

Nevada Test Site Tour Booklet



Community Advisory Board
for Nevada Test Site Programs
June 17, 2010



EM *Environmental Management*

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Prohibited Articles On Nevada Test Site Public Tours

The following item/personnel are prohibited within the boundaries of the Nevada Test Site. Tour escorts are required to do random checks.

- Bluetooth “Enabled” Devices
- PDA, BlackBerry, etc.
- Laptops & Associated Media
- Alcoholic Beverages
- Chemical Irritants
- Pets & Animals
- Global Positioning System (GPS)
- Recording devices
- Portable Data Storage Devices
- Cameras
- Cellular phones
- Weapons
- Explosives
- Any Item Prohibited by Law
- Controlled Substances
- Ammunition
- Incendiary Devices
- Binoculars
- Optical Instruments

Possession of these items may delay the tour and prevent your participation.

If at any point during the tour these items are discovered, the tour may be terminated.



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Tour Agenda

7:45 a.m.	Depart for Mercury	12:20 p.m.	Sedan Crater Briefing (Lunch)
9:00 a.m.	Mercury Badge Office	12:45 p.m.	Depart for Apple II houses
9:20 a.m.	Depart for Gate 100	1:05 p.m.	Apple II houses
9:25 a.m.	Gate 100 Badge Check	1:15 p.m.	Depart for Area 25, Jackass Flats/Cane Springs Road
9:35 a.m.	Mercury Cafeteria (rest stop)	1:45 p.m.	R-MAD Briefing
9:55 a.m.	Depart for Frenchman Flat	1:55 p.m.	Depart for Engine Maintenance Assembly and Disassembly (EMAD) Facility
10:10 a.m.	Frenchman Flat Briefing	2:05 p.m.	EMAD Briefing
10:30 a.m.	Depart for Area 5, Radioactive Waste Management Complex (RWMC)	2:25 p.m.	Depart for Mercury
10:40 a.m.	Area 5 RWMC Briefing (rest stop)	2:45 p.m.	Mercury Cafeteria (rest stop)
11:10 a.m.	Depart for Icecap Ground Zero	2:55 p.m.	Gate 100 Badge Check
11:40 a.m.	Icecap Ground Zero Briefing	4:15 p.m.	Arrive at Durango & 95 parking
Noon	Depart for Sedan Crater		



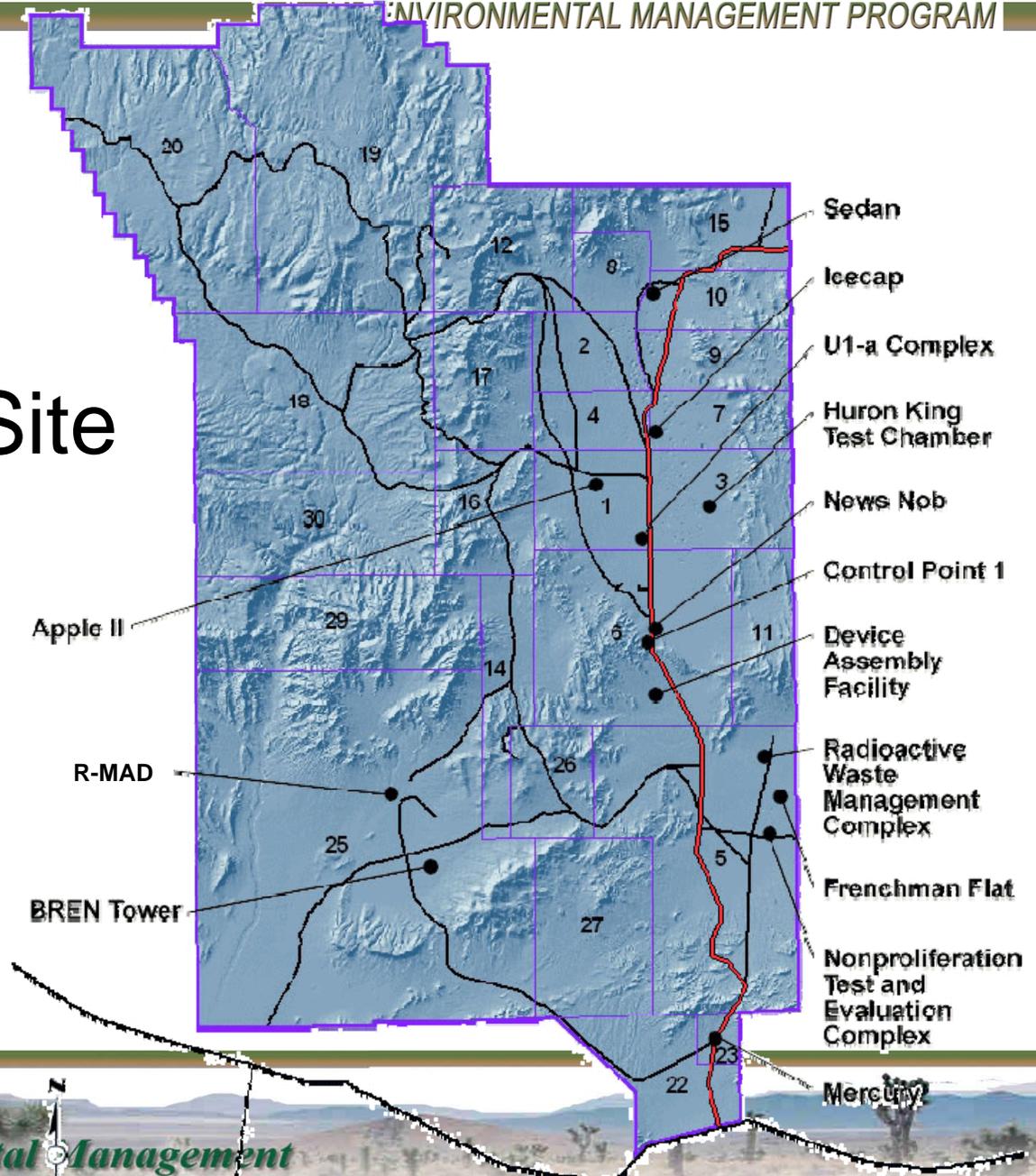
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Nevada Test Site Tour Map



