CHAPTER 7
MITIGATION MEASURES

7.0 MITIGATION MEASURES

Chapter 7 presents the proposed mitigation measures that would be implemented by the U.S. Department of Energy (DOE) to avoid, minimize, rectify, reduce, eliminate, or compensate for potential adverse impacts on the environment (40 *Code of Federal Regulations* [CFR] 1508.20) resulting from any of the three alternatives analyzed in this site-wide environmental impact statement (SWEIS). These proposed mitigation measures are listed by resource category and address specific adverse environmental impacts identified in Chapter 5. Where the potential impacts and mitigation measures vary across the three alternatives, measures specific to each alternative are described. Some of these resource areas include American Indian perspectives prepared by the American Indian Writers Subgroup (AIWS); the AIWS input is in text boxes identified with a Consolidated Group of Tribes and Organizations (CGTO) feather icon.

DOE considers planning and implementation of mitigation measures throughout the environmental analysis process. This SWEIS represents the latest phase of DOE's environmental analysis of activities occurring at the Nevada National Security Site (NNSS) (formerly known as the Nevada Test Site) and other Nevada sites managed by the National Nuclear Security Administration (NNSA). As such, these mitigation measures build on those developed through prior environmental analyses covering the history of the NNSS and NNSA-managed sites in Nevada.

In accordance with DOE regulations (10 CFR 1021.331), DOE will prepare a mitigation action plan for those mitigation commitments made in a future Record of Decision associated with the continued management and operation of the NNSS and other NNSA-managed sites in Nevada. This mitigation action plan will identify specific mitigation measures associated with the alternative selected in the Record of Decision and describe plans for implementing the mitigation measures, monitoring their implementation and effectiveness, and reporting the results of mitigation efforts to DOE management and applicable Federal, state, local, and tribal entities and the public. DOE may revise the mitigation action plan as more-specific and -detailed information regarding the various missions, programs, capabilities, and projects at the NNSS and other offsite locations in Nevada becomes available.

Mitigation Measures—American Indian Perspective

Indian people bring a unique perspective based on our traditional ecological knowledge which guides us on how and where to interact with the earth and its resources. As a means of minimizing impacts to these precious resources, we continuously strive to maintain a delicate balance and sustain its spiritual integrity. According to tribal elders, *"Indian people have the conviction that the ecology of the natural environment is inter-connected. We have been blessed from the beginning of creation as having a unique understanding of being a good steward, and a clear path to care for the land and its resources. The songs, stories, traditions and customs provide the foundation for this conviction. It is like the world is a huge stage and there are many cast members--using their roles to make possible for a successful event."*

With this in mind, the Consolidated Group of Tribes and Organizations (CGTO) is providing the U.S. Department of Energy (DOE) recommendations in Section 7.0 in an effort to avert or minimize impacts. We must emphasize recommendations made by the CGTO do not imply we support the proposed action or alternatives. These are merely our attempt to restore harmony and balance to the resources impacted or potentially impacted by DOE activities using the National Environmental Policy Act (NEPA) process.

In 1996 and 2000, the DOE invited the CGTO to participate in the development of the Nevada Test Site (NTS)/DOE Resource Management Plan (RMP) in an effort to mitigate impacts to resources. The CGTO provided culturally-appropriate resource management strategies for the NTS based on traditional Indian perspectives. The CGTO's long-term objective is to see our existing government-to-government relationship evolve and expand into co-management of the Nevada National Security Site (NNSS) (formally NTS) land and its resources. Therefore, the CGTO believes the continued collaborative development of the RMP is essential to blending elements of two world views. In turn, this promotes implementation of culturally-sensitive strategies for the land, which is mutually beneficial to the DOE and the culturally affiliated tribes. The CGTO understands the RMP is a dynamic, living document that requires periodic evaluation and updates. Accordingly, the CGTO recommends the DOE continue to hold annual tribal update meetings, which should include current and proposed activities at the NNSS, and discussions regarding the RMP, mitigation measures, and their potential implications.

See Appendix C for more details.

7.1 Land Use

No adverse impacts on land use that would require mitigation have been identified at the NNSS or at offsite locations under the No Action, Expanded Operations, or Reduced Operations Alternatives.

Additional projects that are conceptual in nature but are anticipated to be located on the NNSS, such as the development of a commercial solar power generation facility, would be subject to additional National Environmental Policy Act review. These future reviews would require identification of environmental impacts, including land use impacts, as well as formulation of measures to mitigate these impacts to the extent practicable.

No adverse airspace impacts that would require mitigation at any project location have been identified under any of the alternatives.

Land Use—American Indian Perspective

The Consolidated Group of Tribes and Organizations (CGTO) is concerned with the U.S. Department of Energy's (DOE's) plans to continue to restrict access and potentially close areas within the Nevada National Security Site (NNSS). As discussed in earlier environmental impact statement (EIS) sections, the NNSS area is part of the traditional Holy Lands for the Western Shoshone, Southern Paiute and Owens Valley Paiute and Shoshone people. These lands are central in the lives of our people and mutually shared for religious ceremony, resource use, and social events (Stoffle et al., 1990a and b).

Since the early 1990's, DOE has funded representatives of the CGTO to visit portions of the NNSS (formerly NTS). This involvement has allowed tribal representatives to identify places, spiritual trails, and cultural landscapes of traditional and contemporary cultural significance. CGTO remains committed in our assertion that portions of the NNSS must be set aside for traditional and contemporary ceremonial use.

