NOTICE

All drawings located at the end of the document.

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MITTAL OF THE BUILDING 111/333 RECONNAISSANCE LEVEL
CTERIZATION REPORT (RLCR) – DWF-005-01

l for your review and approval is subject report for Buildings 111 and 333 which, ı revised to include your previous comments This report characterizes the . chemical and radiological hazards associated with these buildings, summarizes acterization activities, defines the Data Quality Objectives developed for this rization, and presents the data quality assessment, verification and validation of

and characterization of interior and exterior floors, walls and ceilings of these was conducted in accordance with the D&D Characterization Protocol (DDCP), the issance Level Characterization Plan (RLCP), the draft Pre-Demolition Survey Plan and the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) aration of the Characterization Packages, including the implementation of M for development of the Survey Units (both impacted and non-impacted), were l for both buildings based upon historical and process knowledge, facility location ersonnel interviews, radiological data, etc. Surveys and sampling, for both cal and non-radiological constituents were conducted per applicable site es.

f our characterization effort indicate that no radioactive contamination exists in f the prescribed limits and that no significant physical hazards are present Both contain asbestos, in both friable and non-friable form, and fluorescent light ontaining PCBs. Paints on the basement walls of B111 have PCB concentrations 50 ppm. Paints on the floor of B333 contain PCBs at concentrations above 50 ints on the walls of the first and second floor of B111 and B333 were not sampled . However, due the color of the paint, their manufacturer and manufacture date, nts could contain PCB's. Therefore, additional sampling will be conducted to aste management decisions. Based upon our results, Buildings 111 and 333 are d Type 1 Facilities

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01-RF-00317

Steve Tower
D&D Program Lead
DOE, RFFO

TRANSMITTAL OF THE BUILDING 111/333 RECONNAISSANCE LEVEL CHARACTERIZATION REPORT (RLCR) – DWF-005-01

Provided for your review and approval is subject report for Buildings 111 and 333 which, has been revised to include your previous comments This report characterizes the physical, chemical and radiological hazards associated with these buildings, summarizes the characterization activities, defines the Data Quality Objectives developed for this characterization, and presents the data quality assessment, verification and validation of results

Planning and characterization of interior and exterior floors, walls and ceilings of these facilities was conducted in accordance with the D&D Characterization Protocol (DDCP), the Reconnaissance Level Characterization Plan (RLCP), the draft Pre-Demolition Survey Plan (PDSP), and the Multi-Agency Radiation Survey and Site Investigation Manual (MARSSIM) The preparation of the Characterization Packages, including the implementation of MARSSIM for development of the Survey Units (both impacted and non-impacted), were identified for both buildings based upon historical and process knowledge, facility location on-site, personnel interviews, radiological data, etc Surveys and sampling, for both radiological and non-radiological constituents were conducted per applicable site procedures

Results of our characterization effort indicate that no radioactive contamination exists in excess of the prescribed limits and that no significant physical hazards are present Both buildings contain asbestos, in both friable and non-friable form, and fluorescent light ballasts containing PCBs. Paints on the basement walls of B111 have PCB concentrations less than 50 ppm Paints on the floor of B333 contain PCBs at concentrations above 50 ppm Paints on the walls of the first and second floor of B111 and B333 were not sampled for PCBs However, due the color of the paint, their manufacturer and manufacture date, these paints could contain PCB's Therefore, additional sampling will be conducted to support waste management decisions Based upon our results, Buildings 111 and 333 are considered Type 1 Facilities

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Throughout the characterization effort, the Building 111/333 Project Team has kept you and our Colorado Department of Health and Environment (CDPHE) Representatives informed regarding progress, schedules, results of surveys and samples, modifications to our characterization strategy, etc., through the consultative process We will continue to utilize the data that we have gathered to date to help plan future characterization efforts and, most importantly, will use the consultative process with you and the CDPHE in planning for closure.

Upon your approval, please forward this report to the CDPHE for their review and concurrence. Please notify Kaiser-Hill when you transmit this document to CDPHE If you have any questions, don't hesitate to call me at extension 5008

Denny Ferrera

Denny Ferrera
RISS Deputy Project Manager
Kaiser-Hill Company, L L C

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Enclosure
As Stated

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Fred Gerdeman

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Rocky Flats Environmental Technology Site

RECONNAISSANCE-LEVEL CHARACTERIZATION REPORT (RLCR)

BUILDING 111 AND BUILDING 333

REVISION 0

February 14, 2001

This report was approved by:

Tom Scott D&D Programs	2/15/01 Date
Steve Luker Quality Assurance	2/14/01 Date
Kevin Daniels ESH&Q Manager, RISS	2/15/01 Date
Cameron Freiboth Project Manager	02/14/01 Date

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ABBREVIATIONS/ACRONYMS

ACM	Asbestos containing material
Be	Beryllium
CBDPP	Chronic Beryllium Disease Prevention Program
CCR	Code of Colorado Regulations
CDPHE	Colorado Department of Public Health and Environment
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
$DCGL_{EMC}$	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
IWCP	Integrated Work Control Program
K-H	Kaiser-Hill
LBP	Lead-based paint
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
PDSP	Pre-demolition survey plan
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RLC	Reconnaissance Level Characterization
RLCR	Reconnaissance Level Characterization Report
RSP	Radiological Safety Practices
SVOCs	Semi-volatile organic compounds
TCLP	Toxic Collection Leachate Procedure
TSA	Total surface activity
TSCA	Toxic Substances Control Act
VOCs	Volatile organic compounds

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EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) of Building 111 and Building 333 was performed to enable compliant disposition and waste management Because these buildings were classified as MARSSIM Class 3 (RFCA Type 1) facilities, the RLC implemented a Pre-Demolition (Final Status) Survey design to determine whether the facilities can be released (off the site) without restrictions pursuant to the D&D Characterization Protocol (MAN-077-DDCP) Physical, radiological and chemical hazards were assessed based on historical reviews (including operating and spill records), process knowledge, and newly acquired RLC data Environmental media beneath and surrounding the facilities were not within the scope of this characterization

Results indicate that no radioactive contamination exists in excess of the prescribed limits and that no significant physical hazards are present Both buildings contain asbestos, in both friable and non-friable form, and fluorescent light ballasts containing PCBs Paints on the basement walls of B111were analyzed for PCBs, and the 95% upper confidence limit on the mean value is 30 ppm, which is below the regulatory limit of 50 ppm Paints on the floor of B333 contain PCBs at concentrations above 50 ppm Paints on the walls of the first and second floor of B111 and the walls of B333 were not sampled but, due to their color and manufacturer date, could contain PCBs Therefore, additional sampling will be conducted for waste management purposes

Sampling for lead in paint on B111 and B333 surfaces was not required Environmental Waste Compliance Guidance #27, *Lead-Based Paint (LBP)* and *Lead-Based Paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal.

Based upon this RLC and subject to concurrence by the CDPHE, both facilities are considered to be Type 1 facilities. Asbestos containing material and PCB ballasts will be removed and disposed of in compliance with Environmental Protection Agency (EPA) and Colorado Department of Public Health and Environment (CDPHE) regulations All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), in accordance with the Decommissioning Program Plan, Section 3.3 5, as applicable

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1.0 INTRODUCTION

As part of the Rocky Flats Environmental Technology Site (RFETS or Site) Closure Project, numerous buildings and structures will be removed Among these are Building 111 and Building 333 (B111 and B333) Both are located off Central Avenue in the western portion of the Industrial Area (refer to Figure 1-1) These facilities no longer support the RFETS mission and need to be removed to reduce Site infrastructure, risks and/or operating costs

Before the facilities can be released, hazards must first be identified Hazards identified will be used to plan final disposition This document presents the existing physical, radiological and chemical hazards associated with the two facilities, and classifies the facilities pursuant to the RFETS Decommissioning Program Plan (DPP, 1999, Type 1, 2 or 3) The hazards assessment is based on facility history and process knowledge, operating and spill records, and results of the reconnaissance level characterization (RLC)

Planning and characterization of interior and exterior walls, floors, and roofs of these facilities was conducted in accordance with the D&D Characterization Protocol (DDCP, K-H, 1999), the draft Pre-Demolition Survey Plan (MAN-127-PDSP), and the *Multi-Agency Radiation Survey and Site Investigation Manual* (MARSSIM) The preparation of the Characterization Packages, including the implementation of MARSSIM guidance for development of the Survey Units for both buildings was based upon historical and process knowledge, facility location on-site, personnel interviews, radiological data, etc Surveys and sampling, for both radiological and non-radiological constituents, were conducted per applicable site procedures. The results of the pre-demolition "exterior" surveys completed on the exterior for Building 123, and the trailers associated with various trailer complexes (i.e., 112, 331, 439, 444, 690, 891, 893), as well as B111 and B333, do not indicate the presence of DOE added material Based upon these results and history that no known or documented external releases have occurred from facilities in the 100, 400 and 800 Areas, there is a very low potential for contamination on exterior surfaces of facilities located within these areas Therefore, future planning for pre-demolition "exterior" surveys of facilities, located within these Areas, will not be as rigorous as previous surveys, when implementing MARSSIM

Throughout the characterization effort, the B111/B333 Project Team has kept the Department of Energy (DOE) and Colorado Department of Public Health and Environment (CDPHE) Representatives informed regarding progress, schedules, results of surveys and samples, modifications to our characterization strategy, etc through the consultative process. Kaiser-Hill, L L C (K-H) will continue to utilize the data that has been gathered to date to help plan future characterization efforts and, most importantly, will continue to use the consultative process with the DOE and the CDPHE in planning for closure

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1.1 Purpose

The purpose of this report is to communicate and document the results of the RLC effort The purpose includes summarizing the data into a concise, usable format and interpreting the data for use in management decisions, primarily

- Definition of individual hazards and overall risk associated with facility decontamination and decommissioning (D&D),
- Typing of facilities based on hazards identified,
- Determining the need for additional characterization, and
- Waste classification to enable compliant disposal

1.2 Scope

This report characterizes the physical, radiological and chemical hazards associated with B111 and B333 Based on the hazards identified, the facilities were typed Environmental media beneath and surrounding the facilities are not within the scope of this characterization, except for the sediment in the manhole located in the parking lot east of B111 Both facilities and environmental media will be dispositioned in accordance with the Rocky Flats Cleanup Agreement (RFCA)

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2.0 OPERATING HISTORY AND PHYSICAL DESCRIPTION

2.1 Building 111

2.1.1 Physical Description Building 111

B111 was constructed in 1953 and is located on the north side of Central Avenue, one block west of Fourth Street The size of the north-south section is approximately 50' wide by 263' long, with a basement, main, and 2nd floor The east-west section measures approximately 50' wide by 185' long, and it has only one floor B111 contains approximately 44,000 square feet of floor space

B111 was designed and built as an administration office facility and has always been used as such The basement contained a photography department with several photography dark rooms. The building also contained a Site printing shop, Basement Room 6, with all the associated printing equipment

2.1.1.1 General Construction and Foundation

B111 is a steel-reinforced poured-concrete superstructure and is an L-shaped building The auditorium section, which was an add-on modification, consists of 8" reinforced, poured concrete floors, walls and roof/deck.

2.1.1.2 Walls

The B111 exterior walls are poured steel-reinforced concrete between the poured concrete superstructure columns. Steel framed window sections, approximately 8' wide X 8' high, on the main floor and 2nd floor, fill in part of the wall sections On the exterior walls, below the window sections, there are Transite® panels over insulation. The inside of most exterior walls are insulated with aluminum-foil-backed thermal insulation and covered with gypsum board. There are many different types of interior walls, including drywall, Transite® panels, wood paneling, and wallpaper over Transite® panels or drywall.

The building stairway walls are steel-reinforced poured-concrete walls All of the stairways and handrails are constructed from steel There are several rooms on all three floors and the west wing that have steel reinforced poured-concrete walls Most of the hallway walls are paneled Transite®. Most office partition walls are a combination of drywall and steel stud construction, wood paneling, and some Transite® paneled walls that in some cases are covered with paneling or wallpaper

2.1.1.3 Floors

All of the floors in B111 are poured steel-reinforced concrete The concrete floors in some rooms are covered with tile Other floor areas are covered with carpeting A lot of the office floors have both floor tile and carpeting The entire floor tile was the older 9" X 9", which is known to or suspected to contain asbestos

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2.1.1.4 Ceilings

B111 has mostly drop-ceilings with acoustical tiles

2.1.1.5 Roof

B111 has six roof sections, all of which are flat-roof design The roofs are a typical built-up-roof design, which consists of an aluminum or asphalt emulsion coating over lightweight insulation filled concrete, a 4-ply system, with the first ply nailed and then the roof sealed with tar and covered with gravel The building roofs have a combined total of approximately 30 moisture-relief vents The flat roof design has parapet walls around the outside of the roof with scupper-type drains leading to approximately 30 roof downspout drains. The entire roof perimeter parapet walls have lightening arresting rods

2.1.1.6 Doors

B111 has 12 entrance doors, including a dock entrance on the 2nd floor and a dock entrance at the basement level utility room. All of the doors are metal fire rated doors Door 1, which is on the southwest corner of the building north-south section, has a weather-protecting cover over it. Doors 5, 6 and 7 also have weather-protecting covers Door 21 is a 2nd floor freight-dock and double-door entry The basement has a basement-level entry door serviced by a hydraulic elevator/lift, which is enclosed by a wire cage

2.1.1.7 Utilities

B111 has a dedicated power transformer located in the basement utility area, south section of the basement, Room 1D. The building was heated by Site-supplied steam. High-pressure steam and condensate return lines were piped from the Steam Plant into the basement where the pressure was reduced Low-pressure steam was piped from the B111 basement utility area up to the roof. Individual conditioned air (heated or cooled) pipes were dropped over the roof and down to the heat/cooling registers in all of the B111 offices and other areas of the building. The entire B111 has a fire sprinkler system that was tied into the Site's Firewater Flow Alarm System Public address system speakers are located through the building. Other utilities include domestic water and sewer connections and an airline.

2.1.1.8 Heating, Ventilation and Air Conditioning (HVAC)

B111 has a cooling tower on the roof and an air-filtration ventilation system on the roof and in the basement utility area, Room 1A The building has two large steam/cooling heat exchangers mounted on the roof for heating and/or cooling the building's ventilation air The building ventilation air has two large air-blowers for movement of the conditioned air throughout the entire building Inlet air for the building is pre-filtered in the inlet air filter house located on the roof

Many areas, offices and rooms had dedicated air conditioning systems, which have been removed, and the openings are covered with plywood All of the utility equipment

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remains in the Basement Room 1A, but the building is not currently being heated and/or cooled

2.1.2 Description of Building 111 Operations

2.1.2.1 Historical Processes

B111 was used as the Site's main administration building for approximately 47 years During this time, it also housed in the basement area a Site photographic department, a Site printing department, and two or more Site libraries at various times For many years it provided administration offices for Site contractor management and DOE management

2.1.2.2 Current Status

There are floor-plan, roof-plan, and electrical and engineering drawings for B111 All of the equipment, office cubicle walls in certain areas, and other office equipment have been removed, with a few exceptions. Room 110, on the main floor, was once a classified vault, but the vault door has been removed. Basement Room 5 has a large photographic enlarger piece of equipment, approximately 6' wide X 20' long X 5' high left to be demolished with the building.

Room 7F, in the basement, is an old photography vault, and it still has the vault door in place. Room 6 has a refrigerator/freezer, approximately 6' wide X 4' deep X 6' high, which has been left to be demolished with the building The freon in the refrigerator/freezer and all other equipment has been drained. All of the water systems are off and drained, including the building fire sprinkler systems. All drinking foundations have been removed. All of the fire alarm panels have been gutted.

Currently, B111 has one operable telephone for emergencies All of the B111 restrooms have the plumbing equipment grouted off. The B111 main power transformer in Room 1D is still activated to supply power to two basement sump pumps in Room 1A. B111 is totally empty of personnel, and it is approximately 98 percent deactivated All of the doors to the building are posted controlling access, and only supervised walkdown access is allowed.

2.2 Building 333

2.2.1 Physical Description of Building 333

B333 is located on the north side of Central Avenue, halfway between Fourth and Sixth Streets It was built in 1953 to house the Site paint shop to support all buildings on site that did not have a paint shop in them It has always been used as a paint shop Two additions were added onto the building at later dates to expand the capacity of the building and improve operations These additions were built in the mid and late 1960s When the additions were added the building increased in size from 30' wide by 30' long to 30' wide by 100' long

2.2.1.1 General Construction and Foundation

The original construction of the building was reinforced concrete The two additions to the east and west were constructed of concrete blocks The building is built on grade with foundation walls four feet deep. The original building and the east addition contain a filtered spray booth on the east side of each area The west side of the east addition has a large preparation area. There is an overhead monorail crane to move large items from the preparation area to the spray booth and the rollup truck door The west side was constructed to house an abrasive blasting operation to prepare large metal objects for painting The filtration and return hoppers are located outside the building on the west side. For safety, all electrical switches and outlets are explosion proof in the building

2.2.1.2 Walls

The original construction was of reinforced concrete with interior walls of concrete block and gypsum board on stud framing. The dry wall goes to a height of 10 feet The east addition was made of concrete block with reinforced columns made of concrete block These columns supported the I-beam framework for the overhead monorail A partition wall made of gypsum board goes to the roofline to separate the paint spray booth from the rest of the addition. The west addition has concrete block exterior, on three sides, with the fourth being the concrete wall of the original building and an interior block wall The interior walls of the abrasive blasting room are covered with black iron sheet to a height of six feet to protect the walls from being abraded by the abrasive blasting material

2.2.1.3 Floors

The floors of the building are six-inch reinforced concrete. The original floor is suspect asbestos-containing tile. The east addition floor has been painted with epoxy paint. The west addition floor is a sump covered with a grating The sump is approximately nine feet square and six inches deep, to allow for the collection and removal of the abrasive blasting material to the filtration system. The edges, about a foot and half wide of concrete, are painted with epoxy paint.

2.2.1.4 Ceilings

The ceiling of the building is the underside of the roof and is painted In the northwest corner of the original building there is a skylight in the ceiling The ceilings in the two dry-walled rooms of the original building are drop-in type, open-lattice ceilings

2.2.1.5 Roof

The roof for the original building is a poured reinforced-concrete slab sloped to the southeast corner for drainage that drains onto the east addition roof It is covered with an asphalt glaze and gravel covering The east and west addition roofs are poured lightweight concrete on metal pan supported by open-web steel roof joists This is in turn covered with an asphalt glaze and gravel covering The west addition drains to the west with a downspout at the middle of the west wall The east addition slopes to the north and drains to a gutter that takes the roof runoff to the east and a downspout

2.2.1.6 Doors

There are seven steel doors leading into the building Three are double-man doors, two are single-man doors, and two are truck doors All the man doors have two panes of wire-mesh glass in the upper half of the door The truck door in the east addition is a wall-mounted rollup door. The west truck door is a swing-out, ten-foot high, steel door with no windows in it. There is a rolling steel door between the spray booth in the original building and the preparation area in the east addition Also there is a rolling steel door between the preparation area and the spray booth in the east addition

2.2.1.7 Utilities

Utilities supplied to this building were electricity, steam, domestic water and sewer An addition on the north side of the building has a steam condensate return and a small electric hot water heater. The building had its own air compressor to supply compressed air to the spray paint operations (removed) Utilities have been disconnected The building also has three floor drains, which have been plugged

2.2.1.8 Heating, Ventilation and Air Conditioning (HVAC)

Heat to the building came from steam radiators and electric heaters On the roof of the east addition, there are two air-handling units that provide ventilation to the two rooms in the east addition. There are steam coils in these units to provide the necessary heat There is an air-handling unit on the west addition that provides air to the abrasive blasting room but no heat. There is a small exhaust fan in Room 100B in the original structure that exhausts through the skylight above this room There is no air conditioning in the building

2.2.2 Description of B333 Operations

2.2.2.1 Historical Processes

B333 operations consisted of performing the various painting needs of the buildings on Site that did not have paint shops in them. Signs were also made by silk- screening or engraving the letters on aluminum, lamicord plastic, or brass sheets

Painting center lines and lettering of the street surfaces as needed was carried out from this building If floor tile in Site buildings needed to be replaced, the replacement was done by building personnel

2.2.2.2 Current Status

The building is currently empty and closed for D&D The only equipment remaining in the building is the monorail track, the paint spray booths, abrasive blasting equipment, and its associated electric panels Utilities have been disconnected

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3.0 SUMMARY OF CHARACTERIZATION ACTIVITIES

An RLC was designed to demonstrate that DOE-added contaminants are not present or have been removed to the extent that residual levels of contamination are below the Derived Concentration Guideline Levels (DCGLs) and that the building materials can be disposed of as sanitary waste/construction debris or recycled This section of the RLC Report (RLCR) presents data quality objectives (DQOs) used, historical and process knowledge, and additional characterization performed to dispose of the facilities Section 3.0 also describes the survey units for characterizing the two facilities, and defines the methods used to perform radiological surveys, scans and sampling The RLC followed the guidance provided in the site DDCP and the Pre-Demolition Survey Plan (PDSP)

3.1 Data Quality Objectives

The following section revisits the original DQOs used in designing the RLC Characterization Packages. The DQOs were modified based on the Project Scoping Meeting held September 14, 2000 (refer to Decision Boundaries and Optimization of Plan Design below)

The Problem

The problem consists of the unknown volume of floors, walls, ceilings and roofing, and the unknown extent of radiological and chemical contamination on and in floors, walls (interior and exterior), ceilings and roofing

The Decision

The decision is whether release criteria for radiological and chemical constituents have been met (see Decision Rules below), based on types and quantities of any radiological and chemical contamination present

Inputs to the Decision

The inputs to the decision include historical and process knowledge, data collected from this RLC, and release criteria and waste management regulations (see Decision Rules below).

Decision Boundaries

The decision boundaries include the floors, walls (interior and exterior), roofing, and surfaces on any fixed equipment associated with the two facilities, including the abrasive blasting equipment outside B333 Environmental media under the buildings were not considered within the project boundaries However, the decision boundaries were expanded to evaluate the B111 carpeting, the B111 transformer pad, the hydraulic fluid in the B111 elevator system, the sludge in the B111 chiller system (in the basement), the sediments in the B111 basement drains and the manhole in the parking lot east of B111, and the B333 paint shop floor drain.

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Decision Rules

This section presents the rules to support the characterization decisions, specific to each type of contamination. Decision rules are applied based on process knowledge, facility walkdowns, and/or radiological surveys

Radionuclides

- If all radiological survey and scan measurements are below the surface contamination guidelines provided in DOE Order 5400 5 (Radiation Protection of the Public and Environment), the related surface is considered not radiologically contaminated
- If any radiological survey or scan measurement exceeds the surface contamination guidelines provided in DOE Order 5400.5, the related survey unit must be evaluated per the statistical tests described in Section 7 0 of the RFETS Pre-Demolition Survey Plan (PDSP)
- If total alpha activity exceeds the most conservative transuranic (Americium-241) action levels per RFCA Tier II, then sediment samples are considered radiologically contaminated

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 hazardous waste in accordance with 6 CCR 1007-3, Part 261 and 268

Hazardous Substances

If material contains a listed hazardous substance equal to or above the CERCLA reportable quantity (40 CFR 302.4), the material is subject to CERCLA regulation (i.e., notification requirements).

Beryllium

If surface concentrations of beryllium are equal to or greater than 0 2 $\mu g/100\ cm^2$, the material is considered beryllium contaminated per 10 CFR 850 31

Polychlorinated Biphenyls (PCBs)

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

Asbestos

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

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Tolerable Limits on Decision Error

For radiological contamination, tolerable limits on decision error (95% confidence) are applied to the MARSSIM design of survey and sampling plans, as well as actual measurement data resulting from implementation of the plans Survey area size limits are based upon the requirements of Table 1 of PRO-475-RSP-16 01 Survey areas were developed based on current radiological postings, the procedurally driven size limitations, function and use of area, and where possible, maintaining contiguous survey areas

Decision error does not apply to asbestos sample sets per 40 CFR 763 Results are compared with the decision rule on a sample-by-sample basis.

Optimization of Plan Design

Radiological characterization was conducted on interior floors, walls and ceilings, and exterior walls and roofs as necessary. In addition, carpeted surfaces within B111, sediment from the B111 footing drain/basement sump and the manhole in the parking lot east of B111, and sludge from the B111 chiller system were characterized The following criteria were used to develop the radiological survey/sampling characterization package

- Radiological field measurement methods and instrumentation, as described in Section 3.0 of the site PDSP (MAN-127-PDSP)
- Radiological sampling and preparation for laboratory measurements, as described in Section 3.0 of the site PDSP (MAN-127-PDSP)

As was discussed during the Project Scoping Meeting, radiological surveys of Impacted Class 3 areas within the buildings were limited to floors and walls less than 6 ft from the floor. The rationale is that the most probable contamination in a non-nuclear facility would have resulted from foot traffic and would appear on the floors and the lower portion of walls. Other sources of contamination would also impact the floors and the lower portion of walls, just as likely as the ceilings and the higher portion of walls If contamination were found on the floors and the lower portion of walls during this RLC, additional investigations would be conducted and would include the ceilings and the higher portion of walls. Refer to Section 3 2 3

Sampling and analysis of hazardous waste, hazardous substances (e g , PCBs), beryllium, and asbestos were conducted in accordance with Section 6 0 of the D&D Characterization Protocol As was discussed during the Project Scoping Meeting, sampling was expanded to determine the following

- Presence of toxic metals in the floor of the B111 photographic laboratory,
- Presence of PCBs around the B111 transformer, in the hydraulic fluid used in the B111 elevator lift system, and in paints on the concrete foundation (outer basement walls),
- Presence of toxic metals and PCBs in sediments in the two B111 basement drains and the manhole in the parking lot east of B111,

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- Presence of VOCs and PCBs in the water in the B111 basement footing drain,
- Presence of VOCs in the manhole in the parking lot east of B111,
- Presence of toxic metals in the sludge contained in the B111 chiller system,
- Presence of toxic metals, VOCs and PCBs in the B333 floor,
- Presence of PCBs in the B333 floor paint,
- Presence of toxic metals and PCBs in abrasive blasting waste,
- Presence of Be on B111 and B333 surfaces, and
- Presence of asbestos in B111 and B333.

Refer to Section 3.3

3.2 Radiological Characterization

Radiological characterization was performed to define the nature and extent of radioactive materials that may be present on or in the two facilities This section reviews the historical radiological information on these facilities, or lack thereof, and discusses the RLC conducted. Radiological hazards are discussed in Section 4 0, and RLC data are presented in Attachments A - S of this report The RLC radiological survey packages containing field data are maintained in the B111/B333 Closure Project RLC file

3.2.1 Summary of Historical Information

Historically, radiological surveys for B111 and B333 may have been performed, but the data are not readily available. There are no Plant Action Tracking System items outstanding on these facilities, which indicates no associated radiological program deficiencies.

3.2.2 Summary of RLC Data Collected

Although historical review indicates no use of DOE-added radioactive material in the two buildings, insufficient quantitative radiological data existed to designate these structures as non-contaminated pursuant to the site PDSP. Therefore, radiological surveys were performed in and on the two facilities. A summary of each survey unit and the data collected is provided in Table 3-1 Survey unit maps are provided in Attachment R

Sediment samples from the B111 footing drain/basement sump and the manhole in the parking lot east of B111 were analyzed for gross alpha/beta The B111 chiller system sludge and the abrasive blasting waste was also analyzed for gross alpha/beta Four samples of B333 abrasive blasting waste were collected (i e , two from the blasting area and one from each of the exterior hoppers)

Table 3-1 Survey Units and Data Types for B111 and B333

SURVEY AREA	SURVEY UNIT	TYPE	CLASS	DESCRIPTION	% SCAN	# TSAs/ SMEARS	# RAD. SAMPLES
B111							
A (Basement)	111-A-001	1	3	Photo Area (north)	10	15	0
	111-A-002	1	3	Mechanical Area (south)	10	15	0
B (First Floor)	111-B-003	1	3	Auditorium Area	10	15	0
	111-B-004	1	3	West Wing	10	15	0
	111-B-005	1	3	Main Bldg – South	10	15	0
	111-B-006	1	3	Main Bldg – North	10	15	0
C (Second Floor)	111-C-007	1	3	South Area	10	15	0
	111-C-008	1	3	North Area	10	15	0
D (Stairwells)	111-D-009	1	3	Stairwell (Door No 7)	10	15	0
	111-D-010	1	3	Stairwell (Door No 5)	10	15	0
E (Roof)	111-E-011	1	3	Roof	10	15	3
F (Exterior Walls)	111-F-012	1	3	Main Bldg	10	15	0
	111-F-013	1	3	West Wing	10	15	0
B333							
A (Interior)	333-A-001	1	3	Paint Shop (Rms 100, 100 A-C, 101, 102, 102A & 105)	10	15	0
	333-A-002	1	3	Sandblasting Area (Rms 103 & 104)	10	15	0
B (Exterior)	333-B-003	1	3	Walls	10	15	0
C (Roof)	333-C-004	1	3	Roof	10	15	0

3.2.3 Sampling and Field Measurement Methods, Procedures and Equipment

Measurements were performed to evaluate the radiological contaminants of concern (i e , plutonium and americium) The TSA measurements were collected with a NE Electra using a DP-6 probe (90-second counts) Removable activity measurements were analyzed with an Eberline SAC-4 (two-minute counts) Surface scans were performed

with the NE Electra at a scan rate of 1.5 inches per second Refer to Attachment S for *a priori* calculations of instrument minimum detectable concentration

Radiological survey packages were developed for each survey unit in accordance with RFETS Radiological Safety Practices (RSP) 16 01, "Radiological Survey/Sampling Package Design, Preparation, Control, Implementation and Closure," RFETS RSP 16 02, "Radiological Surveys of Surfaces and Structures," and RFETS RSP 16 05, "Radiological Survey/Sample Quality Control." Sampling of sediment was conducted in accordance with RFETS RSP 16 03, "Radiological Samples of Building Media"

Specific TSA and removable survey locations were selected using a random number generator for all facilities. If a random location was inaccessible, the measurement was obtained as close as possible to the original location, and the new location was annotated on the survey map Scan locations were biased toward heavy foot-traffic areas and areas likely to collect airborne particulates.

Measurement locations were clearly identified with labels or permanent markings to provide a method of referencing survey results to survey measurement locations These measurement locations were incorporated into a grid map with a one-square meter reference coordinate system. Measurement results as well as statistical data analyses are presented in Attachments A to Q for each survey unit

If elevated readings were observed on the metallic roof/HVAC components and/or a carpeted surface, an investigation was performed to verify the presence of NORM versus DOE-added radioactivity. Common examples of NORM found during final survey is the presence of radon and/or polonium (Po-210) Po-210 is a radon progeny that selectively oxidizes to metal surfaces. This phenomenon has been observed on many other structures at RFETS, and has been demonstrated at other nuclear facilities. The elevated roof and carpet activity (historically associated with radon/Po-210 activity) was investigated in the following manner:

Roofing Materials: Roofing materials have historically been associated with elevated readings due to radon/polonium buildup. If elevated readings were observed on the metallic surfaces of roofs (i.e., HVAC system components or metal flashing), an investigation was performed to verify the presence of Po-210 verses DOE-added radioactivity.

The elevated roof activities were initially investigated per RFETS Technical Basis Document TBD-00156, *Using Graphical Data Distribution Analysis to Distinguish between Background and DOE-added Materials in Environmental Data Sets*, which provides a method of statistically evaluating the data collected from the affected surfaces Forty-five (45) total surface activity measurements were collected across surfaces of the affected areas The data were then plotted, and a statistical test was performed to verify that the activity represented a single log-normal distribution with 95% confidence If the statistical evaluation did not conclude that the elevated activity was due to a single log-normal distribution, as would be expected for natural radioactivity, then a coupon sample was collected and analyzed to verify the presence of Po-210 and the absence of DOE-Added Radioactivity Refer to the Data Summary sheets in Attachment K for a summary

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of the elevated readings obtained on B111 roof HVAC piping The OASIS alpha-spectroscopy results in Attachment T show activity resulting from Po-210 The investigation data and coupon analysis results quantitatively show the presence of Po-210 as the cause of these elevated readings. RFETS Technical Basis Document TBD-00153, *Use of OASIS for Direct Differentiation between Po-210 and DOE-added Materials*, provides a description of the OASIS system and supporting QA evaluations

Carpeted Surfaces: Carpeted surfaces have historically been associated with elevated readings due to radon/polonium buildup. Radiological scans performed on carpeted surfaces showed that slightly elevated readings were uniformly distributed along the carpeted areas within the offices of B111. Suspecting radon/polonium to be the cause of these elevated readings, survey technicians were instructed to perform on-site alpha spectroscopy measurements using the Science Applications International Corporation (SAIC) Alpha Analyzer Model AP-2 instrument Although the AP-2 is not used for a quantitative analysis, the instrument can be used to confirm the presence of a specific radionuclide Two separate 60-minute counts were performed directly on two areas associated with elevated readings (Survey Unit 111-B-005, 1st floor of main building-south areas)

Results showed the absence of any spectral data associated with DOE-added radioactive materials (see Attachment U for AP-2 spectral results and RFETS Radiological Safety Procedure *3-PRO-113-RSP-03 02, AP-2 Alpha Analyzer*) Based on these results, the carpeted areas were no longer scanned, and survey technicians were instructed to focus attention on other areas that would have a similar potential for contamination (e.g , lower walls, ledges, baseboards, book shelves, etc) Therefore, even with avoiding the carpeted surfaces, a full ten percent (10%) scan of all Impacted Class 3 areas was performed by focusing attention on other likely areas of radiological contamination.

3.2.4 Laboratory Analysis

Radiological coupon samples (three samples collected from HVAC metal piping surfaces on B111 roof; Survey Unit 111-E-011) were analyzed using both SAIC AP-2 instrumentation and the Oxford Alpha Spectroscopy Integrated System (OASIS) Use of the on-site OASIS consisted of two parts: 1) establishing presence/absence of DOE-added radionuclides at the sensitivities specified for the OASIS (i e , 50% $DCGL_W$), and 2) quantification of Po-210 concentrations relative to levels measured in the field with hand-held (Electra) instruments. Refer to Attachment T and the RFETS Technical Basis Document TBD-00153, *Use of the OASIS for Direct Differentiation Between Po-210 and DOE-Added Materials* Sediment samples from the B111 footing drain/basement sump and the manhole in the parking lot east of B111, and the sludge sample from the B111 chiller system were analyzed for gross alpha/beta The four samples of B333 abrasive blasting waste underwent isotopic analysis

3.3 Chemical Characterization

Chemical characterization was performed to determine the nature and extent of chemical contamination that may be present on or in B111 and B333 Characterization was based upon a review of historical and process knowledge, visual inspections, and additional

sampling and analysis. Limited historical data were available Contaminants of concern include asbestos, beryllium, RCRA/CERCLA constituents, lead in paint, and PCBs Historical and process knowledge, and sampling and analysis conducted are presented in this section. Related hazards are discussed in Section 4 0, and data are summarized in Attachment V.

Asbestos: Some historical asbestos inspection data exist for B111, and no historical data exist for B333. Therefore, an asbestos inspection and sampling of suspect material were required for RLC. A CDPHE-certified asbestos inspector conducted the inspection and sampling in accordance with PRO-563-*ACPR Asbestos Characterization Protocol*, Revision 0 Potential asbestos-containing material was identified for sampling at the discretion of the inspector

Beryllium: There is no record of beryllium operations or storage being conducted in Buildings 111 and 333 (refer to *D&D Facility Characterization Interview Checklist, Type 1 Facility Checklist, and List of Known Beryllium Areas*) However, wipe samples were taken to confirm the historical evidence that the buildings were not impacted by beryllium operations conducted elsewhere on site Also, some beryllium-contaminated items may have been brought into B333 (e.g , been sand-blasted prior to painting) Therefore, there is the potential for beryllium-contaminated dust to have been generated and dispersed within the building Sampling results will indicate if surfaces present any beryllium hazards.

Eleven wipe samples were taken from biased locations within B111, at least three samples per floor, and ten wipe samples were taken from biased locations in the B333 abrasive blasting area and painting/drying areas. Beryllium sampling of porous and non-porous surfaces was performed in accordance with PRO-536-*BCPR Beryllium Characterization Procedure.*

RCRA/CERCLA Constituents (including metals and volatile and semi-volatile organic compounds [VOCs & SVOCs]): Based on historical knowledge, several areas were sampled for toxic metals and/or volatile organics Areas included locations in the B111 photographic laboratory where spills occurred, the floor of the B333 paint shop where multiple paint layers are present and where solvents may have spilled, and the abrasive blasting area and equipment (interior and exterior) The abrasive blasting area and equipment could be contaminated by toxic metals in the abrasive blasting waste According to historical and process knowledge, no other regulated chemicals were used or stored in B111 or B333 (*D&D Facility Characterization Interview Checklist and Facility Checklist*)

Process knowledge reveals spills of photographic fixer solution, containing silver, in the B111 basement Documentation indicates that the spills were cleaned up, however, cleanup verification data could not be specifically identified, and there is a potential for heavy metal concentrations in the concrete, which may exceed the RCRA maximum concentrations for toxicity characteristic According to historical and process knowledge, no other RCRA-regulated chemicals were used or stored in B111 (*D&D Facility Characterization Interview Checklist and Facility Checklist*) Three concrete cores (and

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one duplicate) from the floor in Room #7 were taken to verify that cleanup was adequate in accordance with PRO-487-MPCR *Metals and PCB Characterization Procedure.*

Sediment samples were collected from two B111 basement drains and the manhole located in the parking lot 30 ft east of B111. One of the drains is a footing drain in the mechanical room at the south end of B111, and is connected to the manhole The other drain is located next to the lift in the southeast corner of the B111 basement All sediment samples were analyzed for metals and PCBs The sediment samples from the footing drain and the manhole were also analyzed for volatile organic compounds In addition, a water sample was collected from the footing drain, and it was analyzed for volatile organic compounds and PCBs Samples were collected from these areas to determine if any upgradient spills could have been released to the environment

A sludge sample was taken from the chiller system in the B111 basement and analyzed for toxic metals Biocides used in the past may have contained toxic metals

Some of the B333 floor in the thinner cleaning area (east side of Room 102A) and the satellite accumulation area (east side of Room 102) could have been contaminated with solvents used to clean paint brushes and other painting equipment Therefore, three concrete samples from these areas were collected and analyzed for VOCs to determine if solvents contaminated the floor, or if past spills evaporated and/or were cleaned up below action levels

The floor of the B333 paint-shop (in the eastern half of the building) contains multiple layers of paint from painting operations Some of this paint could contain lead and other metals, and therefore, because of potential leaching, the painted concrete could exhibit hazardous waste characteristics. Therefore, 15 core samples (paint plus concrete) from the concrete floor were collected and analyzed for toxic metals (3 from the west paint booth area, 3 from the east paint booth area, 3 from the satellite accumulation area and adjacent sign shop area, 2 from the thinner cleaning area, 2 from the abrasive blasting pit, 1 from the containment in Room 104, and 1 duplicate). Concrete samples were pulverized, homogenized, and split at the laboratory as part of the routine sample preparation. Part of the sample was analyzed per the Toxicity Characteristic Leaching Procedure (TCLP), and the other part of the sample was analyzed for total PCBs All 15 TCLP samples were analyzed for metals, and 3 of the TCLP samples were analyzed for VOCs Sampling was performed in accordance with PRO-487-MPCR *Metals and PCB Characterization Procedure* and PRO-488-*BLCR Bulk Solids and Liquids Characterization Procedure*

It is assumed that the walls throughout B333, including those behind the paint booths, were painted much less frequently than the floors in the paint-shop, (i e , not as impacted by painting operations) and that the wall would not exhibit hazardous waste characteristics from lead and other toxic metals in the paint Therefore, sampling of walls is not necessary (refer to Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP)* and *Lead-based Debris Disposal*)

Four samples of B333 abrasive blasting waste were taken (two from the abrasive blasting pit and two from the abrasive collection hoppers) and analyzed for toxic metals (via

TCLP) and PCBs. Abrasive blasting was used to clean materials prior to painting The abrasive blasting waste may possess hazardous waste characteristics from metals in paints cleaned off previously painted materials B333 paint wastes have been assigned a RCRA D008 waste code. TCLP metals results will indicate hazards presented by the abrasive and related equipment, including the air cleaning equipment and the abrasive collection system

Sampling for lead in paint on B111 surfaces is not required Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP)* and *Lead-based paint Debris Disposal*, states that LBP debris generated outside of currently identified high contamination areas shall be managed as non-hazardous (solid) wastes, and additional analysis for characteristics of hazardous waste derived from LBP is not a requirement for disposal

Polychlorinated Biphenyls (PCBs). Based on historical knowledge, several PCB issues required evaluation, including the potential of PCB contamination around the B111 transformer (111-1), PCB concentrations in the hydraulic fluid used in the elevator lift system, PCB concentrations in B111 and B333 paints, and the presence of fluorescent light ballasts containing PCBs.

The concrete pad under Transformer 111-1 is believed to have been exposed to undetermined amounts of PCB dielectric oil in the past Therefore, three concrete core samples (and 1 duplicate) was taken in accordance with PRO-487-*MPCR Metals and PCB Characterization Procedure* from the secondary containment of Transformer 111-1 and analyzed using SW-846 Method 8082. There is no need to sample the Transformer 111-1 dielectric oil. PCB oils were flushed from the transformer in 1986. In 1991, the total PCB concentration in the transformer oil was only 5 5 ppm, and PCBs on swipe samples (13) from the exterior of the transformer were not detectable.

Building personnel and historical information suggest that the hydraulic fluid used in the elevator lift system located on the East side of B111 may contain PCBs Therefore, one sample from the hydraulic reservoir was taken.

Because PCB oils were known to have leaked from Transformer 111-1 and could have been released from the lift, sludge samples were collected in adjacent, downgradient areas Sample locations include the following

- Drain next to lift at southeast corner of B111,
- Footing drain (confined space) in mechanical room at South end of the B111 basement, and
- Parking lot manhole 30 ft East of B111

One sample was collected from each location A duplicate sample was collected from the manhole, and a water sample was also collected

Sixteen paint samples were taken from basement walls of B111 and analyzed for PCBs Paint samples from the first and second floor walls of B111 were not collected, however,

it is recognized that paints on the walls could contain PCBs Therefore, additional sampling of wall paints will be conducted for waste management purposes

As was discussed previously, there are multiple layers of paint on the floor of the B333 paint-shop (the eastern half of the building). Some of the paint may contain PCBs at concentrations ≥ 50 ppm and be subject to TSCA regulation as PCB Bulk Product Waste (40 CFR 761) Therefore, the 15 concrete samples, analyzed for RCRA constituents, were also analyzed for PCBs In addition, because one of the samples had a relatively high PCB concentration, four concrete and four paint samples were collected and analyzed for PCBs. The sample locations were biased around the original high concentration to maximize the probability of differentiating PCB contamination in the paint versus contamination in the concrete Paint samples from the walls of B333 were not collected, however, it is recognized that paints on the walls could contain PCBs Therefore, additional sampling of wall paints will be conducted for waste management purposes The 4 samples of abrasive blasting waste were also analyzed for total PCBs PCB samples were collected in accordance with PRO-488-BLCR and analyzed for PCBs using SW-846 Method 8082

The buildings contain fluorescent light ballasts that may contain PCBs Therefore, fluorescent light fixtures were inspected to identify PCB ballasts PCB ballasts were identified based on factors such as labeling (e g , PCB-containing and non-PCB-containing), manufacturer, and date of manufacturing All ballasts that do not indicate non-PCB-containing were assumed to be PCB-containing

4.0 HAZARDS

This section presents physical, radiological and chemical hazards by facility, including data from radiological field measurements and laboratory analysis Radiological data are presented in Attachments A - S and in the B111/B333 Closure Project RLC project file

The RLC (serving also as the Pre-Demolition Survey, PDS) confirmed that B111 and B333 (inside and outside) do not contain radiological contamination above the surface contamination guidelines provided in DOE Order 5400 5 and the RFETS Radiological Control Manual Carpeted areas within B111 had scan results demonstrating elevated readings These elevated readings were suspect due to the presence of naturally occurring radioactive material (NORM), specifically buildup of radon and its respective progeny (e g , Po-210) within the carpet material AP-2 spectral results show no DOE-added material present, and all TSA/Removable measurements taken below the carpeted surface (bare concrete) are less than the $DCGL_W$ The B111 roof survey unit (111-E-011) had a number of total surface activity measurements on the metallic HVAC piping components above the surface contamination guidelines These elevated readings were suspected to be elevated due to naturally occurring radioactive material (NORM), specifically Po-210, deposited on the roof surface AP-2 results validate the absence of DOE-added material, and corresponding OASIS Laboratory analysis data confirm the presence of radon progeny Radiological hazards are summarized in Table 4-1 and in the text below listed by facility.

For each building, the potential for a chemical hazard due to each of the following contaminants was considered:

- Asbestos;
- Metals, including beryllium and lead in paint,
- VOCs/SVOCs; and
- PCBs

Each potential chemical hazard was evaluated based upon historical and process knowledge, visual inspections, and sampling and analysis. In addition, each facility was inspected for the presence of asbestos-containing material (ACM) and PCB-containing light ballasts, and for evidence of chemical spills, including PCB leaks from PCB light ballasts Numerous samples were taken and analyzed for ACM, beryllium, toxic metals, volatile organic compounds, and PCBs The chemical hazards are summarized in Table 4-1 and in the text below by facility Data are summarized in Attachment V Sample location maps are also included in Attachment V

Table 4-1 Summary of B111 and B333 Radiological and Chemical Hazards

Contaminant of Concern	Analysis	Historical or RLC?	Below release limit or regulatory thresholds?
Plutonium, Americium, Uranium	Field measurements were performed on B111 and B333, including AP-2 measurements on the B111 roof and carpeting OASIS Laboratory measurements were performed on the B111 HVAC piping surfaces located on the roof Sediment samples from the B111 footing drain/basement sump and the manhole in the east parking lot were analyzed for gross alpha/beta The B111 chiller system sludge was analyzed for gross alpha/beta.	RLC	Yes
Asbestos	Suspect materials were sampled in B111 and B333 Friable and non-friable asbestos was detected in both buildings	RLC	No
Metals, including Be	Concrete floor samples were collected from the B111 photo lab and the B333 paint shop, and analyzed for toxic metals Paints were not analyzed (see Section 3 3) Wipe samples were collected from B111 and B333 and analyzed for beryllium. B111 chiller system sludge was analyzed for toxic metals Sediment samples from two B111 basement drains and the manhole in east parking lot were analyzed for toxic metals. Abrasive blasting waste from B333 was analyzed for toxic metals.	RLC	Yes
VOCs/SVOCs	Sediment samples from the B111 footing drain/sump and east parking lot manhole were analyzed for volatile organic compounds Concrete floor samples from the B333 paint shop were analyzed for volatile organic compounds	RLC	Yes
PCBs	The following were sampled. -Concrete pad around the B111 transformer -Hydraulic oil in B111 lift. -Sediments from two B111 basement drains and the manhole in east parking lot. -Water from the B111 footing drain -B333 concrete floor -B333 abrasive waste -Paint from the floor in B333 and the walls in the B111 basement Light ballasts in B111 and B333 were inspected to identify PCB-containing and leaking ballasts	RLC	**No; paint on the floor of B333 exceeded 50 ppm.**

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Physical hazards associated with B111 and B333 consist of those common to standard industrial environments and include physical hazards associated with energized systems, utilities, and trips and falls. There are no unique physical hazards associated with the facilities. The buildings have been relatively well maintained and are in good physical condition, and therefore, do 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

4.1 B111

4.1.1 Radiological Hazards

The RLC (serving as the PDS) confirms that B111 (interior and exterior) does not contain elevated activity above the surface contamination guidelines provided in DOE Order 5400.5 and the RFETS Radiological Control Manual Carpeted areas within B111 had scan results demonstrating elevated readings These elevated scan readings were suspected to be due to the presence of naturally occurring radioactive material (NORM), specifically buildup of radon and its respective progeny (e g , Po-210) within the carpet material. AP-2 spectral results show no DOE-added material present, and all TSA/Removable measurements taken below the carpeted surface (bare concrete) are less than the $DCGL_W$ The B111 roof survey unit (111-E-011) had a number of total surface activity measurements on the metallic HVAC piping components above the surface contamination values. These elevated readings were suspect due to naturally occurring radioactive material (NORM), specifically Po-210, deposited on the roof surface AP-2 results validate the absence of DOE-added material, and corresponding OASIS Laboratory analysis data confirm the presence of radon progeny. In addition, gross alpha/beta results on the B111 chiller system sludge, and the sediments from the basement footing drain/sump and the parking lot manhole indicate no contamination. Refer to Attachments A - M, R and S, and the B111/B333 Closure Project RLC file Isolation control postings are displayed at all entrances to B111 to ensure no radioactive materials are introduced into the facility.