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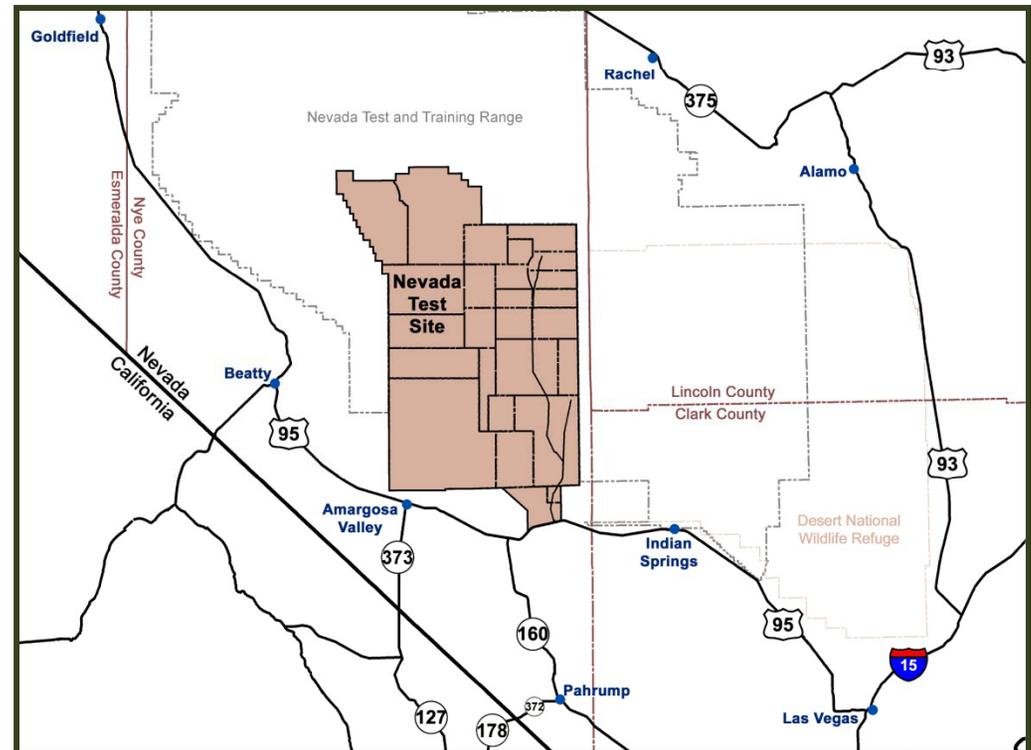
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The Nevada Test Site (NTS)

- Approximately 1,375 square miles of U.S. Department of Energy (DOE) controlled land
 - Surrounded by approximately 4,500 square miles of federally-controlled land
- Located approximately 65 miles northwest of Las Vegas, Nevada



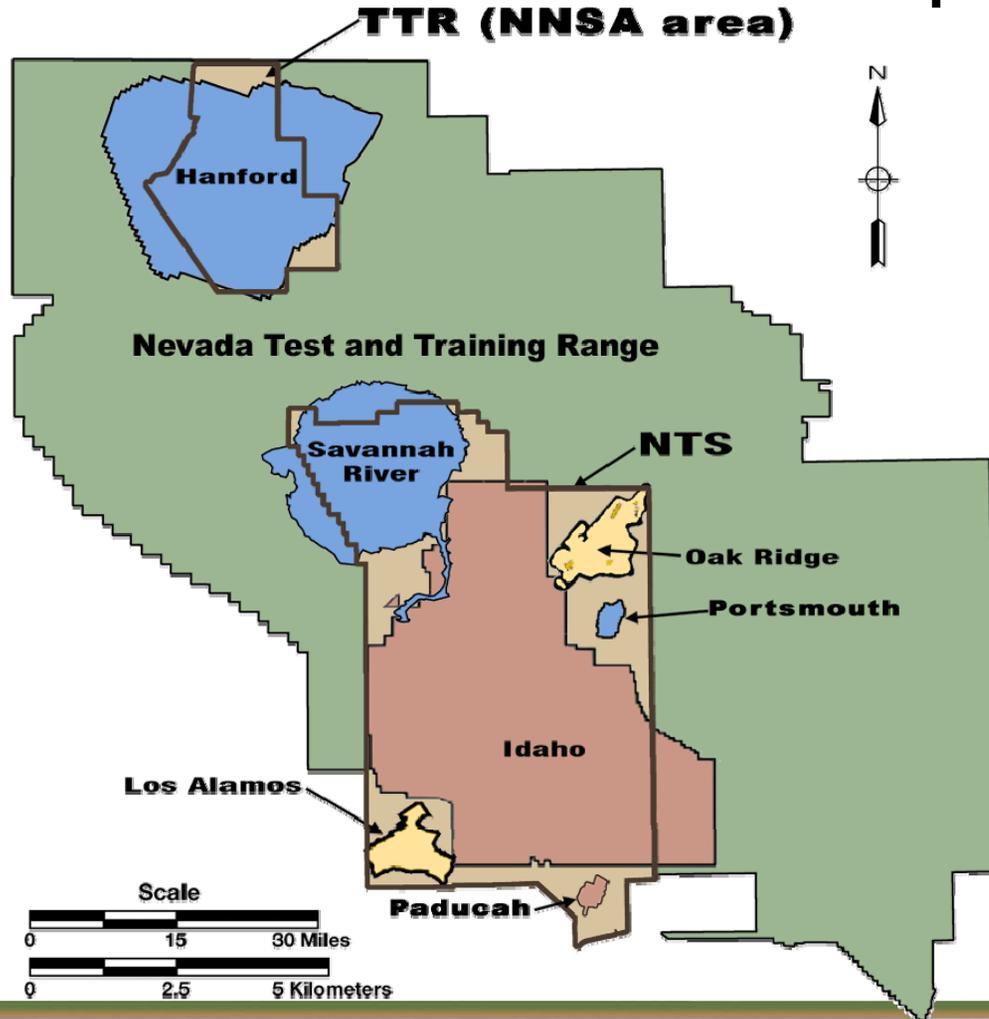
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DOE Site Comparisons



Site	Sq. Mi.
Hanford	560
Idaho	893
Los Alamos	43
Oak Ridge	53
Paducah	5
Portsmouth	6
Savannah River	310
TOTAL	1,870
NTS	~1360
TTR (NNSA area)	~280
TOTAL	~1640



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Historic Activities

- First NTS atmospheric nuclear test detonated on January 27, 1951
- Conducted 928 atmospheric and underground nuclear tests between 1951 and 1992
- Development and testing of nuclear weapons generated radioactive waste