In order to fulfill the Holy Land use expectations, the CGTO also recommends continuing to identify special places, spiritual trails, and landscapes, and setting aside these places for unique and innovative co-stewardship activities and ceremonial access. For example, studies have begun regarding the identification of places, spiritual trails and cultural landscapes in the Timber Mountain Caldera. We strongly encourage DOE to pursue these studies, which, when completed, will add an American Indian cultural component that will broaden the understanding and importance of this National Natural Landmark. The CGTO recommends the Gold Meadows area continue to be set aside for exclusive Indian use because of significant cultural resources. Similarly, the CGTO recommends DOE set aside Water Bottle Canyon, Scrugham Peak, Prow Pass, Timber Mountain, select areas within the Calico Hills and portions of Shoshone Mountain for exclusive Indian use. As such, areas should be made to forego any additional land disturbances within these areas and provide reasonable access for Indian people. The CGTO also recommends tribal visits to areas designated for repatriation such as Pahute Mesa, and periodic assessments conducted to compliance with the Native American Graves Protection and Repatriation Act (NAGPRA).

See Appendix C for more details.

7.2 Infrastructure and Energy

The NNSS would continue to utilize measures for energy and water conservation, including the following:

- Implementing strategies and policies to support energy-efficient commuting and travel
- Identifying, promoting, and implementing water reuse strategies that reduce potable water consumption (Water efficiency practices could include water management planning; system audits; repairs of water leaks; water-efficient landscaping and irrigation; installation of water-efficient [WaterSense™] products, including toilets and urinals, faucets and showerheads, and boiler systems; and other water uses.)
- Increasing diversion of compostable and organic material from waste streams to reduce energy used in disposal

- Managing existing building systems to reduce consumption of energy, water, and materials
- Identifying opportunities to consolidate and dispose existing assets to optimize real property portfolios

7.3 Transportation

Radiological and nonradiological risks to the public would result from overland transport of radioactive and nonradioactive wastes. These risks would be reduced by choosing (to the extent practicable) waste transportation routes that minimize both impacts from potential exposure to radiation during incident-free transport and postulated accidents and the potential for traffic accidents. Other measures to mitigate impacts could include (to the extent practicable) scheduling transports of wastes during periods of lighter traffic volume and training local emergency response personnel.

7.4 Socioeconomics

No adverse impacts are expected over the course of the next 10 years. Therefore, no mitigation measures are proposed.

Socioeconomics—American Indian Perspective

Although the U.S. Department of Energy (DOE) continues to make strides to diversify their workforce, the Consolidated Group of Tribes and Organizations (CGTO) strongly encourages DOE to enhance efforts to hire more Indian people and promote the hiring of Indian-owned businesses to mitigate socioeconomic impacts to our people. To facilitate this effort, the CGTO could serve as a point of contact to assist DOE and its contractors in identifying and promoting employment opportunities for American Indians at the Nevada Site Office and the Nevada National Security Site (NNSS).

See Appendix C for more details.

7.5 Geology and Soils

Impacts related to surface disturbance would be mitigated on a site-specific basis, depending on factors such as the size of the area of disturbance, future use of the site, soil characteristics, annual precipitation, and site slope. Following removal of soils and vegetation, disturbed sites would be stabilized using water or commercially available soil stabilizers, such as polymers. Potential mitigation measures could include planting natural vegetation, gravel re-armoring, chemical stabilization, and seeding. Where intensive revegetation techniques are necessary, subsoils could be amended and irrigation may be used to encourage germination and plant establishment.

Instability of slopes resulting from excavation could be mitigated by shoring, bolting, and grouting.

Where possible, DOE would use areas disturbed by past activities for staging, parking, and equipment storage during construction to minimize erosion.

7.6 Hydrology

During development projects, DOE would use site planning, design, construction, and maintenance strategies to maintain or restore, to the maximum extent technically feasible, the predevelopment hydrology of the property with regard to the temperature, rate, volume, and duration of flow. Such strategies could include use of biological systems and engineered systems such as, but not necessarily limited to, the following:

- Rain gardens, bioretention, and infiltration planters
- Porous pavements
- Vegetated swales and bioswales
- Trees and tree boxes

Geology and Soils—American Indian Perspective

During the evaluation of the *Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada (1996 NTS EIS)*, the Consolidated Group of Tribes and Organizations (CGTO) noted severe disturbances to the geology and soils, or minerals, in large portions of the Nevada National Security Site (NNSS) (formerly the Nevada Test Site [NTS]) stemming from previous testing activities. This seemingly irreparable damage has made certain areas unfit for human use and inaccessible to American Indians who have relied on the earth, soil and minerals for medicine and religious purposes.

In general, the mitigation measures proposed by the U.S. Department of Energy (DOE) for geology and soils include erosion control through stabilization and re-vegetation. The CGTO is concerned about the unnatural erosion control methods proposed by DOE. In particular, the CGTO struggles with activities that require relocating rocks and soil away from where they were originally placed by the Creator and using them contrary to the Creator's intention. Indian people know relocating the soil in a culturally-unacceptable manner can cause adverse impacts to the environment, such as the increased potential for noxious weed growth. This could potentially threaten nearby native vegetation and harm people and wildlife that rely on it for survival.