4.1.2 Chemical Hazards

4.1.2.1 Asbestos

B111 contains some asbestos containing materials, including ceiling tile, floor tile and mastic, Transite® wall panels, window caulking, roof tar and flashing, and thermal system insulation The ceiling tile and insulation contain friable asbestos Estimated quantities are presented in Section 5 0 The asbestos data are contained in *Asbestos Inspection & Beryllium Survey Report for B111*, dated October 24, 2000, which is contained in the B111/B333 Closure Project RLC file Data are also summarized in Attachment V.

4.1.2.2 Metals (including beryllium and lead in paint)

Process knowledge indicates that the only operation involving toxic metals occurred in the basement photographic lab Photographic fixer solutions contained silver, and

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solution spills were known to have occurred Also, biocides used in the building chiller system may have contained toxic metals. However, analytical results indicate no metal contamination. Concrete samples from the floor of the photo lab and the sludge sample from the basement chiller system did not contain metal concentrations above the hazardous waste characteristic limits. Also, metal concentrations in the sediment samples from the two basement drains and the parking lot manhole east of the building were below the hazardous waste characteristic limits Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V

The paint on the interior and exterior surfaces were not characterized for lead in paint Some paints may contain lead and other metals However, Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP)* and *Lead-based Paint Debris Disposal*, states that LBP debris generated outside of high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream

Beryllium wipe data confirm that beryllium operations on site had no impacts on B111 All wipe results were <0.1 ($\mu g/100\ cm^2$) The beryllium data are contained *in Asbestos Inspection & Beryllium Survey Report for B111*, dated October 24, 2000, which is contained in the B111/B333 Closure Project RLC file Data are also summarized in Attachment V.

4.1.2.3 VOCs/SVOCs

According to historical and process knowledge, no organic chemicals were used or stored in the facility in any significant amount. Solvents were used to clean copier parts and maybe other equipment, however, only small quantities were used on rags and wipes, and no releases/spills are known to have occurred Facility inspections also found no evidence of spills. In addition, ozone-depleting compounds have been removed from all remaining systems, including the process chiller in Room 1A (AQD-111-005) and the large refrigerator/freezer. Therefore, no related hazards are present.

Sediment samples from the footing drain/sump in the B111 basement and from the manhole East of B111 were analyzed for volatile organic compounds to determine if organic compounds had been spilled and resulted in downgradient contamination Results indicate concentrations below the hazardous waste characteristic limits Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V

4.1.2.4 PCBs

Analytical results indicate no PCB contamination The hydraulic oil in the lift had a total Aroclor® concentration below 50 ppm (i e , the total concentration for all Aroclors® was approximately 23 ppm) Total Aroclor® concentrations in the concrete around the basement transformer were well below 1 ppm Total Aroclor ®concentrations in the sediments in the basement floor drains and the exterior manhole, and in the water from the footing drain/basement sump were well below 25 ppm, which has been used as the

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agency-approved cleanup criterion for previous RFETS remediation projects (e g , Proposed Action Memorandum RF/ER-95-0066 UN) Based on this data, a No Further Action request will be submitted to the regulatory agencies in an interim update to the Historical Release Report for Potential Area of Concern 100-607, which is located in the basement of B111 Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V

PCB ballasts were found in B111. Four of the PCB ballasts were leaking, but the leaks were contained in the lighting fixtures No floor contamination was noted All PCB ballasts will be removed and disposed of in accordance with site procedures prior to building demolition. Records of the fluorescent light ballast inspection, including locations, are contained in the B111/B333 Closure Project RLC file

Results from the analysis of 16 paint samples from the B111 basement walls range from 2 ppm to 130 ppm. One sample had a concentration exceeding 50 ppm The 95% upper confidence limit on the mean value is 30 ppm Paint samples from the first and second floor walls of B111 were not collected, however, it is recognized that paints on the walls could contain PCBs. Therefore, additional sampling of wall paints will be conducted for waste management purposes. Waste management decisions will be made using the 95% upper confidence limit on the mean value. Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V.

4.2 B333

4.2.1 Radiological Hazards

The RLC (serving also as the PDS) confirms that B333 (interior and exterior) does not contain elevated activity above the surface contamination values provided in DOE Order 5400.5 and the RFETS Radiological Control Manual Refer to Attachments N - S, and the B111/B333 Closure Project RLC file. Analytical results also indicate that isotopic concentrations in the abrasive blasting waste are below Tier II action levels Isolation control postings are displayed at all entrances to B333 to ensure no radioactive materials are introduced into the facility.

4.2.2 Chemical Hazards

4.2.2.1 Asbestos

B333 contains some asbestos containing materials, including caulking compound and tape, roof flashing, and thermal system insulation The insulation contains friable asbestos Estimated quantities are presented in Section 5 0 The asbestos data are contained in *Asbestos Inspection & Beryllium Survey Report for B333*, dated October 24, 2000, which is contained in the B111/B333 Closure Project RLC file Data are also summarized in Attachment V

4.2.2.2 Metals (including beryllium and lead in paint)

Analytical results indicate that B333 is not contaminated by toxic metals Metal concentrations in the concrete floor were below the hazardous waste characteristic limits

Metal concentrations in the abrasive blasting waste were also below the hazardous waste characteristic limits, which confirms that building surfaces are not contaminated, and indicates that the interior and exterior abrasive blasting equipment are also not contaminated. Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V

The paint on the interior and exterior walls and other non-floor surfaces were not characterized for lead in paint Some paints may contain lead and other metals, however, Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP)* and *Lead-based Paint Debris Disposal*, states that LBP debris generated outside of high contamination areas shall be managed as non-hazardous (solid) wastes and need not be sampled unless the potentially lead-containing component is to be scabbled or otherwise comprise a separate waste stream

Beryllium wipe data confirm that beryllium operations on site had no impacts on B333 All wipe results were <0 1 (μg/100 cm^2). The beryllium data are contained in *Asbestos Inspection & Beryllium Survey Report for B333*, dated October 24, 2000, which is contained in the B111/B333 Closure Project RLC file Data are also summarized in Attachment V

4.2.2.3 VOCs/SVOCs

Analytical results indicate that paint cleaning operations and related waste accumulation/storage did not contaminate the building floor Organic compound concentrations in the concrete floor were below the hazardous waste characteristic limits Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V.

4.2.2.4 PCBs

Analytical results indicate that some PCB concentrations in the paint on the floor of the B333 paint-shop exceed 50 ppm. Paints on walls were not sampled, however, it is recognized that paints on the walls could contain PCBs Therefore, additional sampling of wall paints will be conducted for waste management purposes Waste management decisions will be made using the 95% upper confidence limit on the mean value The abrasive blasting waste (containing paint) had PCB concentrations below 50 ppm The floor drain in the B333 paint shop did not contain any paint, and therefore, is considered PCB-free.

Thirteen out of the fourteen floor samples (concrete and paint) had PCB concentrations ranging from non-detectable to 15 6 ppm However, one sample from the floor of the paint- shop had a PCB concentration of 32 1 ppm Based on this one relatively high concentration, follow-up sampling was conducted to determine if the paint on the concrete had PCB concentrations ≥ 50 ppm Four concrete and four paint samples were collected and analyzed Two of the paint samples had concentrations above 50 ppm, and the 90% upper confidence limit was 81 ppm Although the mean concentration is below 50 ppm (at 49 45), it is too close to the action level to confidently conclude that the mean is truly below the action level of 50 ppm All four concrete samples had concentrations

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below 2 ppm. PCB concentrations in the abrasive blasting waste ranged from non-detectable to 13.2 ppm. Data are included in the B111/B333 Closure Project RLC file and summarized in Attachment V.

Several PCB ballasts were found in B333 (in the older portion of the building) Some of these PCB ballasts were leaking, but the leaks were contained in the lighting fixtures No related staining on the floor was noted. All PCB ballasts will be removed and disposed of in accordance with site procedures prior to building demolition Records of the fluorescent light ballast inspection, including locations, are contained in the B111/B333 Closure Project RLC file

5.0 DECOMMISSIONING WASTE TYPES AND VOLUME ESTIMATES

The demolition and disposal of B111 and B333 will generate a variety of wastes Table 5-1 presents the estimated volumes by facility and waste type There will be no radioactive or hazardous waste. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), as applicable, in accordance with the Decommissioning Program Plan, Section 3 3 5, as applicable Asbestos and PCB ballasts will be removed and managed pursuant to EPA and CDPHE regulations and Site procedures

Table 5-1 Estimated Waste Volumes by Waste Type and Facility

Facility	Concrete (cu ft)	Wood (cu ft)	Metal (cu ft)	Corrugated/ Sheet Metal (cu ft)	Wall Board (cu ft)	ACM	Other Waste
B111	73,400 (doesn't include basement floor, footings, and walls greater than 3 ft below grade) (5,500 tons)	1,000	10,000	1,000	1,000	Ceiling tile - 31,500 sq ft Floor tile and mastic - 39,100 sq ft Interior/exterior Transite® wall panels - 26,000 sq ft Interior/ exterior thermal systems insulation (TSI)- 8,000 linear feet Window caulking - 1,000 individual windows Roof flashing above auditorium - 500 sq ft Roof tar patches - 400 sq ft	Fiber glass insulation – 1,000 cu ft Carpet – 13,000 sq ft
B333	9,600 (700 tons)	None	1,000	50	37	Thermal system insulation - 300 liner feet TSI patching compound – 50 sq ft Roof flashing - 500 sq ft	Paint booth filter media – 27 cu ft Cement block - 2,200 cu ft

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6.0 DATA QUALITY ASSESSMENT

6.1 Introduction

Data used in making management decisions for decommissioning and waste management must be of adequate quality to support the decisions Adequate data quality for decision-making is required by the Kaiser-Hill Team Quality Assurance Program (K-H, 1997, §7.1.4 and 7.2.2), as well as by the customer (DOE, RFFO, Order O 414 1, Quality Assurance, §4.b (2)(b)). Regulators and the public also expect decisions and data that are technically and legally defensible Verification and validation of the data ensure that data used in decisions resulting from the Pre-Demolition Survey (PDS) are usable and defensible

Verification and validation (V&V) of this report are the primary components of the DQA V&V constitutes the cornerstone of the DQA, because statistical tests and material background determinations relative to decision-making for radiological survey units were not implemented nor required Instead, measurement results were compared, on a one-to-one basis, with release criteria given in DOE Order 5400 5 and RFCA (Tier II action levels) The PDS results could, theoretically, be used to conduct Sign Tests for decisions, but because all individual measurements were less than the $DCGL_W$ (excluding confirmed NORM values), the survey units meet release criteria without further data reduction This DQA supports conclusions in the report through implementation of the guidelines taken from the following MARSSIM sections

§4 9, Quality Control,

§8 2, Data Quality Assessment,

§9.0, Quality Assurance & Quality Control,

Appendix E, Assessment Phase of the Data Life Cycle, and

Appendix N, Data Validation using Data Descriptors

Chemical and radiological media sample results were validated consistent with the following RFETS-specific documents and industry guidelines

- *KH V&V Guidelines*
- ✓ *Module SS01 "Volatile Organics"*
- ✓ *Module SS03 "PCB/Pesticides"*
- ✓ *Module SS05 "Inorganic Metals"*
- ✓ *Module RC01 "Isotopic Determinations by Alpha Spectroscopy"*
- EPA 540/R-94/013, *USEPA Contract Laboratory Program National Functional Guidelines for Inorganic Data Review*
- EPA 540/R-94/012, *USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review*
- Lockheed-Martin, 1997 Evaluation of Radiochemical Data Usability, ES/ER/MS-5

DQA was performed on measurement and sample results obtained from the Survey Units listed in Table 6-1 These survey units are traceable to specific building locations

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Buildings 111 & 333, RLCR

	MARSSIM sec 4.9	QAPP	SOPs	Training & Quals (personnel)	calibrations	QC Samples	sample quantities (adequacy of)	precision	MARSSIM sec 8.2	Reviews DQOs & Sampling Design	"prelim" data review	graphical data review	conclusions	MARSSIM sec 9.0	Reports (to decision makers)	site description	analytical methods & MDA/MDC	background radiation	measurement results	Chain-of-Custody	SOPs	Quality records	results by geographic location	defined level of data review	data quality indicators (PARCCS)	QC measurements	MARSSIM Appdx E (DQA)	review DQOs & survey design	draw conclusions	MARSSIM Appdx N	raw data, original data forms	QA assessments/NCRs/CARs	data reduction/calculations	method validation	historical data
Inventory of Report & Data Package		X	X	X	X	X	X	X		X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X		X	X		X	X	X	X	X
Reconnaissance-Level Characterization Rpt															X	X						X						X							
[redacted]										X																									
[redacted]						X	X			X		X	X					X							X			X			X		X	
Data Package		X		X																															X
CHAR SURVEY PACKAGES			X			X	X			X					X						X	X												X	
Summary Package Cover Sheets																																			
(MARSSIM) Pre-Survey Calculations Worksheets						X												X				X												X	
Sampling [illegible]			X																			X													
Total Surface Activity Data Summary						X												X				X				X				X					
Removable Contamination Summary																		X				X				X									
Measurement Data Summary																		X				X													
[illegible]											X	X										X													
[illegible]												X										X	X												
(MARSSIM) Post-Survey Calculations Worksheets						X																X									X				
Lab Data						X										X		X				X				X									
Chain-of-Custody						X													X			X								X					
Survey Data Summary						X					X							X				X	X								X				
[illegible]																																			
QA/QC																X						X													
Calibrations Worksheets Data Summary Spreadsheets				X												X						X													
[illegible]																X					X	X													
Measurement Data Summary				X												X		X			X	X				X				X					

MARSSIM Table 6 1

Table 6-1 Type 1 Facilities, PDS Compliance with MARSSIM Data Quality Guidelines

6.2 Verification of Results

Verification ensures that data produced and used by the project are documented and traceable per quality requirements Verification consisted of reviewing the project's data relative to the following subsets, for each unique building

- Scans (total surface contamination);
- Surveys (TSA and removable),
- Media samples (alpha spectroscopy analysis),
- Chain-of-Custody was intact from initial sampling though transport and final analysis;
- Preservation and hold-times were within tolerance, and
- Format and content of the data are clearly presented relative to goals of the project (i.e., to determine, with at least 95% confidence, that the survey units of interest are adequate for unrestricted radiological release)

Verification of the PDS data also addresses quality records representing implementation of the following quality controls·

- Instrument calibrations, for accuracy,
- Laboratory control samples, for accuracy,
- Blanks, for accuracy;
- Duplicate measurements (radiochemistry & surveys), for precision,
- Chemical yield, for accuracy;
- Count times, for sensitivity; and
- Sample preparations, for accuracy and representativeness.

All radiological data are organized into survey packages, which correlate to unique (MARSSIM) survey units. Each survey package is systematically reviewed by the responsible Radiological Engineer, a peer reviewer, and finally, Radiological Engineering Management

All relevant Quality records associated with the PDS decisions will be submitted to the CERCLA Administrative Record for permanent storage within 30 days of the completion of this report

6.3 Validation of Results

Validation consists of a technical review of all data that directly support the PDS decisions, such that any limitations of the data relative to project goals are delineated, and

the associated data are qualified (caveated) accordingly Data were validated relative to the following:

- Original DQOs of the project as defined in Section 3 1, and
- Quality criteria consistent with the various applicable sections in the MARSSIM, expressed in terms of the PARCC parameters described below

MARSSIM criteria for "data quality assessment" used in final status surveys generally fall within the generic categories of quality assurance, quality control, data validation, and data assessment (including verification and validation) Table 6-1 provides a "crosswalk" that lists the primary MARSSIM sections and generic data quality criteria (at top) and their corresponding implementation via this report and the project files

All of the significant MARSSIM criteria listed in Table 6-1 are summarily addressed within the "PARCC Parameters" discussion presented below. PARCC parameters are congruent with "data descriptors" in the MARSSIM parlance and address characteristics of the data that must be defined for scientific integrity and defensibility Note that at least one "X" in each column of the table constitutes achievement of the MARSSIM quality objective The following discussion of the PARCC parameters -- Precision, Accuracy, Representativeness, Comparability, and Completeness, also include discussion of bias and sensitivity, two more data descriptors emphasized in MARSSIM

6.3.1 Precision

Radiological Surveys

Duplicate measurements were periodically acquired (5% frequency of real surveys) within each MARSSIM survey unit. All duplicate measurements were within tolerance based on the acceptance criterion that both results be below $DCGL_W$

Alpha Spectroscopy (Radiochemistry)

Results from laboratory duplicates, analyzed via standard alpha spectroscopy, indicate adequate reproducibility based on duplicate results within statistical tolerance values (>90% confidence of equivalency between the original sample and the duplicate)

Duplicate measurements of media samples were repeatable based on duplicate-pair results both below RFCA Tier II action levels

Alpha Spectroscopy (OASIS)

Precision for the OASIS was satisfactory based on control-charting of a standard (reference) source, specifically Np-237 A minimum of 30 points were used to construct the control chart, with control tolerances established as ±3 sigma

Chemical Results

One precision issue was associated with chemical analyses for Building 333, there were no issues with chemical analyses for Building 111 Repeatability of the original PCB

results for the concrete slab in B333 was unacceptable, based on only one field duplicate pair. As a result, additional samples were acquired to establish the specific medium containing the PCBs (i.e., the paint layer vs the underlying concrete, or both)

6.3.2 Accuracy (and Bias)

Radiological Surveys

Accuracy of radiological surveys, for both Buildings 111 and 333, is satisfactory based on RFETS-programmatic annual calibrations that establish instrument efficiencies and sensitivities for all instrumentation used on this project Daily source checks also provided periodic checks to ensure that all sensors are within tolerance during daily operations. Calibration and calibration check results were within the RFETS and industry-standard requirement of 20% of the applicable reference standard values Full-scale multi-point calibrations provided accuracies of ± 10% prior to implementation of survey instruments in the field, consistent with guidelines put forth in ANSI-N323 d

No biases were noted in the instrumentation used based on performance checks performed daily on each instrument.

Distance measurements recorded on maps are within 3% of actual distances based on the laser technology used for distance measurements associated with the surveys

Alpha Spectroscopy (Radiochemistry) for B333

All sample results acquired from paint/concrete composites are well below their respective RFCA Tier II Action Levels. Sample mass to surface activity conversions have not been performed, nor are they applicable for comparison with surface-based unrestricted release criteria.

Alpha Spectroscopy (OASIS) for B111

OASIS analysis of the metal coupon surfaces was acquired to increase confidence in concluding that elevated readings on the B111 roof were, in fact, due to radon Use of the on-site OASIS consisted of two parts. 1) establishing presence/absence of DOE-added radionuclides at the sensitivities specified for the OASIS (i e , 50% $DCGL_W$), and 2) quantification of Po-210 concentrations relative to levels measured in the field with hand-held (Electra) instruments

Accuracies of the OASIS alpha spectroscopy results are acceptable based on establishing a batch-specific efficiency for the system and measurement of reference standards within control limits (Np-237, as established by ±3 sigma bounds about the arithmetic mean)

Background values are approximately 1.2 dpm/100 cm^2 for the sample batches, which is typical for the OASIS Background values approaching 2 dpm/100 cm^2 require corrective actions to the OASIS protocol, but this upper limit was not approached during analysis of the samples

Chemical Results

There were QC issues with various chemical results, however, issues did not result in data rejection. For B111, matrix spikes and continuing calibrations were outside of tolerance for PCBs (a matrix spike was not performed on the single water sample, sediment and oil matrix spikes were out of tolerance) Selected core samples had a variety of QC problems. out-of-tolerance continuing calibrations, surrogate recoveries, matrix-spike (MS) and matrix spike duplicate (MSD) recoveries However, QC results were outside of concentration control limits due to dilutions of the sample, i e , due to the presence of PCBs in concentrations much greater than detection limits (>>10x) Consequently, the QC results (out of tolerance) had no impact on the data or decisions based on the data.

For B333, MS, MSD, and surrogate recoveries were outside of tolerance for bulk concrete/paint PCB samples (a matrix spike was not performed on the single water sample, sediment and oil matrix spikes were out of tolerance) However, QC results were outside of specifications due to dilutions of the sample, i e , due to the presence of PCBs in concentrations much greater than detection limits (>>10x) Consequently, the QC results (out of tolerance) had no impact on the data or decisions based on the data

6.3.3 Representativeness

Samples and surveys, for both Buildings 111 and 333, are representative based on the following criteria·

- Familiarity with facilities -- multiple walk-downs and collaborations by management and technical staff;
- Implementation of industry-standard Chain-of-Custody protocols,
- Compliance with sample preservation and hold times; and
- Documented and (site) approved methods, particularly RSPs for scans/surveys and the following documents for alpha spectroscopy:
  - TBD-00143, Direct Analysis of Alpha Emitters using the Oxford Alpha Spectroscopy Integrated System (OASIS)
  - TBD-00153, Use of the OASIS for Direct Differentiation Between Po-210 and DOE-Added Materials
  - IWCP Work Control No T0104752, Building 333 Characterization
  - IWCP Work Control No T0104502, Building 111 and 111B Characterization

Qualifications for radiological surveys and chemical results are given below

Radiological Surveys

Readings in excess of the $DCGL_w$ were not representative of DOE-added radionuclides All radiological survey measurements in excess of the $DCGL_W$ resulted from random

TSA measurements from exterior roofing surfaces (all sheet metal with the exception of one concrete surface). These elevated readings represent a consistent phenomena across the RFETS, where Po-210 (NORM) has effectively deposited as a fixed radioactive material. AP-2 measurements and OASIS laboratory data corroborates this phenomena

Chemical

All samples throughout the buildings were grab samples Core samples were homogenized at the lab before analysis B333 samples consisted of both concrete and paint layers to represent worst-case scenarios of bulk material One sample required statistical analysis, because results approached the action level of 50 ppm The results yield a lognormal frequency distribution; as a result, the arithemetic mean or the 90% UCL (based on a normal distribution) is not an appropriate estimator to compare with action levels A lognormal 90% UCL on the mean would be a more appropriate estimator based on the PCB frequency distribution Therefore, to better define the distribution, four (4) additional samples were taken Results verified PCBs are within the paint matrix and not the concrete.

6.3.4. Completeness

For both Buildings 111 and 333, all survey units are complete with respect to radiological surveys, including QC measurements for TSAs, as presented in Attachments A – S One of the B111 VOC analyses could not be performed, because it was not possible to collect sufficient volume from the drain next to elevator Sampling completeness is addressed in Tables 6-2 and 6-3 below.

Table 6-2 Building 111 Sampling Completeness

ANALYTE	# Required	# Taken	Comments
Asbestos	inspector discretion	14	EPA 600/M4-82020
Beryllium (swipes)	10 (negotiated w/ CDPHE)	11	Swipes, 10 real, 1 field blank, NIOSH Method 7102
Toxic metals (TCLP)	7 real, 1 dupe	4 (sediment) (4 real) 4 (concrete) (3 real, 1 dupe)	RIN 00D1518, SW 1311/7470A (Hg) SW 1311/6010B RIN 00R1034, as above
PCBs	4 real 4 (3 real and 1 dupe) 1 (real) 1 (real) water 16 (real) paint	4 (sediment) 4 (concrete) 1 (oil) 1 (water) 16 (paint)	RIN 00D1518 – OLM 03 1 CLP RIN 00R1034, SW3550B/8082 RIN 00R1035, SW 3550B/8082 RIN 00D1518 – OLM 03 1 CLP RIN 01R0049, SW3550B/8082
VOCs (TCLP)	3 (real)	2 (sediment)	RIN 00D1518 VOA CLP
Radionuclides	0	3 (sheet metal) coupons	B771 OASIS alpha spectroscopy
Gross alpha/beta	0	3 (sediment)	RIN 00D1518, KH Module RC04

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Table 6-3 Building 333 Sampling Completeness

ANALYTE	# Required	# Taken	Comments
Asbestos	inspector discretion	17	EPA 600/M4-82020
Beryllium (swipes)	10 (negotiated w/ CDPHE)	11	Swipes, 10 real, 1 field blank, NIOSH Method 7102
Toxic metals (TCLP)	15 (14 real and 1 dupe) 4 (4 real)	13 (painted concrete) 6 (abrasive blasting waste)	RIN 01R0003, SW 1311/6010B SW 1311/7470A (Hg) Method as above
PCBs	15 (14 real and 1 dupe) 8 (8 real) 4 (real)	15 (painted concrete) 4 (concrete core) & 4 (paint layer) 4 (abrasives blasting waste)	RIN 01R0003, SW3550B/8082 8 additional samples required to differentiate contaminants within concrete vs paint. Method as above OLM 03 1 CLP
VOCs (TLCP)	2 (real)	3 (painted concrete)	RIN 01R0003, SW 1311/8260
Radionuclides (e g., Pu, Am & U)	6 (5 real and 1 dupe)	4 (painted concrete) & 2 abrasive blasting waste	RIN 01R0003 KH Module RC01

Consistent with EPA's G-4 DQO process, the radiological survey design was optimized by checking actual measurement results against model output with original estimates Use of actual sample/survey (result) variances in MARSSIM's DQO model confirms that an adequate number of samples/surveys were acquired All radiological results are valid without qualification, and form data sets with adequate quantities and quality of data for release decisions.

No beta/gamma survey designs were implemented for B111 and B333 based on the use of transuranic limits as DCGLs in the unrestricted release decision process Stated differently, based on the well-established suite of actinides historically used at the RFETS, all of these actinides would emit alpha radiation in exceedance of the applicable transuranic DCGLs before other DCGLs would be exceeded for their respective Uranium species. The Building 371 Technical Position Paper, *Basis for Performing Solely Alpha Contamination Surveys for Building 371/374*, corroborates the use of this approach

6.3.5 Comparability

All results presented are comparable with radiological survey and analytical data on a site- and DOE-complex wide basis This comparability is based on

- Use of standardized engineering units in the reporting of measurement results,
- Consistent sensitivities of measurements (50% $DCGL_W$, 50% $DCGL_{EMC}$ for scans),
- Use of site-approved procedures (RSPs and TBDs),

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- Systematic quality controls; and
- Thorough documentation of the planning, sampling/analysis process, and data reduction into formats designed for making decisions posed from the project's original data quality objectives

6.3.6 Sensitivity

Adequate sensitivities, in units of dpm/100 cm^2, were attained for all surveys implemented based on MDAs at 50% of the transuranic $DCGL_w$ (50% $DCGL_{emc}$ for scans) Derivations of MDAs are given in Attachment S for the Electras MDAs for removable contamination measurements are derived from 3-PRO-112-RSP-02 01, Radiological Instrumentation The nominal MDAs for each survey method are summarized as follows

- Surveys (Eberline SAC-4) - removable contamination 10 dpm/100cm^2
- Surveys (NE Electra) - total surface contamination (TSA) 50 dpm/100cm^2
- Surveys (NE Electra) - scans <126 dpm/100 cm^2
- Alpha Spectroscopy, OASIS (Oxford System, Building 771) -- <10 dpm/100 cm^2 for Pu-239/240 & Am-241 collectively; <12 dpm /100 cm^2
- Alpha Spectroscopy (off-site, ASD SOW) - <1 pCi/g for each actinide of interest (Pu-239/240, U-233/234, U-235, U-238, Am-241)

Anomalously high local area background (LAB) values were noted in one location, on the second floor, for TSA measurements. These elevated LAB values, ranging to 78 dpm/100cm^2, were concluded as due to radon, and were subtracted from measured survey values consistent with other location-specific LAB values

A priori sensitivities were used relative to all survey results. This practice is considered adequate as an industry practice. One exception could be elevated local area backgrounds

Sensitivities were adequate for all chemical analyses, with MDLs well less than half of any applicable regulatory action levels.

Radiological Survey

Anomalies associated with high local area background values were encountered in B111, which if used for each individual measurement location, would compromise TSA sensitivities if actual MDAs were calculated for each TSA measurement Two such measurements were encountered in B111, on the second floor Because a priori sensitivities are used for each Survey Unit, determined as part of the instrument's daily performance check routine, elevated local area background values did not compromise sensitivities for TSA measurements

6.4 Summary

In summary, the data presented in this report have been verified and are qualified as valid and complete for comparison with release criteria (action levels) as stated in the original DQOs

7.0 FACILITY CLASSIFICATION

Based on the analysis of radiological, chemical and physical hazards, B111 and B333 were classified pursuant to the RFETS Decommissioning Program Plan (DPP, K-H, 1999) Classification was based on a review of historical and process knowledge, and newly acquired RLC data, and will be subject to concurrence by the Colorado Department of Public Health and the Environment

B111 and B333 are classified as RFCA Type 1 facilities These facilities present no radiological or physical hazards. All demolition debris will be managed in compliance with regulations governing PCBs (40 CFR 761), as applicable, in accordance with the Decommissioning Program Plan, Section 3.3 5 PCB ballasts and asbestos containing material will be removed and disposed of in compliance with EPA and CDPHE regulations.

To ensure that the Type 1 facilities remain free of contamination and that Pre-Demolition Survey data remain valid, isolation controls have been established, and the facilities are posted accordingly

8.0 REFERENCES

DOE/RFFO, CDPHE, EPA, 1996 Rocky Flats Cleanup Agreement (RFCA), July 19, 1996

DOE/RFFO, CDPHE, EPA, 1999 Decontamination and Decommissioning Characterization Protocol, MAN-077-DDCP, Rev 1, June 19, 2000

DOE Order 5400 5, "Radiation Protection of the Public and the Environment "

DOE Order 414 1A, "Quality Assurance "

K-H, 1997. "Kaiser-Hill Team Quality Assurance Program", Rev 5, 12/97

K-H, 1998. Facility Disposition Program Manual, MAN-076-FDPM, Rev 1, September 1999

K-H, 2000 Pre-Demolition Survey Plan, MAN-127-PDSP, Rev 0, October 3, 2000

K-H, 2000 Asbestos Inspection & Beryllium Survey Report for B111, October 24, 2000

K-H, 1999 Decommissioning Program Plan, June 21, 1999

MARSSIM – Multi-Agency Radiation Survey and Site Investigation Manual, December, 1997 (NUREG-1575, EPA 402-R-97-016)

RFETS Chronic Beryllium Disease Prevention Program, "List of Known Beryllium Areas" (Maintenance Work Package Planning Package, 1-E33-IWCP-3, Rev 3) January 1998.

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*

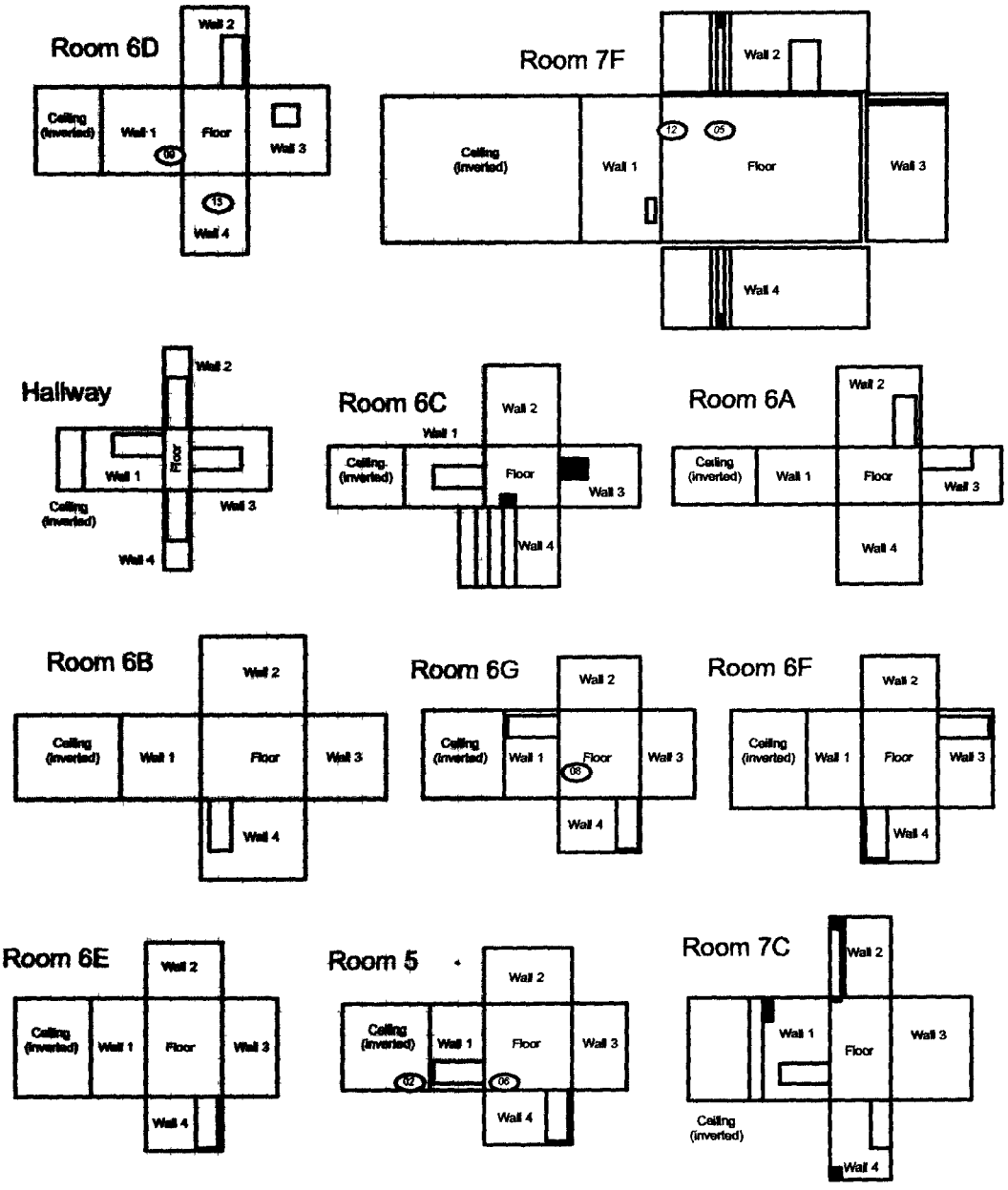
ATTACHMENT R

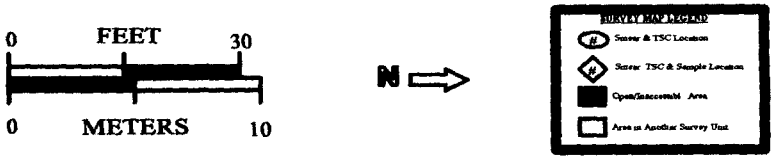
SURVEY UNIT MAPS
FOR BUILDING 111 AND BUILDING 333

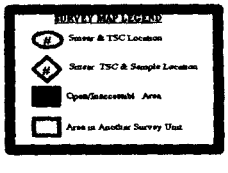
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-001** **Classification 3**
Building 111
Survey Unit Description B111 Basement-North
Total Area 1849 sq. m

SURVEY UNIT 111-A-001 - MAP 1 OF 2



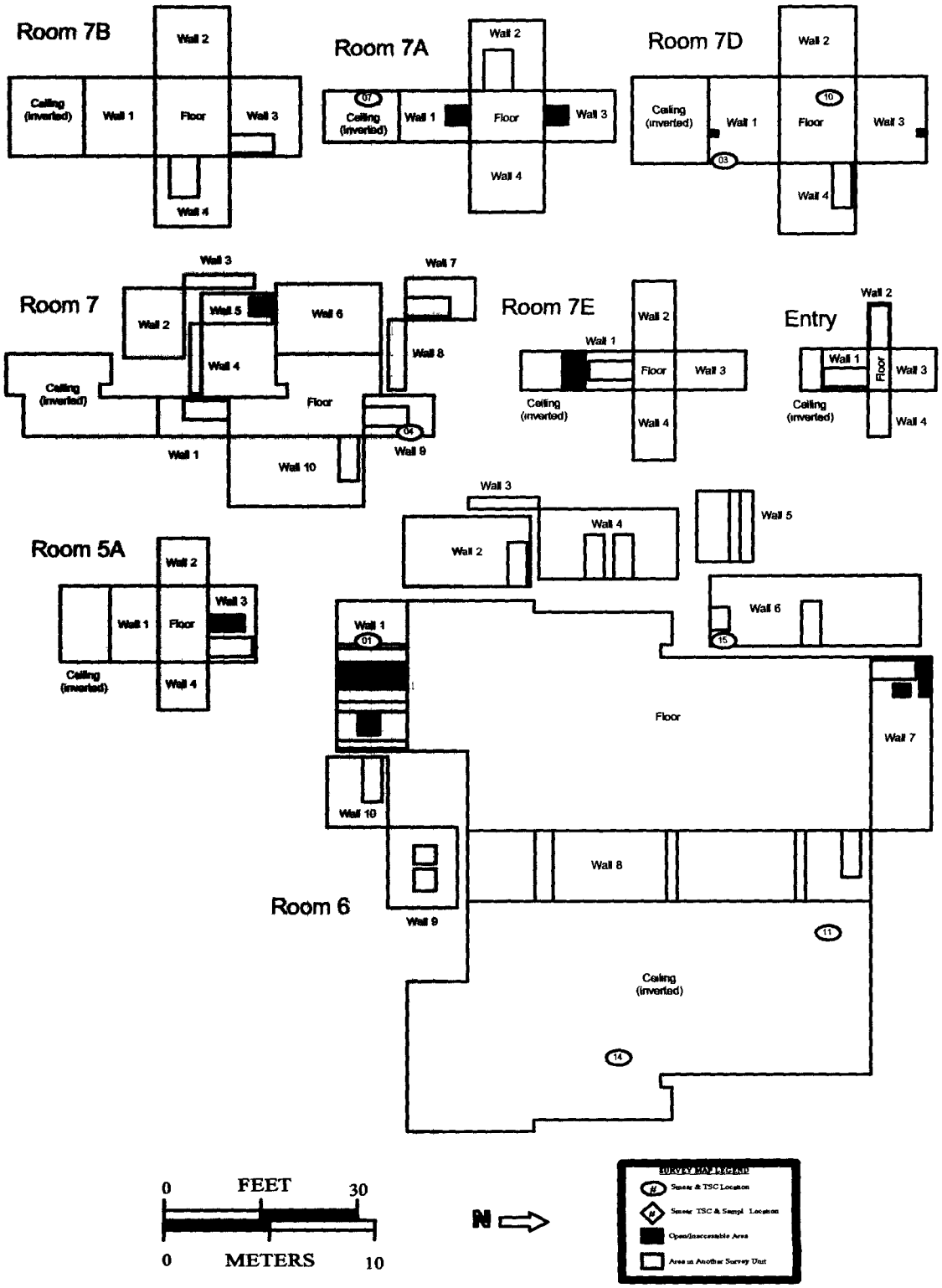




RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-001** **Classification 3**
Building 111
Survey Unit Description B111 Basement-North
Total Area 1849 sq m

SURVEY UNIT 111-A-001 - MAP 2 OF 2

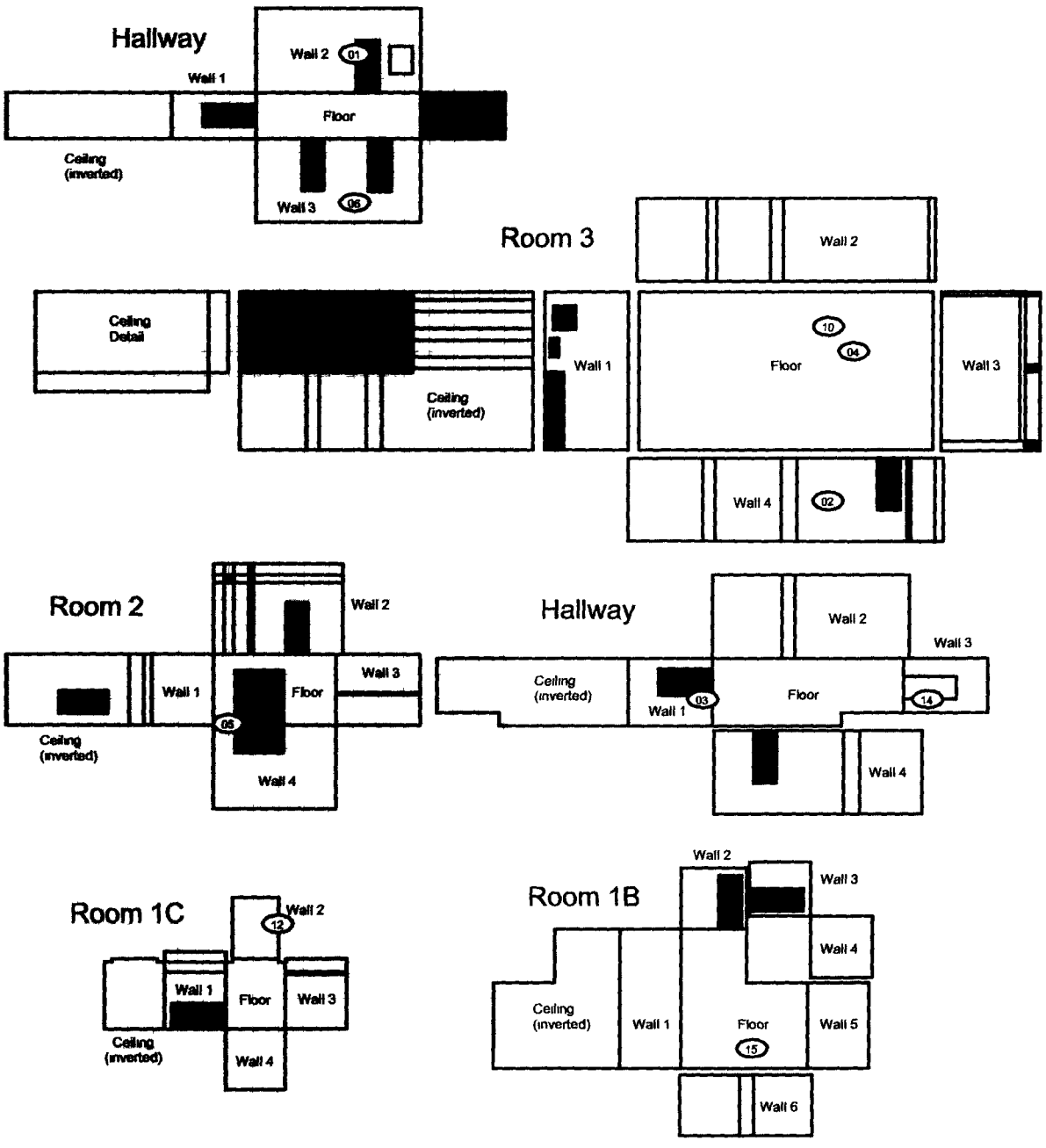


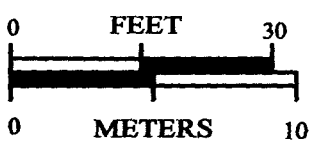
50

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-002** **Classification 3**
Building 111
Survey Unit Description B111 Basement-South
Total Area 1309 sq m

SURVEY UNIT 111-A-002 - MAP 1 OF 2





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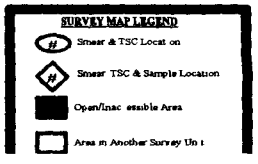
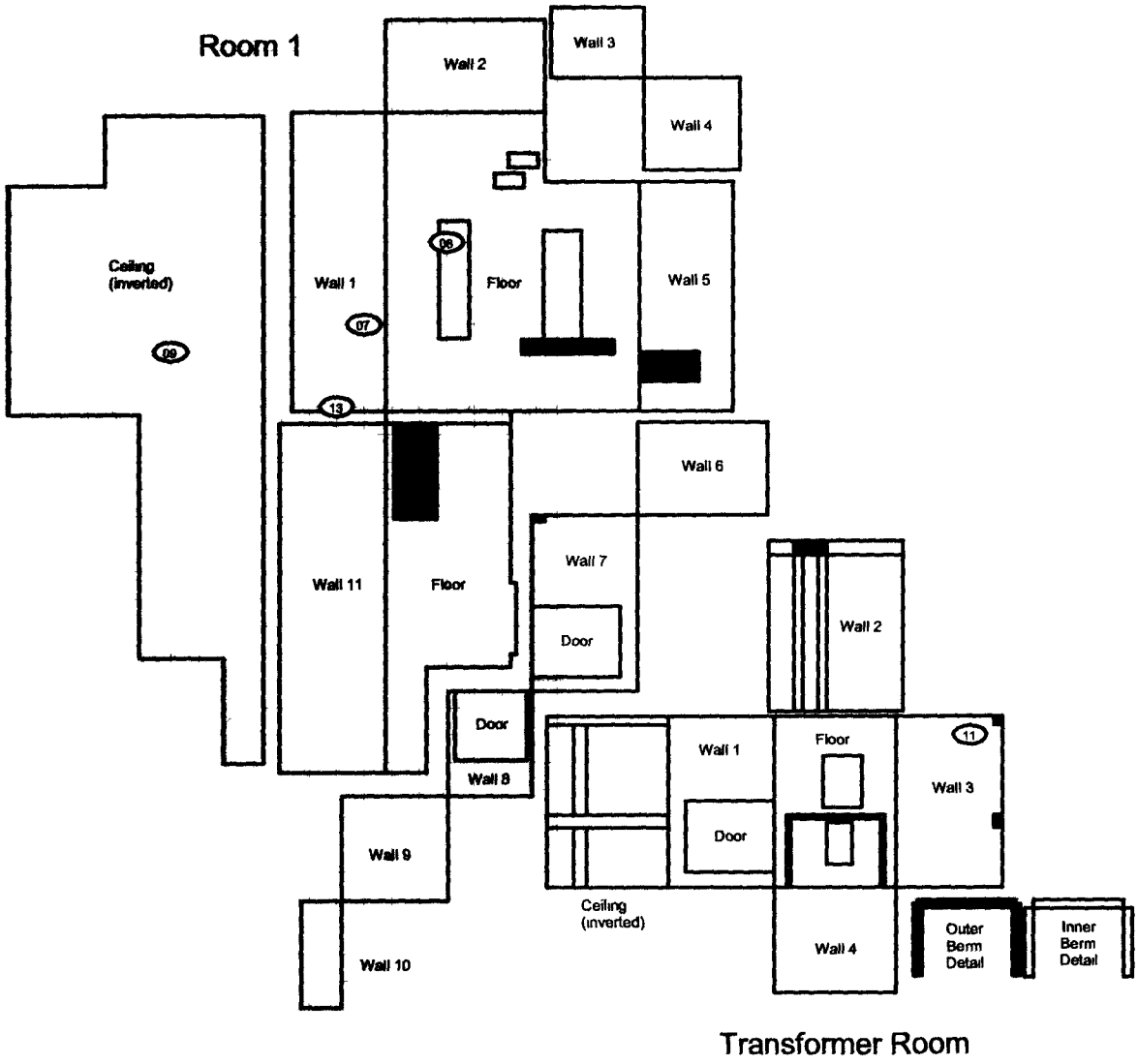