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Nonproliferation Test and Evaluation Complex (NPTEC)

- World's largest facility for open air testing of hazardous toxic materials and biological simulants
- Available to private and public sector sponsors on a user-fee basis



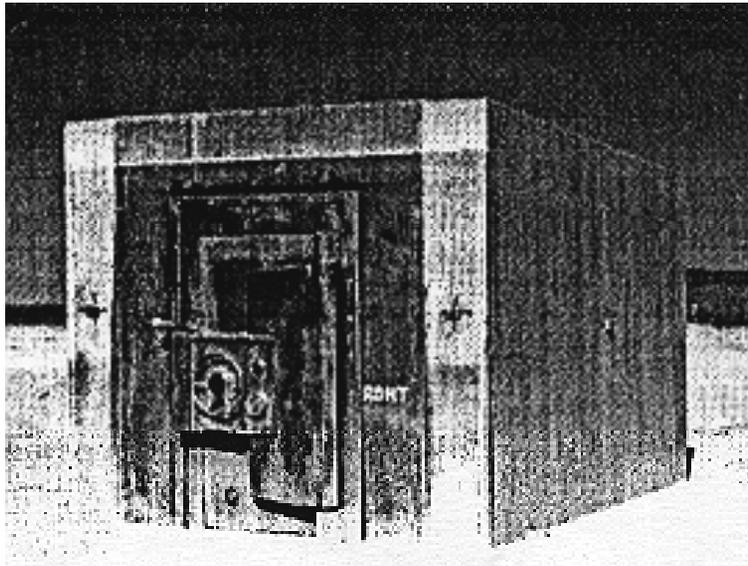
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Atmospheric Test Relics



*Bank Vault prior to the 1957
Priscilla test*



Effect of the test on the vault



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Atmospheric Test Relics (continued)



Concrete shelter domes prior to the 1957 Priscilla test



Effect of the test on the concrete shelter dome



Area 5 Radioactive Waste Management Complex

- 740 acres available for disposal – 160 acres currently used
- Low-Level Waste (LLW) and Mixed LLW disposal cells are excavated pits and trenches
- Thirty-two (34) engineered disposal cells
 - Nine (9) Active (one for MLLW)
 - 25 operationally closed



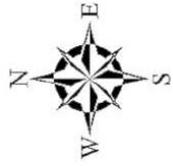
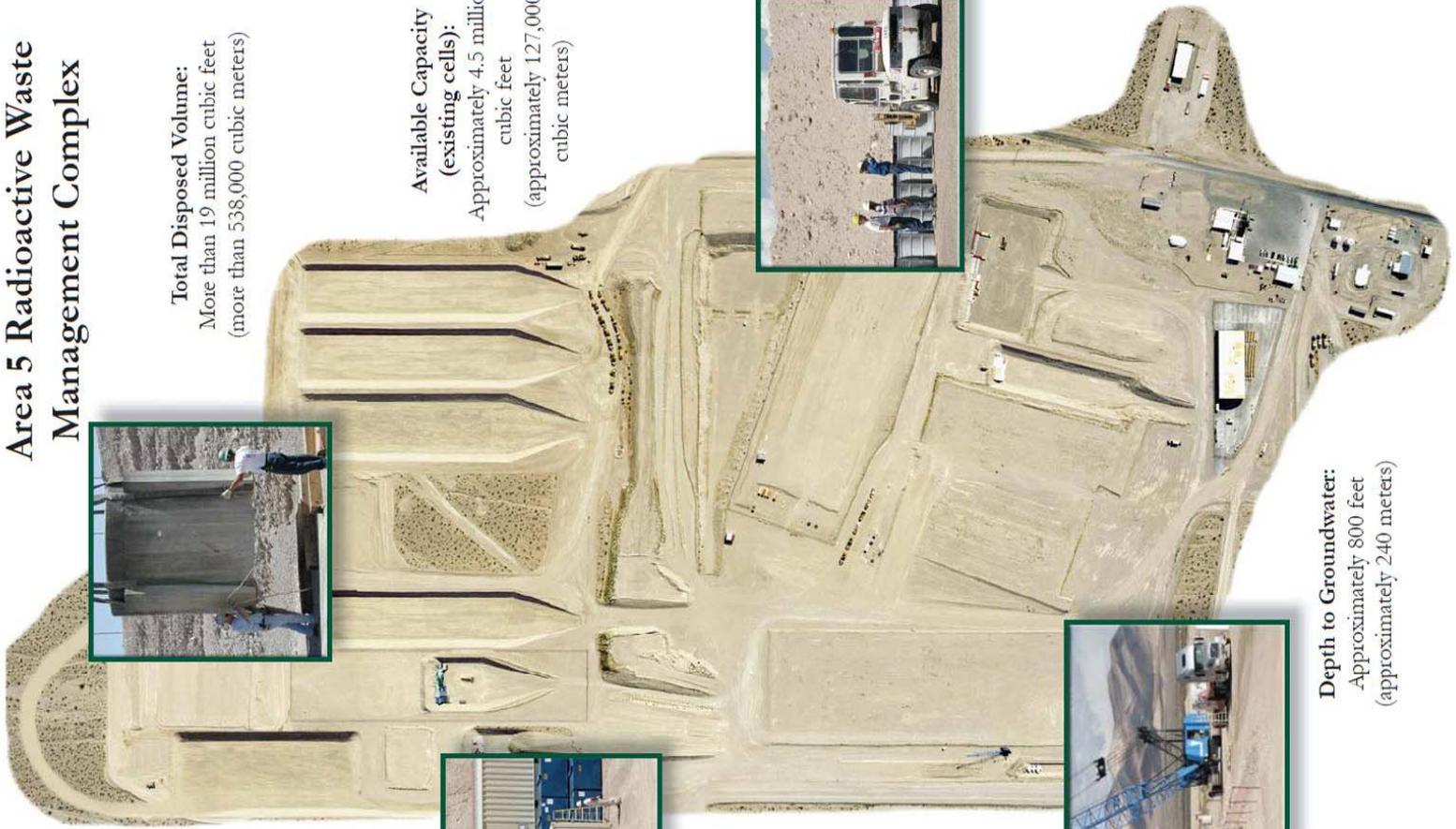
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Area 5 Radioactive Waste Management Complex



Total Disposed Volume:
 More than 19 million cubic feet
 (more than 538,000 cubic meters)