Therefore, the CGTO recommends DOE implement culturally-appropriate stabilization efforts and re-vegetation techniques based on traditional ecological knowledge. Indian people stabilize our land by offering prayers to explain to the soil why it is being removed, how we intend to use it, and thanking it for its use. We then remove and protect the top soil for future use. We replace the soil with dirt and gravel from nearby land only after once again offering prayers, and re-contour the land out of respect to the visual landscape and unseen song and storyscapes. Indian people re-vegetate our land by determining suitable locations, offering prayers to bless the seeds and plants so they can grow strong. We take great care in placing the seedlings in the direction of the morning sun and give thanks for the opportunity to plant them, and for the water that is used to provide nourishment. Plants must be compatible with their new homes, neighboring plants, animal habitats, and soil composition. We believe a holistic approach helps to sustain balance and protects and restores our ancestral lands.

In the *1996 NTS EIS* and in the 2002 *Supplement Analysis for the Final Environmental Impact Statement for the Nevada Test Site and Off-Site Locations in the State of Nevada (2002 NTS SA)*, the CGTO continued to express concerns about the removal of contaminated soils and the need for religious leaders to conduct balancing ceremonies and healing prayers at these disturbed locations. In particular, the CGTO recommended tribal representatives provide information useful in the re-vegetation of a portion of the Double Tracks site located on the Tonopah Test Range (TTR). The CGTO maintains our involvement is still necessary for the Double Tracks site as well as the Clean Slates site also located on TTR; however, we are awaiting DOE's approval to proceed so we may begin to heal these lands and its resources.

See Appendix C for more details.

- Pocket wetlands
- Reforestation/revegetation using native plants
- Protection and enhancement of riparian buffers and floodplains
- Rainwater harvesting for use (e.g., irrigation; heating, ventilation, and air-conditioning; nonpotable indoor uses)

Surface-water resources could be affected by disposal unit construction or environmental restoration activities that could alter drainage patterns, leading to possible erosion and deposition of sediments and inundation of areas or ponding of water. Impacts of sediment generation could be minimized by limiting exposed surfaces and intercepting runoff from exposed surfaces prior to discharge. Erosion and sediment controls would include use of runoff interceptor trenches or swales, filter or silt berms or fences, sediment barriers or basins, rock-lined ditches or swales, or stormwater drainage structures, as well as timely revegetation of exposed surfaces. Where practicable, NNSA would use areas disturbed by past activities for staging, parking, and equipment storage during construction to minimize erosion.

DOE would delineate a Wellhead Protection Area using site-specific modeling or a standard 1,000-foot radius around all drinking water source wells to protect against the introduction of contaminants. No experiments, construction, placement of facilities, parking, or hazardous material storage would occur in this area. NNSA would also continue to perform detailed hydrographic studies of its water supply system

to ensure that new withdrawals of groundwater would allow sufficient groundwater aquifer recharge for future uses.

DOE would utilize water conservation measures to the maximum extent practicable (for example, efficient landscaping and recycling of wastewater).

When scheduling experiments, DOE would consider weather and ground conditions to minimize certain potential impacts that may be exacerbated by sheet flow during storm events, such as erosion and the spread of contaminants.

Hydrology—American Indian Perspective

When water is respected, it sustains all life forms. Conversely, when water is mistreated, it withdraws life-giving support and returns to the underworld. The Consolidated Group of Tribes and Organizations (CGTO) knows the hydrological systems throughout the Nevada National Security Site (NNSS) have been impacted from drought. Drainage patterns have been unnaturally altered from U.S. Department of Energy (DOE) activities and will continue to be impacted if these proceed. There are places on the NNSS where the rain falls but does not nurture the plants and animals. Therefore, the CGTO must be involved with DOE in mitigating impacts to hydrological resources because if the water is mistreated, it will remove itself from the NNSS.

To minimize some adverse impacts to hydrological resources, the CGTO recommends the DOE allow Indian people access to clean the natural tanks and pohs (natural catchment basins) to bring and gather water from the rain and to nourish the plants and animals that rely on it. The water within these features is central to our ceremonies in restoring balance. By supporting the CGTO in this proposed project, DOE will help reduce drought conditions. In turn, this project will provide spiritual, cultural and ecological benefits to the land and the environment, thereby facilitating our obligation to sustain the spiritual and ecological balance. Implementation will require cultural experts to identify sites, inventory and evaluate site resources and conditions, and to implement culturally-appropriate mitigation measures.

See Appendix C for more details.

7.7 Biological Resources

In February 2009, the U.S. Fish and Wildlife Service (USFWS) issued a programmatic Biological Opinion (Opinion) to the National Nuclear Security Administration Nevada Site Office (NNSA/NSO) that authorized the incidental "take" (accidental killing, injury, harassment, etc.) of desert tortoises that may occur during NNSS activities. Before implementing any new activity in desert tortoise habitat, NNSA provides specified information and consults with USFWS to determine if the anticipated incidental take for each action, at the project level, complies with the Opinion. The Opinion concluded that activities anticipated to occur on the NNSS would not jeopardize the continued existence of the Mojave population of desert tortoises and that no critical habitat would be destroyed or adversely modified. NNSS activities occurring within the range of the desert tortoise must comply with the terms and conditions outlined in the Opinion, as shown in Table 5–27 in Chapter 5, Section 5.1.7. The 2009 Opinion also states that, if the level of incidental take is reached and anticipated to be exceeded during the course of actions, such an incidental take would represent new information requiring reinitiation of consultation and review of the reasonable and prudent measures in the Opinion. If a proposed activity or group of activities would result in an exceedance of the parameters of the Opinion, NNSA would consult with USFWS, in accordance with Section 7 of the Endangered Species Act.

