

## C.5 NEVADA OPERATIONS OFFICE SUMMARY

**NOTE:** This site summary provides information and data for sites under the Department's Nevada Operations Office. The data for this summary were collected in 1999 and do not necessarily reflect funding or completion profiles for the site. The data do not include changes that resulted from actual FY 2000 appropriations or anticipated changes as a result of both FY 2000 supplemental and FY 2001 budget requests. The Department is in the process of updating its life-cycle information for the EM program.

The 1999 data were the basis for DOE's *Status Report on Paths to Closure* (March 2000). The costs in the "Cost and Completion Date" section of this summary are the sum of the project planning baselines prepared by the field office and generally do not include estimates of project uncertainty. On the other hand, the cost range in the national status report includes an estimate of the cost resulting from project uncertainties, and EM's overall estimate of life-cycle costs of \$151-195 billion from FY 2000 to FY 2070 (or \$168-\$215 billion if the costs incurred between FY 1997 and FY 2000 are included in the cost range estimate).

For over 40 years, the primary mission of the Department of Energy's (DOE) Nevada Operations Office was to conduct research, development, and testing of nuclear devices. Most testing took place at the Nevada Test Site, but nuclear testing activities have also been conducted at eight Offsite locations in five different states. In addition, the Nevada Operations Office is also responsible for the Tonopah Test Range Area, which is used for research and development.

The *Nevada Test Site (NTS)* is located in a remote region of Nevada and is roughly the size of the State of Rhode Island. In addition to weapons testing, the NTS has hosted secondary missions including: neutron and gamma-ray interaction studies; open air reactor, nuclear engine, and nuclear furnace tests; hazardous materials spill response testing; and a variety of other

experiments involving radioactive and non-radioactive materials.

The *Tonopah Test Range Area*, northwest of the NTS, is used by the DOE Albuquerque Operations Office and the Department of Defense for research and development of ordnance delivery systems, electronic combat training missions, and other activities. The Nevada Operations Office has environmental restoration responsibilities for historic Nevada Operations Office testing activities conducted at the site. For planning and control purposes, the Tonopah Test Range is considered to be part of NTS.

## Nevada Offsites

***Amchitka Island*** was the site of three underground nuclear detonations conducted in October 1965, October 1969, and November 1971. These tests were conducted for seismic testing, calibration, and warhead development.

The ***Central Nevada Test Area*** was used for one subsurface nuclear test, Project Faultless, detonated in January 1968. DOE conducted the test to determine the suitability of the area for additional testing. It also conducted non-nuclear special experiments to determine the behavior of seismic waves.

The ***Gnome-Coach Site*** and ***Gasbuggy Site*** tests were conducted at two sites in New Mexico as part of the Plowshare program, which was a series of nuclear and conventional tests conducted by the Atomic Energy Commission (AEC) to explore peacetime uses of nuclear explosives. The Gnome-Coach test was conducted in bedded salt in December 1961. The Gasbuggy test was a single subsurface nuclear test conducted in December 1967.

The ***Rio Blanco Site*** and ***Rulison Site*** tests, which were conducted at two sites in Colorado, were also part of the Plowshare program. The tests were designed to increase natural gas production from low-permeability sandstone. The Rulison test detonation took place in September 1969 in a sandstone formation. The Rio Blanco test consisted of the nearly simultaneous detonation of three devices in a deep well in May 1973.

The ***Salmon Site*** was used for two nuclear detonations, Salmon and Sterling, to evaluate the seismic response of salt deposits to nuclear explosives. The Salmon Site was also the location for two non-nuclear gas detonations used for seismic decoupling studies in the Miracle Play Program. DOE conducted the Salmon test in the Tatum Salt Dome in October 1964 and the Sterling test in the Salmon cavity in December 1966.

The ***Project Shoal Area*** test was conducted in Nevada in October 1963. The purpose of the test was to determine the effect of a nuclear detonation in a granite rock formation and to compare the seismic activity of natural earthquakes with activity from an underground nuclear explosion.

