Consolidated Nuclear Security, LLC, Excess Facility Disposition Program 17289

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ABSTRACT

Consolidated Nuclear Security, LLC (CNS), the management and operating contractor for the Y-12 National Security Complex (Y-12) in Oak Ridge, Tennessee, and the Pantex Plant (Pantex) in Amarillo, Texas, has developed an integrated strategy to address badly deteriorating excess facilities presenting risks to people, the environment, and the National Nuclear Security Administration (NNSA) mission. The comprehensive, integrated Excess Facilities Disposition Program (EFDP) incorporates NNSA scope for excess facility risk reduction, preparation of facilities to be transferred to the U.S. Department of Energy (DOE) Office of Environmental Management (EM) for demolition, and demolition of non-process contaminated facilities. The Program has been developed using the NNSA Office of Safety, Infrastructure, and Operations (NA-50) *Program Management Plan* as a guide.

The Program has undertaken actions to address the most immediate risks associated with CNS excess facilities. At Y-12, new foam roofs have been installed on Buildings 9201-5 (Alpha 5), 9204-4 (Beta 4), and 9206 to minimize further facility degradation. Tanks and dikes outside of Alpha 5 and Beta 4 are also being disconnected, drained, and filled with concrete. In addition, Beta 4 will be getting a new electrical system as its Manhattan Project-era system will be replaced by a temporary “construction power” setup that will provide as-needed electricity to the building that is safer, more reliable, and will ease demolition activities in the future.

The EFDP is also focusing on the basement of Alpha 5 and is planning to remove the water from the aging facility's flooded basement, which in some areas contains up to 54 inches of water. The EFDP is also planning several efforts to remove excess materials from Alpha 5 and Beta 4, de-inventory the Alpha 5 Mercury House System and numerous transformers, and de-inventory Beta 4 hydraulic pumps and systems. Efforts are also underway to deactivate and decommission non-process-contaminated facilities at Y-12 and at Pantex.

The EFDP has prioritized the performance of work to reduce risk while at the same time supporting the preparation of process-contaminated Y-12 facilities for transfer to EM. The Program aligns with the EM goal to have the NNSA scope completed in Alpha 5 and Beta 4 by the end of FY 2020, and Building 9206 completed by the end of FY 2024. These dates and project sequencing will support the Y-12-related DOE EM cleanup initiatives.

INTRODUCTION

The Y-12 National Security Complex (Y-12) and the Pantex Plant (Pantex) are U.S. Department of Energy (DOE) National Nuclear Security Administration (NNSA) facilities. Y-12 is located in Oak Ridge, Tennessee, and was built as part of the Manhattan Project for the purpose of enriching uranium for the first atomic bombs. In the years after World War II, it has been operated as a manufacturing facility for nuclear weapons components and related defense purposes. Pantex, located northeast of Amarillo, in Carson County, Texas, is the United States' only nuclear weapons assembly and disassembly facility and is charged with maintaining the safety, security, and reliability of the nation's nuclear weapons stockpile. Both plants are managed and operated for DOE by Consolidated Nuclear Security, LLC (CNS).

Excess Facility Disposition Program

CNS has identified the need for an integrated strategy to address the current backlog of excess NNSA facilities at Y-12 and Pantex presenting risks to human health and safety, the environment, and the NNSA mission. The Excess Facilities Disposition Program (EFDP) prepared the initial PLN CNS-F-0004, *Excess Facilities Disposition Program Plan* (EFDP Plan), in December 2015 to address the fiscal year (FY) 2016 NNSA scope for risk reduction, stabilization, and deactivation/de-inventory of excess process contaminated facilities at Y-12 [1]. The plan focused on reducing risk to workers, the environment, and the NSSA mission and preparing the facilities for transfer to the DOE Oak Ridge Office of Environmental Management (EM) for deactivation and decommissioning (D&D) as planned in DOE/OR/01-2583, *Portfolio Plan for the Y-12 National Security Complex* [2]. The initial EFDP Plan centered primarily on the most critical "legacy" Y-12 process contaminated facilities—Buildings 9201-5 (Alpha 5), 9204-4 (Beta 4), and 9206—presenting the most significant risks.