The NNSA/NSO Desert Tortoise Compliance Program was developed in 1992, with the issuance by USFWS of the first Biological Opinion for the NNSS. The Desert Tortoise Compliance Program serves to implement the terms and conditions of the most current version of the Biological Opinion for the NNSS, to document compliance actions taken, and to assist NNSA/NSO with USFWS consultations. Some of the activities of the Desert Tortoise Compliance Program include (1) reviewing proposed activities at the NNSS to determine if they may be located in tortoise habitat and if clearance surveys and/or monitoring is required (2) conducting clearance surveys at project sites within 1 day of the start of project construction, (3) ensuring that environmental monitors are on site during heavy equipment operations, (4) developing training modules and ensuring that all personnel working on the NNSS are trained in the requirements of the Opinion, and (5) preparing annual compliance reports for submittal to

USFWS. By implementing the Desert Tortoise Compliance Program, NNSA/NSO would ensure that most if not all impacts on desert tortoises addressed in this analysis would involve harassment, rather than injury or mortality.

In addition to the Desert Tortoise Compliance Program, NNSA/NSO conducts a comprehensive program to monitor and protect sensitive plant and animal species and other biological resources on the NNSS, including the following:

- Biological surveys are performed at project sites where land-disturbing activities are proposed. The goal is to minimize adverse effects of land disturbance on sensitive and protected/regulated plant and animal species, their associated habitat, and other important biological resources. Survey reports document species and resources found and provide mitigation recommendations.
- Beginning in 2004, in compliance with DOE Order 450.1A, Environmental Protection Program, NNSA/NSO began annual surveys each spring to assess wildland fire hazards on the NNSS. NNSS ecologists conduct these wildland fire surveys in coordination with NNSS Fire and Rescue.
- Under the NNSS Sensitive Plant Monitoring Program, the status or ranking of sensitive plant species known to occur on the NNSS is evaluated annually to ensure such plants are afforded the appropriate protection under Federal and state laws. Sensitive plant species populations on the NNSS are routinely monitored to assess plant density, plant vigor, or identify any threats or impacts to the species.
- As part of the Sensitive and Protected/Regulated Animal Monitoring Program to ensure such animal species are afforded the appropriate protection under Federal and state laws, NNSA/NSO currently monitors 18 animal species on the NNSS. State and Federal lists of sensitive and protected/regulated animal species are reviewed annually to update the list of animal species that are included in this program.
- Additional monitoring is conducted for such things as natural wetlands to characterize seasonal baselines and trends in physical and biological parameters; West Nile virus to help the Southern Nevada Health District ascertain the presence and/or prevalence of the virus in the NNSS mosquito population; and constructed water sources to assess their use by wildlife and to develop and implement mitigation measures to prevent them from causing significant harm to wildlife.
- The Habitat Restoration Program involves the revegetation of disturbed land and evaluation of previous revegetation efforts. These activities are conducted at both the NNSS and the Tonopah Test Range (TTR).
- An Ecological Monitoring and Compliance Program Report is published each year documenting the previous year's activities and accomplishments in all of the above noted areas.

These activities are all elements of NNSA/NSO's program to ensure compliance with DOE Order 450.1A, Environmental Protection Program, and all applicable statutes, and regulations.

At TTR NNSA's Sandia Site Office (SSO) has an ecology program that serves to conserve flora and fauna (NNSA/SSO 2010). The primary objectives of the Ecology Program include:

- Collect ecological resource inventory data to support site activities, while preserving ecological resources, and maintaining regulatory compliance
- Collect information on plant and animal species present to further the understanding of ecological resources on site

- Collect biota contaminant data on an as needed basis in support of site projects and regulatory compliance
- Assist Sandia organizations comply with regulations and laws
- Provide information to employees regarding ecological resource conservation
- Support Sandia line organizations with biological surveys in support of site activities

Enhancement measures that have been utilized in the past include installing artificial nest platforms, boxes and perches.

In 2010, an Avian Protection Plan was adopted and implemented at TTR (Lacy 2011). The Avian Protection Plan was developed to describe procedures that would be taken by NNSA at TTR to address potential impacts from its associated transmission and distribution lines to avian species that are known to occur in the area (NNSA/SSO 2010).

In August 2010, NNSA/SSO completed retrofitting four electrical transmission/distribution structures to reduce the risk of electrocution of larger birds, particularly raptors. The retrofitting included new insulator caps, the re-routing of and insulation of jumpers and insulation of grounding wires.

In the future, new construction and refurbishments at TTR would use of raptor safe pole design and wire configuration to help reduce avian mortality. Regular surveys along the power lines will be conducted. Monitoring would be increased for any structures or lines segments that have any avian issues. If the need for any type of mortality reduction measures are identify they will be fully developed in cooperation with state and Federal agencies.

Bird mortality incidents reported as a result of power outages or through incidental observations will be reviewed immediately. If the cause is related to an unprotected power pole or conductor issue, a mortality reduction action (i.e., retrofitting poles, installing protective coverings or installation of perch deterrents diverters) will be implemented accordingly, consistent with standard practices recommended by the Avian Power Line Interaction Committee (APLIC 2006).

When a nest is detected in or around electrical transmission/distribution facilities, a risk assessment will be conducted to determine if nest removal or relocation is needed. If it is determined that the nest poses no risk to system function, maintenance procedures, or to the birds, the nest would be allowed to remain. If it is determined that the nest poses a potential risk, then a further assessment will be conducted to determine if the risk is imminent or not imminent. TTR will coordinate with the USFWS to determine whether the nest would need to be removed and discarded or relocated to an alternative location.