### C.5.1 End State

NTS is a Defense Programs site. The primary mission of the site is nuclear stockpile stewardship including the maintenance of readiness to conduct underground nuclear tests. Decisions regarding land use on NTS are documented in the Resource Management Plan. Decisions involving resource management, future land use, and private development will be done in partnership with the interests of the DOE, national laboratories, U.S. Air Force, Bureau of Land Management, Tribal Nations, state and local agencies, and other stakeholders.

Responsibility for land use on the Tonopah Test Range Area falls within the purview of the Department of Defense, U.S. Air Force. The Department of Defense is in the process of developing an Environmental Impact Statement governing Air Force activities on the Nellis Air Force Range, which includes the Tonopah Test Range Area.

#### The Offsites Projects

Offsite test locations under the purview of the Nevada Operations Office will have surface areas released for alternative uses without restriction and/or relinquished to the U.S. Fish and Wildlife Service (Amchitka), the State of Mississippi (Project Salmon), or the U.S. Bureau of Land Management. Subsurface contamination will require controlled access. Environmental monitoring of the surface areas, if necessary, will be implemented per agreements with the states' regulators. Upon establishing an agreement with each affected state, Tribal Nations, and other stakeholders, long-term surveillance and maintenance (LTS&M) of the subsurface is assumed in perpetuity and planned for 100 years.

Exhibit C.5-1 provides a summary of the currently assumed site end states for sites being managed by the Nevada Operations Office.

Exhibit C.5-1  
Summary of Nevada Operations Office End States

Site Name	End State Description
Nevada Test Site	Decisions regarding future land use on NTS are documented in the Resource Management Plan. Surface soil plumes that straddle or extend outside NTS boundaries will be characterized and remediated. Soil areas within the boundaries of the site will be characterized and monitored. Subsurface contaminants in and around the underground shot cavities will not be remediated since cost-effective remediation technologies have not yet been demonstrated. All of the site will remain under controlled access. Transuranic waste (TRU) and mixed TRU will be characterized and shipped to the Waste Isolation Pilot Plant. On-site mixed low-level waste (MLLW) will be treated and disposed of on or off site. Environmental Restoration generated MLLW that meets land disposal restrictions will be disposed of on site. Low-level waste from approved generators on and off site will be disposed of in Area 3 and Area 5 of the NTS. Filled disposal pits and trenches will be closed and capped according to approved closure designs and plans.
Tonopah Test Range Area	The site is currently part of the Nellis Air Force Range and the Department of Defense is responsible for the site future use. Soil hot-spots will be removed to levels agreed upon with the state and the U.S. Air Force. Contamination in the industrial areas will be either cleaned up and closed, or closed in place and covered with engineered caps. The site is expected to remain under controlled access.
Offsites: Amchitka Island, Central Nevada Test Area, Gasbuggy Site, Gnome- Coach, Rio Blanco Site, Rulison Site, Salmon Site, and Project Shoal Area	DOE will not maintain an active presence at these sites. It is currently anticipated that following completion of all remedial activities, the surface areas will be released for alternate uses. However, it is also anticipated that DOE will maintain subsurface restrictions (institutional control) on all subsurface areas in proximity to the shot cavities.  Environmental Management (EM) is currently reviewing the site closure dates for the Nevada Offsites to determine what, if any, additional surface cleanup is required and whether the remaining site activities involve only subsurface characterization of groundwater contamination and/or long-term monitoring.

## C.5.2 Cost and Completion Dates

The Nevada Operations Office has divided its EM work into nine discrete projects comprising four environmental restoration projects, three waste management projects, and crosscutting support projects. A Project Baseline Summary (PBS) exists for each project and contains detailed programmatic information, including cost, schedule, scope, end state, and interim milestones. Although the NTS EM mission is scheduled for completion in 2014, NTS will be open to receive low-level waste from other sites through 2070. For additional information on these projects, refer to individual PBSs.