The first annual update to the EFDP Plan was completed in October 2016 and provided updates of the projects that were initiated in FY 2016 and added plans to address 60 non-process contaminated facilities at Y-12 and 85 non-process contaminated facilities at Pantex.

A primary goal of the EFDP is to perform the work on the legacy process contaminated facilities required to meet the conditions for acceptance by the EM program. These expectations were established in 2008 through walkdowns of the legacy facilities by a DOE team and are documented in *Assessments of the IFDP at ORNL and Y-12 for Transfer of Facilities and Materials to DOE-EM,* which was prepared by DOE Office of Environmental Management and the DOE Office of Engineering and Technology [3]. The EFDP Plan is also consistent with the NNSA Office of Safety, Infrastructure, and Operations (NA-50) *Program Management Plan* (NA-50 PMP) [4]. The NA-50 PMP provides guidance for management and disposition of excess facilities, including methods available for funding, methods for developing and tracking risks, cost estimating requirements, and project/portfolio development guidelines.

EXCESS FACILITY RISK

Risk Sources

There are currently 80 NNSA facilities located at Y-12 and 85 NNSA facilities located at Pantex that are currently excess or expected to be excess in the next 10 years. Most of the current inventory of excess facilities did not transition from operational status to excess status according to DOE Order 430.1C, *Real Property Asset Management* [5]. Due to timing issues, these facilities were also not transitioned in accordance with the Disposition section of the NA-50 PMP.

DOE Order 430.1C requires that “Planning for disposition must be initiated when real property assets are identified as no longer required for current or future programs. Disposition includes stabilizing, preparing for reuse, deactivating, decommissioning, decontaminating, dismantling, demolishing, and/or disposing of real property assets.” The NA-50 PMP requires that “M&O [management and operating] Partners will promptly remove all programmatic equipment and materials as soon as possible from facilities after the equipment is no longer needed or collect a space use charge to recover the cost of maintaining the facility in a safe shutdown condition.” However, many of Y-12’s facilities were shut down with materials and equipment in place. In addition, the rate of facility deterioration has exceeded the budgeted funds to maintain the facilities in a safe condition.

The primary risks identified for the excess facilities include fire, structural failure, and release of hazardous materials.

- **Fire.** Fires may be caused by the power distribution systems or other components of antiquated electrical systems. The old power distribution panels consist of fusible switches that, when corroded, may create high-resistance conditions that cause elevated temperatures and could result in electrical fires.

There are varying amounts of combustibles in the excess facilities that could allow fire propagation if initiated by faulty electrical components or other causes. If a fire of adequate intensity and duration occurred prior to de-inventory, then a release of uranium or certain hazardous chemicals could occur. Fire suppression systems have been removed from service or are not functional in some excess facilities.

- **Structural Failure.** Structural failures may be caused by collapsed roofs and subsequent water infiltration as well as aging-related corrosion of structural steel. Degradation is widespread with varying levels of severity. Roof panels in some of the excess facilities have collapsed. Water infiltration, which occurs through degraded portions of the roof and around fan housings, has resulted in the spread of contamination where radiological and toxicological contaminants are present. Water intrusion has also led to wet and uneven walking surfaces, flooded basements, and mold/mildew growth, which subjects workers to increased personal protective equipment requirements (such as respirators) and more dangerous working conditions.

- **Release of Hazardous Material.** Release of hazardous materials may happen if a fire of adequate intensity and duration occurred or as a result of water infiltration. Some of the excess facilities continue to house enriched uranium and/or hazardous chemicals, which, if released, could contaminate the air, soil, or groundwater.