Unless there is an immediate threat to birds or system function, nest removal or relocation (excluding eagles and state or federally listed species) would occur only during the non-breeding season when the nest is not being used or during the breeding season if the nest is unoccupied. If removal or relocation of an eagle or state or federally listed species nest is necessary, TTR would coordinate with the USFWS regarding permitting and authorization pursuant to applicable regulations. Nest removal or relocation would occur when the nest is occupied only in cases where it is deemed warranted based on the risk to system function or electrocution risk of the birds. Removal or relocation of an occupied nest would require coordination and permitting/authorization with the USFWS and/or Nevada Department of Wildlife.

Biological Resources—American Indian Perspective

The mitigation measures presented by the U.S. Department of Energy (DOE) in Section 7.7 focus on avoidance of biological resources, relocation of animals species and monitoring plants, animals, and their habitats. The Consolidated Group of Tribes and Organizations (CGTO) recommends DOE mitigate adverse impacts to biological resources through avoidance, culturally-appropriate re-vegetation efforts, reintroduction of native animals, and traditional plant and animal management methods. Indian people have extensive traditional ecological knowledge and deep concern for the biological resources of the area and should participate directly with DOE to mitigate impacts and protect their resources.

According to tribal elders, *"Prior to re-vegetation efforts, we talk to the land to let it know what we plan to do and ask the Creator for help. We choose our seeds from the sweetest and best plants and store them for the winter to dry. When the winter is over, we place the seeds in a moist towel or sock until they are ready to transplant into the ground. This is a long and delicate process, requiring patience, skill and knowledge passed down from our ancestors. If the plants are struggling to grow, we tag them and move them to face the same direction of the sun."*

The DOE would benefit from this knowledge to enhance their re-vegetation efforts. The CGTO knows DOE struggles with success rates regarding the density and diversity of native plants during re-vegetation efforts. A co-stewardship approach with us would enable DOE to enhance their re-vegetation efforts, thus saving time, money and resources.

Part of the mitigation measures presented by DOE in this section includes notifying the U.S. Fish and Wildlife Service (FWS) of incidental taking of desert tortoises. The desert tortoise is culturally significant to Indian people because of its healing powers, longevity and wisdom. It is integral to our traditional winter stories, well-being and perpetuation of our native culture. Incidental taking of this traditionally-important animal is particularly disturbing to native people. Accordingly, the CGTO must be notified concurrently with the FWS to prepare our people and the environment of this loss.

Over the past 14 years, various initiatives have been undertaken to restore animal habitats and reintroduce certain animals such as the desert big horn sheep near the southern portions of the Nevada National Security Site (NNSS) without participation from the CGTO. Modification of habitat or the restocking of animals is considered a highly sensitive religious act and requires participation from Indian people. For these activities to be successful, it is essential to have tribal representatives involved throughout this process.

See Appendix C for more details.

7.8 Air Quality and Climate

To reduce emissions from mobile sources, NNSA would provide further incentives for the NNSS commuter program to encourage more employees to travel by bus to the NNSS, rather than by privately owned vehicles.

NNSA would extend the Conservation and Renewable Energy Program to activities beyond 2015 and continue improving energy efficiency measures in new and existing buildings through at least 2020. To reduce dependence on energy generated from fossil fuels, NNSA would pursue using at least a portion of the electricity generated from the solar power projects proposed under all of the alternatives.

Waste management, facility decommissioning, and environmental restoration activities have the potential to release radioactive constituents and nonradioactive pollutants from suspension of particulates from soil, operation of heavy equipment, evaporation of tritium, and treatment of explosive waste. The release of these pollutants would be controlled by compliance with DOE and external regulatory requirements, and pursuing site closure in place when appropriate.

Emissions from construction equipment would be minimized through activities such as properly maintaining the equipment, applying diesel engine refit technology as practicable (e.g., catalytic particulate filters), and limiting unnecessary equipment idling times. To reduce diesel particulate matter, DOE would require the use of U.S. Environmental Protection Agency (EPA) Tier 4 certified diesel engine construction equipment. During a transition period to EPA Tier 4 equipment, DOE would require that equipment meets the EPA Tier 3 standards. Other measures to reduce diesel particulate emissions would

include using construction equipment that runs on compressed natural gas as well as some smaller construction equipment with electric engines.

Release of dust and particulates to air would be controlled using standard best management practices, including watering and/or using surfactants to control dust emissions, revegetating exposed areas, watering roadways, and minimizing activities under windy conditions. Work could also be performed under containment structures, as needed.

7.9 Visual Resources

Recent studies have shown that painting structures one to two shades darker than the color of the general surrounding area reduces the visual impact of the structure compared with painting it a matching or lighter hue (BLM 2008a). Therefore, new structures would be painted accordingly. In addition, shotcrete[1] structures would implement integral color, in the same nature, to reduce visibility. Colors would be chosen from the U.S. Bureau of Land Management Standard Environmental Colors Chart CC-001: June 2008. Because color selection would vary by location, color panels would be evaluated from key observation points during common lighting conditions (front and back lighting) to aid in the appropriate color selection. Panels would be a minimum of 3 feet by 2 feet in dimension and would be evaluated from various distances to ensure the best possible color selection.

All paints used for the color panels and structures would be color-matched directly from the physical color chart, not digital or color-reproduced versions of the color chart. Paints would have a dull, flat, or satin finish only. Appropriate paint types would be selected for the finished structures to ensure long-term durability of the painted surfaces. The paint color would be maintained over time.

Mitigation Measure 1: Apply Minimum Lighting Standards. Lights will be installed at the lowest practicable height, and the lowest practicable wattage will be used. Lights will be screened and directed downward, away from the night sky, to the highest degree possible. The number of nighttime lights will be minimized to the highest degree possible.