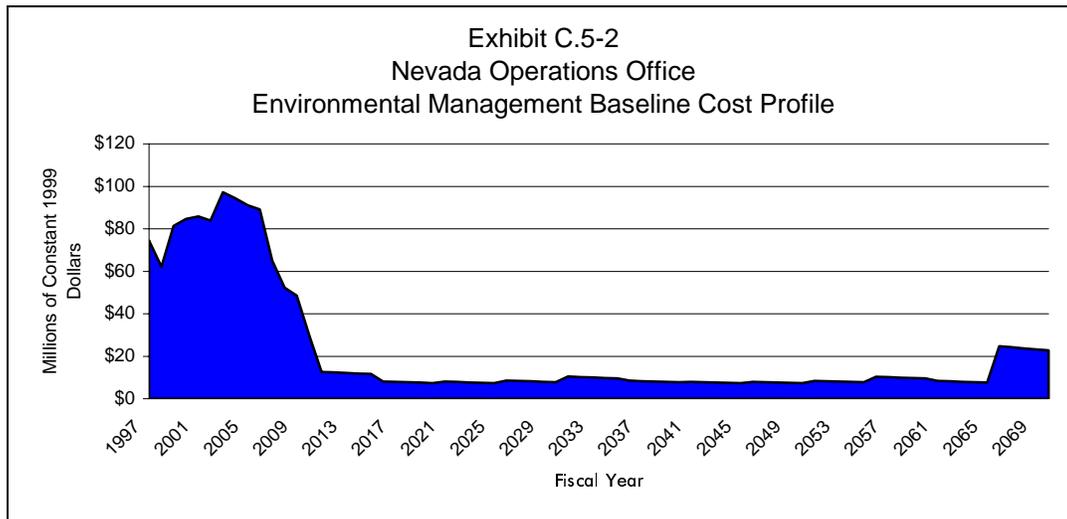
The overall planned site restoration completion dates are as follows:

Site	Date
Nevada Test Site . . . . .	2014
Tonopah Test Range Area . . . . .	2009*
Amchitka Island . . . . .	2002*
Central Nevada Test Area . . . . .	2009*
Gasbuggy Site . . . . .	2011*
Gnome-Coach Site . . . . .	2010*
Rio Blanco Site . . . . .	2007*
Rulison Site . . . . .	2005*
Salmon Site . . . . .	2002*
Project Shoal Area . . . . .	2008*

\*EM is currently reviewing the site closure dates for the Nevada Offsites to determine what, if any, additional surface cleanup is required and whether the remaining site activities involve only subsurface characterization of groundwater contamination and /or long-term monitoring.

The sum of the costs of the planning baselines for individual projects managed by the Nevada Operations Office site cleanup is \$1.6 billion (constant 1999 dollars) with environmental restoration ending in 2014, and waste management for low-level waste disposal activities ending in 2070. Long-term surveillance and maintenance will continue after restoration land disposal activities are complete.

The projected cost profile for environmental management associated with the Nevada Operations Office was developed by combining the cost estimates in each of the PBSs. Exhibit C.5-2 displays the resultant baseline cost profile.