**Available Capacity
 (existing cells):**
 Approximately 4.5 million
 cubic feet
 (approximately 127,000
 cubic meters)

**Number of Existing
 Disposal Cells:**
 Active (open) - 9
 Closed - 25



**Number of Monitoring
 Locations:**

- Air - 4
- Groundwater - 3
- Meteorology - 3
- Radon Flux - 1
- Soil Gas - 1
- Soil Moisture - 8
- Soil Temperature - 1
- Thermoluminescent Dosimeters - 16



Depth to Groundwater:
 -Approximately 800 feet
 (approximately 240 meters)



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Area 5 Disposal Capabilities

- Diverse DOE and defense-related radioactive waste streams and package types handled
 - Asbestos
 - Contact-handled LLW heavy monoliths
 - High-concentration thorium
 - Remote-handled LLW heavy monoliths
 - Thorium nitrate
 - High specific activity LLW
 - Non-standard packaging



- Mixed LLW
- Classified waste
- High radon emanation



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Area 5 Disposal Cells – Waste Container Configuration



Boxes containing LLW are placed in a stair-stacked configuration within an engineered grid



Area 5 Capacity

- Total current disposed volume is more than 19 million cubic feet of LLW and Mixed LLW
- Available open capacity in existing cells: approximately four and one-half (4.5) million cubic feet
- Available capacity in the undeveloped areas of the 732 acre site: estimated at 116 million cubic feet



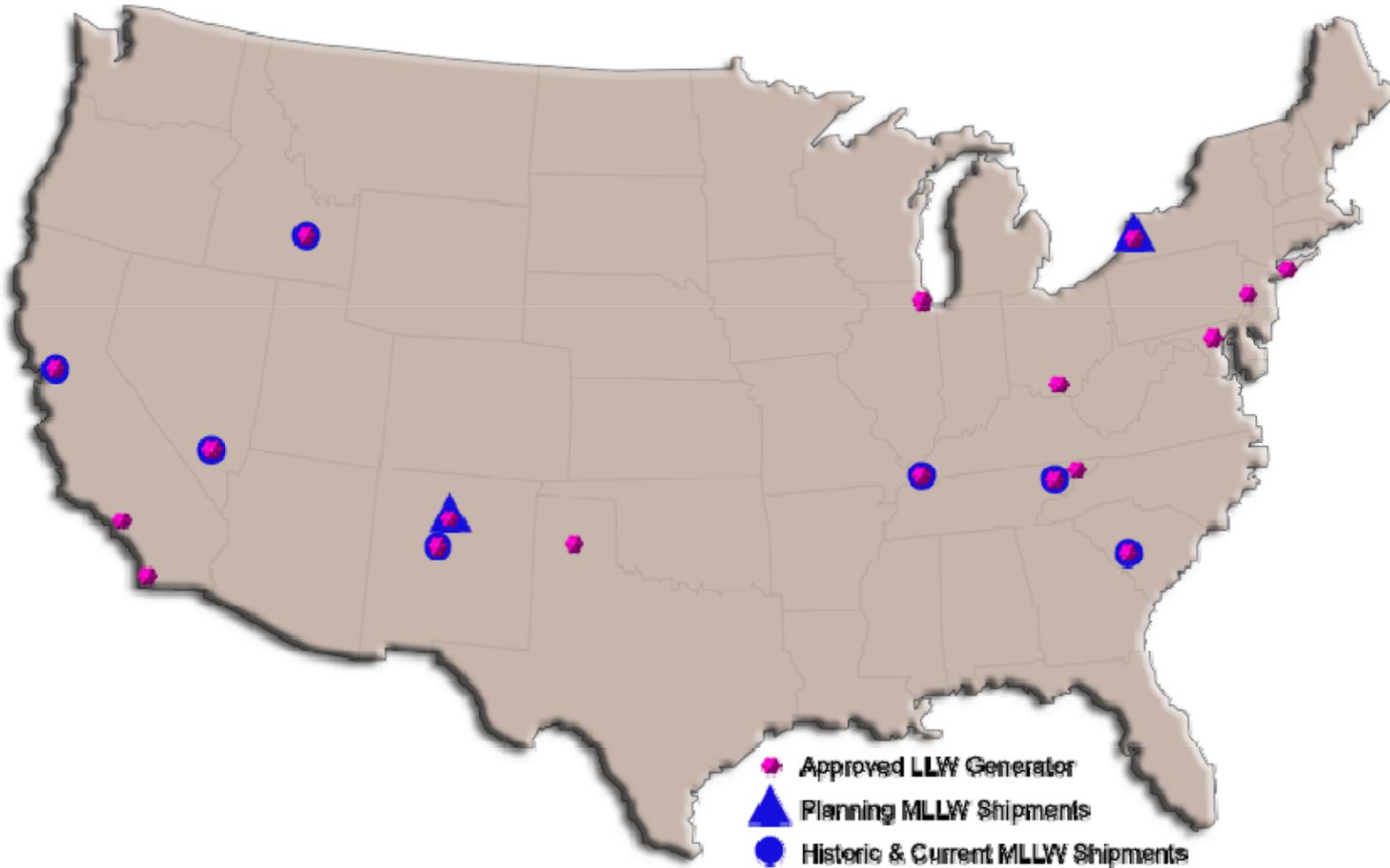
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NTS Approved Generators