Visual Resources—American Indian Perspective

All landforms within the Nevada National Security Site (NNSS) have high sensitivity levels for American Indians. The ability for us to see the land without the distraction of buildings, towers, cables, roads and other objects is critical to establishing the spiritual connection between Indian people and our traditional lands. We rely on unobstructed views, as we share our songs and stores. These activities help us reaffirm the importance of the land and the tie to American Indian ceremonialism that is necessary for our cultural survival.

The Consolidated Group of Tribes and Organizations (CGTO) knows that many of the activities described under the proposed action and alternatives, such as those associated with facility construction and environmental restoration, will adversely impact visual resources. For Indian people, the adverse impact to visual resources will most certainly impact the spiritual harmony of the environment as a whole. Facility construction and operation will impede visual resources and affect the solitude and cultural integrity of the land.

Although the U.S. Department of Energy (DOE) proposes to mitigate visual resource impacts by painting structures to reduce visibility, the CGTO knows additional mitigation measures are necessary. The CGTO recommends that landscape modifications, including those associated with environmental restoration activities, be done in consultation with tribal representatives. Specifically, DOE should make provisions for Indian people to participate in annual monitoring of land disturbing activities through the duration of the project. The CGTO should also participate in restoring the land, and concealing infrastructure using traditional Indian re-vegetation methods (See American Indian Perspective for Section 7.7, Biological Resources). Finally, the CGTO recommends that DOE make provisions for Indian people to conduct ceremonies and offer prayers and songs in an effort to re-balance this adversely impacted resource.

See Appendix C for more details.

[1] *Shotcrete is concrete projected through a hose at high speeds onto a surface.*

7.10 Cultural Resources

NNSA/NSO is committed to ensuring that the Cultural Resources Management program for the NNSS meets the requirements of Federal mandates, addresses the concerns of external groups, minimizes adverse impacts on cultural resources, and integrates historic preservation into routine management and project-specific compliance activities. At all times the NNSS Cultural Resources Management program attempts to combine preservation and mitigation strategies to meet the needs of the NNSA/NSO mission. As part of this commitment and as part of compliance with Section 106 of the National Historic Preservation Act, NNSA/NSO conducts cultural resource surveys and identifies cultural resources within the area of potential effect for all proposed projects and activities (undertakings) that may affect cultural resources. If possible, NNSA/NSO avoids significant cultural resources impacts by adjusting the location of a proposed undertaking. When avoidance is not practicable, NNSA/NSO consults with the Nevada State Historic Preservation Officer, and possibly the Advisory Council on Historic Preservation, to identify measures to mitigate adverse impacts on those resources.

Under all of the alternatives, projects and activities would have the potential for adverse impacts on cultural resources. Several strategies for mitigating adverse impacts on cultural resources could be employed. For archaeological resources, these strategies would consist of avoidance, evaluation and data recovery, and monitoring. For structure-related (also known as built environment) resources, strategies would consist of avoidance, evaluation and archival documentation, and monitoring. The *Cultural Resources Management Plan for the Nevada Test Site* (DOE 2010a) provides cultural resources compliance guidance to NNSA/NSO, its contractors, and other users of the NNSS. Under Federal regulations, a significant cultural resource, designated as a "historic property," warrants consideration with regard to potential adverse impacts resulting from proposed Federal actions (DOE 2002e). The descriptions of mitigation measures below summarize those actions described in the Cultural Resources Management Plan.

Mitigation Measure 1: Avoidance of Significant Cultural Resources. When specific project information becomes available, it may be possible to avoid impacts on cultural resources through project design. For archaeological resources, prior to determining whether avoidance is feasible, it may be necessary to conduct test excavations to determine the vertical and horizontal extent of the resource. Once avoidance can be assured, resource location information would be delineated on project plans or sensitive areas would be fenced off prior to project implementation as areas to be avoided and periodically monitored. If, during the project, avoidance is determined to be infeasible, the processes outlined in Mitigation Measure 2 (for archaeological resources) and Mitigation Measure 3 (for built environment resources, i.e., buildings, structures, engineered features, etc.) would be followed, as applicable.

Mitigation Measure 2: Evaluation and Data Recovery of Significant Archaeological Resources. It is presumed that it would not be possible to avoid all cultural resources within the various areas of program implementation. Resources that cannot be avoided would be subject to test excavations to determine their significance and, if determined to be significant, would be subject to data recovery. The process that would be followed to determine resource significance and conduct data recovery would be developed in a Historic Properties Treatment Plan. All archaeological work on properties eligible for listing in the National Register of Historic Places would be conducted in accordance with *Treatment of Archaeological Properties: A Handbook* (ACHP 1980), the Advisory Council on Historic Preservation's *Archaeology Guidance* (ACHP 2009), and *Archaeology and Historic Preservation: the Secretary of the Interior's Standards and Guidelines* (*Standards and Guidelines*) (NPS 1983). Investigations would be performed under the supervision of professionals whose education and experience meet or exceed the Secretary of the Interior's professional qualifications standards, as described in the *Standards and Guidelines* (NPS 1983).

Mitigation Measure 3: Archival Documentation of Significant Built Environment Resources. If project implementation requires removal of a built environment resource (e.g., buildings, structures, engineered features), Historic American Building Survey/Historic American Engineering Record (HABS/HAER) documentation would be completed. DOE/NNSA would contact the Nevada State Historic Preservation Officer to determine the level and kind of HABS/HAER documentation that would be required for the resource. DOE/NNSA would ensure that the required documentation is completed and accepted by HABS/HAER before the resource is deconstructed.