### C.5.3 Accomplishments Since the 1998 *Paths to Closure* Report

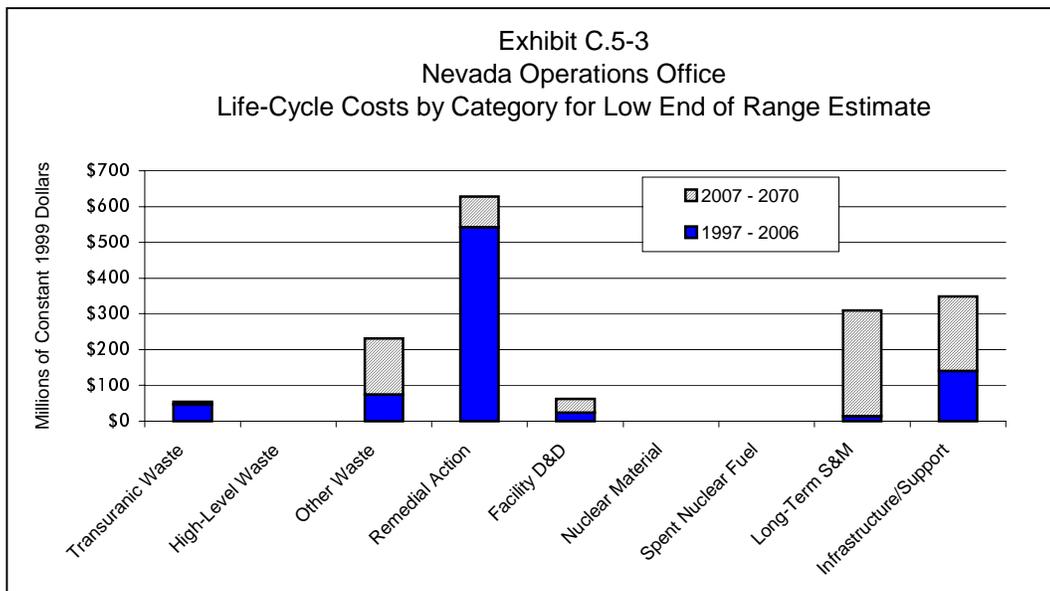
Since the 1998 *Paths to Closure* report, the Nevada Operations Office achieved several goals including the following:

- ❑ Disposed of 17,125 cubic meters of low-level waste;
- ❑ Treated 13 cubic meters of mixed low-level waste prior to disposal at off-site facilities;
- ❑ Completed 31 corrective actions and 34 site assessments; and
- ❑ Deactivated one facility.

### C.5.4 Work Scope Summary

The EM program at NTS consists of three divisions: Environmental Restoration, Waste Management, and Technology Development. Each division ensures that all federal laws and regulations are followed at DOE sites in the process of investigation, corrective action, handling, transportation, disposal, and monitoring of the contaminated materials generated through weapons testing activities. More information about work scope can be found at the following websites, which contain links to the conceptual summary disposition maps (<http://emi-web.inel.gov/summary.html>) and the detailed disposition maps (<http://emi-web.inel.gov/dmaps.html>) in PDF format.

Exhibit C.5-3 illustrates the Nevada Operations Office environmental management costs by major work scope categories including its two crosscutting support projects, Program Integration and Agreements in Principle/Grants. Corrective action costs drive the overall cost for the EM program at the Nevada Operations Office.



### C.5.5 Critical Closure Path and Programmatic Risk

The critical closure path schedule presented as Exhibit C.5-4 sets forth the estimate for completing the closure activities at the Nevada Operations Office. Completion of the EM mission at the Nevada Operations Office as scheduled will depend on the timely accomplishment of critical activities and milestones. Sites have assigned programmatic risk scores to each of the critical activities/milestones. Exhibit C.5-5 presents a summary of milestones on the critical closure path that have high programmatic risk (programmatic risk scores of 4 or 5 in any category). Exhibit C.5-6 displays a summary of waste disposition data that have high programmatic risk (programmatic risk score of 4 or 5 in any category).