Risk Evaluation

Current risks associated with the excess legacy facilities were evaluated using the CNS risk management processes. The following steps were performed during the risk evaluation:

- The three major risks facing each facility were identified and developed into “If…, Then…” statements.

- The probability and impact of each risk occurring at each facility were scored for ten categories, including safety, security, mission, quality, cost, technical, legal, environmental, community, and reputation.

- The probability and impact scores were combined into a current risk score.

The risk score for each facility (or group of facilities) was summarized in a probability impact matrix that represents the collective risks for all of the excess facilities at Y-12 and Pantex, as shown in Tables I and II, respectively. Under the current conditions, eight of the nine risks identified for the three legacy facilities may possibly occur with a high/very high impact to the Y-12 site. The risks associated with the excess non-process contaminated facilities are much lower than those posed by the excess process contaminated facilities. The excess non-process contaminated facilities have a very low probability of fire or structural failure and contain little or no hazardous materials that could be released to the environment.

However, if an event did occur, then it could present a risk to workers, impact the mission, and divert resources.

Table I. Probability Impact Matrix for the Excess NNSA Facilities at Y-12

Probability of Occurrence	Threat				
	V Likely	10 **0**	16 **0**	20 **0**	23 **0**	25 **0**
	Likely	7 **0**	13 **0**	18 **0**	22 **0**	24 **0**
	Possible	4 **0**	9 **0**	15 **0**	19 **3**	21 **2**
	Unlikely	2 **0**	6 **3**	11 **3**	14 **3**	17 **1**
	V Unlikely	1 **0**	3 **7**	5 **5**	8 **1**	12 **0**
Risk Management Matrix		V Low	Low	Medium	High	V High

Table II. Probability Impact Matrix for the Excess NNSA Facilities at Pantex

Probability of Occurrence	Threat				
	V Likely	10 **0**	16 **0**	20 **0**	23 **0**	25 **0**
	Likely	7 **0**	13 **0**	18 **0**	22 **0**	24 **0**
	Possible	4 **0**	9 **0**	15 **0**	19 **0**	21 **0**
	Unlikely	2 **0**	6 **11**	11 **4**	14 **4**	17 **0**
	V Unlikely	1 **0**	3 **12**	5 **5**	8 **7**	12 **0**
Risk Management Matrix		V Low	Low	Medium	High	V High

Activities were performed on Alpha 5, Beta 4, and 9206 in FY 2016 that have resulted in major risk reduction, as illustrated in Fig. 1. New foam roofs have

reduced the risk of water infiltration and structural failure. De-inventory of exterior tanks and dikes at Alpha 5 and Beta 4 and de-inventory of enriched uranium at 9206 have reduced the risk of uncontrolled release of hazardous materials. Despite these risk reduction efforts, the physical condition of Alpha 5, Beta 4, and 9206 continues to pose significant risks to people, the environment, and the NNSA mission until demolition is complete. If there were to be a significant release associated with one of these facilities, the potential health and environmental impact, loss of stakeholder confidence across the entire DOE Oak Ridge Reservation (ORR), and subsequent impact to DOE mission cannot be overstated.