Mitigation Measure 4: Monitoring of Significant Archaeological Resources. Portions of the area of potential effects have been determined to have the potential for buried archaeological resources. During project implementation, archaeological monitoring would be conducted within these areas. Any unanticipated resources identified during monitoring would be evaluated and treated in accordance with Mitigation Measures 1 and 2. If human remains were discovered during monitoring, the regulatory requirements described in Mitigation Measure 6 would be followed.

Mitigation Measure 5: Monitoring of Significant Built Environment Resources. Significant built environment resources would be periodically monitored to ensure protection of the resources. If unexpected effects on significant built environment resources were identified, provisions for protection, stabilization, or mitigation would be made in consultation with the Nevada State Historic Preservation Officer.

Mitigation Measure 6: Discovery of Human Remains. Should human remains be discovered during project implementation, NNSA would follow the requirements of the Native American Graves Protection and Repatriation Act and other applicable Federal laws.

Cultural Resources—American Indian Perspective

The Consolidated Group of Tribes and Organizations (CGTO) understands the mitigation measures proposed by the U.S. Department of Energy (DOE) in this site-wide environmental impact statement (SWEIS) include avoidance, evaluation and data recovery, and monitoring, as described further under Mitigation Measures 1 through 6 of the Nevada Test Site (NTS) Cultural Resource Management Plan (Drollinger and Beck 2010). Accordingly, the CGTO must be an integral part of these mitigation measures so impacts on American Indian cultural resources can be minimized or averted. American Indian people know the Nevada National Security Site (NNSS) landscape in great depth and can help DOE identify and protect traditional-use plants, animals, geography, archaeological sites, and traditional cultural properties that have been or may be adversely impacted by NNSS programs and activities.

The CGTO recommends DOE make provisions for Indian people to continue to identify culturally significant locations so potentially impacted resources can be identified, alternative solutions discussed, and adverse impacts averted. These studies will address and guide DOE in developing culturally-appropriate Best Management Practices to protect cultural resources and more effectively implement Mitigations Measures 1 through 6. To accomplish this, Indian people must be involved with the following actions:

- Assess and determine culturally-appropriate measures to protect geological formations important to the spiritual landscape.
- Implement culturally-appropriate environmental restoration techniques that require minimal ground disturbance.
- Restore impacted plant and animal species essential to the spiritual and cultural landscape.
- Provide American Indian people access to CGTO designated areas so we can conduct purification and balancing ceremonies in an attempt to restore the natural and spiritual harmony of the NNSS landscape.
- Complete Traditional Cultural Property (TCP) Nomination process previously recommended by the CGTO in 2009 for Shoshone Mountain and initiated for Water Bottle Canyon.
- Complete the Indian History Project report prepared collaboratively with DOE, the U.S. Department of Defense (DOD) and CGTO in 2001.
- Develop and implement systematic American Indian ethnographic studies to better understand the interconnectedness of the cultural landscape, and implement culturally-appropriate methods to protect the landscape and sustain spiritual and cultural balance.
- Complete the re-vegetation efforts for the restoration of Clean Slates dating back to 1996.

In addition, the CGTO recommends Gold Meadows continue to be set aside for exclusive Indian use because of significant cultural resources. Similarly, the CGTO recommends DOE set aside Water Bottle Canyon, Scrugham Peak, Prow Pass, Timber Mountain, and select areas within Calico Hills and Shoshone Mountain for exclusive Indian use. Efforts should be made to forego any additional land disturbances within these areas and provide access to Indian people.

The CGTO agrees with the mitigation measures proposed by DOE in this SWEIS regarding site monitoring, and recommends Indian people serve as site monitors. As a minimum, the CGTO recommends annual tribal visits to monitor the condition of cultural sites located within the NNSS and off-site locations to offer appropriate. The CGTO further recommends visits to areas designated or potentially designated for repatriation such as Pahute Mesa. Finally, we recommend Indian people conduct periodic assessments in accordance with the Native American Graves Protection and Repatriation Act (NAGPRA) and other federal mandates.

See Appendix C for more details.

7.11 Waste Management

Waste management activities at the NNSS would result in the permanent commitment of land for disposal of radioactive and nonradioactive waste. This land commitment would be reduced through continuation of the DOE Waste Minimization and Pollution Prevention Program, which reduces the quantity of waste generated each year and enhances the recycle or reuse of waste or excess materials, resulting in less waste that requires disposal each year. Land commitment would also be reduced by restricting waste disposal to approved, designated areas.

Waste Management—American Indian Perspective

We continue to strongly oppose the transportation, storage and disposal of radioactive waste at the Nevada National Security Site (NNSS); however, Indian people must continue to fulfill our birth-rite obligation to care for our Holy Land and do what we can to try to restore balance to Area 5 and other contaminated locations. The Consolidated Group of Tribes and Organizations (CGTO) recommends U.S. Department of Energy (DOE) allocate funds and resources for Indian people to conduct systematic ethnographic studies of these waste management programs. If DOE selects the expanded use alternative, the CGTO must conduct a cultural assessment of the Area 3 Radioactive Waste Management Site (RWMS) prior to new use to mitigate potential impacts.

The CGTO supports DOE's intention to minimize waste within the NNSS area. We encourage the DOE to partner with us to develop and participate in DOE's waste minimization and pollution prevention programs. In particular, the waste minimization efforts described in the SWEIS regarding land commitments must include members of the CGTO to ensure that cultural implications of these decisions are considered prior to implementation.

