Midnite Mine Superfund Site

10090 Percent Design

Appendix H – Demolition

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TABLE OF CONTENTS

TABLE

LIST OF ACRONYMS

ACM	asbestos-containing material
BMP	Best Management Practice
BODR	Basis of Design Report
CD	Consent Decree
CSZ	Construction Support Zone
DMC	Dawn Mining Company LLC
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
GSR	Green and Sustainable Remediation
~~HEPA~~	~~high-efficiency particulate air~~
MA	Mine Area
Newmont	Newmont USA Limited
RAO	Remedial Action Objective
RD/RA	Remedial Design/Remedial Action
Site	Midnite Mine Superfund Site
SOW	Statement of Work
SWMP	Stormwater Management Plan
Tribe	Spokane Tribe of Indians
WTP	Water Treatment Plant

H1.0 INTRODUCTION

This appendix to the *Midnite Mine Superfund Site Basis of Design Report* (BODR) outlines the procedures for demolition of existing structures within the Mine Area (MA) at the Midnite Mine Superfund Site (Site), and disposal~~and placement~~ of these materials. ~~within the backfill materials in Pit 3 and Pit 4.~~ These procedures are based upon descriptions and experience for similar demolition work with closures associated with~~by~~ the U.S. Department of Energy (DOE) and U.S. Environmental Protection Agency (EPA) rules ~~techniques used for successful uranium mill demolition~~ and regulations~~debris placement at sites in the western United States~~.

This appendix:

- Demonstrates that the design will attain the applicable standards identified in the Consent Decree (CD) ~~).~~
- Describes the overall demolition equipment and procedures for various tasks
- Presents the demolition sequence for Site~~site~~ structures~~.~~
- Presents Green~~green~~ and Sustainable Remediation (GSR) considerations

H2.0 PERFORMANCE STANDARDS

The Performance Standards presented herein are defined in the *Consent Decree Statement of Work* (CD SOW; EPA, 2011), and were developed to confirm attainment of the Remedial Action Objectives (RAOs) of the Selected Remedy. The performance standards include both general and specific standards applicable to the Selected Remedy work elements and associated work components. All of the Performance Standards for the Midnite Mine RA, as well as a summary of where or how they are addressed in the RD, are summarized on Table 4-6 of the BODR. The general and specific Performance Standards related to facilities demolition and disposal~~debris placement~~ are listed and discussed below.

Table H-1 – Performance Standards Applicable to Construction Support Facilities

Performance Standard No. in CD SOW	Performance Standard	Comments
2.3.11	Buildings, facilities, structures, and equipment not needed for remediation shall be demolished, disposed, or otherwise removed in a timely manner as determined during Remedial Design.	The (Remedial Design/Remedial Action) RD/RA schedule included in ~~the *RD Work Plan* (MWH, 2012) and in~~ Appendix X ~~(preliminary RA schedule)~~ of the BODR show the anticipated timing for demolition/disposal of buildings, facilities, structures, and equipment not needed for the remediation. All non-essential buildings, facilities, structures, and ~~-~~equipment will be demolished and disposed of in selected areas of the waste portion of the backfill in Pits 3 and 4 during the course of the RA. Site materials-containing asbestos (which is not contaminated by radioactive materials) and hazardous materials will be disposed of off-site in accordance with applicable county, state, and federal regulations.
2.3.18	Best Management Practices (BMPs) shall be used as specified below during all construction activities to minimize the transport of disturbed material by water, wind erosion or vehicles. The Settling Defendants shall develop a catalog of BMPs that shall be used at the Site and shall identify the primary activities requiring those BMPs. The BMP catalog shall be comprehensive and is subject to the review and approval of EPA. The minimum BMPs that must be contained in the BMP catalog are presented below. The Settling Defendants shall include these BMPs in the BMP catalog along with additional BMPs that may be necessary to complete the Work. A Stormwater Management Plan (SWMP) shall be prepared which contains the BMP catalog and identifies BMPs and specific sediment control measures to be employed before, during, and after construction.	The SWMP is included in Appendix O of the BODR, and it includes the proposed BMPs to be used during the RA, including the demolition activities.~~-~~ This document includes specific BMPs for sediment and stormwater control before, during, and after construction.
2.3.18. A	The Work shall be conducted in a manner that minimizes the generation of fugitive dust. If the application of water or other dust suppressants to Work Areas is used to control the generation and migration of fugitive dust, such application of dust suppressants shall comply with the following requirements: i. . Subject to EPA approval, water treated to meet the Water Treatment Plant discharge limits may be used for dust suppression in the Work Area, provided it will not result in releases to surface water or adversely affect worker health and safety. ii. Application of dust suppressants shall be performed in a manner that minimizes surface water runoff, over spray of chemical suppressants into surface water bodies, wetlands or other sensitive habitats, and/or generation of muddy conditions.	The RA contractor(s) will meet this Performance Standard through compliance with specific Technical Specifications that describe dust suppression methods and procedures, and will be subject to EPA review and approval. The Technical Specifications for the project are provided in Appendix K. For most of the RA construction activities (including demolition activities), it is anticipated that if dust suppression is required, it will consist of watering (i.e., spraying) as the structures are demolished. Dust suppressant additives may be added to permanent non-paved access roads or haul roads, subject to prior EPA approval.

