



Rocky Flats Environmental Technology Site

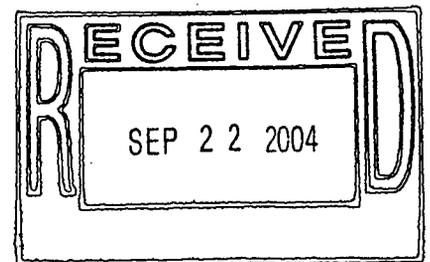
PRE-DEMOLITION SURVEY REPORT (PDSR)

Building 771 Area AH (East)

REVISION 0

September 13, 2004

**CLASSIFICATION REVIEW NOT REQUIRED PER
EXEMPTION NUMBER CEX-005-02**



ADMIN RECORD

B771-A-000267

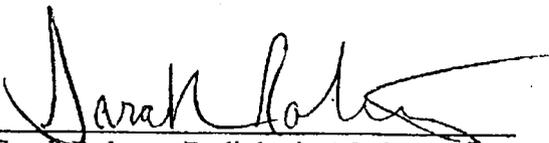
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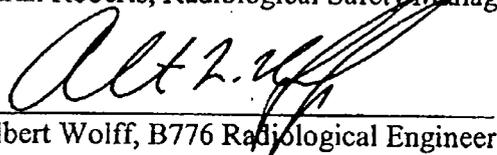
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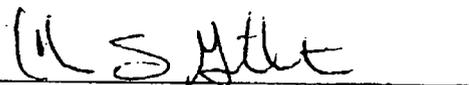
September 13, 2004.

Prepared by: 
Sarah Roberts, Radiological Safety Manager

Date: 9/10/04

Reviewed by: 
Albert Wolff, B776 Radiological Engineer

Date: 9/10/04

Approved by: 
Chris Gilbreath, B771 Project Manager

Date: 9/10/04

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos Containing Material
Be	Beryllium
CDPHE	Colorado Department of Public Health and the Environment
DCGL _{EMC}	Derived Concentration Guideline Level – elevated measurement comparison
DCGL _W	Derived Concentration Guideline Level – Wilcoxon Rank Sum Test
D&D	Decontamination and Decommissioning
DDCP	Decontamination and Decommissioning Characterization Protocol
DOE	U.S. Department of Energy
DPP	Decommissioning Program Plan
DQA	Data quality assessment
DQOs	Data quality objectives
EPA	U.S. Environmental Protection Agency
FDPM	Facility Disposition Program Manual
HVAC	Heating, ventilation, air conditioning
HSAR	Historical Site Assessment Report
HEUN	Highly Enriched Uranyl Nitrate
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
K-H	Kaiser-Hill
LBP	Lead-based paint
LLW	Low-level waste
MARSSIM	Multi-Agency Radiation Survey and Site Investigation Manual
MDA	Minimum detectable activity
MDC	Minimum detectable concentration
NORM	Naturally occurring radioactive material
NRA	Non-Rad-Added Verification
OSHA	Occupational Safety and Health Administration
PARCC	Precision, accuracy, representativeness, comparability and completeness
PCBs	Polychlorinated Biphenyls
PDS	Pre-demolition survey
PDSR	Pre-demolition survey report
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFFO	Rocky Flats Field Office
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSA	Removable Surface Activity
RSOP	RFCA Standard Operating Protocol
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxicity Characteristic Leaching Procedure
TSA	Total surface activity

VOCs Volatile organic compounds
WSRIC Waste Stream and Residue Identification and Characterization

EXECUTIVE SUMMARY

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of the east side of the Building 771 Second Floor (Area AH East), for structural surfaces that exist within six feet of the final grade. This report also provides the radiological status of areas that exist greater than six feet below the final grade.

Because this area will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). Building surfaces characterized as part of this PDS include the interior surfaces of Area AH East (within six feet of the final grade).

The PDS encompassed both chemical and radiological characterization. The characterization was built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project*.

Based upon the results of this PDSR, major portions of Area AH East meet the unrestricted release limits specified in the site Pre-Demolition Survey Plan. After multiple hydroblasting passes (with 35,000 to 50,000 psi high pressure water) which removed ¼" to ½" of surface concrete, and extensive dry decontamination efforts, several areas of the structure do not meet unrestricted release limits. The areas of the structure that do not meet unrestricted release limits and exist within six feet of final grade will be covered with fixative and packaged as radiological waste during building demolition.

No removable contamination in excess of the unrestricted release limits (20 dpm/100 cm²) exists in Area AH (East). No beryllium contamination has been detected above the action level in Area AH (East). In addition, radiological controls shall be in place during demolition to assure there is no release of contamination. These controls shall include the use of water and fixative for dust suppression, air sampling, and continuous RCT coverage. Air sampling shall include localized low-volume air monitors within the demolition zone and lapel air samplers for appropriate operators and support personnel.

The contaminated surfaces (i.e., painted surfaces within 6' of final grade) will be carefully removed during demolition activities. A bright-colored fixative will be used to allow for visible detection of these areas by operators and waste personnel. In the event painted debris becomes mixed with the areas of concrete that have been free-released, these portions will be dispositioned as radiological waste to the extent practicable (i.e., all debris where paint is visible and any areas where contaminated concrete may have mixed with areas of concrete that have been free-released). All attempts will be made to minimize mixing of clean and contaminated concrete during demolition.

The remainder of the structure can be demolished and the concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete. The structural surfaces that exist greater than six feet below final grade that meet the established limits (less than 100 nCi/g surface and less than 7 nCi/g over the volume of concrete) will remain in place. All metal items (equipment, piping, and rebar) removed during demolition shall be

packaged as radiological waste. To ensure that the facility remains free of contamination and PDS data remain valid, Level 1 isolation controls are established.

1 INTRODUCTION

A Pre-Demolition Survey was performed to enable compliant disposition and waste management of the east side of Building 771 Second Floor (AH East). Because this Type 3 building will be demolished, the characterization was performed in accordance with the Pre-Demolition Survey Plan (MAN-127-PDSP). The results of this survey shall demonstrate that the structural concrete to be used for fill material meets the unrestricted release limits specified in the site Pre-Demolition Survey Plan. The results of this survey also demonstrate that major portions of Area AH (East) do not meet unrestricted release limits. These areas shall be segregated and packaged as radiological waste during building demolition. Building surfaces characterized as part of this PDS include the interior surfaces of the east half of the Building 771 second floor (within six feet of the final grade).

Data is also provided for structural surfaces that exist greater than 6' below final grade to demonstrate compliance with the established limits (less than 100 nCi/g surface and less than 7 nCi/g over the volume of concrete). These areas were characterized per the *Building 771/774 Closure Project Characterization Plan for Areas Greater than Six Feet Below Final Grade*, dated November 24, 2003 (refer to Attachment K). This portion of the structure shall remain in place.

As part of the Rocky Flats Environmental Technology Site (RFETS) Closure Project, numerous facilities will be removed. Among these is Area AH East. This facility no longer supports the RFETS mission and will be removed to reduce Site infrastructure, risks and/or operating costs.

Before this Type 3 facility can be demolished, the Data Quality Objectives (DQOs) for a Pre-Demolition Survey (PDS) must be satisfied; this document presents the PDS results for Area AH East. The PDS was conducted pursuant to the Decontamination and Decommissioning Characterization Protocol (MAN-077-DDCP) and the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). The PDS is built upon physical, chemical and radiological hazards identified in the facility-specific *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.

1.1 PURPOSE

The purpose of this report is to communicate and document the results of Area AH East. A PDS is performed prior to building demolition to define the pre-demolition radiological and chemical conditions of a facility. The pre-demolition conditions are compared with the release limits for radiological and non-radiological contaminants. PDS results will enable project personnel to make final disposition decisions, develop related worker health and safety controls, and estimate waste volumes by waste types.

1.2 SCOPE

This report presents the pre-demolition radiological and chemical conditions of the Area AH East surfaces that will be free-released and used as backfill per the requirements of the *RFETS, RFCA RSOP for Recycling Concrete*. The results of this report also demonstrate that major portions of Area AH (East) do not meet the unrestricted release

limits. These areas shall be segregated and packaged as radiological waste during building demolition.

Also included in the scope of this report is the characterization of the structural surfaces that exist greater than six feet below final grade that were surveyed in accordance with the *Building 771/774 Closure Project Characterization Plan for Areas Greater than Six Feet Below Final Grade*, dated November 24, 2003 (refer to Attachment K).

1.3 DATA QUALITY OBJECTIVES (FOR FREE-RELEASE)

The Data Quality Objectives (DQOs) used in designing this PDS meet the minimum requirements specified in Section 2.0 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to section 2.0 of MAN-127-PDSP for these DQOs.

1.3.1 The Problem

The problem involves determining whether or not the survey unit is suitable for unrestricted release in accordance with this plan.

1.3.2 The Decision

The decision is verification that objectives specified in the decommissioning decision document have been met (e.g., certain materials meet unrestricted release criteria for radiological and non-radiological constituents).

1.3.3 Inputs to the Decision

Inputs to the decision include the magnitude and location of data from preceding characterizations, including RLC and In-Process Characterization (IPC), PDS results, decision document action levels, and unrestricted release criteria.

1.3.4 Decision Boundaries

The decision boundaries are the spatial confines of the facility, including rooms and sets of rooms, in two and three dimensions. Interior surfaces are included, including those below grade. Boundaries may be further defined in RFCA decision documents.

1.3.5 Decision Rules

The following are decision rules to be used during PDS:

1.3.5.1 Radionuclides

If all radiological survey and scan measurements (and sample measurements, where sample activity is translated to surface activity as described in Section 7.2.3 of the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP)), are below the surface contamination guidelines specified in the Site PDSP, then the related areas and/or volume are considered not radiologically contaminated. The media sample result is calculated by converting volumetric activity (typically reported in pCi/g) to surface activity (dpm/100

cm²). The volumetric result (pCi/g) is multiplied by the weight of the sample (grams) and by 2.22 (conversion from pCi to dpm).

If any radiological survey or scan measurement exceeds the surface contamination guidelines provided in the Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP), the related survey unit must be evaluated per the statistical tests described in section 7.0, Data Analysis and Quality Assessment, of this plan. If any radiological sample measurement (or disposal unit volume) exceeds 100 nanocuries per gram of transuranic material, the related volume of material is considered transuranic (TRU) waste.

1.3.5.2 Hazardous Waste

If decommissioning waste is mixed with or contains a listed hazardous waste, or if the waste exhibits a characteristic of a hazardous waste, then the waste is considered RCRA-regulated hazardous waste in accordance with 6 CCR 1007-3, Parts 261 and 268.

1.3.5.3 Hazardous Substances

If material contains a listed hazardous substance above a decision document action level (e.g., RFCA) and/or the CERCLA reportable quantity (40 CFR 302.4), the material is subject to CERCLA regulation (i.e., remediation and/or notification requirements).

1.3.5.4 Beryllium

If surface concentrations of beryllium are equal to or greater than 0.2 µg/100 cm², the material is considered beryllium contaminated per 10 CFR 850.

1.3.5.5 PCBs

If material contains PCBs, in a non-liquid state, from the manufacturing process at concentrations ≥50 ppm, the material is considered PCB Bulk Product Waste and subject to the requirements of 40 CFR 761.

If PCB contamination from a past spill/release is suspected, or if a PCB spill is discovered that has not been cleaned up, the associated material is considered PCB Remediation Waste and subject to the requirements of 40 CFR 761. PCB remediation waste includes: materials disposed of prior to April 18, 1978, that are currently at concentrations ≥50 ppm PCBs, regardless of the concentration of the original spill; materials which are currently at any volume or concentration where the original source was ≥500 ppm PCBs beginning on April 18, 1978, or ≥50 ppm PCBs beginning on July 2, 1979; and materials which are currently at any concentration if the PCBs are spilled or released from a source not authorized for use under 40 CFR 761.

If a waste or item contains PCBs in regulated concentrations, the waste or item is classified as PCB-regulated material and subject to the requirements of 40 CFR 761.

1.3.5.6 Asbestos

If any one sample of a sample set representing a homogeneous medium results in a positive detection (i.e., >1% by volume), then material is considered ACM (40 CFR 763 and 5 CCR 1001-10).

1.3.6 Tolerable Limits on Decision Error

Acceptable false negative (*a*) errors for calculating the number of samples generally range from 1% to 10%. The default value specified by the Site PDSP is 5%, which was assumed for the survey design in this report.

1.3.7 Optimization of Plan Design

Statistically based radiological surveying and sampling will be conducted per the guidance in Appendix B of the RFETS Pre-Demolition Survey Plan for D&D Facilities (MAN-127-PDSP). Refer to Section 4.0 of the PDSP for direction of characterization of non-radiological, chemical constituents. For this report, the minimum number of measurement locations is fifteen per 100 square meters of floor area for Class 1 survey units, and fifteen per 1000 square meters of floor area or total area (whichever is larger) for Class 2 survey units, as calculated based on the guidance in MAN-127-PDSP. The measurement design was based on total surface area for the Room 283 survey units, because the floors/lowers and upper walls/ceilings were divided into 2 survey units (771043 and 771077).

The DCGL_w is 100 dpm/100 cm² for TSA and media measurements/samples, and 20 dpm/100 cm² for RSA measurements. The LBGR was adjusted to obtain a relative shift of two. The estimated standard deviation for each measurement type was calculated based on an assumed coefficient of variation of 30%.

The scan requirements for specific survey unit classifications are as follows:

- Class 1: 100% of accessible surface
- Class 2: 10-50% upper walls/ceilings (the only Class 2 survey unit included in the scope of this report is upper walls/ceiling only)

No Class 3 survey units are included in the scope of this report.

2 HISTORICAL SITE ASSESSMENT

A facility-specific Hazards Characterization Report was conducted to understand the facility history and related hazards. The Building 771 Hazards Characterization was performed in June 2001 (Refer *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0). Based on the characterization results, radiological contamination is suspected on the structural surfaces of the 2nd Floor of Building 771 (including Area AH East). Media sample results indicated radiological contamination in excess of the unrestricted release limits in or under the paint in all areas

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except Room 283 (refer to Attachment M). Therefore, all paint was removed from Area AH (areas within 6' of final grade), with the exception of Room 283.

Interviews with site personnel indicate that the paint in Room 283 was used for aesthetic purposes only (to provide more light in the area for safety considerations).

The area included in the scope of this PDSR is referred to herein Area AH East. This area was part of the original building 771 construction, and included the Room 249 Zone 1 Exhaust and Utilities Area, the Room 283 HVAC Exhaust and Utilities Area, and Room 235 HVAC Supply and Utilities Area. All non-load-bearing walls were removed from Area AH East during D&D activities.

Area AH East consists of three Class 1 survey units (771040, 771044, and 771076), and three Class 2 survey units (771042, 771087, 771089) based the contamination potential, per Section 3.0 of the PDSP.

The hazards characterization results and historical review (refer to Attachment J) were used to identify PDS data gaps and needs, and to develop radiological and chemical PDS characterization packages. Characterization documentation is located in the Building 771 Characterization Project files.

3 RADIOLOGICAL CHARACTERIZATION AND HAZARDS

Area AH East was characterized for radiological hazards per the PDSP. Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on the facility surfaces. Measurements were performed to evaluate the contaminants of concern (weapons-grade plutonium isotopes). Based upon a review of the characterization data, historical and process knowledge, in-process survey data, building walk-downs, and the Site Pre-Demolition Survey Plan (MAN-127-PDSP), a Radiological Characterization Plan was developed during the planning phase that describes the minimum survey requirements (refer to survey packages 771040, 771042, 771044, 771076, 771087, and 771089). A Survey Unit Overview Map is presented in Attachment A. Based on hazard characterization data and historical and process knowledge, transuranic isotopes are the primary contaminants of concern in Buildings 771/774. Therefore, the PDS was performed to the transuranic PDS unrestricted release criteria. Individual radiological survey unit packages are maintained in the Building 771 Characterization Project files.

The Area AH East survey unit packages were developed in accordance with Radiological Safety Practices (RSP) 16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure*. Total surface activity (TSA) and removable surface activity (RSA) measurements were collected in accordance with RSP 16.02 *Radiological Surveys of Surfaces and Structures*. Radiological survey data were verified, validated and evaluated in accordance with RSP 16.04, *Radiological Survey/Sample Data Analysis*. Quality control measures were implemented relative to the survey process in accordance with RSP 16.05, *Radiological Survey/Sample Quality Control*.

For this report, the minimum number of measurement locations is fifteen per 100 square meters of floor area or total area for Class 1 survey units, and fifteen per 1000 square meters of floor area or total area for Class 2 survey units, as calculated based on the guidance in MAN-127-PDSP. The total area was used for determining the number of measurements required (in lieu of floor area) when large portions of the floor were outside the boundaries of the survey unit (i.e., greater than 6' below final grade).

Random survey locations that landed on previously identified "hot-spots" (i.e., areas shaded in red on survey unit overview maps) were relocated as close to the original location as possible within the contiguous square-meter. When this was not possible, a new random location was selected from a random-number generator.

The contamination levels for areas beneath fixative (annotated in yellow on survey unit maps) and beneath the spots that do not meet unrestricted release limits (annotated in red on survey unit maps) range from 100 dpm/100 cm² to 10,000 dpm/100 cm², with a limited number of isolated spots up to 15,000 dpm/100 cm². Average contamination levels are less than 1000 dpm/100 cm².

Surfaces that exist greater than 6' below final grade were characterized per the requirements of the *Building 771/774 Closure Project Characterization Plan for Areas Greater than Six Feet Below Final Grade*, dated November 24, 2003. The structural surfaces that exist greater than six feet below final grade that meet the established limits (less than 100 nCi/g surface and less than 7 nCi/g over the volume of concrete) will remain in place. Surfaces that did not meet the established surface limits (100 nCi/g) were removed with a scabbling tool or grinder. Areas that did not meet the established volumetric limits (7 nCi/g) were removed with a concrete saw. The data and map for Area AH for surfaces greater than 6' below final grade is provided in Attachment K.

After completion of final status surveys on the second floor, DOE brought in an independent verification contractor (IVC) to survey this area. The IVC found numerous hotspots above the total maximum surface contamination limit of 300 dpm/100 cm² and during performance of their scans. The Project performed follow-up surveys in the same locations and confirmed the presence of activity above the limits. A large percentage of these hotspots were found on the floor near the west wall.

After vacuuming these locations, the large majority of the hotspots were readily removed. The Project went on to perform some additional surveys in areas they had previously surveyed and found new hotspots above the release criteria. One of these hotspots reading approximately 850 dpm was removed with a tape press for alpha spectroscopy; the results of the analysis confirmed the presence of Pu-239 and Am-241.

The Project then performed smoke tests of the second floor to evaluate the airflow patterns as part of their investigation of these newly discovered hotspots. The test showed airflow across an identified area of fixed contamination in a west and north direction to floor locations along the west wall that were previously surveyed below the release criteria.

In addition, the Project recognized that the isolation controls after completion of the final survey were not well marked, understood or enforced. Specifically, workers and equipment were moving through areas of identified fixed contamination into areas previously surveyed below the surface contamination limits.

Due to the movement of workers/equipment and the airflow tests, the Project concluded that areas previously surveyed below the surface contamination limits were being recontaminated. This explained why the IVC found hotspots in areas the Project had previously affirmed below the surface contamination limits.

Based on this conclusion, the Project took several corrective actions. The isolation boundaries around the areas of fixed contamination were greatly enhanced and the level of traffic on the second floor was greatly reduced. All portions of the second floor required to meet the surface contamination limits were vacuumed as this method was proven to be highly effective at removing these newly deposited hotspots.

Lastly to verify that the combination of enhanced isolation controls and vacuuming was effective, a verification survey of an approximate 100 m² area was performed around the stairwell opening near the west wall. The survey was intentionally biased to this location as it falls in the path of the most foot traffic and is downwind of the large area of fixed contamination.

The results of this verification survey show that the contamination levels in this area show compliance with the surface contamination limits. Based on the effectiveness of the vacuuming effort as confirmed by the verification survey in the worst case area, the Project has demonstrated that the second floor meets the surface contamination limits (refer to Attachment L).

Radiological survey data, statistical analysis results, survey locations, and radiological scan maps are presented in Attachments B, C, D, E, F, and G, *Radiological Data Summary and Survey Maps*.

Area AH East East Side – (Survey Unit 771040)

The east side of Area AH East is classified as a Class 1 survey unit. This area includes the former Rooms 229, 230, 231, 241, 245, 246, and 247 (Room 249 HVAC exhaust utilities area and chemical makeup). A total of 82 random TSA and RSA measurements were collected. Surface scans of 1182 m² (100% of accessible surfaces) were performed. All paint was removed from the structural surfaces; therefore no media samples were collected for this survey unit.

All scans and surveys in survey unit 771040 were less than the applicable PDS transuranic DCGL values, with the exception of the areas marked in red on the survey unit map. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771040 are presented in Attachment B, *Survey Unit 771040 Radiological Data Summary and Survey Map*.

Area AH East Room 283 East (upper walls/ceiling) – (Survey Unit 771042)

The east side of Room 283 is classified as a Class 2 survey unit. This area includes the upper walls/ceiling only (lower walls and floor are located greater than 6' below final grade). A total of 15 random and 1 biased TSA and RSA measurements were collected. Surface scans of 104 m² (13% of accessible surfaces) were performed. Because most of the upper walls/ceiling in Room 283 are not painted, biased paint samples were collected and no elevated results were detected (refer to Attachment M). Therefore the paint was not removed from this survey unit.

Equipment items that remain in this area include six large building exhaust fans and associated ductwork, electrical panels, conduit, domestic cold water, fire protection, steam and steam condensate. These systems are not suspected to be internally contaminated. The piping systems have been air-gapped and are free of liquids. Surveys of the exterior surfaces did not detect any contamination in excess of the unrestricted release limits. The piping will be removed and packaged as radiological waste during demolition.

The east side of Room 283, from column line 14 to the east side of Room 283, shall be packaged as radiological waste. This area was excluded from the final survey because low levels of contamination (less than 1000 dpm/100 cm²) were detected on the cinderblock portions of the east wall during characterization efforts. This was not unexpected, because the east wall is adjacent to the Building 771 exhaust tunnel, and shares a common wall with the tunnel. Personnel interviews indicate that a plenum that exhausted into the tunnel was removed from this area after the 1957 fire, and the void was filled with cinderblock. Fixative has been applied to this area for removal and packaging as low-level radiological waste.

All scans and surveys in survey unit 771042 were less than the applicable PDS transuranic DCGL values. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771042 are presented in Attachment C, *Survey Unit 771042 Radiological Data Summary and Survey Map*.

Area AH East Room 249 – (Survey Unit 771044)

The east side of Room 249 in Area AH East is classified as a Class 1 survey unit. This area includes the east half of Room 249, and housed the zone I filter plenums, fans, motors and ductwork. A total of 129 random TSA and RSA measurements were collected. Surface scans of 1441 m² (100% of accessible surfaces/areas not covered with fixative) were performed. All paint was removed from the structural surfaces; therefore no media samples were collected for this survey unit.

Areas of fixed contamination were identified on the main plenum on the steel liner and columns (1000 dpm/100 cm² average, 96,000-dpm/100 cm² maximum), therefore fixative has been applied to all remaining surfaces. The remaining plenum structure will be packaged as radiological waste during demolition.

All scans and surveys in survey unit 771044 were less than the applicable PDS transuranic DCGL values, with the exception of the areas marked in red on the survey unit map. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771044 are presented in Attachment D, *Survey Unit 771044 Radiological Data Summary and Survey Map*.

Area AH East North Side – (Survey Unit 771076)

The north side of area AH East is classified as a Class 1 survey unit. This area includes Rooms 232, 233, 234, and 235), and housed the HVAC supply fans and plenums. A total of 67 random TSA and RSA measurements were collected. Surface scans of 1507 m² (100% of accessible surfaces/areas not covered with fixative) were performed. All paint was removed from the structural surfaces; therefore no media samples were collected for this survey unit.

All scans and surveys in survey unit 771044 were less than the applicable PDS transuranic DCGL values, with the exception of the areas marked in red on the survey unit map. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771076 are presented in Attachment E, *Survey Unit 771076. Radiological Data Summary and Survey Map*.

Area AH Stairwell #4 – (Survey Unit 771087)

Stairwell #4, located on the south side of Room 283, is classified as a Class 2 survey unit. This area includes the wall/ceiling surfaces of Stairwell #4 that exist within 6' of final grade. A total of 15 random TSA and RSA measurements were collected. Surface scans of 34 m² (18% of accessible surfaces) were performed. Because most of the lower walls in Room 283 exist more than 6' below final grade, biased paint samples were collected and no elevated results were detected (refer to Attachment M). Therefore the paint was not removed from this survey unit.

All scans and surveys in survey unit 771087 were less than the applicable PDS transuranic DCGL values. Radiological survey data, statistical analysis results, survey locations, and radiological scan maps for survey unit 771087 are presented in Attachment F, *Survey Unit 771087 Radiological Data Summary and Survey Map*.

Area AH Door 21 Stairwell – (Survey Unit 771089)

The Door 21 Stairwell, located in the southeast corner of Room 283, is classified as a Class 2 survey unit. This area includes the wall/ceiling surfaces of the Door 21 Stairwell that exist within 6' of final grade. A total of 15 random TSA and RSA measurements were collected. Surface scans of 55 m² (55% of accessible surfaces) were performed. Because most of the lower walls in Room 283 exist more than 6' below final grade, biased paint samples were collected and no elevated results were detected (refer to Attachment M). Therefore the paint was not removed from this survey unit.

All scans and surveys in survey unit 771089 were less than the applicable PDS transuranic DCGL values. Radiological survey data, statistical analysis results, survey

locations, and radiological scan maps for survey unit 771089 are presented in Attachment G, *Survey Unit 771089 Radiological Data Summary and Survey Map*.

