup of the trenches and anticipates establishing a preferred cleanup approach in 2013
- Los Alamos National Laboratory
  - Disposal in four disposal locations on 85 acres
  - Site investigations are underway and an agreement was reached with State of New Mexico Environment Department that cleanup would be complete by 2015

CAU 547 – Question 5

What are the closure scenarios?

The scenarios currently being fully evaluated are Clean Closure and Closure in Place.

Clean Closure (Removal of Above-grade Piping)

- Removal of all piping at or above the pre-test ground surface
- Not all contaminated piping would be removed. The borehole where the test originated will be left in place along with piping that was previously buried below the ground surface and subsurface structures such as vaults

CAU 547 – Question 5
(continued)

- Limited data available for contamination within the piping
  - Bernalillo and Player are anticipated to meet TRU levels of plutonium, and Mullet anticipated to meet low level waste levels
- Use Restrictions, access controls, and monitoring will be required for the remaining contaminated sub-surface features

CAU 547 – Question 5
(continued)

Closure in Place

- Augmentation and extension of existing soil covers at each site by placing armored soil cover over the entire piping lengths
- Boreholes where the tests originated will be left in place along with other subsurface structures
- Use restrictions will be implemented
- Enhanced physical barriers will be constructed (e.g., fencing)
- Enhanced monitoring will be required

CAU 547 – Question 6

What was the result of the risk evaluation done for the CAU 547 closure alternatives?

Closure in Place with Soil Covering and Use Restriction

- Additional radiological dose – none
- Physical hazards – associated with transporting soil to the site and covering the pipe with soil and other barriers (e.g., geotextile).
- Risk related to number of work hours (~10,400 hrs)

CAU 547 – Question 6
(continued)

Clean Closure

- Additional radiological dose – maximum potential dose received by most exposed worker would be ~216 mrem
- Physical hazards – associated with heavy equipment excavation and hoisting with cranes, use of power tools, and performing these operations wearing PPE such as SCBA and protective clothing.
- Risks to site workers, vehicle operators, and the general public related to excavation, preparation, and transportation of the waste materials over public roads to the disposal location.
- Risks related to number of work hours (~64,600 hrs)

CAU 547 – Question 7

What are the cost estimates for the closure scenarios?

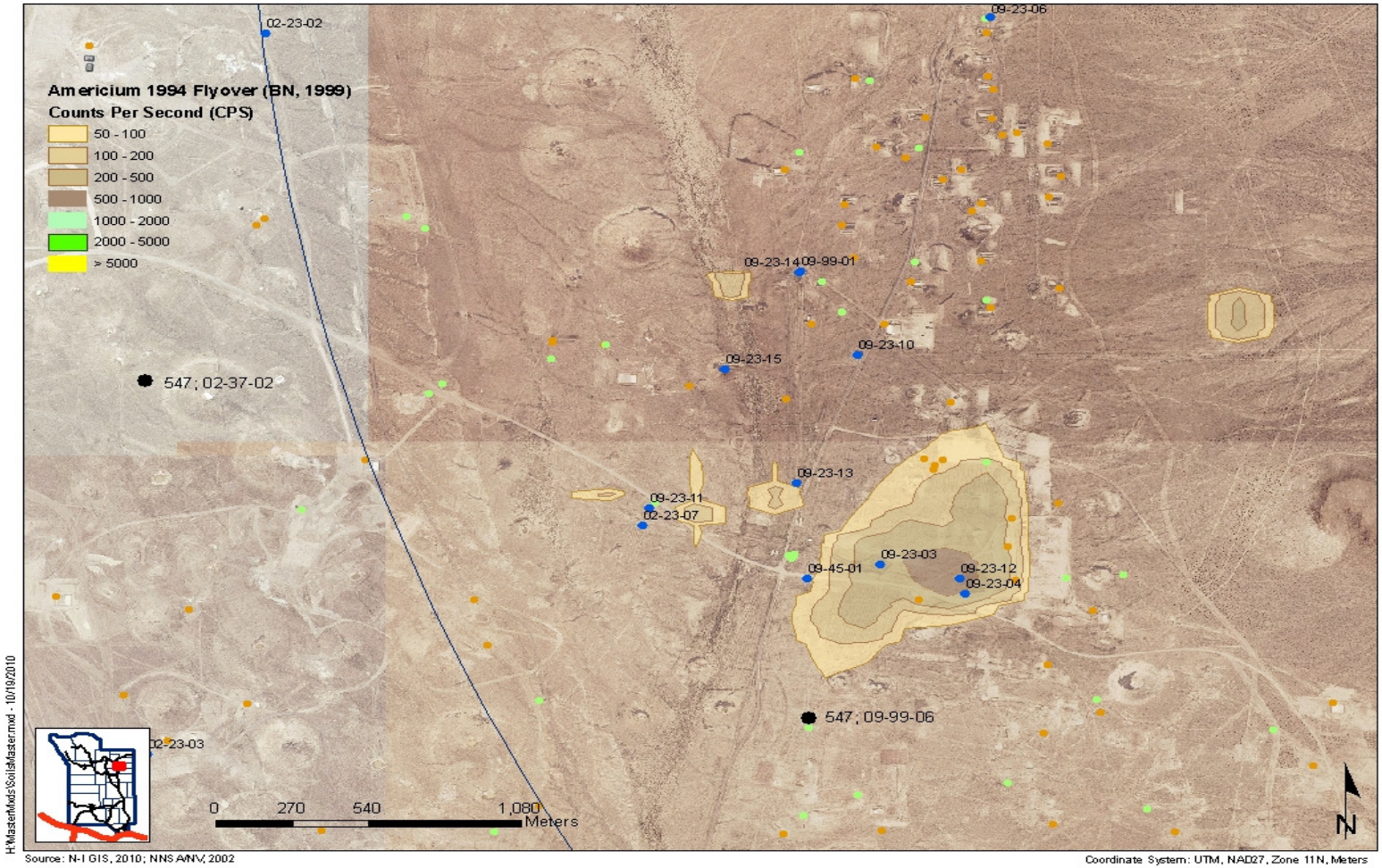
Closure in Place	**~$ 2 – 3 M**
•Monitoring not included	
•Monitoring (assumes no air monitoring)	**~$80 K/year**
Clean Closure	**~$30 – 35 M**
•Monitoring/Maintenance not included	
•Monitoring/Maintenance	**~$28 K/year**

