

ATTACHMENT 11

QUALITY ASSURANCE OF DECOMMISSIONING ACTIVITIES AT
FEDERAL BUILDING 8
(FDA/CFSAN LICENSE NUMBER 19-30771-01)

Quality Assurance Review of Decommissioning Activities at Federal Building 8

Prepared by:



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INTRODUCTION

The Food and Drug Administration (FDA) is a Nuclear Regulatory Commission (NRC) radioactive materials licensee. The FDA operated research and testing laboratories at a facility located in Washington, DC known as Federal Building 8 (FB-8). The FDA has now relocated research operations and administrative personnel to facilities elsewhere in the Washington, DC area. The owner of FB-8, the General Services Administration, designated the building for major renovation. This renovation requires the removal of interior walls, fixed laboratory equipment, and mechanical systems.

The FDA is required to demonstrate that the site and property is acceptable for release in accordance with the requirements and conditions specified by the NRC. The FDA has retained the services of Clym Environmental Services, LLC (Clym) to assist in the decommissioning of FB-8. All decommissioning-related activities (scoping, characterization and final status surveys; remediation; and waste disposal) have been conducted under the authority of FDA's NRC radioactive materials license.

This Quality Assurance review was conducted to provide independent verification that the procedures and methods used by Clym were appropriate for release of FB-8 in accordance with NRC conditions, the Final Status Survey (FSS) Plan, and accepted decommissioning practices. The review was performed at the request of Clym during the week of October 25, 2004 by J. Stewart Bland and Michael S. Davidson. Mr. Bland and Mr. Davidson each hold current certification in the comprehensive practice of health physics by the American Board of Health Physics.

SCOPE

The scope of this review focuses on activities conducted during the FSS process. Four key criteria were evaluated:

1. Appropriate application of the site characterization to the specified surveys.
2. Appropriate use of instruments/detectors/lab analysis, including calibrations, correlations to characterization radionuclides, detection capability, and use in the field.
3. Verification of direct surface contamination measurements.
4. Review of records for completeness.

METHOD

The review included assessment of project documents, a tour of FB-8, observation of routine instrument operability checks and surveys, conduct of verification surveys, and interview of project personnel.

Survey Units 5772A and 5772B were selected for verification measurements. These units had been identified as among the most grossly contaminated during characterization. Contamination was due exclusively to beta emitters. Random scan and static measurements for beta activity were taken in both units with a Ludlum 2221 scaler/ratemeter and 43-37B gas

flow proportional detector. The static measurements consisted of 1 minute counts taken at four locations. Three of the measurements were compared to original FSS measurements (5772B E5, J5, N6). The fourth measurement (5772A H6) was taken at a random location that had not been selected by Clym for its quantitative measurements. Swipe samples were taken in the four locations and analyzed using a Beckman LS-6500 liquid scintillation counter.

REFERENCES

1. Final Status Survey Plan, Federal Building 8, "revised draft", provided October 15, 2004.
2. Procedures for Conducting Final Status Surveys at Federal Building 8, provided October 21, 2004.
3. Procedures for Conducting Quality Assurance Surveys at Federal Building 8, provided October 21, 2004.
4. Procedures for Conducting Operational Checks on Proportional Detectors in the Field, provided October 21, 2004.
5. Reference Background Measurements log (background and MDCRs by instrument).
6. Operational Checks log (calibration certificates, semi-daily background determinations).
7. Radiation Safety Survey Reports 5462A, 9/17/2004; 5772A, 9/28/2004; and 5772B, October 28, 2004.
8. Radiological Work Permit 10264, October 26, 2004.

OBSERVATIONS

1. Reference 5 identified background values and MDCRs by instrument for each surface matrix surveyed during the FSS. Each instrument set was assigned to a specific survey technician. Instrument operability checks were found to be valid only for those ratemeter/detector combinations initially calibrated together. These are considered to be good practices.
2. QA verifications of measurements for FSS as required by Reference 3 were performed in higher risk areas for contamination as identified during characterization. (i.e., laboratory benchtops, fume hoods, historically known spill areas). This is considered to be a good practice.
3. Survey instruments were found to be in current calibration and were checked for operability in accordance with Reference 4. Survey technicians handled and operated survey instruments and completed survey documentation in accordance with References 1 through 4.
4. Total beta detection efficiencies (instrument and surface) were based on calibration data provided by the instrument vendor. These efficiencies were calculated using total source activity; no distinction was made between instrument efficiency and surface efficiency. For Clym's application of efficiency to their measurements, an additional surface efficiency was included. This approach provides additional conservatism, since the surface efficiency has already been indirectly included in the efficiency determination.

5. The actual source used for instrument operability checks (including serial number and activity) and the criteria for operability acceptance were not identified in the operability check documentation (Reference 6). See Recommendation 1.
6. Attachment 1 shows verification survey results. Verification scan measurements of survey unit surfaces showed no elevated activity. Verification static measurements validated FSS measurements. A verification static measurement in the randomly selected location showed no activity detectable above background. Verification swipe surveys showed no loose surface contamination.
7. The Project Manager and survey technicians were knowledgeable in decommissioning practices and project-specific procedures and conducted operations in a professional manner.

RECOMMENDATIONS

1. On the instrument operability check documentation, identify sources by serial number and activity, specify the acceptable range for the operability check, and indicate whether the instrument passes the check. (This recommendation was implemented by the Project Manager during the site visit and is considered to be accepted and complete).
2. For future surveys, consider the use of 2π emission rate rather than total source activity for instrument beta efficiency determination (calibration). The instrument vendor did not include a source 2π emission rate; therefore, this recommendation can not be implemented for the FB8 surveys. The approach taken provides conservative results.

ATTACHMENTS

1. Quality Assurance Measurements, Federal Building 8 Final Status Survey

END OF REPORT

ATTACHMENT 1

**Quality Assurance Measurements
Federal Building 8 Final Status Survey**

Performed:	10/26/2004@1430
Static Measurements:	Ludlum 2221 ratemeter/scaler S/N 117370 Cal due: 1/28/2005 Ludlum gas flow proportional detector 43-37B S/N 117370 Cal due: 9/9/2005
Swipe samples:	Beckman LS-6500 Cal due: calibrated daily before use
Reference Surveys:	Lab 5772A, 9/28/2004, K. Romansky Lab 5772B, 9/28/2004, K. Romansky
Reference Instruments:	same as above
NOTES:	1. Random scan surveys of survey unit surfaces showed no elevated activity.

Survey Unit	Location	Matrix	Beta Activity									
			Static Measurements			Swipe Samples						
			Gross (c min ⁻¹)	Background (c min ⁻¹)	Net Activity (d min ⁻¹ 100cm ²)	1.96σ	Acceptable range	Original measurement	Within 95% CL overlap?	d min ⁻¹ 100cm ²	Original measurement	Within 95% CL overlap?
5772A	H6	soapstone benchtop	698	619	271	244	27 to 516	n/a	n/a	14 ± 32	n/a	n/a
5772B	N6	drywall	846	595	863	256	607 to 1118	969 ± 258	yes	13 ± 29	18 ± 37	yes
5772B	J5	concrete floor with black mastic	975	942	113	295	-181 to 408	605 ± 306	yes	4 ± 31	17 ± 36	yes
5772B	E5	concrete floor with white mastic	1136	1081	189	317	-128 to 506	7 ± 313	yes	16 ± 32	20 ± 36	yes