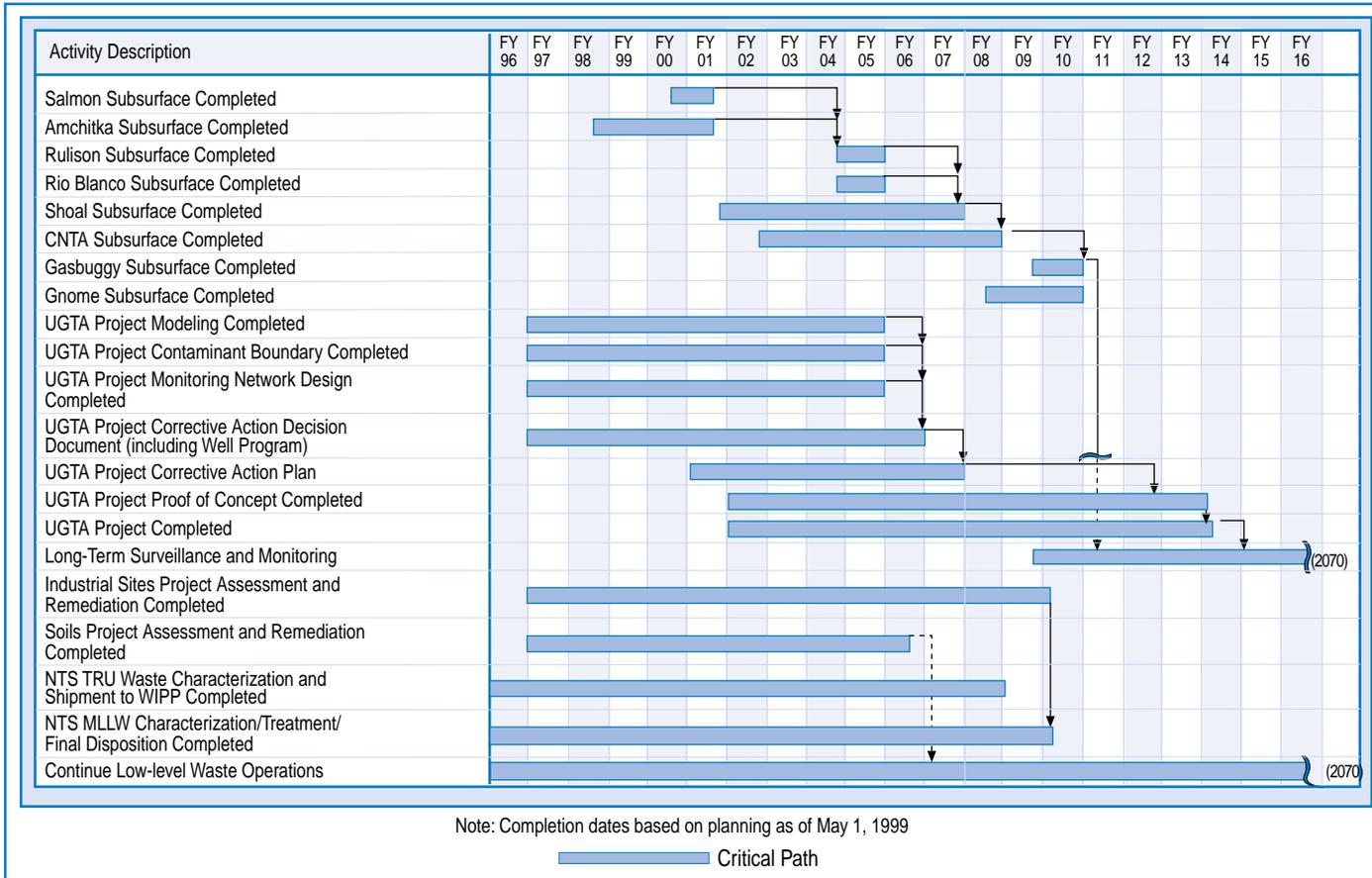


Exhibit C.5-4  
 Nevada Operations Office  
 Critical Closure Path

Exhibit C.5-5  
Nevada Operations Office  
Summary of High Programmatic Risk Milestones

Site	Project, Action, Event	Dates	Programmatic Risk Categories*		
			Technological	Work Scope Definition	Intersite Dependency
Nevada Test Site	Complete Value of Information Analysis (VOIA)	April 1999	3	4	2
	Complete Draft Yucca Flat Value Of Information Analysis Report	April 1999	3	4	2
	Complete Draft Frenchman Flat Model Report	April 1999	3	4	4
	Complete Installation Of Six Characterization Wells	September 1999	3	4	2

\*For a discussion of programmatic risk categories, see Appendix D on the Internet site <http://www.em.doe/closure/>.

Exhibit C.5-6  
Summary of High Programmatic Risk Waste Disposition Data  
Nevada Operations Office

Site	Stream Name	Waste Stream Activity Name	Programmatic Risk Categories*		
			Technological	Work Scope Definition	Intersite Dependency
Nevada Test Site	V3XA Spheres	To Be Determined	1	4	1

\*For a discussion of programmatic risk categories, see Appendix D on the Internet site <http://www.em.doe/closure/>.