CAU 547
DOE Recommended Alternative

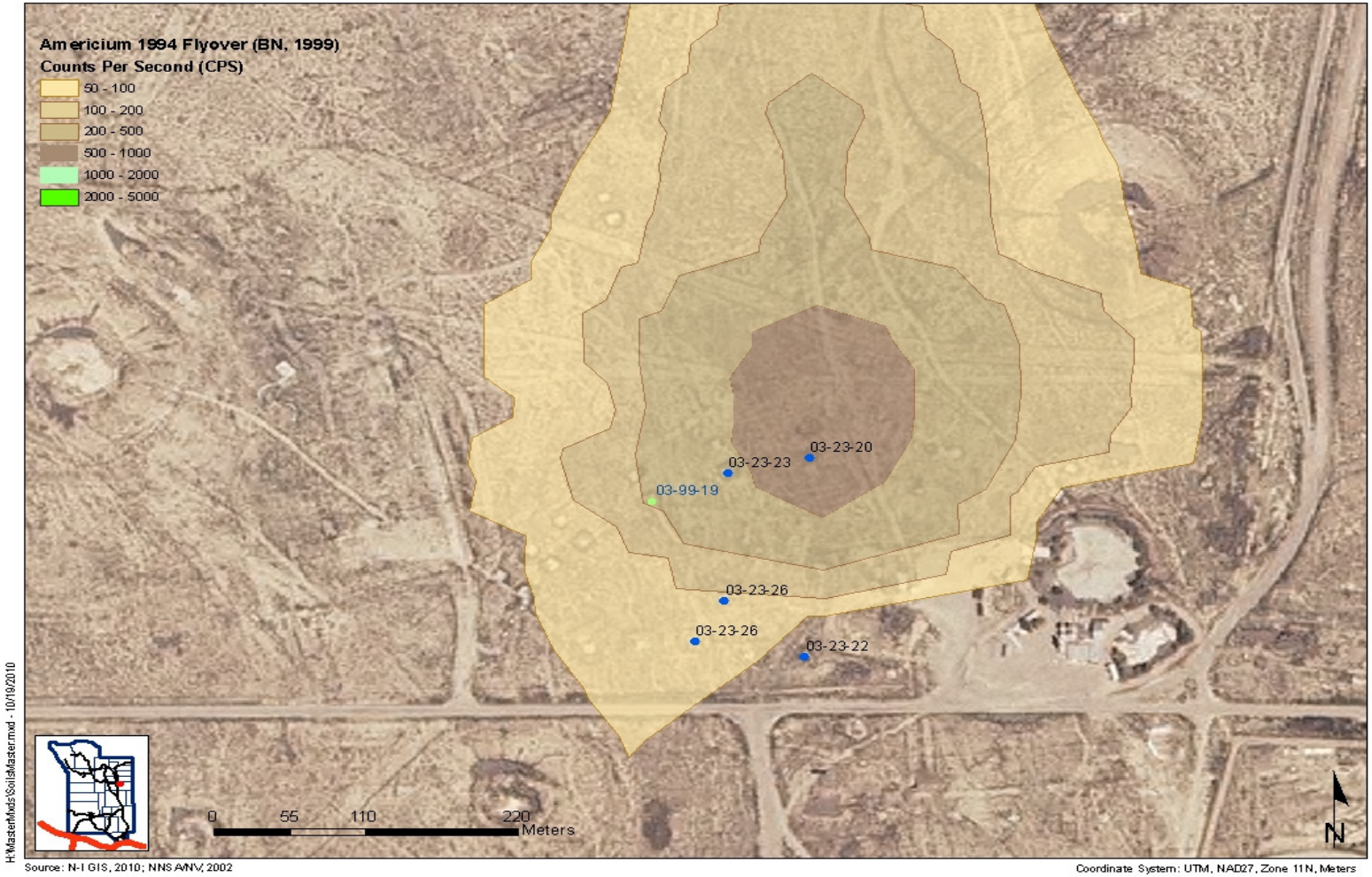
Closure in Place with Soil Covering, Enhanced Physical Controls and Use Restriction