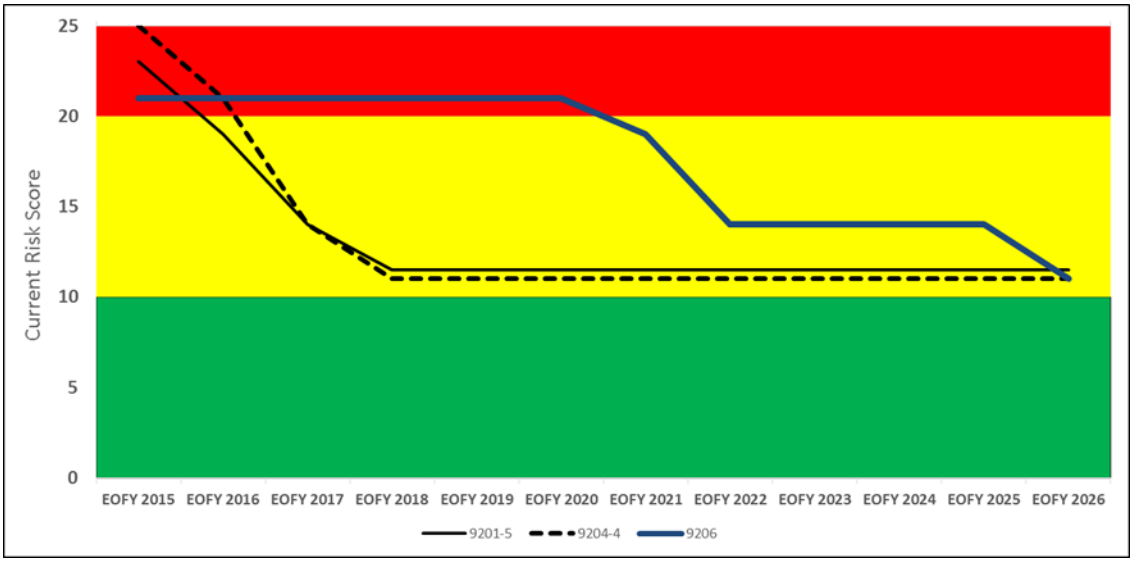

Fig. 1. Y-12 Legacy Facilities Disposition Risk Burndown.

CONDITIONS FOR TRANSFER OF Y-12 LEGACY PROCESS CONTAMINATED FACILITIES TO EM

EM Y-12 Portfolio Plan

DOE/OR/01-2583 presents the roadmap for completing the DOE EM cleanup scope at Y-12 and describes the complete remedial work scope for Y-12 from FY 2015 through completion in FY 2047 at a total forecasted cost of $8.8 billion based on the annual budget submittal for FY 2016. Y-12 cleanup activities in the FY 2015 to FY 2024 time frame focus on mercury remediation activities, reflecting the overall EM cleanup priorities for the ORR.

The general goal of DOE/OR/01-2583 is to implement risk reduction and protective measures while facilitating ongoing site missions at Y-12. Completion of the Y-12 cleanup mission helps to ensure success in modernizing facilities and infrastructure and reduces the legacy footprint at Y-12. These actions are consistent with and supportive of NNSA enterprise transformation planning. Through risk reduction activities—building demolition and land and water remediation—EM supports Y-12 becoming a more responsive and cost-effective enterprise.

DOE/OR/01-2583 assumes that the Y-12 excess process contaminated facilities currently managed by NNSA would be transferred to EM in a condition consistent with the recommendations contained in the *Assessments of the IFDP at ORNL and Y-12 for Transfer of Facilities and Materials to DOE-EM* report.

Facility Transfer Conditions

In December 2007, the Assistant Secretary for Environmental Management (EM-1) invited the DOE Program Secretarial Offices (PSOs) of Nuclear Energy, Science, and NNSA to propose facilities and legacy waste for transfer to EM. In parallel, the DOE Oak Ridge Operations office was preparing documentation for a large, highly complex project—the Integrated Facility Disposition Project (IFDP)—that proposed to complete known cleanup (remediation, D&D, waste management and disposition) of the site over the next 26 years. In addition to cleanup scope already owned by EM, IFDP incorporated cleanup scope owned by NNSA, the DOE Office of Science, and the DOE Office of Nuclear Energy and proposed to transfer this scope (unfunded liabilities) to EM for completion. The objectives of the EM-1 transfer invitation and the IFDP are the same: to identify and commence the process of dealing with the large inventory of excess facilities that have yet to be included as EM scope and budget.