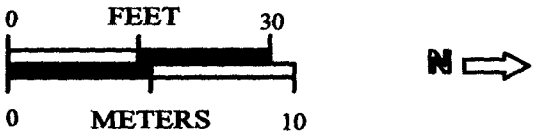
51

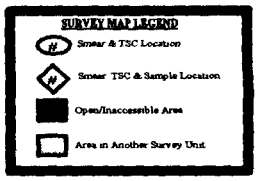
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-002** **Classification 3**
Building: 111
Survey Unit Description B111 Basement-South
Total Area 1309 sq. m

SURVEY UNIT 111-A-002 - MAP 2 OF 2







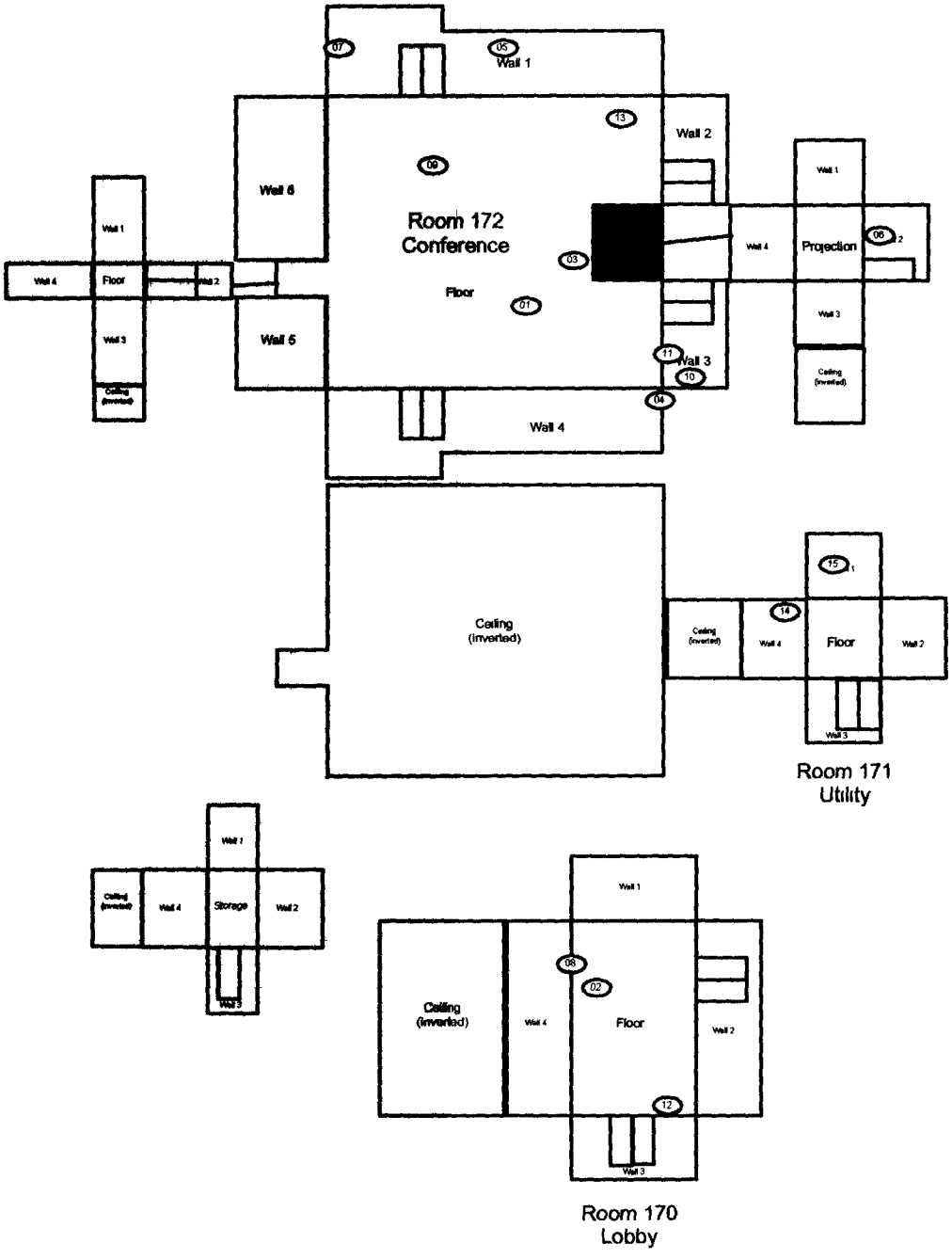
52

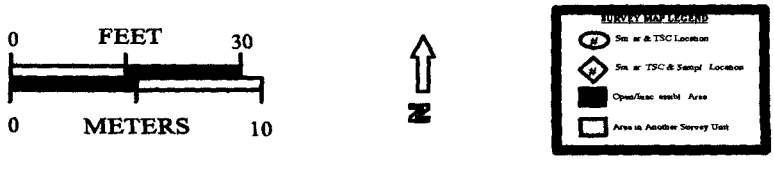
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit 111-B-003** **Classification 3**
Building 111
Survey Unit Description B111 Auditorium

MAP ID: 5/2001/01-0077

SURVEY UNIT 111-B-003 - MAP 1 OF 1





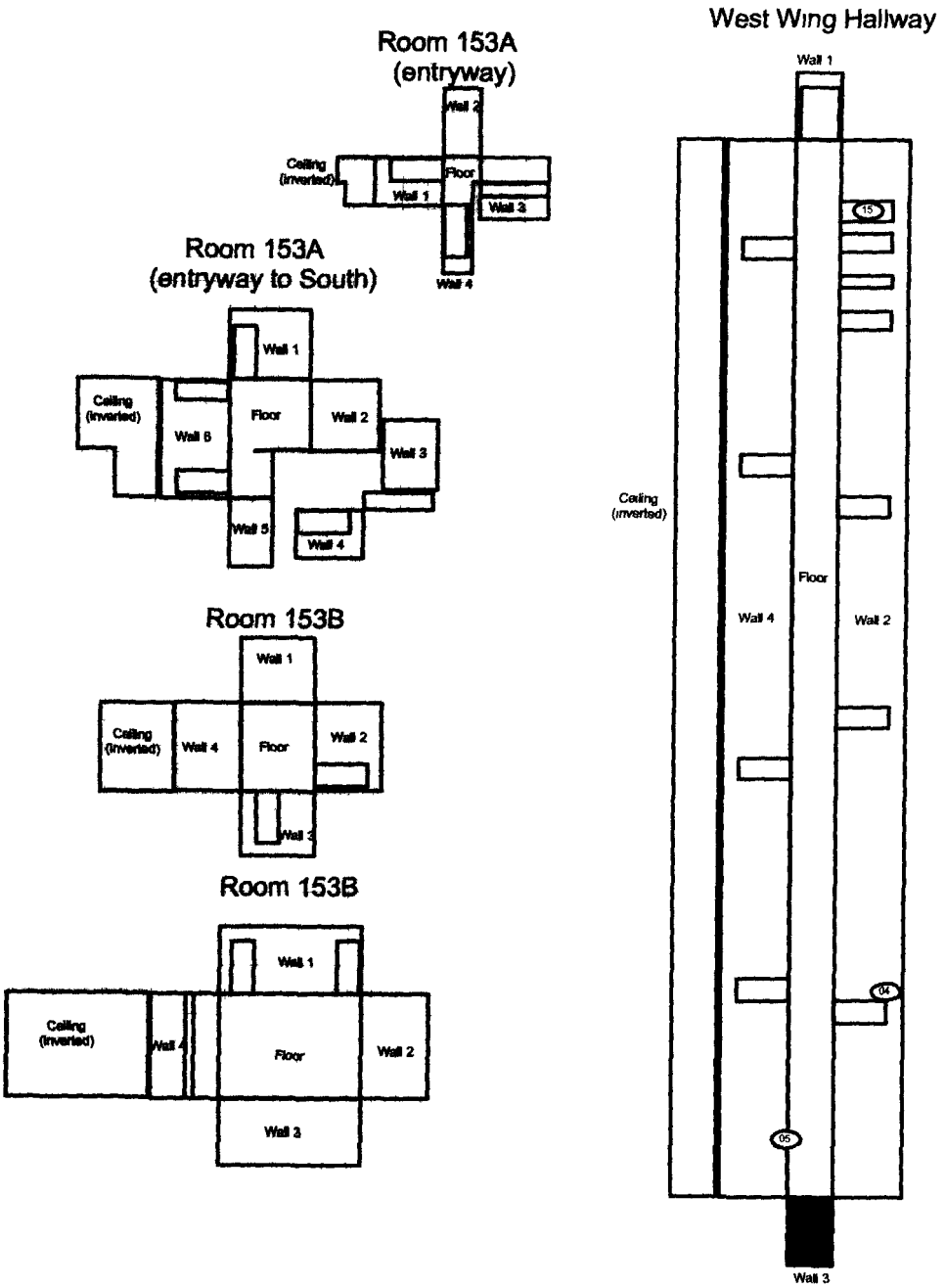
53

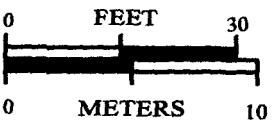
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

MAP ID: N2001/01-0077

SURVEY UNIT 111-B-004 - MAP 1 OF 4





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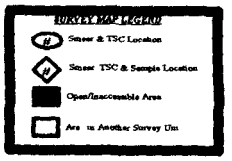


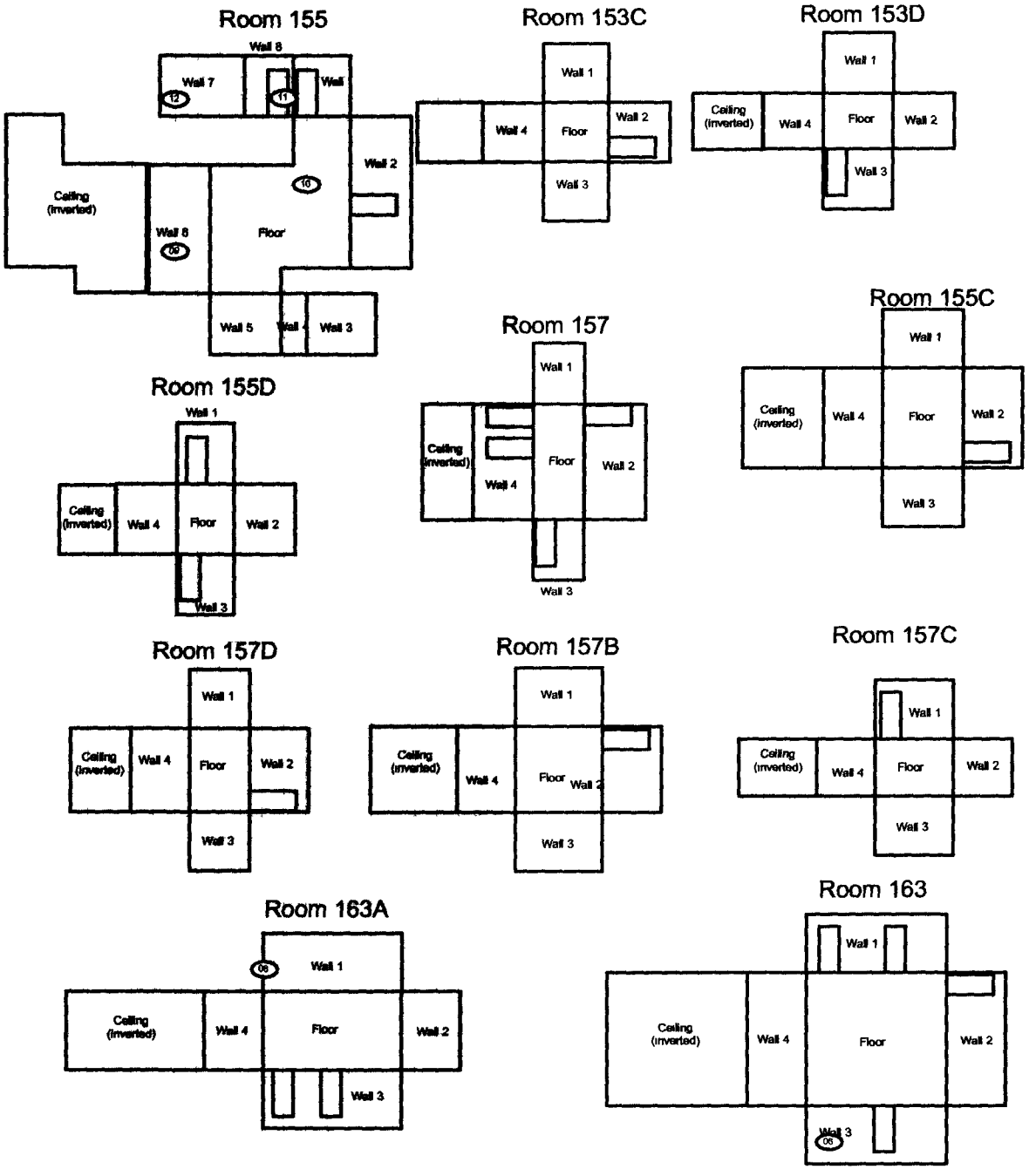
54

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-004 - MAP 2 OF 4



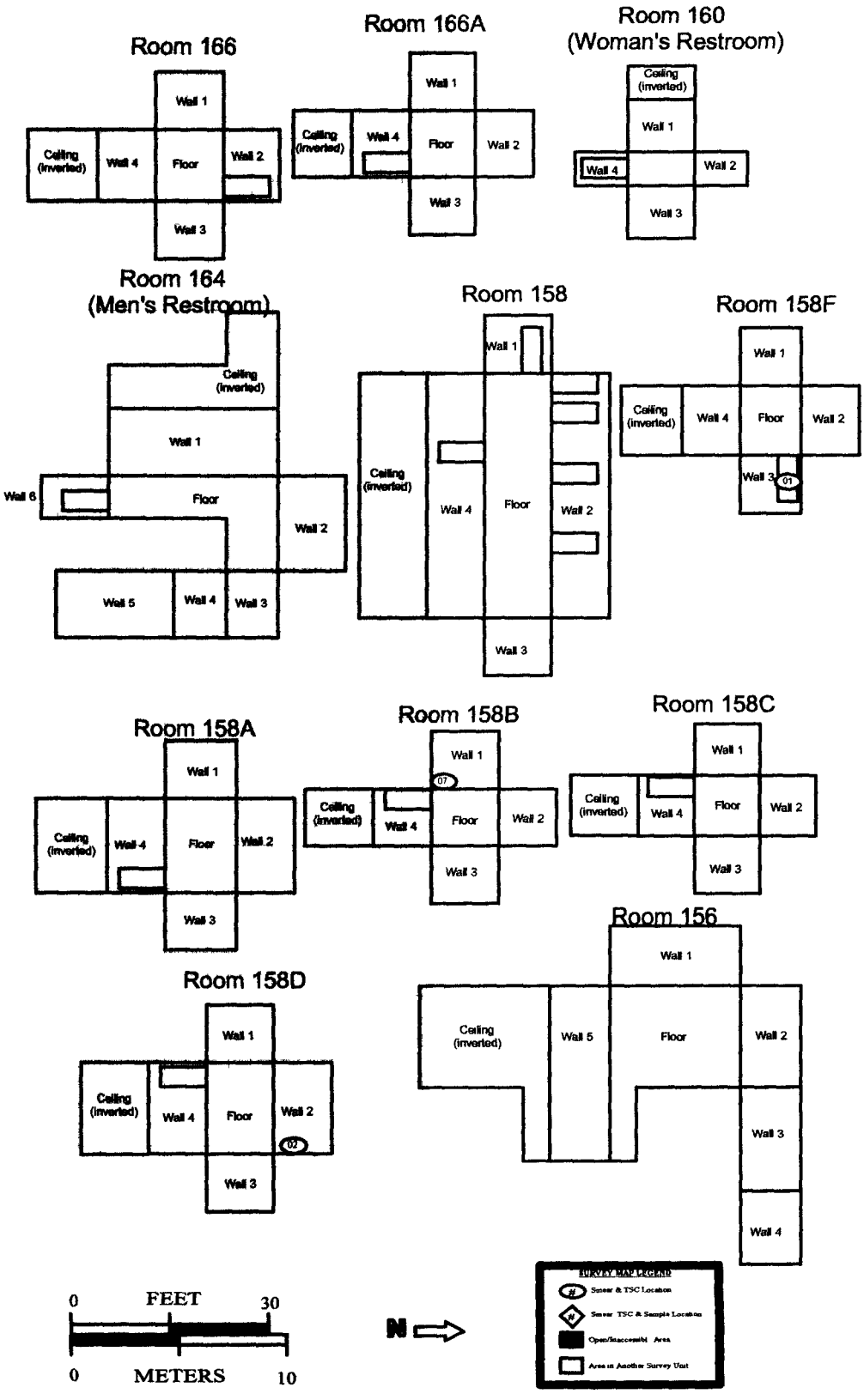
55

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-004 - MAP 3 OF 4



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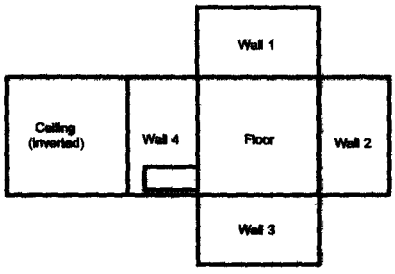
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

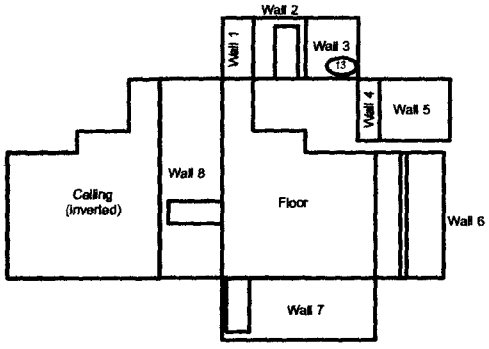
MAP ID: N2001/01-0077

SURVEY UNIT 111-B-004 - MAP 4 OF 4

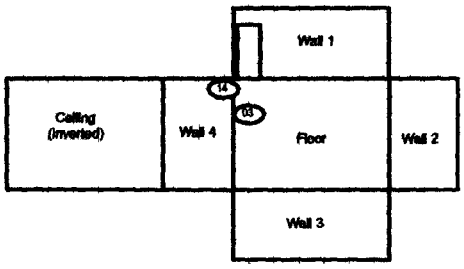
Room 154A



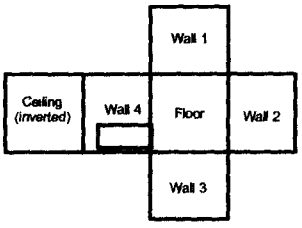
Room 154
(Financial Admin)



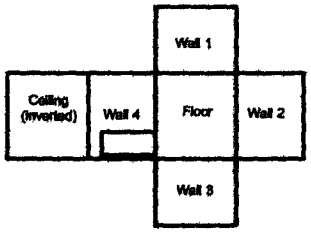
Room 152



Room 166A



Room 166



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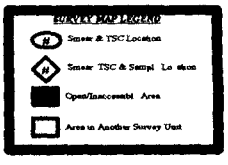

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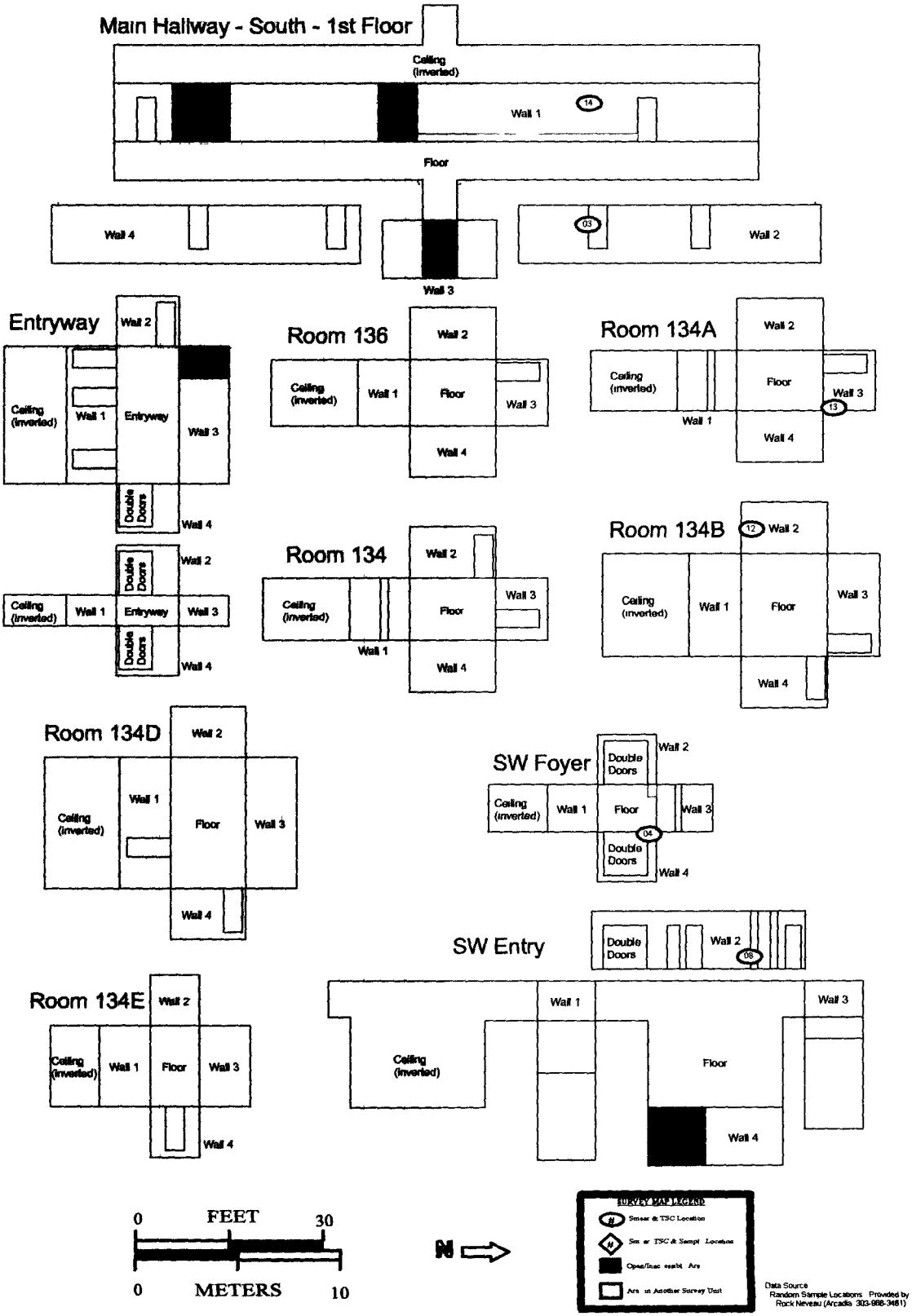
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-005** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - South

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-005 - MAP 1 OF 3



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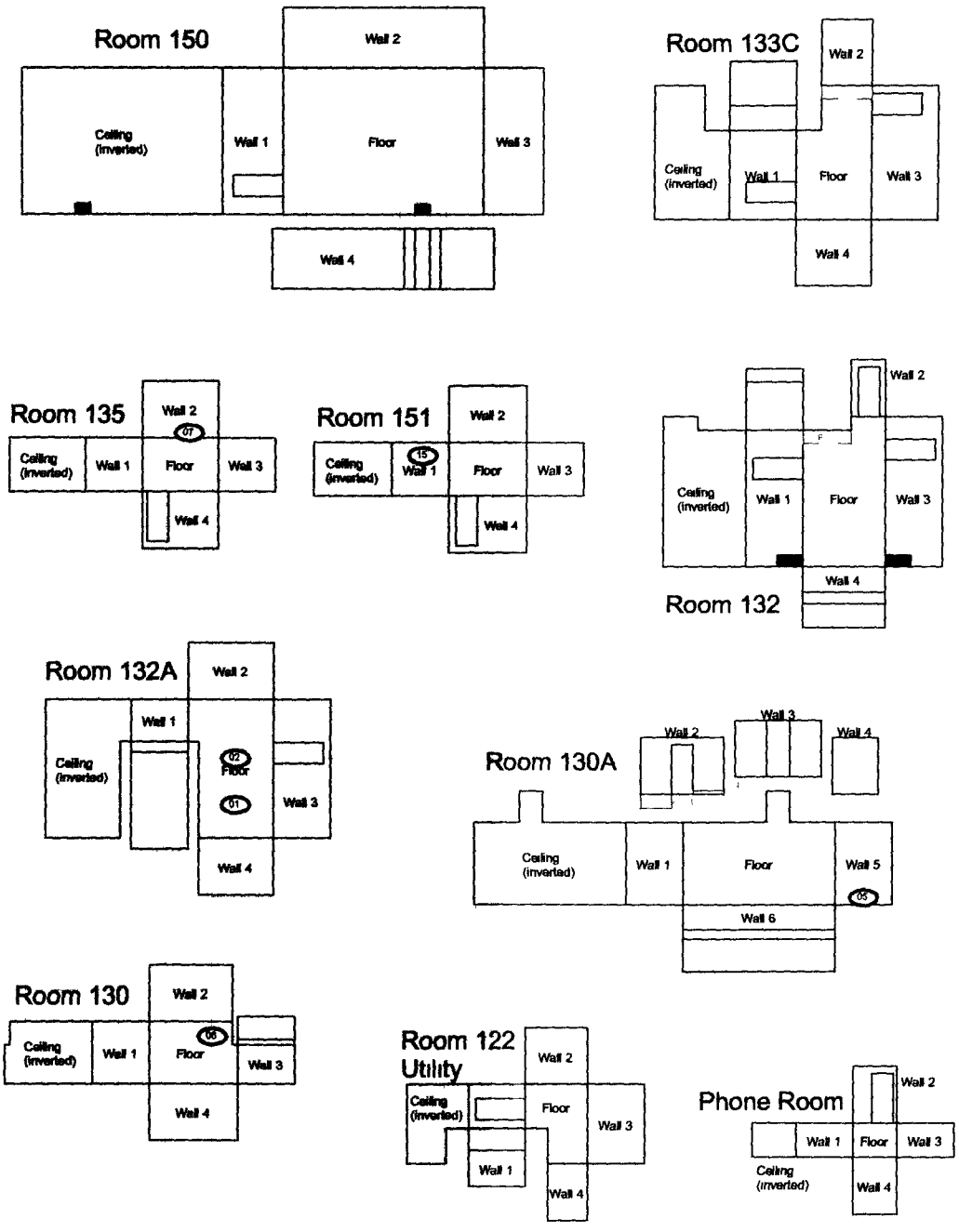
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-005** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - South

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-005 - MAP 2 OF 3



Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadia 303-988-3481)

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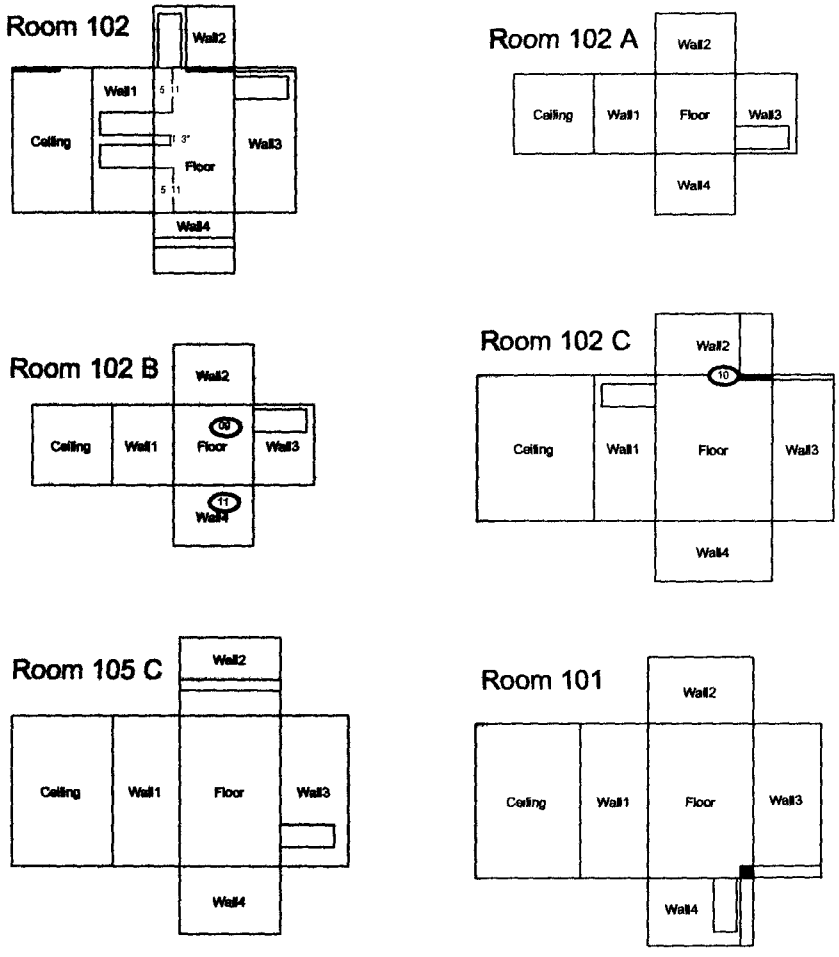
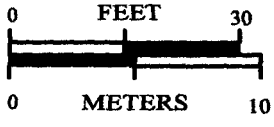
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-005** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - South

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-005 - MAP 3 OF 3





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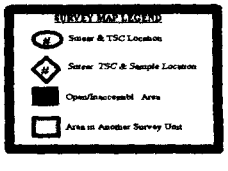


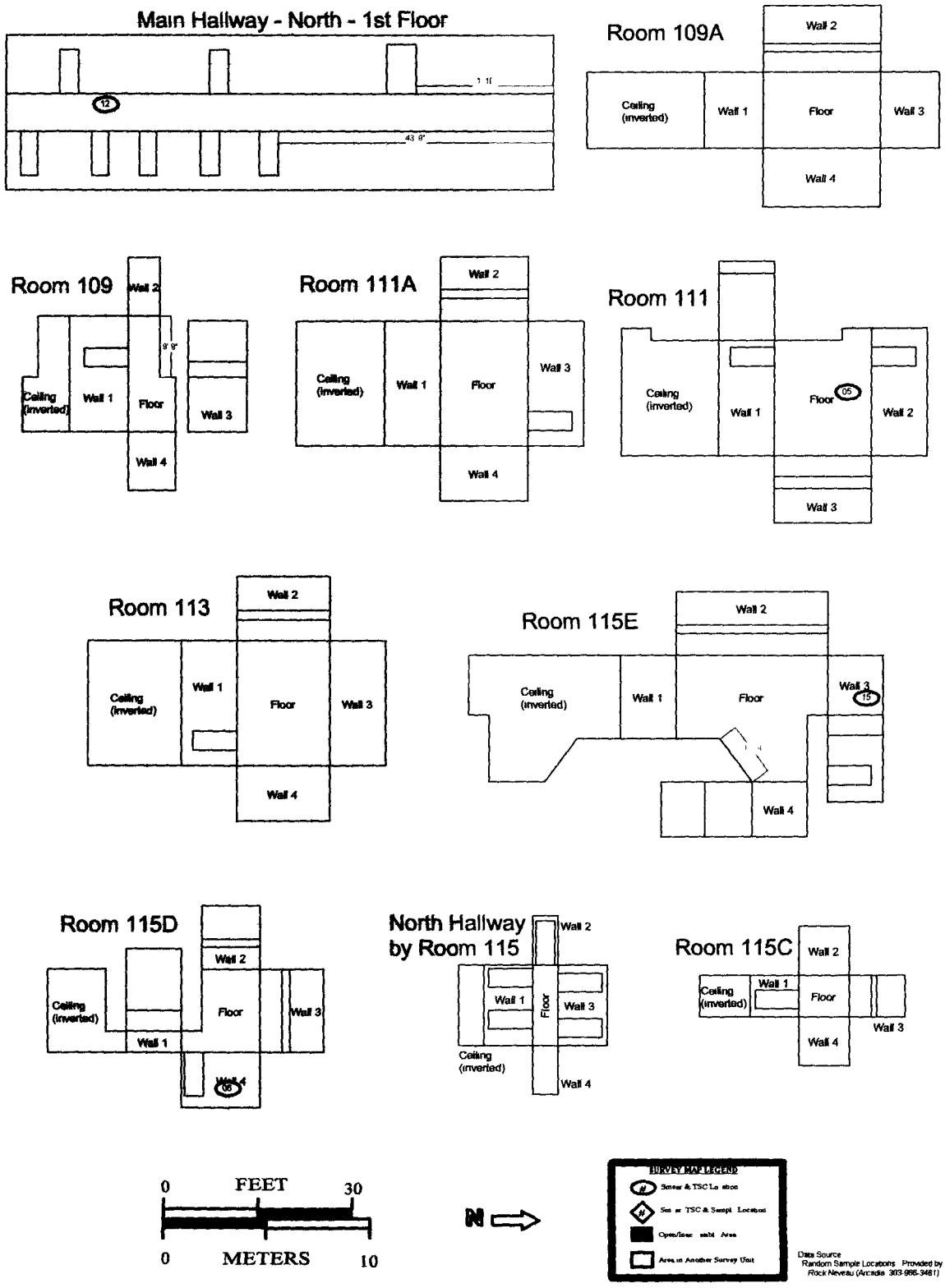
Data Source:
Random Sample Location Provided by
Rock Neveau (Arcadis 303-988-3481)

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-006** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor North

MAP ID. fv2001/01-0077

SURVEY UNIT 111-B-006 - MAP 1 OF 3



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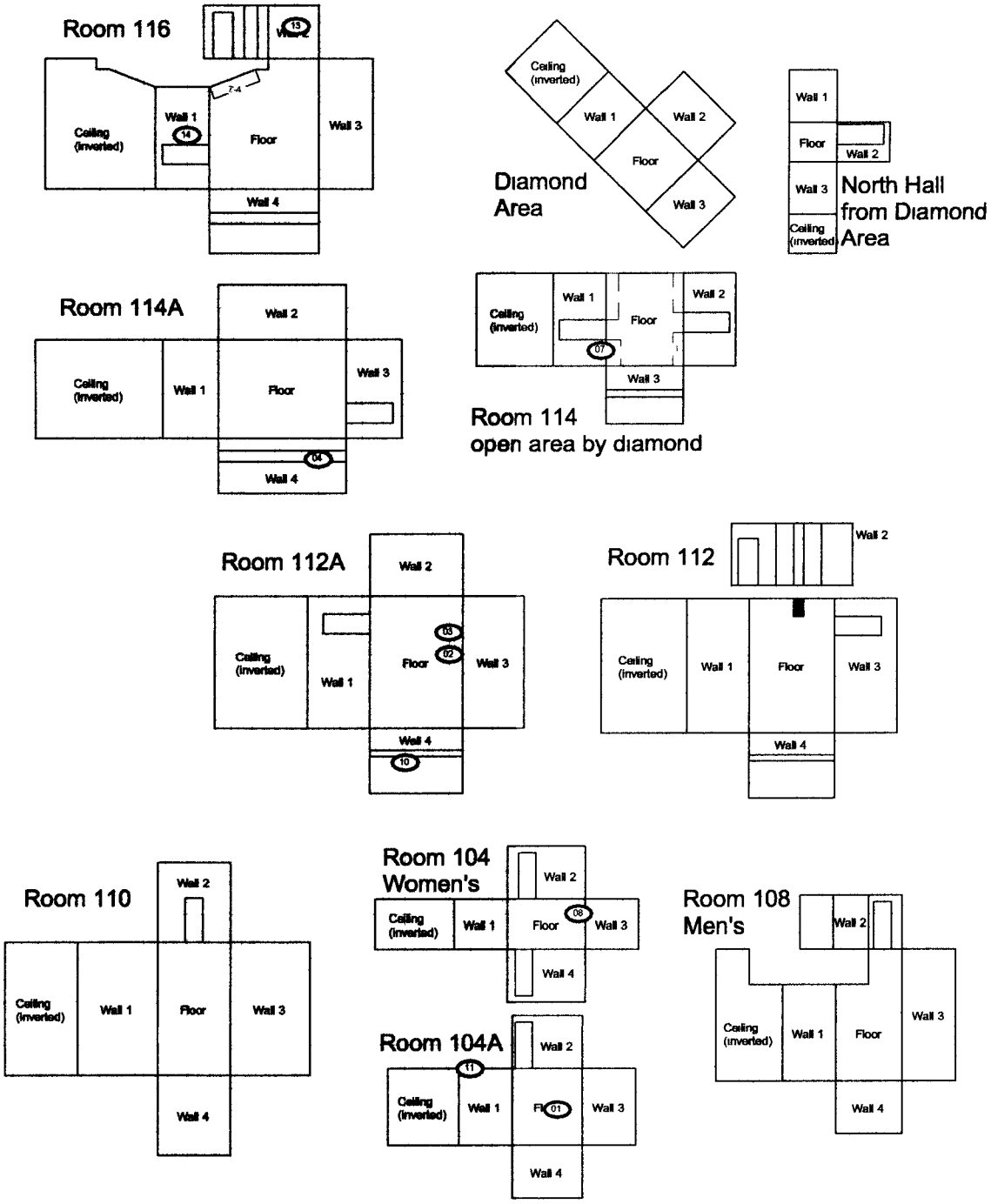
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-006** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - North

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-006 - MAP 2 OF 3



Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadis 303-986-3481)

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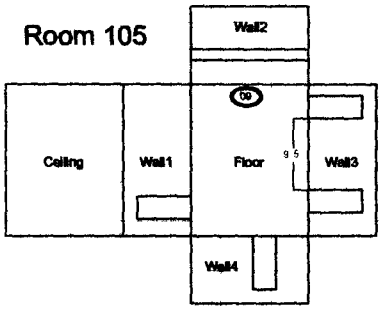
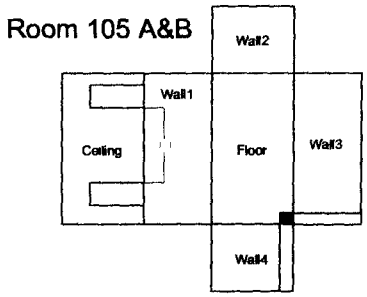
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

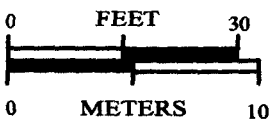
Survey Area B **Survey Unit: 111-B-006** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - North

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-006 - MAP 3 OF 3







N

Data Source
Random Sample Locations Provided by
Rick Neveau (Arcadis 303-988-3461)

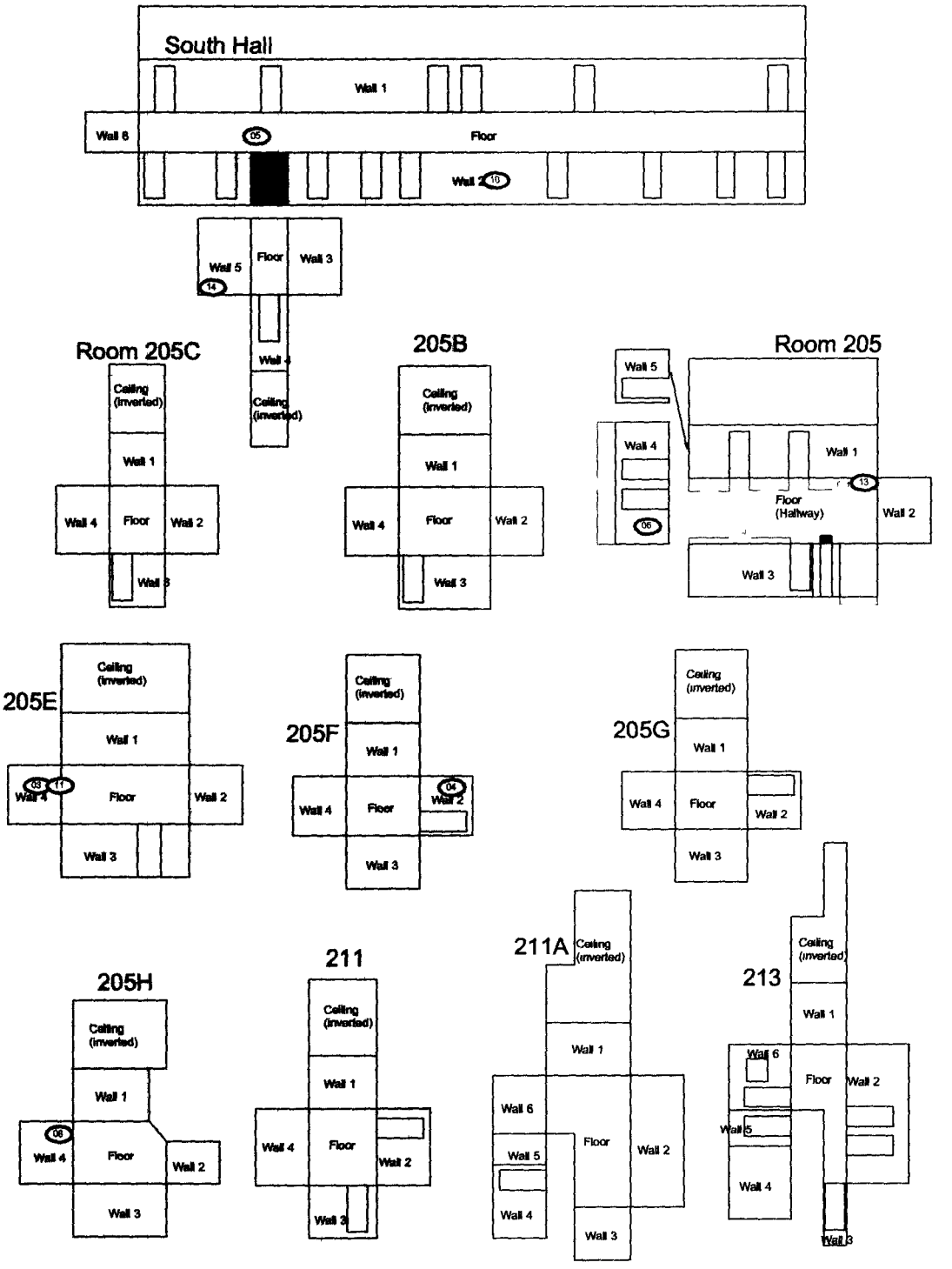
63

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-007** **Classification 3**
Building 111
Survey Unit Description B111 South Area

MAP ID. fy2001/01-0077

SURVEY UNIT 111-C-007 - MAP 1 OF 3



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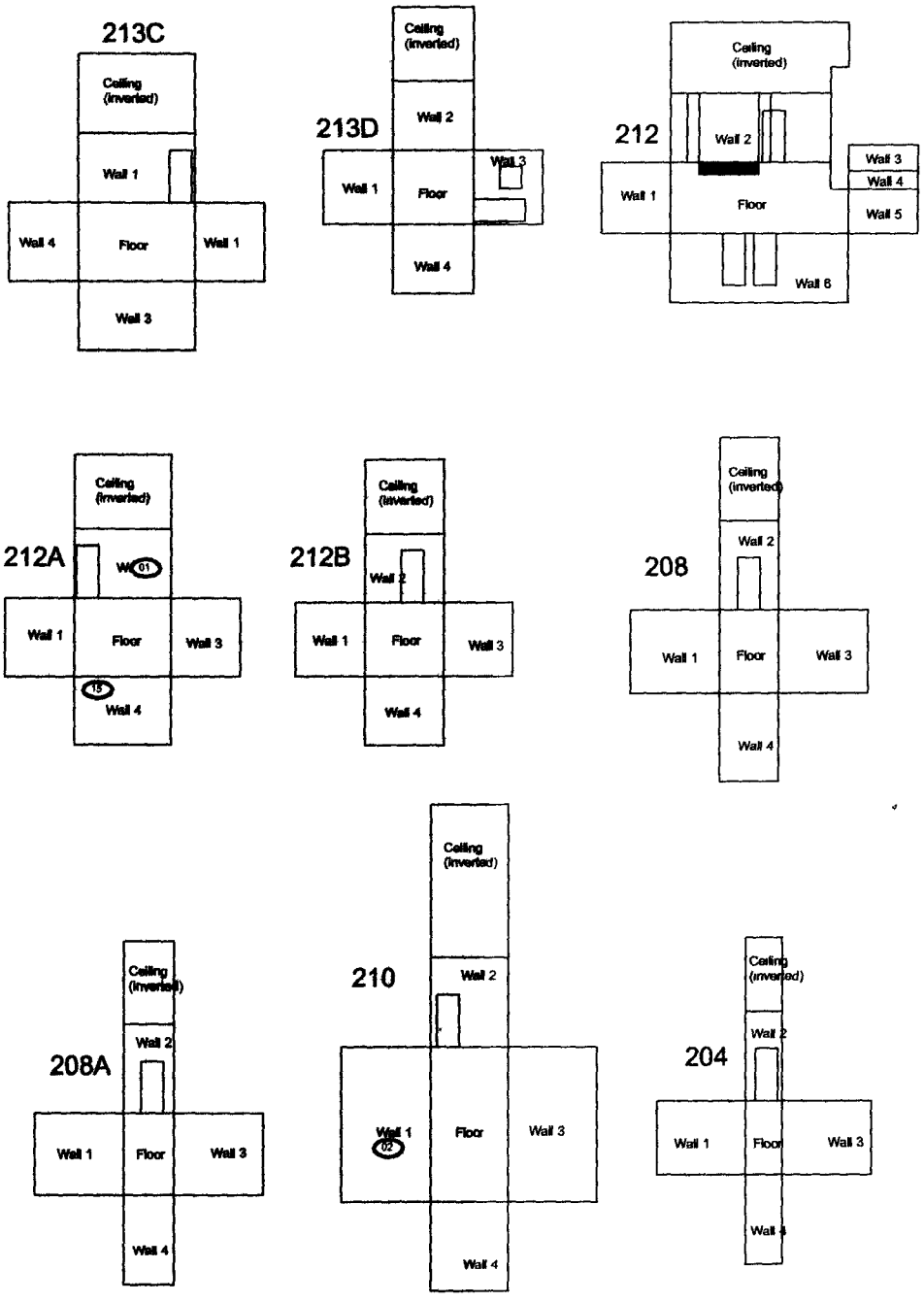
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-007** **Classification 3**
Building 111
Survey Unit Description B111 South Area