- Lowest risk to current site workers and public
- Risk to future site workers is limited as area is not amenable to future industrial uses.
  - Each CAS is in past testing areas where surface, shallow subsurface, and deep subsurface remain
  - Existing and future land use restrictions
  - Posted areas

Soils Sites near Player and Mullet



Soils Site near Bernalillo



CAU 547
DOE Recommended Alternative

Closure in Place with Soil Covering, Enhanced Physical Controls and Use Restriction

- This corrective action is:
  - Consistent with past practices for CASs containing contaminants exceeding action levels where removal is either impractical or not cost effective
  - Selected alternative can be safely completed, with future worker exposure limited due to administrative controls and future land use
- Bottom Line: Clean closure presents minimal gain while potentially exposing workers to risk.

CAU 566 – Question 1

What are the estimated costs associated with the alternatives for the disposition of the locomotives at EMAD?

- Leave in Place ~$100 K
  - Includes draining fluids and removing batteries for proper disposal, and pushing locomotives down the tracks

- Dispose Onsite ~$300 – 400 K
  - Includes draining fluids and removing batteries for proper disposal, and dismantlement and transport of the locomotives to U10c sanitary landfill

CAU 566 – Question 2

What were the costs associated with the transfer of the small locomotive to the museum?

- Decontamination and Release (small engine) ~$64 K
  - Included decontamination, asbestos removal and preparation of the release documentation
  - Does not include transportation costs

CAU 566 – Question 3

How long did it take for the museum to get the small locomotive transferred once it was signed over?

- Signed over in April of 1992
- Museum officially requested transfer in November of 2009
- Locomotive was released in October of 2010

CAU 566 – Question 4

How is property released?

- Property is designated as "available for release" by one of two methods
  1. Declared as excess property
     - Made available for other federal agencies
     - If no federal agency interest, then may be released to other entities
  2. Abandonment letter to the NNSA /Office of Science Organizational Property Management Officer for approval with the following conditions:

CAU 566 – Question 4
(continued)

- Property has no commercial value, or
- Estimated cost of continued care/handling would exceed estimated proceeds from sale

Either process would result in the following:

- Title transferred to the State of Nevada through State Agency for Surplus Property (SASP)
  - Title then transferred to other entity by the State
- Radiological Release surveys performed to verify property does not pose unacceptable risk
- Additional Surveys/Samples may be required depending on the property location (for example, beryllium evaluations)

Soils – Question 1

What are the assumptions for each exposure scenario?