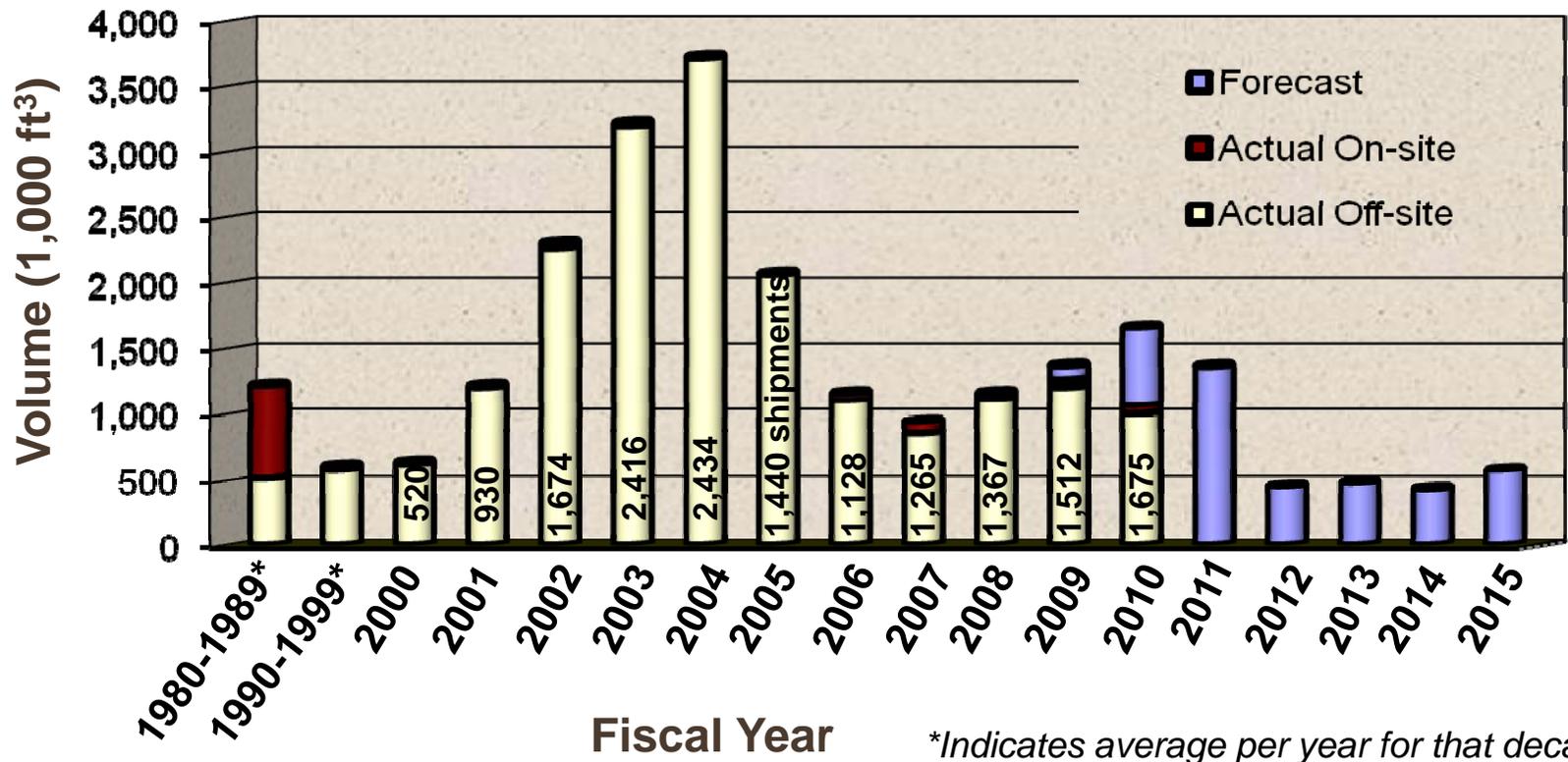
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NTS LLW/Mixed LLW Disposal Volumes



FY 2004 (total) – 3,743,292 ft ³ FY 2005 (total) – 2,089,028 ft ³ FY 2006 (total) – 1,172,949 ft ³ FY 2007 (total) – 943,824 ft ³	FY 2008 (total) – 1,174,656 ft ³ FY 2009 (total) – 1,273,472 ft ³ FY 2010 (as of 05-02-10) – 1,075,666 ft³
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*Indicates average per year for that decade



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ENVIRONMENTAL MANAGEMENT PROGRAM

NEVADA TEST SITE LOW-LEVEL WASTE OPERATIONS FY 2010 WEEKLY WORKING REPORT

DOE APPROVED GENERATORS	W/E: 5/23/2010				FY 2010 TOTAL			WMP TOTAL	
	Disposal Location	Weekly Shipments	Volume (Ft ³)	Volume (M ³)	FY 2010 Shipments	Volume (Ft ³)	Volume (M ³)	Volume (Ft ³)	Volume (M ³)
ARGONNE NATIONAL LABORATORY	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	0	0.00	0.00	30	15,658.60	443.40	37,286	1,055.81
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
BECHTEL JACOBS (ORR)	Area 3	0	0.00	0.00	0	0.00	0.00	171,554	4,857.87
	Area 5	2	456.27	12.92	52	54,724.09	1,549.61	653,584	18,507.44
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
BERKELEY NATIONAL LABORATORY	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	0	0.00	0.00	0	0.00	0.00	0	0.00
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
BROOKHAVEN NATIONAL LABORATORY	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	1	144.08	4.08	46	35,326.32	1,000.33	67,215	1,903.33
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
BWXT Y-12	Area 3	0	0.00	0.00	0	0.00	0.00	1,610	45.59
	Area 5	26	35,794.24	1,013.58	334	497,290.90	14,081.71	1,313,715	37,200.26
	Mixed	0	0.00	0.00	1	102.17	2.89	6,519	184.59
DURATEK, INC.	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	2	874.81	24.77	11	7,420.90	210.14	20,453	579.16
	Mixed	0	0.00	0.00	1	2,084.98	59.04	22,938	649.53
WASTREN ADVANTAGE, INC. (ORR)	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	0	0.00	0.00	1	2,556.78	72.40	43,264	1,225.09
	Mixed	0	0.00	0.00	12	20,341.20	576.00	29,664	840.00
GENERAL ELECTRIC VALLECITOS	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	0	0.00	0.00	0	0.00	0.00	0	0.00
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
IDAHO NATIONAL LABORATORY AMWTP	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	3	4,184.79	118.50	46	55,442.27	1,569.95	79,042	2,238.23
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
IDAHO NATIONAL LABORATORY ICP	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	1	19.07	0.54	13	5,923.93	167.75	19,220	544.25
	Mixed	0	0.00	0.00	4	823.02	23.31	18,565	525.70
IDAHO NATIONAL LABORATORY BEA	Area 3	0	0.00	0.00	0	0.00	0.00	9,683	274.19
	Area 5	0	0.00	0.00	44	31,557.40	893.61	170,063	4,815.66
	Mixed	0	0.00	0.00	0	0.00	0.00	990	28.03
LOS ALAMOS NATIONAL LABORATORY	Area 3	0	0.00	0.00	0	0.00	0.00	4,803	136.01
	Area 5	2	988.81	28.00	2	988.81	28.00	989	28.00
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
LAWRENCE LIVERMORE NATIONAL LABORATORY	Area 3	0	0.00	0.00	0	0.00	0.00	343,230	9,719.19
	Area 5	4	5,380.54	152.36	15	14,000.82	396.46	243,976	6,908.63
	Mixed	0	0.00	0.00	0	0.00	0.00	406	11.49



