Rocky Flats Environmental Technology Site

DRAFT
RECONNAISSANCE-LEVEL CHARACTERIZATION REPORT (RLCR)

BUILDING 111 AND BUILDING 333

REVISION 0

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EXECUTIVE SUMMARY

A Reconnaissance Level Characterization (RLC) was performed to release Building 111 and Building 333 and 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, chemical and radiological hazards were assessed based on historical reviews, 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 or chemical 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 Some fluorescent light ballasts containing PCBs also exist in both buildings

Based upon this RLC, and subject to concurrence by the Colorado Department of Public Health and the Environment, both facilities are considered to be Type I facilities and can be disposed of as sanitary waste/construction debris (except for the PCB ballasts and asbestos containing material) Facility types, as defined in the Decommissioning Program Plan, are defined as follows

Type 1 facilities are considered "free of contamination"
Type 2 facilities contain no significant contamination or hazards, but are in need of decontamination
Type 3 facilities contain significant radiological contamination and/or hazards

The presence of asbestos and PCB fluorescent light ballasts does not make a facility a Type 2 as long as asbestos and ballasts are removed pursuant to Site asbestos abatement and waste management procedures

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

1.0 INTRODUCTION

As part of the Rocky Flats Environmental Technology Site (RFETS) 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 eastern 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, K-H, 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) The RLC was conducted pursuant to the RFETS Decontamination and Decommissioning Characterization Protocol (DDCP, K-H, 1999) and the Pre-Demolition Survey Plan For D&D Facilities (MAN-127-PDSP) The content and outline of this report are consistent with the Kaiser-Hill (K-H) Facility Disposition Program Manual (FDPM, K-H, 1998)

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, and
- Waste classification to enable compliant disposal

1.2 Scope

This report covers physical, radiological and chemical characterization of B111 and B333 Based on the hazards identified, the facilities were typed and assessed against waste disposal criteria Environmental media beneath and surrounding the facilities are not within the scope of this characterization Both facilities and environmental media will be dispositioned pursuant to 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

Building 111 was constructed in approximately 1953 Building 111 is located on the north side of Central Avenue, one block west of Fourth Street The size of Building 111 north-south section is approximately 50' wide by 263' long, with a Basement, Main, and 2nd Floor The Building 111 east-west section measures approximately 50' wide by 185' long and it has only one floor Building 111 contains approximately 44,046 square feet of floor space

Building 111 was designed and built as an Administration Office Facility and has always been used as such The Basement of Building 111 contained a Photography Department with several Photography Dark Rooms The Building 111 also contained a Plant Printing Shop, Basement Room 6, with all the associated printing equipment

2.1.1.1 General Construction and Foundation

Building 111 has steel reinforced poured concrete superstructure Building 111 is L-shaped building The north-south section of Building 111 is three floors, a Basement Floor, a Main Floor, and a Second Floor The east-west section of Building 111 has just one floor, Main Floor, which is the same elevation as the north-south Main Floor The Building111 Auditorium section, which was an add-on modification, has an 8" reinforced poured concrete floors and walls and roof/deck

2.1.1.2 Walls

The Building 111 exterior walls are poured steel reinforced concrete between the concrete poured concrete superstructure columns Steel framed window sections, approximately 8' wide X 8' high, on the Main Floor and Second 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 on interior walls including drywall, Transite® panels, wood paneling, wallpaper over Transite® panels or drywall

The building 111 stairway walls are steel reinforced poured concrete walls All of Building 111 stairways and handrails are constructed from steel There are several rooms on all three floors and the West Wing of Building 111 that have steel reinforced poured concrete walls Most of the hallway walls are paneled Transite® Most offices 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 Building 111 are poured steel reinforced concrete The concrete floors are 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 in Building 111 was the older 9" X 9" which is known to or suspected to contain asbestos

2.1.1.4 Ceilings

Most of Building 111 has mostly drop-ceiling type ceilings with acoustical tiles The drop-ceiling type with acoustical tiles is used in the hallways and most offices