In 2008 a DOE team was established to evaluate the proposed facility transfers. The team visited numerous DOE sites, including Y-12, and performed walkdowns of the facilities proposed for transfer. Using DOE Guide 430.1-5, *Transition Implementation Guide* [6], a walkdown checklist was created and walkdowns of the proposed facilities were conducted. The results were used to compare facilities with criteria for transfer, identify significant project risks and project liabilities, and derive recommended conditions for transfer. During the walkdowns, the various forms of materials at the facilities were addressed in relation to EM's responsibilities according to criteria for transfer. Development of these criteria was coordinated with EM-12, the Office of Disposal Operations. The criteria for facility transfer, individual walkdown reports, facility descriptions, and the resulting conclusions and recommendations are contained in the *Assessments of the IFDP at ORNL and Y-12 for Transfer of Facilities and Materials to DOE-EM* report. The conditions for transfer of facilities at Y-12 presented in the report are summarized below.

- Utility Reroute and Systems Isolation. It is expected that the transferring PSO will reroute utilities and other systems necessary for active facilities. Once that is accomplished, EM assumes the responsibility for isolating a facility from site utilities prior to demolition.

- Characterization. It is expected that available survey information, characterization databases, documented process knowledge, and other characterization information be assembled and provided to EM, either directly or as links to site electronic files. In particular, if there are bulk materials and waste remaining (the extent of which has been agreed to by EM), records of their physical, chemical, and radiological characteristics will be very important.

- Removal of Excess Materials. In general, it is expected that the transferring PSO will remove unattached bulk materials, tools and equipment, office furniture, and stored materials; that is, complete general sweep-out for items not requiring EM skills for removal and disposition. This applies regardless of whether or not the items are contaminated.

- Removal of Asset Materials at Y-12. Three buildings at Y-12 store materials critical to the NNSA mission. Inventories include significant quantities of depleted uranium metal, in-process storage containers and drums, classified chemicals, classified weapons components and tooling, and precious metals. According to DOE Order 430.1C, NNSA must relocate these materials prior to transfer.

- Removal of Reactive Materials. Energetically reactive materials were observed in storage at Y-12. These materials should be removed prior to transfer.

- Uranium Materials and Residues. Uranium materials and residues remain in several facilities at Y-12. Some of these materials will be removed as a condition of transfer and others during D&D.

- Special Operations. Within Building a building at Y-12, there is a pilot facility that supports a critical mission. The materials and operations in this facility are classified. Classified equipment, materials, chemicals, etc. must be removed as a condition of transfer.

- D&D in High Security Areas at Y-12. At Y-12, most facilities are located within areas of high security. D&D work at these facilities will require cleared D&D workers or escorts, and perhaps additional security personnel. In addition, complications with ingress and egress of demolition equipment and waste packages will result in significant project inefficiencies. It is expected that NNSA will make physical and/or administrative changes to the extent feasible to minimize the effect of these restrictions on D&D.

- Removal of Chemical Inventory. Some active facilities contain large numbers of laboratory chemicals, although generally they are in small individual containers. Specifically for these facilities, and, in general for any facility proposed for transfer, laboratory chemicals must be removed prior to transfer.

The assessment team returned to Y-12 in September 2016 to observe the current condition of the legacy facilities and the progress that has been made on meeting the transfer conditions. The team had no significant issues, were generally pleased with progress, and a report of its visit is forthcoming.

EFDP WORK SCOPE

As noted previously, several projects were performed in FY 2016 to stabilize the condition and reduce risks presented by the legacy facilities at Y-12. Work is planned for FY 2017 and beyond that will complete stabilization and risk reduction,

prepare the facilities for transfer to EM in accordance with the transfer conditions, and disposition excess non-process contaminated facilities.