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NEVADA TEST SITE
LOW-LEVEL WASTE OPERATIONS
FY 2010
WEEKLY WORKING REPORT

DOE APPROVED GENERATORS	WE: 5/23/2010				FY 2010 TOTAL			WMP TOTAL	
	Disposal Location	Weekly Shipments	Volume (Ft ³)	Volume (M ³)	FY 2010 Shipments	Volume (Ft ³)	Volume (M ³)	Volume (Ft ³)	Volume (M ³)
LOVELACE RESPIRATORY RESEARCH INSTITUTE	Area 3	0	0.00	0.00	0	0.00	0.00	10,213	289.20
	Area 5	0	0.00	0.00	0	0.00	0.00	6,974	197.48
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
NAVAL REACTORS/ KAPI	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	0	0.00	0.00	0	0.00	0.00	0	0.00
NATIONAL SECURITY TECHNOLOGIES	Area 3	0	0.00	0.00	0	0.00	0.00	349,600	9,899.57
	Area 5	40	16,464.63	466.23	304	110,052.19	3,116.33	348,436	9,868.03
	Mixed	0	0.00	0.00	4	2,172.21	61.51	31,475	891.28
NUCLEAR FUEL SERVICES	Area 3	0	0.00	0.00	0	0.00	0.00	13,440	380.58
	Area 5	1	1,152.67	32.64	37	47,306.10	1,339.56	304,424	8,620.33
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
ORNL BUILDING 3019 D&D	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	0	0.00	0.00	0	0.00	0.00	0	0.00
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
PADUCAH	Area 3	0	0.00	0.00	0	0.00	0.00	236,166	6,687.48
	Area 5	1	785.05	22.23	32	30,801.85	872.21	553,456	15,672.12
	Mixed	0	0.00	0.00	6	7,001.13	198.25	7,001	198.25
PANTEK	Area 3	0	0.00	0.00	0	0.00	0.00	34,950	989.67
	Area 5	0	0.00	0.00	1	1,359.97	38.51	147,958	4,189.70
PERMAFIX - M&EC	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	25	3,684.83	104.34	803	138,098.98	3,910.53	250,973	7,106.76
	Mixed	0	0.00	0.00	26	9,879.66	279.76	70,299	1,990.64
PORTSMOUTH	Area 3	0	0.00	0.00	0	0.00	0.00	51,628	1,461.94
	Area 5	0	0.00	0.00	150	172,820.19	4,893.72	1,371,244	38,829.31
	Mixed	0	0.00	0.00	0	0.00	0.00	125,832	3,563.15
BOEING-ROCKETDYNE	Area 3	0	0.00	0.00	0	0.00	0.00	188,240	5,330.36
	Area 5	0	0.00	0.00	0	0.00	0.00	74,350	2,105.36
	Mixed	0	0.00	0.00	0	0.00	0.00	110	3.11
SANDIA NATIONAL LABORATORIES	Area 3	0	0.00	0.00	0	0.00	0.00	72,766	2,060.50
	Area 5	0	0.00	0.00	0	0.00	0.00	111,462	3,156.25
	Mixed	0	0.00	0.00	1	718.62	20.35	1,885	53.37
SAVANNAH RIVER	Area 3	0	0.00	0.00	0	0.00	0.00	92,761	2,626.70
	Area 5	0	0.00	0.00	0	0.00	0.00	277,583	7,860.27
	Mixed	0	0.00	0.00	0	0.00	0.00	16,410	464.68
NAVARRO NEVADA	Area 3	0	0.00	0.00	0	0.00	0.00	427	12.09
	Area 5	0	0.00	0.00	0	0.00	0.00	43,401	1,228.98
	Mixed	0	0.00	0.00	0	0.00	0.00	7,480	211.80



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DOE APPROVED GENERATORS	W/E: 5/23/2010				FY 2010 TOTAL			WMP TOTAL	
	Disposal Location	Weekly Shipments	Volume (Ft ³)	Volume (M ³)	FY 2010 Shipments	Volume (Ft ³)	Volume (M ³)	Volume (Ft ³)	Volume (M ³)
UT-BATTELLE (ORNL)	Area 3	0	0.00	0.00	0	0.00	0.00	1,276	36.13
	Area 5	0	0.00	0.00	1	130.03	3.68	6,104	172.85
WEST VALLEY	Area 3	0	0.00	0.00	0	0.00	0.00	89,618	2,537.70
	Area 5	0	0.00	0.00	0	0.00	0.00	380,991	10,788.46
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
ENERGX - ARGONNE BLDG 330	Area 3	0	0.00	0.00	0	0.00	0.00	0	0.00
	Area 5	2	971.86	27.52	2	971.86	27.52	972	27.52
	Mixed	0	0.00	0.00	0	0.00	0.00	0	0.00
INACTIVE OFFSITE WASTE GENERATORS	Area 3	0	0.00	0.00	0	0.00	0.00	9,946,379	281,650.06
	Area 5	0	0.00	0.00	0	0.00	0.00	12,210,537	345,763.88
	Mixed	0	0.00	0.00	0	0.00	0.00	283,372	8,024.20
INACTIVE ONSITE WASTE GENERATORS	Area 3	0	0.00	0.00	0	0.00	0.00	8,211,495	232,523.62
	Area 5	0	0.00	0.00	0	0.00	0.00	76,538	2,167.31
GRAND TOTAL		110	70,901.65	2,007.71	1,979	1,265,554.98	35,836.52	39,267,044	1,111,918.75

At this time, Area 3 is not receiving waste for disposal.