H3.0 ENGINEERING DESIGN DRAWINGS

The engineering design drawings are contained in Volume II of the BODR. The drawings related to demolition include:

Sheet Number	Description
8-1	Demolition Plan – Midnite Mine Site
8-2	Demolition Plan – East Access Road
8-3	Demolition and Removal Plan – Construction Support Facilities
8-4	Plan View – Demolition Debris Disposal Zones
8-5	Pit 4 – Demolition Debris Disposal Zone Sections
8-6	Pit 3 – Demolition Debris Disposal Zone Sections (1 of 2)
8-7	Pit 3 – Demolition Debris Disposal Zone Sections (2 of 2)

H4.0 STRUCTURES IDENTIFIED FOR DEMOLITION

The locations of existing facilities and structures to be demolished in the MA are shown in Drawings 8-1 and 8-2. These facilities include: (1) the existing water treatment plant (WTP) equipment and structures, (2) the existing buildings on the west side of the Sitesite, (3) the seepage collection facilities in the MA drainages, (4) surface pipelines, (5) buried culverts, and (6) overhead power lines, and (7) interim decontamination facilities and (8) temporary property fencing. Other buried structures requiring demolition may be identified during the RD process.

In addition, some of the structures in the Construction Support Zone (CSZ)Area discussed in Appendix B may require dismantling/removal and/or demolition/disposal at the end of the RA. Drawing 8-3 depicts the construction support facilities. These facilities include the following:

- Fencing associated with the construction support facilities
- Crew meeting/lunch trailers
- Construction offices
- Storage trailers
- Maintenance/electrical shop
- Decontamination office
- Locker, shower and laundry building

- Construction fuel and water storage and delivery systems
- Ambulance garage
- Safety/Emergency Services office
- Restroom trailers

H5.0 DEMOLITION EQUIPMENT, TASKS, AND PROCEDURES

During the RA, a subcontractor specializing in materials characterization and disposal will be contracted to evaluate the buildings and other infrastructure identified in H4.0. This contractor will characterize and identify the types of materials that will be generated during demolition, then depending on the characterization assist with segregation and disposal of the materials generated during demolition either on or off-site. This subcontractor will prepare a disposal plan prior for the work that describes the processes to be used during this phase of the demolition process. During the actual demolition, any equipment or materials that are salvageable and can be verified to be uncontaminated by the selected RA contractor~~Contractor~~ may be removed or recycled and not disposed in the MA. Facilities in the CSZ~~Construction Support Area~~ may have a salvage value or recycling opportunities as described in H4.0.~~.~~ This strategy is reflected in the Technical Specifications.

Demolition of the MA facilities consists of use of mechanized equipment specially designed and equipped for demolition work to minimize manual labor and potential occupational exposures. Dust suppression techniques will be used to minimize generation of dust during demolition activities. The RA contractor(s) will comply with specific technical specifications (in Appendix K) and the Health and Safety Plan (Appendix L) that describe dust suppression methods and procedures and are subject to EPA review and approval.

H5.1 TYPICAL DEMOLITION EQUIPMENT

The equipment typically used for demolition is described below. Actual equipment used for the Midnite RA will depend on the selected RA contractor and actual demolition schedule.

Hydraulic shear. This is a hydraulically operated attachment on the end of the arm of a track-mounted excavator or crane. This shear is used to cut piping, I-beams, tanks and other steel into pieces that will fit into trucks.

Grapple. This is a hydraulically operated attachment on the end of the arm of the track-mounted excavator or crane. The grapple is either an excavator bucket with a thumb, or a grasping attachment with several "fingers." The grapple is used to load dismantled pieces of piping, tanks, and concrete into trucks.

