

Nevada National Security Site Industrial Sites Project Closeout – 12498

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ABSTRACT

The U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office is responsible for environmental restoration (ER) at the Nevada National Security Site (NNSS). This includes remediation at Industrial Sites where past nuclear testing activities and activities that supported nuclear testing may have or are known to have resulted in the release of contaminants into the environment. Industrial Sites at the NNSS have included nuclear facilities that supported the nuclear rocket/missile development programs, gas stations, landfills, spill sites, ordnance sites, and numerous other waste disposal and release sites. The NNSS Industrial Sites activities neared completion at the end of fiscal year 2011 while other activities required under the *Federal Facility Agreement and Consent Order* (FFACO) and part of the same NNSS ER Project are forecasted to extend to 2027 or beyond. With the majority of Industrial Sites corrective action units (CAUs) completed (more than 250 CAUs and over 1,800 corrective action sites), it was determined that an activity closeout process should be implemented to ensure that the work completed over the past 15 years is well documented in a comprehensive and concise summary. While the process used to close each individual CAU is described in approved documents, no single document describes in summary fashion the work completed to close the many individual Industrial Sites. The activity closeout process will be used to develop an Industrial Sites closeout document that describes these years of work. This document will summarize the number of Industrial Sites closed under the FFACO and provide general descriptions of projects, contaminants removed, and sites closed in place with corresponding Use Restrictions. Other pertinent information related to Industrial Sites work such as the project history, closure decisions, historical declarations, remediation strategies, and final CAU status will be included in the closeout document, along with a table listing each CAU and corresponding corrective action sites within each CAU. Using this process of conducting the activity closeout and developing a closeout document may prove useful for other ER projects within the DOE complex in describing how a long period of ER can be summarized in a single document.

INTRODUCTION

The Nevada National Security Site (NNSS), formerly the Nevada Test Site, is the nation's continental nuclear weapons testing site. In operation since 1951, more than 900 nuclear weapons tests were conducted at the NNSS until detonations were suspended in 1992. To assess and remediate the effects of over 40 years of nuclear weapons testing and other nuclear experiments at the NNSS, a project for environmental restoration (ER) was developed. This ER Project is implemented by the U.S. Department of Energy (DOE), National Nuclear Security Administration Nevada Site Office (NNSA/NSO). Oversight of this work is provided by the Nevada Division of Environmental Protection (NDEP) as the state agency with regulatory authority over the ER Project. Together, NNSA/NSO and NDEP along with the U.S. Department of Defense have developed the *Federal Facility Agreement and Consent Order* (FFACO) to set requirements, expectations, and a schedule for ER activities [1].

The FFACO process defines a corrective action site (CAS) as a release site potentially requiring corrective action and provides for the grouping of CASs into corrective action units (CAUs). This process provides structure to the remediation program at the NNSS so that investigation parameters, schedules, and defined scope of work can be established for each CAS. The FFACO was developed and signed by NDEP and NNSA/NSO in April 1996, and work has been ongoing since that time to conduct ER activities at the NNSS.

One of the three distinct activities defined to conduct this ER work is Industrial Sites, which provides a method of grouping similar CAUs based on the type of investigation and remediation required. Work within the Industrial Sites activity has been under way since before the development and signing of the FFACO. During fiscal year (FY) 2011, nearly all of the Industrial Sites scope has been accomplished. As of September 2011, 261 of the total 266 Industrial Sites CAUs have been completed and closed, and three of the remaining five CAUs will be closed in FY 2012.

With the completion of the majority of this work, a decision was made to initiate the activity closeout for Industrial Sites in FY 2012. Closeout of the entire ER Project at the NNSS is not likely to occur until at least the year 2027, as the other FFACO activities (Soils, and Underground Test Area [UGTA] or groundwater) are still ongoing. However, for several reasons, it will be beneficial to document the closeout of the Industrial Sites activities now, as the work is finalized, rather than waiting for the completion of the Soils and UGTA activities.

Ensuring that the commitments to the FFACO have been met is a primary consideration of NNSA/NSO in performing work and conducting an Industrial Sites activity closeout. This includes verifying for each of the identified CASs that documentation clearly identifies (1) the actions taken, (2) the closure decisions, (3) any remaining commitments to ongoing inspection where contamination was left in place, and (4) NDEP acceptance of the actions. The subsequent summary document produced during the project closeout will describe these commitments and help meet the goal of FFACO compliance.

The following discussion describes the Industrial Sites activities, details reasons for the closeout, and defines the process of conducting the Industrial Sites activity closeout.

INDUSTRIAL SITES ACTIVITY

During nuclear weapons testing at the NNSS, many facilities and systems were constructed and used in nuclear testing and support activities, and many waste disposal sites and release sites were generated as a result of testing. Figures 1 through 4 show typical facilities and areas at the NNSS that were identified as Industrial Sites.



Fig 1. NNSS CAU 116 Area 25 Test Cell C Facility – remediated under Industrial Sites.