Work Accomplished to Date

Roof Repairs. Roof repairs, including removal of potentially leaking equipment and plenums, were performed in many areas of Buildings 9201-5, 9204-4, and 9206. The buildings were totally encapsulated with approximately 280,000 ft^2 of new polyurethane spray foam roofing. The spray-foam roofs consist of 1 to 2 inches of polyurethane foam with an elastomeric coating, which creates a complete membrane to prevent leaks. The new spray-foam roofs will protect the facilities by sealing penetrations and leaks, thereby slowing further deterioration of the structures. The work was performed with funding from NA-50 and subcontracted through NNSA's Roof Asset Management Program. Before and after pictures of the roofs are shown in Figs. 2 through 4.

Fig. 2. Before and After Pictures of the Alpha 5 Roofing Project.

Fig. 3. Before and After Pictures of the Beta 4 Roofing Project.

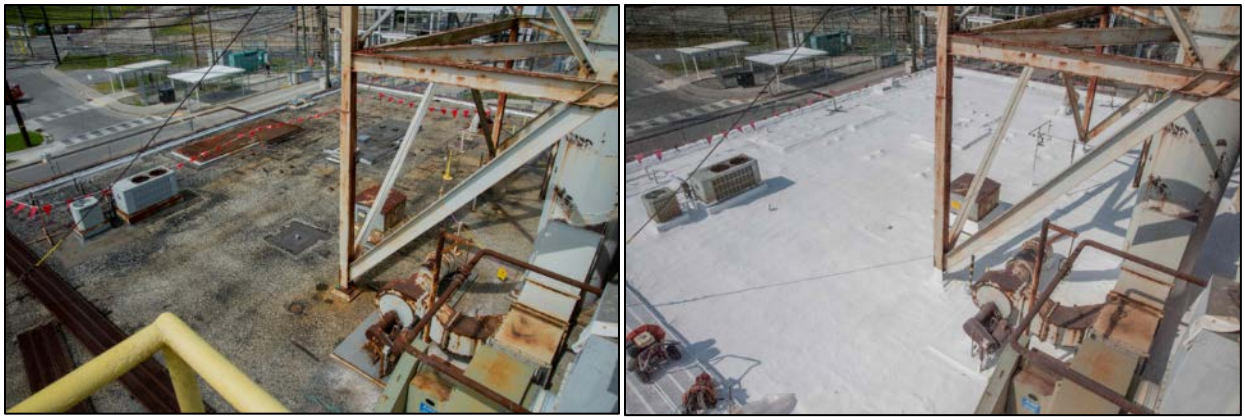

Fig. 4. Before and After Pictures of the Building 9206 Roofing Project.

De-Watering Flooded Basement. The basement of Alpha 5 is flooded with up to 54 inches of water as shown in Fig. 5. Initial characterization, including circulating the water during characterization as shown in Fig. 6, indicated that the flood water on the west side of the basement met the treatment facility acceptance criteria. Temporary pumps will be brought in and pumping initiated in the west side of the flooded basement in FY 2017. The flood water on the east side of the basement contains some additional contaminants; therefore, de-watering of the flooded basement in the east side of Alpha 5 is delayed pending characterization results and an evaluation of potential treatment options. De-watering the flooded basement at Alpha 5 will reduce the potential release of contaminated water into the environment and slow degradation of the structure.

Fig. 5. Flooded Wind Tunnel in Alpha 5.

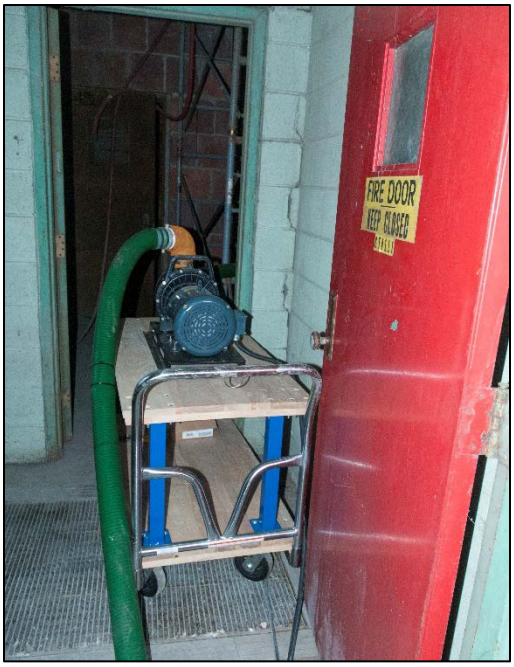

Fig. 6. Pump Used for Circulating Water During Characterization.