Hydraulic excavator. A hydraulic excavator is used to load dismantled pieces of piping, tanks, and concrete onto trucks for transport to the area for temporary storage or the disposal location. Also, excavator buckets with different widths may be used to excavate solids from tanks or cemented soils from around deeper foundations or pilings.

Front-end loader. In areas with smooth ground conditions and free from debris that may damage rubber tires, a front-end loader will be used to load soil, dismantled pieces of piping, tanks, or concrete into trucks.

Concrete shear. This is a hydraulically operated attachment on the end of the arm of a track-mounted excavator or crane. The concrete shear is similar to the steel shear, used to break concrete walls, slabs, and other facilities that will fit into the jaws of the shear. The shear breaks the concrete into pieces that can be loaded into trucks.

Concrete impactor. For concrete foundations that cannot be broken with the concrete shear, a concrete impactor is used. This is another attachment on the end of the arm of a track-mounted excavator or crane. The impactor uses a vibratory tip (similar to a jack-hammer) to break concrete into pieces that can be loaded into trucks. Alternatively, a wrecking ball may be used to break up thick foundations.

Trucks. Haul trucks are used to transport dismantled equipment, concrete, and soils to the area for temporary storage or the disposal location.

Water truck. A water truck or similar rubber-tired watering equipment is routinely used for dust suppression to wet haul roads from the specific demolition site to the area for temporary storage or the disposal location.

Other targeted spraying methods will be used during demolition activities. This will include wetting ~~down~~ structures before or during demolition, and spraying during loading or dumping of debris.

Grader. A road grader or blade is used to smooth haul roads and other work surfaces on a routine basis.

Off-Site Disposal Truck. In the event that materials are identified that must be transported off-site for proper disposal, a truck specifically designed for off-site disposal will be identified and used. The truck will be property placarded prior shipment.

H5.2 DEMOLITION TASKS AND PROCEDURES

The general demolition activities for these facilities will include the following discrete tasks.

1) Inspection of structures or facilities for the presence of~~or contamination associated with~~ asbestos containing materials (ACMs) or hazardous materials.

2) Preparation of structures or facilities for demolition including removal and proper off-site disposal of any ACMs or hazardous materials.

3) Demolition of the above-ground portion structures or facilities.

4) Demolition of foundations and below-ground features.

5) Loading and hauling of demolition debris.

6) Placement and compaction of demolition debris.

These tasks and the equipment and procedures necessary to complete them are presented below.

H5.2.1 Preparation for Demolition

Several pre-demolition activities will be completed prior to actual demolition of the structures and other facilities. These activities will be conducted by a specialty contractor as discussed in H5.0. Demolition preparation activities are outlined below.

1) Facilities will be inspected for the presence of~~or contamination associated with~~ ACMs and~~or~~ hazardous materials.

2) If ~~the presence of~~ ACMs or ~~the presence or~~ contamination associated with hazardous materials are~~is~~ identified by the specialty contractor, this material ~~, those materials~~ will be segregated~~contained~~ and transported for off-Site~~on-site~~ disposal in compliance with applicable Stevens County, ~~and~~ Washington State and Federal regulations. All other demolition materials and debris will be backfilled in the pits on-Site.

~~3) Facility equipment and structures that have remaining reagents, residues, and fluids will be removed and disposed.~~

4)3) Utilities for individual structures will be disconnected, and utility lines will be removed when no longer needed.

5)4) Water lines will be drained to appropriate locations for storage and treatment.

6)5) Structures and other facilities to be demolished will be assessed from a structural stability standpoint to determine the method and direction of demolition for safe delivery of the structure to the ground for cutting or breaking of debris, loading, and removal.

H5.2.2 Above-Ground Structure Removal

This will consist of dismantling of above-ground structures or facilities, using the equipment listed above. The dismantled structures may be removed for recycling or reuse or the structure debris will be broken, cut or compressed into sizes appropriate for loading into the trucks ~~to be used~~ for transport of the demolition debris to the pits.

Depending on the type of structure or facility, demolition may be conducted with associated equipment and structures remaining inside. For safety or material handling efficiency, the equipment may be removed prior to the structure being demolished. This decision will be made by the RA contractor in consultation and with approval from the DMC/Newmont and the EPA.

H5.2.3 Below-Ground Feature Removal

After above-ground structures and facilities have been demolished and removed from the demolition area, then removal of concrete foundations and other below-ground features will be conducted. The concrete will be broken into pieces of suitable size for loading into trucks.