2.1.1.5 Roof

The Building 111 has six roof sections, all of which are flat-roof design The roofs typical built-up-roof design which is 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 111 Roofs have a combined total of approximately 30 moisture relief vents Building 111 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

Building 111 has approximately 12 entrance doors, including a dock entrance on the Second Floor and a Dock entrance at the Basement level Utility Room All of the doors on Building 111 are metal fire rated doors, and they were alarmed to let security know when a door is open and/or closed at nights and on the weekends Door 1, which is on the southwest corner of the Building 111 north-south section, has a weather-protecting cover over it Doors 5, 6 and 7 also have weather-protecting covers Door 21 is a Second Floor Freight dock and double door entry The Building 111 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

Building 111 has a dedicated power transformer located in the Basement Utility Area, south section of the basement, Room 1D Building 111 is heated by Plant supplied steam High-pressure steam and condensate return lines are piped from the Steam Plant into the basement where the pressure is reduced Low-

pressure steam is piped from the Building 111 Basement Utility up to the roof Individual conditioned air (heated or cooled) pipes are dropped over the roof and down to the heat/cooling registers in all of the Building 111 offices and other areas of the building The main steam supply form the Steam Plant are labeled asbestos free, but most of the other Building 111 exterior steam lines are not labeled, therefore they could be assumed to be insulated with asbestos type insulation Most of Building 111 interior insulated pipes are labeled as to whether or they contain asbestos The entire Building 111 has a Fire Sprinkler System that is tied into the Plant's Firewater Flow Alarm System Public Address Systems speakers are located through the Administration facility

2.1.1.8 Heating, Ventilation and Air Conditioning (HVAC)

Building 111 has a Cooling Tower on the Roof Building 111 also has an air filtration ventilation system on the Roof and in the Basement Utility Area, Room 1A Building 111 has two large steam/cooling heat exchangers mounted on the roof for heating and/or cooling the building's ventilation air The Building 111 ventilation air has two large air-blowers for movement of the conditioned air throughout the entire building Inlet air for Building 111 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 now been removed and the openings are covered with plywood All of the Utility equipment 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

Building 111 was used as the Plant's main Administration Building for approximately 47 years During this time, it also housed in the Basement area, a Plant Photographic Department, a Plant Printing Department, and two or more Plant Libraries at various times For many years it provided Administration Offices for upper Plant Management and upper Department of Energy Management Offices

2.1.2.2 Current Status

There are floor plan, roof plan, and electrical, engineering drawings for Building 111 Building 111 has had all of the equipment, office cubicle walls in certain areas, and other office equipment removed, with a few exceptions Room 110, on the Main Floor of Building 111, was once a Classified Vault but the vault door has been removed The Building 111 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 Building 111 Basement, is an old Photography Vault and it still has the vault door in place The Building 111 Room 6 has a refrigerator/freezer approximately 6' wide X 4' deep X 6' high that has been left to be demolished with the building Building 111 has all of the water systems off and drained which includes the building fire sprinkler systems All of the Building 111 Fire Alarm Panels have been gutted

Currently, Building 111 has one operable telephone for emergencies All of the Building 111 restrooms have the plumbing equipment grouted off The Building 111 Main Power Transformer in Room 1D is still activated to supply power to two Basement Sump Pumps in Room 1A Building 111 is totally empty of personnel and it is approximately 98 percent deactivated All of the doors to Building 111 and currently padlocked and only supervised walkdown access is allowed

2 2 Building 333

2.2.1 Physical Description of Building of Building 333

Building 333 is located on the north side of Central Avenue, halfway between Fourth and Sixth Streets It was built in 1953 to house the Paint Shop for support to the Lump Sum Area (support to all buildings on site that do not have a paint shop in them) and has always been used as such 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 1960's When the additions were added the building increased in size from 30 feet by 30 feet to 30 feet wide by 100 feet long building

