

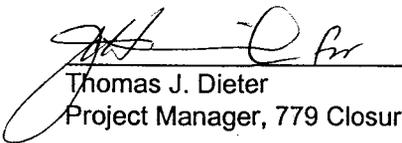
M. D. Brailsford
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The amount of measurable holdup in the remaining buildings in the 779 Cluster is documented in Appendix 1. The amount of holdup, the proposed categorization, and the associated AB documentation for each building are listed below in Table 1.

Table 1 – Building Categorization and Associated AB

Building	Holdup	Category	AB Documentation
Building 779	3.04E-4 g Aged WP Pu	Industrial Facility	Site SAR
Building 782	115 g Aged WG Pu	Nonreactor Nuclear Facility, Hazard Category 3	779 BIO
Other Remaining Buildings in 779 Cluster (i.e., 783, 727, trailers, and guard posts)	None	Industrial Facilities	Site SAR
Outside Wooden LLW Crate Storage in Cluster	None	NA	779 BIO

Please forward this information to the Department of Energy, Rocky Flats Field Office (DOE, RFFO) and request their approval to recategorize the remaining buildings in the 779 Cluster and apply the AB Documentation as shown in Table 1. If there are any questions or comments, please contact Julia Hamrick at extension 6812 or Brian Voelz at extension 7583.


Thomas J. Dieter
Project Manager, 779 Closure Project

11/5/99
Date

JCH:ras

Attachment:
As Stated

Orig and 1 copy

This attachment documents the location and amount of known holdup remaining in the 779 Cluster. Buildings 779 and 782 are treated separately because the facility features (e.g., physical separation) preclude bringing material together or causing harmful interaction from a common severe event. Table A1 shows the location and amount of material at risk remaining at the time this document was prepared.

Table A1 – Holdup Remaining in 779 Cluster

Building	Holdup	Pu (g)	Source
779	FP-405 filters have been removed and surfaces decontaminated, but the demister and 1 st stage are not radiologically clean.	2.8E-4 g	Calculated based on contamination surveys as discussed below.
	Contaminated Water generated by hydrolazing is collected in a 500 gallon tank before it is transferred to 776/777.	1.9E-5 g	Calculated based on Radiological Engineering upper estimate of hydrolazing effluent contamination ($\approx 1E-8$ grams/liter). 500 gal x 3.785 liters/gal x 1E-8 grams/liter
	Total	3.0E-4 g	
782	FP-401 and associated ductwork.	30.0 g	Upper bound scan data (2σ uncertainty) from Reference 5.
	FP-402 and associated ductwork.	85.0	Upper bound scan data (2σ uncertainty) from Reference 5.
	Total	115 g	
Other Buildings	None	0.0	No known holdup

Holdup values for FP-405 were calculated using contaminated surface areas in conjunction with the associated level of contamination. The estimated holdup (MAR) value was calculated using the following formula:

$$\text{MAR (grams Aged WG Pu)} = \text{Activity } \left(\frac{\text{dpm}}{\text{cm}^2} \right) \times \text{Surface Area (cm}^2) \times 4.5E-13 \left(\frac{\text{Ci}}{\text{dpm}} \right) \times 11.90$$

$$\left(\frac{\text{grams Aged WG Pu}}{\text{Ci}} \right)$$

Activity values are based on Radiological Operations surveys. Surveys were taken on internal plenum sections and suspect areas (Reference 6). The single highest survey reading in the demister section is 3,750 dpm/100 cm² alpha. The single highest survey reading in the 1st HEPA stage is 4,770 dpm dpm/100 cm² alpha. The uncertainty associated with the contamination values was not propagated through each reading or the calculations averaging several readings because it is offset by the following assumptions or conditions:

- The total activity was overestimated by applying the single highest contamination reading to the entire surface area.

The curie to dpm conversion is based on the definition of a curie (3.7E10 disintegrations per second). The Specific Activity (curie to grams conversion) for individual isotopes are contained in various documents (e.g., Table C-2 in SARAH or Reference 8). However, the Specific Activity for an isotopic mix such as Aged Weapons Grade (WG) Plutonium is not readily available and must be calculated. This evaluation used the Specific Alpha Activity for Aged WG Pu listed on Page 39 of Nuclear Safety Technical Report RFP-4910 (Reference 7).

Contaminated surface areas were calculated using dimensions from engineering drawings (Reference 4). The HEPA filters have been removed and plenum surfaces decontaminated. The demister section is 18'-9" long, 5'-1" wide, and 9'-5" high, which converts to a total surface area of approximately 594,100 cm². The first stage is 18"-9" long, 5'-6" wide, and 9'-5" high, which converts to a total surface area of approximately 615,907 cm². The uncertainty associated with duct dimensions (e.g., length, diameter) is considered negligible and is not addressed because:

- The surface area was overestimated by assuming that open areas, such as the 18'-3" by 9'-5" filter frame, are a solid surface.
- components are removed on a daily basis and many of the material will be packaged and removed by the time this document is prepared and approved.

Using the formula above, the holdup remaining in the FP-405 is calculated to be approximately 2.8E-4 g WG Pu.

References

1. DOE Limited Standard DOE-EM-STD-5502-94, *Hazard Baseline Documentation*, August 1994.
2. DOE Standard DOE-STD-1027-92, *Hazard Categorization and Accident Analysis Techniques for Compliance with DOE Order 5480.23*, Nuclear Safety Analysis Reports, December 1992.
3. *Safety Analysis and Risk Assessment Handbook*, Nuclear Safety Technical Report NSTR-007-96/RFP-5098, Rocky Mountain Remediation Services, L.L.C., Revision 1.
4. Drawing 23475-430, FP-405 Equipment Plan and Elevations, Issue I.
5. Interoffice Correspondence SMHT-97.227, from Safeguards Measurements Holdup Team to W. H. James, *Holdup Inventory Report*, October 15, 1997.
6. Radiological Safety Contamination Survey, Building 779, Room 142, 405 Plenum, 9/28/99.
7. Nuclear Safety Technical Report RFP-4910, *Reference Computations of Public Dose and Cancer Risk from Airborne Releases of Plutonium*, Revision 0, December 23, 1993.
8. LA-12846-MS, *Specific Activities and DOE-STD-1027-92 Hazard Category 2 Thresholds*, LANL Fact Sheet, Los Alamos National Laboratory, November 1994.