NEVADA TEST SITE LOW-LEVEL WASTE OPERATIONS FY 2010 WEEKLY WORKING REPORT

Total offsite waste received in FY10 =	1,153,330.58	Ft ³	32,658.68	M ³
Total onsite waste received in FY10 =	112,224.40	Ft ³	3,177.84	M ³
Offsite waste comprises approximately	76.90%	of the total waste inventory		
Onsite waste comprises approximately	23.10%	of the total waste inventory		
Number MLLW shipments =	0	Week Ending 5/23/10	55	FY 2010 Total
Total mixed waste received in FY10 =	43,122.99	Ft ³	1,221.11	M ³
Total mixed waste capacity remaining =	376,539.29	Ft ³	10,662.40	M ³



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Device Assembly Facility (DAF)

- Original purpose: consolidate all nuclear explosive assembly functions
- Current mission: support National Security initiatives
- Entire complex covered by compacted earth



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Control Point-1 (CP-1)

- Command post used for conducting nuclear tests



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News Nob



Soldiers pose by News Nob, a vantage point for atmospheric tests established for the media



Journalists set up on News Nob to witness an atmospheric test in March 1953



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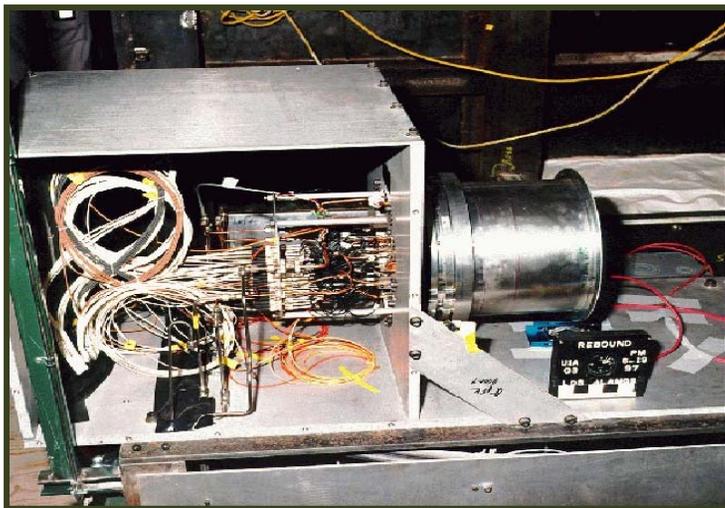
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U1a

- Underground laboratory for subcritical experiments
- Data for National Laboratories
- Safety and reliability of stockpile



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Huron King Test Chamber

- Visual Line of Site underground nuclear test (yield less than 20 kilotons) conducted June 24, 1980
- Tested the effects of a system generated electromagnetic pulse on a full-scale operating military Defense Satellite Communications System



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Icecap Ground Zero

- Location for underground nuclear test scheduled for the spring of 1993
- Moratorium on nuclear weapons testing on September 23, 1992
- Planned test range was 20 - 150 kilotons and would have been conducted 1,550 feet underground
- Tower is 157-feet tall
- Inside is a 300,000 pound diagnostic canister suspended from the top of the tower



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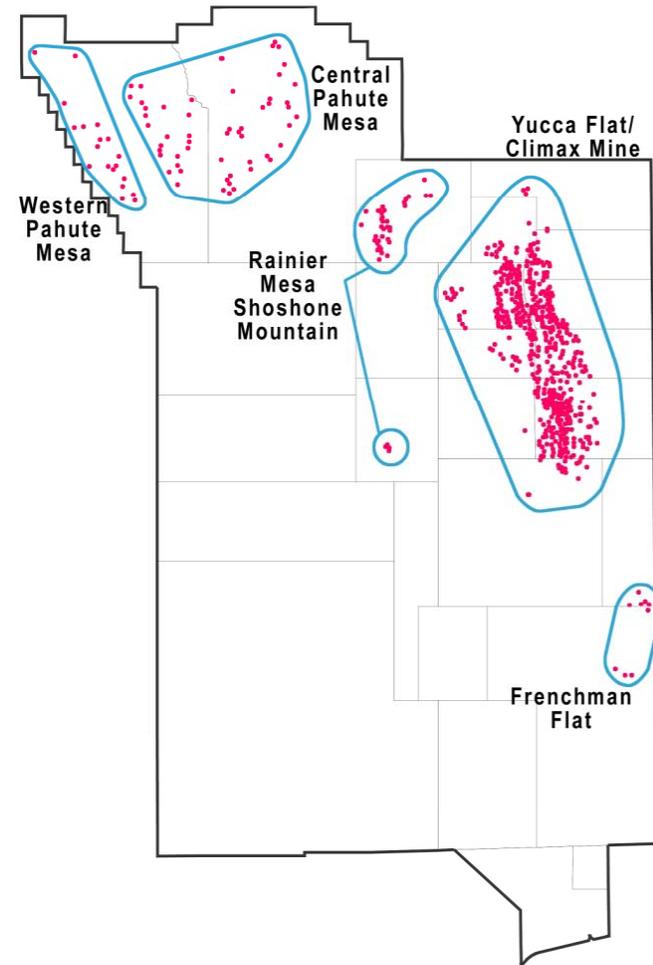
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Underground Test Area Sub-Project

- Conducted 828 underground nuclear tests at depths ranging from approximately 90 to 4,800 feet below the ground surface
- About one-third of tests occurred in, near, or below the water table, which resulted in groundwater contamination



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Underground Test Area Sub-Project

- The Underground Test Area (UGTA) sub-project evaluates the historic testing impacts on groundwater resources and study the extent of contaminant migration
- The scope includes collection of multiple sources of field data in order to create a 3-D computer model
 - This model includes groundwater, flow and transport parameters
- The models will be used to create a monitoring network



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Sedan Crater

- Excavation experiment using a 104-kiloton thermonuclear device (part of the Plowshare Program)
- Conducted on July 6, 1962
- Detonated 635 feet underground



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Sedan Crater

(continued)

- Displaced 12 million tons of earth
- Crater is 1,280 feet in diameter and 320 feet deep
- Released seismic energy equivalent to a 4.75 magnitude earthquake
- Listed on the National Register for Historic Places on April 1, 1994



- Currently part of the Soils Sub-Project



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Soils Sub-Project

- Atmospheric nuclear weapons tests, nuclear safety experiments, and evaluation tests for peaceful uses of nuclear explosives conducted at the Nevada Test Site (NTS) and Nevada Test and Training Range (operated by the U.S. Air Force) resulted in the radioactive contamination of surface soils
- Soils sub-project is responsible for:
 - 128 Corrective Action Sites
 - Characterizing and/or remediating surface soil contamination
 - Ensuring appropriate controls (i.e. postings, barriers, etc.) are in place at the sites conducting long-term site monitoring



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Apple II Houses

- 29-kiloton test was detonated from a 500-ft tower on May 5, 1955
- 6,600 ft to the east of the tower are the remains of a wooden two story house
- Part of a Civil Defense exercise