Fig 2. NNSS CAU 547 internally contaminated piping – ongoing Industrial Sites activity.



Fig 3. NNS CAU 561 Area 5 debris pile – investigated and closed under Industrial Sites.



Fig 4. NNS CAU 117 Pluto Facility – undergoing Industrial Sites demolition.

Many of these facilities and areas were abandoned after testing was completed, and the remediation of radiological and/or chemical contamination was not addressed. The FFACO was developed to ensure proper investigation and remediation of these facilities. A survey of the

NNSS in the mid-1990s resulted in the identification of more than 1,000 sites that required investigation. These consisted of structures, debris, and soils where the level of contamination was unknown, but where clearly some type of testing or support activities had been conducted and the release of contamination to the environment was suspected. These sites were defined as CASs and grouped into CAUs. A total of 266 Industrial Sites CAUs comprising 1,858 CASs were defined and documented in the FFAO.

The task of investigating and remediating these sites was performed under a very prescriptive process. The review of the closure process for each CAU was conducted by NDEP during defined phases of the closure. The NNSA/NSO and NDEP worked very closely during the 15-year effort to ensure that closures were conducted properly, documented in a prescribed manner, and approved by NDEP at completion.

The investigation process began with an historical review of the work that was conducted at each CAS within the CAU. This included a review of available documentation, site visits, and interviews with personnel who worked at the locations if available. These data were compiled into a preliminary assessment document that formed the basis for the characterization to be conducted.

An investigation document was then developed that defined the investigation objectives, the type of sampling to be conducted, the locations of the sampling, and the types of analysis to be performed. Sampling and analysis typically involved investigation for radionuclides and chemical constituents, but other potential contaminants (e.g. asbestos, sanitary debris) also could be identified. Consideration was given to avoid disturbing items present at the sites that might be of cultural or historical significance. Once the characterization parameters were documented and agreed upon, typically in a Corrective Action Investigation Plan, fieldwork began.

Fieldwork had to be conducted in a manner that was compliant with Integrated Safety Management and Radiological Control Manual requirements. This meant that Work Plans, Health and Safety Plans, Radiological Work Permits, and other necessary documents had to be developed and approved. Fieldwork was then conducted at each of the CASs within the CAU, and results of the effort were documented. The results, along with remediation decisions, were identified in a Corrective Action Decision Document.

If the investigation determined that no further corrective action was required, the site was closed as is with no restrictions. If the site was found to be contaminated but no cleanup was required due the location of the site, size of the cleanup effort, or extent of the contamination, a Use Restriction was implemented that resulted in restricting the site to certain activities in the future.

When remediation was required, a Correction Action Plan was developed for the cleanup. The Correction Action Plan defined the extent of the cleanup, waste management activities, verification sampling, and any final site restoration activities.

As this process was completed, a Closure Report was drafted to summarize the characterization, remediation, final site status, and establishment of any Use Restrictions. The Closure Report also documented any deviations made to approved documents that were implemented during the remediation. The Closure Report was submitted to NDEP for review, and closure of the CAU was considered final only when the Closure Report was approved and documented in an approval letter.

All of these documents—the Corrective Action Investigation Plan, Corrective Action Decision Document, Corrective Action Plan, and Closure Report—were unique to each CAU and did not provide an overall summary of the entire Industrial Sites project. Project closeout is being implemented to summarize these activities for each CAU in a single document so that an overall picture of the Industrial Sites project can be documented.

As the process of investigation, remediation, and closure was conducted throughout the 15-year implementation of the Industrial Sites project, a number of regulatory decisions were made to address areas where a clear resolution was not apparent. For example, if contamination was identified at a site where no remediation occurred and a Use Restriction was implemented, a review of the Use Restriction might be warranted at a later date if the regulatory threshold for a particular contaminant was revised. If a contaminant threshold was established based on risk analysis, and further review of the risk analysis resulted in a change to the threshold, a Record of Technical Change was issued to the Closure Report to document the new condition. An investigation at a specific CAU might result in sampling at areas adjacent to previously closed CAUs, and new data obtained might result in changes to the original closure or associated Use Restrictions. For these and other reasons, refinements to regulatory decisions and FFACO implementation of Industrial Sites closures occurred during the 15-year life of the project. These refinements will be addressed and documented during the closeout effort.

Another phase of the Industrial Sites activity was the inclusion of a number of CAUs where remediation could not occur either because the site was part of an active operation or the site was deemed historical. These sites remain essentially untouched with regard to environmental restoration. As the Industrial Sites project is completed with no investigation performed at these sites, closure will be based on the status of the site as active or historical. During project closeout, a review of these sites will be made to ensure the exempting condition is still applicable.