4 CHEMICAL CHARACTERIZATION AND HAZARDS

Based on a thorough review of historical and process knowledge, visual inspections, and personnel interviews, no additional chemical hazard sampling requirements were identified.

4.1 Asbestos

Asbestos containing building material is not present in or on Area AH East (previously removed).

4.2 Beryllium (Be)

Area AH East is not and has never been a beryllium-controlled area. Per the Beryllium Sampling Decision Tree in the PDSP, 28 biased beryllium smear samples were collected in Area AH East (seven per survey unit, with the exception of 771043, which encompasses upper walls/ceiling surfaces only), in accordance with the PDSP and the *Beryllium Characterization Procedure*, PRO-536-BCPR, Revision 0, September 9, 1999.

All beryllium smear sample results were less than the investigative limit of 0.1 $\mu\text{g}/100\text{cm}^2$. PDS beryllium laboratory sample data and location maps are contained in Attachment H, *Chemical Data Summaries and Sample Maps*.

4.3 RCRA/CERCLA Constituents [including metals and volatile organic compounds (VOCs)]

Based upon the *B771 and B774 Hazards Characterization Report, 771 Closure Project*, Revision 0, dated June 12, 2001, personnel interviews, facility walk-downs, and historical process knowledge (WSRIC/WEMS), the Area AH East did not contain hazardous waste storage units. A visual inspection of the building by 771/774 Industrial Hygiene personnel verified the absence of hazardous waste residuals and/or stains on the floor/concrete slab, walls, or ceiling. As a result of these observances, it has been determined that no sampling for RCRA/CERCLA constituents is required. The concrete generated from the demolition of the areas included in the scope of this report can be used for onsite recycling in accordance with the Concrete Recycling RSOP.

4.4 Polychlorinated Biphenyls (PCBs)

Based on historical knowledge, personnel interviews, and 771/774 Environmental Compliance Personnel walk-downs, Area AH East never used/transferred free flowing/exposed PCB's. At one time the facility may have used PCB ballasts in its fluorescent light fixtures, however, all of these have been removed, and compliantly disposed of, resulting in no impact on demolition activities in this area.

Per the *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, PCBs are present in some applied paints (i.e., on several walls and floors within the B771 and B774 Contamination Areas). However, any painted debris that is not disposed of as radiological waste will be recycled on-site, therefore does not require additional sampling to quantify levels of PCBs.

5 PHYSICAL HAZARDS

Physical hazards associated with Area AH East are common to standard industrial environments. Several large floor penetrations exist that have been covered with steel plates (following survey) to avoid fall hazards. In addition, auxiliary lighting is required for access to the area. The facility has been relatively well maintained and is in good physical condition, therefore, does not present hazards associated with building deterioration.

Physical hazards are controlled by the Site Occupational Safety and Industrial Hygiene Program, which is based on OSHA regulations, DOE orders, and standard industry practices.

6 DATA QUALITY ASSESSMENT

Data used in making management decisions for decommissioning of Area AH East, and consequent waste management, is of adequate quality to support the decisions documented in this report. The data presented in this report (Attachments B, C, D, E, F, and G) were verified and validated relative to MAN-127-PDSP, Pre-Demolition Survey Plan for D&D Facilities, and original project DQOs.

In summary, the Verification and Validation (V&V) process corroborates that the following elements of the characterization process are adequate:

- ◆ the *number* of samples and surveys;
- ◆ the *types* of samples and surveys;
- ◆ the sampling/survey process as implemented "in the field"; and
- ◆ the laboratory analytical process, relative to accuracy and precision considerations.

Details of the DQA are presented in Attachment I. The DQA Checklists are provided in the individual survey unit packages (located in the Building 771 Characterization Files).

The Minimum Detectable Activity (MDA) for each PDS instrument was determined *a priori* based on typical parameters (background, efficiency, and count time). A list of radiological field instrumentation and associated sensitivities is presented in Table I.

Table 1
PDS Radiological Field Instrumentation and Minimum Detectable Activities

Model	Measurement Type	MDA (dpm/100 cm ²)
NE Electra DP6	TSA	48
Eberline SAC-4	Removable (Smears)	10
NE Electra AP6	Scans	300

7 DECOMMISSIONING WASTE TYPES

The demolition and disposal of Area AH East will generate a variety of wastes. Structural surfaces exist within 6' of final grade that do not meet unrestricted release limits shall be packaged as radiological waste. These areas shall be delineated with blue paint and yellow fixative, such that they can be easily identified during demolition for segregation and packaging.

The remaining concrete within 6' of final grade can be used as backfill onsite in accordance with the RFCA RSOP for Recycling Concrete. The portions of the structure that exist beneath the 6' grade line can remain in place given that they meet the established limits (less than 100 nCi/g at the surface and less than 7 nCi/g over the volume of concrete). Any equipment items removed (piping, plenums, etc.) will be packaged as radiological waste. Any area that does not meet unrestricted release limits shall be covered with fixative to prevent the release of contamination during demolition activities.

The estimated volume of radiological waste to be generated for this area is 1800 cubic yards. This includes any remaining equipment items, concrete that does not meet the unrestricted release limits, and rebar.

8 FACILITY CLASSIFICATION AND CONCLUSIONS

Based on the analysis of radiological, chemical and physical hazards, Area AH East is classified as an RFCA Type 3 facility pursuant to the RFETS Decommissioning Program Plan (DPP; K-H, 1999). Based upon the results of this PDSR, portions of the Area AH East structure meet the unrestricted release limits specified in the site Pre-Demolition Survey Plan and is ready for demolition. Areas that are marked in red in Attachments B, D, and E do not meet unrestricted release limits and will be packaged as radiological waste during demolition. The structural surfaces in Area AH that exist beneath the 6' grade line meet the established limits (less than 100 nCi/g at the surface and less than 7 nCi/g over the volume of concrete) therefore can remain in place (refer to Attachment K). The PDS for Area AH (East) was performed in accordance with the DDCP and PDSP, all PDSP DQOs were met, and all data satisfied the PDSP DQA criteria.

A facility walkdown and historical review indicates that no RCRA/CERCLA constituents exist in Area AH East (refer to Attachment J, Historical Review). Any painted debris generated during demolition will be recycled on-site or disposed of as radiological waste.

Radiological contamination in excess of the PDSP Table 7-1 limits was not detected in Area AH East (with the exception of the areas in red on maps in Attachments B, C, D, E, F, and G). The applicable limits are as follows:

Table 2
PDSP Table 7-1 Surface Contamination Limits

Radionuclides	Total Average (dpm/100 cm ²) ⁽¹⁾ (DCGL _W)	Total Maximum (dpm/100 cm ²) ⁽²⁾ (DCGL _{EMC})	Removable (dpm/100 cm ²) (DCGL _W)
Transuranics	100	300	20

(1) Measurements of average contamination should not be averaged over an area of more than 1 m².

(2) The maximum contamination level applies to an area of not more than 100 cm².

Based upon this PDSR, portions of Area AH (East) can be demolished and concrete can be used for backfill on-site per the RFCA RSOP for Recycling Concrete. The areas shaded in red in Attachments B, D, and E do not meet unrestricted release limits and shall be covered with fixative and packaged as radiological waste during demolition. The portions of the structure that exist beneath the 6' grade line can remain in place because they meet the established limits (less than 100 nCi/g at the surface and less than 7 nCi/g over the volume of concrete). These areas have also been covered with fixative to prevent the release of contamination during demolition activities.

No removable contamination in excess of the unrestricted release limits (20 dpm/100 cm²) exists in Area AH (East). No beryllium contamination has been detected above the action level in Area AH (East). In addition, radiological controls shall be in place during demolition to assure there is no release of contamination. These controls shall include the use of water and fixative for dust suppression, air sampling, and continuous RCT coverage. Air sampling shall include localized low-volume air monitors within the demolition zone and lapel air samplers for appropriate operators and support personnel.

The contaminated surfaces (i.e., painted surfaces within 6' of final grade) will be carefully removed during demolition activities. A bright-colored fixative will be used to allow for visible detection of these areas by operators and waste personnel. In the event painted debris becomes mixed with the areas of concrete that have been free-released, these portions will be dispositioned as radiological waste to the extent practicable (i.e., all debris where paint is visible and any areas where contaminated concrete may have mixed with areas of concrete that have been free-released). All attempts will be made to minimize mixing of clean and contaminated concrete during demolition.

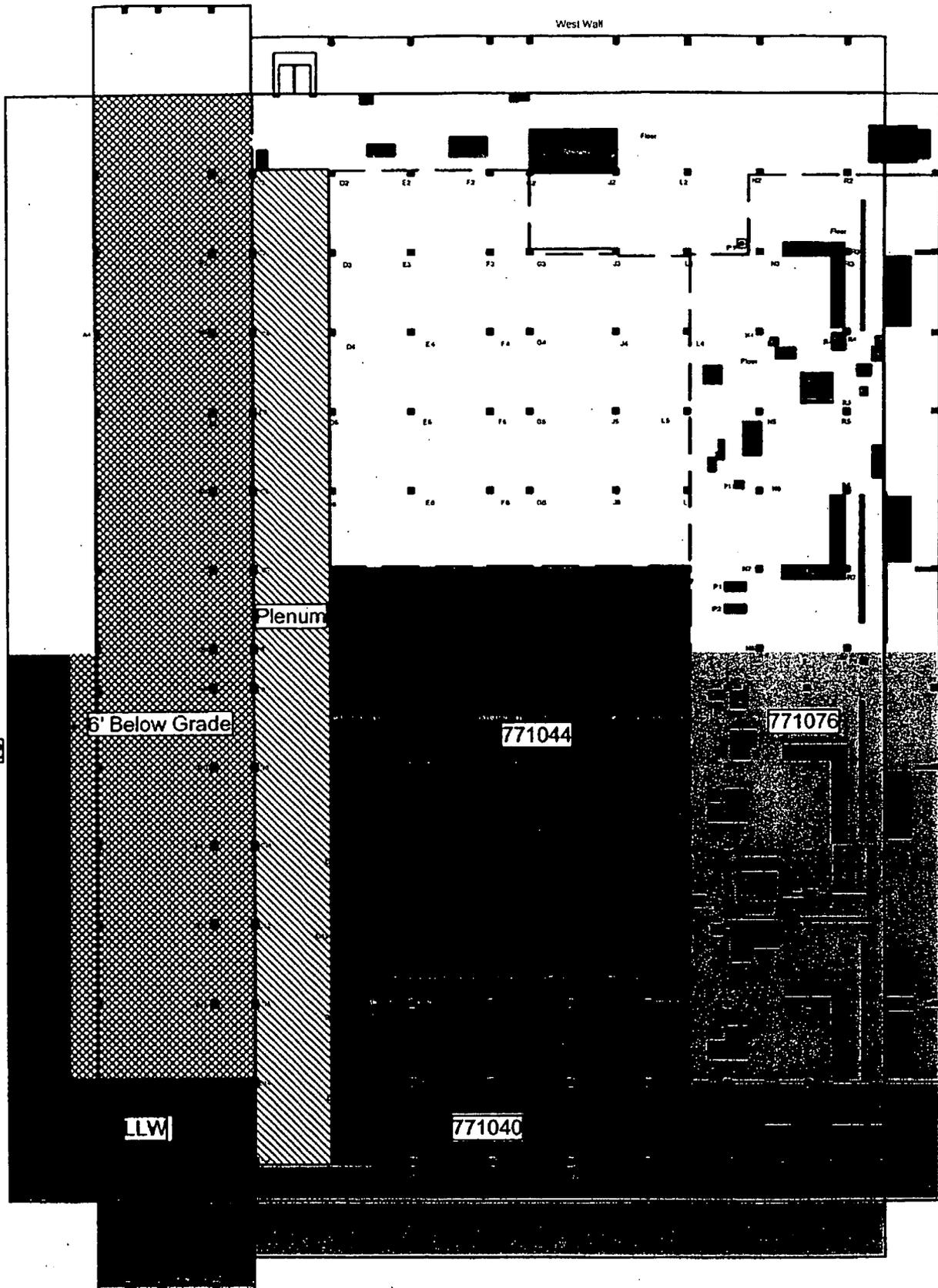
To ensure that the facility remains free of contamination and that PDS data remain valid, Level 1 isolation controls have been established.

9 REFERENCES

- B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.
- DOE/RFFO, CDPHE, EPA, 1996. *Rocky Flats Cleanup Agreement (RFCA)*, July 19, 1996.
- DOE Order 5400.5, *Radiation Protection of the Public and the Environment*
- DOE Order 414.1A, *Quality Assurance*.
- EPA, 1994. *The Data Quality Objective Process*, EPA QA/G-4.
- K-H, 1999. *Decommissioning Program Plan*, June 21, 1999.
- MAN-131-QAPM, *Kaiser-Hill Team Quality Assurance Program*, Rev. 1, November 1, 2001.
- MAN-076-FDPM, *Facility Disposition Program Manual*, Rev. 3, January 1, 2002.
- MAN-077-DDCP, *Decontamination and Decommissioning Characterization Protocol*, Rev. 4, July 15, 2002.
- MAN-127-PDSP, *Pre-Demolition Survey Plan for D&D Facilities*, Rev. 1, July 15, 2002.
- MARSSIM - *Multi-Agency Radiation Survey and Site Investigation Manual* (NUREG-1575, EPA 402-R-97-016).
- PRO-475-RSP-16.01, *Radiological Survey/Sampling Package Design, Preparation, Control, Implementation, and Closure*, Rev. 1, May 22, 2001.
- PRO-476-RSP-16.02, *Pre-Demolition (Final Status) Radiological Surveys of Surfaces and Structures*, Rev. 2, March 10, 2003.
- PRO-477-RSP-16.03, *Radiological Samples of Building Media*, Rev. 1, May 22, 2001.
- PRO-478-RSP-16.04, *Radiological Survey/Sample Data Analysis for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-479-RSP-16.05, *Radiological Survey/Sample Quality Control for Final Status Survey*, Rev. 1, May 22, 2001.
- PRO-563-ACPR, *Asbestos Characterization Procedure*, Revision 0, August 24, 1999.
- PRO-536-BCPR, *Beryllium Characterization Procedure*, Revision 0, August 24, 1999.
- RFETS, Environmental Waste Compliance Guidance #25, Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition.*
- RFETS, Environmental Waste Compliance Guidance #27, Lead-Based Paint (LBP) and Lead-Based Paint Debris Disposal.*
- RFETS, RFCA RSOP for Recycling Concrete*, September 28, 1999

ATTACHMENT A

Survey Unit Overview Map



ATTACHMENT B

Survey Unit 771040
Radiological Data Summary and Survey Map

Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 82 Nbr Biased Measurements Required: 0 Nbr QC Required: 5
Nbr Random Measurements Performed: 82 Nbr Biased Measurements Performed: 0 Nbr QC Performed: 5

Alpha

Maximum:	94.8 dpm/100cm ²
Minimum:	-2.0 dpm/100cm ²
Mean:	33.1 dpm/100cm ²
Standard Deviation:	19.8
QC Maximum:	80.3 dpm/100cm ²
QC Minimum:	31.2 dpm/100cm ²
QC Mean:	53.7 dpm/100cm ²
Transuranic DCGL _w :	100.0 dpm/100cm ²
Transuranic DCGL _{BMC} :	300.0 dpm/100cm ²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 82 Nbr Biased Measurements Required: 0
Nbr Random Measurements Performed: 82 Nbr Biased Measurements Performed: 0

Alpha

Maximum:	12.9 dpm/100cm ²
Minimum:	-1.2 dpm/100cm ²
Mean:	2.2 dpm/100cm ²
Standard Deviation:	2.5
Transuranic DCGL _w :	20.0 dpm/100cm ²

Media Sample Results

Nbr Random Required: 0 Nbr Biased Required: 0
Nbr Random Collected: 0 Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AH Survey Unit: 771040 Building: 771

Description: Bldg. 771 2nd floor (East end)

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
21	541020	08/12/04	Electra	1262	DP-6	11/24/04	0.232	NA	48.0	NA	T
22	541020	08/12/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
23	541020	08/12/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
24	541020	08/12/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
25	541020	08/12/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
26	541020	08/12/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R
27	514979	08/12/04	Electra	2382	DP-6	01/24/05	0.230	NA	48.0	NA	T
28	516635	08/13/04	Electra	2382	DP-6	01/24/05	0.230	NA	48.0	NA	Q
29	514979	08/13/04	Electra	2382	DP-6	01/24/05	0.230	NA	48.0	NA	T
30	514979	08/13/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
31	514979	08/13/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
32	514979	08/13/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
33	514979	08/13/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
34	514979	08/20/04	Electra	2385	DP-6	12/01/04	0.220	NA	48.0	NA	T
35	514979	08/20/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
36	514979	08/20/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

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Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N001	22	8.4	N/A	
771040PRP-N002	23	-0.6	N/A	
771040PRP-N003	35	-0.9	N/A	
771040PRP-N004	36	1.8	N/A	
771040PRP-N005	30	2.1	N/A	
771040PRP-N006	31	3.6	N/A	
771040PRP-N007	32	-0.6	N/A	
771040PRP-N008	33	0.3	N/A	
771040PRP-N009	30	3.6	N/A	
771040PRP-N010	31	2.1	N/A	
771040PRP-N011	35	2.1	N/A	
771040PRP-N012	22	0.9	N/A	
771040PRP-N013	23	-0.6	N/A	
771040PRP-N014	24	2.4	N/A	
771040PRP-N015	25	-0.6	N/A	
771040PRP-N016	26	-0.6	N/A	
771040PRP-N017	22	3.9	N/A	
771040PRP-N018	23	5.4	N/A	
771040PRP-N019	24	-0.6	N/A	
771040PRP-N020	25	2.4	N/A	
771040PRP-N021	26	2.4	N/A	
771040PRP-N022	22	0.9	N/A	
771040PRP-N023	23	-0.6	N/A	
771040PRP-N024	24	0.9	N/A	
771040PRP-N025	25	2.4	N/A	
771040PRP-N026	36	1.8	N/A	
771040PRP-N027	35	0.6	N/A	
771040PRP-N028	36	-1.2	N/A	
771040PRP-N029	35	3.6	N/A	

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Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N030	32	5.4	N/A	
771040PRP-N031	33	0.3	N/A	
771040PRP-N032	30	3.6	N/A	
771040PRP-N033	36	0.3	N/A	
771040PRP-N034	35	2.1	N/A	
771040PRP-N035	36	-1.2	N/A	
771040PRP-N036	25	12.9	N/A	
771040PRP-N037	35	0.6	N/A	
771040PRP-N038	22	6.9	N/A	
771040PRP-N039	23	2.4	N/A	
771040PRP-N040	24	2.4	N/A	
771040PRP-N041	25	0.9	N/A	
771040PRP-N042	26	2.4	N/A	
771040PRP-N043	30	-0.9	N/A	
771040PRP-N044	31	0.6	N/A	
771040PRP-N045	32	2.4	N/A	
771040PRP-N046	33	0.3	N/A	
771040PRP-N047	30	3.6	N/A	
771040PRP-N048	31	0.6	N/A	
771040PRP-N049	32	2.4	N/A	
771040PRP-N050	33	4.8	N/A	
771040PRP-N051	30	2.1	N/A	
771040PRP-N052	31	0.6	N/A	
771040PRP-N053	32	0.9	N/A	
771040PRP-N054	33	1.8	N/A	
771040PRP-N055	30	2.1	N/A	
771040PRP-N056	31	0.6	N/A	
771040PRP-N057	32	5.4	N/A	
771040PRP-N058	33	3.3	N/A	

Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N059	30	3.6	N/A	
771040PRP-N060	31	2.1	N/A	
771040PRP-N061	32	0.9	N/A	
771040PRP-N062	33	-1.2	N/A	
771040PRP-N063	30	0.6	N/A	
771040PRP-N064	31	8.1	N/A	
771040PRP-N065	32	5.4	N/A	
771040PRP-N066	33	3.3	N/A	
771040PRP-N067	30	0.6	N/A	
771040PRP-N068	31	3.6	N/A	
771040PRP-N069	32	2.4	N/A	
771040PRP-N070	33	4.8	N/A	
771040PRP-N071	30	3.6	N/A	
771040PRP-N072	31	0.6	N/A	
771040PRP-N073	33	1.8	N/A	
771040PRP-N074	32	-0.6	N/A	
771040PRP-N075	33	0.3	N/A	
771040PRP-N076	30	3.6	N/A	
771040PRP-N077	31	5.1	N/A	
771040PRP-N078	32	6.9	N/A	
771040PRP-N079	33	4.8	N/A	
771040PRP-N080	30	3.6	N/A	
771040PRP-N081	31	0.6	N/A	
771040PRP-N082	32	-0.6	N/A	

Comments:

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Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N001	21	34.4	N/A	
771040QRP-N001	28	31.2	N/A	
771040PRP-N002	21	20.2	N/A	
771040PRP-N003	34	61.6	N/A	
771040PRP-N004	34	18.9	N/A	
771040PRP-N005	27	17.4	N/A	
771040PRP-N006	27	14.8	N/A	
771040PRP-N007	27	11.8	N/A	
771040PRP-N008	27	23.5	N/A	
771040PRP-N009	27	17.4	N/A	
771040PRP-N010	27	49.6	N/A	
771040PRP-N011	34	58.4	N/A	
771040PRP-N012	21	60.3	N/A	
771040QRP-N012	28	45.5	N/A	
771040PRP-N013	21	46.0	N/A	
771040QRP-N013	28	80.3	N/A	
771040PRP-N014	21	68.9	N/A	
771040QRP-N014	28	54.2	N/A	
771040PRP-N015	21	51.6	N/A	
771040PRP-N016	21	66.3	N/A	
771040PRP-N017	21	8.5	N/A	
771040PRP-N018	21	25.8	N/A	
771040PRP-N019	21	17.2	N/A	
771040PRP-N020	21	40.4	N/A	
771040QRP-N020	28	57.3	N/A	
771040PRP-N021	21	8.5	N/A	
771040PRP-N022	21	54.7	N/A	

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Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N023	21	46.0	N/A	
771040PRP-N024	21	25.8	N/A	
771040PRP-N025	21	10.3	N/A	
771040PRP-N026	34	-2.0	N/A	
771040PRP-N027	34	40.2	N/A	
771040PRP-N028	34	28.0	N/A	
771040PRP-N029	34	85.7	N/A	
771040PRP-N030	27	52.2	N/A	
771040PRP-N031	27	43.5	N/A	
771040PRP-N032	27	43.5	N/A	
771040PRP-N033	34	25.2	N/A	
771040PRP-N034	34	34.3	N/A	
771040PRP-N035	34	52.5	N/A	
771040PRP-N036	21	37.4	N/A	
771040PRP-N037	34	94.8	N/A	
771040PRP-N038	21	34.4	N/A	
771040PRP-N039	21	11.6	N/A	
771040PRP-N040	21	8.5	N/A	
771040PRP-N041	21	23.2	N/A	
771040PRP-N042	21	17.2	N/A	
771040PRP-N043	27	29.2	N/A	
771040PRP-N044	27	43.5	N/A	
771040PRP-N045	29	40.9	N/A	
771040PRP-N046	27	60.9	N/A	
771040PRP-N047	29	26.1	N/A	
771040PRP-N048	27	6.1	N/A	
771040PRP-N049	29	29.2	N/A	

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Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N050	27	32.2	N/A	
771040PRP-N051	27	43.5	N/A	
771040PRP-N052	27	17.4	N/A	
771040PRP-N053	29	34.8	N/A	
771040PRP-N054	27	14.8	N/A	
771040PRP-N055	27	8.7	N/A	
771040PRP-N056	27	20.5	N/A	
771040PRP-N057	27	37.9	N/A	
771040PRP-N058	27	69.6	N/A	
771040PRP-N059	27	58.3	N/A	
771040PRP-N060	27	34.8	N/A	
771040PRP-N061	27	29.2	N/A	
771040PRP-N062	27	11.8	N/A	
771040PRP-N063	27	17.4	N/A	
771040PRP-N064	27	26.1	N/A	
771040PRP-N065	27	6.1	N/A	
771040PRP-N066	27	17.4	N/A	
771040PRP-N067	27	32.2	N/A	
771040PRP-N068	27	43.5	N/A	
771040PRP-N069	27	55.3	N/A	
771040PRP-N070	27	26.1	N/A	
771040PRP-N071	27	23.5	N/A	
771040PRP-N072	27	26.1	N/A	
771040PRP-N073	27	6.1	N/A	
771040PRP-N074	27	37.9	N/A	
771040PRP-N075	27	14.8	N/A	
771040PRP-N076	27	26.1	N/A	

Survey Area: AH

Survey Unit: 771040

Building: 771

Description: Bldg. 771 2nd floor (East end)

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771040PRP-N077	27	23.5	N/A	
771040PRP-N078	27	43.5	N/A	
771040PRP-N079	27	64.0	N/A	
771040PRP-N080	27	17.4	N/A	
771040PRP-N081	27	58.3	N/A	
771040PRP-N082	27	6.1	N/A	

Comments:

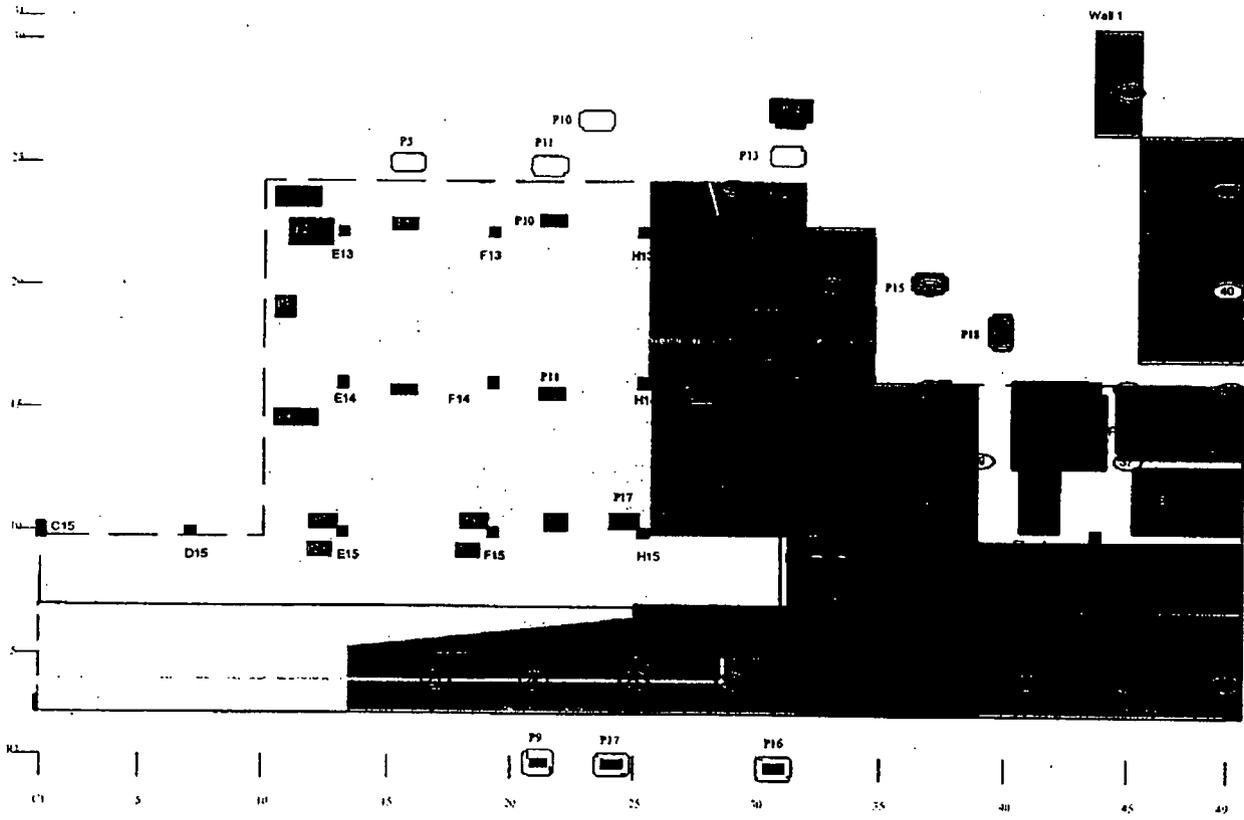
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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

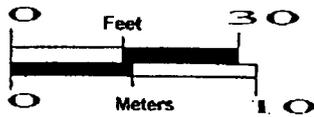
Survey Area: AM Survey Unit: 771040 Classification: 1
 Building: 771
 Survey Unit Description: 2nd floor (east end)

Total Floor Area: 541 sq. m Total Area: 1699 sq. m Grid Size: 4m x 4m

SURVEY UNIT 771040 - MAP 1 OF 3



	Scanned Area
	Hot Spots
	Fixative
	Fixative on ceiling below



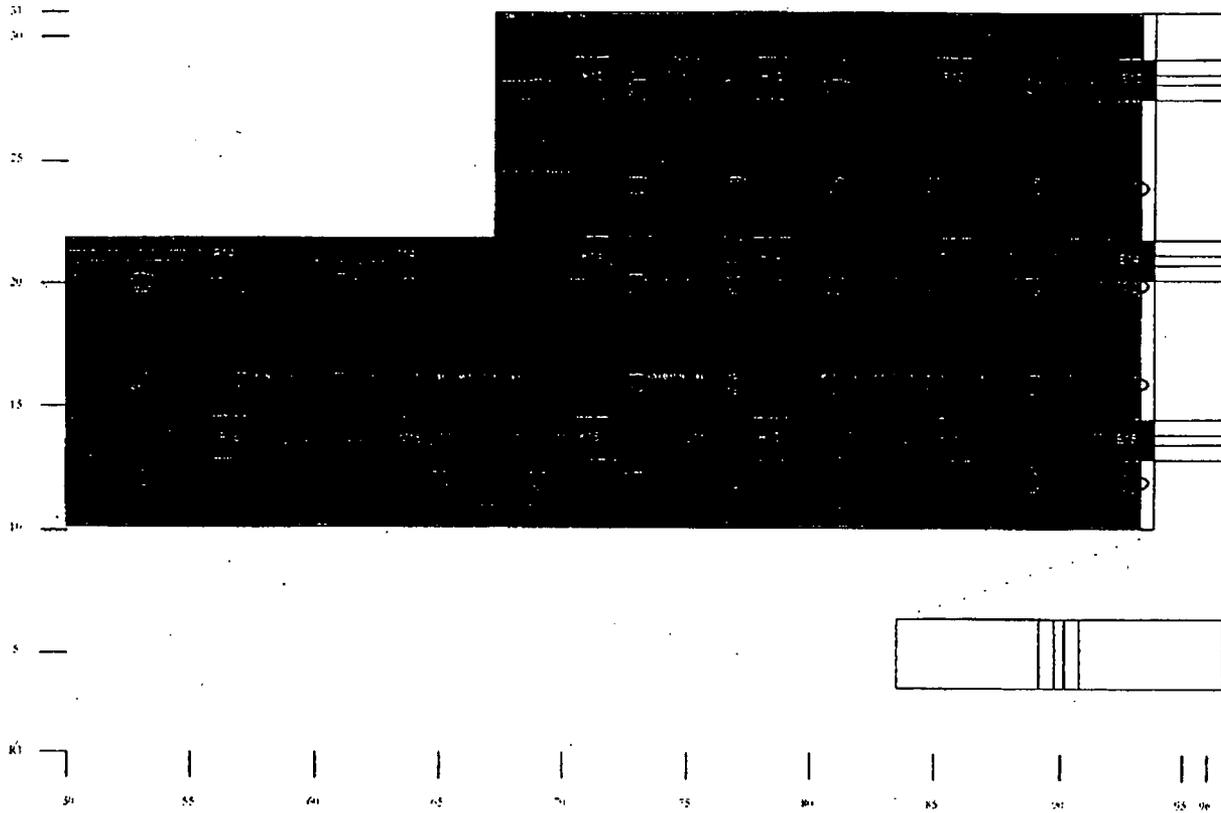
Survey Map Legend	
	Access and TSM Location
	Access, TSA and Sample Location
	Open/Removable Area
	Below Floor Grate

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

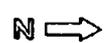
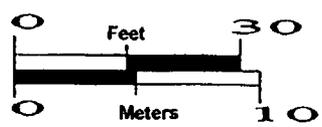
Survey Area: AH Survey Unit: 771040 Classification: 1
 Building: 771
 Survey Unit Description: 2nd floor (east end)
 Total Floor Area: 541 sq. m Total Area: 1699 sq. m Grid Size: 4m x 4m

SURVEY UNIT 771040 - MAP 2 OF 3

Ceiling
(inverted)



	Scanned Area
	Hot Spots
	Fixture



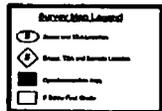
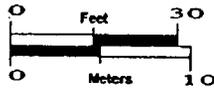
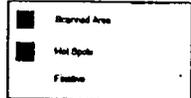
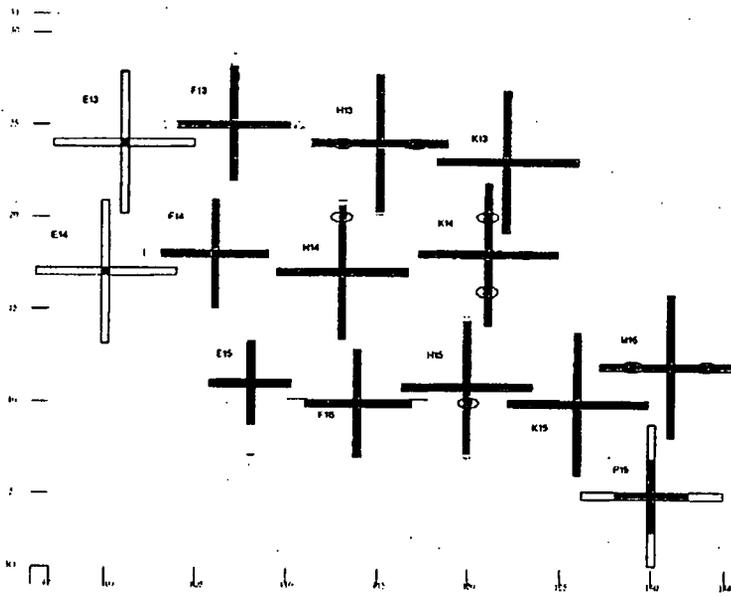
Survey Map Legend	
	Scrape and TBA Location
	Scrape, TBA and Sample Location
	Obstructed Area
	4 Meter Fixed Grid

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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771040 Classification: 1
 Building: 771
 Survey Unit Description: 2nd floor (east end)
 Total Floor Area: 541 sq. m Total Area: 1699 sq. m Grid Size: 4m x 4m

SURVEY UNIT 771040 - MAP 3 OF 3



ATTACHMENT C

Survey Unit 771042
Radiological Data Summary and Survey Map

Survey Area: AH

Survey Unit: 771042

Building: 771

Description: 2nd Floor (Room 283 Upper Walls and Ceiling East Side)

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 16

Nbr Biased Measurements Performed: 0

Nbr QC Performed: 2

Alpha

Maximum:	90.5 dpm/100cm ²
Minimum:	9.9 dpm/100cm ²
Mean:	45.1 dpm/100cm ²
Standard Deviation:	25.1
QC Maximum:	89.5 dpm/100cm ²
QC Minimum:	47.6 dpm/100cm ²
QC Mean:	68.6 dpm/100cm ²
Transuranic DCGLW:	100.0 dpm/100cm ²
Transuranic DCGLMC:	300.0 dpm/100cm ²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 16

Nbr Biased Measurements Performed: 0

Alpha

Maximum:	1.2 dpm/100cm ²
Minimum:	-1.8 dpm/100cm ²
Mean:	-0.3 dpm/100cm ²
Standard Deviation:	1.1
Transuranic DCGLW:	20.0 dpm/100cm ²

Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AH

Survey Unit: 771042

Building: 771

Description: 2nd Floor (Room 283 Upper Walls and Ceiling East Side)

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	511760	08/15/04	Electra	1262	DP-6	11/24/04	0.232	NA	48.0	NA	T
2	516572	08/15/04	Electra	1551	DP-6	12/21/04	0.224	NA	48.0	NA	Q
3	516572	08/15/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	NA	R
4	516572	08/15/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	NA	R
5	516572	08/15/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	NA	R
6	514979	08/16/04	Electra	1262	DP-6	11/24/04	0.232	NA	48.0	NA	T
7	514979	08/16/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	NA	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

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Survey Area: AH

Survey Unit: 771042

Building: 771

Description: 2nd Floor (Room 283 Upper Walls and Ceiling East Side)

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771042PRP-N001	3	-1.8	N/A	
771042PRP-N002	4	0.9	N/A	
771042PRP-N003	5	-0.3	N/A	
771042PRP-N004	3	-0.3	N/A	
771042PRP-N005	4	0.9	N/A	
771042PRP-N006	7	1.2	N/A	
771042PRP-N007	5	-1.8	N/A	
771042PRP-N008	3	-1.8	N/A	
771042PRP-N009	4	-0.6	N/A	
771042PRP-N010	5	-0.3	N/A	
771042PRP-N011	3	-1.8	N/A	
771042PRP-N012	4	-0.6	N/A	
771042PRP-N013	7	-0.3	N/A	
771042PRP-N014	7	1.2	N/A	
771042PRP-N015	5	1.2	N/A	
771042PRP-N016	5	-0.3	N/A	

Comments:

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Survey Area: AH

Survey Unit: 771042

Building: 771

Description: 2nd Floor (Room 283 Upper Walls and Ceiling East Side)

Random/QC Total Surface Activity Data Sheet

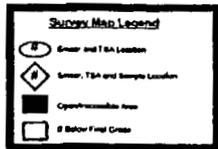
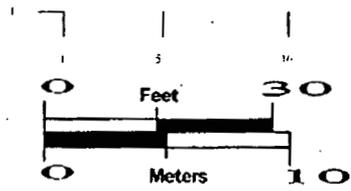
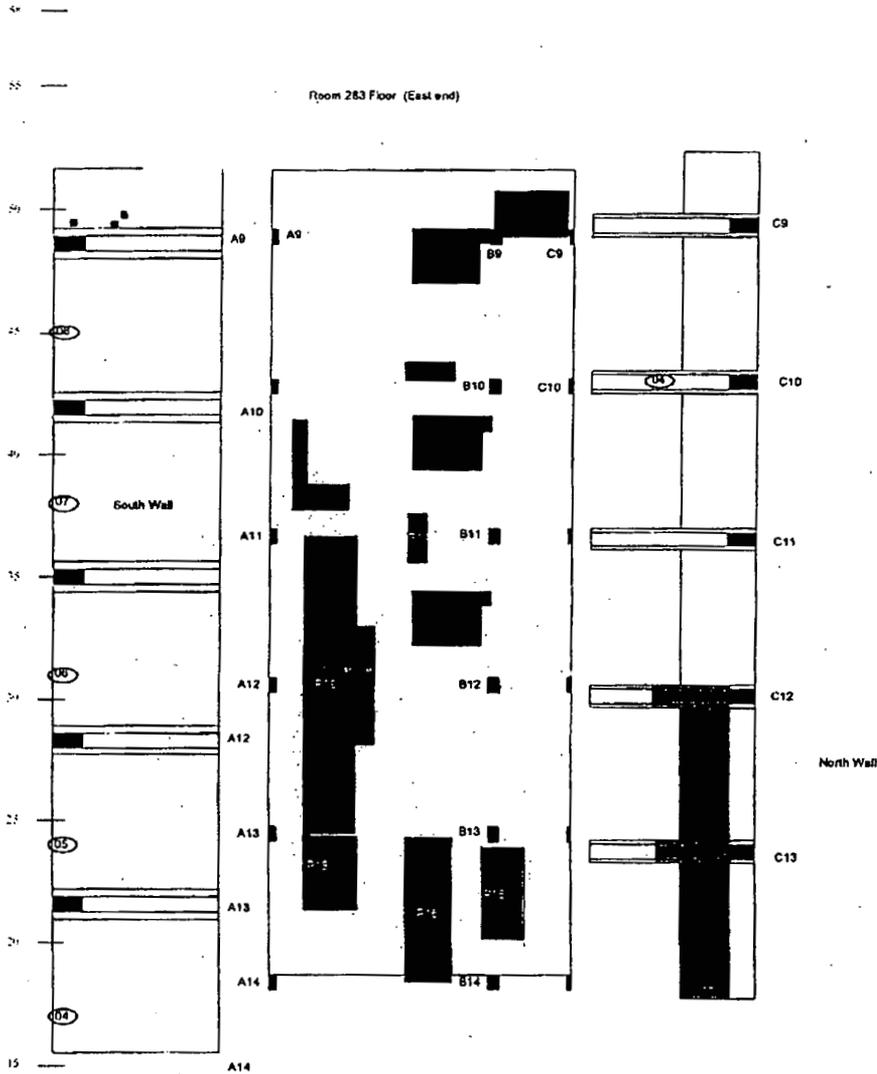
Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771042PRP-N001	1	35.8	N/A	
771042QRP-N001	2	47.6	N/A	
771042PRP-N002	1	24.6	N/A	
771042PRP-N003	1	90.5	N/A	
771042QRP-N003	2	89.5	N/A	
771042PRP-N004	1	59.1	N/A	
771042PRP-N005	6	81.9	N/A	
771042PRP-N006	1	30.2	N/A	
771042PRP-N007	1	38.8	N/A	
771042PRP-N008	1	50.5	N/A	
771042PRP-N009	1	35.8	N/A	
771042PRP-N010	1	30.2	N/A	
771042PRP-N011	1	9.9	N/A	
771042PRP-N012	1	18.6	N/A	
771042PRP-N013	6	70.3	N/A	
771042PRP-N014	6	84.9	N/A	
771042PRP-N015	1	38.8	N/A	
771042PRP-N016	1	21.6	N/A	

Comments:

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771042 Classification: 2
 Building: 771
 Survey Unit Description: 2nd Floor (Room 283 upper walls and ceiling east side)
 Total Floor Area: N/A Total Area: 787 sq. m Grid Size: 7 m x 7 m

SURVEY UNIT 771042 - MAP 1 OF 3

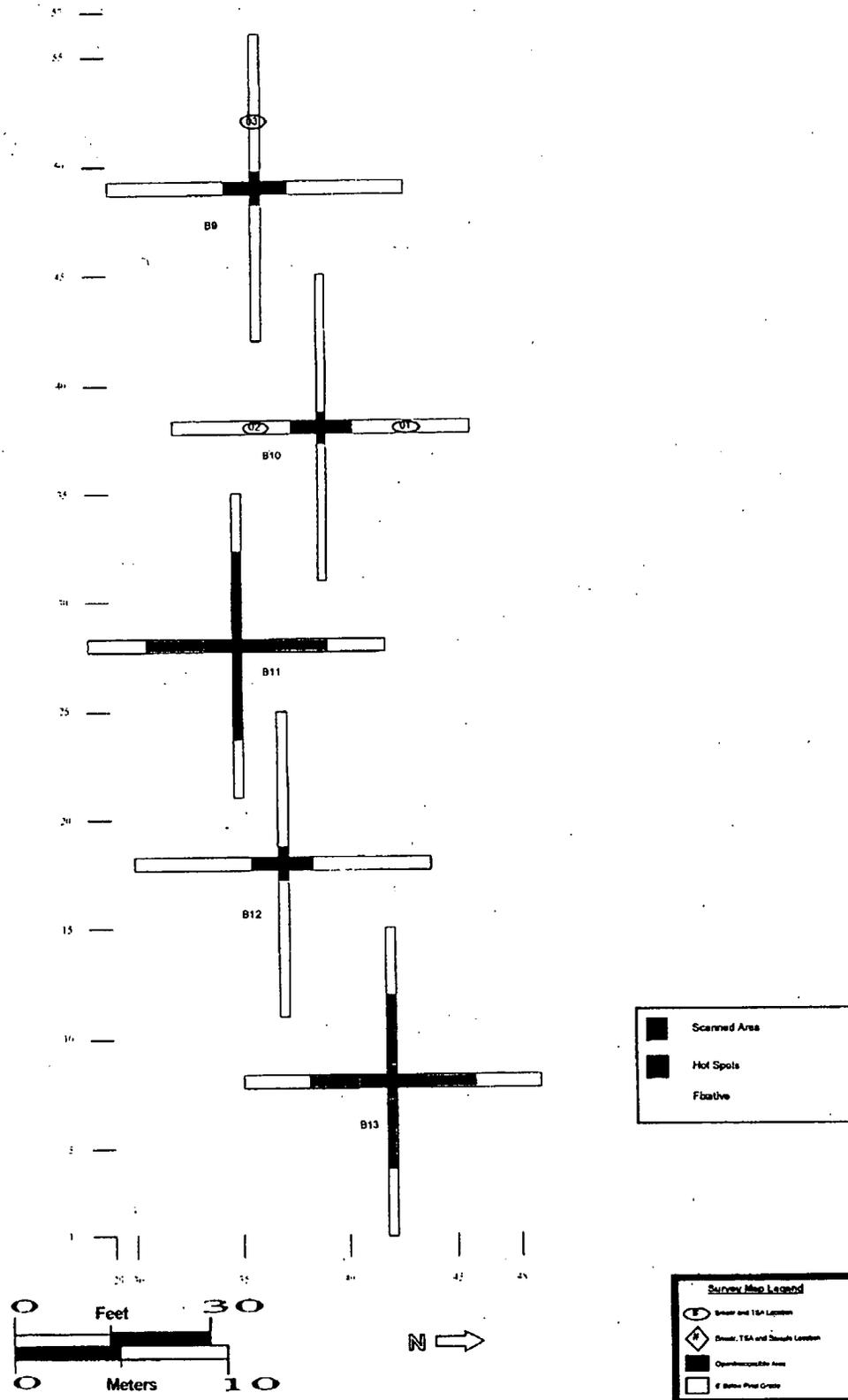


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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771042 Classification: 2
Building: 771
Survey Unit Description: 2nd Floor (Room 283 upper walls and ceiling east side)
Total Floor Area: N/A Total Area: 787 sq. m Grid Size: 7 m x 7 m

SURVEY UNIT 771042 - MAP 2 OF 3

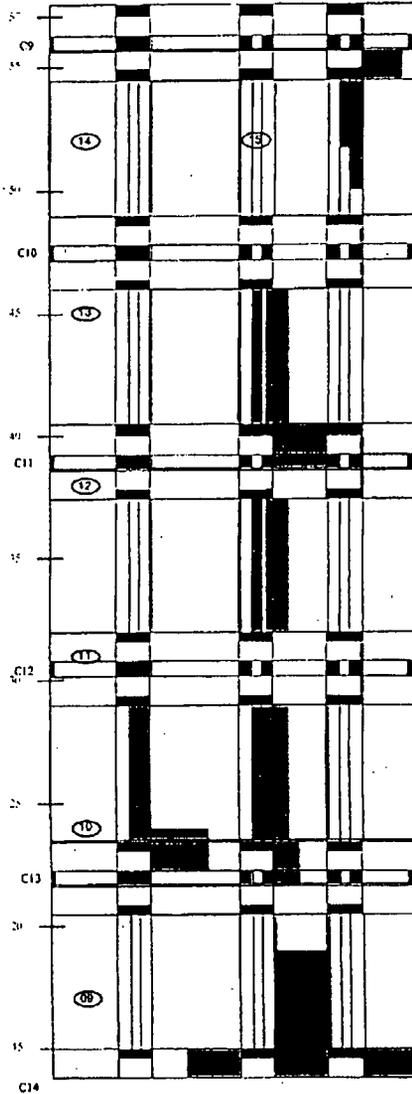


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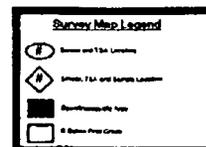
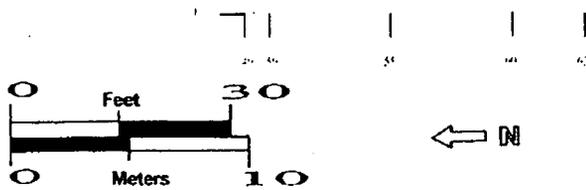
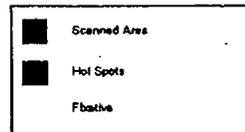
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771042 Classification: 2
 Building: 771
 Survey Unit Description: 2nd Floor (Room 283 upper walls and ceiling east side)
 Total Floor Area: N/A Total Area: 787 sq. m Grid Size: 7m x 7m

SURVEY UNIT 771042 - MAP 3 OF 3



283 East Ceiling
(inverted)



ATTACHMENT D

Survey Unit 771044
Radiological Data Summary and Survey Map

Survey Area: AH Survey Unit: 771044 Building: 771

Description: 2nd Floor AH Room 249 East

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 129 Nbr Biased Measurements Required: 0 Nbr QC Required: 7
Nbr Random Measurements Performed: 129 Nbr Biased Measurements Performed: 0 Nbr QC Performed: 7

Alpha	
Maximum:	86.8 dpm/100cm ²
Minimum:	-2.4 dpm/100cm ²
Mean:	35.4 dpm/100cm ²
Standard Deviation:	19.8
QC Maximum:	56.7 dpm/100cm ²
QC Minimum:	13.7 dpm/100cm ²
QC Mean:	32.6 dpm/100cm ²
Transuranic DCGL _w :	100.0 dpm/100cm ²
Transuranic DCGL _{EMC} :	300.0 dpm/100cm ²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 129 Nbr Biased Measurements Required: 0
Nbr Random Measurements Performed: 129 Nbr Biased Measurements Performed: 0

Alpha	
Maximum:	5.7 dpm/100cm ²
Minimum:	-1.5 dpm/100cm ²
Mean:	0.3 dpm/100cm ²
Standard Deviation:	1.4
Transuranic DCGL _w :	20.0 dpm/100cm ²

Media Sample Results

Nbr Random Required: 0 Nbr Biased Required: 0
Nbr Random Collected: 0 Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
7	703970	07/26/04	Electra	1536	DP-6	12/22/04	0.218	NA	48.0	NA	T
18	513474	08/12/04	Electra	394	DP-6	12/04/04	0.225	NA	48.0	NA	T
19	510482	08/12/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
20	510482	08/12/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
21	510482	08/12/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
22	712563	08/13/04	Electra	1551	DP-6	12/21/04	0.224	NA	48.0	NA	T
23	712563	08/13/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
24	712563	08/13/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
25	712563	08/13/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
26	712563	08/13/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
27	712563	08/13/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R
28	510482	08/13/04	Electra	1262	DP-6	11/24/04	0.232	NA	48.0	NA	T
29	513474	08/14/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
30	513474	08/14/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
31	513474	08/14/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
32	513474	08/14/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
33	513474	08/14/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R
34	712563	08/14/04	Electra	1236	DP-6	08/17/04	0.219	NA	48.0	NA	Q
35	513474	08/16/04	Electra	394	DP-6	12/04/04	0.225	NA	48.0	NA	T
36	712563	08/16/04	Electra	1551	DP-6	12/21/04	0.224	NA	48.0	NA	T
37	712563	08/16/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
38	712563	08/16/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
39	712563	08/16/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
40	712563	08/16/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
41	712563	08/16/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R
42	703970	08/20/04	Electra	1262	DP-6	11/24/04	0.232	NA	48.0	NA	T
43	712563	08/20/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
44	712563	08/20/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
45	712563	08/20/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
46	712563	08/20/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
47	712563	08/20/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