Depending on the thickness and extent of concrete floor slabs and foundations, the equipment used for breaking up concrete may be a concrete shear or concrete impactor, a hydraulic excavator, and/or equivalent equipment.

H5.2.4 Loading and Hauling of Demolition Debris

Demolition debris from above-ground or below-ground activities will be loaded into haul trucks, using the equipment listed above. Because of the wide variety in shape and size of the demolition debris, the following guidelines are used in sizing, handling and disposing of debris.

1) Material will be cut or dismantled into pieces that can be safely lifted or carried with the equipment being used. Material will also be cut or dismantled to minimize void spaces after disposal.

2) A front-end loader, hydraulic excavator, or equivalent equipment will be utilized to crush or compact compressible materials. These materials will be laid out in a staging area or other approved area to facilitate crushing or compacting with equipment.

3) Pipe or conduit with an opening or diameter larger~~large~~ than 12 inches that cannot be crushed will be filled with grout or similar approved material prior to disposal.

4) Tanks and vats will be handled according to the wall material and wall thickness. Tanks will be crushed or compacted if possible. Tanks that cannot be crushed will be dismantled, if feasible. Tanks that cannot be crushed or dismantled will be transported to the disposal area, filled with grout or similar approved material, and buried.

H5.2.5 Placement and Compaction of Demolition Debris

The objective for placement and compaction of demolition debris in the disposal area is to minimize void spaces and reduce the potential for settlement after placement and compaction. The techniques for placement of debris in Pits 3 and 4 are outlined below.

Compressible materials are to be crushed and then covered with backfill material, and incompressible materials are to be placed in the disposal area, with the void spaces outside of the materials filled with soils. Internal void spaces of incompressible materials are to be filled with backfill material where possible, or grout if necessary.

The debris is to be spread in a layer such that structural shapes or other large pieces do not lie across or on top of each other, to prevent nesting. The material to be used for filling voids around the debris (unclassified waste) is to be spread in loose layers over the debris, and worked into and around the debris materials until the void spaces are minimized. A sufficient lift thickness of fill material should be placed over the debris so that the surface is accessible with tracked equipment. The fill material~~debris~~ will then be walked with tracked equipment to compress the debris as much as possible into the underlying backfill. After this initial compression step if additional fill is~~placement (if~~ necessary, a~~), the~~ lift of fill can be added and compacted with compaction equipment.

~~Compressible materials are to be crushed and then covered with backfill material, and incompressible materials are to be placed in the disposal area, with the void spaces outside of~~

~~the materials filled with soils. Internal void spaces of incompressible materials are to be filled with backfill material where possible, or grout if necessary.~~

Materials such as pipe and tubing have a varying degree of compressibility, depending on the diameter and wall thickness ~~of the pipe~~. Pipe with a 12-inch diameter or larger and is not compressible is to be filled with grout or granular material for burial, and pipe with smaller diameter is to be crushed before burial.

Vessels and tanks will either be crushed (if thin-walled and compressible) or cut open (if thick-walled and incompressible). Vessels that are to be cut open and filled, will be placed in the disposal area such that fill can also be placed around them and compacted. Thick-walled tanks or vessels that cannot be cut open due to cutting difficulties or worker health concerns will be placed in the designated zones of demolition debris disposal in Pit 3 or 4 (shown in the Section 8 drawings). For these tanks or vessels, interior voids spaces would be filled with cement grout.

Metallic debris will be placed by sizes so that larger pieces are not stacked on top of each other at angles that create void spaces. Large structural shapes will either be laid edge to edge so that they can be covered by fill material or they will be spaced far enough apart that equipment can operate between them to compact fill. Long structural (incompressible) members will be oriented horizontally. The specified maximum demolition debris dimensions of 30 cubic feet, 20 feet for debris, and 10 feet for pipe are outlined in the references cited (DOE, 1995, 2000). However, demolition debris is typically sized for the haulage equipment and often the individual pieces of debris will be less than these maximum dimensions in order to fit in trucks. Using the methods discussed above for debris placement in the disposal area and controlling the lift thickness will minimize the potential for excessive void spaces and settlement.

H6.0 DEMOLITION SEQUENCING

Due to construction sequencing, demolition of some structures must occur before a suitable disposal site within Pit 4 has been prepared. In these situations, demolition debris will be stockpiled until a suitable disposal area within the waste backfill can be prepared.

