

**ENVIRONMENTAL COMPLIANCE AND AREA COMPLETION PROJECTS  
(EC&ACP) DEACTIVATION & DECOMMISSIONING (D&D) POLICY ON  
DECOMMISSIONING END POINTS FOR SLABS, PITS, BASEMENTS AND BASINS  
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This document establishes the EC&ACP D&D policy for development of decommissioning end points for slabs, pits, basements, and basins. During the development of facility specific decommissioning end points and the preparation of work packages for those end points, please use and comply with the details of this policy. This document supersedes what was previously issued as Revision 1 of this document, on August 29, 2016.

**POLICY<sup>1</sup>**

The overall objective of decommissioning is to place facilities in a safe, stable and low-cost end state that supports “area closure”. In other words, the decommissioning objective is three fold. The objective is to:

- 1) permanently reduce the risks to workers, the public and/or environment from residual radiological, chemical, biological, or physical hazards
- 2) minimize future Surveillance & Maintenance (S&M) costs for decommissioned facilities, and
- 3) facilitate future “area closure” actions by EC&ACP.

In support of the above objectives [and consistent with Manual 1C, DOE direction, and Contract No. DE-AC09-08SR22470], EC&ACP will decommission slabs, pits, and basements in a consistent manner. Specifically, EC&ACP will use the end points for slabs, pits, basins, and basements detailed below. These end points should be tailored to specific facilities and not used verbatim if they are not applicable.

*Slabs*

- The concrete foundation slab is clean. In other words, the slab is free of all coarse debris and floor coverings (e.g., carpet, wood, tile, and linoleum) readily removed by scraping. If EC&ACP must use other mechanical means (e.g., scabbling) or solvent application to remove the floor coverings, then the floor coverings and adhesives are abandoned in place provided they are non-hazardous materials.
- All electrical conduit, piping or drain penetrations are flush (i.e., within 2”) with the top of the ground floor slab, or ground level.

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<sup>1</sup> The policy is consistent with Manual 1C, Procedure 501, which states “The final stage in disposition for a facility is decommissioning. In this stage, the remaining residual hazards in the facility are dealt with permanently, in a way that allows whatever remains of the facility to be released for another use. Decommissioning a facility can entail one of two alternatives; *in situ* disposal....or demolition.”

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- All sanitary or process sewer connections are plugged and filled with a cementitious material (e.g., grout, controlled low strength material, concrete, etc.).
  - Other resultant holes, two (2) inches or more in the least dimension, are plugged and filled with a cementitious material (e.g., grout, controlled low strength material, concrete, etc.).
  - Other resultant holes, less than two (2) inches in the least dimension require no further action.
- Slabs, sumps, or basements are left intact (i.e., No breaches will be made or left that penetrate through to the soil below unless cores are required to support facility characterization. Coring holes will be repaired with non-shrink grout or concrete).
  - Curbing remaining on the slab is cleaved or breached, at as many locations as necessary, to ensure drainage of rainwater.
  - In occupied areas with pedestrian traffic (e.g., the demolished monitoring buildings at the F-Area entrance):
    - Abandoned ledges and drop-offs (e.g., between slabs of different elevation, between ramps and grade, between ramps and slabs/asphalt, between slabs and grade, or slabs and asphalt) are filled and sloped, barricaded, or otherwise made inaccessible to casual traffic. In addition, concrete pedestals that are less than 12” in height are surrounded by fill and sloped, barricaded, or removed flush (i.e., within 2”) with the top of the ground floor slab.
    - Railings for abandoned stairs, ramps, and loading docks remain in place. There is a post-decommissioning action plan, which provides for the inspection and maintenance of the railings.
    - Curbing less than 30” in height is removed or barricaded.
  - In unoccupied areas with low pedestrian traffic (e.g., T, D, and M-Areas):
    - Abandoned ledges and drop-offs (e.g., between slabs of different elevation, between ramps and grade, between ramps and slabs/asphalt, between slabs and grade, or slabs and asphalt) remain. In addition, concrete pedestals less than 4 ft. in height may be abandoned in place.
    - Railings for abandoned stairs, ramps, and loading docks remain in place. There are no post-decommissioning efforts to maintain the railings.
    - Traffic bollards should be removed but may be left in place if specified in the facility specific end points document.