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Page: 2 of 13

Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N001	46	-0.6	N/A	
771044PRP-N002	44	-0.6	N/A	
771044PRP-N003	19	-1.2	N/A	
771044PRP-N004	20	0.9	N/A	
771044PRP-N005	21	-0.9	N/A	
771044PRP-N006	19	-1.2	N/A	
771044PRP-N007	20	-0.6	N/A	
771044PRP-N008	21	2.1	N/A	
771044PRP-N009	19	-1.2	N/A	
771044PRP-N010	20	-0.6	N/A	
771044PRP-N011	21	0.6	N/A	
771044PRP-N012	19	-1.2	N/A	
771044PRP-N013	20	-0.6	N/A	
771044PRP-N014	21	-0.9	N/A	
771044PRP-N015	19	1.8	N/A	
771044PRP-N016	20	-0.6	N/A	
771044PRP-N017	21	-0.9	N/A	
771044PRP-N018	19	1.8	N/A	
771044PRP-N019	20	-0.6	N/A	
771044PRP-N020	45	1.5	N/A	
771044PRP-N021	46	0.9	N/A	
771044PRP-N022	44	0.9	N/A	
771044PRP-N023	21	-0.9	N/A	
771044PRP-N024	19	0.3	N/A	
771044PRP-N025	20	-0.6	N/A	
771044PRP-N026	21	-0.9	N/A	
771044PRP-N027	19	-1.2	N/A	
771044PRP-N028	20	-0.6	N/A	
771044PRP-N029	21	2.1	N/A	

Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N030	19	-1.2	N/A	
771044PRP-N031	44	0.9	N/A	
771044PRP-N032	45	0.0	N/A	
771044PRP-N033	20	-0.6	N/A	
771044PRP-N034	47	-1.5	N/A	
771044PRP-N035	43	2.7	N/A	
771044PRP-N036	21	-0.9	N/A	
771044PRP-N037	19	-1.2	N/A	
771044PRP-N038	20	2.4	N/A	
771044PRP-N039	21	-0.9	N/A	
771044PRP-N040	43	-0.3	N/A	
771044PRP-N041	23	-0.9	N/A	
771044PRP-N042	24	0.6	N/A	
771044PRP-N043	25	-0.6	N/A	
771044PRP-N044	26	1.8	N/A	
771044PRP-N045	27	0.9	N/A	
771044PRP-N046	23	-0.9	N/A	
771044PRP-N047	44	-0.6	N/A	
771044PRP-N048	45	0.0	N/A	
771044PRP-N049	46	-0.6	N/A	
771044PRP-N050	23	-0.9	N/A	
771044PRP-N051	26	0.3	N/A	
771044PRP-N052	25	0.9	N/A	
771044PRP-N053	27	2.4	N/A	
771044PRP-N054	23	-0.9	N/A	
771044PRP-N055	24	-0.9	N/A	
771044PRP-N056	25	0.9	N/A	
771044PRP-N057	26	4.8	N/A	
771044PRP-N058	27	0.9	N/A	

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)
771044PRP-N059	24	0.6	N/A
771044PRP-N060	23	-0.9	N/A
771044PRP-N061	47	0.0	N/A
771044PRP-N062	43	5.7	N/A
771044PRP-N063	41	-1.2	N/A
771044PRP-N064	25	-0.6	N/A
771044PRP-N065	24	-0.9	N/A
771044PRP-N066	23	0.6	N/A
771044PRP-N067	31	1.8	N/A
771044PRP-N068	29	0.9	N/A
771044PRP-N069	30	-0.6	N/A
771044PRP-N070	31	-1.2	N/A
771044PRP-N071	32	4.2	N/A
771044PRP-N072	33	0.9	N/A
771044PRP-N073	29	2.4	N/A
771044PRP-N074	30	0.9	N/A
771044PRP-N075	31	-1.2	N/A
771044PRP-N076	32	-0.3	N/A
771044PRP-N077	33	-0.6	N/A
771044PRP-N078	29	-0.6	N/A
771044PRP-N079	30	-0.6	N/A
771044PRP-N080	31	3.3	N/A
771044PRP-N081	37	-0.3	N/A
771044PRP-N082	38	-0.3	N/A
771044PRP-N083	37	-0.3	N/A
771044PRP-N084	47	0.0	N/A
771044PRP-N085	32	1.2	N/A
771044PRP-N086	33	0.9	N/A
771044PRP-N087	29	0.9	N/A

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N088	30	0.9	N/A	
771044PRP-N089	31	1.8	N/A	
771044PRP-N090	32	-0.3	N/A	
771044PRP-N091	33	2.4	N/A	
771044PRP-N092	29	0.9	N/A	
771044PRP-N093	30	0.9	N/A	
771044PRP-N094	31	1.8	N/A	
771044PRP-N095	32	-0.3	N/A	
771044PRP-N096	39	3.0	N/A	
771044PRP-N097	43	-0.3	N/A	
771044PRP-N098	45	-1.5	N/A	
771044PRP-N099	46	0.9	N/A	
771044PRP-N100	45	-1.5	N/A	
771044PRP-N101	30	-0.6	N/A	
771044PRP-N102	31	0.3	N/A	
771044PRP-N103	32	1.2	N/A	
771044PRP-N104	33	-0.6	N/A	
771044PRP-N105	29	0.9	N/A	
771044PRP-N106	30	-0.6	N/A	
771044PRP-N107	31	1.8	N/A	
771044PRP-N108	32	-0.3	N/A	
771044PRP-N109	31	0.3	N/A	
771044PRP-N110	33	0.9	N/A	
771044PRP-N111	29	-0.6	N/A	
771044PRP-N112	30	-0.6	N/A	
771044PRP-N113	31	-1.2	N/A	
771044PRP-N114	44	-0.6	N/A	
771044PRP-N115	43	-0.3	N/A	
771044PRP-N116	47	0.0	N/A	

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N117	47	0.0	N/A	
771044PRP-N118	31	-1.2	N/A	
771044PRP-N119	32	-0.3	N/A	
771044PRP-N120	33	0.9	N/A	
771044PRP-N121	29	2.4	N/A	
771044PRP-N122	30	-0.6	N/A	
771044PRP-N123	31	-1.2	N/A	
771044PRP-N124	32	4.2	N/A	
771044PRP-N125	33	2.4	N/A	
771044PRP-N126	29	-0.6	N/A	
771044PRP-N127	30	-0.6	N/A	
771044PRP-N128	31	-1.2	N/A	
771044PRP-N129	32	4.2	N/A	

Comments:

Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N001	42	14.9	N/A	
771044PRP-N002	42	9.3	N/A	
771044PRP-N003	18	81.2	N/A	
771044PRP-N004	18	42.5	N/A	
771044PRP-N005	18	31.0	N/A	
771044PRP-N006	18	22.1	N/A	
771044PRP-N007	18	24.7	N/A	
771044PRP-N008	18	27.8	N/A	
771044PRP-N009	18	22.1	N/A	
771044PRP-N010	18	42.5	N/A	
771044PRP-N011	18	69.2	N/A	
771044PRP-N012	18	33.6	N/A	
771044PRP-N013	18	22.1	N/A	
771044PRP-N014	18	4.3	N/A	
771044PRP-N015	18	22.1	N/A	
771044PRP-N016	18	39.8	N/A	
771044PRP-N017	18	31.0	N/A	
771044PRP-N018	18	22.1	N/A	
771044PRP-N019	18	22.1	N/A	
771044PRP-N020	42	43.7	N/A	
771044PRP-N021	42	3.7	N/A	
771044PRP-N022	42	40.7	N/A	
771044PRP-N023	18	51.4	N/A	
771044PRP-N024	18	57.6	N/A	
771044PRP-N025	18	60.3	N/A	
771044PRP-N026	18	4.3	N/A	
771044PRP-N027	18	72.3	N/A	

Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N028	18	31.0	N/A	
771044PRP-N029	18	81.2	N/A	
771044PRP-N030	18	54.5	N/A	
771044PRP-N031	42	14.9	N/A	
771044PRP-N032	42	26.5	N/A	
771044PRP-N033	18	22.1	N/A	
771044PRP-N034	42	29.5	N/A	
771044PRP-N035	42	17.9	N/A	
771044PRP-N036	18	63.4	N/A	
771044PRP-N037	18	24.7	N/A	
771044PRP-N038	18	81.2	N/A	
771044PRP-N039	18	36.7	N/A	
771044PRP-N040	42	32.1	N/A	
771044PRP-N041	22	19.1	N/A	
771044QRP-N041	34	22.9	N/A	
771044PRP-N042	22	40.1	N/A	
771044PRP-N043	22	54.8	N/A	
771044PRP-N044	22	37.0	N/A	
771044QRP-N044	34	35.2	N/A	
771044PRP-N045	22	66.9	N/A	
771044PRP-N046	22	37.0	N/A	
771044PRP-N047	42	12.3	N/A	
771044PRP-N048	42	23.5	N/A	
771044PRP-N049	42	26.5	N/A	
771044PRP-N050	22	22.2	N/A	
771044PRP-N051	22	37.0	N/A	
771044PRP-N052	22	42.8	N/A	

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N053	22	42.8	N/A	
771044PRP-N054	22	42.8	N/A	
771044QRP-N054	34	38.4	N/A	
771044PRP-N055	22	40.1	N/A	
771044PRP-N056	22	22.2	N/A	
771044PRP-N057	22	24.9	N/A	
771044PRP-N058	22	37.0	N/A	
771044PRP-N059	22	42.8	N/A	
771044PRP-N060	22	33.8	N/A	
771044PRP-N061	42	46.8	N/A	
771044PRP-N062	42	38.1	N/A	
771044PRP-N063	36	7.1	N/A	
771044PRP-N064	22	54.8	N/A	
771044PRP-N065	22	63.8	N/A	
771044PRP-N066	22	66.9	N/A	
771044PRP-N067	28	20.9	N/A	
771044PRP-N068	28	40.7	N/A	
771044PRP-N069	28	3.7	N/A	
771044PRP-N070	28	6.2	N/A	
771044PRP-N071	28	32.1	N/A	
771044PRP-N072	28	55.4	N/A	
771044PRP-N073	28	17.9	N/A	
771044PRP-N074	28	9.3	N/A	
771044PRP-N075	28	26.5	N/A	
771044PRP-N076	28	14.9	N/A	
771044PRP-N077	28	14.9	N/A	
771044PRP-N078	28	17.9	N/A	

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N079	28	52.4	N/A	
771044PRP-N080	28	38.1	N/A	
771044PRP-N081	35	33.6	N/A	
771044PRP-N082	35	45.6	N/A	
771044PRP-N083	35	-0.2	N/A	
771044PRP-N084	42	35.1	N/A	
771044PRP-N085	28	32.1	N/A	
771044PRP-N086	28	78.2	N/A	
771044PRP-N087	28	23.5	N/A	
771044QRP-N087	34	32.0	N/A	
771044PRP-N088	28	23.5	N/A	
771044PRP-N089	28	17.9	N/A	
771044QRP-N089	34	13.7	N/A	
771044PRP-N090	28	38.1	N/A	
771044PRP-N091	28	9.3	N/A	
771044PRP-N092	28	38.1	N/A	
771044PRP-N093	28	20.9	N/A	
771044PRP-N094	28	35.1	N/A	
771044PRP-N095	28	20.9	N/A	
771044PRP-N096	35	36.7	N/A	
771044PRP-N097	42	35.1	N/A	
771044PRP-N098	42	66.6	N/A	
771044PRP-N099	42	-2.4	N/A	
771044PRP-N100	42	26.5	N/A	
771044PRP-N101	28	61.0	N/A	
771044QRP-N101	34	29.3	N/A	
771044PRP-N102	28	86.8	N/A	

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N103	28	32.1	N/A	
771044PRP-N104	28	40.7	N/A	
771044PRP-N105	28	58.0	N/A	
771044PRP-N106	28	17.9	N/A	
771044PRP-N107	28	58.0	N/A	
771044PRP-N108	28	52.4	N/A	
771044PRP-N109	28	12.3	N/A	
771044PRP-N110	28	46.8	N/A	
771044PRP-N111	28	43.7	N/A	
771044PRP-N112	28	32.1	N/A	
771044PRP-N113	28	29.5	N/A	
771044PRP-N114	42	26.5	N/A	
771044PRP-N115	42	29.5	N/A	
771044PRP-N116	42	20.9	N/A	
771044PRP-N117	42	69.6	N/A	
771044PRP-N118	28	23.5	N/A	
771044QRP-N118	34	56.7	N/A	
771044PRP-N119	28	29.5	N/A	
771044PRP-N120	28	86.8	N/A	
771044PRP-N121	28	55.4	N/A	
771044PRP-N122	28	52.4	N/A	
771044PRP-N123	28	23.5	N/A	
771044PRP-N124	28	38.1	N/A	
771044PRP-N125	28	58.0	N/A	
771044PRP-N126	28	58.0	N/A	
771044PRP-N127	28	0.6	N/A	
771044PRP-N128	28	26.5	N/A	

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Survey Area: AH

Survey Unit: 771044

Building: 771

Description: 2nd Floor AH Room 249 East

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771044PRP-N129	28	20.9	N/A	

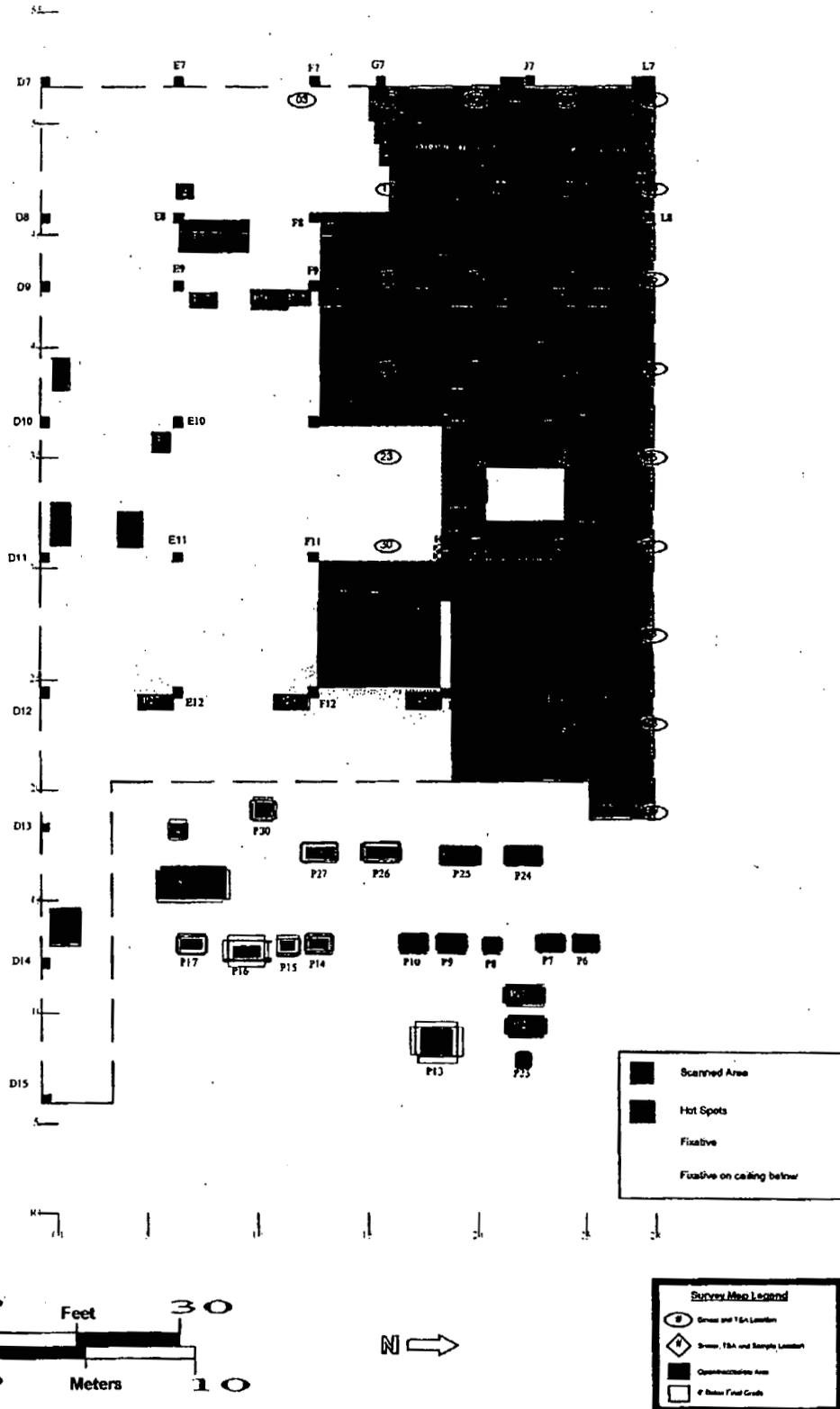
Comments:

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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771044 Classification: 1
Building: 771
Survey Unit Description: Room 249 East
Total Floor Area: 856 sq. m Total Area: 2300 sq. m Grid Size: 4m x 4m

SURVEY UNIT 77144 - MAP 1 OF 3

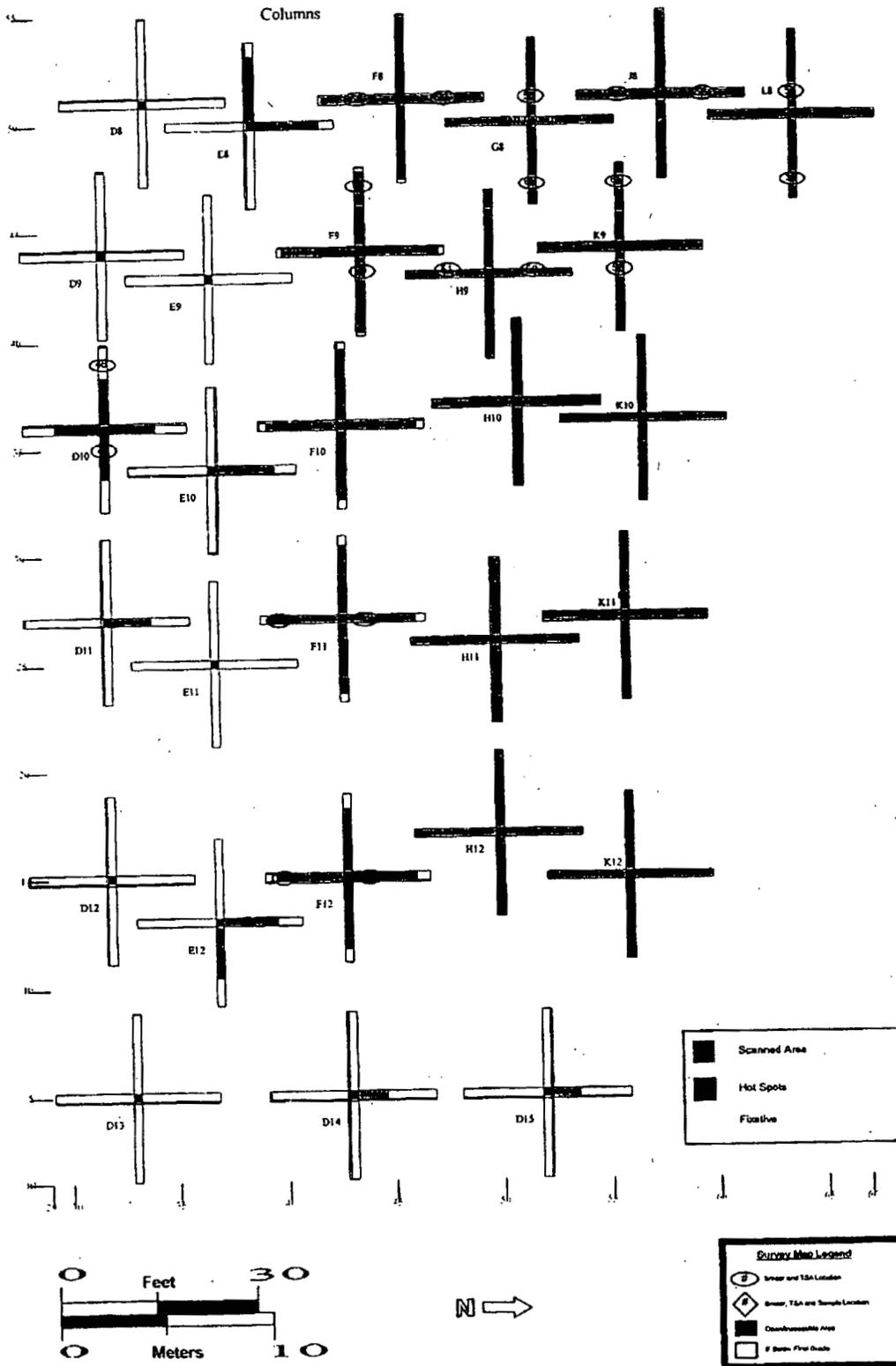


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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771044 Classification: 1
 Building: 771
 Survey Unit Description: Room 249 East
 Total Floor Area: 850 sq. m Total Area: 2300 sq. m Grid Size: 4m x 4m

SURVEY UNIT 77144 - MAP 2 OF 3



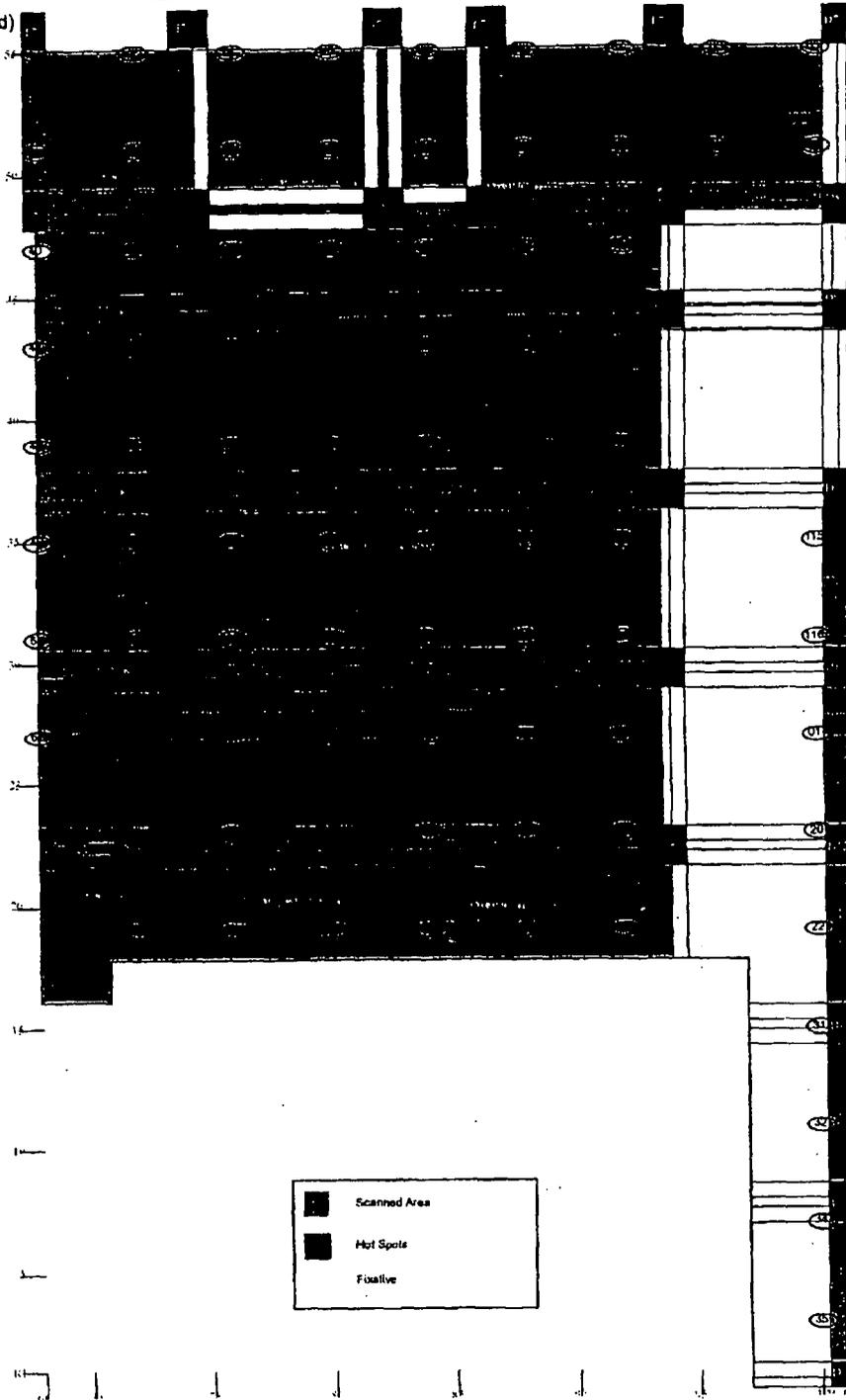
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771044 Classification: 2
Building: 771
Survey Unit Description: Room 249 East

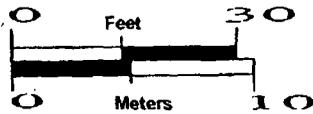
Total Floor Area: 856 sq. m Total Area: 2300 sq. m Grid Size: 4m x 4m

SURVEY UNIT 771 - MAP 3 OF 3

Ceiling
(Inverted)



	Scanned Area
	Hot Spots
	Fixative



Survey Map Legend	
	Survey and TGA Location
	Survey, TGA and Sample Location
	Obstructed Area
	Floor Level Grade

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ATTACHMENT E

Survey Unit 771076
Radiological Data Summary and Survey Map

Survey Area: AH	Survey Unit: 771076	Building: 771
------------------------	----------------------------	----------------------