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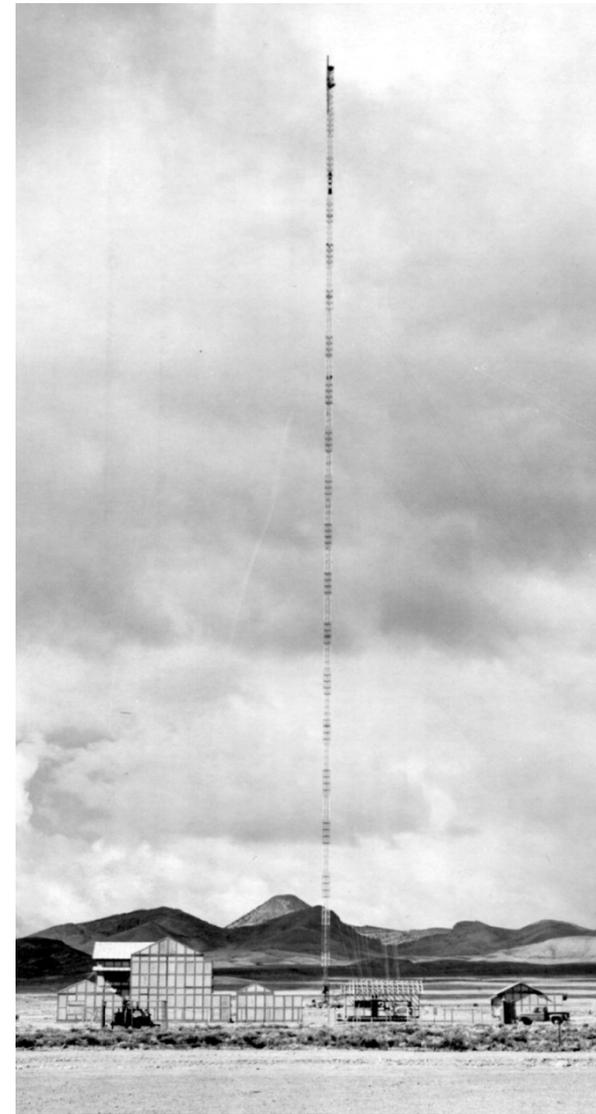
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Bare Reactor Experiment Nevada (BREN)

- Part of research project to estimate radiation doses received by survivors of the Hiroshima and Nagasaki atom bomb blasts
- A 1,527 ft steel tower erected in 1962
- Unshielded mobile reactor mounted on tower
- Simulated Japanese style houses located at the base were subjected to varying intensities of radiation



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Industrial Sites Sub-Project

- Portions of the facilities and land at the Nevada Test Site and Tonopah Test Range were used in direct support of nuclear testing
 - Facilities included gas stations, motor pools, worker housing, and research buildings
- Activities resulted in some environmental contamination and subsequent hazardous and radioactive waste generation
 - Contaminants of Concern may include hazardous chemicals, unexploded ordnance, and low-level radionuclides



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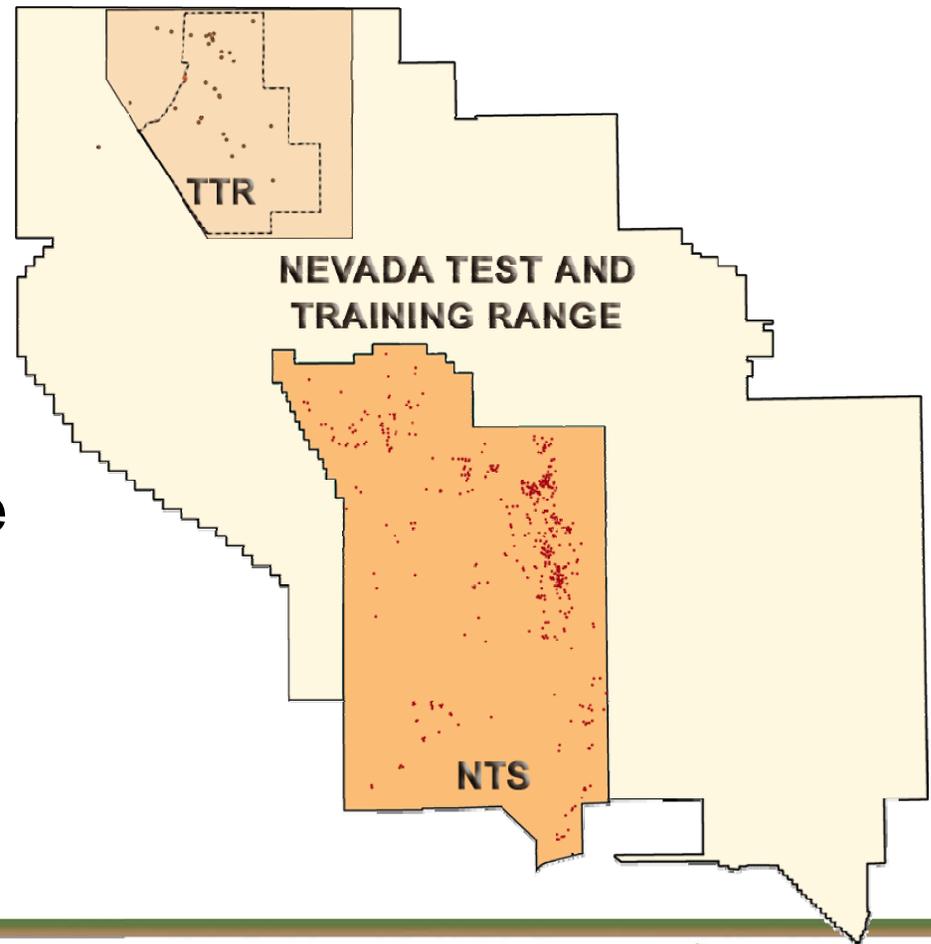
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Industrial Sites Sub-Project

(continued)

- The Industrial Sites sub-project remediates the contaminated sites
 - Sites include leach fields, sumps, disposal wells, tanks, contaminated waste piles, ordnance sites, etc.
- 1,112 Corrective Action Sites
 - 1,102 formally closed



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Reactor Maintenance, Assembly and Disassembly (R-MAD)

- Built in 1959 and used until 1973 as part of the Nuclear Rocket Development Station
- 80-room, 5-level facility designed to prepare reactor rockets for testing
- FY 2010 decontamination and decommissioning accelerated as a result of American Recovery and Reinvestment Act funding



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