- Industrial Area Exposure Assumptions
  - 261 possible working days / year
  - Non-working 26 alternate Fridays
  - 10 days of vacation
  - Workers present 225 days / year, 10 hours / day for 25 years
  - Workers spend 1/3 of time outdoors

Soils – Question 1
(continued)

- Remote Work Area Exposure Assumptions
  - Workers present 8 hours / day, 42 days / year, for 25 years
  - Workers spend 1/3 of time outdoors

- Occasional Use Area Exposure Assumptions
  - Workers present 8 hours / day, 10 days / year, for 5 years
  - Workers spend 100% of time outdoors

Soils – Question 2

Can you provide additional discussion on the corrective action scoring?

CAA 2, Clean Closure		
Standard	**Rank**	**Explanation**
Short-Term Reliability and Effectiveness	1	This alternative is reliable and effective, but involves increased short-term exposure of site workers to COCs during soil removal operations.
Reduction of Toxicity, Mobility, and/or Volume	2	This alternative will result in a decrease of toxicity and mobility, but will generate significant waste volumes.
Long-Term Reliability and Effectiveness	2	This alternative is reliable and effective at protecting human health and the environment because removal of the contaminated media will eliminate future exposure of site workers to COCs. However, the short term exposure to site workers would increase.
Feasibility	1	Removal of deep subsurface contamination is not feasible.
Cost	1	Cost is estimated to be in excess of $90 million.
Score	7	

Soils – Question 2 (continued)

CAA 3, Closure in Place with Administrative Controls		
Standard	**Rank**	**Explanation**
Short-Term Reliability and Effectiveness	2	This alternative is reliable and effective in providing increased protection of human health by preventing contact with COCs.
Reduction of Toxicity, Mobility, and/or Volume	1	This alternative will not reduce toxicity or mobility of the COCs that are present, but will not generate excavation waste volumes.
Long-Term Reliability and Effectiveness	1	This alternative is reliable in the long term with ongoing maintenance. It is effective in providing protection of human health by preventing inadvertent contact with COCs.
Feasibility	2	This alternative is easily implemented, but requires maintenance and long-term monitoring.
Cost	2	The installation costs are estimated at $25,000. Ongoing maintenance costs for this alternative are estimated at $1,000 annually.
Score	8	

Soils – Question 3

What are the costs for the closure alternatives for CAU 372?

Closure in Place ~$ 40 K

- Monitoring not included
- Monitoring (assumes no air monitoring) ~$ 5 K/year

Clean Closure ~$110 M

Record Retention – Question 1

What record retention policies are used for Use Restrictions?

- Use Restrictions (UR) are held under a Real Estate Operating Permit and the Facility Information Management System (FIMS)
  - Provides administrative controls for identification prior to performing work
  - URs also recorded in the NNSS Geographic Information System database
  - Specific information also available on the Facility Data intranet site

Record Retention – Question 1
(continued)

- UR records are "permanent records" as identified in:
  - Title 36 CFR Chapter XII, Subpart B, "Records Management"
  - DOE O 243.1, "Records Management Program," Attachment 2, "Contractor Requirements Document"

Record Retention – Question 1
(continued)

- A “permanent” record is one that cannot be destroyed. Once a project is closed out, it is archived.
- The following records are considered permanent records:
  - **DISPOSAL/CLEANUP**

    This category includes records documenting cleanup of past-practice waste sites/units, closure of waste sites under Resource Conservation and Recovery Act (RCRA) and other applicable regulations, cleanup of waste sites under Comprehensive Environmental Response, Compensation, and Liability Act and RCRA corrective action provisions/ disposal of radioactive and hazardous waste from waste

Record Retention – Question 1
(continued)

sites. Records include those generated once a decision has been made to clean up a given location, from removal/ treatment of the contaminated area to restoration of the area to its natural condition.

– **Designation/Means of Disposal**
  - Procedures Governing Disposal and Cleanup
  - Permanent
  - Retain on site until final cleanup Transfer to NARA 5 years after cutoff. (N1-434-98-28)

Record Retention – Question 1
(continued)

- **Waste Disposal Characterizations/Records**
  - Records indicating type (classification) and degree of contamination, date of disposal, method of disposal (burial, landfill, etc.), volume, and disposal location.
  - May include engineering studies, reports of unusual problems encountered during removal or treatment
  - Permanent.
  - Cutoff 5 years after disposal
  - Transfer to National Archives and Records Administration 25 years after cutoff. (N1-434-98-28)