Description: North East Side 2nd Floor

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 67	Nbr Biased Measurements Required: 0	Nbr QC Required: 4
Nbr Random Measurements Performed: 67	Nbr Biased Measurements Performed: 0	Nbr QC Performed: 4

Alpha	
Maximum:	71.2 dpm/100cm ²
Minimum:	-6.8 dpm/100cm ²
Mean:	31.7 dpm/100cm ²
Standard Deviation:	15.1
QC Maximum:	62.7 dpm/100cm ²
QC Minimum:	18.0 dpm/100cm ²
QC Mean:	32.9 dpm/100cm ²
Transuranic DCGL _w :	100.0 dpm/100cm ²
Transuranic DCGL _{EMC} :	300.0 dpm/100cm ²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 67	Nbr Biased Measurements Required: 0
Nbr Random Measurements Performed: 67	Nbr Biased Measurements Performed: 0

Alpha	
Maximum:	13.5 dpm/100cm ²
Minimum:	-1.5 dpm/100cm ²
Mean:	0.8 dpm/100cm ²
Standard Deviation:	2.9
Transuranic DCGL _w :	20.0 dpm/100cm ²

Media Sample Results

Nbr Random Required: 0	Nbr Biased Required: 0
Nbr Random Collected: 0	Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
18	513185	08/11/04	Electra	1536	DP-6	12/22/04	0.218	NA	48.0	NA	T
19	514510	08/11/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
20	513185	08/12/04	Electra	390	DP-6	06/02/04	0.215	NA	48.0	NA	T
21	514510	08/12/04	Electra	399	DP-6	09/23/04	0.224	NA	48.0	NA	T
22	514510	08/12/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
23	514510	08/12/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

ldp

Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)
771076PRP-N001	19	0.6	N/A
771076PRP-N002	19	0.6	N/A
771076PRP-N003	19	-0.9	N/A
771076PRP-N004	19	-0.9	N/A
771076PRP-N005	19	-0.9	N/A
771076PRP-N006	19	0.6	N/A
771076PRP-N007	19	-0.9	N/A
771076PRP-N008	19	-0.9	N/A
771076PRP-N009	19	-0.9	N/A
771076PRP-N010	19	0.6	N/A
771076PRP-N011	19	-0.9	N/A
771076PRP-N012	19	-0.9	N/A
771076PRP-N013	19	-0.9	N/A
771076PRP-N014	19	-0.9	N/A
771076PRP-N015	19	0.6	N/A
771076PRP-N016	19	-0.9	N/A
771076PRP-N017	19	-0.9	N/A
771076PRP-N018	19	2.1	N/A
771076PRP-N019	19	-0.9	N/A
771076PRP-N020	19	2.1	N/A
771076PRP-N021	19	-0.9	N/A
771076PRP-N022	19	-0.9	N/A
771076PRP-N023	19	2.1	N/A
771076PRP-N024	19	-0.9	N/A
771076PRP-N025	19	-0.9	N/A
771076PRP-N026	19	-0.9	N/A
771076PRP-N027	19	-0.9	N/A
771076PRP-N028	19	2.1	N/A
771076PRP-N029	19	-0.9	N/A

Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771076PRP-N030	19	-0.9	N/A	
771076PRP-N031	19	-0.9	N/A	
771076PRP-N032	19	0.6	N/A	
771076PRP-N033	19	-0.9	N/A	
771076PRP-N034	19	0.6	N/A	
771076PRP-N035	19	-0.9	N/A	
771076PRP-N036	19	-0.9	N/A	
771076PRP-N037	19	-0.9	N/A	
771076PRP-N038	19	-0.9	N/A	
771076PRP-N039	19	-0.9	N/A	
771076PRP-N040	19	0.6	N/A	
771076PRP-N041	19	-0.9	N/A	
771076PRP-N042	19	2.1	N/A	
771076PRP-N043	19	0.6	N/A	
771076PRP-N044	19	0.6	N/A	
771076PRP-N045	19	-0.9	N/A	
771076PRP-N046	22	3.0	N/A	
771076PRP-N047	23	0.9	N/A	
771076PRP-N048	22	1.5	N/A	
771076PRP-N049	23	8.4	N/A	
771076PRP-N050	22	0.0	N/A	
771076PRP-N051	23	0.9	N/A	
771076PRP-N052	22	-1.5	N/A	
771076PRP-N053	23	3.9	N/A	
771076PRP-N054	22	9.0	N/A	
771076PRP-N055	23	0.9	N/A	
771076PRP-N056	22	10.5	N/A	
771076PRP-N057	23	0.9	N/A	
771076PRP-N058	22	7.5	N/A	

Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771076PRP-N059	23	-0.6	N/A	
771076PRP-N060	22	1.5	N/A	
771076PRP-N061	23	2.4	N/A	
771076PRP-N062	22	1.5	N/A	
771076PRP-N063	23	-0.6	N/A	
771076PRP-N064	22	13.5	N/A	
771076PRP-N065	23	-0.6	N/A	
771076PRP-N066	22	1.5	N/A	
771076PRP-N067	23	2.4	N/A	

Comments:

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Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)
771076PRP-N001	18	45.0	N/A
771076PRP-N002	18	41.8	N/A
771076PRP-N003	18	14.3	N/A
771076PRP-N004	18	32.6	N/A
771076PRP-N005	18	41.8	N/A
771076PRP-N006	18	20.7	N/A
771076PRP-N007	18	39.1	N/A
771076PRP-N008	18	23.5	N/A
771076PRP-N009	18	20.7	N/A
771076PRP-N010	18	17.5	N/A
771076PRP-N011	18	39.1	N/A
771076PRP-N012	18	-6.8	N/A
771076PRP-N013	18	14.3	N/A
771076PRP-N014	18	39.1	N/A
771076PRP-N015	18	39.1	N/A
771076PRP-N016	18	71.2	N/A
771076PRP-N017	18	26.7	N/A
771076PRP-N018	18	17.5	N/A
771076PRP-N019	18	17.5	N/A
771076PRP-N020	18	17.5	N/A
771076PRP-N021	18	41.8	N/A
771076PRP-N022	18	23.5	N/A
771076PRP-N023	18	35.8	N/A
771076PRP-N024	18	23.5	N/A
771076PRP-N025	18	32.6	N/A
771076PRP-N026	18	23.5	N/A
771076PRP-N027	18	20.7	N/A

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Page: 6 of 8

Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771076PRP-N028	18	26.7	N/A	
771076PRP-N029	18	35.8	N/A	
771076PRP-N030	18	-0.9	N/A	
771076PRP-N031	18	23.5	N/A	
771076PRP-N032	18	14.3	N/A	
771076PRP-N033	18	29.9	N/A	
771076PRP-N034	18	39.1	N/A	
771076PRP-N035	18	23.5	N/A	
771076PRP-N036	18	23.5	N/A	
771076PRP-N037	18	20.7	N/A	
771076PRP-N038	18	29.9	N/A	
771076PRP-N039	18	29.9	N/A	
771076PRP-N040	18	11.5	N/A	
771076PRP-N041	18	71.2	N/A	
771076PRP-N042	18	29.9	N/A	
771076PRP-N043	18	29.9	N/A	
771076PRP-N044	18	35.8	N/A	
771076PRP-N045	18	35.8	N/A	
771076PRP-N046	20	36.6	N/A	
771076PRP-N047	20	45.9	N/A	
771076PRP-N048	20	42.7	N/A	
771076QRP-N048	21	62.7	N/A	
771076PRP-N049	20	21.3	N/A	
771076PRP-N050	20	39.9	N/A	
771076PRP-N051	20	42.7	N/A	
771076QRP-N051	21	18.0	N/A	
771076PRP-N052	20	24.1	N/A	

Survey Area: AH

Survey Unit: 771076

Building: 771

Description: North East Side 2nd Floor

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771076PRP-N053	20	21.3	N/A	
771076PRP-N054	20	12.0	N/A	
771076PRP-N055	20	67.8	N/A	
771076PRP-N056	20	27.3	N/A	
771076PRP-N057	20	49.2	N/A	
771076QRP-N057	21	32.7	N/A	
771076PRP-N058	20	33.4	N/A	
771076PRP-N059	20	49.2	N/A	
771076PRP-N060	20	18.0	N/A	
771076PRP-N061	20	33.4	N/A	
771076PRP-N062	20	58.5	N/A	
771076PRP-N063	20	36.6	N/A	
771076PRP-N064	20	49.2	N/A	
771076QRP-N064	21	18.0	N/A	
771076PRP-N065	20	27.3	N/A	
771076PRP-N066	20	55.2	N/A	
771076PRP-N067	20	52.0	N/A	

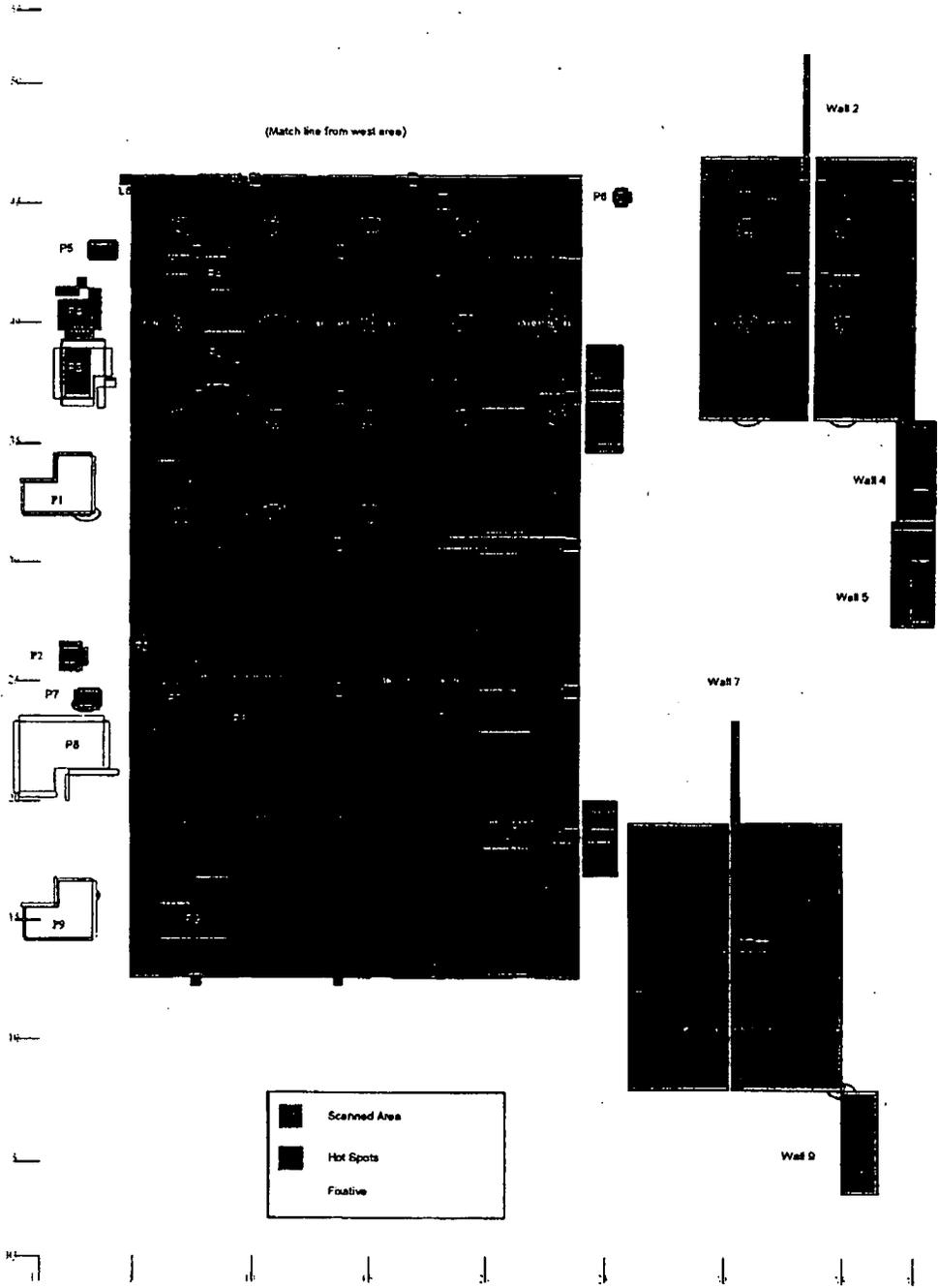
Comments:

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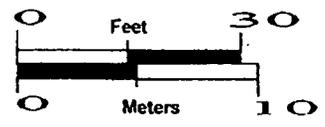
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771076 Classification: 1
 Building: 771
 Survey Unit Description: Second floor (east side, north end)
 Total Floor Area: 443 sq. m Total Area: 1540 sq. m Grid Size: 4 m x 4 m

SURVEY UNIT 771076 - MAP 1 OF 3



	Scanned Area
	Hot Spots
	Foxtail

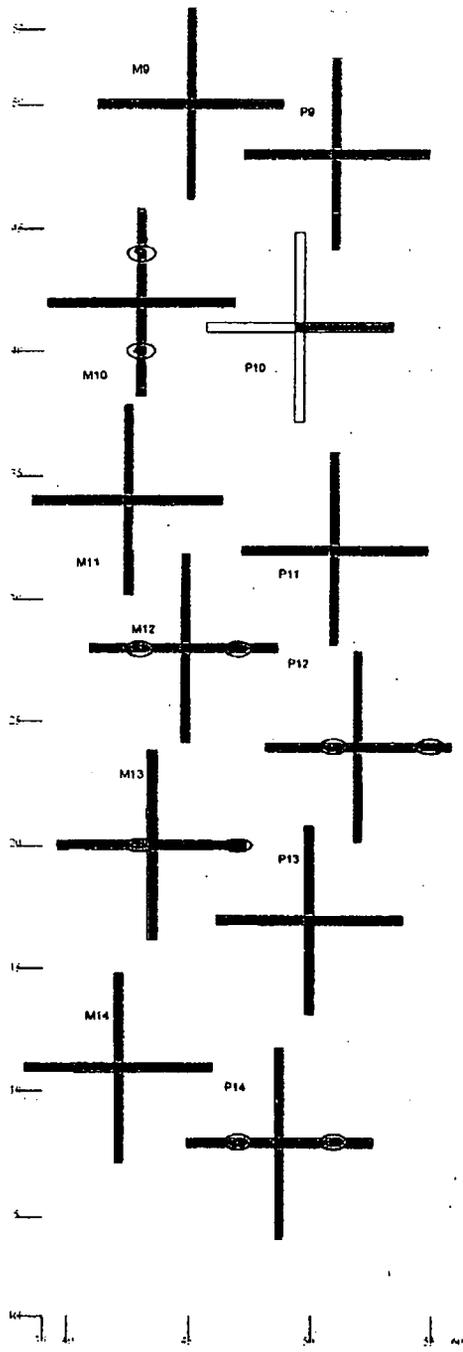


Survey Map Legend	
	Sensor and TSM Location
	Sensor, TSM and Camera Location
	Clear/Accessible Area
	Below Floor Grade

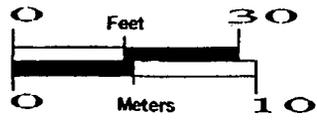
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771076 Classification: 1
Building: 771
Survey Unit Description: Second floor (east side, north end)
Total Floor Area: 443 sq. m Total Area: 1540 sq. m Grid Size: 4m x 4m

SURVEY UNIT 771076 - MAP 2 OF 3



	Scanned Area
	Hot Spots
	Fixture



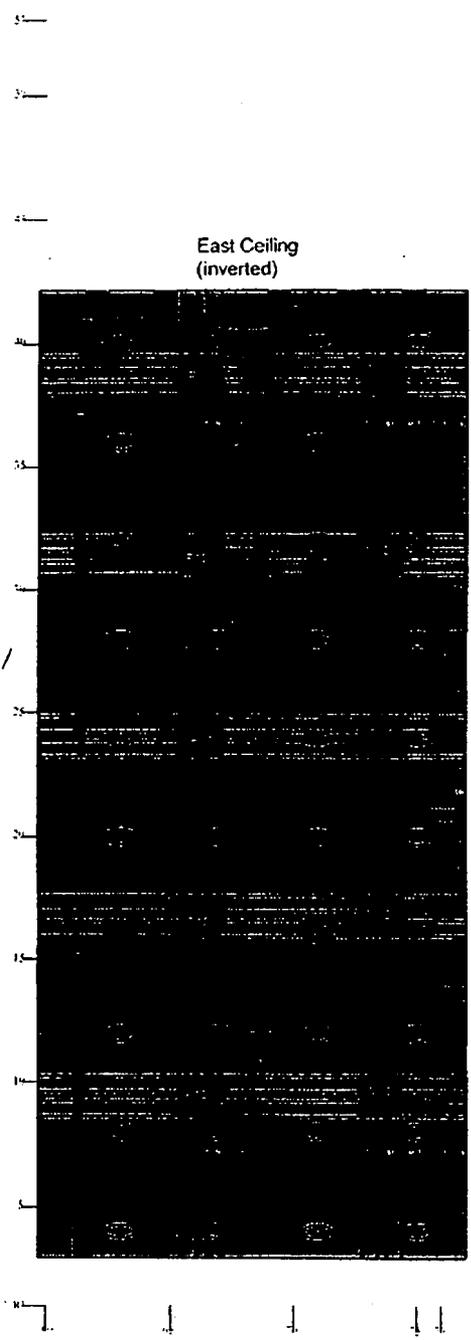
Survey Map Legend	
	Scanned Area
	Hot Spots
	Fixture
	Open/Unscanned Area
	Other Fixed Grid

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RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

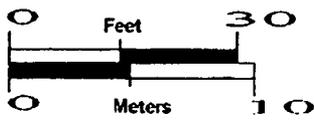
Survey Area: AH Survey Unit: 771076 Classification: 1
Building: 771
Survey Unit Description: Second floor(east side, north end)
Total Floor Area: 443 sq. m Total Area: 1540 sq. m Grid Size: 4m x 4m

SURVEY UNIT 771076 - MAP 3 OF 3



East Ceiling
(inverted)

	Scanned Area
	Hot Spots
	Fixative



Survey Map Legend	
	Shower and T&A Location
	Shower, T&A and Sample Location
	Occupancy Area
	2 Meter Field Cross

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ATTACHMENT F

Survey Unit 771087
Radiological Data Summary and Survey Map

Survey Area: AH

Survey Unit: 771087

Building: 771

Description: Room 283 Door 22 Stairwell

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr QC Required: 2

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Nbr QC Performed: 2

Alpha

Maximum:	61.7 dpm/100cm ²
Minimum:	-1.9 dpm/100cm ²
Mean:	14.5 dpm/100cm ²
Standard Deviation:	14.9
QC Maximum:	4.4 dpm/100cm ²
QC Minimum:	-1.3 dpm/100cm ²
QC Mean:	1.6 dpm/100cm ²
Transuranic DCGL _w :	100.0 dpm/100cm ²
Transuranic DCGL _{EMC} :	300.0 dpm/100cm ²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15

Nbr Biased Measurements Required: 0

Nbr Random Measurements Performed: 15

Nbr Biased Measurements Performed: 0

Alpha

Maximum:	2.4 dpm/100cm ²
Minimum:	-1.2 dpm/100cm ²
Mean:	-0.1 dpm/100cm ²
Standard Deviation:	1.1
Transuranic DCGL _w :	20.0 dpm/100cm ²

Media Sample Results

Nbr Random Required: 0

Nbr Biased Required: 0

Nbr Random Collected: 0

Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AH

Survey Unit: 771087

Building: 771

Description: Room 283 Door 22 Stairwell

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	711754	08/12/04	Electra	2385	DP-6	12/01/04	0.220	NA	48.0	NA	T
2	515011	08/12/04	Electra	2382	DP-6	01/24/05	0.230	NA	48.0	NA	Q
3	711754	08/12/04	SAC-4	1178	NA	04/29/04	0.333	NA	10.0	10.0	R
4	711754	08/12/04	SAC-4	1410	NA	04/07/04	0.333	NA	10.0	10.0	R
5	711754	08/12/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: AH

Survey Unit: 771087

Building: 771

Description: Room 283 Door 22 Stairwell

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771087PRP-N001	3	0.9	N/A	
771087PRP-N002	4	0.3	N/A	
771087PRP-N003	5	0.6	N/A	
771087PRP-N004	3	-0.6	N/A	
771087PRP-N005	4	1.8	N/A	
771087PRP-N006	5	-0.9	N/A	
771087PRP-N007	3	-0.6	N/A	
771087PRP-N008	4	-1.2	N/A	
771087PRP-N009	5	-0.9	N/A	
771087PRP-N010	3	-0.6	N/A	
771087PRP-N011	4	-1.2	N/A	
771087PRP-N012	5	-0.9	N/A	
771087PRP-N013	3	2.4	N/A	
771087PRP-N014	4	-1.2	N/A	
771087PRP-N015	5	0.6	N/A	

Comments:

79

Survey Area: AH	Survey Unit: 771087	Building: 771
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Description: Room 283 Door 22 Stairwell

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771087PRP-N001	1	13.1	N/A	
771087PRP-N002	1	19.0	N/A	
771087PRP-N003	1	7.2	N/A	
771087PRP-N004	1	13.1	N/A	
771087QRP-N004	2	4.4	N/A	
771087PRP-N005	1	16.2	N/A	
771087PRP-N006	1	19.0	N/A	
771087PRP-N007	1	7.2	N/A	
771087PRP-N008	1	25.3	N/A	
771087PRP-N009	1	61.7	N/A	
771087PRP-N010	1	-1.9	N/A	
771087PRP-N011	1	0.8	N/A	
771087PRP-N012	1	9.9	N/A	
771087PRP-N013	1	9.9	N/A	
771087PRP-N014	1	4.0	N/A	
771087QRP-N014	2	-1.3	N/A	
771087PRP-N015	1	13.1	N/A	

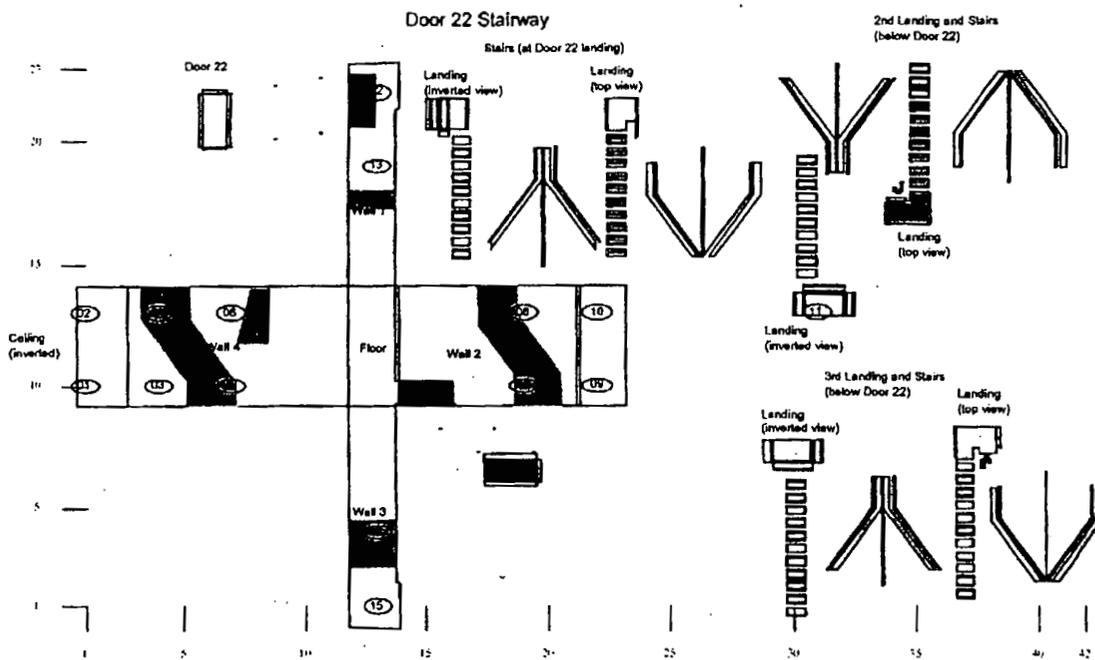
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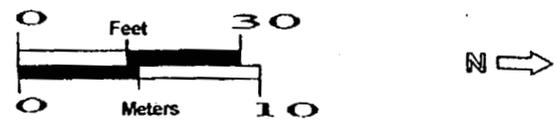
RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771087 Classification: 1
 Building: 771
 Survey Unit Description: Stairwell #4
 Total Floor Area: 24 sq. m Total Area: 190 sq. m Grid Size: 3m x 3m

SURVEY UNIT 771087 - MAP 1 OF 1



	Scanned Area
	Hot Spots
	Fixative



Survey Map Legend	
	Sniper and TSA Location
	Sniper TBA and Sample Location
	Contaminated Area
	6 Meter Ring Closure

ATTACHMENT G

Survey Unit 771089
Radiological Data Summary and Survey Map

Survey Area: AH

Survey Unit: 771089

Building: 771

Description: Door 21 Stairwell

Rocky Flats Environmental Technology Site Final Radiological Survey Summary Results

Total Surface Activity Measurements

Nbr Random Measurements Required: 15
Nbr Random Measurements Performed: 15

Nbr Biased Measurements Required: 0
Nbr Biased Measurements Performed: 0

Nbr QC Required: 2
Nbr QC Performed: 2

Alpha

Maximum:	46.2 dpm/100cm ²
Minimum:	0.6 dpm/100cm ²
Mean:	18.9 dpm/100cm ²
Standard Deviation:	11.4
QC Maximum:	38.6 dpm/100cm ²
QC Minimum:	23.5 dpm/100cm ²
QC Mean:	31.1 dpm/100cm ²
Transuranic DCGL _w :	100.0 dpm/100cm ²
Transuranic DCGL _{EMC} :	300.0 dpm/100cm ²

Removable Surface Activity Measurements

Nbr Random Measurements Required: 15
Nbr Random Measurements Performed: 15

Nbr Biased Measurements Required: 0
Nbr Biased Measurements Performed: 0

Alpha

Maximum:	5.7 dpm/100cm ²
Minimum:	-1.8 dpm/100cm ²
Mean:	0.4 dpm/100cm ²
Standard Deviation:	1.7
Transuranic DCGL _w :	20.0 dpm/100cm ²

Media Sample Results

Nbr Random Required: 0
Nbr Random Collected: 0

Nbr Biased Required: 0
Nbr Biased Collected: 0

Conclusion - A comparison of the random, biased and QC measurement results against the PDSP, Table 7-1 Surface Contamination Guideline limits was conducted; the comparison demonstrates that this survey unit passes the criterion specified in the PDSP.