MAP ID: fy2001/01-0077

SURVEY UNIT 111-C-007 - MAP 2 OF 3



0 FEET 30

0 METERS 10

N

SURVEY MAP LEGEND

- Smear & TSC Location
- Smear TSC & Sampl Location
- Open/inac ssibl Area
- Area in Another Survey Unit

Data Source
Random Sample Locations Provided by
Rock Nieveau (Arcadis 303-986-3461)

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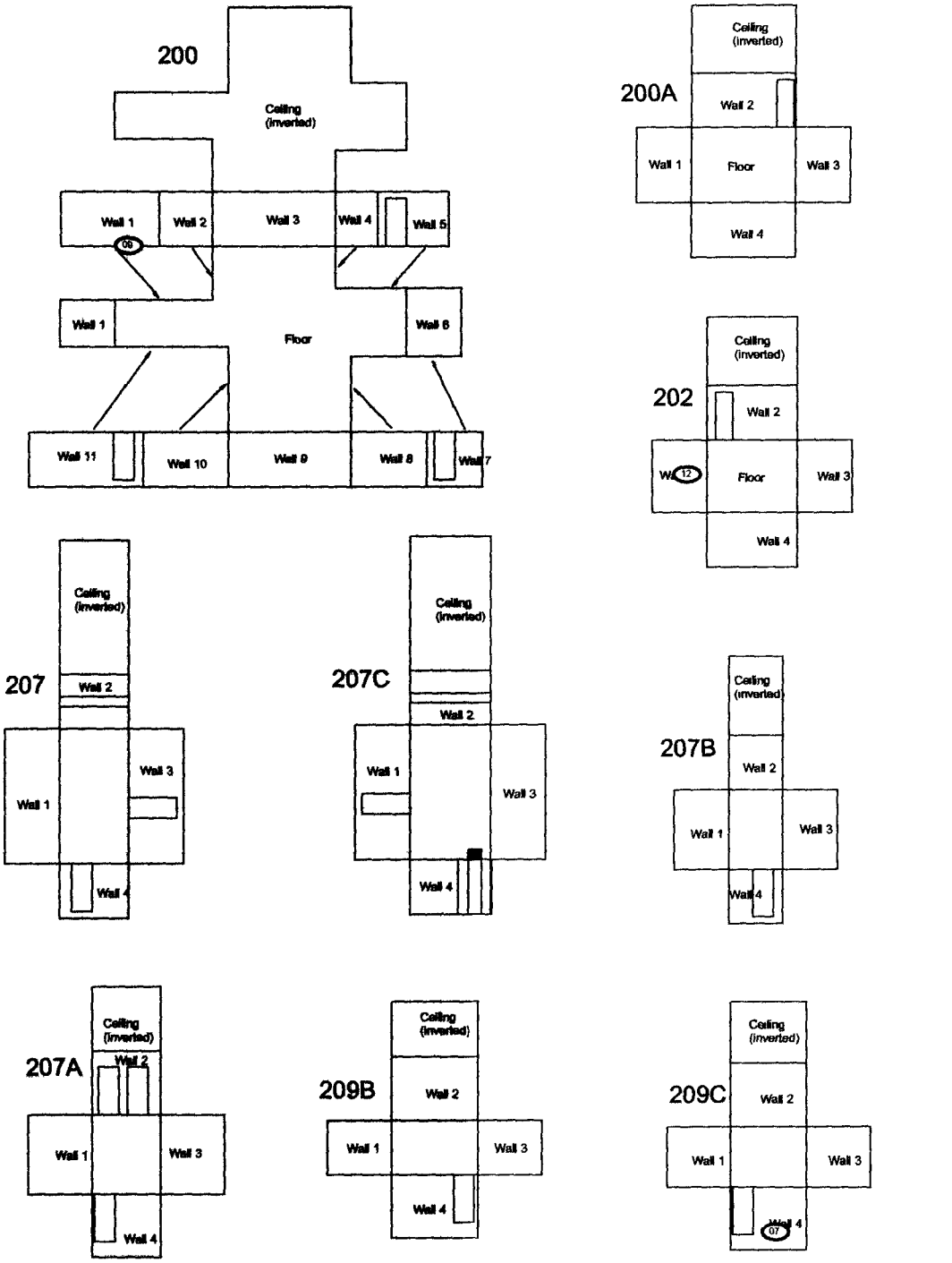
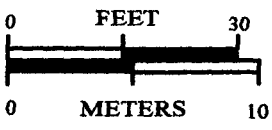
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

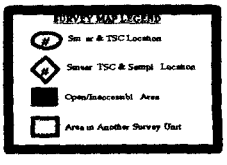
Survey Area C **Survey Unit: 111-C-007** **Classification 3**
Building 111
Survey Unit Description B111 South Area

MAP ID: fy2001/01-0077

SURVEY UNIT 111-C-007 - MAP 3 OF 3







Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadis 303-985-3481)

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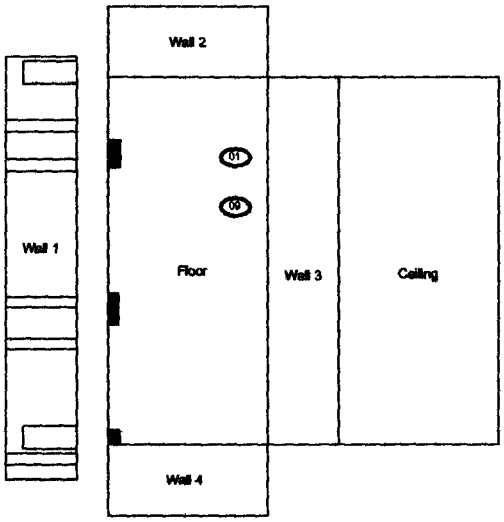
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-008** **Classification 3**
Building 111
Survey Unit Description B111 Second Floor-North Hall

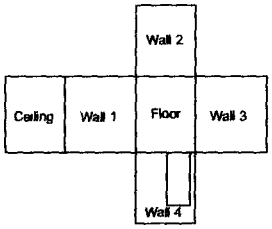
MAP ID. fv2001/01-0077

SURVEY UNIT 111-C-008 - MAP 1 OF 2

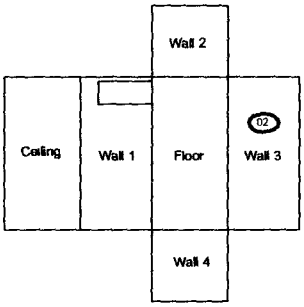
B111 2nd Floor, Room 222



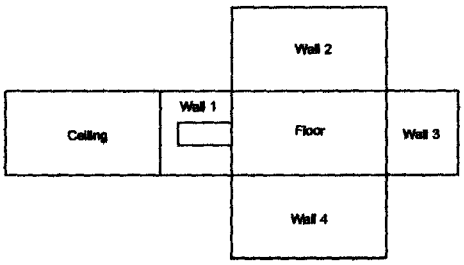
Room 222G



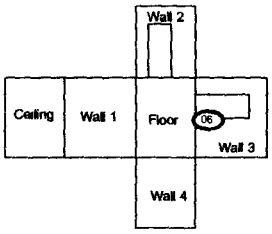
Room 222C



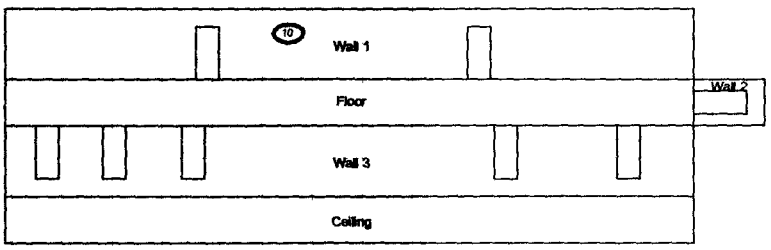
Room 220 (Vault)

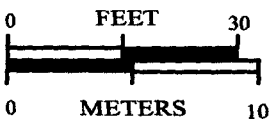


Room 222F



North Hall





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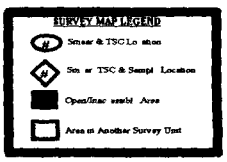

Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadis 303-988-3461)

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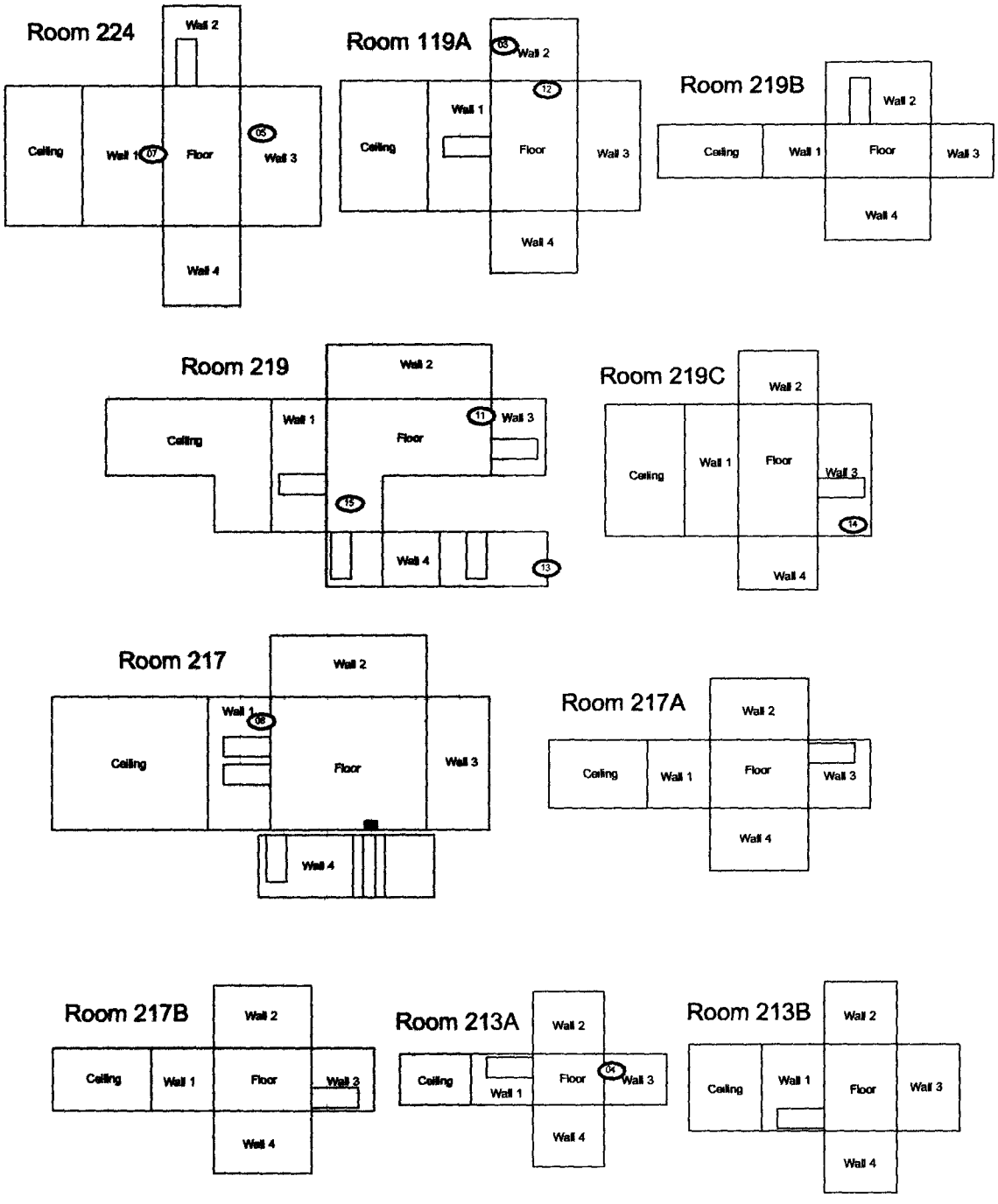
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-008** **Classification 3**
Building 111
Survey Unit Description B111 Second Floor-North Hall

MAP ID. fy2001/01-0077

SURVEY UNIT 111-C-008 - MAP 2 OF 2



Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadia 303-888-3481)

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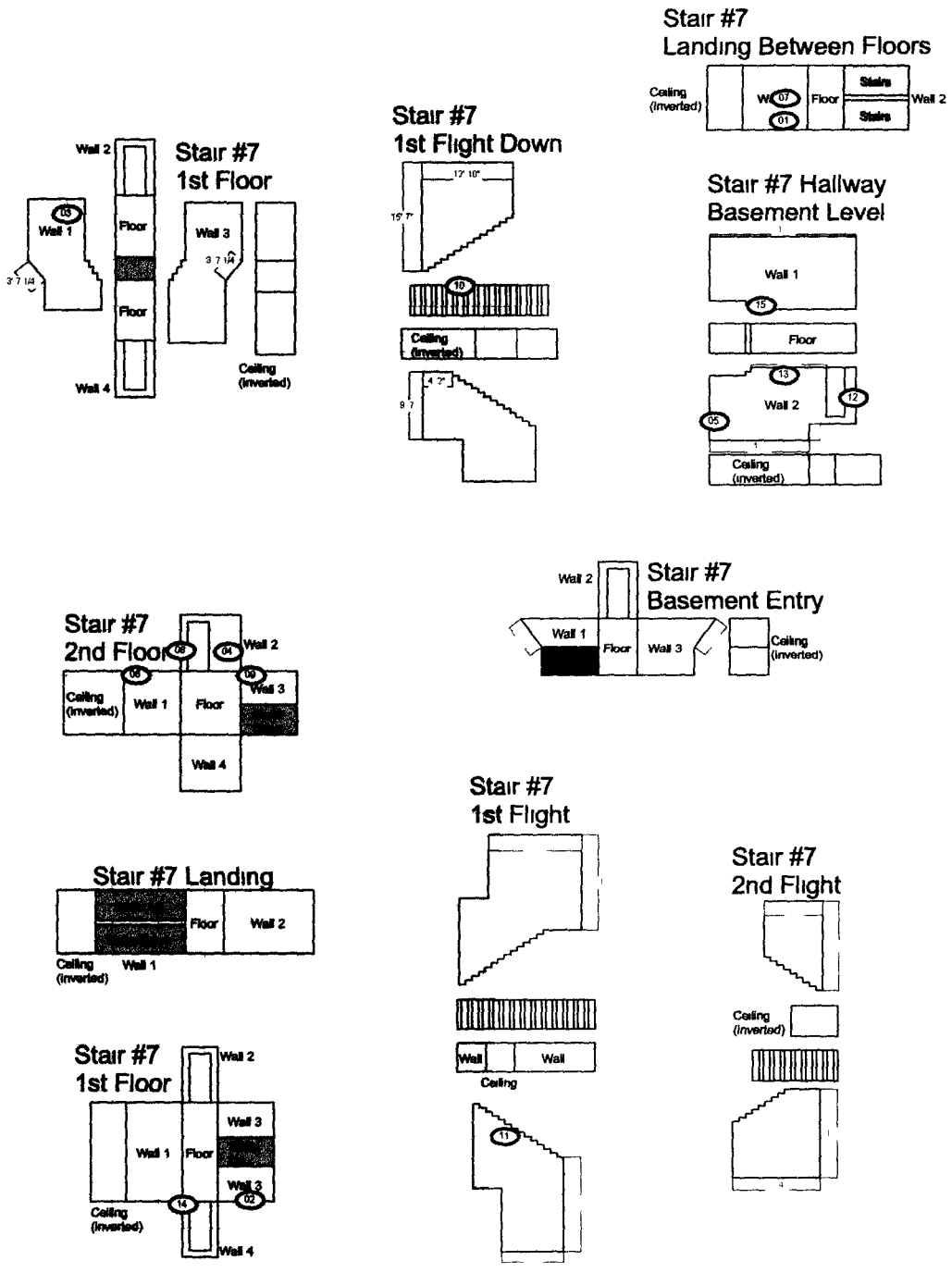
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area D **Survey Unit: 111-D-009** **Classification 3**
Building 111
Survey Unit Description B111 - Stairwell #7

MAP ID. fv2001/01-0077

SURVEY UNIT 111-D-009 - MAP 1 OF 1



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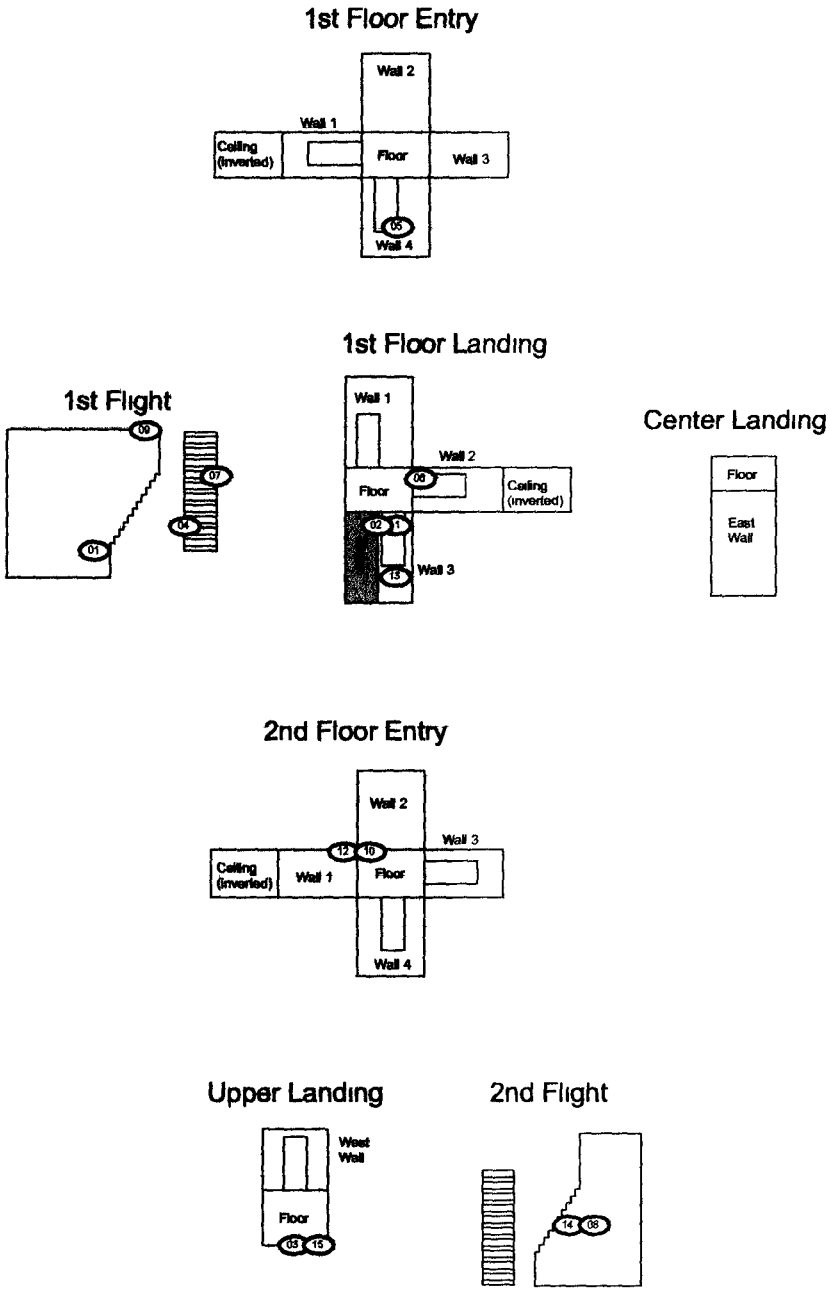
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area D **Survey Unit. 111-D-010** **Classification 3**
Building 111
Survey Unit Description B111 Stairwell (Door No 5)

MAP ID. fv2001/01-0077

SURVEY UNIT 111-D-010 - MAP 1 OF 1



0 FEET 30
0 METERS 10

N

SURVEY MAP LEGEND
Smear & TSC Location
Smear TSC & Sample Location
Open/Inaccessible Area
Area in Another Survey Unit

Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadia 303-988-3481)

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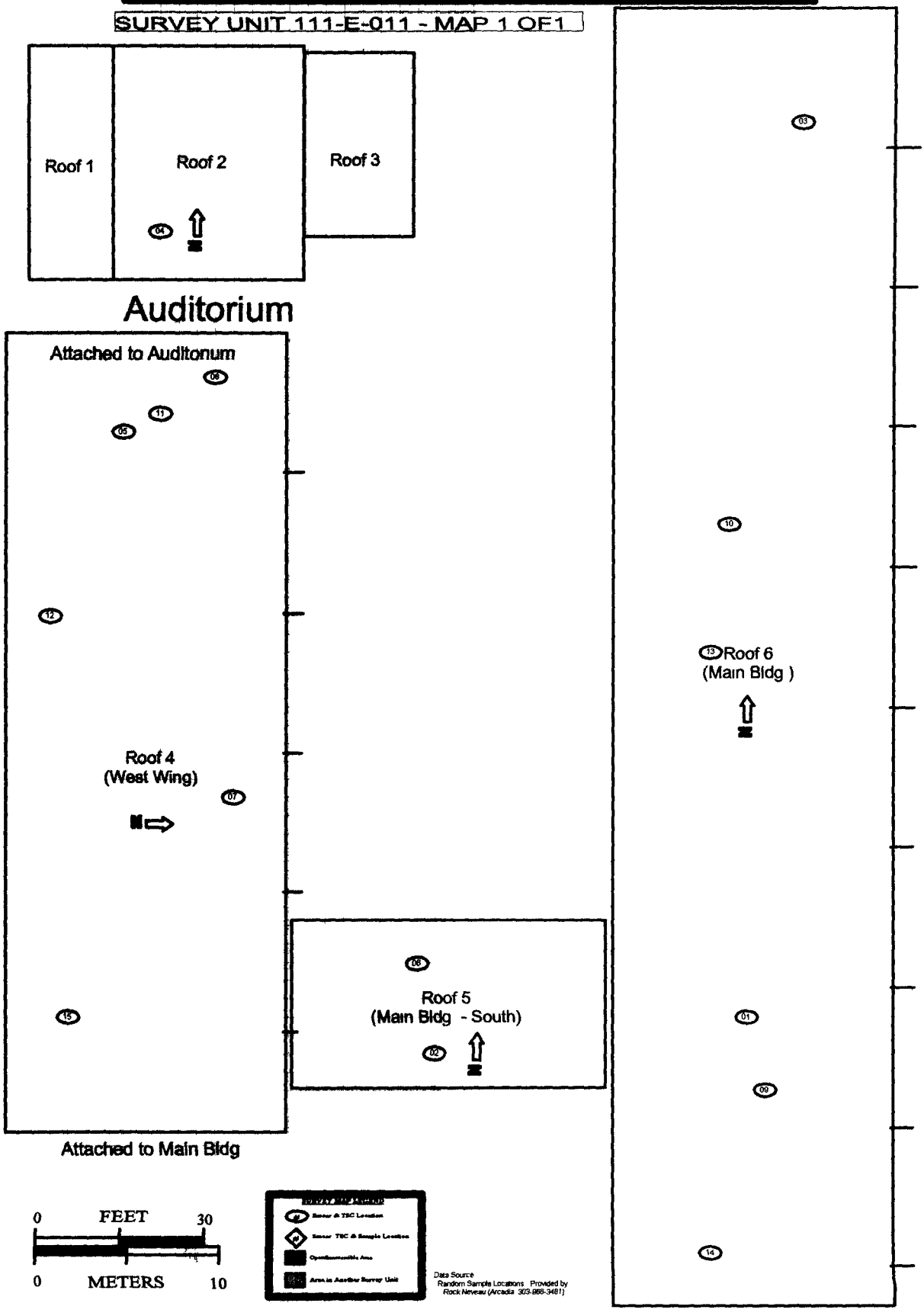
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area E **Survey Unit 111-E-011** **Classification 3**
Building 111
Survey Unit Description B111 Roof

MAP ID: fy2001/01-0077

SURVEY UNIT 111-E-011 - MAP 1 OF 1

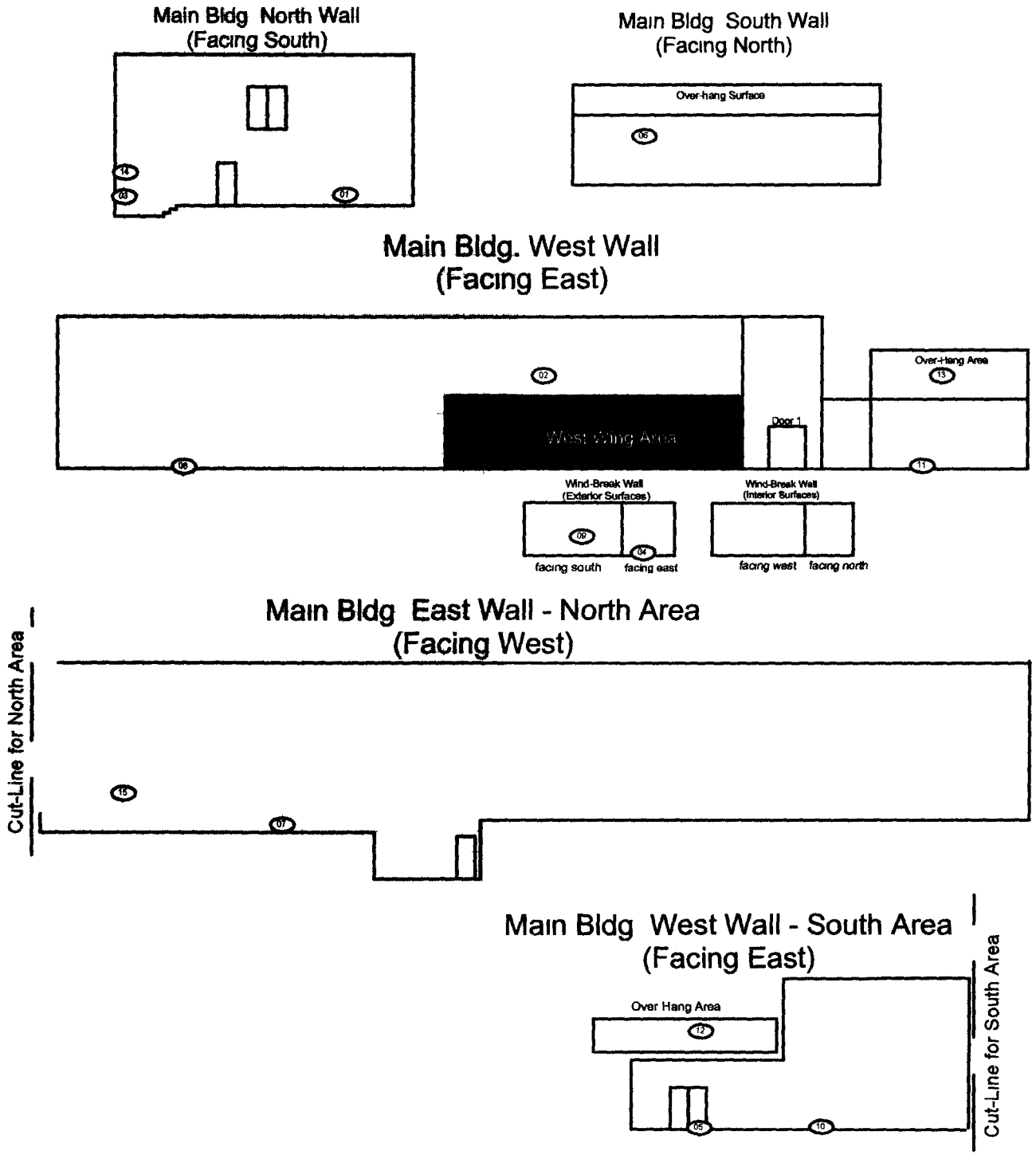


71

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area F **Survey Unit 111-F-012** **Classification 3**
Building 111
Survey Unit Description B111 Main Ext. Walls
Total Area XXXX sq m

SURVEY UNIT 111-F-012 - MAP 1 OF 1



0 FEET 30

0 METERS 10

SURVEY MAP LEGEND

Smear & TSC Location

Smear TSC & Sampl Location

Open/Inaccessible Area

Area in Another Survey Unit

12

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

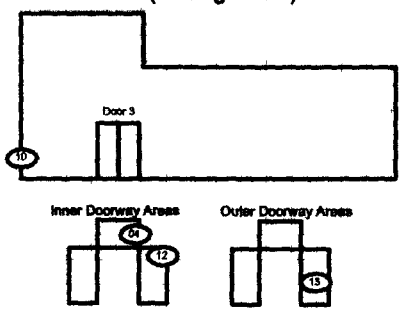
Survey Area F **Survey Unit: 111-F-013** **Classification 3**
Building 111
Survey Unit Description B111 West Wing Ext. Walls
Total Area XXXX sq m

SURVEY UNIT 111-F-013 - MAP 1 OF1

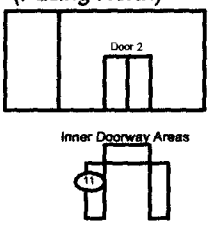
West Wing South Wall up to Auditorium
(Facing North)

Bushes Start Here
(and run west to end of map)

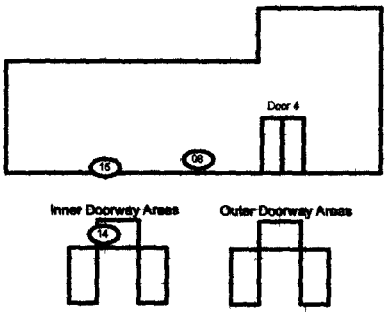
West Wing Auditorium South Wall -Door 3 Area
(Facing North)



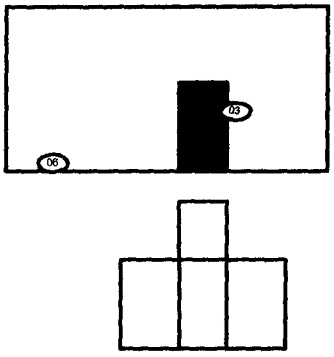
West Wing South Wall -Door 2 Area
(Facing North)



West Wing Auditorium North Wall
(Facing South)

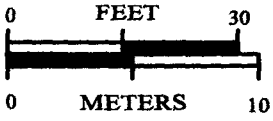


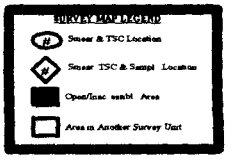
West Wing Auditorium West Wall
(Facing East)



Pop-out Room
(all surfaces)

West Wing North Wall up to Auditorium
(Facing South)





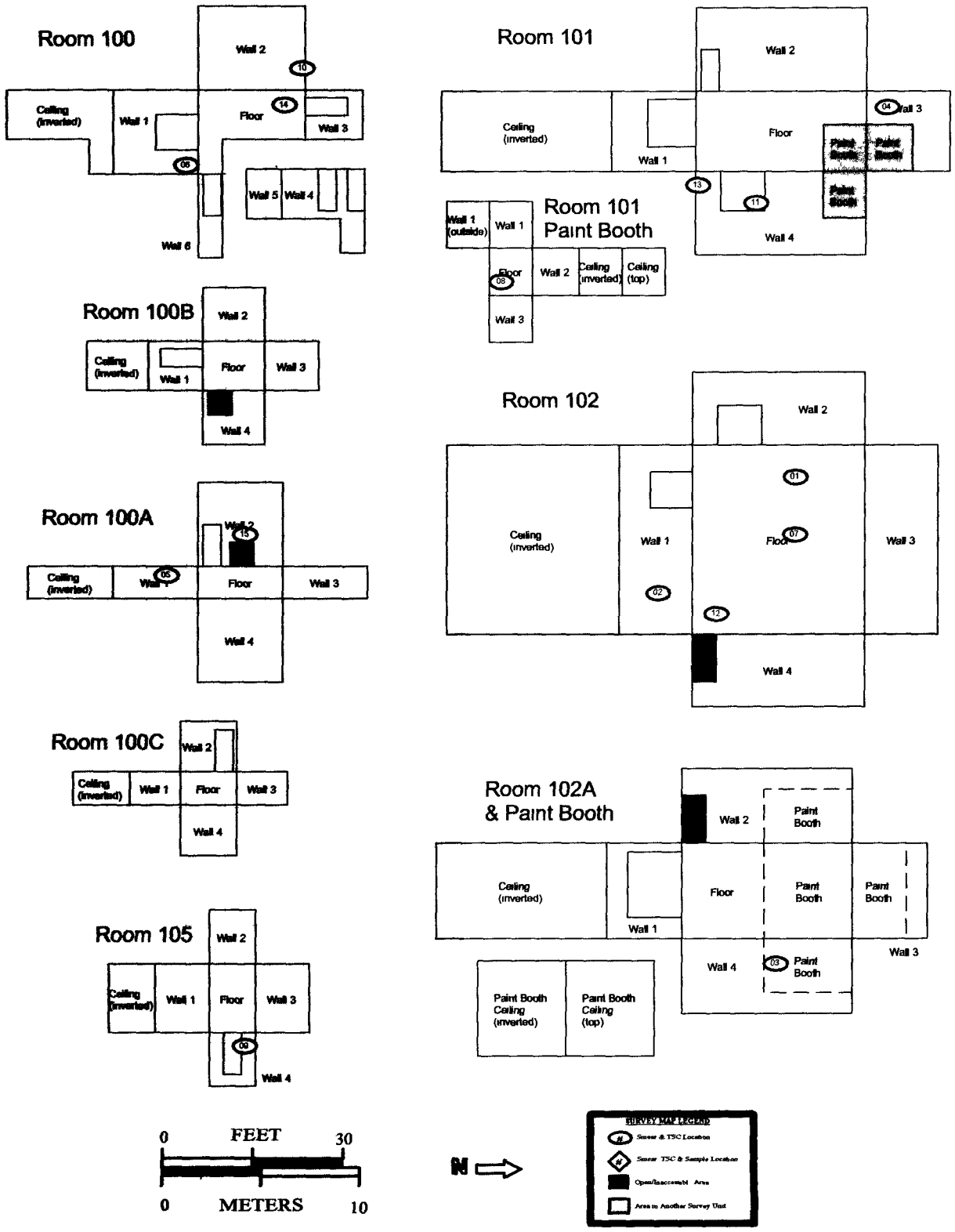
73

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B333

Survey Area A **Survey Unit: 333-A-001** **Classification 3**
Building 333
Survey Unit Description B333 - Paint Shop

MAP ID. fy2001/01-0070

SURVEY UNIT 333-A-001 - MAP 1 OF 1



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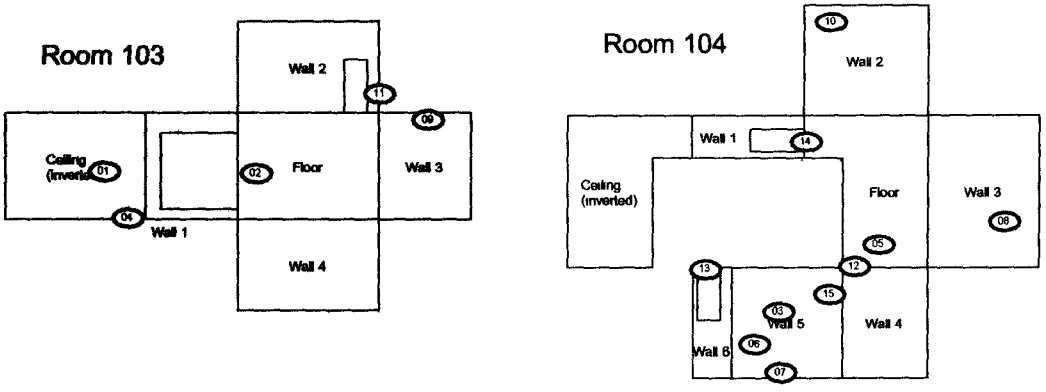
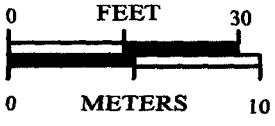
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B333

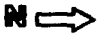
Survey Area A **Survey Unit 333-A-002** **Classification 3**
Building 333
Survey Unit Description B333 - Sand Blast Area

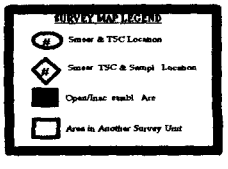
MAP ID. fy2001/01-0070

SURVEY UNIT 333-A-002 - MAP 1 OF 1









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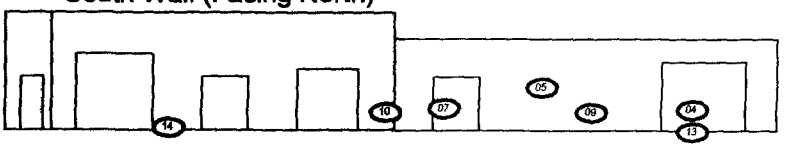
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B333

Survey Area B **Survey Unit: 333-B-003** **Classification 3**
Building 333
Survey Unit Description B333 - Exterior Walls

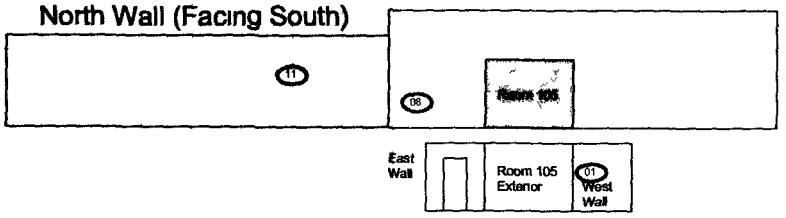
MAP ID: fy2001/01-0070

SURVEY UNIT 333-B-003 - MAP 1 OF 1

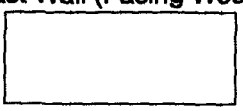
South Wall (Facing North)



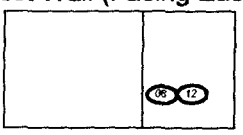
North Wall (Facing South)



East Wall (Facing West)

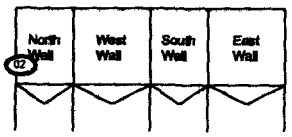


West Wall (Facing East)

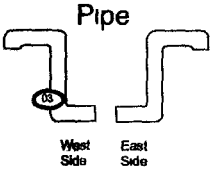


Sandblasting Equipment

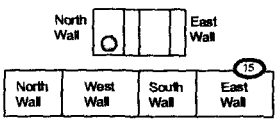
North Side

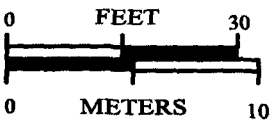


Pipe

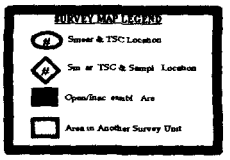


South Side





N



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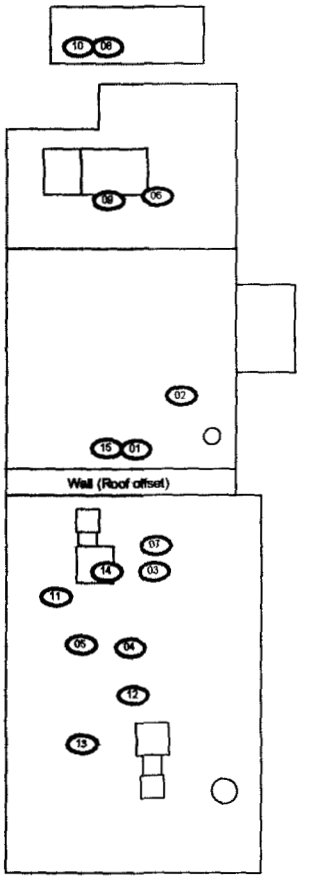
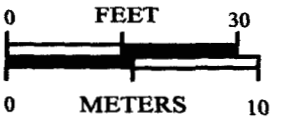
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B333

Survey Area C **Survey Unit: 333-C-004** **Classification 3**
Building 333
Survey Unit Description B333 - Roof

MAP ID. fy2001/01-0070

SURVEY UNIT 333-C-004 - MAP 1 OF 1





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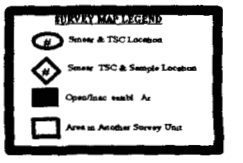

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ATTACHMENT S

MINIMUM DETECTABLE CONCENTRATIONS (MDC) CALCULATIONS

FOR BUILDING 111 AND BUILDING 333

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MDC Calculations for NE Electra and SAC-4

The purpose of this calculation is to document the basis for the count time for the NE Electra DP6-BD probe (utilized to measure total surface activity) and the Eberline SAC-4 (utilized to measure removable surface activity) during the performance of the reconnaissance level characterizations (RLC) for Buildings 111 and 333

The *a priori* MDC for the NE Electra and SAC-4 are calculated using the equation derived by Strom and Stansbury, 1992 The equation is provided below

(1)

$$MDC = \frac{3 + 3\ 29\sqrt{R_b t_s (1 + \frac{t_s}{t_b})}}{E_T (A/100) t_s}$$

Where

R_b	=	background counting rate (cpm)
t_s	=	sample counting time interval (min)
t_b	=	background counting time (min)
E_T	=	total 4π efficiency (c/d)
A	=	surface area measured/sampled (cm^2)

The parameters and calculation results for the NE Electra are as follows

Background Count Rate (cpm) (1)	Background Count time (min)	Sample Count Time (min)	Total Efficiency (c/d) (2)	Probe Area (cm^2)	MDC (dpm/100 cm^2) (1)
4 3	1 5	1 5	0 20	100	49

(1) Calculated based on average observed Local Area Background (LAB) for the Type 1 survey units (408 individual measurements)
(2) Based on the lowest applied efficiency value

The parameters and calculation results for the SAC-4 are as follows

Background Count Rate (cpm) (3)	Background Count time (min)	Sample Count Time (min)	Total Efficiency (c/d)	Probe Area (cm^2)	MDC (dpm/100 cm^2) (1)
0 3	10	2	0 33	100	9

(3) Calculated based on average observed Local Area Background (LAB) for the Type 1 survey units (107 individual measurements)

79

Per the requirements in the site Pre-Demolition Survey Plan, the *a priori* MDC for each instrument shall be less than 50% of the DCGL Accordingly, the sample and background count times for the NE Electra should be a minimum of ninety (90) seconds, and the sample and background count times for the SAC-4 should be a minimum of two-minutes and ten minutes, respectively

PREPARED BY

Jay M. Britten / Jay M Britten

Radiological Engineer

PEER REVIEWED BY

Rock Neveau /

Radiological Engineer

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ATTACHMENT T

B111 ROOF SAMPLE ANALYSIS RESULTS

Sample ID: **120100 111-E-011-7 Roof coupon** **Type:** **Unknown**

Batch ID: unknowns
Acquisition Start: December 01, 2000 12:25:21
Analysis Date: December 01, 2000 16:41.00
Procedure: Po210 count
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00002201.OXS LiveTime: 13,000.00

Calibrations:
Energy = 5.420E+01 +2.768E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: August 16, 2000 08:13:56 Std. TS4189b
Shape not Calibrated.
Efficiency = 3.312E-01 ± 4.399E-03
Calibration Date: August 16, 2000 13:23:16 Std TS4189b

External Recovery No Ext.Recovery

Original Sample Amount:
525.000 ± 0.000 ft^3
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #		ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	ROI # 2	Po218	5556.4	6103.7	5828.9	2.8
2	ROI # 3	Po214	6589.7	7877.5	7232.4	45.2
3	ROI # 4	Po212	8394.4	8749.3	8572.3	2.8
4	ROI # 4	Po210	2521.2	5360.8	5261.4	3.0

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
ROI # 2	4.7 ± 2.3	0.30	0.022 ± 0.010	Unknown
ROI # 3	-1.2 ± 0.6	1.20	-5.56E-03 ± 2.78E-03	Unknown
ROI # 4	1.0 ± 1.0	0.00	4.62E-03 ± 4.62E-03	Unknown
ROI # 4	466.2 ± 21.7	4.81	2.152 ± 0.100	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
ROI # 2	Po218	1.000	0.065 ± 0.031	6.64E-02
ROI # 3	Po214	1.000	-1.68E-02 ± 8.39E-03	9.51E-02
ROI # 4	Po212	1.000	0.014 ± 0.014	3.77E-02
ROI # 4	Po210	1.000	6.497 ± 0.315	1.52E-01

Activity reported as of December 01, 2000 12:25:21

ANALYSIS REVIEWED BY: [signature]

APPROVED BY: [signature] 12-6-00

Po 210 41 ± 2 dpm/100 cm² (± 1s)

82

Sample ID: 120100 111-E-011-15Roof coupon **Type:** Unknown

Batch ID: unknowns
Acquisition Start: December 04, 2000 12:01:35
Analysis Date: December 04, 2000 16:36:09
Procedure: Po210 count
Device: Oasis:01:01
Analysis Method: ROI Analysis
Spectrum File: 00002237.OXS LiveTime: 10,800.00

Calibrations:
Energy = 5.420E+01 +2.768E+00 * Chn Coeff. of Correlation: -0.998
Calibration Date: August 16, 2000 08:13:56 Std: TS4189b
Shape not Calibrated.
Efficiency = 3.312E-01 ± 4.399E-03
Calibration Date: August 16, 2000 13:23:16 Std: TS4189b

External Recovery No Ext.Recovery

Original Sample Amount:
1250.000 ± 0.000 ft^3
Aliquot Amount: 1.000 ± 0.000 samp

ROI DATA

ROI ID #		ASSOCIATED NUCLIDE	EXTENTS START	EXTENTS END	PK EN (keV)	FWHM (keV)
1	ROI # 2	Po218	5556.4	6131.3	5842.7	2.8
2	ROI # 3	Po214	6589.7	7877.5	7232.4	2.8
3	ROI # 4	Po212	8394.4	8749.3	8572.3	0.0
4	ROI # 4	Po210	2521.2	5360.8	5236.5	4.5

ROI ANALYSIS RESULTS

ROI ID	NET COUNTS	BKG/INTERF	CPM	ROI TYPE
ROI # 2	2.5 ± 1.7	0.50	0.014 ± 9.68E-03	Unknown
ROI # 3	1.3 ± 1.4	0.71	7.17E-03 ± 7.96E-03	Unknown
ROI # 4	-0.3 ± 0.1	0.28	-1.58E-03 ± 7.89E-04	Unknown
ROI # 4	578.8 ± 24.2	5.18	3.216 ± 0.134	Unknown