This brief summary of the Industrial Sites project was provided to establish the size of the effort. Over 15 years, a total of 266 CAUs (over 1,800 sites) will have been evaluated following the prescriptive process of the FFACO. A series of documents for each CAU were developed, reviewed, and approved. A number of regulatory decisions regarding cleanup and contaminant thresholds were established that affected subsequent work, and revisions to these decisions were implemented as the project progressed. In addition, a number of sites remain as either active or under historical status where no characterization was performed, and a final review will be required to ensure the status is appropriate.

This information is all relevant to the project closeout in that a summary description of this work will be included in the closeout document. In addition, a table summarizing the final status (e.g., investigation technique, Clean Closed or Use Restricted, typical contaminants) will be developed and included in the project closeout report so that a single document can be used to locate CAU information. The remainder of this discussion will address how the project closeout was implemented and how such a large amount of information can be captured in a single document to describe the Industrial Sites activities.

PROJECT CLOSEOUT OBJECTIVES AND PURPOSE

As the Industrial Sites project nears completion in FY 2012, the need to implement a project closeout and develop a project closeout document was identified.

Personnel familiar with the project over the last several years and still performing the remaining CAU work in FY 2012 will provide details to the closeout document that might otherwise be lost if the work was performed at a later date. The closeout of the entire ER program at the NNS is not expected for several years, but current compliance with DOE Order 413.3B, *Program and Project Management for the Acquisition of Capital Assets* [2], is required and the development of an ER project completion package will allow for a more orderly closeout of the entire project. Lessons learned during the Industrial Sites closeout can be applied to the closure of the entire NNS ER program. Any items identified during the closeout process that are incomplete or incorrect can be remedied while the few remaining Industrial Sites CAUs are completed in FY 2012. The remaining discussion will focus on the closeout process and address how the closeout will meet the desired objectives.

The DOE Order 413.3B mandates that project closeout be conducted at the Critical Decision 4 stage of a project. Critical Decision 4 requires that a project closeout be performed for projects that are complete and not being turned over to an operational phase. In addition, some of the more recent Industrial Sites activities were completed under the *American Recovery and Reinvestment Act* (ARRA) [3], which also requires a project closeout. The main requirement for project closeout is that a summary of the project be documented. The development of an Industrial Sites project closeout document will be the mechanism by which NNSA/NSO ensures and documents that all required Industrial Sites activities have been completed.

A cornerstone of the closeout document will be a summary table of the CAUs completed during the Industrial Sites project. This table will summarize each of the CAUs completed during the project, including the CASs, their associated Use Restrictions, contaminants detected, and method of closure. The table will provide a single location where the status of the activities conducted over the past 15 years can quickly be reviewed and a link to the documentation that details each of the closures can be identified. The rest of the closeout document—which will describe regulatory decisions, the status of historical sites, and record-keeping requirements—will be based on this table.

During the life of the Industrial Sites project, a number of regulatory decisions were made to address situations where a clear answer was not apparent and agreement between NDEP and NNSA/NSO was required. These decisions included suspending the need to analyze for particular constituents when a repeated history of evaluating these constituents proved that regulatory thresholds were not exceeded; decisions regarding the avoidance of historically cultural areas when performing field investigations and proposing Use Restrictions rather than disturbing the site; and the decision to Use Restrict sites based on the limited benefits (i.e., no overall reduction in risk to human health) and the high cost of restoration.

The project closeout document will provide a single location for the documentation of these decisions. During the life of the Industrial Sites project, these decisions were documented in individual closure documents and in regulatory agreement letters, but no single document exists that summarizes these decisions. Conducting closeout will allow for the summary documentation of these decisions in a single document, and the closeout process will ensure that all commitments under the FFAO for Industrial Sites will have been met.

SUMMARY

The NNS Industrial Sites activities were completed over the span of 15 years and involved the investigation, cleanup or Use Restriction, and closure of more than 260 CAUs and over 1,800 sites. These activities will conclude in FY 2012 (with the exception of one CAU). In order to

capture the work completed over this length of time and document decisions made during the activities, a closeout effort was initiated. The closeout will review the work conducted during the Industrial Sites activities and produce a single document that summarizes Industrial Sites activities. This closeout is being conducted at an interim stage in the overall NNSA/NSO ER Project since the Soils and UGTA activities will continue for a number of years, but the completion of the Industrial Sites project warrants conducting a closeout now while personnel are available and information is still current. The process followed by NNSA/NSO in conducting project closeout for the Industrial Sites portion of the ER program may prove useful within the DOE complex in demonstrating how a large ER project can be summarized.

REFERENCES

1. *Federal Facility Agreement and Consent Order*. (1996; as amended March 2010). Agreed to by the State of Nevada; U.S. Department of Energy, Environmental Management; U.S. Department of Defense; and U.S. Department of Energy, Legacy Management.
2. U.S. Department of Energy. (2010). *Program and Project Management for the Acquisition of Capital Assets*, DOE Order 413.3B. Washington, DC.
3. *American Recovery and Reinvestment Act of 2009*. (2009). Public Law 111-5. Washington, DC.

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