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Survey Area: AH Survey Unit: 771089 Building: 771

Description: Door 21 Stairwell

Instrument Data Sheet

Inst/RCT Number	RCT ID	Analysis Date	Instr Model	Instru S/N	Probe Type	Calibration Due Dt	Instru Efficiency		A-Priori MDA (dpm/100cm ²)		Survey Type
							Alpha	Beta	Alpha	Beta	
1	703970	08/14/04	Electra	1236	DP-6	08/17/04	0.219	NA	48.0	NA	T
2	712563	08/14/04	SAC-4	1178	NA	09/17/04	0.333	NA	10.0	10.0	R
3	712563	08/14/04	SAC-4	1410	NA	10/13/04	0.333	NA	10.0	10.0	R
4	712563	08/14/04	SAC-4	1491	NA	09/17/04	0.333	NA	10.0	10.0	R
5	712563	08/14/04	SAC-4	1354	NA	09/18/04	0.333	NA	10.0	10.0	R
6	712563	08/14/04	SAC-4	1185	NA	01/27/05	0.333	NA	10.0	10.0	R
8	513474	08/15/04	Electra	394	DP-6	12/04/04	0.225	NA	48.0	NA	Q

Survey Types: T = Total Surface Activity, Q = TSA QC, S = Scan, R = Removable Surface Activity, I = Investigation

Survey Area: AH

Survey Unit: 771089

Building: 771

Description: Door 21 Stairwell

Random Removable Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771089PRP-N001	2	0.9	N/A	
771089PRP-N002	3	-0.6	N/A	
771089PRP-N003	4	-1.2	N/A	
771089PRP-N004	5	5.7	N/A	
771089PRP-N005	2	0.9	N/A	
771089PRP-N006	3	0.9	N/A	
771089PRP-N007	4	0.3	N/A	
771089PRP-N008	5	-1.8	N/A	
771089PRP-N009	6	-0.6	N/A	
771089PRP-N010	2	-0.6	N/A	
771089PRP-N011	3	-0.6	N/A	
771089PRP-N012	4	0.3	N/A	
771089PRP-N013	5	1.2	N/A	
771089PRP-N014	6	0.9	N/A	
771089PRP-N015	2	0.9	N/A	

Comments:

84

Survey Area: AH

Survey Unit: 771089

Building: 771

Description: Door 21 Stairwell

Random/QC Total Surface Activity Data Sheet

Random Measurement Location	Inst / RCT Nbr	Net Alpha (dpm/100cm ²)	Net Beta (dpm/100cm ²)	
771089PRP-N001	1	12.4	N/A	
771089PRP-N002	1	46.2	N/A	
771089QRP-N002	8	38.6	N/A	
771089PRP-N003	1	18.8	N/A	
771089PRP-N004	1	18.8	N/A	
771089PRP-N005	1	18.8	N/A	
771089PRP-N006	1	30.7	N/A	
771089PRP-N007	1	15.6	N/A	
771089PRP-N008	1	21.6	N/A	
771089PRP-N009	1	21.6	N/A	
771089PRP-N010	1	6.5	N/A	
771089PRP-N011	1	3.3	N/A	
771089PRP-N012	1	28.0	N/A	
771089QRP-N012	8	23.5	N/A	
771089PRP-N013	1	24.8	N/A	
771089PRP-N014	1	15.6	N/A	
771089PRP-N015	1	0.6	N/A	

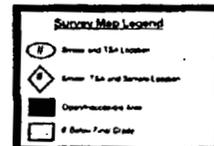
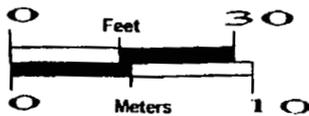
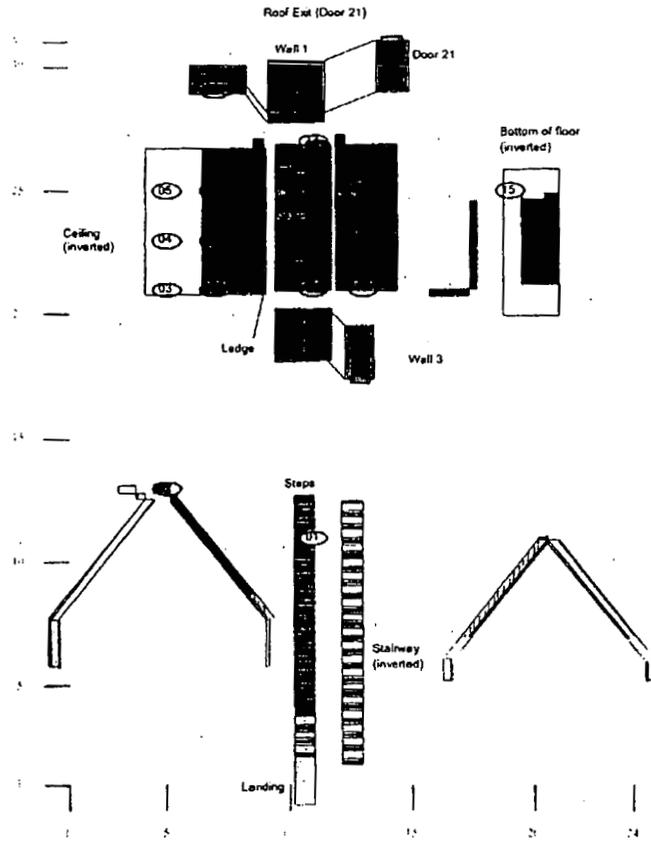
Comments:

85

RADIOLOGICAL CLOSEOUT SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771089 Classification: 2
 Building: 771
 Survey Unit Description: Room 283 Staiwell (Door #21)
 Total Floor Area: 16 sq. m Total Area: 101 sq. m Grid Size: 2m x 2m

SURVEY UNIT 771089 - MAP 1 OF 1



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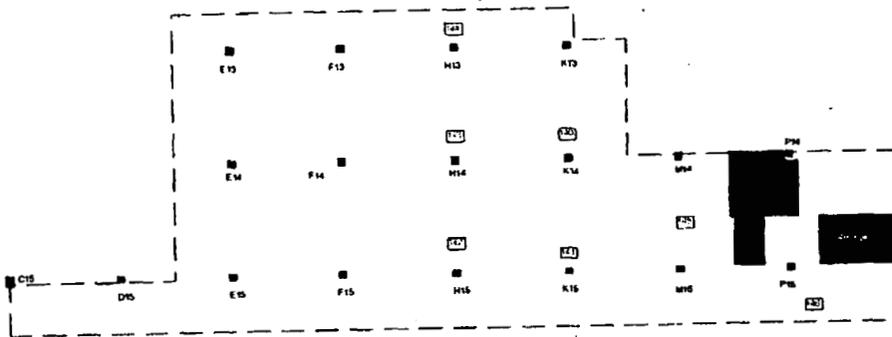
ATTACHMENT H

Chemical Data Summaries and Sample Maps

BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771040 Be Classification: NA
 Building: 771
 Survey Unit Description: Second floor east end
 Total Floor Area: 8104 sq. ft. Total Area: NA Grid Size: NA

SURVEY UNIT 771040 Be - MAP 1 OF 1



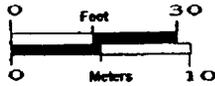
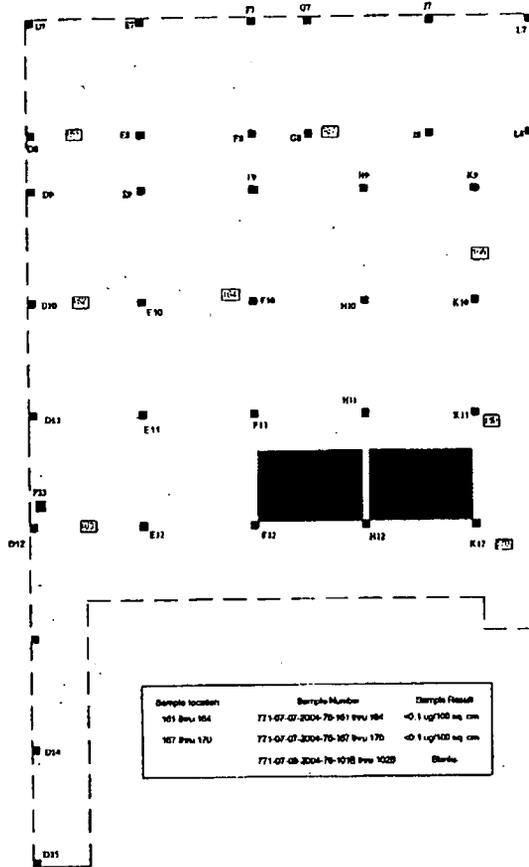
Sample Location	Sample Number	Sample Result
140 Inu 140	771-07-0004-76-140 Inu 140	<0.1 ug/100 mg on filter
	771-07-00-2004-76-1010 Inu 1020	



BERYLLIUM CHARACTERIZATION SURVEY FOR THE 771 CLUSTER

Survey Area: AH Survey Unit: 771044 Be Classification: NA
 Building: 771
 Survey Unit Description: Second floor (Room 249 east end)
 Total Floor Area: 10646 sq. ft. Total Area: NA Grid Size: NA

SURVEY UNIT 771044 Be - MAP 1 OF 1



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AH East

771	283	7/7/04	BE SWIPE BETWEEN COLUMN H15 & H14	SURFACE	771-07072004-76-142	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMN H14 & H13	SURFACE	771-07072004-76-143	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE WEST OF COLUMN H13	SURFACE	771-07072004-76-144	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS M14 & M15	SURFACE	771-07072004-76-145	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE EAST OF COLUMN P15	SURFACE	771-07072004-76-146	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C2 & D2	SURFACE	771-07072004-76-154	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C4 & D4	SURFACE	771-07072004-76-155	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C6 & D6	SURFACE	771-07072004-76-156	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C8 & D8	SURFACE	771-07072004-76-157	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2

AH East

771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C10 & D10	SURFACE	771-07072004-76-158	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C12 & D12	SURFACE	771-07072004-76-159	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS C14 & D14	SURFACE	771-07072004-76-160	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS D8 & E8	SURFACE	771-07072004-76-161	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS D10 & E10	SURFACE	771-07072004-76-162	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS D12(P33) & E12	SURFACE	771-07072004-76-163	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS E10 & F10	SURFACE	771-07072004-76-164	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE SOUTH OF B15	SURFACE	771-07072004-76-166	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2
771	283	7/7/04	BE SWIPE BETWEEN COLUMNS G8 & J8	SURFACE	771-07072004-76-167	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 - UG/100C M2

AH East

771	283	7/7/04	BE SWIPE BETWEEN COLUMNS K9 & K10	SURFACE	771-07072004-76-168	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 UG/100C M2
771	283	7/7/04	BE SWIPE NORTH OF COLUMN K11	SURFACE	771-07072004-76-169	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 UG/100C M2
771	283	7/7/04	BE SWIPE NORTH OF COLUMN K12	SURFACE	771-07072004-76-170	BERYLLIUM AND BE COMPOUNDS (AS BE)	< 0.1000 UG/100C M2

ATTACHMENT I
Data Quality Assessment

DATA QUALITY ASSESSMENT (DQA)

VERIFICATION & VALIDATION OF RESULTS

V&V of the data confirm that appropriate quality controls are implemented throughout the sampling and analysis process, and that any substandard controls result in qualification or rejection of the data in question. The required quality controls and their implementation are summarized in a tabular, checklist format for each category of data – radiological surveys and chemical analyses (specifically beryllium).

DQA criteria and results are provided in a tabular format for each suite of surveys or chemical analyses performed; the radiological survey assessment is provided in Table E-1, and beryllium in E-2. A data completeness summary for all results is given in Table E-3. A data completeness summary for the radiological data representing areas greater than 6' below final grade is provided in Table E-4. These areas were characterized per the *Building 771/774 Closure Project Characterization Plan for Areas Greater than Six Feet Below Final Grade*, dated November 24, 2003 (refer to Attachment K).

All relevant Quality records supporting this report are maintained in the B771 Characterization Project Files. This report will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of approval by the Regulators. All radiological data are organized into Survey Packages, which correlate to unique Survey Units. Chemical data are organized by RIN (Report Identification Number) and are traceable to the sample number and corresponding sample location.

Survey designs were implemented based on the transuranic limits used as DCGLs in the unrestricted release decision process. All survey results were evaluated against, and were less than the Transuranic DCGL_w (100 dpm/100cm²).

SUMMARY

In summary, the data presented in this report have been verified and validated relative to the quality requirements and project decisions as stated in the original DQOs. All data are useable based on qualifications stated herein and are considered satisfactory without qualification.

Based upon an independent review of the radiological data, it is determined that the original project DQOs satisfied site PDSP guidance. All facility contamination levels were below applicable unrestricted release levels, except as noted above. Minimum survey requirements were met, sampling/survey protocol was performed in accordance with applicable procedures, survey units were properly designed and bounded, and instrument performance and calibration were within acceptable limits.

Level 1 Isolation Controls have been implemented to prevent the inadvertent introduction of further contamination into the facility. On this basis, the B771 AH (2nd Floor) meets the RLCP and PDSP DQO criteria with the confidences stated herein.

Table E-1 V&V of Radiological Surveys – B771 AH (2nd Floor East Side)

V&V CRITERIA, RADIOLGICAL SURVEYS		K-H RSP 16.00 Series MARSSIM (NUREG-1575)		
QUALITY REQUIREMENTS				
	Parameters	Measure	Frequency	COMMENTS
ACCURACY	initial calibrations	80% < x < 120 %	≥ 1	Calibration using Alpha Group procedure and approved technicians.
	daily source checks	80% < x < 120 %	≥ 1/day	Performed daily/within range.
	local area background: Field	typically < 10 dpm	≥ 1/day	All local area backgrounds were within expected Ranges < 10 cpm
PRECISION	field duplicate measurements for TSA	≥ 5% of real survey points	≥ 100% packages	N/A
REPRESENTATIVENESS	MARSSIM methodology: Survey Unit 771044, 771076, 771040, 771089, 771042, and 771087	statistical	NA	Random w/ statistical confidence.
	Survey Maps	NA	NA	Random measurement locations controlled/mapped to ± 1m.
	Controlling Documents (Characterization Pkg; RSPs)	qualitative	NA	Refer to the Characterization Package (planning document) for field/sampling procedures (located in Project files); thorough documentation of the planning, sampling/analysis process, and data reduction into formats.
COMPARABILITY	units of measure	dpm/100cm ²	NA	Use of standardized engineering units in the reporting of measurement results.
COMPLETENESS	Plan vs. Actual surveys	> 95%	NA	
	usable results vs. unusable	> 95%		

SENSITIVITY	detection limits	TSA: ≤50 dpm/100cm ² RA: ≤10 dpm/100cm ²	all measures	MDAs ≤ ½ DCGL _w per MARSSIM guidelines.
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Table E-2 V&V of Beryllium Results – B771 AH (2nd Floor East Side)

V&V CRITERIA, CHEMICAL ANALYSES		DATA PACKAGE		COMMENTS
BERYLLIUM	Prep: NMAM 7300 METHOD: OSHA ID-125G	LAB ---->	Johns Manville Corp. Denver, Co.	
QUALITY REQUIREMENTS		RIN ---->	RIN 771-07072004- 76-140 to 146 and 154 to 164 and 167 to 170	
		Measure	Frequency	
ACCURACY	Calibrations Initial	linear calibration	≥1	No qualifications significant enough to change project decisions, i.e., classification of Type 3 facilities confirmed for radiological contamination. No Beryllium results above action level (0.2ug/100cm ²) or investigative level (0.1ug/100cm ²).
	Continuing	80%<%R<120%	≥1	
	LCS/MS	80%<%R<120%	≥1	
	Blanks - lab & field	<MDL	≥1	
	interference check std (ICP)	NA	NA	
PRECISION	Laboratory Control Sample Duplicate	80%<%R<120% (RPD<20%)	≥1	
	field duplicate	all results < RL	≥1	
REPRESENTATIVENESS	COC	Qualitative	NA	
	hold times/preservation	Qualitative	NA	
	Controlling Documents (Plans, Procedures, maps, etc.)	Qualitative	NA	
COMPARABILITY	measurement units	ug/100cm ²	NA	
COMPLETENESS	Plan vs. Actual samples usable results vs. unusable	>95% >95%	NA	
SENSITIVITY	detection limits	MDL of 0.10ug/100cm ²	all measures	

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Table E-3 Data Completeness Summary – B771 AH (2nd Floor East Side)

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Beryllium	B771 AH 771044 (RM 249 Central east side)	8 biased (interior)	8 biased (interior)	No beryllium contamination found at any location, all results below the regulatory limit	OSHA ID-125G RIN 771-07-07-2004-76-161 thru 164 and 167 to 170 No results above action level (0.2ug/100cm ²) or investigative level (0.1ug/100cm ²).
Beryllium	B771 AH 771040 (East)	7 biased (interior)	7 biased (interior)	No beryllium contamination found at any location, all results below the regulatory limit	OSHA ID-125G RIN 771-07-07-2004-76-140 thru 146 No results above action level (0.2ug/100cm ²) or investigative level (0.1ug/100cm ²).
Radiological	Survey Area: B771 AH 771076 (North Side)	67 α TSA (67 – Random/Systematic) and 67 α Smears (67 - Random/Systematic) 4 QC TSA 100 % scanned	67 α TSA (67 – Random/Systematic) and 67 α Smears (67 - Random/Systematic) 4 QC TSA 100 % scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level All results less than DCGLs, except as noted	Transuranic DCGLs

Table E-3 Data Completeness Summary – B771 AH (2nd Floor East Side)

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
				in red on survey unit scan map (Att. E)	
Radiological	Survey Area: AH Survey Unit: 771042 (283 Above 2m East side)	16 α TSA (16 – Random/Systematic) and 16 α Smears (16 - Random/Systematic) 2 QC TSA 13% scanned	19 α TSA (19 – Random/Systematic) and 19 α Smears (19 - Random/Systematic) 2 QC TSA 13% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level No result above action level	Transuranic DCGLs

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Table E-3 Data Completeness Summary – B771 AH (2nd Floor East Side)

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area: AH Survey Unit: 771040 (RM 249 East side)	82 α TSA (82 – Random/Systematic) and 82 α Smears (82 - Random/Systematic) 5 QC TSA 100% scanned	82 α TSA (82 – Random/Systematic) and 82 α Smears (82 - Random/Systematic) 5 QC TSA 100% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level All results less than DCGLs, except as noted in red on survey unit scan map (Att. B)	Transuranic DCGLs
Radiological	Survey Area: AH Survey Unit: 771087 (RM 283 Stairwell 22)	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 18% scanned	15 α TSA (15 – Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 18% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level No result above action level	Transuranic DCGLs

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Table E-4 Data Completeness Summary (Areas Greater than 6' Below Final Grade) – B771 AH (2nd Floor East Side)

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	B771 AH (Greater than 6' Below Final Grade)	15 Random In-Situ Gamma-Spectroscopy 100% Scan with Bicron Fidler (NaI)	15 Random In-Situ Gamma-Spectroscopy	No radiological contamination found at any location in excess of action levels	No results above action level of 7 nCi/g (volumetric) or 100 nCi/g (surficial) for Am-241 and Pu-239 No results above action level of 250,000 cpm
Beryllium	B771 AH (Greater than 6' Below Final Grade)	See Table E-3	See Table E-3	No beryllium contamination found at any location, all results below the regulatory limit	The beryllium swipes presented for survey units 771040 and 771044 were all collected on the floor (horizontal) surfaces. The floors are greater than 6' below final grade. Therefore, the beryllium data collected for the respective survey units were collected in areas greater than 6' below final grade.

Table E-3 Data Completeness Summary – B771 AH (2nd Floor East Side)

ANALYTE	Building/Area /Unit	Sample Number Planned (Real & QC) ^A	Sample Number Taken (Real & QC)	Project Decisions (Conclusions) & Uncertainty	Comments (RIN, Analytical Method, Qualifications, etc.)
Radiological	Survey Area: AH Survey Unit: 771089 (Door 21 Stairwell)	15 α TSA (15 - Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 55% scanned	15 α TSA (15 - Random/Systematic) and 15 α Smears (15 - Random/Systematic) 2 QC TSA 55% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level No result above action level	Transuranic DCGLs
Radiological	Survey Area: AH Survey Unit: 771044 (East Central)	129 α TSA (129 - Random/Systematic) and 129 α Smears (129 - Random/Systematic) 7 QC TSA 100% scanned	129 α TSA (129 - Random/Systematic) and 129 α Smears (129 - Random/Systematic) 7 QC TSA 100% scanned	No elevated contamination at any location; all values below PDS unrestricted release levels No result above action level All results less than DCGLs, except as noted in red on survey unit scan map (Att. D)	Transuranic DCGLs

ATTACHMENT J

Historical Review

Area AH (B771 HVAC and Utilities Area)
Historical Review
September 10, 2004

Facility ID: Building 771 2nd Floor Area (Survey Area AH East)

Anticipated Facility Type (1, 2, or 3):

Survey area AH is part of a Type 3 Facility. Although the area was primarily a building utilities area, this area contained contaminated Zone 1 and Zone 2 HVAC systems, as well as the Health Physics vacuum system pumps and piping.

Physical Description:

Building 771 is located in the north-central section of RFETS Industrial Area. The building is predominantly constructed of reinforced concrete, with some non-production portions of the building constructed of concrete block and fabricated metal. The original building was a two-story structure built into the side of a hill with most of the three sides covered by earth. The fourth side, facing the north, provides the main entrance to the building. The original building measures 263 feet (north to south) by 282 feet (east to west) on the ground floor, and 202 feet by 282 feet on the second floor. The building is 31 feet tall, and there are no outside windows in the main building. The Building 771 2nd Floor Area (AH) was part of the original building.

Historical Operations:

The 2nd floor consisted of the following areas:

The Main Plenum Area: This area includes rooms 280, 280A, 280B, 280C, 281, 281A, 281B, 282, 282A, 282B, 282C and 282D; filter elements; cinderblock walls; and plenum doors. The primary filter bank contained 525 filters. The secondary filter bank contained 391 filters. All filters, and the first stage of the plenum, have been removed.

Room 283 HVAC Exhaust and Utilities Area: This area includes Room 283, 283A (SOE Control Room), 283B, 283C, 283D, 283E, 283F, 283G, 283H, 283I and 283J; the six main exhaust fans and motors; uninterruptible power supply system; main electrical switch gear; and Control Room Panels.

Room 235 HVAC Supply and Utilities Area: This area includes Rooms 236, 237, 238, 238A, 239, 240, 240A, 240B, 240C, 240D, 240E and 240G; supply fans and motors; plenums; and walls. This area contains the B771 air intake system, consisting of filters, heaters, blowers and dampeners.

Room 249 HVAC Exhaust and Utilities Area: This area includes Room 249; Zone 1 Filter Plenums, fans, motors, and ductwork; and chemical make-up tanks, piping, and valves. The Zone 1 Filter Plenums were highly contaminated and had the potential to contain anything that was exhausted from the Building 771 gloveboxes and hoods. Multiple kilograms of SNM hold-up were present in the Zone 1 Filter Plenums. This area has been decontaminated by hydrolasing,

Current Operational Status

The Building 771 2nd Floor (Area AH) is no longer operational. All major equipment/piping and non-load-bearing walls have been removed.

Area AH (B771 HVAC and Utilities Area)

Historical Review

September 10, 2004

Contaminants of Concern

Asbestos

The Building 771 2nd Floor Area (AH) was part of the original construction, therefore the presence of ACM was suspected. A Certified Building Inspector performed a complete inspection of the area and sampled the suspect materials. Asbestos-Containing Material (ACM) was identified in the following materials:

- Main filter plenum (removed)
- silver-painted flashing (to be removed per the demolition plan)
- drywall joint compound (removed)
- mudded fittings on domestic water and steam condensate piping (removed)

Beryllium (Be)

Based on historical and existing classifications, the general area of the B771 2nd Floor was not a RFETS Beryllium (Be) Area. The interiors of the Zone 1 exhaust plenums were controlled as Be areas during the D&D process. The effected sections of these plenums have since been removed.

Lead

The remaining paint in the AH area will not be removed from the substrate.

Although the AH Area paint was not specifically sampled and evaluated for lead, the samples collected from other areas of Building 771 are considered representative of the expected lead levels in Area AH. Analysis of 61 paint samples from the process areas of the 771/774 complex indicates that lead levels are below regulatory limits in paint.

RCRA/CERCLA Constituents

Area AH West was never used to manage hazardous waste.

PCBs

Free-flowing or exposed PCBs have never been used or transferred in Area AH. PCB ballasts in fluorescent light fixtures were present throughout the area, and have been removed and disposed of. PCBs may be present in some applied paints. Because additional paint sampling was not performed in Area AH, and because painted surfaces remain in the area (cinderblock and concrete walls), any painted debris generated during demolition that is not recycled on-site will be disposed of a PCB bulk product waste.