NUCLIDE ANALYSIS RESULTS

ROI ID	ASSOC NUC	EMM. PROB	ACTIVITY (dpm/samp)	MDA (dpm)
ROI # 2	Po218	1.000	0.042 ± 0.029	8.57E-02
ROI # 3	Po214	1.000	0.022 ± 0.024	9.35E-02
ROI # 4	Po212	1.000	-4.76E-03 ± 2.38E-03	7.58E-02
ROI # 4	Po210	1.000	9.711 ± 0.426	1.75E-01

Activity reported as of December 04, 2000 12:01:35

ANALYSIS REVIEWED BY: Gaye A Haas

APPROVED BY: C J Brannen 12 6 00

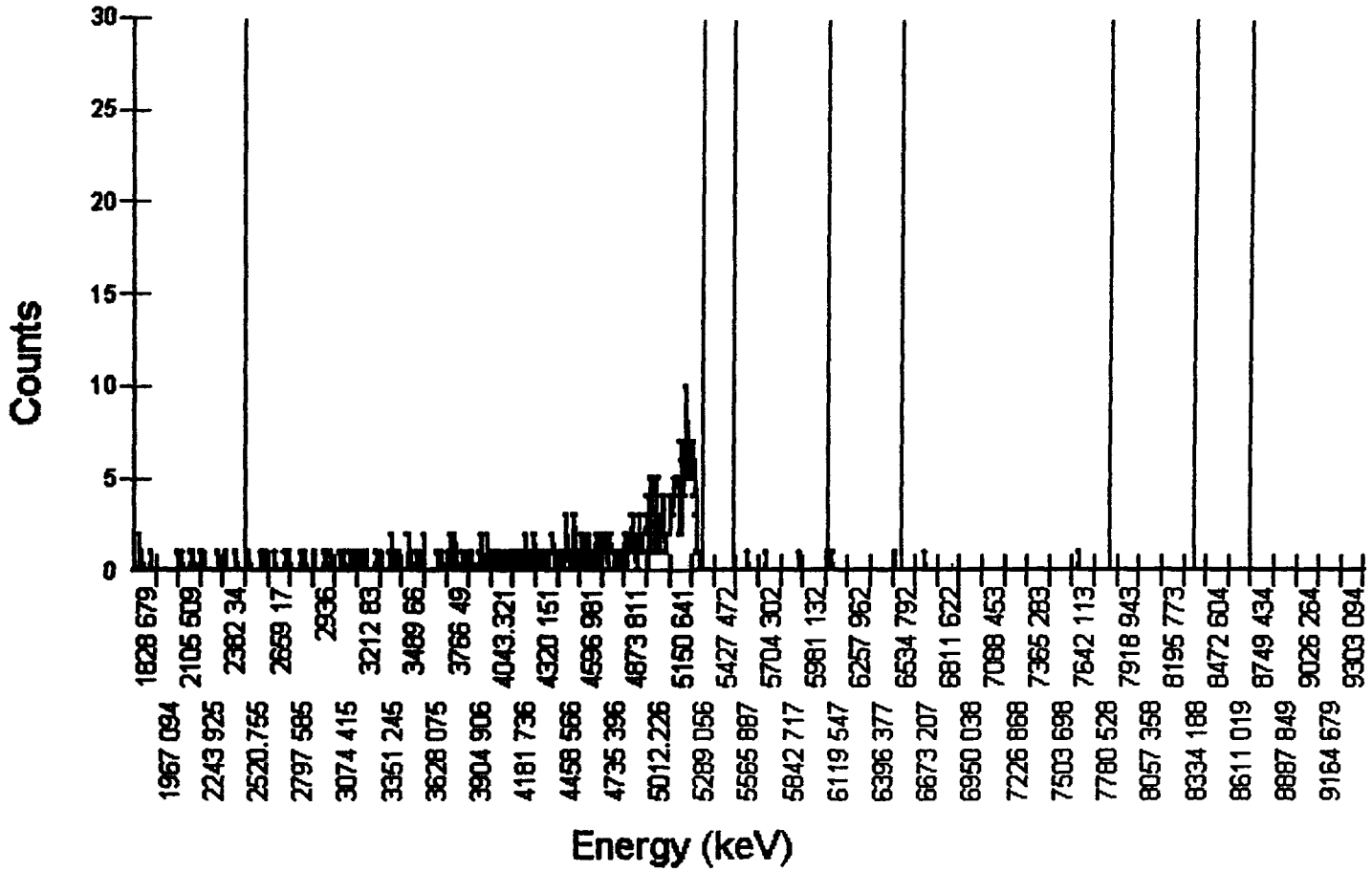
Po 210 61 ± 5 $\frac{dpm}{100\ cm^2}$ (± 2s)

83

Sample ID: 120100 111-E-011-15kloor coupon

Live Time: 10800.0

Analysis Date: 12/04/2000 4:36:09 PM

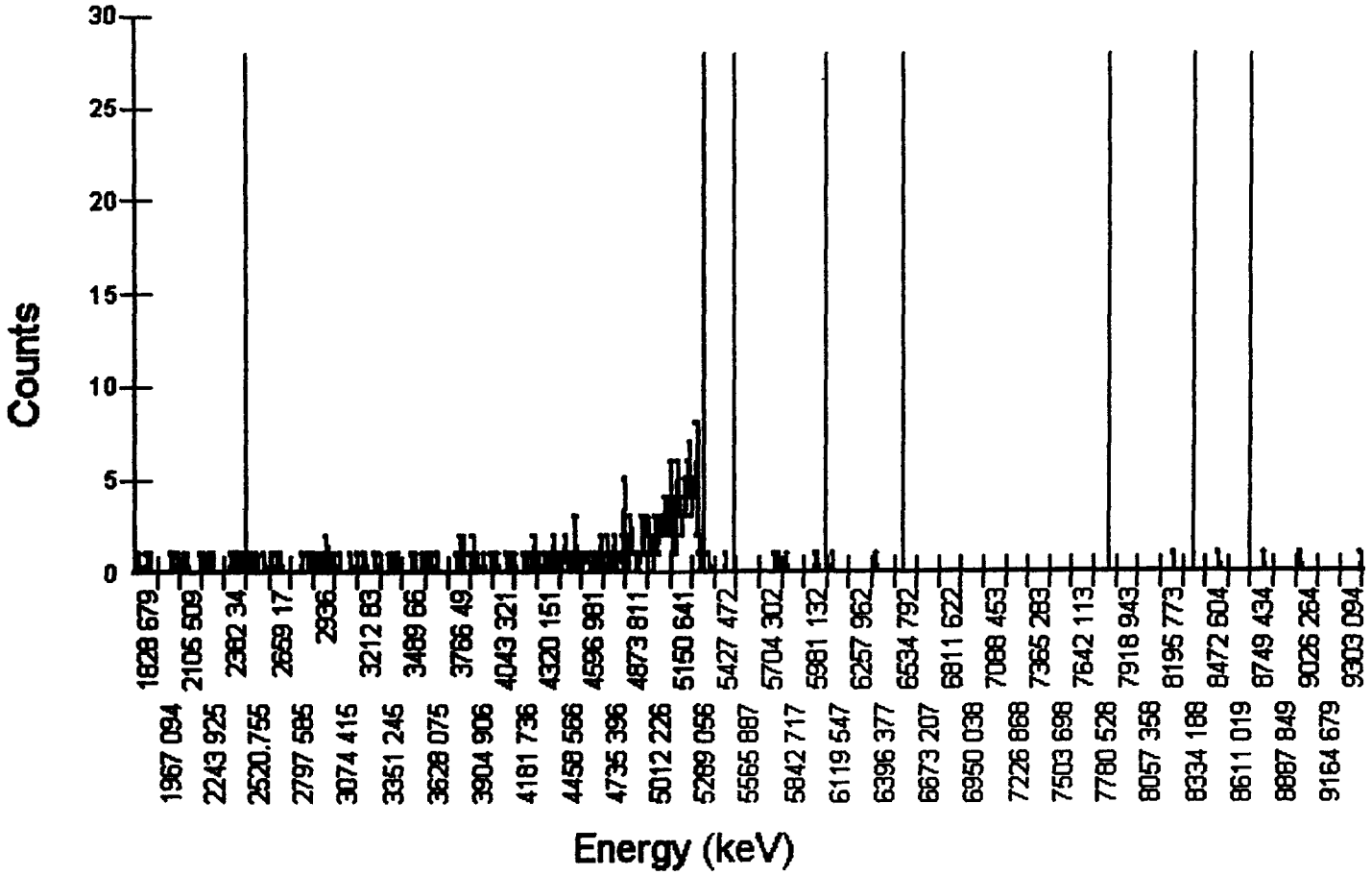


84

Sample ID: [illegible]

Live Time: 13000.0

Analysis Date: 12/01/2000 4:41:00 PM



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ATTACHMENT U

B111 CARPET SPECTRAL ANALYSIS RESULTS

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

Mfg	SAIC	Mfg		Mfg	
Model	AP-2	Model		Model	
Serial#	A-146	Serial#		Serial#	
Cal Due	Nov-00	Cal Due		Cal Due	
Bkg	n/a	Bkg		Bkg	
Efficiency	n/a	Efficiency		Efficiency	
MDA	n/a	MDA		MDA	
Mfg		Mfg		Mfg	
Model		Model		Model	
Serial#		Serial#		Serial#	
Cal Due		Cal Due		Cal Due	
Bkg		Bkg		Bkg	
Efficiency		Efficiency		Efficiency	
MDA		MDA		MDA	

Survey Type. Alpha Spectroscopy
Building 111
Location Main floor west end
Purpose RSP/RFRCM Compliance

RWP # n/a

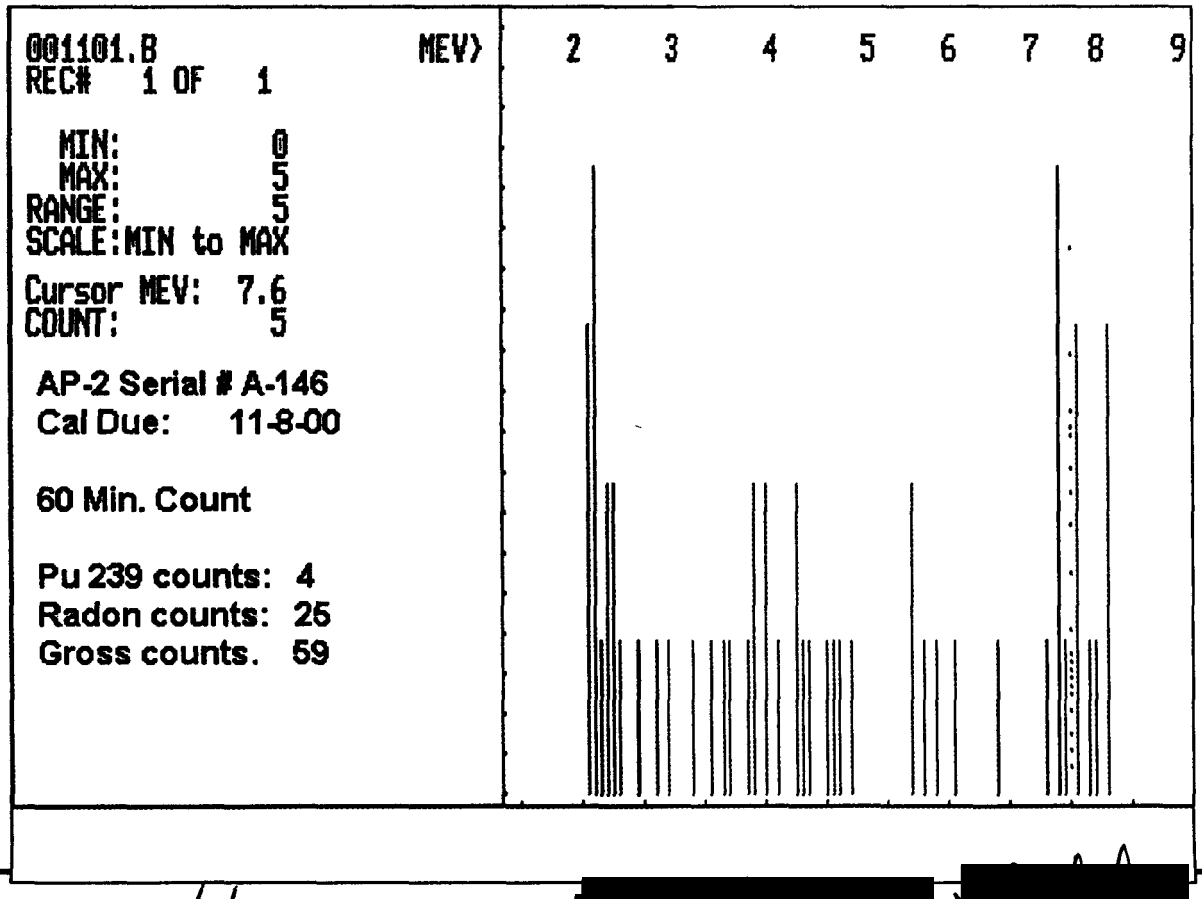
Date 11/01/00 Time 1300

RCT [redacted] / [redacted] / [redacted]
Print name Signature Emp #

RCT n/a / / n/a
Print name Signature Emp #

PRL #: n/a

Comments: Survey Unit # 111-B-005
Carpet on floor in front of room 134E



Date Reviewed: 11/1/00 RS Supervision: [redacted]
Print Name Signature Emp #

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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

INSRUMENT DATA

Mfg	SAIC	Mfg		Mfg	
Model	AP-2	Model		Model	
Serial#	A-146	Serial#		Serial#	
Cal Due	Nov-00	Cal Due		Cal Due	
Bkg	n/a	Bkg		Bkg	
Efficiency	n/a	Efficiency		Efficiency	
MDA	n/a	MDA		MDA	
Mfg		Mfg		Mfg	
Model		Model		Model	
Serial#		Serial#		Serial#	
Cal Due		Cal Due		Cal Due	
Bkg		Bkg		Bkg	
Efficiency		Efficiency		Efficiency	
MDA		MDA		MDA	

Survey Type: Alpha Spectroscopy

Building 111

Location Main Building South Area

Purpose RSP/RFRCM Compliance

RWP # n/a

Date 11/01/00 Time 900

RCT [redacted]

Print name Signature Emp #

RCT n/a / N/A / n/a

Print name Signature Emp #

PRL #: n/a

Comments: Survey Unit # 111-B-005
Carpet on floor in front of room 134E

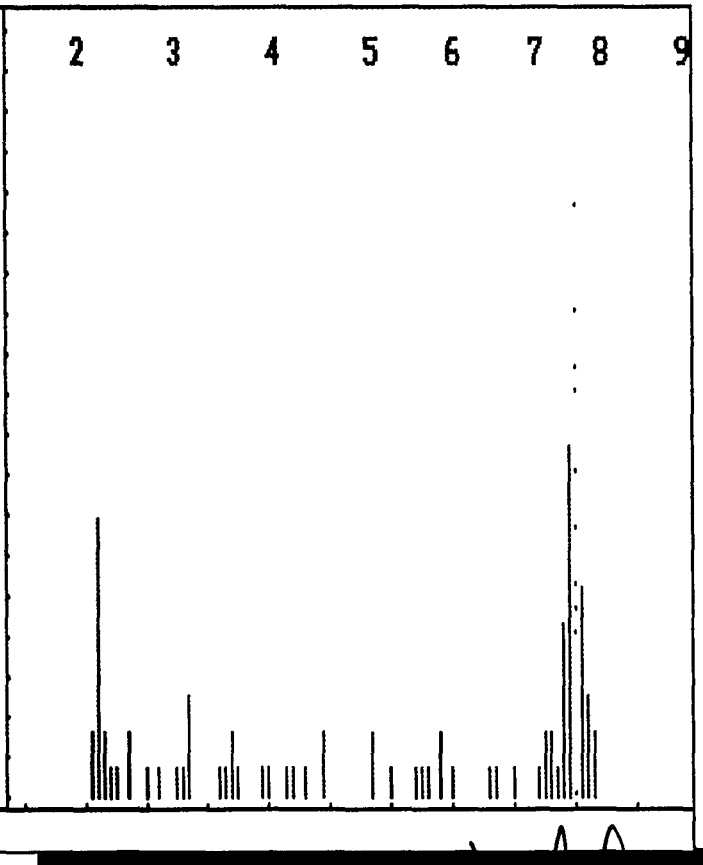
001101.1 MEV>
REC# 1 OF 1

MIN: 0
MAX: 17
RANGE: 17
ZOOM: MAX x 0.750
Cursor MEV: 7.6
COUNT: 17

AP-2 Serial # A-146
Cal. Due. 11-8-00

60 Min. Count

PU 239 Counts: 4
Radon Counts: 58
Gross Counts: 96



Date Reviewed: 11/1/00 RS Supervision: [redacted]

Print Name Signature Emp #

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ATTACHMENT V

CHEMICAL CHARACTERIZATION DATA

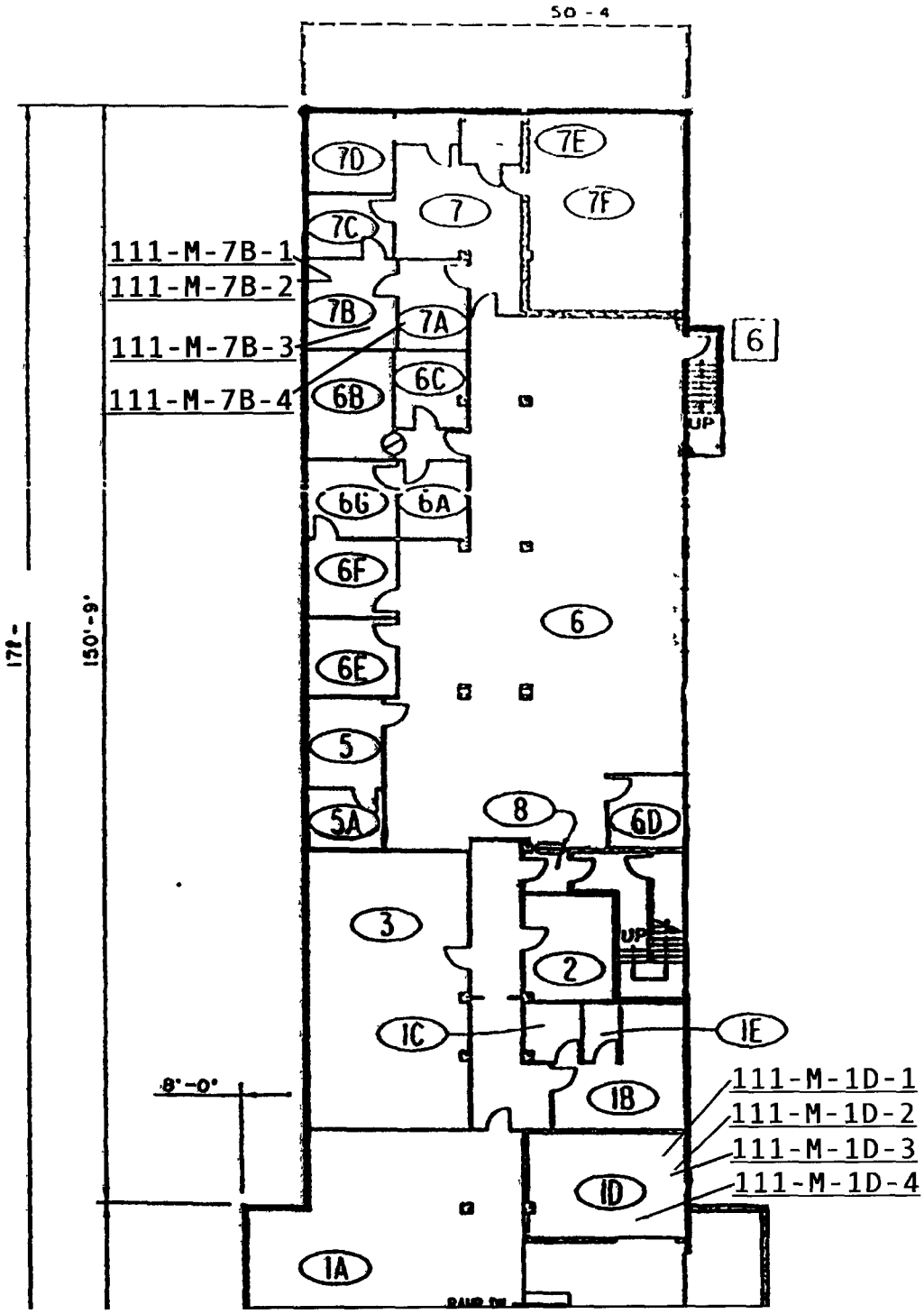
FOR BUILDING 111 AND BUILDING 333

CHEMICAL CHARACTERIZATION DATA – B111

Analyte	Sample Location	Sample Type	No. of Samples	Concentration Range	Action Levels
Beryllium	Floors & window sills	Wipes	11	<0 1 μg/100 cm^2	0 2 μg/100 cm^2
Heavy Metals	Photo lab Basement drains Exterior manhole Chiller system	Concrete core Sludge Sediment Sludge	4 2 1 1	0 0152 – 0 196 ppm[1] 23 E -6 – 49 E -6 ppm[1] 96 E -6 ppm[1] 47 E -6 ppm[2]	5 ppm 5 ppm 5 ppm 1 ppm
VOCs	Basement footing drain Exterior manhole	Sludge Sediment	1 1	<0 022 ppm[3] <0 016 ppm[3]	0 5 ppm 0 5 ppm
PCBs	Around transformer Elevator Basement drains Exterior manhole Exterior manhole	Concrete core Hydraulic oil Sludge Sediment Water	4 1 2 2 1	0 0288 – 0 715 ppm[4] 23 31 ppm[4] 6 0 – 9 75 ppm[4] 4 6 – 5 95 ppm[4] 7 ppm[4]	50 ppm 50 ppm 25 ppm 25 ppm 25 ppm
Asbestos	Multiple	Various materials	14	None detect – 15% Chrysotile[5]	>1% by volume

[1]Chromium – analyte with average concentration nearest to action level (as a %)
[2]Cadmium – analyte with average concentration nearest to action level (as a %)
[3]Trichloroethylene – analyte with average concentration nearest to action level (as a %)
[4]Sum of all Aroclors
[5]Asbestos will be removed prior to demolition

90



Building 111 Basement Sample Locations

CHEMICAL CHARACTERIZATION DATA – B333

Analyte	Sample Location	Sample Type	No. of Samples	Concentration Range	Action Levels
Beryllium	Floor – various	Wipes	11	<0 1 μg/100 cm^2	0 2 μg/100 cm^2
Heavy Metals	Floor – various	Concrete core	15	-0 0919 – 0 263 ppm[1]	5 ppm
	Exterior hoppers	Abrasive blasting waste	4	0 0306 – 0 434 ppm[1]	5 ppm
VOCs	Floor in paint cleaning/ waste accumulation areas	Concrete core	3	<0 05 ppm[2]	0 5 ppm
PCBs	Floor (various)	Painted concrete	15	Non-detect – 32 1 ppm[3]	25 ppm
		Floor paint	4	8 8 – 86 ppm	50 ppm
		Concrete core	4	0 06 – 1 3 ppm	25 ppm
	Exterior hoppers and abrasive blasting area floor	Abrasive blasting waste	4	Non-detect – 13 2 ppm[3]	25 ppm
Asbestos	Multiple	Various materials	17	Non-detect – 15% Chrysotile and Amosite[4]	>1% by volume

[1]Lead – analyte with average concentration nearest to action level (as a %)
[2]Trichloroethylene – analyte with average concentration nearest to action level (as a %)
[3]Sum of all Aroclors
[4]Asbestos will be removed prior to demolition

ATTACHMENT V

CHEMICAL CHARACTERIZATION DATA

FOR BUILDING 111 AND BUILDING 333

CHEMICAL CHARACTERIZATION DATA – B111

Analyte	Sample Location	Sample Type	No. of Samples	Concentration Range	Action Levels
Beryllium	Floors & window sills	Wipes	11	<0 1 μg/100 cm^2	0 2 μg/100 cm^2
Heavy Metals	Photo lab	Concrete core	4	0 0152 – 0 196 ppm[1]	5 ppm
	Basement drains	Sludge	2	23 E -6 – 49 E -6 ppm[1]	5 ppm
	Exterior manhole	Sediment	1	96 E -6 ppm[1]	5 ppm
	Chiller system	Sludge	1	47 E -6 ppm[2]	1 ppm
VOCs	Basement footing drain	Sludge	1	<0 022 ppm[3]	0 5 ppm
	Exterior manhole	Sediment	1	<0 016 ppm[3]	0 5 ppm
PCBs	Around transformer	Concrete core	4	0 0288 – 0 715 ppm[4]	50 ppm
	Elevator	Hydraulic oil	1	23 31 ppm[4]	50 ppm
	Basement drains	Sludge	2	6 0 – 9 75 ppm[4]	25 ppm
	Exterior manhole	Sediment	2	4 6 – 5 95 ppm[4]	25 ppm
	Exterior manhole	Water	1	7 ppm[4]	25 ppm
	Basement walls	Wall paint	16	2 – 130 ppm[4,5]	50 ppm
Asbestos	Multiple	Various materials	14	None detect – 15% Chrysotile[6]	>1% by volume

[1]Chromium – analyte with average concentration nearest to action level (as a %)
[2]Cadmium – analyte with average concentration nearest to action level (as a %)
[3]Trichloroethylene – analyte with average concentration nearest to action level (as a %)
[4]Sum of all Aroclors
[5]The 95% upper confidence limit on the mean value is 30 ppm
[6]Asbestos will be removed prior to demolition

CHEMICAL CHARACTERIZATION DATA – B333

Analyte	Sample Location	Sample Type	No. of Samples	Concentration Range	Action Levels
Beryllium	Floor – various	Wipes	11	<0 1 μg/100 cm^2	0 2 μg/100 cm^2
Heavy Metals	Floor – various	Concrete core	15	-0 0919 – 0 263 ppm[1]	5 ppm
	Exterior hoppers	Abrasive blasting waste	4	0 0306 – 0 434 ppm[1]	5 ppm
VOCs	Floor in paint cleaning/ waste accumulation areas	Concrete core	3	<0 05 ppm[2]	0 5 ppm
PCBs	Floor (various)	Painted concrete	15	Non-detect – 32 1 ppm[3]	25 ppm
		Floor paint	4	8 8 – 86 ppm	50 ppm
		Concrete core	4	0 06 – 1 3 ppm	25 ppm
	Exterior hoppers and abrasive blasting area floor	Abrasive blasting waste	4	Non-detect – 13 2 ppm[3]	25 ppm
Asbestos	Multiple	Various materials	17	Non-detect – 15% Chrysotile and Amosite[4]	>1% by volume

[1]Lead – analyte with average concentration nearest to action level (as a %)
[2]Trichloroethylene – analyte with average concentration nearest to action level (as a %)
[3]Sum of all Aroclors
[4]Asbestos will be removed prior to demolition

SURVEY UNIT 333-A-001 DATA

97

Survey Unit 333-A-001 Data Summary

Total Surface Activity Measurements

	Number Required	Number Obtained	
	15	15	
MIN	-5 0		dpm/100 cm^2
MAX	13 3		dpm/100 cm^2
MEAN	3 5		dpm/100 cm^2
STD DEV	4 8		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	Number Required	Number Obtained	
	15	15	
MIN	-0 6		dpm/100 cm^2
MAX	1 5		dpm/100 cm^2
MEAN	0 0		dpm/100 cm^2
STD DEV	0 6		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

98

Survey Unit 333-A-001 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	2343	1241	N/A	1 1	1241	N/A	N/A	1 4
Cal Due Date	1/13/01	3/27/01	N/A		3/27/01	N/A	N/A	
Efficiency (c/d)	0 22	0 218	N/A		0 218	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	2343	11/20/00	2 7	**7 4**				
2	1241	11/20/00	0 0	**-5 0**	1241	11/20/00	2 7	**6 2**
3	2343	11/20/00	1 3	**0 9**				
4	1241	11/20/00	1 3	**0 9**				
5	1241	11/20/00	1 3	**0 9**				
6	2343	11/20/00	4 0	**13 3**				
7	2343	11/20/00	2 0	**4 2**				
8	2343	11/20/00	3 3	**10 1**				
9	1241	11/20/00	2 7	**7 4**				
10	1241	11/20/00	0 7	**-1 8**				
11	1241	11/20/00	2 7	**7 4**				
12	1241	11/20/00	1 3	**0 9**				
13	1241	11/20/00	1 3	**0 9**	1241	11/20/00	1 3	**0 2**
14	2343	11/20/00	1 3	**0 9**				
15	2343	11/20/00	2 0	**4 2**				
				MIN 5 0				
				MAX **13 3**				
				MEAN **3 5**				
				SD 4 8				
				Transuranic $DCGL_W$ **100**				

99

Survey Unit 333-A-001 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	830	11/20/00	0 0	-0 6
2	959	11/20/00	0 0	0 0
3	767	11/20/00	0 0	-0 6
4	959	11/20/00	0 5	1 5
5	959	11/20/00	0 0	0 0
6	830	11/20/00	0 0	-0.6
7	833	11/20/00	0 0	0 0
8	833	11/20/00	0 0	0 0
9	767	11/20/00	0 5	0 9
10	767	11/20/00	0 0	-0 6
11	767	11/20/00	0 0	-0 6
12	833	11/20/00	0 0	0 0
13	959	11/20/00	0 0	0 0
14	833	11/20/00	0 0	0 0
15	830	11/20/00	0 5	0 9
			MIN	-0 6
			MAX	1 5
			MEAN	0 0
			SD	0 6
			Transuranic $DCGL_W$	20

10C

SURVEY UNIT 333-A-002 DATA

101

Survey Unit 333-A-002 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-12 0		dpm/100 cm^2
MAX	12 3		dpm/100 cm^2
MEAN	-0 4		dpm/100 cm^2
STD DEV	7 7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 6		dpm/100 cm^2
MAX	3 0		dpm/100 cm^2
MEAN	0 3		dpm/100 cm^2
STD DEV	1 1		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

102

Survey Unit 333-A-002 Total Surface Contamination Results

Total Surface Activity Survey

Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	2343	1241	N/A	2 6
Cal Due Date	1/13/01	3/27/01	N/A	
Efficiency (c/d)	0 22	0 218	N/A	

Quality Control Survey

NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
2343	1241	N/A	1 0
1/13/01	3/27/01	N/A	
0 22	0 218	N/A	

Total Surface Activity Measurements

Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1241	11/20/00	0 0	-12 0
2	1241	11/20/00	0 0	-12 0
3	2343	11/20/00	1 3	-2 9
4	1241	11/20/00	1 3	-6 1
5	2343	11/20/00	2 7	0 3
6	1241	11/20/00	5 3	12 3
7	1241	11/20/00	2 0	-2 9
8	1241	11/20/00	4 0	6 3
9	1241	11/20/00	1 3	-6 1
10	1241	11/20/00	1 3	-6 1
11	1241	11/20/00	2 7	0 3
12	2343	11/20/00	4 7	9 5
13	2343	11/20/00	4 0	6 3
14	2343	11/20/00	2 0	2 9
15	2343	11/20/00	4 7	9 5
			MIN	12 0
			MAX	12 3
			MEAN	-0 4
			SD	7 7
			Transuranic $DCGL_W$	100

Quality Control Measurements

Serial #	Date	(cpm)	(dpm/100 cm²)
2343	11/20/00	4 0	14
1241	11/20/00	1 3	1 4

103

Survey Unit 333-A-002 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	767	11/20/00	0 0	-0 6
2	959	11/20/00	0 0	0 0
3	959	11/20/00	0 0	0 0
4	833	11/20/00	0 0	0 0
5	767	11/20/00	0 0	-0 6
6	833	11/20/00	0 0	0 0
7	767	11/20/00	0 0	-0 6
8	830	11/20/00	0 0	-0 6
9	767	11/20/00	1 0	2 4
10	959	11/20/00	0 0	0 0
11	830	11/20/00	0 5	0 9
12	830	11/20/00	0 5	0 9
13	959	11/20/00	0 0	0 0
14	833	11/20/00	1 0	3 0
15	833	11/20/00	0 0	0 0
			MIN	-0 6
			MAX	3 0
			MEAN	0 3
			SD	1 1
			Transuranic $DCGL_W$	20

104

SURVEY UNIT 333-B-003 DATA

105

Survey Unit 333-B-003 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	1 2		dpm/100 cm^2
MAX	43 9		dpm/100 cm^2
MEAN	20 8		dpm/100 cm^2
STD DEV	13 7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 6		dpm/100 cm^2
MAX	3 0		dpm/100 cm^2
MEAN	0 4		dpm/100 cm^2
STD DEV	1 0		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

106

Survey Unit 333-B-003 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	2343	1241	N/A	2 4	2343	1241	N/A	2 0
Cal Due Date	1/13/01	3/27/01	N/A		1/13/01	3/27/01	N/A	
Efficiency (c/d)	0 22	0 218	N/A		0 22	0 218	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1241	11/20/00	3 3	3 9				
2	2343	11/20/00	6 7	19 5				
3	1241	11/20/00	10 7	37 9				
4	1241	11/20/00	6 7	19 5				
5	2343	11/20/00	5 3	13 1				
6	1241	11/20/00	8 0	25 5				
7	1241	11/20/00	3 3	3 9	2343	11/20/00	3 3	6
8	1241	11/20/00	9 3	31 5				
9	1241	11/20/00	7 3	22 3				
10	1241	11/20/00	5 3	13 1				
11	1241	11/20/00	12 0	43 9				
12	1241	11/20/00	9 3	31 5				
13	1241	11/20/00	4 0	7 2				
14	2343	11/20/00	10 7	37 9	1241	11/20/00	3 3	6 0
15	1241	11/20/00	2 7	1 2				
				MIN 1 2				
				MAX 43 9				
				MEAN 20 8				
				SD 13 7				
				Transuranic $DCGL_W$ 100				

107

Survey Unit 333-B-003 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	767	11/20/00	0 0	-0 6
2	767	11/20/00	0 5	0 9
3	833	11/20/00	1 0	3 0
4	833	11/20/00	0 0	0 0
5	833	11/20/00	0 0	0 0
6	830	11/20/00	0 5	0 9
7	767	11/20/00	0 0	-0.6
8	959	11/20/00	0 0	0 0
9	830	11/20/00	0 5	0 9
10	833	11/20/00	0 0	0 0
11	830	11/20/00	0 5	0 9
12	959	11/20/00	0 5	1 5
13	959	11/20/00	0 0	0 0
14	959	11/20/00	0 0	0 0
15	767	11/20/00	0 0	-0 6
			MIN	-0 6
			MAX	3 0
			MEAN	0 4
			SD	1 0
			Transuranic $DCGL_W$	20

108

SURVEY UNIT 333-C-004 DATA

109

Survey Unit 333-C-004 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	3 7		dpm/100 cm^2
MAX	67 9		dpm/100 cm^2
MEAN	30 4		dpm/100 cm^2
STD DEV	17 9		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 6		dpm/100 cm^2
MAX	1 5		dpm/100 cm^2
MEAN	0 4		dpm/100 cm^2
STD DEV	0 8		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

110

Survey Unit 333-C-004 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1241	1682	N/A	1 2	1682	N/A	N/A	2 5
Cal Due Date	3/27/01	1/20/01	N/A		1/20/01	N/A	N/A	
Efficiency (c/d)	0 218	0 208	N/A		0 208	N/A	N/A	

Total Surface Activity Measurements					Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1241	11/21/00	10 0	40 4				
2	1241	11/21/00	7 3	28 0				
3	1241	11/21/00	4 0	12 9				
4	1241	11/21/00	2 0	3 7				
5	1241	11/21/00	8 7	34 4				
6	1241	11/21/00	10 0	40 4				
7	1241	11/21/00	3 3	9 7				
8	1682	11/21/00	7 0	27 9				
9	1241	11/21/00	4 0	12 9				
10	1682	11/21/00	7 0	27 9				
11	1241	11/21/00	12 7	52 8				
12	1241	11/21/00	9 3	37 2	1682	11/21/00	9 6	34
13	1241	11/21/00	4 0	12 9	1682	11/21/00	13 0	50
14	1241	11/21/00	11 3	46 4				
15	1241	11/21/00	16 0	67 9				
				MIN 3 7				
				MAX 67 9				
				MEAN 30 4				
				SD 17 9				
				Transuranic $DCGL_W$ 100				

111

Survey Unit 333-C-004 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	830	11/21/00	0 5	**0 9**
2	833	11/21/00	0 0	**-0 3**
3	767	11/21/00	0 0	**0 0**
4	833	11/21/00	0 5	**1 2**
5	959	11/21/00	0 0	**0 0**
6	959	11/21/00	0 5	**1 5**
7	833	11/21/00	0 0	**-0 3**
8	959	11/21/00	0 0	**0 0**
9	830	11/21/00	0 0	**-0 6**
10	767	11/21/00	0 0	**0 0**
11	830	11/21/00	0 5	**0 9**
12	833	11/21/00	0 0	**-0 3**
13	767	11/21/00	0 5	**1 5**
14	959	11/21/00	0 5	**1 5**
15	767	11/21/00	0 0	**0 0**
			MIN	**-0 6**
			MAX	**1 5**
			MEAN	**0 4**
			SD	**0 8**
			Transuranic $DCGL_W$	**20**

112

SURVEY UNIT 111-A-001 DATA

113

Survey Unit 111-A-001 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-13 3		dpm/100 cm^2
MAX	48 7		dpm/100 cm^2
MEAN	13 0		dpm/100 cm^2
STD DEV	17 0		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 8		dpm/100 cm^2
MAX	8 3		dpm/100 cm^2
MEAN	1 7		dpm/100 cm^2
STD DEV	3 3		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

114

Survey Unit 111-A-001 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1388	N/A	N/A	4 2	1241	N/A	N/A	5 0
Cal Due Date	11/23/00	N/A	N/A		3/27/01	N/A	N/A	
Efficiency (c/d)	0 22	N/A	N/A		0 22	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1388	10/11/00	8 0	**17 7**				
2	1388	10/11/00	7 3	**14 4**				
3	1388	10/11/00	12 0	**36 2**				
4	1388	10/11/00	8 7	**20 9**				
5	1388	10/11/00	8 0	**17 7**	1241	10/11/00	5 3	**1 4**
6	1388	10/11/00	6 0	**8 4**				
7	1388	10/11/00	6 7	**11 7**				
8	1388	10/11/00	2 7	**-6 9**				
9	1388	10/11/00	1 3	**-13 3**				
10	1388	10/11/00	6 0	**8 4**	1241	10/11/00	4 7	**-1 4**
11	1388	10/11/00	11 3	**33 0**				
12	1388	10/11/00	4 0	**-0 8**				
13	1388	10/11/00	3 3	**-4 1**				
14	1388	10/11/00	14 7	**48 7**				
15	1388	10/11/00	4 7	**2 4**				
				MIN 13 3				
				MAX **48 7**				
				MEAN **13 0**				
				SD 17 0				
				Transuranic $DCGL_W$ **100**				

115

Survey Unit 111-A-001 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	830	6/1/00	0 0	-0 8
2	833	6/1/00	0 0	-0 8
3	830	6/1/00	2 0	5 3
4	833	6/1/00	0 0	-0 8
5	830	6/1/00	0 0	-0 8
6	833	6/1/00	0 0	-0 8
7	830	6/1/00	3 0	8 3
8	833	6/1/00	2 0	5 3
9	830	6/1/00	0 0	-0 8
10	833	6/1/00	2 0	5 3
11	830	6/1/00	1 0	2 3
12	833	6/1/00	0 0	-0 8
13	830	6/1/00	0 0	-0 8
14	833	6/1/00	0 0	-0 8
15	830	6/1/00	2 0	5 3
			MIN	-0 8
			MAX	8 3
			MEAN	1 7
			SD	3 3
			Transuranic $DCGL_W$	20

116

SURVEY UNIT 111-A-002 DATA

117

Survey Unit 111-A-002 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-7 2	dpm/100 cm^2	
MAX	15.1	dpm/100 cm^2	
MEAN	3 3	dpm/100 cm^2	
STD DEV	8 2	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	100	dpm/100 cm^2	

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 3	dpm/100 cm^2	
MAX	3 0	dpm/100 cm^2	
MEAN	1 1	dpm/100 cm^2	
STD DEV	1 5	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	20	dpm/100 cm^2	

118

Survey Unit 111-A-002 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1445	N/A	N/A	1 7	1425	N/A	N/A	2 4
Cal Due Date	3/24/01	N/A	N/A		2/2/01	N/A	N/A	
Efficiency (c/d)	0 238	N/A	N/A		0 212	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm^2)	Serial #	Date	(cpm)	(dpm/100 cm^2)
1	1445	09/27/00	5 3	**15 1**				
2	1445	09/27/00	5 3	**15 1**				
3	1445	09/27/00	1 3	**-1 7**	1425	09/27/00	4 7	**11 1**
4	1445	09/27/00	1 3	**-1 7**				
5	1445	09/27/00	2 7	**4 2**				
6	1445	09/27/00	2 0	**1 2**				
7	1445	09/27/00	4 7	**12 6**				
8	1445	09/27/00	0 0	**-7 2**				
9	1445	09/27/00	2 7	**4 2**				
10	1445	09/27/00	4 7	**12 6**				
11	1445	09/27/00	1 3	**-1 7**				
12	1445	09/27/00	0 7	**-4 2**				
13	1445	09/27/00	0 0	**-7 2**				
14	1445	09/27/00	4 7	**12 6**				
15	1445	09/27/00	0 7	**-4 2**	1425	09/27/00	4 0	**7 8**
				MIN 7 2				
				MAX **15 1**				
				MEAN **3 3**				
				SD 8 2				
				Transuranic $DCGL_W$ **100**				

119

Survey Unit 111-A-002 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	77	9/26/00	0 0	**-0 3**
2	833	9/26/00	0 0	**0 0**
3	1042	9/26/00	0 0	**-0 3**
4	767	9/26/00	1 0	**3 0**
5	770	9/26/00	1 0	**2 7**
6	833	9/26/00	0 0	**0 0**
7	1042	9/26/00	1 0	**2 7**
8	767	9/26/00	1 0	**3 0**
9	770	9/26/00	0 0	**-0.3**
10	833	9/26/00	0 0	**0.0**
11	1042	9/26/00	1 0	**2 7**
12	767	9/26/00	0 0	**0 0**
13	770	9/26/00	0 0	**-0 3**
14	833	9/26/00	0 0	**0 0**
15	1042	9/26/00	1 0	**2 7**
			MIN	-0 3
			MAX	**3 0**
			MEAN	**1 1**
			SD	1 5
			Transuranic $DCGL_W$	**20**

120

SURVEY UNIT 111-B-003 DATA

121

Survey Unit 111-B-003 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-5 4		dpm/100 cm^2
MAX	32 3		dpm/100 cm^2
MEAN	10 2		dpm/100 cm^2
STD DEV	11 6		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 6		dpm/100 cm^2
MAX	5 8		dpm/100 cm^2
MEAN	1 8		dpm/100 cm^2
STD DEV	2 4		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

122

Survey Unit 111-B-003 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1254	1144	N/A	4 4	1254	1144	N/A	4 0
Cal Due Date	11/18/00	1/20/01	N/A		11/18/00	1/20/01	N/A	
Efficiency (c/d)	0 23	0 212	N/A		0 23	0 212	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1254	11/06/00	5 3	3 7				
2	1254	11/06/00	6 0	6 7				
3	1144	11/06/00	10 0	26 2				
4	1144	11/06/00	3 3	-5 4				
5	1254	11/06/00	4 0	-1 9				
6	1254	11/06/00	8 0	15 4				
7	1254	11/06/00	7 3	12 4				
8	1144	11/06/00	6 0	7 3				
9	1254	11/06/00	4 0	-1 9	1144	10/11/00	2 7	-6 1
10	1144	11/06/00	5 3	4 0				
11	1144	11/06/00	10 0	26 2				
12	1144	11/06/00	7 3	13 5	1254	10/11/00	5 3	5 6
13	1254	11/06/00	4 0	1 9				
14	1144	11/06/00	8 0	16 8				
15	1144	11/06/00	11 3	32 3				
				MIN	5 4			
				MAX	32 3			
				MEAN	10 2			
				SD	11 6			
				Transuranic DCGL$_W$	100			

123

Survey Unit 111-B-003 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	767	11/6/00	0 0	0 0
2	830	11/6/00	2 0	5 8
3	1042	11/6/00	1 0	2 4
4	833	11/6/00	0 0	0 0
5	830	11/6/00	0 0	-0 3
6	767	11/6/00	1 0	3 0
7	1042	11/6/00	0 0	-0.6
8	833	11/6/00	0 0	0 0
9	767	11/6/00	0 0	0 0
10	1042	11/6/00	1 0	2.4
11	830	11/6/00	2 0	5 8
12	1042	11/6/00	0 0	-0 6
13	833	11/6/00	0 0	0 0
14	830	11/6/00	2 0	5 8
15	833	11/6/00	1 0	3 0
			MIN	-0 6
			MAX	5 8
			MEAN	1 8
			SD	2 4
			Transuranic $DCGL_W$	20

124

SURVEY UNIT 111-B-004 DATA

125

Survey Unit 111-B-004 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-75 7		dpm/100 cm^2
MAX	52 7		dpm/100 cm^2
MEAN	-4 5		dpm/100 cm^2
STD DEV	35 0		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 6		dpm/100 cm^2
MAX	14.8		dpm/100 cm^2
MEAN	1 8		dpm/100 cm^2
STD DEV	4 3		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

126

Survey Unit 111-B-004 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1445	1144	N/A	20 7	1144	N/A	N/A	30 7
Cal Due Date	3/24/01	1/20/01	N/A		1/20/01	N/A	N/A	
Efficiency (c/d)	0 24	0 212	N/A		0 212	N/A	N/A	
Total Surface Activity Measurements					**Quality Control Measurements**			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1445	11/06/00	24 0	13 7				
2	1445	11/06/00	16 7	17 0	1144	11/06/00	42 7	**56 6**
3	1144	11/06/00	20 0	3 5				
4	1445	11/06/00	23 3	10 7				
5	1445	11/06/00	30 0	38 9				
6	1445	11/06/00	17 3	-14 5				
7	1445	11/06/00	14 0	28 3				
8	1445	11/06/00	27 3	27 5				
9	1445	11/06/00	12 0	36 8	1144	11/06/00	34 0	**15 6**
10	1445	11/06/00	19 3	-6 1				
11	1144	11/06/00	4 7	75 7				
12	1445	11/06/00	22 0	5 3				
13	1445	11/06/00	26 0	22 1				
14	1445	11/06/00	33 3	52 7				
15	1445	11/06/00	7 3	56 5				
				MIN	75 7			
				MAX	**52 7**			
				MEAN	**-4 5**			
				SD	35 0			
				Transuranic $DCGL_W$	**100**			