Electrical Power Isolation Project. Beta 4 is in the process of getting a new electrical system. A temporary "construction power" set-up will provide as-needed electricity to the building that is safer, more reliable, and will support future demolition activities. The electrical power isolation project, scheduled for completion in FY 2017, will reduce the potential risk of fire at Beta 4, an example of which is shown in Fig. 7.

Fig. 7. Example of Obsolete "Burned" Distribution Panel.

De-Inventory of Exterior Tanks and Dikes. Multiple exterior tanks and dikes at Alpha 5 and Beta 4 were disconnected, drained, and placed out of service. De-inventory of these exterior tanks and dikes will eliminate surveillance and monitoring efforts to characterize and drain the liquids that accumulate after each rainfall event and eliminate the potential for discharge of potentially contaminated

liquids to the environment. De-inventory of the remaining exterior tanks and dikes at Alpha 5 and Beta 4 will continue into FY 2017.

Repairs and De-Inventory in Building 9206. Numerous activities were completed at Building 9206 during FY 2016. The oil-filled transformers were changed out to allow removal of Fire Protection Engineering compensatory measures and improve the electrical infrastructure. Material at risk was reduced by approximately 3 kg. Seven of the eight tanks in the Primary Evaporator Feed System were drained. The building's Safety Basis documents annual updates were submitted, along with a revised cost estimate for the activities detailed in those documents.

Work Planned in the Future

Y-12 Disposition Portfolios

The portfolios of stabilization, deactivation/de-inventory, and demolition projects to prepare Alpha 5, Beta 4, and 9206 for transfer to EM and to disposition the non-process contaminated facilities at Y-12 are presented in Tables III through V. The project portfolios were developed based on facility walkdowns and understanding of the facility transfer requirements as presented in *Assessments of the IFDP at ORNL and Y-12 for Transfer of Facilities and Materials to DOE-EM*. The project portfolios have been updated to include any additional work that has been completed since the 2008 EM walkdowns and through the end of FY 2016.

Table III. Alpha 5 Disposition Portfolio

Alpha 5 Projects
Alpha 5 Stabilization Planning
Alpha 5 De-Inventory Planning
Alpha 5 Annex Demolition
Alpha 5 Exterior Tank/Dike De-Inventory
Alpha 5 Hg House Vacuum Mercury System De-Inventory
Alpha 5 Oil/Transformer De-Inventory
Alpha 5 Equipment/Material De-Inventory
Alpha 5 Utility Isolations and Reroutes
Alpha 5 Wind Tunnel Water Removal

Table IV. 9206 Disposition Portfolio

9206 Projects
9206 De-Inventory Planning
9206 Exterior Tank/Dike De-Inventory
9206 Equipment/Material De-Inventory
9206 Group 00 De-Inventory
9206 Group 10 De-Inventory
9206 Group 20 De-Inventory
9206 Group 30 De-Inventory
9206 Group 100 De-Inventory
9206 Group Misc De-Inventory
9206 External Utility Isolation

Table V. Beta 4 Disposition Portfolio

Projects
Beta 4 De-Inventory Planning
Beta 4 Exterior Tanks/Dikes De-Inventory
Beta 4 Oil/Transformer De-Inventory
Beta 4 Equipment/Material De-Inventory
Beta 4 Utility Isolations and Reroutes

Forty-five non-process contaminated facilities currently exist at Y-12, with another 15 expected to become excess in the next 10 years. The facilities were evaluated by staff with knowledge of the facilities and through limited walkdowns and combined into projects comprised of facilities similar in type and/or location as indicated in Table VI. The projects will include deactivation, cleanout (if required), characterization, and demolition.