Radiological Contaminants

The contaminants of concern for the 771 project, including all areas of Buildings 771 and 774, are transuranic alpha-emitting radioisotopes (including Pu-238, Pu-239/240, Pu-242, and Am-241). Based on findings documented in Radiological Engineering TBD-00161, Rev. 0, alpha-only surveys assure that the unrestricted-release limits for any other isotopes that may exist in Building 771/774 will not be exceeded.

Since Area AH of B771 was primarily a building utilities area, there were no Plutonium process areas in this area. However, Room 249 did contain the highly contaminated Zone 1 and Zone 2 exhaust plenums along with the associated ductwork. During the D&D process, the area was controlled as an Airborne Radioactivity and Contaminated Area.

Environmental Restoration Concerns

None

Area AH (B771 HVAC and Utilities Area)
Historical Review
September 10, 2004

Additional Information

None

References

- (1) *B771 and B774 Hazards Characterization Report for the 771 Closure Project*, dated June 12, 2001, Revision 0.
- (2) *Building 771/774 Cluster Closure Project Reconnaissance Level Characterization Report*, dated August 8, 1998, Revision 2.

Further Actions

Complete the PDS process.

ATTACHMENT K

SAP for Areas Greater than 6' Below Final Grade and Final Results

**Building 771/774 Closure Project
Characterization Plan For
Areas Greater than Six
Feet Below Final Grade**

**Final
11/14/03**

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Attachment B Verification Sampling Statistical Design

Figure 1 Summary Map of Characterization Results for B771/B774

Figure 2 Final Grade Maps

1.0 INTRODUCTION

This Characterization Plan identifies the characterization and verification approach for portions of Building 771/774 that contain fixed areas of contamination. As stated in the 771 Closure Project Decommissioning Operations Plan Modification 5 (DOP), the objective of this characterization plan is to ensure that the nature and extent of contamination is adequately defined and that the material that will be left in place is consistent with the framework for contaminated soil. The areas that have not been decontaminated to the unrestricted release criteria and will remain in place after backfilling will be characterized in accordance with this project-specific characterization package prepared in accordance with the Decontamination and Decommissioning Characterization Protocol and the Industrial Area Sampling and Analysis Plan. The slab and structure within 0 to 6 feet of the final proposed grade will be decontaminated to the unrestricted release criteria and 0 to 3.5 feet will be removed during demolition. The Building 771/774 slab and structure below 6 feet of the final proposed grade will be decontaminated to ensure that it will not exceed 7 nCi/g (over depth of volume) and/or 100 nCi/g (surface). The described characterization methods are based on the Data Quality Objectives of the Industrial Area Sampling and Analysis Plan (IASAP)(DOE 2001a).

2.0 EXISTING CHARACTERIZATION INFORMATION

The contaminant of concern in Building 771/774 is weapons-grade plutonium, which consists primarily of Pu-239/240 and Am-241 (which is present as a result of ingrowth from the decay of Pu-241). These three isotopes represent over 98% of the total activity per gram of WGP. Other incidental radionuclides were utilized for various processes in Building 771 and 774, including enriched and depleted uranium, and mixed fission products (MFP). However, a review of the *in-situ* gamma-spectroscopy data did not indicate the presence of the associated radioisotopes on structural surfaces (refer to Attachment A).

The locations of the existing random *in-situ* data were selected per the requirements of RSP-09.09, Radiological Characterization of Low Specific Activity Waste by Field Sampling and Analysis. This procedure describes a method to calculate conservative estimates of material activity concentration based on random sampling and calculation of the upper confidence limit (UCL₉₅) of the mean concentration. The statistical evaluation also assumes a lognormal distribution with the intention of biasing results high to provide a high degree of confidence that no transportation or waste acceptance criteria is exceeded. However, because many areas exceeding the specified limits have been identified through this sampling effort, no statistical evaluations of the existing data set will be performed. However, a statistical evaluation will be performed for verification sample data, as described in Section 5.0.

Each characterization unit represented one room or area with similar process histories and contamination potential. Building 771 was divided into seven areas and fifteen random measurements were collected in each unit (with the exception of the Room 182, from which five samples were collected due to previously-existing work interferences). Additional biased *in-situ* measurements were collected in Room 148 and in Building 774.

Ninety (90) paint samples were collected on the second floor of Building 771 as part of the Reconnaissance Level Characterization (RLC) effort. Fifteen (15) paint samples were collected in Room 241 of Building 774 were also collected during RLC. Additional biased ZnS measurements were collected in non-process areas of Building 771 as part of Phase 2 of the UBC characterization effort. Additional paint and *in-situ* measurements were collected in the Building 771/776 tunnel as part of the hydrolazing waste characterization effort. A summary of the type of data collected is presented in Table 1.

A total of 297 biased and random data points have been collected. Thirty-three (33) of the *in-situ* data points, were collected on structural walls and ceilings. None of these structural wall/ceiling data points exceeded 100 nCi/g at the surface and/or 7 nCi/g averaged over the wall/ceiling depth. Based on the *in-situ* gamma spectroscopy data, the average volumetric activity is approximately 9 nCi/g for the slab and 0.03 nCi/g for the wall/ceiling surfaces, indicating that greater than 99% of the remaining activity exists in the slab.

Floor and wall shots in Old Tank 40 (B774) did indicate contamination in excess of 100 nCi/g at the surface. Therefore, remediation will be required on the walls as well as the slab of Old Tank 40.

A summary map of the results for the first floor of Building 771 and Building 774 is presented in Figure 1. No summary map is presented for the second floor of Building 771, given that all surface paint sample results were less than 1 nCi/g.

3.0 POST-REMEDICATION SCANNING (> 6' BELOW FINAL GRADE)

Following the decontamination of the slab, a 100% scan of the slab surfaces will be performed with a qualitative field instrument to verify that all areas in excess of 100 nCi/g have been remediated. Any area flagged as potentially greater than 100 nCi/g will either be remediated or verified to be less than 100 nCi/g with a quantitative instrument (i.e., *in-situ* gamma-spectroscopy or laboratory sample analysis method).

4.0 VERIFICATION SAMPLING (> 6' BELOW FINAL GRADE)

Following completion of remediation activities and the collection of biased post-remediation data, an additional verification sampling effort will be performed on slab surfaces that will remain *in-situ* 6' below final grade. The objective is to verify with 95% confidence that the average slab activity is less than 100 nCi/g (surficial) and 7 nCi/g (volumetric) Pu-239 and Am-241, and to provide an estimate of the average remaining slab activity. In addition, the data will be evaluated for the presence of other incidental radioisotopes, including Radium-226 and Uranium-235, although existing data does not indicate the presence of these isotopes in 771 (refer to Attachment A). The locations of the random sample locations will be selected per a simple non-parametric statistical method (Sign Test) described in Section 8.3 of the MARSSIM manual (refer to Attachment B). Building 771 will be divided into three units, and 774 into one unit (refer to Table 3). The number of samples required will be based on standard deviation

estimates derived from existing data, and verified to be adequate based on actual standard deviations.

5.0 NON-RADIOLOGICAL CONTAMINANTS

The non-radiological contaminants of concern, including beryllium (Be), asbestos (ACM), poly-chlorinated bi-phenyls (PCBs), RCRA contaminants, including lead (Pb), will be evaluated per existing site requirements for demolition. A discussion of each contaminant and path forward is provided below.

Beryllium will be evaluated per the requirements of the PDSP. Asbestos shall be removed and controlled per the requirements of Colorado Department of Public Health and Environment Regulation No. 8, Part B, and OSHA 29 CFR 1926.1101. PCB-based paints shall remain in place and the control measures outlined in the Risk-Based Approach memorandum (8EPR-F) shall be implemented during demolition. RCRA contaminants, including any RCRA closures, shall be evaluated per the requirements of the B771 DOP. Lead analysis of paint from the process areas of the 771/774 complex has revealed lead levels above regulatory limits in only one out of 61 samples taken, and the elevated level was only found in the stack exhaust tunnel (on an orange-colored sealant). Additional sampling will be performed in the exhaust tunnel in order to determine the path forward.

6.0 REPORTS

Upon completion of verification sampling, a final report shall be generated that includes the information described below.

- An overview map delineating decontaminated areas and post-remediation sample results
- The individual verification sample results and statistical evaluation (by survey unit)
- The average remaining activity (by survey unit)
- The conclusion for each survey unit

7.0 MAPS

The final grade maps are presented in Figure 2.

8.0 REFERENCES

DOE, 2001, Industrial Area Sampling and Analysis Plan, Rocky Flats Environmental Technology Site, Golden, Colorado, June.

MAN-127-PDSP, Pre-Demolition Survey Plan for D&D Facilities, Revision 0, Golden, Colorado, April 23, 2001.

PRO-1564-RSP-09.09, Radiological Characterization of Low Specific Activity Waste by Field Sampling and Analysis, Revision 0, Golden, Colorado, 9/26/02.

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Table 1
Number and Type of Existing Characterization Data

Location	No. of Samples	Media	Depth Interval	Analyte	Method
Building 771	16	Paint	Surface	Gross α	Alpha Spec.
	32	Concrete	1 in.	Gross α	ZnS Detector ⁽¹⁾
	100	Concrete	7 in. ⁽²⁾	Pu-239/240 ⁽³⁾ Am-241	In-Situ Gamma Spec.
B771/B776 Tunnel	17	Paint	Surface	Pu-239/240 ⁽³⁾ Am-241	Gamma-Spec.
	6	Concrete	7 in. ⁽²⁾	Pu-239/240 ⁽³⁾ Am-241	In-Situ Gamma Spec.
B771, Second Floor	90	Paint	Surface	Pu-239/240 Am-241	Alpha Spec.
Building 774	11	Concrete	1 in.	Gross α	ZnS Detector ⁽¹⁾
	15 ⁽⁴⁾	Paint	Surface	Pu-239/240 ⁽³⁾ Am-241	Alpha Spec.
	10	Concrete	7 in. ⁽²⁾	Pu-239/240 ⁽³⁾ Am-241	In-Situ Gamma Spec.

- (1) Field survey of concrete core at 1" depth
- (2) Assumed conservative slab depth (actual ranges from 7 to 12 in.)
- (3) When Pu-239 gamma line not detected, determined by multiplying detected Am-241 concentration by 6.95 (assumes 34-year WGP)
- (4) Collected in Room 241 (all results less than 0.1 nCi/g)

Table 2
Characterization Data Summary and Identified Data Gaps

Areas	Areas Evaluated	# Random Samples ⁽¹⁾	# Biased Samples ⁽²⁾	Remediation Required?	# Locations > 100 nCi/g (surface)	# Locations > 7 nCi/g (volumetric)	Data Gaps Identified?	Additional Characterization Samples Required ⁽³⁾
Rooms 183 through 187	Slab/Wall/Ceiling	15	9	No	0	0	No	0
Rooms 181A, 182, 182A	Slab/Wall/Ceiling	5	6	No	0	0	YES	10
Former Room 170s, 180s (South end former Labs)	Slab/Wall/Ceiling	15	5	YES	1	1	No	0
Former Room 150s, 160s (North end former Labs)	Slab/Wall/Ceiling	15	9	YES	0	0	No	0
Room 114, 114A, 114B, 112, and Corridor G Floors	Slab	15	8	YES	2	1	No	0
Room 149, 149A, and 148 Floors	Slab	15	3	YES	1	1	No	0
Room 146, 146A, 146C, 140s and 147s	Slab	15	0	YES	1	1	No	0
B771 Room 148	Slab	0	5	YES	3	0	No ⁽⁵⁾	0
B771/B776 Tunnel	Slab	15	8	YES	2	2	No	0
B771, Second Floor	Slab/Wall/Ceiling	90	0	No	0	0	No	0
B774	Slab/Wall	15 ⁽⁴⁾	21	YES	8	5	No ⁽⁵⁾	0
B771 Non-Process Areas	Slab	0	5	No	0	0	No	0

(1) *In-situ* gamma spectroscopy performed for all random locations

(2) Biased locations surveyed via *in-situ* gamma spectroscopy, ZnS field surveys, and paint sample analysis.

(3) Does not include post-remediation confirmation samples, or verification samples.

(4) Collected in Room 241.

(5) Only biased samples were collected in Rooms 148, and Building 774 Rooms 102, 103 and Old Tank 40. Due to extensive remediation required, no additional random samples will be collected as part of the characterization effort. Post-remediation samples and verification samples shall be collected.

Table 3
Verification Survey Units (Slab Surfaces > 6' Final Grade)

Verification Survey Unit ID	Building	Description	Estimated Surface Area (m ²)
A	771	West Side Process Area	1970
B	771	East Side Process Area	2815
C	771	Second Floor	1260
D	774	Rooms 102, 103, 241, Old Tank 40	1130

**EBERLINE SERVICES
RFETS
SUMMARY REPORT**

Spectroscopy Date: August 2002 through April, 2003

Location: RFETS Building 771, 774.

Customer: Chris Lee

Description: Uranium-235(²³⁵U) concentrations for floors and walls in B771 and B774

Summary: There is no indication in any of the wall, floor or ceiling assays of either B771 or B774 of enriched uranium. In the initial evaluation of these spectra all peaks that were observed were identified. No gamma rays for mixed fission products or activation products were detected in any of the assays, Tank 40 included.

²³⁵U concentrations in the B771 sample locations were not high enough to indicate anything but natural isotopic abundance. All radium-226(²²⁶Ra) peaks were consistent with background levels observed throughout Building 771 and Building 776.

Previously modeled data indicated that ²³⁵U concentrations in B774 were not high enough to indicate anything but natural isotopic abundance, with the exception of old Tank 40. It is the only assay location in either building where the relationship between the ²²⁶Ra and the uranium isotopes indicates some form of uranium purification. Because the uranium's depth distribution in the concrete is not known, a conclusive evaluation of this sample point is not possible with in-situ measurements. Because the ²²⁶Ra levels seem to be similar to the natural levels, and the ²³⁸U appears to be elevated, it is possible that some depleted uranium exists in the bottom of Tank 40. No other locations in B774 have detectable amounts of ²³⁸U. Any ²³⁵U present cannot be distinguished from the naturally occurring ²²⁶Ra.

Detail

At the request of Building 771 radiological engineering, the spectra collected in B771 were re-evaluated for the potential presence of ²³⁵U. Because it is a naturally occurring isotope, its presence could not be ruled out, but because of interference from other naturally occurring isotopes, it could not always be detected. Minimum detectable activities (MDA's) were calculated for ²³⁵U.

Values for ²³⁵U in this report are higher than those actually present. Its most abundant gamma line could not be resolved from the gamma line for naturally occurring ²²⁶Ra. The most abundant peak for ²³⁵U at 185.74 keV was used because it still provided a lower MDA than the second most abundant peak, which did not have interference from nearby peaks. In most cases, radium's daughter product, lead-214, was used to indicate the samples in which interference from ²²⁶Ra caused estimates of ²³⁵U to be affected by more than 50%. A separate column in the report was added to indicate when ²²⁶Ra dominated the region of interest used to calculate the ²³⁵U MDA. No attempt was made to adjust the estimate in an effort to minimize the number of assumptions used in these calculations. The high values were still reported for conservatism.

Assumptions/Deviations: All contamination was modeled as existing in a thin layer just under the paint to provide a worst-case scenario. If the contaminant had been modeled as existing throughout the concrete slab, the MDA's would have been significantly lower.

Analyst: B. P. Art Date: 9/9/04

Reviewer: William R. Salzman Date: 9/9/04

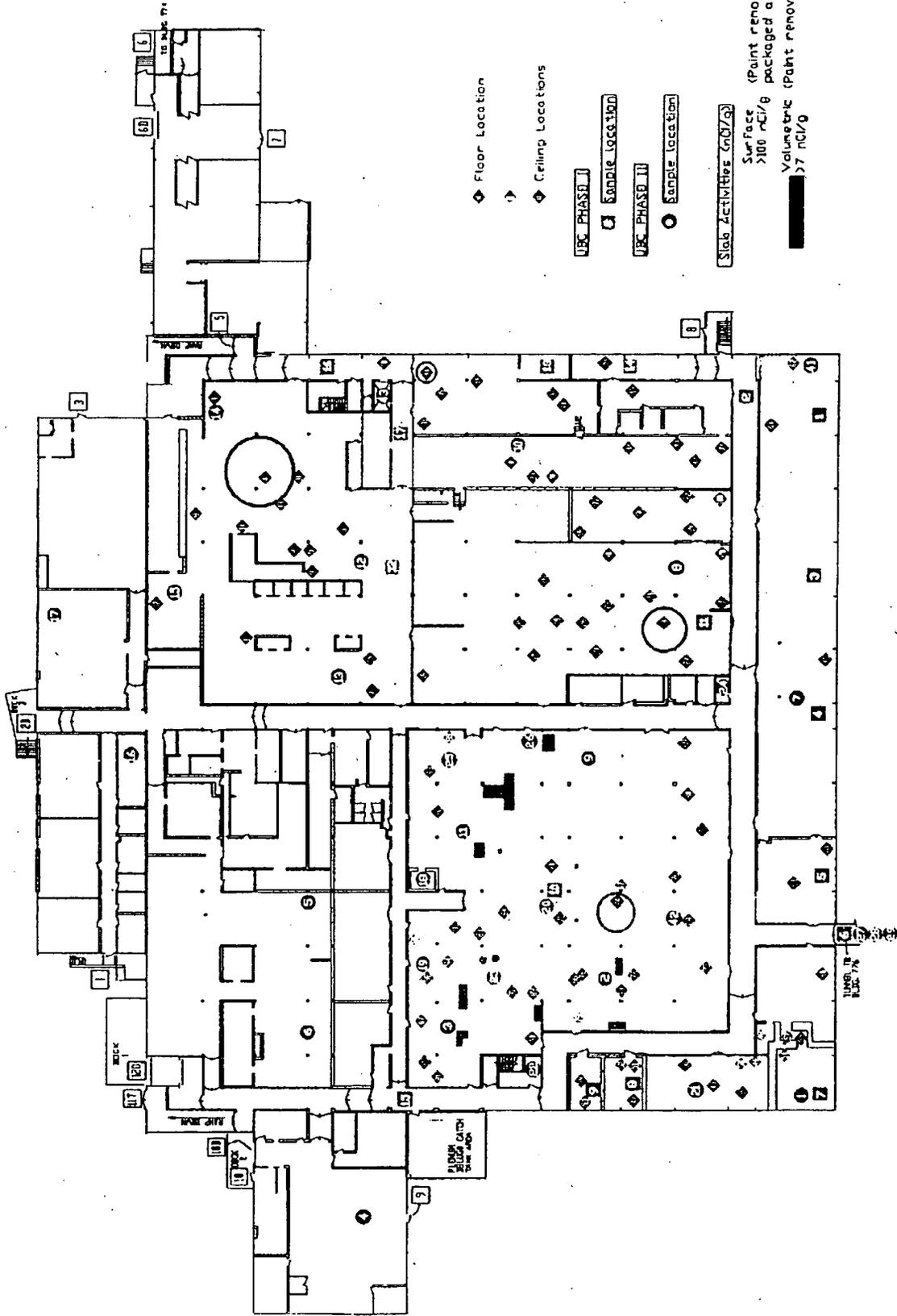
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Attachment B
Verification Sampling Statistical Design

Characterization Unit	Building	SR/CR/ZZ
Characterization Unit Description		
<p>Step 1: Calculate the relative shift Δ/σ.</p> $\Delta/\sigma = (DCGL - LBGR)/\sigma$ <p>where: Δ/σ is the relative shift or the resolution of measurements in units of measurement uncertainty (MARSSIM recommends a value between 1 and 3)</p> <p>DCGL is the derived concentration guideline value (7 nCi/g volumetric and 100 nCi/g surficial)</p> <p>LBGR is the lower bound of the gray region - the lower bound of the range of values of the parameter of interest in a survey unit where the consequences of making a decision error is relatively minor. The LBGR is typically adjusted to obtain a relative shift between 1 and 3.</p> <p>σ is the estimated standard deviation of the total surface activity measurements (MARSSIM recommends assuming a 30% coefficient of variation if scoping or characterization data is not available)</p> <p>Step 2: Determine Sign P using the calculated relative shift and Table 4. Sign p is the estimated probability that a random measurement from the survey unit will be less than the DCGL_L when the survey unit median is actually at the LBGR.</p> <p>Step 3: Determine Decision Error Percentiles for $Z_{1-\alpha}$ and $Z_{1-\beta}$ and the selected decision error levels α and β. Typical (α) and (β) values used at RFETS are 0.05 and 0.05 respectively. This yields a $Z_{1-\alpha}$ and $Z_{1-\beta}$ value of 1.645 and 1.645 respectively.</p> <p>Step 4: Calculate Number of Data Points (N) for Sign Test using the following equation:</p> $N = \frac{(Z_{1-\alpha} + Z_{1-\beta})^2}{4(\text{Sign } p - 0.5)^2}$ <p>where:</p> <p>1.645 is the alpha and beta decision error value (95% confidence) per the PDSP.</p> <p>Sign P equals 0.977250 for a relative shift of 2.0</p> <p>Step 4: Increase N by 20% to allow for missing or invalid data points per MARSSIM, Section 5.5.2.3.</p>		

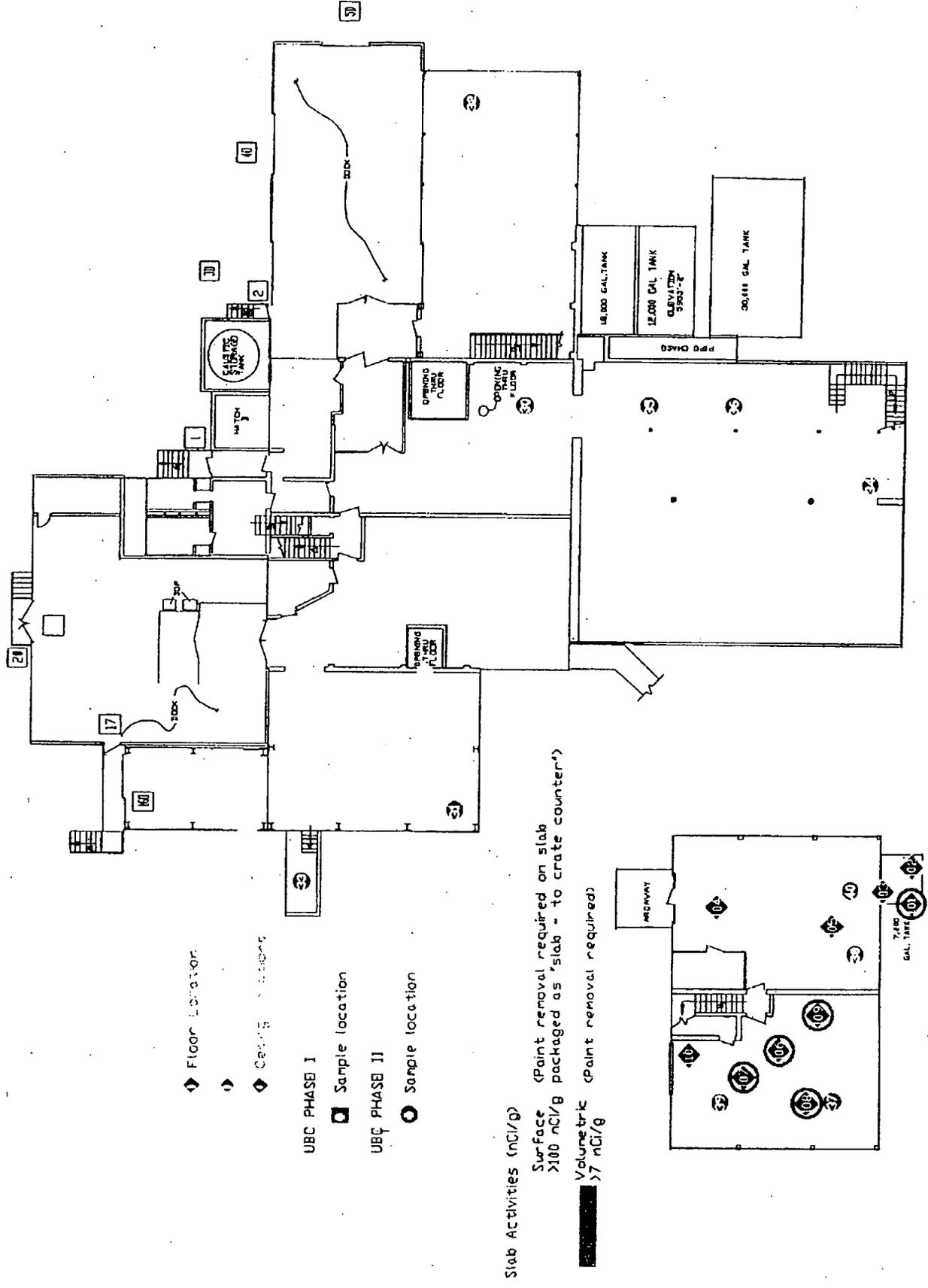
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Figure 1
 Characterization Data Summary
 Page 1 of 2