127

Survey Unit 111-B-004 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	1042	11/7/00	0 0	-0 3
2	830	11/7/00	2 0	5 5
3	767	11/7/00	0 0	-0.3
4	833	11/7/00	0 0	-0 6
5	1042	11/7/00	2 0	5.8
6	830	11/7/00	0 0	-0 6
7	767	11/7/00	0 0	-0 3
8	830	11/7/00	0 0	-0 6
9	1042	11/7/00	1 0	2.7
10	833	11/7/00	0 0	-0 6
11	830	11/7/00	0 0	-0 6
12	767	11/7/00	0 0	-0 3
13	833	11/7/00	0 0	-0 6
14	1042	11/7/00	5 0	14 8
15	833	11/7/00	1 0	2 4
			MIN	-0 6
			MAX	14 8
			MEAN	1 8
			SD	4 3
			Transuranic DCGL$_W$	20

128

SURVEY UNIT 111-B-005 DATA

129

Survey Unit 111-B-005 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-17 0		dpm/100 cm^2
MAX	47 1		dpm/100 cm^2
MEAN	14 3		dpm/100 cm^2
STD DEV	21 4		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 6		dpm/100 cm^2
MAX	8 8		dpm/100 cm^2
MEAN	1 6		dpm/100 cm^2
STD DEV	2 5		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

130

Survey Unit 111-B-005 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1445	1249	N/A	6 4	1445	N/A	N/A	6 0
Cal Due Date	3/24/01	11/15/00	N/A		3/24/01	N/A	N/A	
Efficiency (c/d)	0 24	0 203	N/A		0 24	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1445	11/07/00	14 7	34 7				
2	1249	11/07/00	5 0	-7 1				
3	1249	11/07/00	8 0	7 7	1445	11/07/00	6 0	**0 0**
4	1445	11/07/00	12 0	23 3				
5	1445	11/07/00	6 7	1 1				
6	1249	11/07/00	3 0	-17 0				
7	1445	11/07/00	16 7	43 1				
8	1249	11/07/00	13 0	32 3				
9	1249	11/07/00	3 8	13 0				
10	1249	11/07/00	7 0	2 7	1445	11/07/00	8 0	**8 4**
11	1445	11/07/00	9 3	14 1				
12	1445	11/07/00	14 0	31 7				
13	1249	11/07/00	4 0	12 1				
14	1445	11/07/00	12 7	26 3				
15	1249	11/07/00	16 0	47 1				
				MIN 17 0				
				MAX **47 1**				
				MEAN **14 3**				
				SD 21 4				
				Transuranic $DCGL_W$ **100**				

131

Survey Unit 111-B-005 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	830	11/7/00	1 0	**2 4**
2	833	11/7/00	0 0	**-0 6**
3	1042	11/7/00	1 0	**2 7**
4	767	11/7/00	3 0	**8 8**
5	830	11/7/00	0 0	**-0.6**
6	833	11/7/00	1 0	**2 4**
7	1042	11/7/00	0 0	**-0 3**
8	767	11/7/00	0 0	**-0 3**
9	830	11/7/00	1 0	**2 4**
10	833	11/7/00	1 0	**2.4**
11	1042	11/7/00	0 0	**-0 3**
12	767	11/7/00	0 0	**-0 3**
13	830	11/7/00	0 0	**-0 6**
14	833	11/7/00	1 0	**2 4**
15	1042	11/7/00	1 0	**2 7**
			MIN	-0 6
			MAX	**8 8**
			MEAN	**1 6**
			SD	2 5
			Transuranic $DCGL_W$	**20**

132

SURVEY UNIT 111-B-006 DATA

133

Survey Unit 111-B-006 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-44 2		dpm/100 cm^2
MAX	77 0		dpm/100 cm^2
MEAN	6 3		dpm/100 cm^2
STD DEV	31 6		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9		dpm/100 cm^2
MAX	8 2		dpm/100 cm^2
MEAN	1 9		dpm/100 cm^2
STD DEV	2 6		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

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134

Survey Unit 111-B-006 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1254	N/A	N/A	18 2	1241	N/A	N/A	10 7
Cal Due Date	11/18/00	N/A	N/A		3/27/01	N/A	N/A	
Efficiency (c/d)	0 23	N/A	N/A		0 22	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm^2)	Serial #	Date	(cpm)	(dpm/100 cm^2)
1	1254	11/08/00	16 7	-6 6				
2	1254	11/08/00	14 0	-18 3				
3	1254	11/08/00	20 0	7 7				
4	1254	11/08/00	28 0	42 3				
5	1254	11/08/00	22 0	16 4				
6	1254	11/08/00	8 0	-44 2				
7	1254	11/08/00	25 3	30 6				
8	1254	11/08/00	9 3	-38 6				
9	1254	11/08/00	23 3	22 0	1241	11/07/00	12 7	**9 4**
10	1254	11/08/00	15 3	-12 6	1241	11/07/00	6 0	**-21 3**
11	1254	11/08/00	36 0	77 0				
12	1254	11/08/00	14 0	-18 3				
13	1254	11/08/00	18 0	1 0				
14	1254	11/08/00	22 7	19 4				
15	1254	11/08/00	22 7	19 4				
				MIN 44 2				
				MAX **77 0**				
				MEAN **6 3**				
				SD 31 6				
				Transuranic DCGL$_W$ **100**				

135

Survey Unit 111-B-006 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	830	11/8/00	0 0	**-0 9**
2	767	11/8/00	0 0	**-0 3**
3	830	11/8/00	0 0	**-0.9**
4	830	11/8/00	0 0	**-0 9**
5	833	11/8/00	1 0	**3 0**
6	830	11/8/00	1 0	**2 1**
7	1042	11/8/00	3 0	**8 2**
8	1042	11/8/00	0 0	**-0 9**
9	833	11/8/00	0 0	**0 0**
10	1042	11/8/00	1 0	**2 1**
11	767	11/8/00	1 0	**2 7**
12	833	11/8/00	1 0	**3.0**
13	1042	11/8/00	2 0	**5 2**
14	767	11/8/00	1 0	**2 7**
15	833	11/8/00	1 0	**3 0**
			MIN	-0 9
			MAX	**8 2**
			MEAN	**1 9**
			SD	2 6
			Transuranic $DCGL_W$	**20**

136

SURVEY UNIT 111-C-007 DATA

137

Survey Unit 111-C-007 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-19 0	dpm/100 cm^2	
MAX	70 6	dpm/100 cm^2	
MEAN	18 9	dpm/100 cm^2	
STD DEV	23 6	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	100	dpm/100 cm^2	

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9	dpm/100 cm^2	
MAX	2 3	dpm/100 cm^2	
MEAN	-0 3	dpm/100 cm^2	
STD DEV	1 0	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	20	dpm/100 cm^2	

138

Survey Unit 111-C-007 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1254	N/A	N/A	10 4	1249	N/A	N/A	13 0
Cal Due Date	11/18/00	N/A	N/A		11/15/00	N/A	N/A	
Efficiency (c/d)	0 23	N/A	N/A		0 20	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1254	11/09/00	10 7	**1 3**				
2	1254	11/09/00	13 3	**12 6**				
3	1254	11/09/00	18 7	**35 9**				
4	1254	11/09/00	26 7	**70 6**	1249	11/09/00	12 0	**-4 9**
5	1254	11/09/00	9 3	**-4 8**				
6	1254	11/09/00	12 7	**10 0**				
7	1254	11/09/00	7 3	**-13 4**				
8	1254	11/09/00	15 3	**21.2**	1249	11/09/00	12 0	**-4 9**
9	1254	11/09/00	22 0	**50 2**				
10	1254	11/09/00	6 0	**-19 0**				
11	1254	11/09/00	16 0	**24 2**				
12	1254	11/09/00	16 0	**24 2**				
13	1254	11/09/00	18 0	**32 9**				
14	1254	11/09/00	16 7	**27 3**				
15	1254	11/09/00	12 7	**10 0**				
				MIN 19 0				
				MAX **70 6**				
				MEAN **18 9**				
				SD 23 6				
				Transuranic $DCGL_W$ **100**				

139

Survey Unit 111-C-007 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	830	11/9/00	0 0	**-0 8**
2	833	11/9/00	0 0	**-0 8**
3	1042	11/9/00	0 0	**-0 3**
4	767	11/9/00	0 0	**-0 9**
5	830	11/9/00	0 0	**-0 8**
6	833	11/9/00	0 0	**-0 8**
7	1042	11/9/00	0 0	**-0 3**
8	767	11/9/00	0 0	**-0 9**
9	830	11/9/00	0 0	**-0 8**
10	833	11/9/00	0 0	**-0.8**
11	1042	11/9/00	0 0	**-0 3**
12	767	11/9/00	1 0	**2 1**
13	830	11/9/00	1 0	**2 3**
14	833	11/9/00	0 0	**-0 8**
15	1042	11/9/00	0 0	**-0 3**
			MIN	-0 9
			MAX	**2 3**
			MEAN	**-0 3**
			SD	1 0
			Transuranic $DCGL_W$	**20**

140

Survey Unit 111-C-008 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1254	N/A	N/A	13 9	1249	N/A	N/A	12 4
Cal Due Date	11/18/00	N/A	N/A		11/15/00	N/A	N/A	
Efficiency (c/d)	0 23	N/A	N/A		0 20	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1254	11/09/00	21 3	**31 9**	1249	11/09/00	20 7	**41 1**
2	1254	11/10/00	32 0	**78 2**				
3	1254	11/11/00	16 0	**9 0**				
4	1254	11/12/00	11 3	**-11 4**				
5	1254	11/13/00	17 3	**14 6**				
6	1254	11/14/00	12 0	**-8 3**				
7	1254	11/15/00	17 3	**14 6**				
8	1254	11/16/00	18 0	**17 6**				
9	1254	11/17/00	26 7	**55 3**	1249	11/09/00	20 0	**37 7**
10	1254	11/18/00	20 7	**29 3**				
11	1254	11/19/00	12 7	**-5 3**				
12	1254	11/20/00	13 3	**-2 7**				
13	1254	11/21/00	14 7	**3 3**				
14	1254	11/22/00	16 0	**9 0**				
15	1254	11/23/00	20 7	**29 3**				
				MIN	11 4			
				MAX	**78 2**			
				MEAN	**17 6**			
				SD	24 5			
				Transuranic $DCGL_W$	**100**			

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SURVEY UNIT 111-D-009 DATA

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Survey Unit 111-D-009 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-17 3		dpm/100 cm^2
MAX	17 2		dpm/100 cm^2
MEAN	0 6		dpm/100 cm^2
STD DEV	11 3		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9		dpm/100 cm^2
MAX	8 8		dpm/100 cm^2
MEAN	1 2		dpm/100 cm^2
STD DEV	2 6		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

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Survey Unit 111-D-009 Total Surface Contamination Results

Total Surface Activity Survey

Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1249	1144	N/A	5 2
Cal Due Date	11/15/00	1/20/01	N/A	
Efficiency (c/d)	0 20	0 212	N/A	

Quality Control Survey

NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
1144	N/A	N/A	8 7
1/20/00	N/A	N/A	
0 21	N/A	N/A	

Total Surface Activity Measurements

Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1249	11/09/00	4 0	-5 9
2	1249	11/09/00	3 3	-9 4
3	1249	11/09/00	4 0	-5 9
4	1249	11/09/00	4 0	-5 9
5	1249	11/09/00	8 7	17 2
6	1144	11/09/00	2 7	-11 8
7	1249	11/09/00	6 0	3 9
8	1144	11/09/00	4 7	-2 4
9	1249	11/09/00	6 0	3 9
10	1249	11/09/00	7 3	10 3
11	1249	11/09/00	1 7	-17 3
12	1249	11/09/00	3 3	-9 4
13	1249	11/09/00	6 7	7 4
14	1144	11/09/00	8 7	16 5
15	1249	11/09/00	8 7	17 2
			MIN	17 3
			MAX	17 2
			MEAN	0 6
			SD	11 3
			Transuranic $DCGL_W$	100

Quality Control Measurements

Serial #	Date	(cpm)	(dpm/100 cm²)
1144	11/09/00	8 7	0 2
1144	11/09/00	4 0	-21 9

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Survey Unit 111-D-009 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	1042	11/9/00	0 0	**-0 3**
2	833	11/9/00	1 0	**2 3**
3	833	11/9/00	0 0	**-0 8**
4	1042	11/9/00	1 0	**2 7**
5	833	11/9/00	0 0	**-0 8**
6	833	11/9/00	1 0	**2 3**
7	830	11/9/00	1 0	**2 3**
8	830	11/9/00	0 0	**-0 8**
9	833	11/9/00	0 0	**-0 8**
10	1042	11/9/00	0 0	**-0.3**
11	1042	11/9/00	1 0	**2 7**
12	767	11/9/00	0 0	**-0 9**
13	767	11/9/00	1 0	**2 1**
14	830	11/9/00	0 0	**-0 8**
15	1042	11/9/00	3 0	**8 8**
			MIN	-0 9
			MAX	**8 8**
			MEAN	**1 2**
			SD	2 6
			Transuranic $DCGL_W$	**20**

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SURVEY UNIT 111-D-010 DATA

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Survey Unit 111-D-010 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-3 0	dpm/100 cm^2	
MAX	31 7	dpm/100 cm^2	
MEAN	13 4	dpm/100 cm^2	
STD DEV	9 4	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	100	dpm/100 cm^2	

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9	dpm/100 cm^2	
MAX	2 7	dpm/100 cm^2	
MEAN	0 1	dpm/100 cm^2	
STD DEV	1 5	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	20	dpm/100 cm^2	

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Survey Unit 111-D-010 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1254	1445	N/A	3 4	1445	N/A	N/A	9 7
Cal Due Date	11/18/00	3/24/01	N/A		3/24/01	N/A	N/A	
Efficiency (c/d)	0 23	0 238	N/A		0 238	N/A	N/A	

Sample Location Number	Total Surface Activity Measurements				Quality Control Measurements			
	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1254	11/09/00	10 7	**31 7**				
2	1254	11/09/00	7 3	**16 9**				
3	1254	11/09/00	4 0	**2 7**				
4	1445	11/09/00	5 3	**8 0**				
5	1254	11/09/00	8 0	**20 0**	1445	11/09/00	10 7	**4 2**
6	1254	11/09/00	2 7	**-3 0**				
7	1254	11/09/00	5 3	**8 3**	1445	11/09/00	8 7	**-4 2**
8	1445	11/09/00	5 3	**8 0**				
9	1254	11/09/00	7 3	**16 9**				
10	1445	11/09/00	8 0	**19 4**				
11	1254	11/09/00	3 3	**-0 4**				
12	1254	11/09/00	7 3	**16 9**				
13	1254	11/09/00	6 7	**14 3**				
14	1445	11/09/00	8 0	**19 4**				
15	1445	11/09/00	8 7	**22 3**				
				MIN 3 0				
				MAX **31 7**				
				MEAN **13 4**				
				SD 9 4				
				Transuranic $DCGL_W$ **100**				

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Survey Unit 111-D-010 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	767	11/9/00	1 0	**2 1**
2	1042	11/9/00	0 0	**-0.3**
3	833	11/9/00	0 0	**-0 8**
4	833	11/9/00	0 0	**-0.8**
5	833	11/9/00	0 0	**-0 8**
6	767	11/9/00	0 0	**-0 9**
7	830	11/9/00	1 0	**2 3**
8	767	11/9/00	0 0	**-0 9**
9	830	11/9/00	0 0	**-0 8**
10	1042	11/9/00	1 0	**2 7**
11	1042	11/9/00	0 0	**-0 3**
12	830	11/9/00	0 0	**-0 8**
13	1042	11/9/00	1 0	**2 7**
14	833	11/9/00	0 0	**-0 8**
15	830	11/9/00	0 0	**-0 8**
			MIN	-0 9
			MAX	**2 7**
			MEAN	**0 1**
			SD	1 5
			Transuranic $DCGL_W$	**20**

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SURVEY UNIT 111-E-011 DATA

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Survey Unit 111-E-011 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-6 3		dpm/100 cm^2
MAX	154 4		dpm/100 cm^2
MEAN	60 5		dpm/100 cm^2
STD DEV	46 3		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9		dpm/100 cm^2
MAX	5 8		dpm/100 cm^2
MEAN	2 0		dpm/100 cm^2
STD DEV	2 7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

See Section 3 2 3 and Attachment T of this RLCR for results and assessment of elevated readings

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Survey Unit 111-E-011 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1366	1144	1249	6 6	1144	1249	N/A	9 0
Cal Due Date	1/24/01	1/20/01	11/15/00		1/20/01	11/15/00	N/A	
Efficiency (c/d)	0 212	0 212	0 203		0 212	0 203	N/A	

Sample Location Number	Total Surface Activity Measurements				Quality Control Measurements			
	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1366	11/08/00	17 3	**50 6**	1249	11/08/00	6 0	**-14 8**
2	1366	11/08/00	21 3	**69 5**				
3	1144	11/08/00	18 0	**53 9**				
4	1366	11/08/00	16 0	**44 5**				
5	1366	11/08/00	28 0	**101 1**				
6	1366	11/08/00	19 3	**60 0**				
7	1366	11/08/00	28 7	**104 4**				
8	1366	11/08/00	8 7	**10 0**				
9	1366	11/08/00	25 3	**88 3**				
10	1249	11/08/00	5 3	**-6 3**	1144	11/08/00	11 3	**10 8**
11	1366	11/08/00	32 7	**123 2**				
12	1366	11/08/00	11 3	**22 3**				
13	1366	11/08/00	10 0	**16 2**				
14	1366	11/08/00	10 0	**16 2**				
15	1366	11/08/00	39 3	**154 4**				
				MIN 6 3				
				MAX **154 4**				
				MEAN **60 5**				
				SD 46 3				
				Transuranic $DCGL_W$ **100**				

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NOTE Elevated readings found on HVAC roof piping Radon/polonium suspected roof samples pulled and alpha spectroscopy results showed activity due to Po 210
See Section 3 2 3 and Attachment T of this RLCR for details

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Survey Unit 111-E-011 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	1042	11/9/00	2 0	**5 8**
2	833	11/9/00	0 0	**-0 3**
3	833	11/9/00	0 0	**-0.3**
4	1042	11/9/00	2 0	**5 8**
5	767	11/9/00	0 0	**-0 9**
6	767	11/9/00	0 0	**-0 9**
7	833	11/9/00	2 0	**5 8**
8	833	11/9/00	0 0	**-0.3**
9	767	11/9/00	1 0	**2 1**
10	1042	11/9/00	1 0	**2 7**
11	830	11/9/00	0 0	**-0.3**
12	1042	11/9/00	2 0	**5 8**
13	830	11/9/00	1 0	**2 7**
14	830	11/9/00	0 0	**-0 3**
15	830	11/9/00	1 0	**2 7**
			MIN	-0 9
			MAX	**5 8**
			MEAN	**2 0**
			SD	2 7
			Transuranic $DCGL_W$	**20**

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SURVEY UNIT 111-E-011 RE-SURVEY DATA - A

154

Survey Unit 111-E-011 (A) Re-Survey Data Summary

Total Surface Activity Measurements

	15	15
	Number Required	Number Obtained

MIN	16 8	dpm/100 cm^2
MAX	125 4	dpm/100 cm^2
MEAN	60 3	dpm/100 cm^2
STD DEV	29 0	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Measurements obtained for re-survey of this unit
All removable measurements below regulatory concern, no removable re-surveys required
See Section 3 2 3 and Attachment T of this RLCR for results and assessment of elevated readings

155

Survey Unit 111-E-011 (A) Total Surface Contamination Re-Survey Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	2352	N/A	N/A	7 1	N/A	N/A	N/A	N/A
Cal Due Date	4/24/01	N/A	N/A		N/A	N/A	N/A	
Efficiency (c/d)	0 220	N/A	N/A		N/A	N/A	N/A	

Total Surface Activity Measurements					Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	2352	11/27/00	20 0	**58 6**				
2	2352	11/27/00	26 7	**89 0**				
3	2352	11/27/00	34 7	**125 4**				
4	2352	11/27/00	16 0	**40 4**				
5	2352	11/27/00	16 7	**43 6**				
6	2352	11/27/00	18 7	**52 7**				
7	2352	11/27/00	19 3	**55 4**				
8	2352	11/27/00	10 8	**16 8**				
9	2352	11/27/00	22 7	**70 8**				
10	2352	11/27/00	30 7	**107.2**				
11	2352	11/27/00	14 7	**34 5**				
12	2352	11/27/00	19 3	**55 4**				
13	2352	11/27/00	14 7	**34 5**				
14	2352	11/27/00	17 3	**46 3**				
15	2352	11/27/00	23 3	**73 6**				
			MIN	16 8				
			MAX	**125 4**				
			MEAN	**60 3**				
			SD	29 0				
			Transuranic $DCGL_W$	**100**				

NOTE Elevated readings found on HVAC roof piping Radon/polonium suspected roof samples pulled and alpha spectroscopy results showed activity due to Po 210
See Section 3 2 3 and Attachment T of this RLCR for details

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Survey Unit 111-E-011 (A) Re-Survey Smear Results

TSA Re-Survey Only, No Removable Measurements Required

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SURVEY UNIT 111-E-011 RE-SURVEY DATA - B

158

Survey Unit 111-E-011 (B) Re-Survey Data Summary

Total Surface Activity Measurements

	15	15
	Number Required	Number Obtained

MIN	27 3	dpm/100 cm^2
MAX	109 5	dpm/100 cm^2
MEAN	67 0	dpm/100 cm^2
STD DEV	30 9	dpm/100 cm^2
TRANSURANIC $DCGL_W$	100	dpm/100 cm^2

Measurements obtained for re-survey of this unit
All removable measurements below regulatory concern, no removable re-surveys required
See Section 3 2 3 and Attachment T of this RLCR for results and assessment of elevated readings

159

Survey Unit 111-E-011 (B) Total Surface Contamination Re-Survey Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1672	N/A	N/A	2 7	N/A	N/A	N/A	N/A
Cal Due Date	3/12/01	N/A	N/A		N/A	N/A	N/A	
Efficiency (c/d)	0 219	N/A	N/A		N/A	N/A	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1672	11/27/00	12 9	**46 5**				
2	1672	11/27/00	22 4	**89 8**				
3	1672	11/27/00	18 3	**71 1**				
4	1672	11/27/00	19 3	**75 7**				
5	1672	11/27/00	21 3	**84 8**				
6	1672	11/27/00	22 0	**88 0**				
7	1672	11/27/00	9 3	**30 0**				
8	1672	11/27/00	9 3	**30 0**				
9	1672	11/27/00	24 4	**99 0**				
10	1672	11/27/00	23 7	**95 8**				
11	1672	11/27/00	26 7	**109 5**				
12	1672	11/27/00	8 7	**27 3**				
13	1672	11/27/00	8 8	**27 7**				
14	1672	11/27/00	10 0	**33 2**				
15	1672	11/27/00	24 0	**97 1**				
				MIN 27 3				
				MAX **109 5**				
				MEAN **67 0**				
				SD 30 9				
				Transuranic $DCGL_W$ **100**				

NOTE Elevated readings found on HVAC roof piping Radon/polonium suspected, roof samples pulled and alpha spectroscopy results showed activity due to Po 210
See Section 3 2 3 and Attachment T of this RLCR for details

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Survey Unit 111-E-011(B) Re-Survey Smear Results

TSA Re-Survey Only, No Removable Measurements Required

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SURVEY UNIT 111-F-012 DATA

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Survey Unit 111-F-012 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-9 1	dpm/100 cm^2	
MAX	43 3	dpm/100 cm^2	
MEAN	12 6	dpm/100 cm^2	
STD DEV	16 0	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	100	dpm/100 cm^2	

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9	dpm/100 cm^2	
MAX	9 1	dpm/100 cm^2	
MEAN	1 3	dpm/100 cm^2	
STD DEV	2 8	dpm/100 cm^2	
TRANSURANIC DCGL$_W$	20	dpm/100 cm^2	

Survey Unit 111-F-012 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1254	1241	N/A	3 3	1254	1241	N/A	8 0
Cal Due Date	11/18/00	3/27/01	N/A		11/18/00	3/27/01	N/A	
Efficiency (c/d)	0 231	0 218	N/A		0 231	0 218	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1254	11/08/00	13 3	43 3				
2	1254	11/08/00	4 7	6 1				
3	1254	11/08/00	12 7	40 7				
4	1254	11/08/00	9 3	26 0				
5	1241	11/08/00	4 0	3 2	1254	11/08/00	2 0	**-26 0**
6	1241	11/08/00	5 3	9 2				
7	1254	11/08/00	3 3	0 0				
8	1241	11/08/00	1 3	9 1				
9	1241	11/08/00	8 0	21 6				
10	1254	11/08/00	5 3	8 7	1241	11/08/00	14 0	**27 5**
11	1254	11/08/00	8 0	20 4				
12	1241	11/08/00	1 3	9 1				
13	1241	11/08/00	3 3	0 0				
14	1241	11/08/00	8 0	21 6				
15	1241	11/08/00	4 7	6 5				
				MIN 9 1				
				MAX **43 3**				
				MEAN **12 6**				
				SD 16 0				
				Transuranic $DCGL_W$ **100**				

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Survey Unit 111-F-012 Smear Results

Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	1042	11/8/00	0 0	**-0 9**
2	830	11/8/00	1 0	**2 1**
3	833	11/8/00	0 0	**0 0**
4	833	11/8/00	0 0	**0 0**
5	767	11/8/00	0 0	**-0 3**
6	830	11/8/00	0 0	**-0 9**
7	833	11/8/00	3 0	**9 1**
8	830	11/8/00	0 0	**-0 9**
9	833	11/8/00	0 0	**0 0**
10	767	11/8/00	0 0	**-0 3**
11	830	11/8/00	2 0	**5 2**
12	767	11/8/00	0 0	**-0 3**
13	830	11/8/00	1 0	**2 1**
14	1042	11/8/00	1 0	**2 1**
15	1042	11/8/00	1 0	**2 1**
			MIN	-0 9
			MAX	**9 1**
			MEAN	**1 3**
			SD	2 8
			Transuranic $DCGL_W$	**20**

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SURVEY UNIT 111-F-013 DATA

1662

Survey Unit 111-F-013 Data Summary

Total Surface Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-15 0		dpm/100 cm^2
MAX	55 1		dpm/100 cm^2
MEAN	10 8		dpm/100 cm^2
STD DEV	18 7		dpm/100 cm^2
TRANSURANIC DCGL$_W$	100		dpm/100 cm^2

Removable Activity Measurements

	15	15	
	Number Required	Number Obtained	
MIN	-0 9		dpm/100 cm^2
MAX	5 2		dpm/100 cm^2
MEAN	1 1		dpm/100 cm^2
STD DEV	1 9		dpm/100 cm^2
TRANSURANIC DCGL$_W$	20		dpm/100 cm^2

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Survey Unit 111-F-013 Total Surface Contamination Results

Total Surface Activity Survey					Quality Control Survey			
Meter Model	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)	NE Electra w/ DP6 Probe			Local Area Bkgd (cpm)
Instrument #	1241	1254	N/A	6 0	1241	1254	N/A	8 0
Cal Due Date	3/27/01	11/18/00	N/A		3/27/01	11/18/00	N/A	
Efficiency (c/d)	0 218	0 231	N/A		0 218	0 231	N/A	
	Total Surface Activity Measurements				Quality Control Measurements			
Sample Location Number	Serial #	Date	(cpm)	(dpm/100 cm²)	Serial #	Date	(cpm)	(dpm/100 cm²)
1	1241	10/30/00	6 7	3 3				
2	1254	11/08/00	18 7	55 1				
3	1241	10/30/00	10 7	21 7				
4	1241	10/30/00	6 0	0 1				
5	1241	10/30/00	6 0	0 1				
6	1254	11/08/00	6 0	0 1				
7	1241	10/30/00	7 3	6 1				
8	1254	11/08/00	12 0	26 1				
9	1254	11/08/00	8 0	8 8	1241	10/30/00	6 7	-6 0
10	1254	11/08/00	10 7	20 5				
11	1254	11/08/00	8 7	11 8				
12	1241	10/30/00	4 0	-9 1	1254	11/08/00	10 0	8 7
13	1254	11/08/00	14 7	37 8				
14	1241	10/30/00	4 7	5 8				
15	1241	10/30/00	2 7	15 0				
				MIN -15 0				
				MAX 55 1				
				MEAN 10 8				
				SD 18 7				
				Transuranic $DCGL_W$ 100				

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Survey Unit 111-F-013 Smear Results

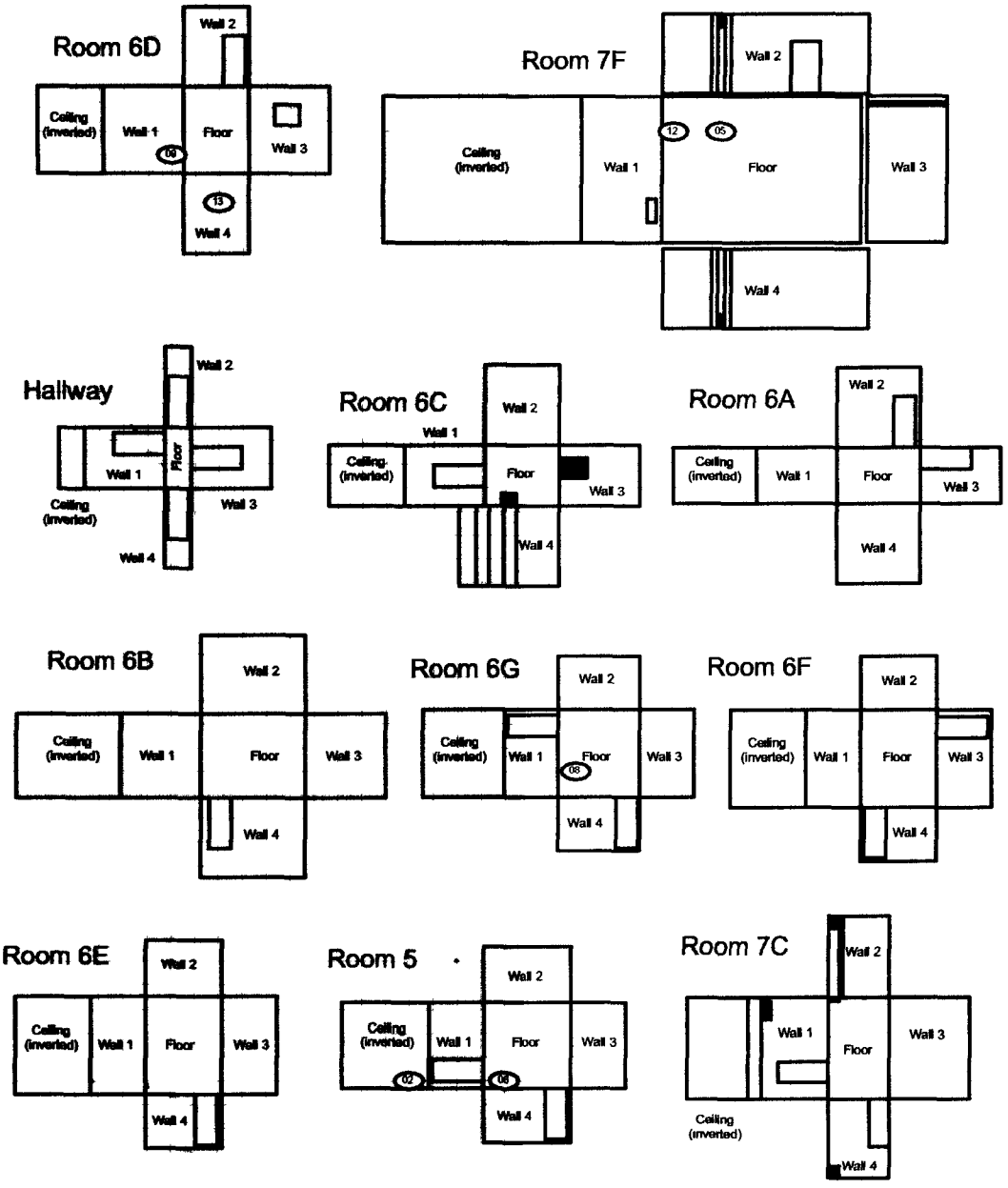
Smear Location Number	Smear Results			
	Serial Number	Date Counted	Gross (cpm)	(dpm/100 cm^2)
1	1042	11/8/00	10	21
2	833	11/8/00	10	30
3	767	11/8/00	10	27
4	1042	11/8/00	20	52
5	830	11/8/00	00	-09
6	830	11/8/00	00	-09
7	830	11/8/00	00	-09
8	767	11/8/00	00	-03
9	833	11/8/00	00	00
10	767	11/8/00	00	-03
11	833	11/8/00	00	00
12	830	11/8/00	10	21
13	1042	11/8/00	00	-09
14	833	11/8/00	10	30
15	1042	11/8/00	10	21
			MIN	-09
			MAX	52
			MEAN	11
			SD	19
			Transuranic $DCGL_W$	20

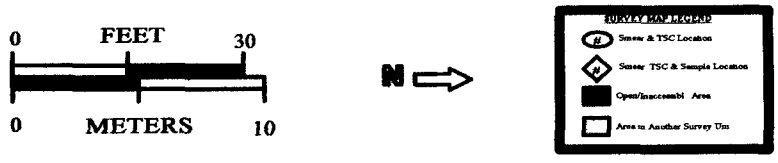
169

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-001** **Classification 3**
Building 111
Survey Unit Description B111 Basement-North
Total Area 1849 sq. m

SURVEY UNIT 111-A-001 - MAP 1 OF 2



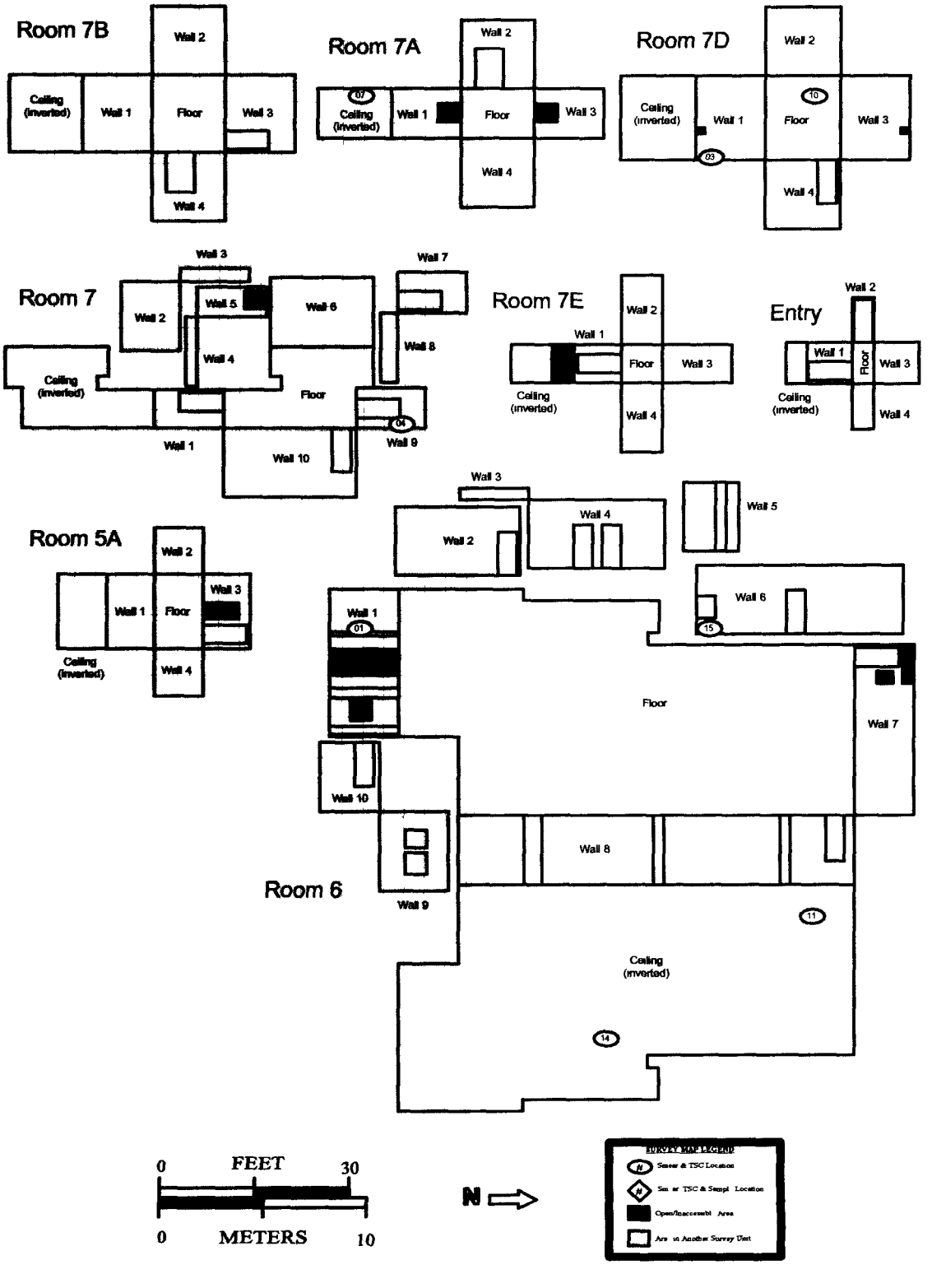


170

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-001** **Classification 3**
Building 111
Survey Unit Description B111 Basement-North
Total Area 1849 sq m

SURVEY UNIT 111-A-001 - MAP 2 OF 2

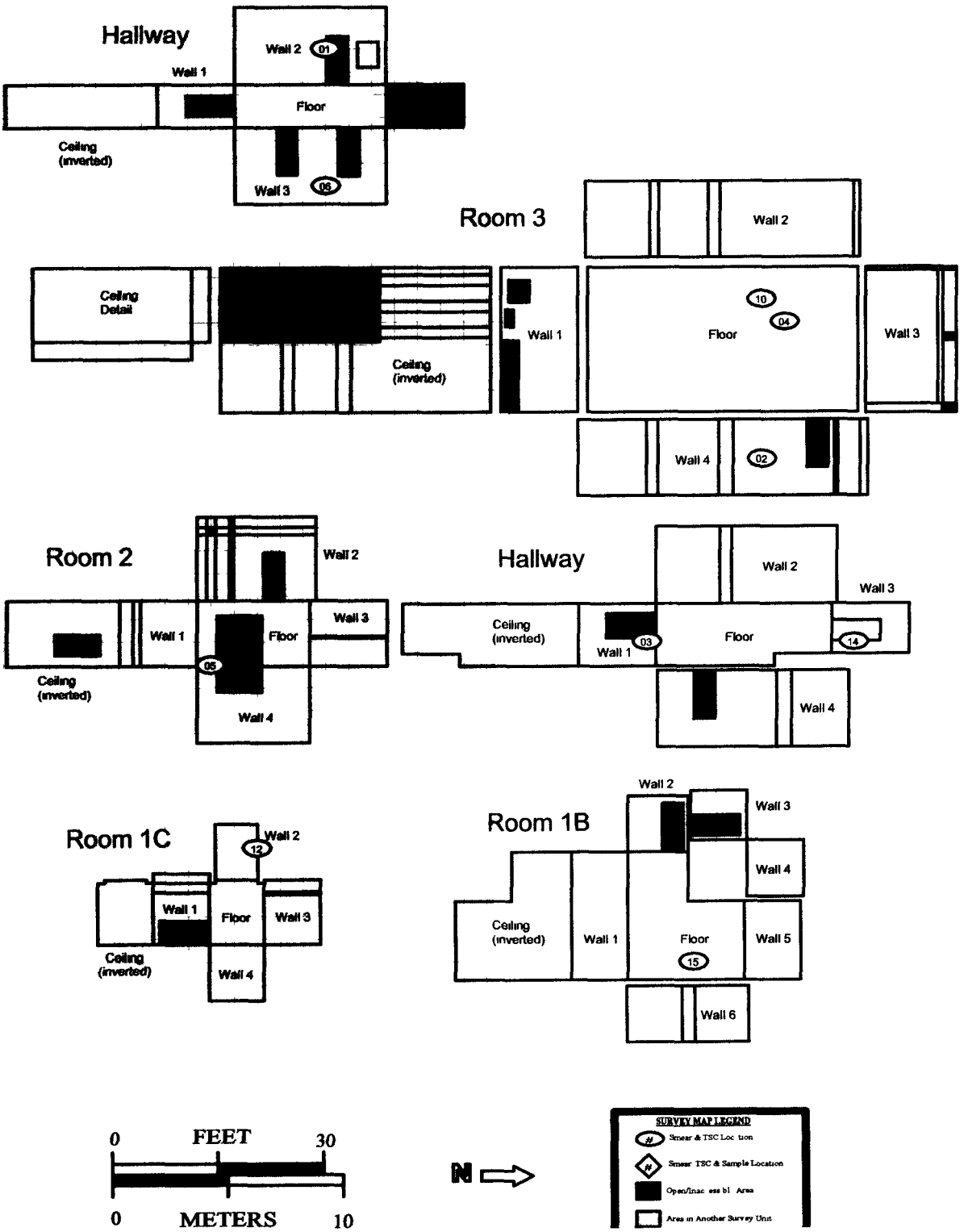


171

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-002** **Classification 3**
Building 111
Survey Unit Description B111 Basement-South
Total Area 1309 sq m

SURVEY UNIT 111-A-002 - MAP 1 OF 2

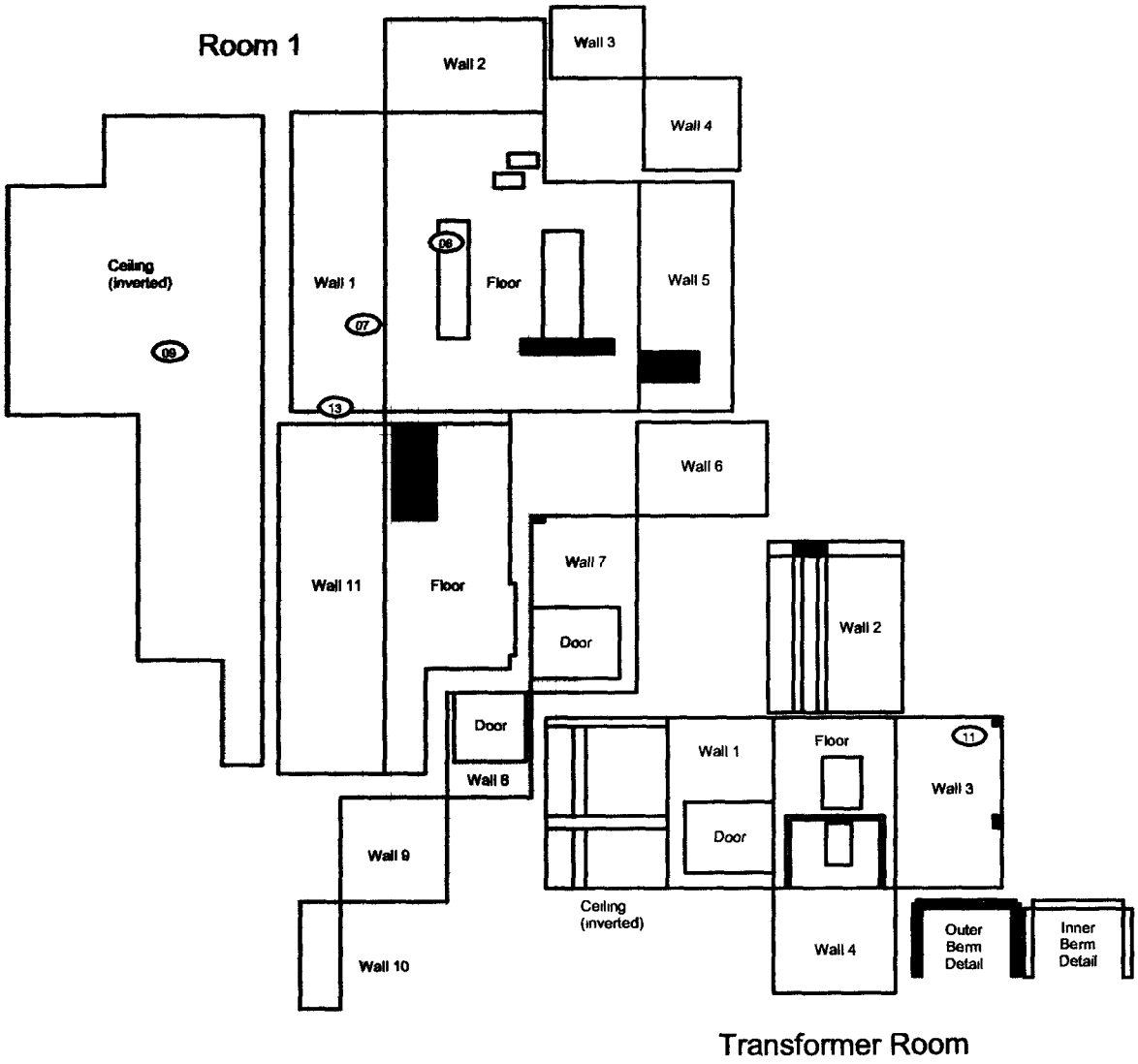


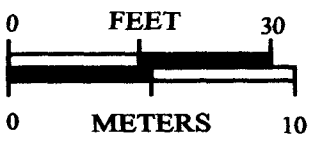
172

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area A **Survey Unit: 111-A-002** **Classification 3**
Building 111
Survey Unit Description B111 Basement-South
Total Area 1309 sq m

SURVEY UNIT 111-A-002 - MAP 2 OF 2





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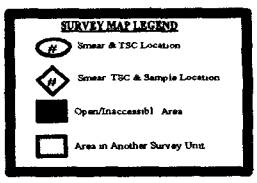