It is anticipated that structures and facilities will be demolished/removed in the following order:

Anticipated Demolition Order	Facility or Structure	Schedule
1	Existing structures and culverts in the proposed construction support facilities area (west edge of the Western Drainage)	Early Works
2	Stormwater~~Storm water~~ storage pond and other facilities on the surface of the South Waste Rock Pile	Phase 1
3	Pipelines and structure in the Western Drainage below the toe of the South Waste Rock Pile	Phase 2
4	Existing WTP and appurtenant structures	Phase 2
5	Pump houses and pipelines in the Eastern and Far East Drainages	Phase 2
6	Pump houses, pipelines, and other facilities in the Central and Western Drainages, including those associated with the Pollution Control Pond	Phase 3
7	Structures and fencing associated with construction support facilities and Site perimeter	Phase 3

Buried pipelines and other non-essential utilities not identified on the drawings will be removed during the course of the RA as they are encountered. Culverts and power-lines will be removed as necessary and in a manner that prevents interruption of surface water management or power supply to operating facilities.

As shown on Drawing 8-3, the new WTP and associated ponds, access control trailer, and WTP perimeter fence will remain in place. The locations for disposal of material in Pits 3 and 4 are within selected portions of the unclassified waste zones as shown on Drawings 8-4 through 8-7.

H7.0 GREEN AND SUSTAINABLE REMEDIATION CONSIDERATIONS

The ~~Below are green and sustainable remediation (~~GSR~~)~~ considerations for the demolition activities include~~Appendix H – Demolition. GSR considerations were evaluated for~~: (1) Construction Materials and Equipment (characteristics and manufacturing considerations), (2) Construction Methods, and (3) Low Impact/Sustainability measures undertaken during construction.

H7.1 Construction Material Considerations

With respect to the demolition there is some salvageable equipment in the existing WTP that can be reused. A number of components in the existing WTP will likely be salvaged and reused in the new WTP, including the filter press, membrane squeeze tank, pumps, and control panels. The applicable chemicals at the existing WTP, namely barium chloride and polymer, will be transferred to the new WTP for use and not otherwise disposed. This equipment and chemical

re-use will reduce new material requirements, and reduce the material sent for disposal. Other equipment and materials from facilities specified to be demolished will be disposed in the on-Sitesite waste pits during the RA, which will reduce any exposure risks due to potential residual contamination.

H7.2 Construction Methods

The demolition equipment used for the construction support facilities will be appropriately sized to reduce fuel consumption and greenhouse gas emissions, and to minimize stormwater erosion during these activities.

Dust suppression will be used in the area and on the access roads to decrease visible dust related emissions. WTP effluent water may be used for dust suppression when available during demolition and construction activities. To minimize water use, organic dust suppressant additives such as lignin sulfonate are anticipated during demolition and construction activities. Use of dust suppressants will be coordinated with and approved by the Tribe.

A schedule for dieselDemolition construction equipment emission standards requirements is included in the technical specifications (Specification 01585 – Green and Sustainable Practices) for use during the Midnite RA (including demolition activities) and will be adopted by the selected RA Contractor. The demolition contractor or subcontractor,workers will be instructed to complyavoid engine idling, and use of machinery with the requirements in this specification.automatic idle-shutdown devices will be suggested. On-Sitesite vehicle speeds will be restrictedlimited to accommodate safe roadway conditions based on roadway grade, roadway soil conditions, roadway congestion, and the need30 miles per hour to limit air emissions caused by roadway and fugitive dust. These dust emission shall be controlled on-site through use of chemical dust suppressant and/or water applications to roadways. Ultra-low sulfur diesel will be used in demolition equipment and support vehicles.

Materials to be demolished will be cut and/or dismantled to minimize void spaces for transportation and disposal. This methodology will minimize the number of truckloads required for transport of demolition debris and therefore reduce diesel fuel consumption and greenhouse gas emissions.

The Stormwater Management Plan (SWMP; included in Appendix O) identifies Best Management Practices (BMPs) and specific sediment control measures that will be employed before, during, and after construction for both sediment and stormwater control.

H7.3 Low Impact Development/Sustainability

Access road routes from the demolition location to the disposal location have been assessed to minimize Sitesite disruption and vehicle mileage. Please note that on-SiteOn-site disposal of the demolition debris will result in a muchsignificantly lower carbon footprint than off-Sitesite disposal.

H8.0 REFERENCES

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