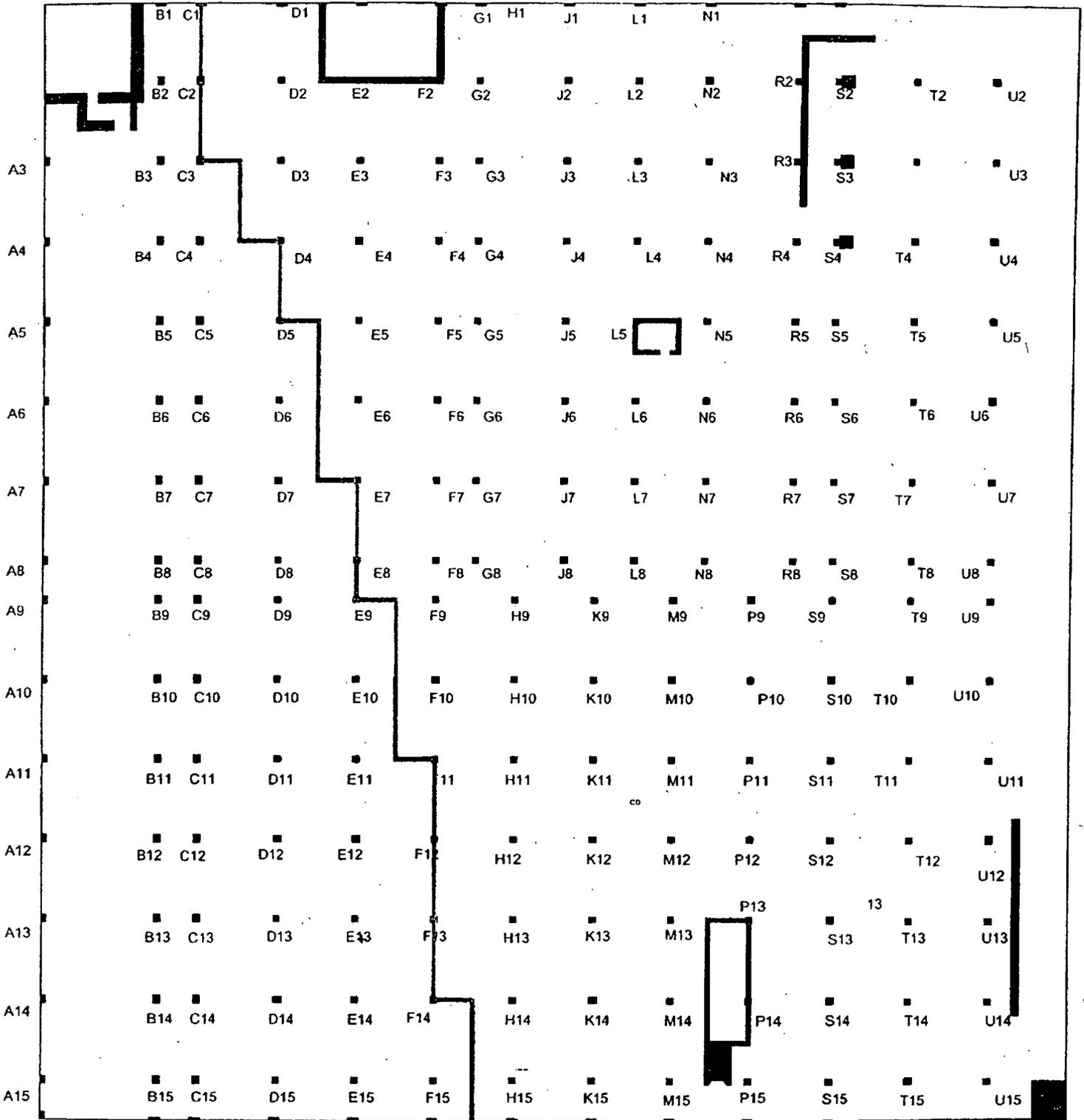


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Figure 1
Characterization Data Summary
Page 2 of 2



Building 771 First Floor Ceiling Final Grade



771 Second-Floor Final Grade Line



Random *In-Situ* Measurements for Area AH
(Survey Unit C)

123

Building 771 Floor Surveys

Map/Room	Area Type / #	Detect?	Detector	Spectrum File ID	SNAP Am241 Activity Concentration (nCi/g)	SNAP Am241 Activity Concentration MDA (nCi/g)	Pu-239/240 Activity Concentration (nCi/g)	Total Alpha Concentration (Am-241/Pu-239/240) (nCi/g)	Total Alpha MDA (nCi/g)	Assumed Contamination Depth (inches)	Assumed Total Thickness (inches)	Estimated Average Pu-239/240 Slab Activity Concentration (nCi/g)	Estimated Average Pu-239/240+Am-241 Slab Activity Concentration (nCi/g)
B771 Second Floor	1	N	33-TN40488A	04280401	< 2.37E-02	2.37E-02	< 1.65E-01	1.88E-01	1.95E-01	0.06	4.00	2.47E-03	2.83E-03
B771 Second Floor	11	Y	33-TN40488A	04280403	3.90E-02	2.33E-02	2.71E-01	3.10E-01	1.92E-01	0.06	4.00	4.07E-03	4.65E-03
B771 Second Floor	14	Y	33-TN40488A	04280401	6.39E-02	2.24E-02	4.44E-01	5.08E-01	1.84E-01	0.06	4.00	6.66E-03	7.62E-03
B771 Second Floor	12	Y	33-TN40488A	04290403	4.33E-02	2.26E-02	3.01E-01	3.44E-01	1.86E-01	0.06	4.00	4.51E-03	5.16E-03
B771 Second Floor	5	Y	33-TN40488A	04290404	4.60E-02	1.38E-02	3.20E-01	3.66E-01	1.14E-01	0.06	4.00	4.80E-03	5.49E-03
B771 Second Floor	2	Y	33-TN40488A	04290405	4.46E-02	1.53E-02	3.10E-01	3.55E-01	1.26E-01	0.06	4.00	4.65E-03	5.32E-03

NOTES:

1. Specific activity values for each isotope are taken from TBD-00076, "Activities for Isotopes of Concern in Weapons Plutonium as a Function of Time", for 34 year old plutonium.

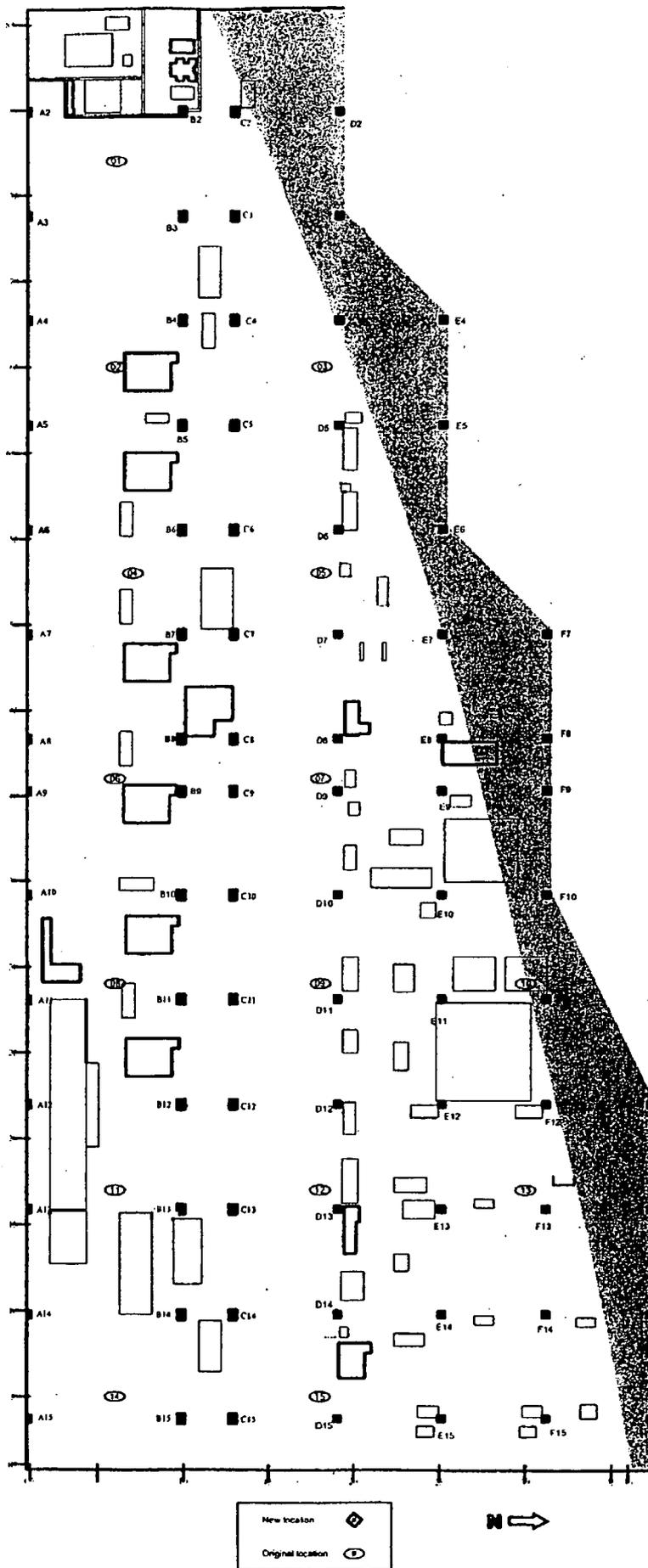
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Building 771 2nd Floor Area Surveys - Amended 8/19/04 per request from Sarah Roberts (slab depth changed from 7" to 4")

Area ID	Detect?	Detector	Spectrum File ID	SNAP Am241 Activity Concentration (nCi/g)	SNAP Am241 Activity Concentration MDA (nCi/g)	Pu-239/240 Activity Concentration (nCi/g)	Total Alpha Concentration (Am-241 + Pu-239/240) (nCi/g)	Assumed Contamination Depth (Inches)	Assumed Slab Thickness (Inches)	Estimated Average Pu-239/240 Slab Activity Concentration (nCi/g)	Estimated Average Pu-239/240+Am-241 Slab Activity Concentration (nCi/g)	Calc. Case
2nd Floor Area 3 (West of 184° R2 x 276° N2)	N	33-TN40488A	07280401	< 3.91E-02	3.91E-02	< 2.72E-01	3.11E-01	0.060	7.0	4.08E-03	4.66E-03	4
2nd Floor Area 5 (East of 121° R4 x 176° N4)	N	33-TN40488A	07280402	< 3.98E-02	3.98E-02	< 2.77E-01	3.16E-01	0.060	7.0	4.15E-03	4.75E-03	4
2nd Floor Area 9 (East of 129° R7 x 151° N7)	N	33-TN40488A	07280403	< 3.86E-02	3.86E-02	< 2.68E-01	3.07E-01	0.060	7.0	4.02E-03	4.60E-03	4
2nd Floor Area 15 (North of 52° P14 x 204° P15)	N	33-TN40488A	07280404	< 4.96E-02	4.96E-02	< 3.45E-01	3.94E-01	0.060	7.0	5.17E-03	5.92E-03	4
2nd Floor Area 8 (East of 95° G7 x 177° J7)	N	33-TN40488A	07280405	< 3.84E-02	3.84E-02	< 2.67E-01	3.05E-01	0.060	7.0	4.00E-03	4.58E-03	4
2nd Floor Area 4 (South of 80° D4 x 175° D5)	Y	33-TN40488A	07280406	4.99E-02	3.72E-02	3.47E-01	3.97E-01	0.060	7.0	5.20E-03	5.95E-03	1
2nd Floor Area 7 (South of 70° D7 x 183° D8)	Y	33-TN40488A	07280407	3.44E+00	6.90E-02	2.39E+01	2.74E+01	0.060	7.0	3.59E-01	4.10E-01	1
2nd Floor Area 10 (South of 69° D11 x 244° D12)	Y	33-TN40488A	07280408	4.18E+00	6.49E-02	2.91E+01	3.32E+01	0.060	7.0	4.38E-01	4.99E-01	1
2nd Floor Area 13 (South of 76° D14 x 211° D15)	Y	33-TN40488A	07280409	4.07E+00	6.55E-02	2.83E+01	3.24E+01	0.060	7.0	4.24E-01	4.85E-01	1
						0.00E+00	0.00E+00	0.060	7.0	0.00E+00	0.00E+00	

- < sign indicates number is an MDA for that measurement.
- Activity per gram values for each isotope taken from TBD-00076, Activities for Isotopes of Concern in Weapons Plutonium as a Function of Time, for 34 year old plutonium.
- Total activity calculation based on one of four cases listed in Assumptions and Calculations sheet.

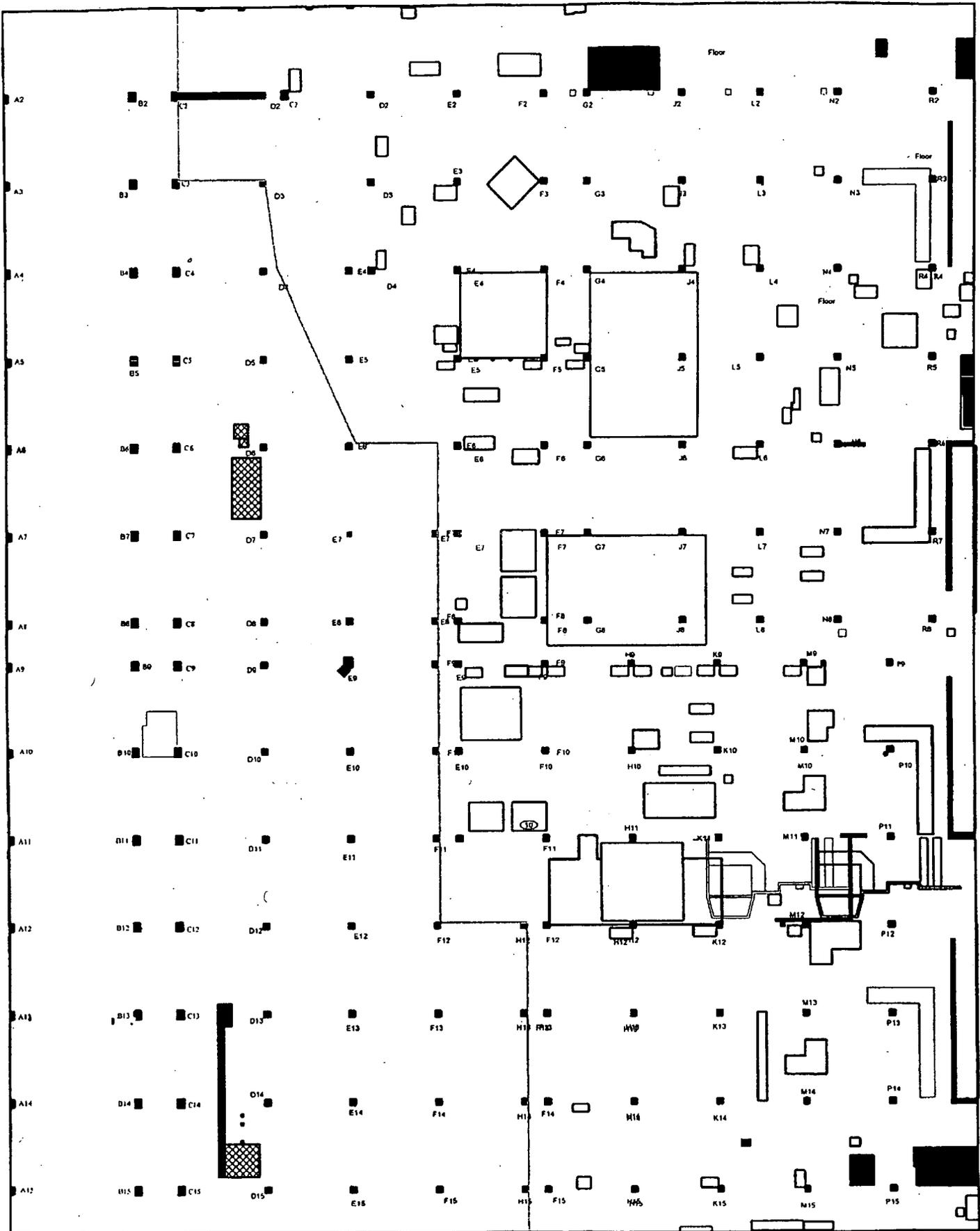
771 2nd Floor



125

Surface Scan (Fidler) Maps for Area AH
(Survey Unit C)

771 2nd Floor (Area AH)



Updated 9/1/2004



 To be cut out

 Remediated

Scanned with fiddler

127

Estimated Grams of WGP Remaining in Area AH

129

Estimated Grams WGP Remaining Area AH

Area AH Random In-Situ Gamma Spectroscopy Results	
Location	Volumetric Result for Pu-239/240 and Am-241 (nCi/g)
1	2.83E-03
2	5.32E-03
3	4.66E-03
4	5.95E-03
5	5.49E-03
6	4.75E-03
7	4.10E-01
8	4.58E-03
9	4.60E-03
10	4.99E-01
11	4.65E-03
12	5.16E-03
13	4.85E-01
14	7.62E-03
15	5.92E-03
mean =	9.70E-02
max =	4.99E-01
stdev =	1.91E-01

	Remaining Surface Area (ft ²)	Remaining Surface Area (m ²)	Remaining Surface Area (cm ²)	Assumed slab thickness (In)	Assumed slab thickness (cm)	Remaining Volume Concrete (cm ³)	Density Concrete (g/cm ³)	Total Remaining Activity (nCi)	SA 35-yr WGP (Ci/g)	Grams WGP (Alpha)
AH Floor	17244	1603	16028405.7	4	10.16	162848602	2.35	3.71E+07	8.24E-02	0.45
									Total Remaining Grams WGP =	0.45

ATTACHMENT L
Verification Surveys

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSTRUMENT DATA

Mfg. <u>Beckhoff</u>	Mfg. <u>NE</u>	Mfg. <u>NE</u>
Model <u>RSO-01</u>	Model <u>Electra</u>	Model <u>Electra</u>
Serial # <u>n/a</u>	Serial # <u>2327</u>	Serial # <u>2325</u>
Cal Due <u>6-6-05</u>	Cal Due <u>10-30-04</u>	Cal Due <u>2-28-05</u>
Bkg. <u>no</u>	Bkg. <u>8.0 cpm</u>	Bkg. <u>4.0 cpm</u>
Efficiency <u>n/a</u>	Efficiency <u>22.2%</u>	Efficiency <u>22.1%</u>
MDA <u>225 dpm</u>	MDA <u>94 dpm</u>	MDA <u>94 dpm</u>
Mfg. <u>n/a</u>	Mfg. <u>n/a</u>	Mfg. <u>n/a</u>
Model	Model	Model
Serial #	Serial #	Serial #
Cal Due	Cal Due	Cal Due
Bkg.	Bkg.	Bkg.
Efficiency	Efficiency	Efficiency
MDA <u>n/a</u>	MDA <u>n/a</u>	MDA <u>n/a</u>

Survey Type: Contamination (alpha)

Building: 771
 Location: Area A1
 Purpose: Verification

RWP #: 04-771-5445

Date: 9-12-04 Time: 1203

PRN/REN #: NA

Comments: 100m² scanned with RS Monitor in the West side of the 2nd Floor. Areas identified by Monitor to be over the DCL level were investigated with the above used ELECTRA. The investigation was done with the GDSec. Count all spots were found to be less than DCL level except for # 8 which was 634 dpm. The area was cleaned with Freon and Retested (see data below)

Survey Tracking No.: 771-04-S 1007

SURVEY RESULTS

N/S Tracking No.: 771-04-A NA

I.D. #	LOCATION	alpha		
		swipe dpm/100cm ²	direct dpm/100cm ²	wipe dpm/wipe
1	Grid 35e/34R	N/A	<300	N/A
2	Grid 27c/34R		<300	
3	Grid 27c/33R		<300	
4	Grid 29c/34R		<300	
5	Grid 30c/30R		<300	
6	Grid 32c/30R		<300	
7	Grid 44e/34R		<300	
8	Grid 44e/33R		<300	
9	Grid 43c/32R		<300	
10	Grid 46c/31R		<300	
11	Grid 45c/31R		<300	
12	Grid 44e/30R		<300	
13	Grid 40c/30R		<300	
14	Grid 37c/30R		<300	
15	Grid 35c/30L	N/A	<300	N/A
16	N/A		N/A	
17				
18				
19				
20	N/A	N/A	N/A	N/A

I.D. #	LOCATION	alpha		
		swipe dpm/100cm ²	direct dpm/100cm ²	wipe dpm/wipe
21				
22				
23				
24				
25				
26				
27				
28				
29				
30				
31				
32				
33				
34				
35				
36				
37				
38				
39				
40				

Date Reviewed: 9-12-03

RS Supervision: T. Fontaine

Print Name

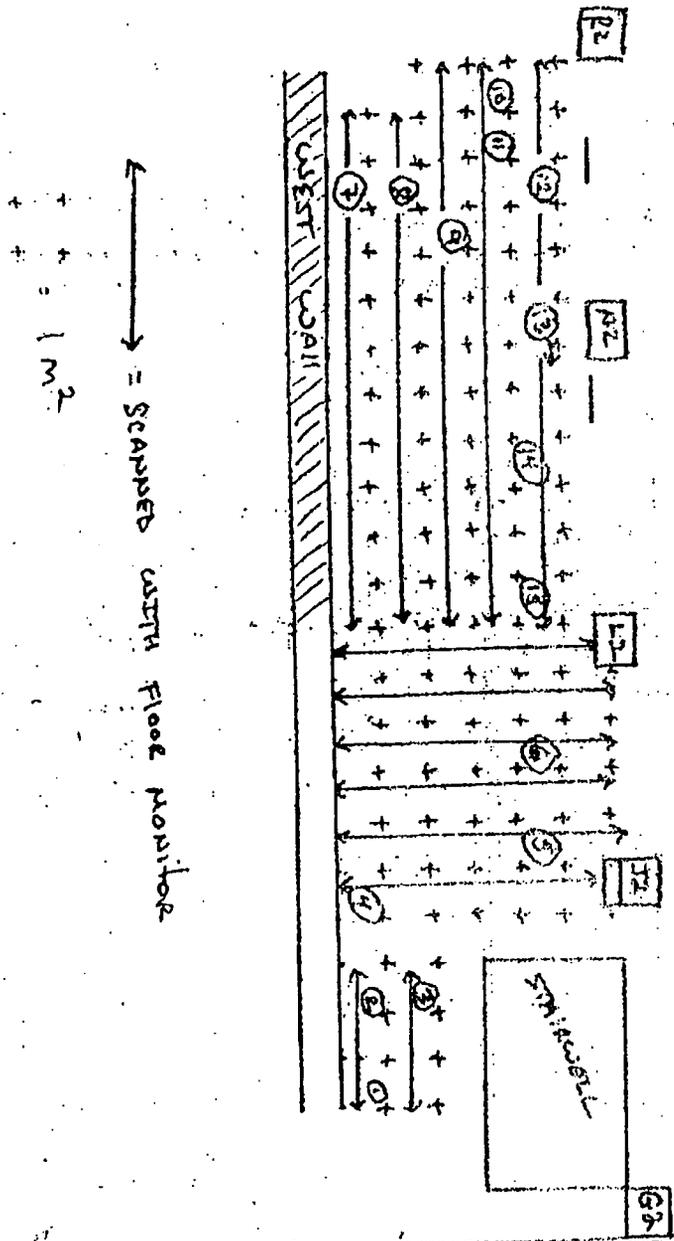
Signature

13

ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

RADIOLOGICAL SAFETY

Drawing Showing Survey Points



ATTACHMENT M
Supporting Documentation

134/134

Room 283 Biased Paint Sample Data

LOCATION DESCRIPTION	SAMPLE LOCATION NUMBER	SITE SAMPLE ID (RIN #01N0045)	NUCLIDE	pCi/g	MDA (pCi/g)	WEIGHT (g)	SURFACE AREA (In ²)	INDIVIDUAL NUCLIDE (dpm/100cm ²)	ESTIMATED MDA (dpm/100cm ²)	TRANSURANIC TOTAL (dpm/100cm ²) DCGL _w =100
Room 282C Exterior	1	004.001	Pu-239/240	0.030	0.080	2.13	52.5	0.0	0.1	
			Am-241	0.061	0.083			0.1	0.1	0.1
Room 283, ceiling	2	011.001	Pu-239/240	0.153	0.194	6.16	26.25	1.2	1.6	
			Am-241	0.066	0.090			0.5	0.7	1.8
Room 283, ceiling	3	010.001	Pu-239/240	0.061	0.082	9.23	26.25	0.7	1.0	
			Am-241	0.000	0.094			0.0	1.1	0.7
Room 283, south wall	4	006.001	Pu-239/240	1.060	0.096	20.40	26.25	28.3	2.6	
			Am-241	0.300	0.090			8.0	2.4	36.4
Room 283, north wall	5	001.001	Pu-239/240	1.180	0.127	13.10	26.25	20.3	2.2	
			Am-241	0.203	0.079			3.5	1.4	23.7
Room 283, north wall	6	008.001	Pu-239/240	0.106	0.072	17.29	26.25	2.4	1.6	
			Am-241	0.091	0.082			2.1	1.9	4.5
Rooms 283C-G, Exterior	7	002.001	Pu-239/240	0.057	0.146	26.55	26.25	2.0	5.1	
			Am-241	0.000	0.082			0.0	2.9	2.0
Room 283, ceiling	8	007.001	Pu-238	0.096	0.087	11.67	26.25	1.5	1.3	
			Pu-239/240	0.351	0.087			5.4	1.3	
			Am-241	0.087	0.078			1.3	1.2	8.2
Room 283, north wall	9	013.001	Pu-239/240	4.110	0.062	13.94	26.25	75.1	1.1	
			Am-241	0.748	0.263			13.7	4.8	88.8
Room 283B, north wall	10	014.000	Pu-239/240	0.509	0.204	2.93	52.5	1.0	0.4	
			Am-241	0.108	0.199			0.2	0.4	1.2
Roof Exit, north wall	11	015.001	Pu-239/240	0.030	0.143	20.02	26.25	0.8	3.8	
			Am-241	0.085	0.077			2.2	2.0	3.0

NOTE: Pu-238 reported if greater than MDC.

MIN	0.1
MAX	88.8
MEAN	15.5
SD	26.9
DCGL _w =	100