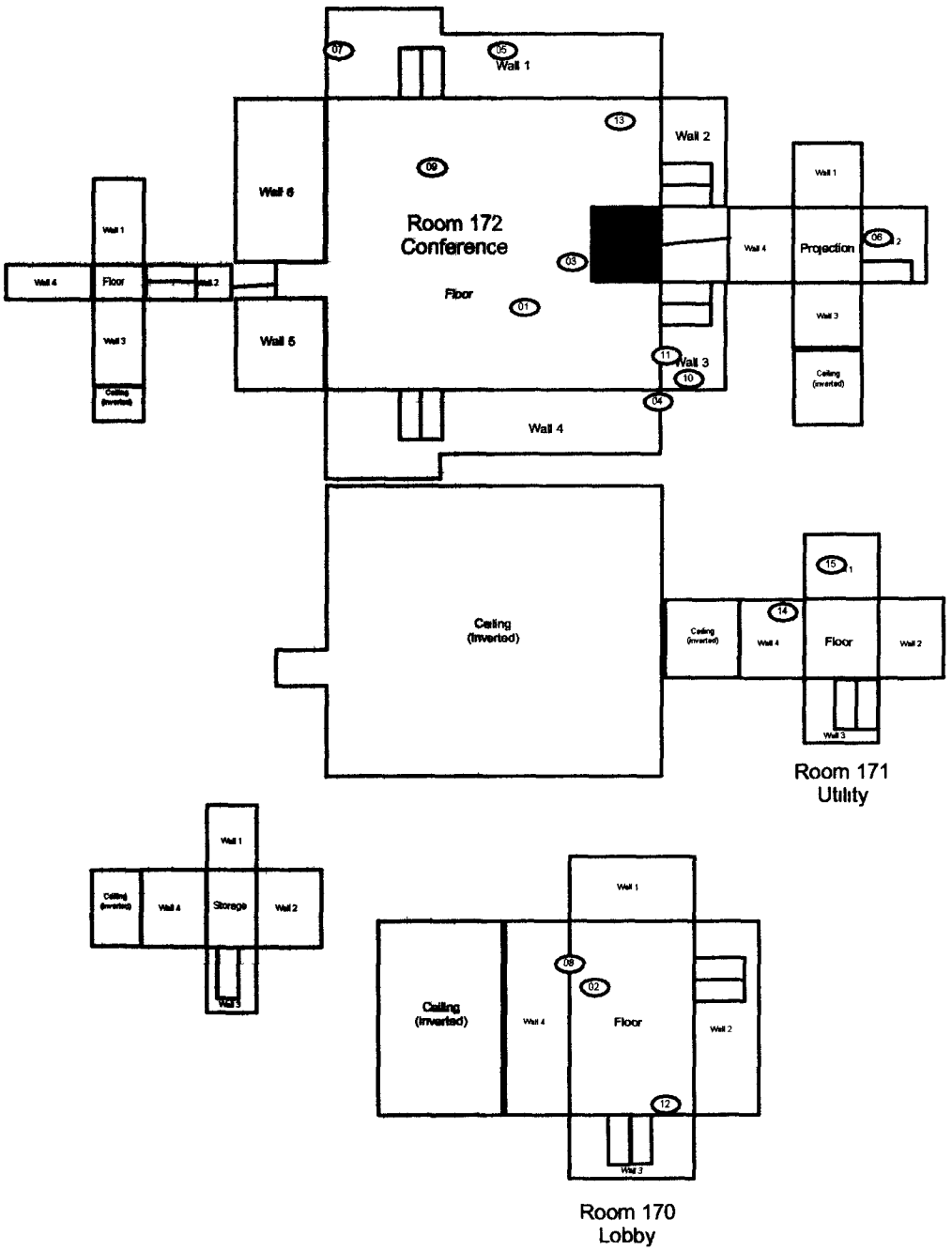
173

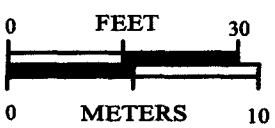
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

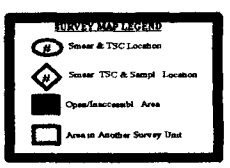
Survey Area B **Survey Unit: 111-B-003** **Classification 3**
Building 111
Survey Unit Description B111 Auditorium

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-003 - MAP 1 OF 1







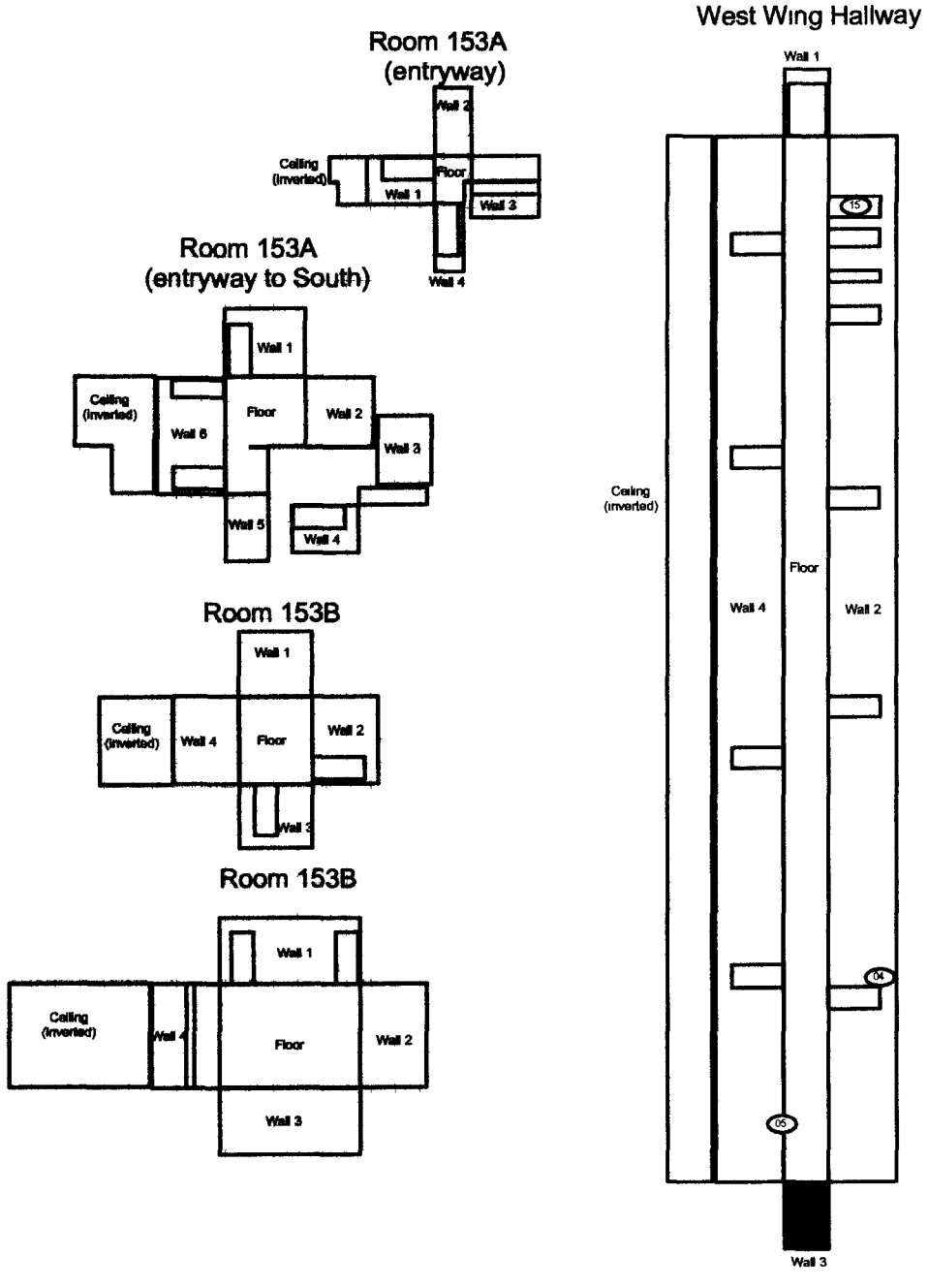
174

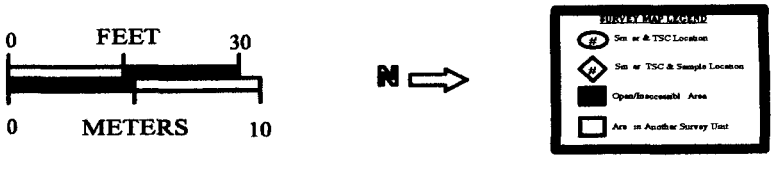
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-004 - MAP 1 OF 4





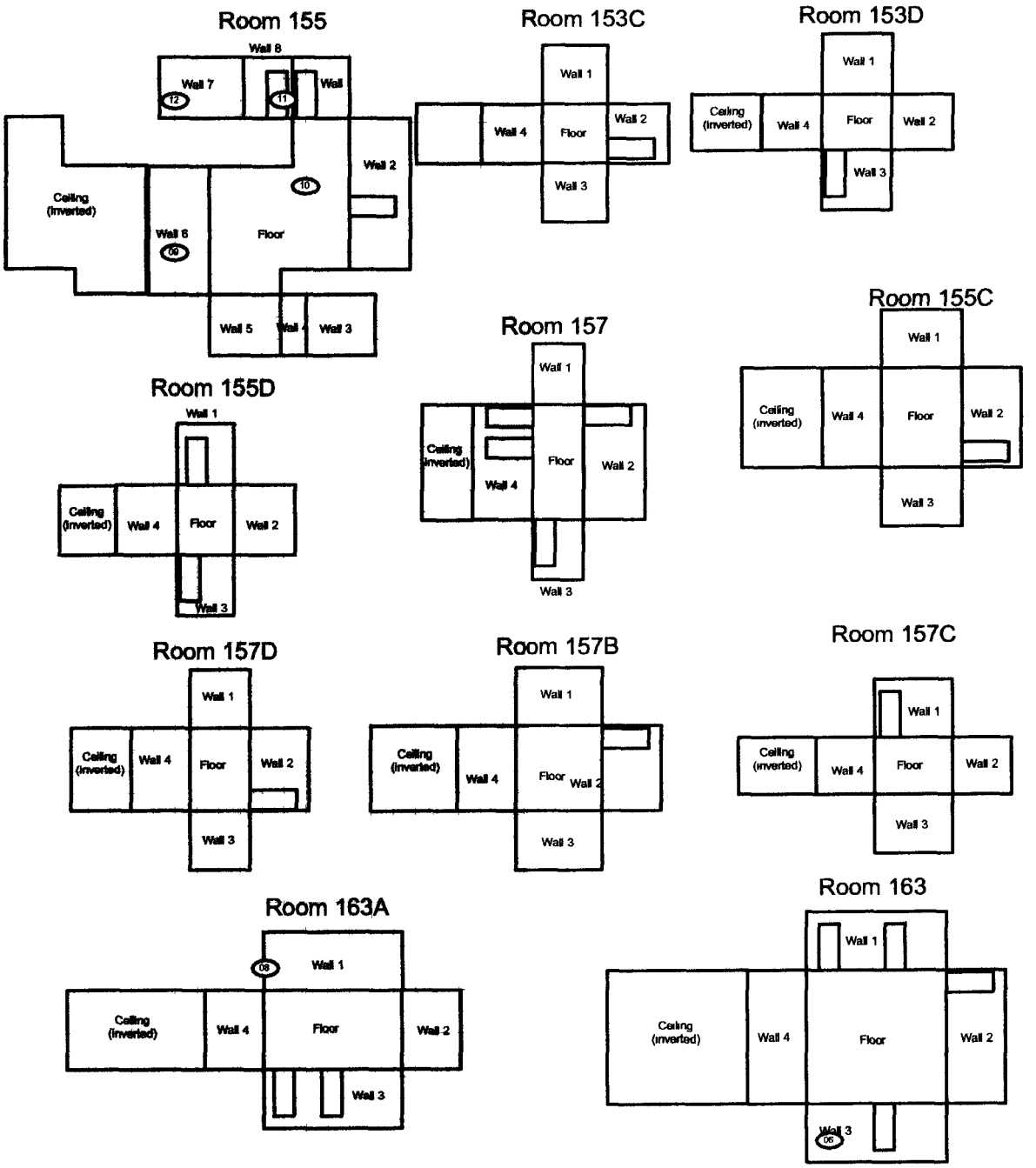
175

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-004 - MAP 2 OF 4



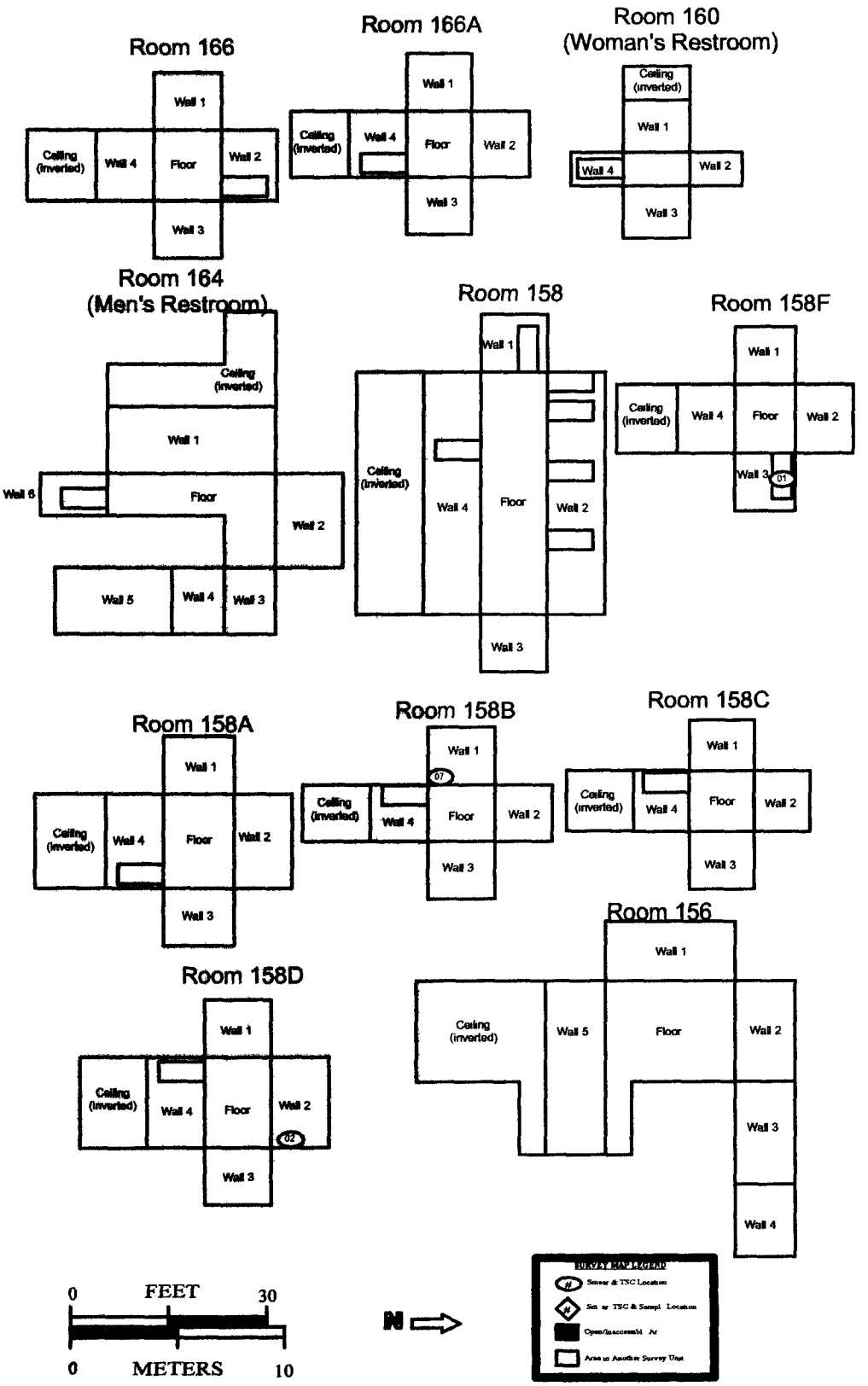
176

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-004 - MAP 3 OF 4



177

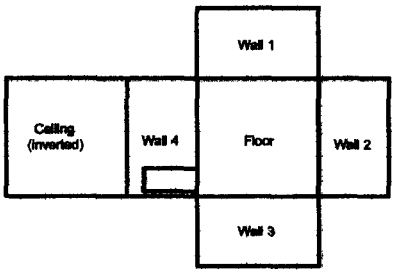
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-004** **Classification 3**
Building 111
Survey Unit Description B111 West Wing

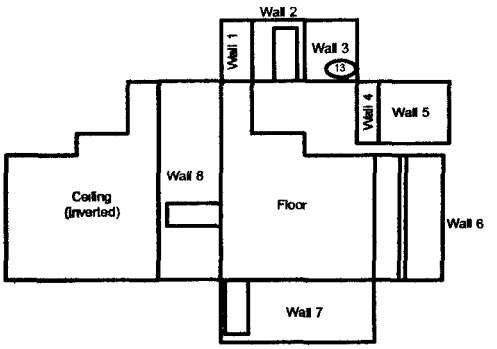
MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-004 - MAP 4 OF 4

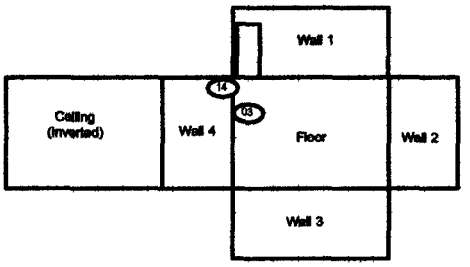
Room 154A



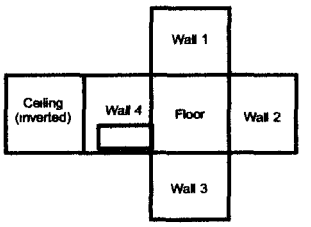
Room 154
(Financial Admin)



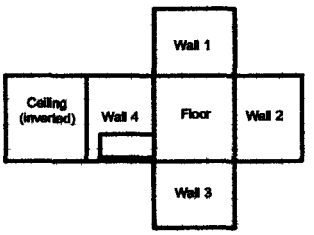
Room 152

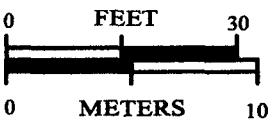


Room 166A



Room 166





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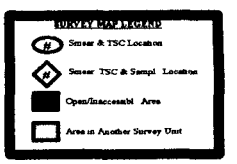


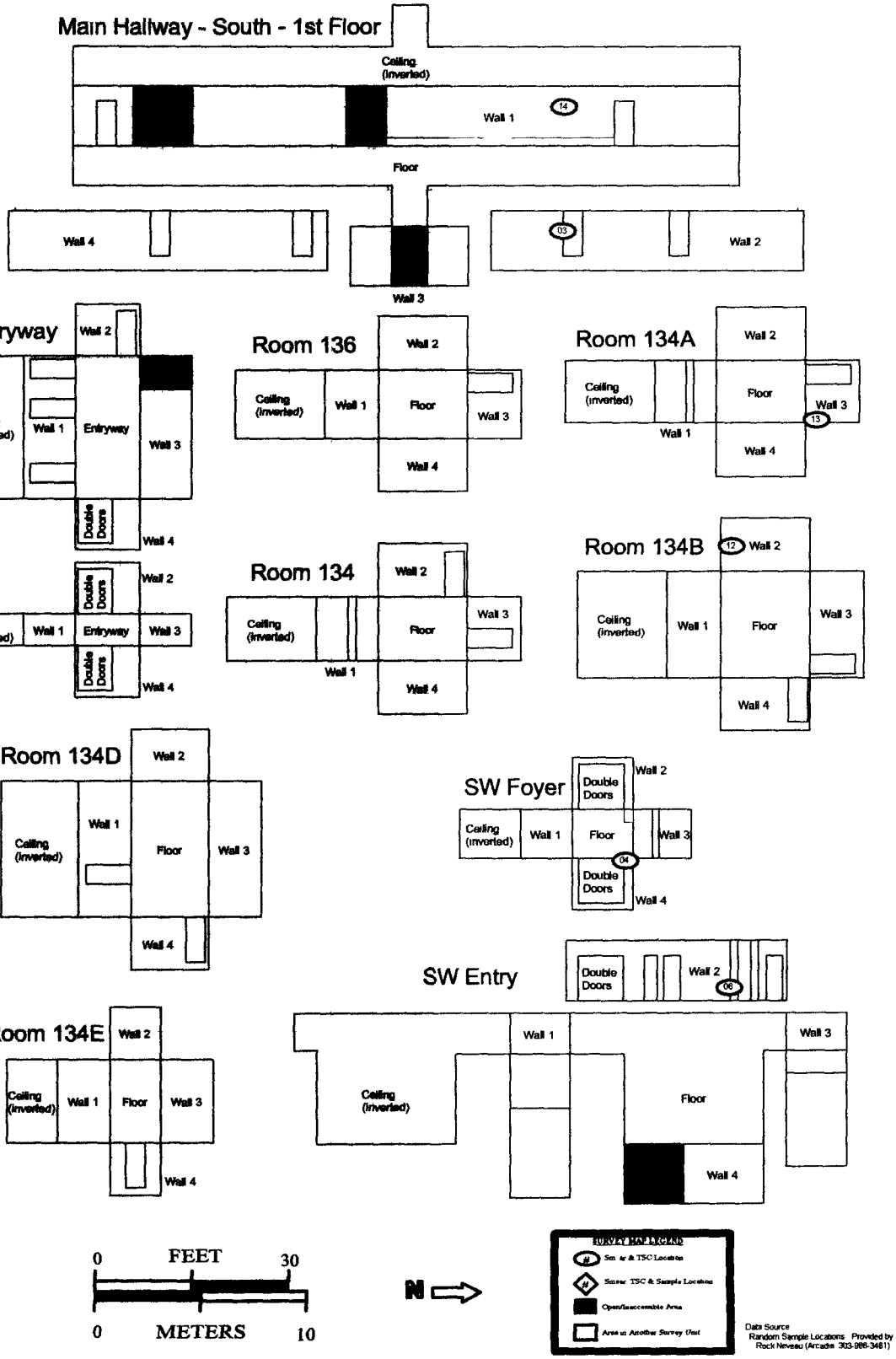
178

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-005** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - South

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-005 - MAP 1 OF 3



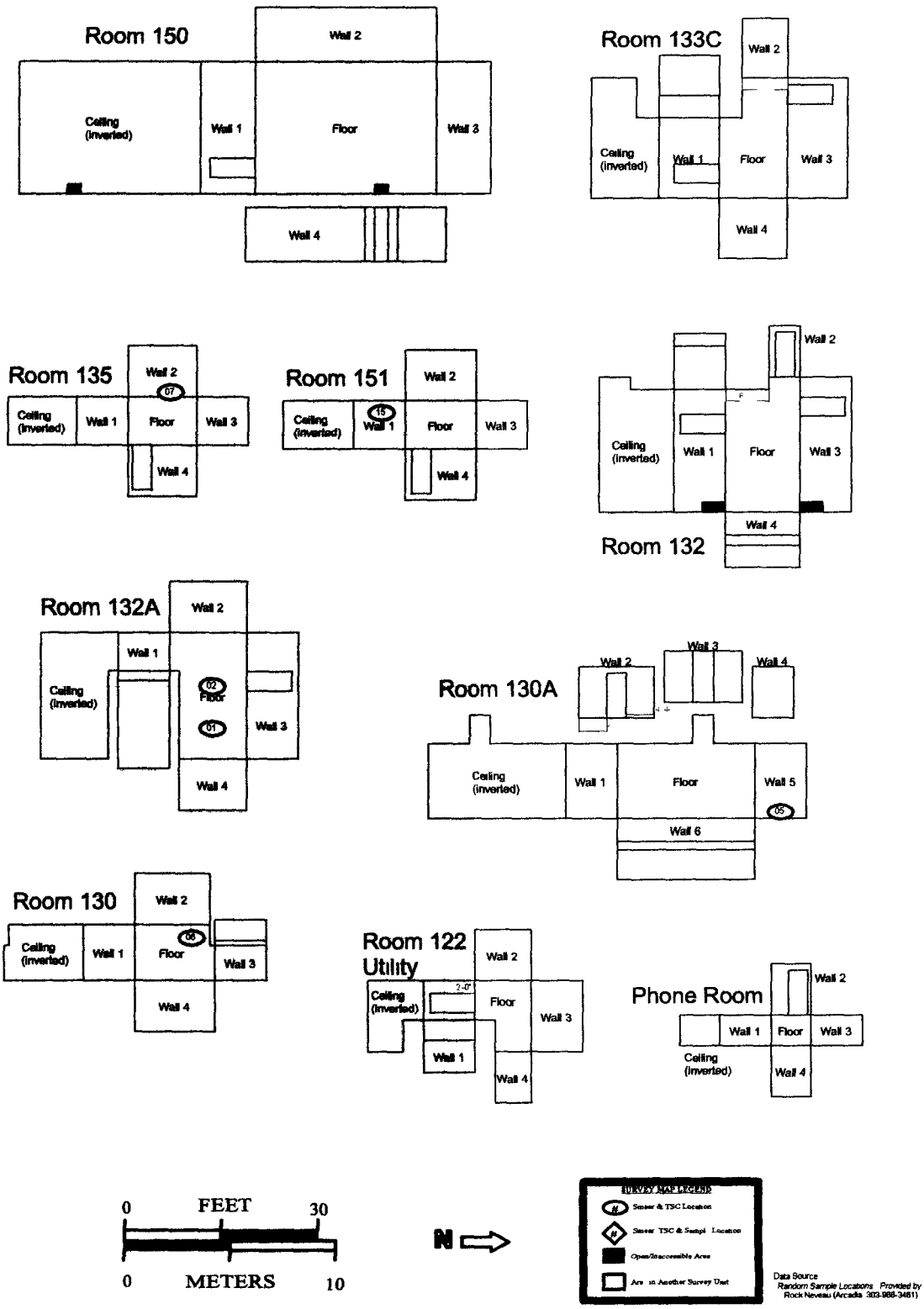
179

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit 111-B-005** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - South

MAP ID. fv2001/01-0077

SURVEY UNIT 111-B-005 - MAP 2 OF 3



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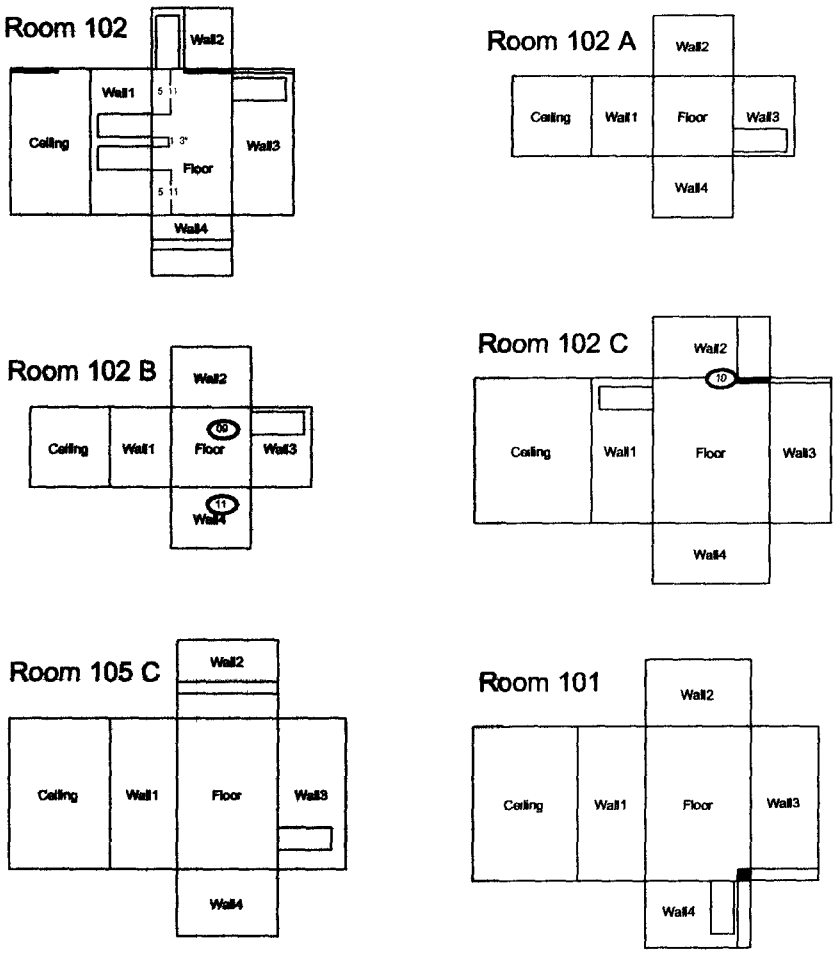
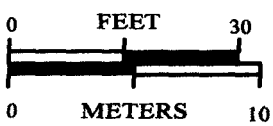
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-005** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - South

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-005 - MAP 3 OF 3





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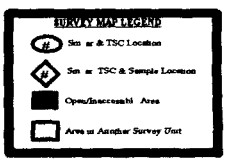


Data Source:
Random Sample Locations Provided by
Rock Neveau (Arcadi 303-866-3481)

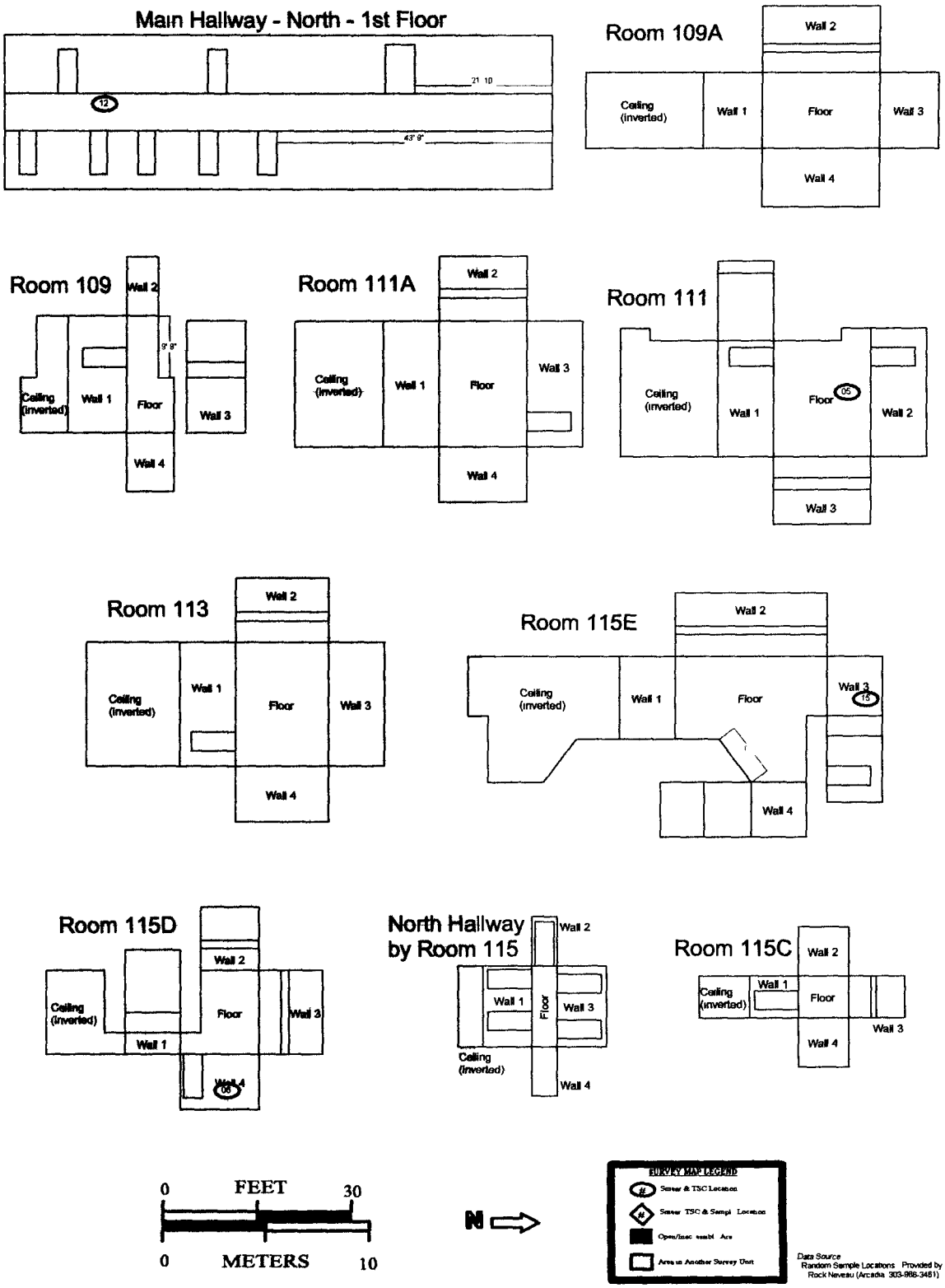
181

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-006** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor North

MAP ID. fv2001/01-0077

SURVEY UNIT 111-B-006 - MAP 1 OF 3



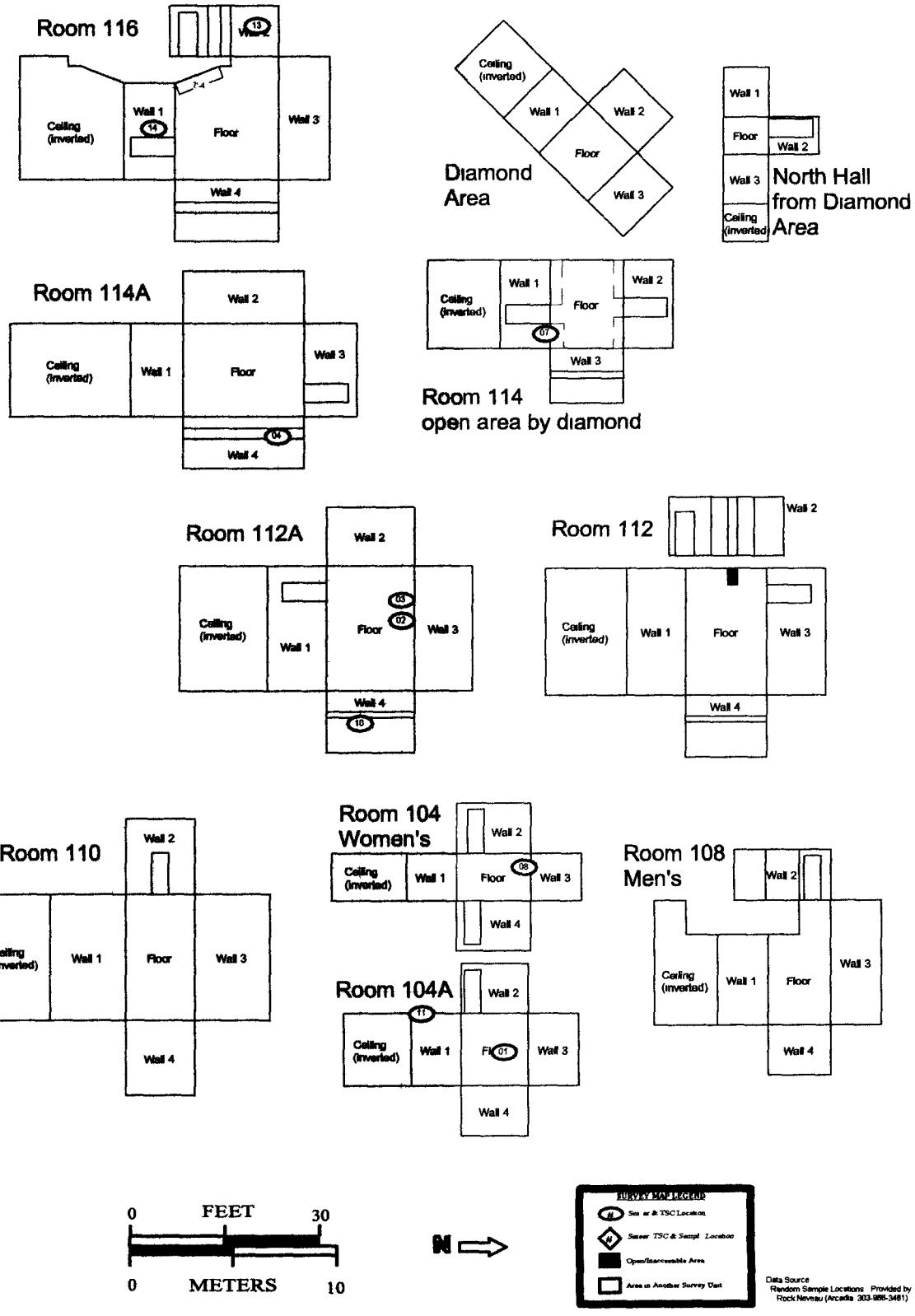
182

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area B **Survey Unit: 111-B-006** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor North

MAP ID. fy2001/01-0077

SURVEY UNIT 111-B-006 - MAP 2 OF 3



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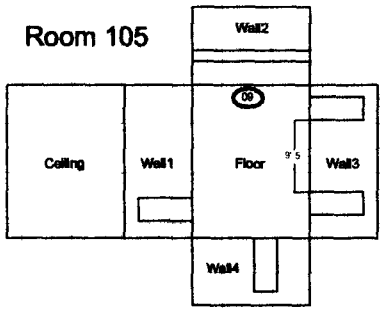
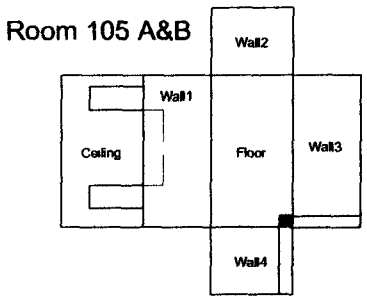
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

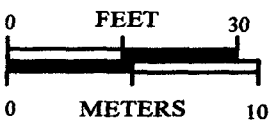
Survey Area B **Survey Unit: 111-B-006** **Classification 3**
Building 111
Survey Unit Description B111 - 1st Floor - North

MAP ID. fv2001/01-0077

SURVEY UNIT 111-B-006 - MAP 3 OF 3







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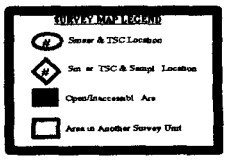


Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadia 303-966-3481)

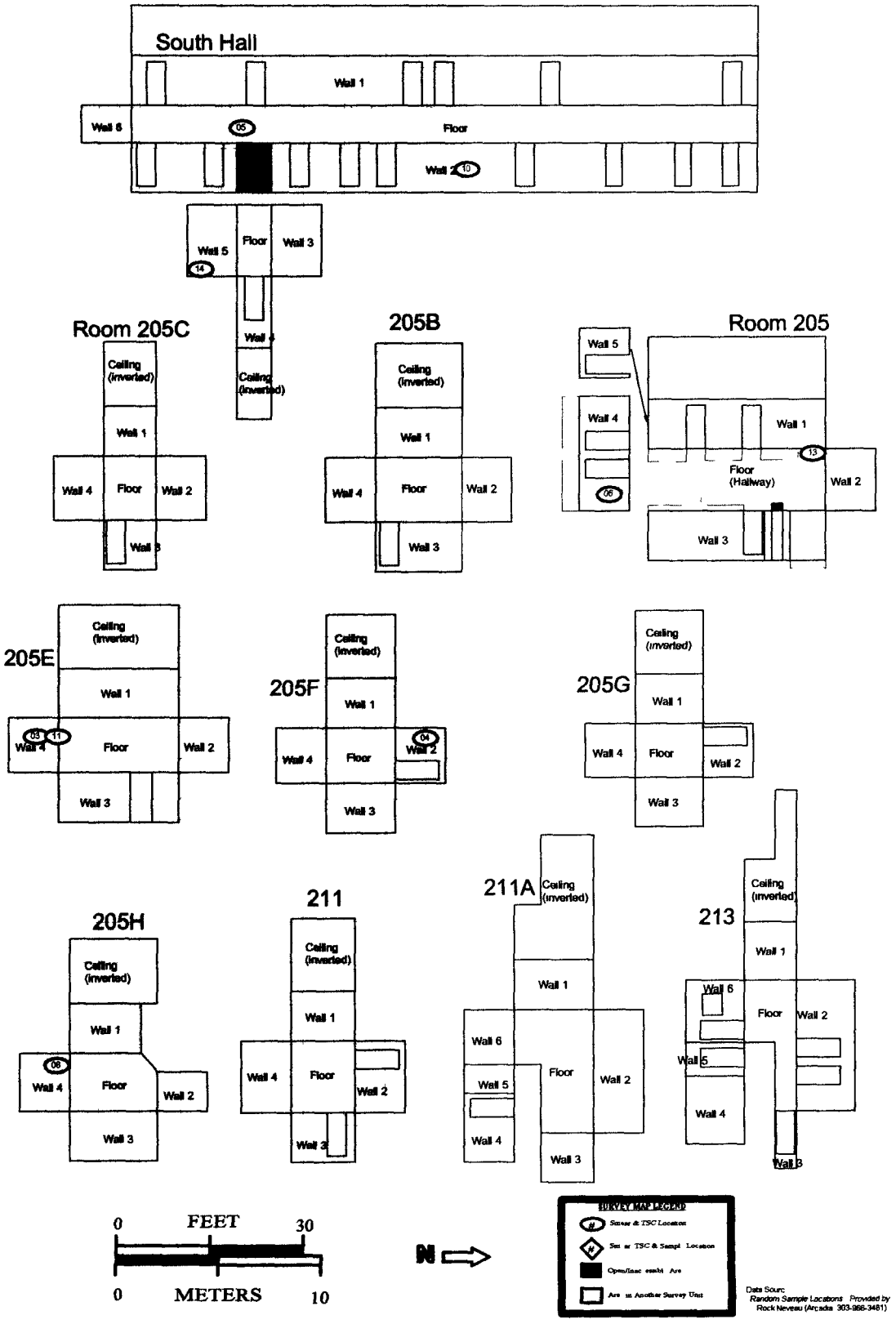
184

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-007** **Classification 3**
Building 111
Survey Unit Description B111 South Area

MAP ID. fy2001/01-0077

SURVEY UNIT 111-C-007 - MAP 1 OF 3



Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadis 303-966-3481)

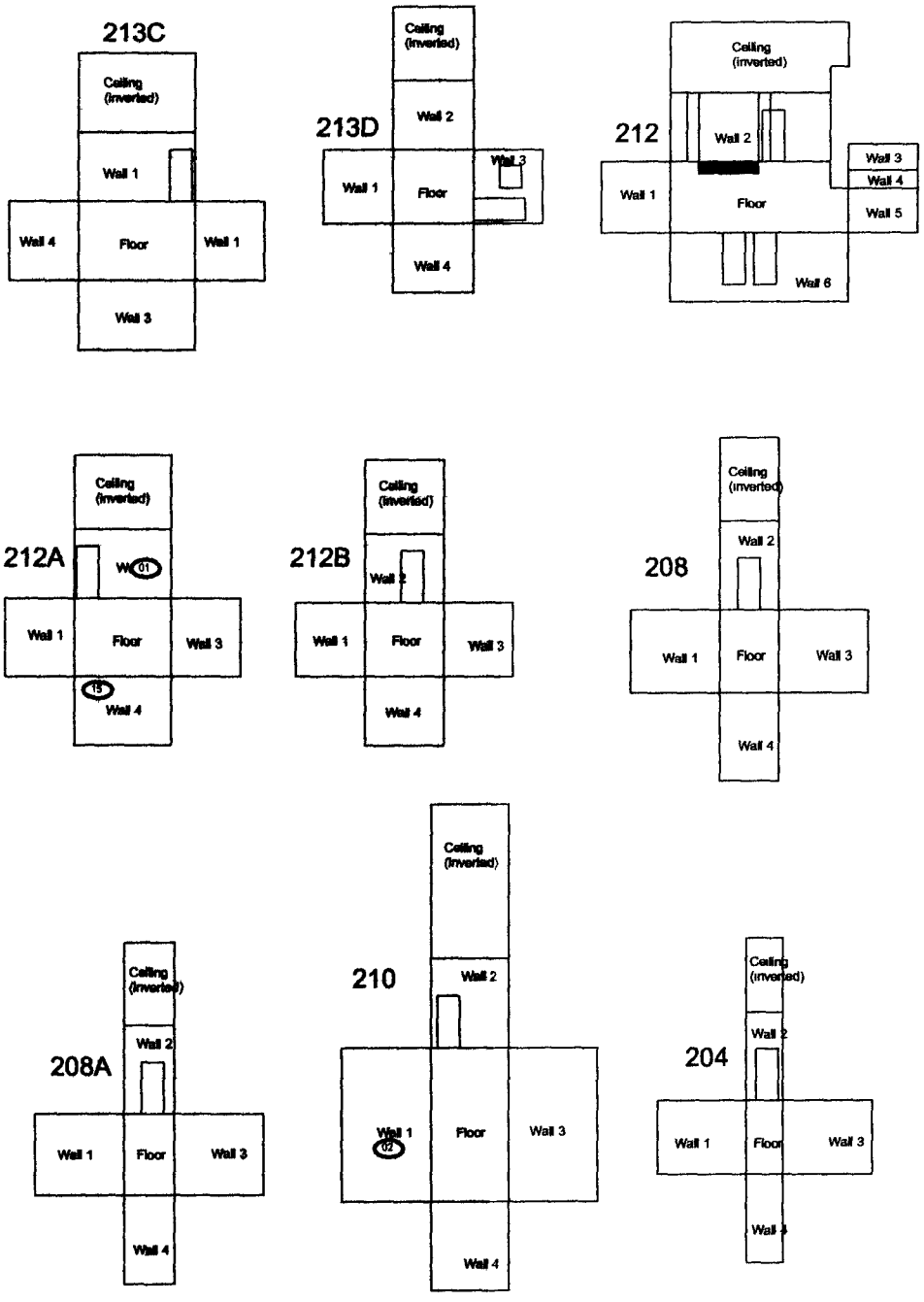
185

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-007** **Classification 3**
Building 111
Survey Unit Description B111 South Area

MAP ID. fv2001/01-0077

SURVEY UNIT 111-C-007 - MAP 2 OF 3



0 FEET 30

0 METERS 10

N

SURVEY MAP LEGEND

Sensor & TSC Location

Sensor TSC & Sample Location

Open/Inaccessible Area

Area in Another Survey Unit

Data Source
Random Sample Locations Provided by
Rock Nevreau (Arcadia 303-988-3481)

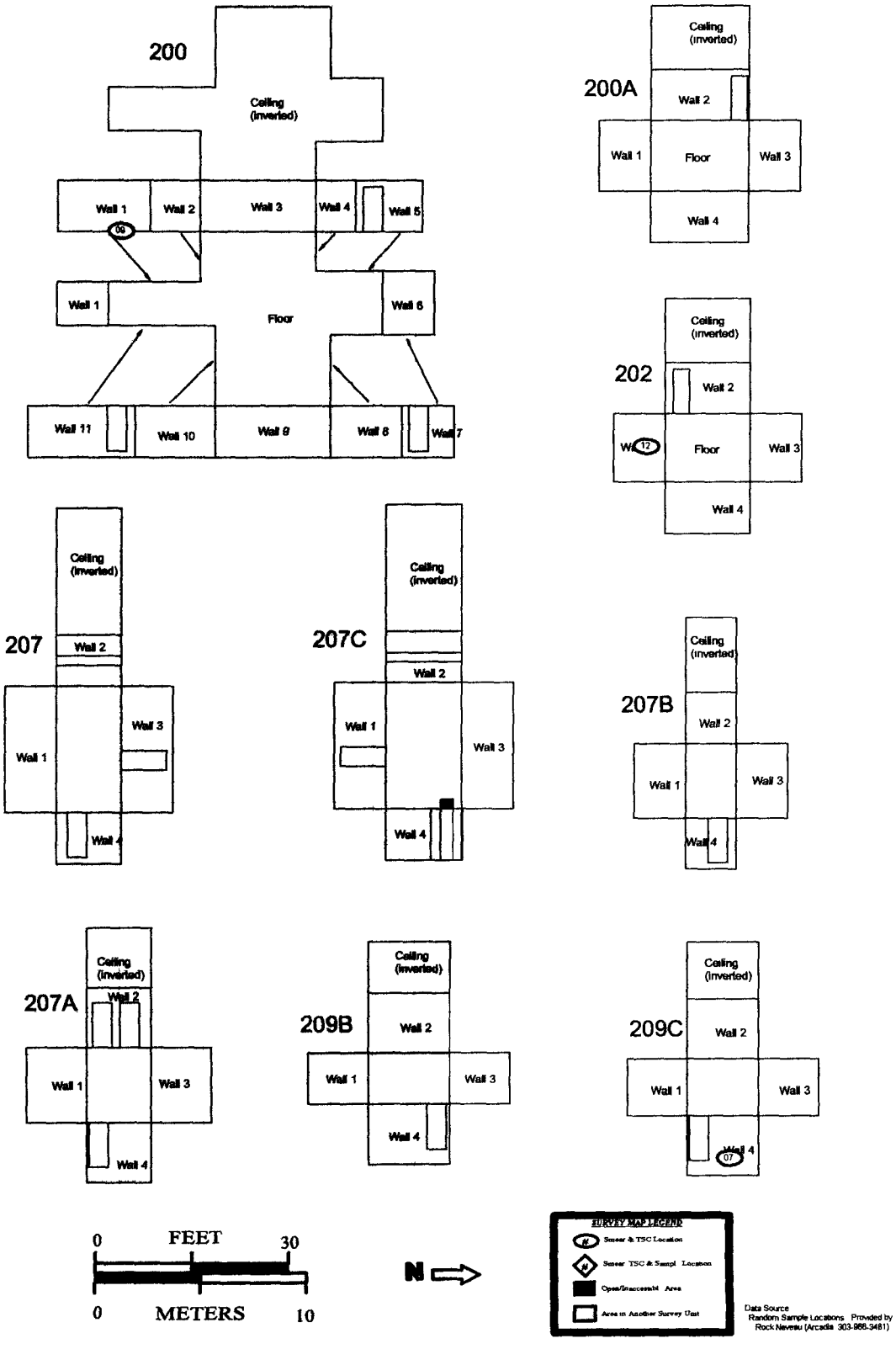
186

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-007** **Classification 3**
Building 111
Survey Unit Description B111 South Area