Pantex Disposition Portfolios

There are currently 35 excess facilities at Pantex, with another 50 facilities to be excessed within the next 10 years. The excess facilities at Pantex fall into three groups. The first group includes the currently excessed facilities that are available for demolition. The second group includes facilities that will become excess as staff is relocated to the Administrative Support Complex (ASC) and facilities are repurposed to improve efficiency. The third group includes facilities that will become excess as mission operations are relocated to the High Explosives Pressing Facility, which is currently undergoing startup. The majority of these excess facilities are considered non-process contaminated and will be dispositioned by NNSA. Some of the buildings have process contamination (e.g., high explosives) but not at levels that warrant transfer to EM. The portfolio of demolition projects to disposition the non-process contaminated facilities at Pantex are presented in Table VI. The project portfolio was developed based on previous demolition experience and facility walkdowns. The projects will include deactivation, cleanout (if required), characterization, and demolition.

Table VI. Y-12 and Pantex Excess Non-Process Contaminated Facilities Disposition Portfolio

Y-12 Projects	Pantex Projects
Group 1 – Demolition of Office Buildings 9111/9112 and 9616-10	Demolition of Currently Excess Temporary Buildings*
Group 2 – Demolition of Trailers	Demolition of Currently Excess Storage Buildings
Group 3 – Demolition of Misc Excess Facilities within the PA	Demolition of Currently Excess Utility Buildings

Group 4 – Demolition of Misc Excess Facilities outside the PA	Demolition of PX 11-015A
Group 5 – Demolition of Shift Superintendent Building	Demolition of PX 12-034
Group 6 – Demolition of Guard Towers	Demolition of PX 16-010B
Group 7 – Demolition of Waste Material Processing Facility	Demolition of PX 11-029
Group 8 – Demolition of Cooling Towers	Demolition of Richmond Magazines
Group 9 – Demolition of Misc Excess Facilities	Demolition of PX FS-004
Group 10 – Demolition of Switchyard Facilities	Demolition enabled by ASC – Year 1
	Demolition enabled by ASC – Year 2
	Demolition enabled by ASC – Year 3
	Demolition enabled by ASC – Year 4
	Demolition enabled by ASC – Year 5
	Demolition enabled by ASC – Years 6 and 7
	Demolition enabled by ASC – Year 8
	Demolition enabled by ASC – Year 9
	Demolition of High Explosive Pressing Facility

*Project funded in FY 2016 with work to be performed in FY 2017
Note: Table VI does not include ASC-related demolition to be performed outside of the 10-year window (FY 2017 through FY 2026).

CONCLUSION

The EFDP embodies CNS' plan for dispositioning facilities at Y-12 and Pantex that are currently excess or planned to be excessed within the next 10 years. The EFDP has developed a plan that reduces risks and will prepare the legacy facilities at Y-12 for transfer to EM. The Program will also eliminate the backlog of currently excess facilities.

While this plan lays out an approach that reduces risk and supports the EM schedule for decommissioning the process contaminated facilities at Y-12, CNS recognizes the budgetary limitations under which NNSA operates. CNS believes, however, that this is critical work and must be completed to avoid eventual risk realization and impact to the ongoing missions. Excess facilities disposition also plays an important role in the effort to revitalize the infrastructure. After the three major facilities (Alpha 5, Beta 4, and 9206) are addressed, the ongoing costs of this

program should decline sharply as the majority of the existing backlog would be reduced.

REFERENCES

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[5] DOE Order 430.1C, *Real Property Asset Management,* U.S. Department of Energy, Washington, DC, August 19, 2016.

[6] DOE Guide 430.1-5, *Transition Implementation Guide,* U.S. Department of Energy, Washington, DC, April 24, 2001.