Finally, the CGTO struggles with the ethics of transporting and relocating radioactive waste from other American Indian lands so those people can live without fear of unnatural radioactivity. We are greatly concerned about the adverse spiritual, environmental, and health impacts associated with relocating these angry rocks from their current locations to our Holy Land. We believe transporting these to our land perpetuates animosity and discord among tribal governments and disproportionately impacts the natural balance of the area. Because these decisions adversely impact our land and our relationships with other tribal governments, the CGTO recommends DOE host a break-out session for culturally-affiliated tribes associated with the NNSS and the multi-state waste generator facilities during DOE's Annual Waste Generator Conference. These efforts will facilitate further discussion, understanding, and develop culturally-appropriate mitigation measures.

See Appendix C for more details.

7.12 Human Health

Impacts on the health and safety of workers would be minimized by continued implementation of formal radiation protection and chemical hazards management programs in compliance with DOE radiation protection and occupational safety and health requirements. Among other measures, DOE has implemented an Integrated Safety Management System that integrates environment, safety, and health management programs at DOE sites. The use of an Integrated Safety Management System helps ensure that (1) all levels of program organizations are accountable for environmental protection; (2) all projects are planned with environment, safety, and health concerns in mind; and (3) continuous improvements in program implementation occur.

Radiation protection mitigation measures would include formal analysis of proposed work in a radiological environment by workers, supervisors, and radiation protection personnel and identification of methods to reduce worker exposures to levels as low as reasonably achievable, e.g., use of personal protection equipment, shielding, time management in radiation areas, and training, as well as distribution of the workload across a larger number of workers.

Mitigation measures to protect workers from physical hazards would involve safety reviews of planned activities and implementation of safety measures, including bracing and stabilizing buildings and excavations, wearing personal protective equipment, and conducting safety monitoring and inspections.

Mitigation measures to protect workers from hazardous or toxic materials include training, monitoring, use of personal protective equipment, administrative controls, and compliance with the NNSS Hazardous Materials Control and Management Program. Among other things, this program subjects the purchase of chemicals to a review process to ensure that toxic chemicals and products are not purchased when less-hazardous substitutes are available. The Chronic Beryllium Disease Prevention Program established at the NNSS and other DOE sites reduces the number of workers potentially exposed to beryllium while at work, minimizes the levels of and potential for exposure to beryllium, and maintains a medical surveillance program for early detection of disease.

Very small impacts on members of the public could result from release of radioactive materials to air, particularly from environmental restoration activities, or from release of other airborne pollutants from activities such as heavy equipment operation. These impacts would be minimized by continued compliance with applicable DOE, other Federal, and state requirements (e.g., requirements implemented under the Atomic Energy and Clean Air Acts). Impacts on the public from releases of radioactive and nonradioactive pollutants to air would be reduced via control measures such as using water or surfactants to reduce suspension of contaminated particulates and continuing environmental monitoring programs that track releases, impacts, and trends and publish their results.

7.13 Environmental Justice

Although no environmental justice impacts have been identified in this SWEIS, NNSA would continue the following activities to avoid disproportionate impacts on low-income and minority populations:

- Expand opportunities for low-income and minority communities to provide input within the public involvement process by seeking the constructive involvement of affected stakeholders.

- Encourage the participation of the Consolidated Group of Tribes and Organizations in DOE-sponsored cultural resources investigations, including those associated with ground-disturbing activities such as environmental restoration.

- Encourage Consolidated Group of Tribes and Organizations participation when developing educational programs, so that students and researchers receive proper guidance regarding how to interact with the physical environment and cultural landscape.

7.14 Environmental Management Systems

Nevada Site Office Environmental Management System – NNSA/NSO conducts activities at its facilities in Nevada in a manner that ensures protection of the environment, the worker, and the public. This is accomplished through the implementation of an Environmental Management System. An Environmental Management System is a business management practice that incorporates concern for environmental performance throughout an organization, with the ultimate goal being continual reduction of the organization's impact on the environment. An Environmental Management System ensures that environmental issues are systematically identified, controlled, and monitored, and it provides mechanisms for responding to changing environmental conditions and requirements, reporting on environmental performance, and reinforcing continual improvement. The NNSA/NSO Environmental Management System incorporates environmental stewardship goals that are identified in the Federal Environmental Management System directives applicable to all DOE and NNSA sites.

Based on independent evaluation of the NNSA/NSO Environmental Management System, certification was maintained for 2009 and 2010. The Environmental Policy underlying the Environmental Management System contains the following key goals and commitments:

- Protect environmental quality and human welfare by implementing Environmental Management System practices
- Identify and comply with all applicable DOE orders and Federal, state, and local environmental laws and regulations
- Identify and mitigate environmental aspects early in project planning
- Establish environmental objectives, targets, and performance measures
- Collaborate with employees, customers, subcontractors, and key suppliers on sustainable development and pollution prevention efforts
- Communicate and instill an organizational commitment to environmental excellence through processes of continual improvement.

NNSA/NSO operations are evaluated to determine whether they have an environmental aspect and to implement the Environmental Management System to minimize or eliminate any potential impacts. Operations are evaluated by performing Hazard Assessments, preparing Health and Safety Plans and Execution Plans, and preparing and reviewing National Environmental Policy Act documents. All of these documents require that mitigation actions be identified to minimize the risk of adverse impacts.

NNSA/NSO operations are reviewed annually to determine what Environmental Management System objectives and targets will be implemented to address specific environmental aspects.