MAP ID. fv2001/01-0077

SURVEY UNIT 111-C-007 - MAP 3 OF 3



Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadis 303-988-3481)

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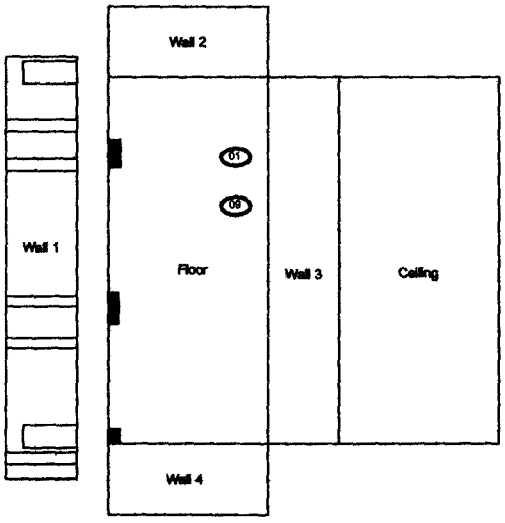
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-008** **Classification 3**
Building 111
Survey Unit Description B111 Second Floor-North Hall

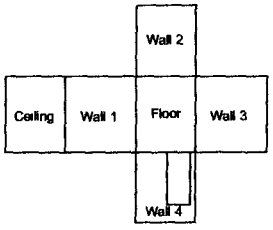
MAP ID. fy2001/01-0077

SURVEY UNIT 111-C-008 - MAP 1 OF 2

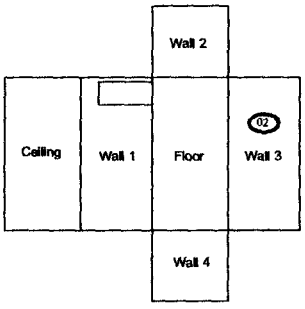
B111 2nd Floor, Room 222



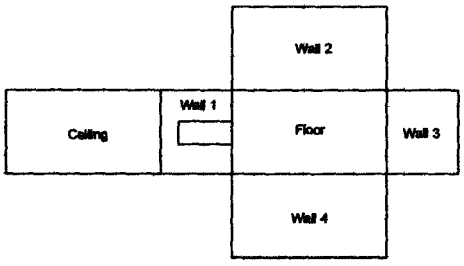
Room 222G



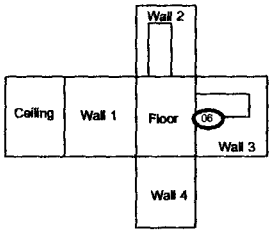
Room 222C



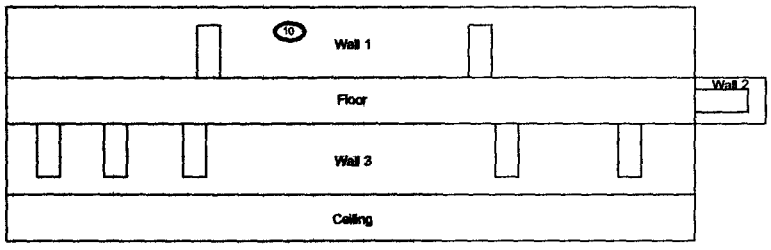
Room 220 (Vault)

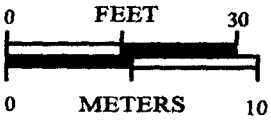


Room 222F



North Hall





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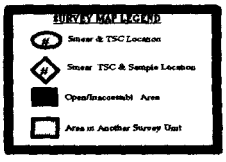


Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadis 303-986-3481)

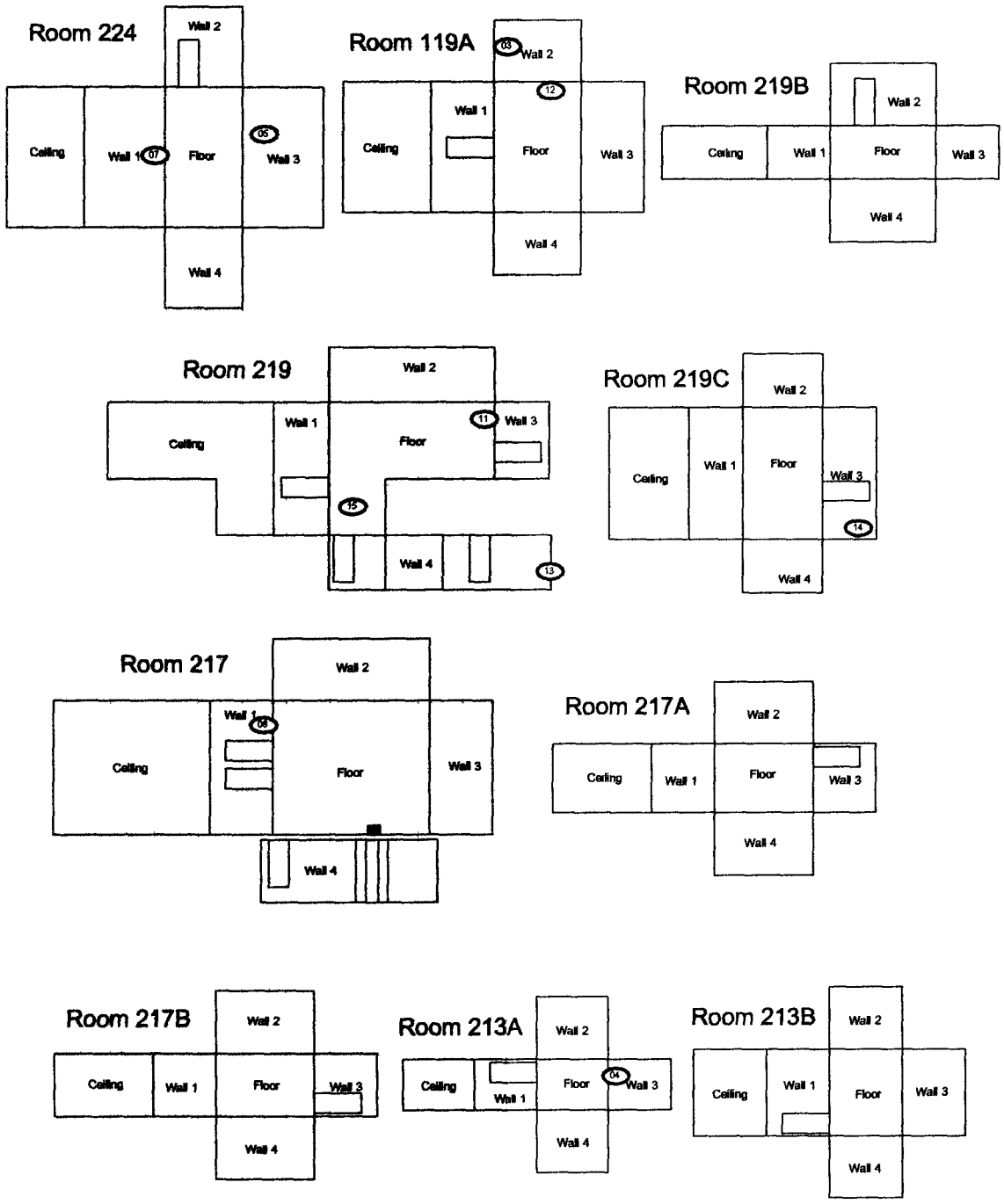
188

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area C **Survey Unit: 111-C-008** **Classification 3**
Building 111
Survey Unit Description B111 Second Floor-North Hall

MAP ID. fy2001/01-0077

SURVEY UNIT 111-C-008 - MAP 2 OF 2



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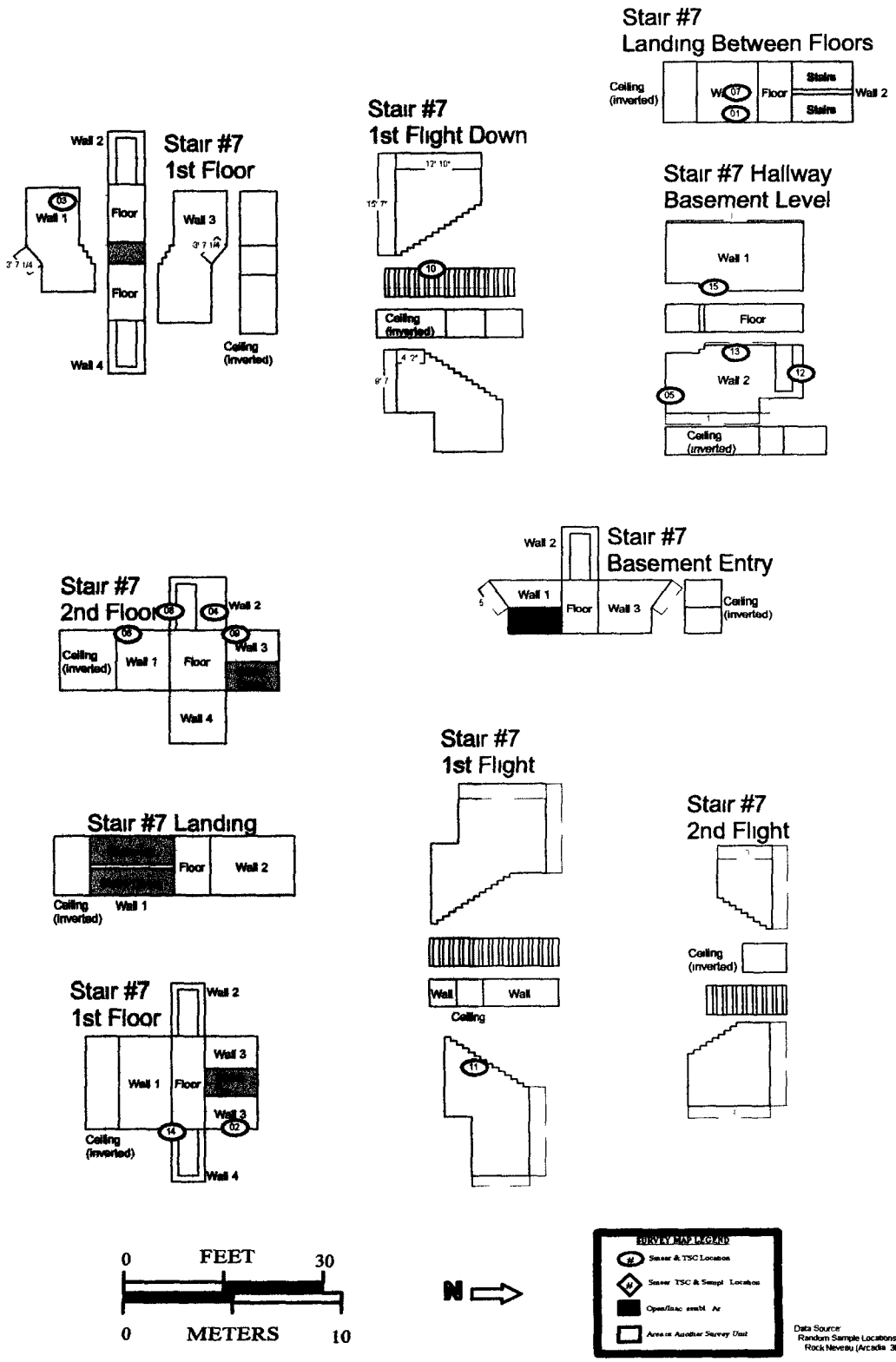
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area D **Survey Unit: 111-D-009** **Classification 3**
Building 111
Survey Unit Description B111 - Stairwell #7

MAP ID N2001/01-0077

SURVEY UNIT 111-D-009 - MAP 1 OF 1



190

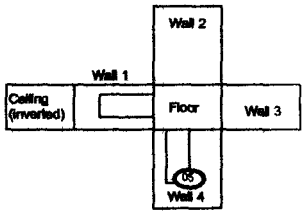
RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area D **Survey Unit: 111-D-010** **Classification 3**
Building 111
Survey Unit Description B111 Stairwell (Door No 5)

MAP ID. fy2001/01-0077

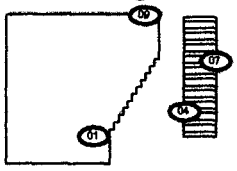
SURVEY UNIT 111-D-010 - MAP 1 OF 1

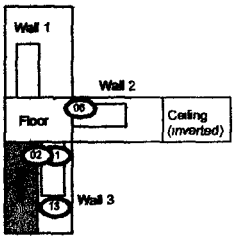
1st Floor Entry



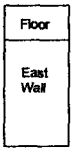
1st Floor Landing

1st Flight

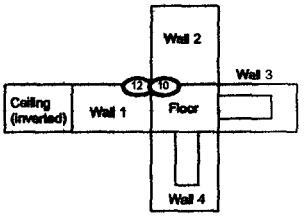




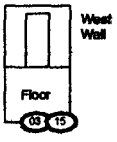
Center Landing



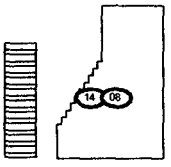
2nd Floor Entry

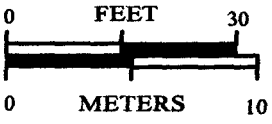


Upper Landing



2nd Flight





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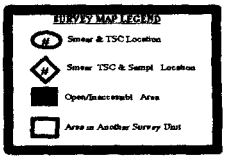


Data Source
Random Sample Locations Provided by
Rock Neveau (Arcadia 303-966-3461)

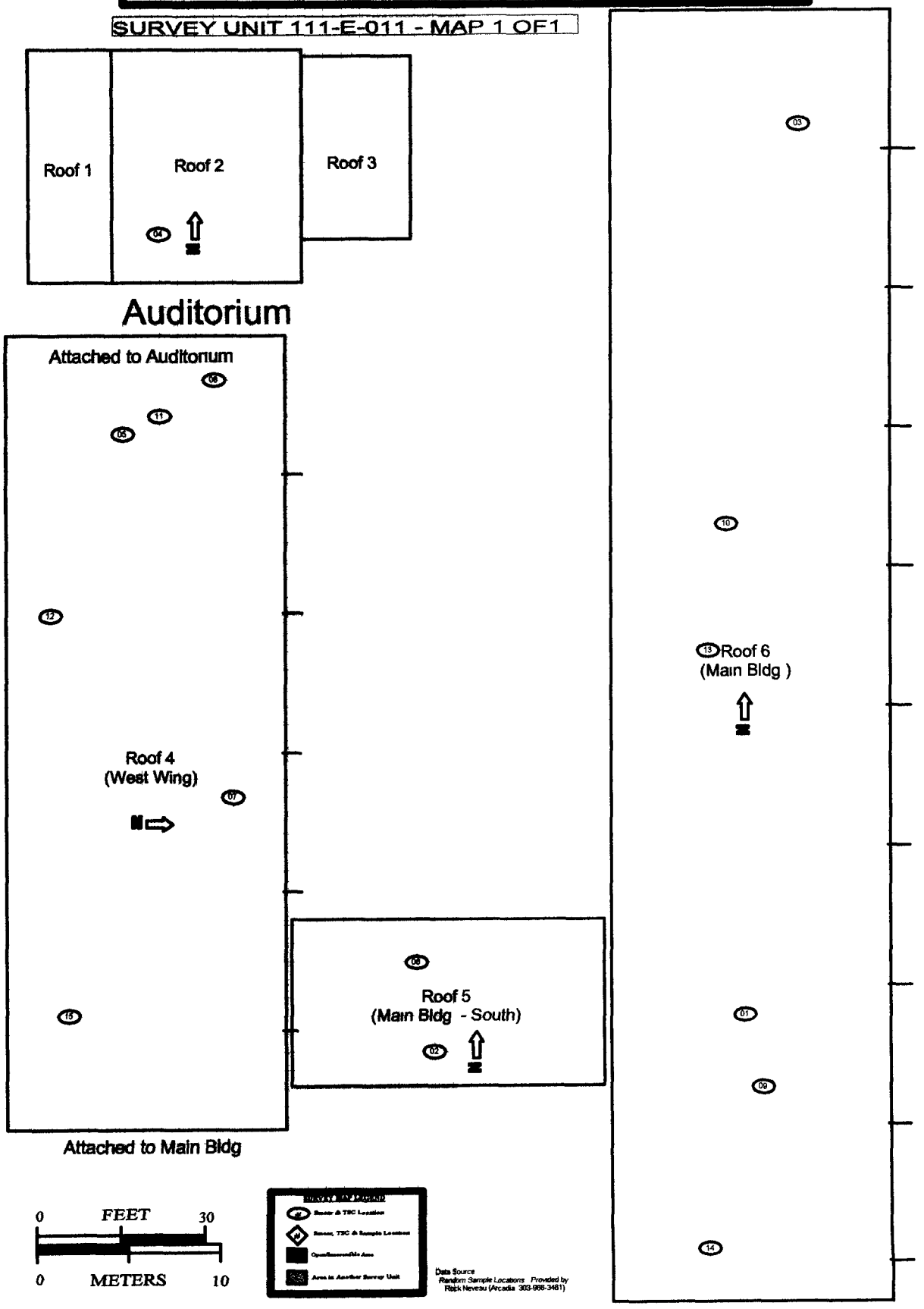
191

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area E **Survey Unit. 111-E-011** **Classification 3**
Building 111
Survey Unit Description B111 Roof

MAP ID: 1/2001/01-0077

SURVEY UNIT 111-E-011 - MAP 1 OF1

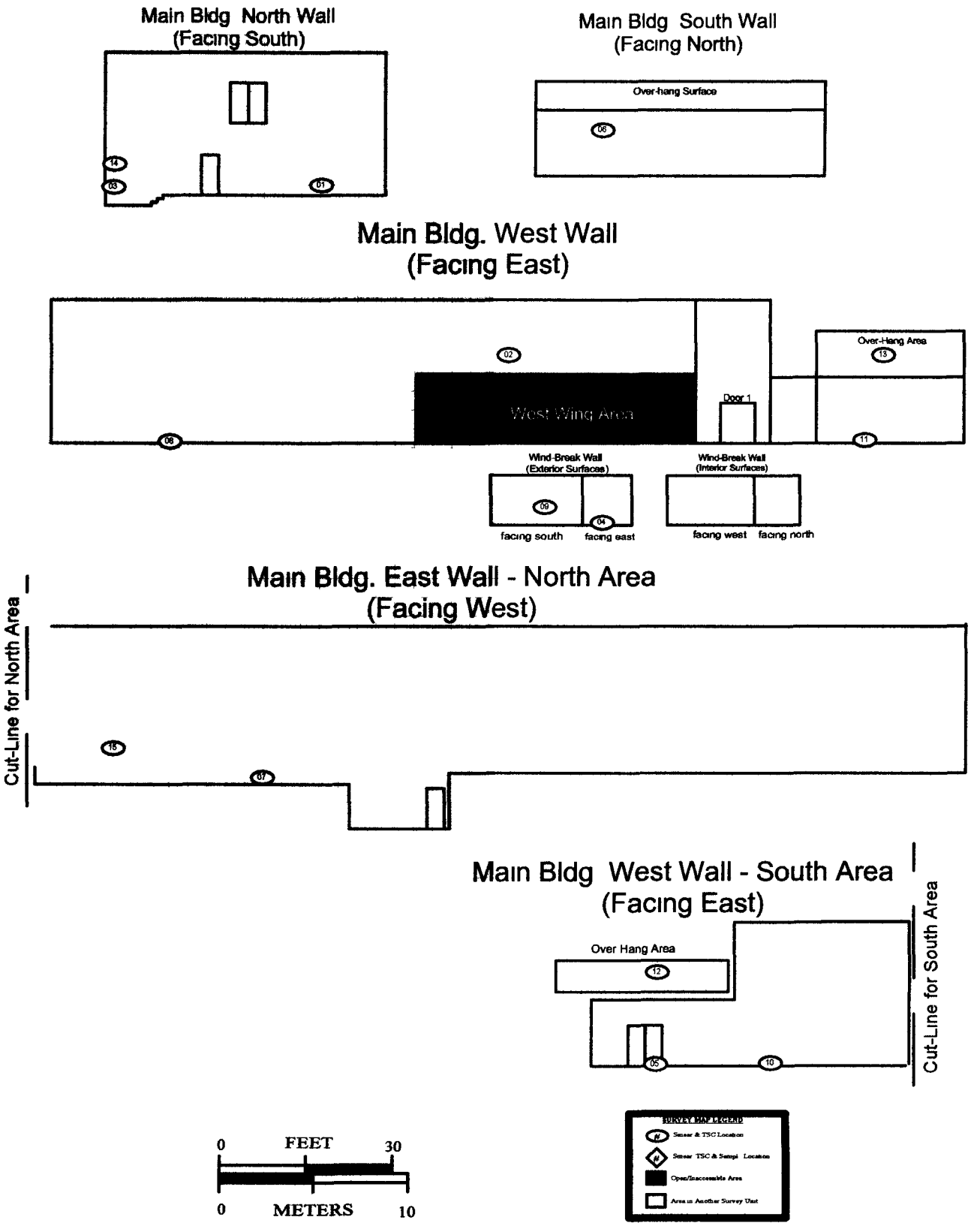


192

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

Survey Area F **Survey Unit 111-F-012** **Classification 3**
Building 111
Survey Unit Description B111 Main Ext. Walls
Total Area XXXX sq m

SURVEY UNIT 111-F-012 - MAP 1 OF 1



193

RADIOLOGICAL CHARACTERIZATION SURVEY FOR B111

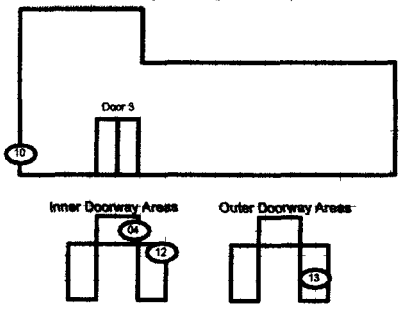
Survey Area F **Survey Unit 111-F-013** **Classification 3**
Building 111
Survey Unit Description B111 West Wing Ext. Walls
Total Area XXXX sq m

SURVEY UNIT 111-F-013 - MAP 1 OF 1

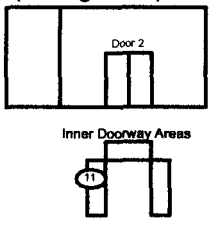
West Wing South Wall up to Auditorium
(Facing North)

Bushes Start Here
(and run west to end of map)

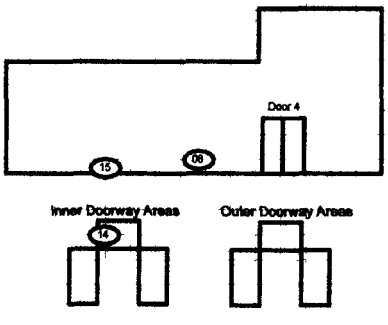
West Wing Auditorium- South Wall -Door 3 Area
(Facing North)



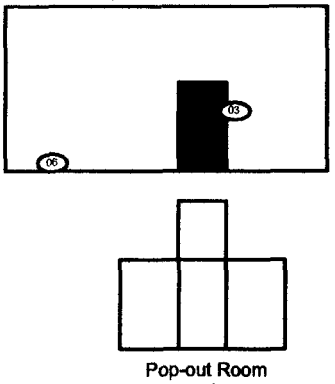
West Wing South Wall -Door 2 Area
(Facing North)



West Wing Auditorium. North Wall
(Facing South)

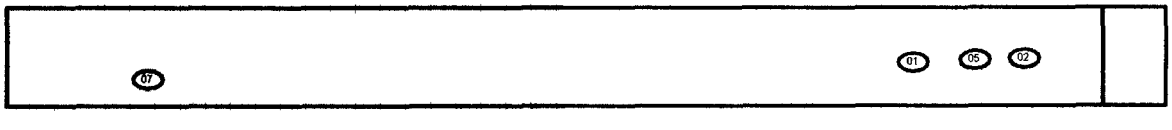


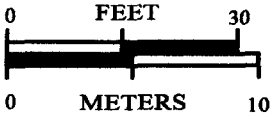
West Wing Auditorium West Wall
(Facing East)

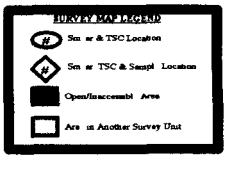


Pop-out Room
(all surfaces)

West Wing North Wall up to Auditorium
(Facing South)







194

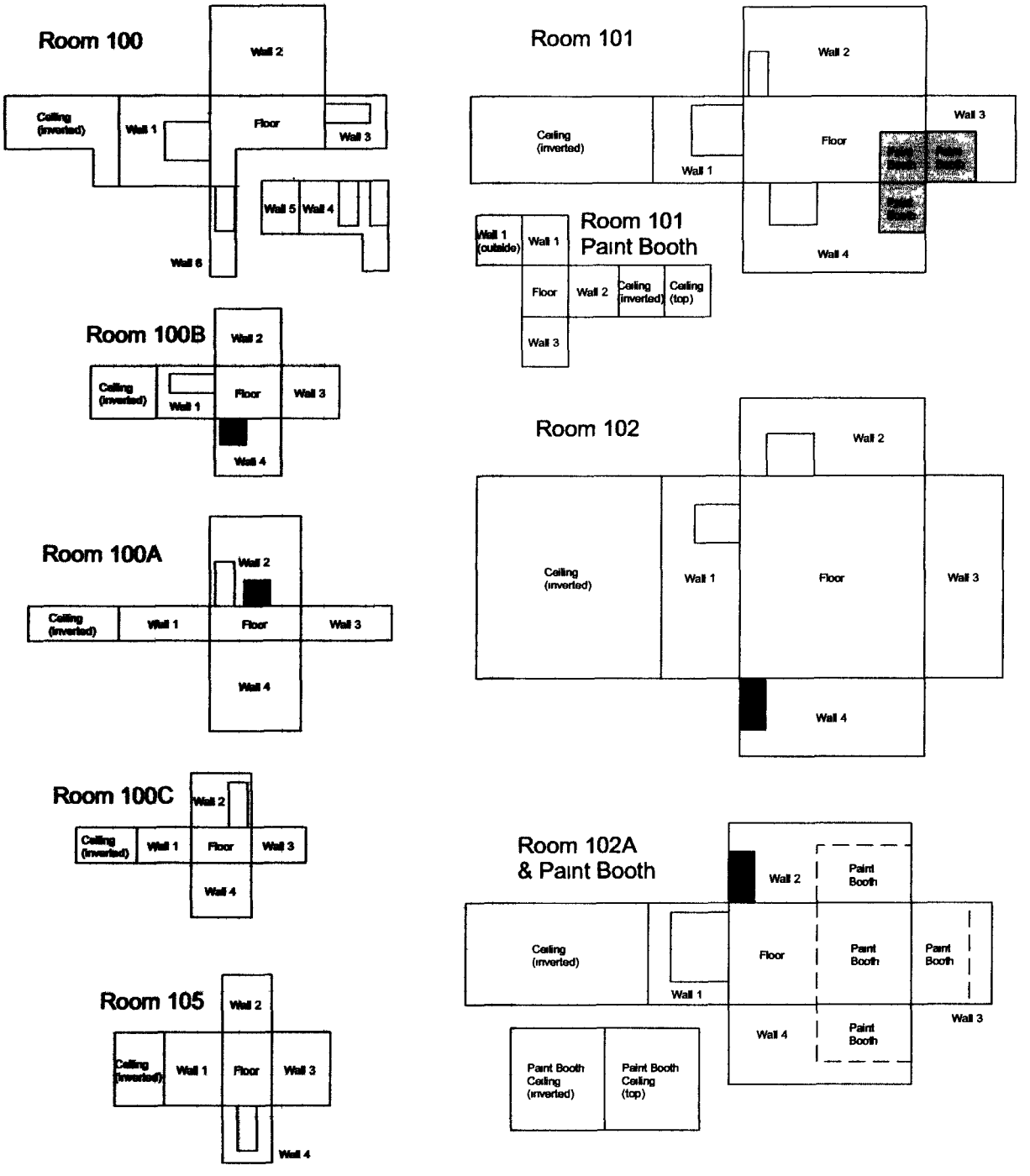
[redacted] ATION SURVEY FOR B333

333-A-001 Classification: 3

Shop

MAP ID: [redacted]

[redacted] A-001 - MAP 1 OF 1



[redacted]

[redacted]

[redacted]

195

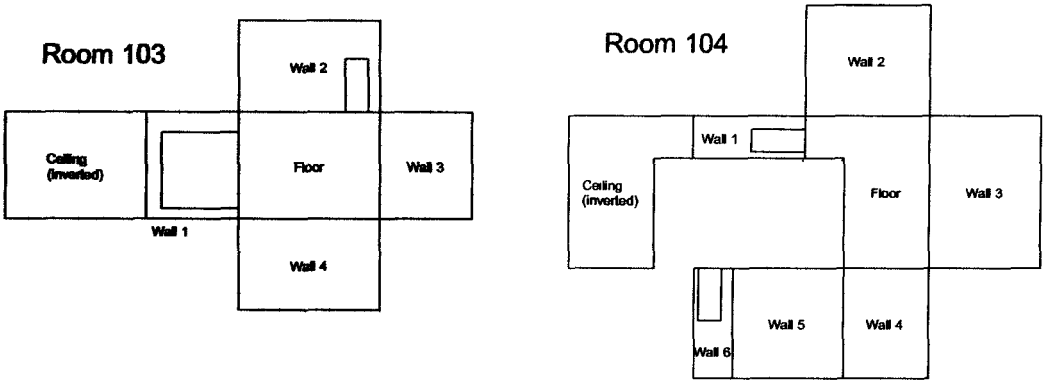
[redacted] **ERIZATION SURVEY FOR B333**

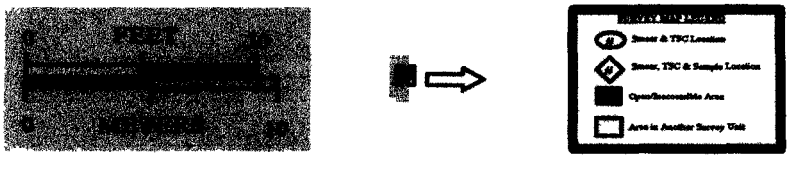
Unit: 333-A-002 **Classification: 3**

Sand Blast Area

[redacted]

[redacted]3-A-002 - MAP 1 OF 1





196

[redacted] ZATION SURVEY FOR B333

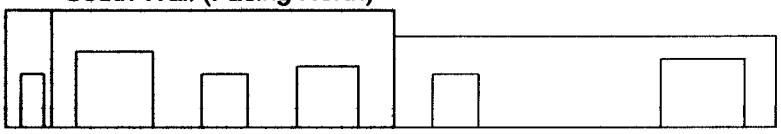
[redacted] 333-B-003 Classification. 3

[redacted] rior Walls

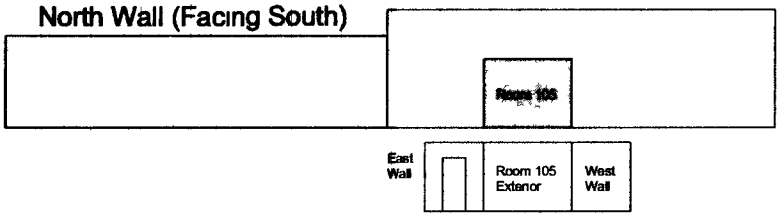
[redacted]

[redacted] B-003 - MAP 1 OF 1

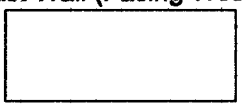
South Wall (Facing North)



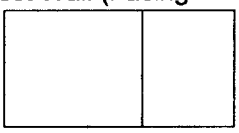
North Wall (Facing South)



East Wall (Facing West)

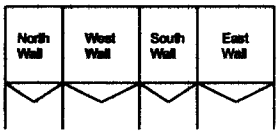


West Wall (Facing East)

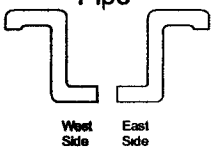


Sandblasting Equipment

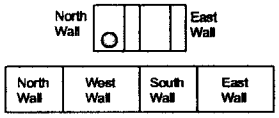
North Side



Pipe



South Side



[redacted]

[redacted]

[redacted]

197

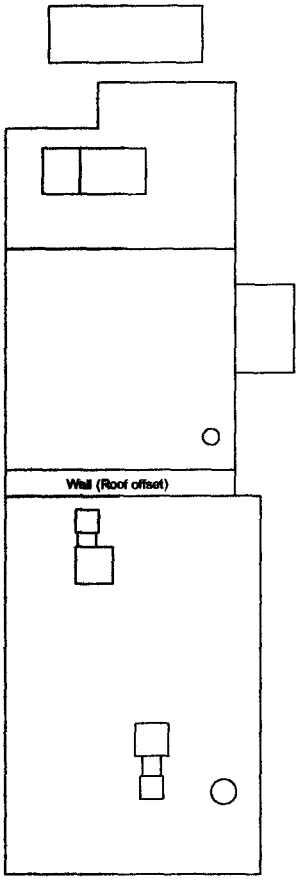
[redacted] ZATION SURVEY FOR B333

[redacted]: 333-C-004 Classification: 3

[redacted] of

[redacted]

[redacted] -C-004 - MAP 1 OF 1



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N ⇨

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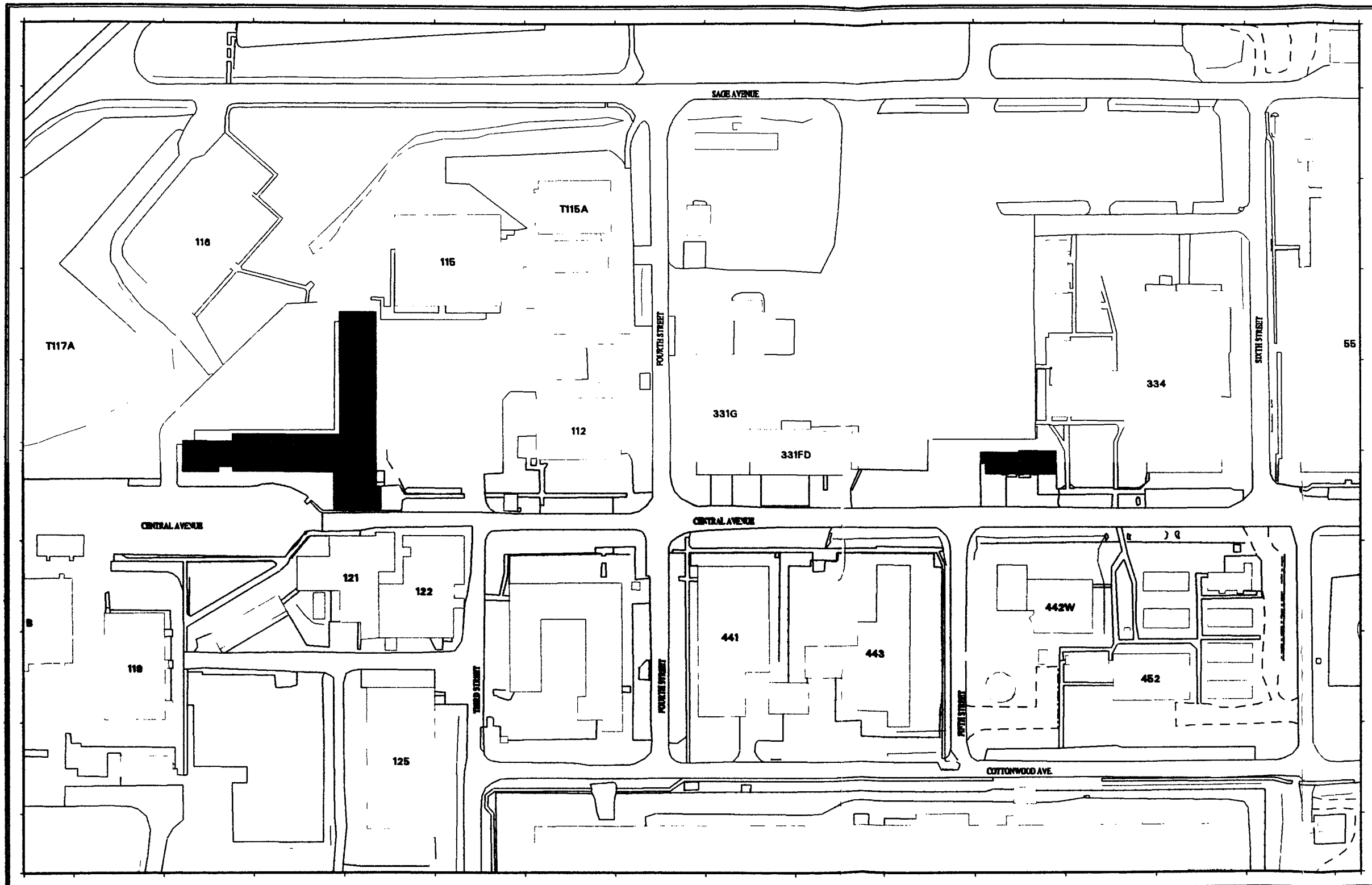
198



Rocky Flats Environmental Technology Site Base Map

(As of December 26, 2000)

Stand rd M p Feature

- Buildings nd the truc ures
- Solar Evapora Ponds (SEP)
- Lakes nd ponds
- Streams d tch or the dr inage features
- Fences nd the barriers
- Rock Flats boundary
- Paved roads
- Di roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial hydro data captured by EG&G RS Vegas.
Digitized from art-aphotographs. U

DISCLAIMER
Neither DynC IBE nor any age make any pr express ability, suitabilit fulness any information, opin disclosed, represents us could not infringe priv and rights.

Scale = 1 1730
1 inch represents approximately 144 feet

50 0 100 200

State Plane Coordinat Projection
Colorado Central Zone
Datum. NAD27

U S Department of Energy
Rocky Flats Environmental Technology Site

Prepared by:
DynCorp

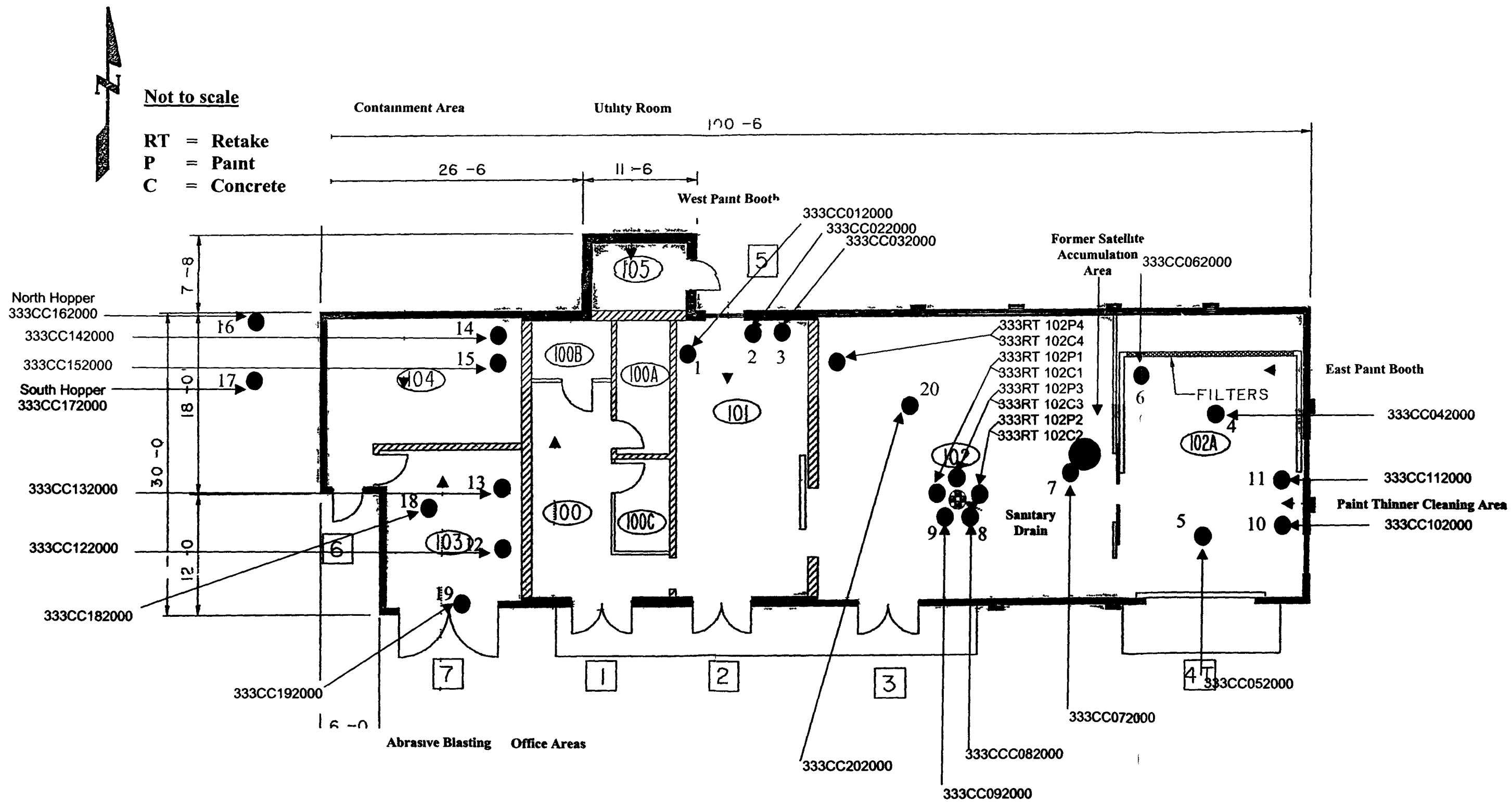
Prepared for:
KAISER HILL

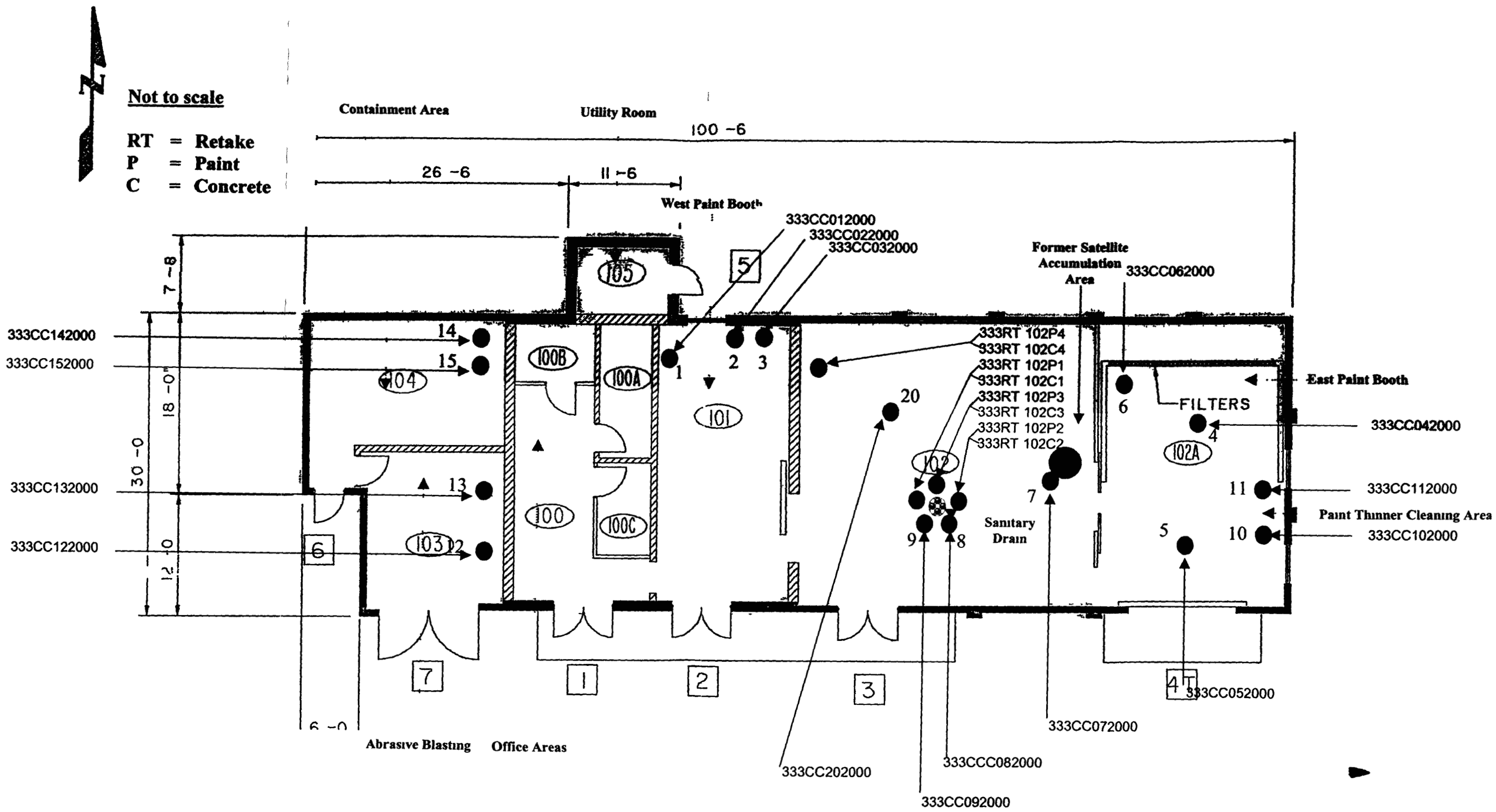
MAP ID: 01-0080

December 26, 2000

MT 8 w.ip | ets/fy2001/01 0080/b ss 111 333 mi

Building 333 Floor Plan



93

Building 333 Floor Plan