*NOTE: Use of barricades/railings is not desired and means for minimizing their use shall be considered and applied where practical.*

*Basins, Basements, and Pits*

- In general; basins, basements, and pits (including sumps, trenches and piping/conduit chases) are filled to grade with cementitious material (e.g., grout, controlled low strength material, concrete, etc.)<sup>2</sup>.
- In certain isolated cases the following types of fill material may be suitable for use (e.g., in large open basins and other large areas where complete compaction is achievable). However, use of these fill materials requires prior approval by EC&ACP Engineering:
  - Common Fill. The fill consists of soils defined as SW, SP, SM and SC by the American Society for Testing and Materials (ASTM) in ASTM D2487, “Standard Practice for Classification of Soils for Engineering Purposes (Unified Soils Classification System)”, and are free from organic materials, loam, trash, scrap or waste materials, snow, ice, and rock greater than three (3) inches in diameter. Common fill is compacted to a minimum of 90% of the maximum density as determined in accordance with ASTM D698, “Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft. lb/ft<sup>3</sup> 600 kN-m/m<sup>3</sup>)”. Copies of test reports are maintained in the work package. The fill is seeded or capped to ground level with at least six (6) inches of coarse aggregate, crusher run, or cementitious material.
  - Gravel or “Crusher Run”. The fill is capped to ground level with at least six (6) inches of cementitious material.
  - Low Permeability Soil. The soil is compacted to a minimum of 90% of the maximum density as determined in accordance with ASTM D698. Copies of test reports are maintained in the work package. The fill is capped to ground level with at least six (6) inches of seeded common fill, coarse aggregate, crusher run, or cement grout.
- If the area to be filled is surrounded by concrete, then zero bleed cementitious material is used.
- Exceptions where (1) compaction is not practical and (2) placement of other approved fill materials is not cost effective; basins, basements, and pits are overfilled with Common Fill and Low Permeability Soil so that a berm is formed.<sup>3,4</sup> This end point is further defined by the following restrictions and conditions:

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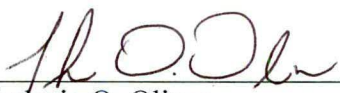
<sup>2</sup> For definitions and descriptions of materials, see ASTM D8, “Standard Technology Relating to Materials for Roads and Pavements”; ASTM D653, “Standard Technology Relating to Soil, Rock, and Contained Fluids”; and SRS Engineering Guide No. 02224-G, “Excavation, Backfill, Placement of Low Permeability Soil and Grading”.

<sup>3</sup> In certain situations (e.g., poor access for compaction equipment or potential damage to surrounding structures), it may not be practical to achieve 90% compaction of Common Fill or Low Permeability Soil. Common Fill or Low Permeability Soil may, however, be the best fill material in terms of lifecycle cost. In these situations and on a case-by-case basis, EC&ACP may “compact” the Common Fill or Low Permeability Soil using a berm. This method of compaction is based on the requirements found in SC Reg R61-107.11 SWM: Construction, Demolition, and Land-Clearing Debris Landfills for closure of C&D landfills under a permit-by-rule.

<sup>4</sup> Overfilling the basement or pit produces a berm. The berm combined with time and natural weathering will “compact” the fill in the basement or pit. As time passes, the berm takes on the contours of the surrounding ground.

- Use of this method must be defined in the facility specific end points document and approved by the EC&ACP Chief Engineer and DOE-SR Chief Engineer.
  - The fill is compacted by manual or machine operation, to the extent practical.
  - The remaining fill is tamped (e.g., machine bucket or shovel) during placement, to the extent practical.
  - The berm's height is as determined by a qualified person, based on the natural compaction characteristics of the fill.
  - The berm is graded, and its top surface is sloped 1-4% so as to promote positive drainage.
  - The sides of the berm are sloped to the surrounding ground. The slope is less than 33% [one (1) foot change in elevation for every three (3) feet horizontal distance].
  - The finished surface and sides are seeded with native grasses (i.e., the seed mix of the season) or other acceptable ground cover. The integrity of the berm is maintained.
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- Final verification surveys are completed prior to filling sumps, trenches, or pits if they were contaminated prior to demolition.
  - In cases where a basin, basement or pit does not present a tripping or fall hazard to casual traffic (e.g., 186/190-P), then no fill is required.

Approved:

  
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Thelesia O. Oliver  
EC&ACP Chief Engineer