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 three feet deep The original building and the east addition contain a filtered spray booth on the eastside of each area The west side of the east addition has a large preperation area There is an overhead monorail crane to move large items from the prep area to the spray booth and the rollup truck door The west side was constructed to house a grit blast operation to surface preperation 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 grit blast room are covered with black iron sheet to a height of six feet to protect the walls from being abraded by the grit blast 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 grit 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 in 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 preperation area in the

east addition Also there is a rolling steel door between the preperation area and the spray booth in the east addition

2.2.1.7 Utilities

Utilities supplied to this building are electricity and steam 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

2.2.1.8 Heating, Ventilation and Air Conditioning (HVAC)

Heat to the building comes 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 When heat is needed 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 grit blast 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

Building 333 operations consisted of performing the various painting needs of the buildings on plant 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 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, grit blast equipment and its associated electric panels

3.0 SUMMARY OF CHARACTERIZATION ACTIVITIES

An RLC was designed to demonstrate that DOE-added radioactive materials 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 facilities can be disposed of as sanitary waste/construction debris 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 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 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), ceilings, roofing and any fixed equipment associated with the two facilities Environmental media were not considered within the project boundaries

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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

- If any radiological sample measurement exceeds the volume contamination thresholds provided in the NRA Verification Program (refer to Kaiser-Hill letter to DOE, RFFO, Application of Surface Contamination Guidelines from Department of Energy Order 5400 5 – WAH-064-98, March 10, 1998), the related volume is classified as 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 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 μg/100 cm^2, the material is considered beryllium contaminated per 10 CFR 850 31

Polychlorinated Biphenyls (PCBs)

- If material contains PCBs from the manufacturing process, the material is considered PCB Bulk Product Waste and subject to the requirements of 40 CFR 761

- If PCB contamination from a past spill/release is suspected, or if a PCB spill is discovered that has not been cleaned up, the associated material is considered PCB Remediation Waste and subject to the requirements of 40 CFR 761

- 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)

Tolerable Limits on Decision Error

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 The following criteria were used to develop the radiological survey/sampling characterization package

- Radiological field measurement methods and instrumentation are described in Section 3 0 of the site PDSP (MAN-127-PDSP)
- Radiological sampling and preparation for laboratory measurements are described in Section 3 0 of the site PDSP (MAN-127-PDSP)

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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	0
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		10	15	0
C (Roof)	333-C-004	1	3		10	15	0

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 "

Specific TSA and removable survey locations were selected using a random number generator for all facilities Scan locations were biased toward heavy foot-traffic areas and areas likely to collect airborne particulates 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

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 metals roofs and walls of trailers, an investigation was performed to verify the presence of Po-210 versus DOE-added radioactivity Po-210 is a radon progeny that selectively oxidizes to metal surfaces This phenomenon has been observed on other structures at RFETS, and has been demonstrated at other nuclear facilities The elevated roof activity was dispositioned per **DISCUSS THE AP2 HERE**

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

Asbestos: Some historical asbestos inspection data exist for Building 111, and no historical data exist for Building 333 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 I 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

Ten 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 needed to be sampled for toxic metals and/or volatile organics, including locations in the B111 photographic laboratory where spill occurred, the floor of the B333 paint shop where multiple paint spills occurred 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 and other metals, 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 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 B333 floor contains multiple layers of paint When there was a paint spill onto the floor, the paint was used to add another layer Some of the paint contained lead and other metals, and therefore, the concrete could exhibit hazardous waste characteristics Therefore, 15 core samples 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, one from the containment in Room 104, and 1 duplicate) Under routine characterization of other Type 1 facilities, sampling of paint on floors would not be necessary, however, because of the very thick paint layers in this particular building, K-H Environmental Systems and Stewardship concluded that application of a bulk debris rule to the concrete slab is not appropriate (see Environmental/Waste Compliance Guidance No 27, *Lead Based Paint (LBP) and LBP Debris Disposal and* 40 CFR 257 and 258)

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 were painted much less frequently (less impacted by painting operations) and that the wall materials would not exhibit hazardous waste characteristics Therefore, sampling of walls is not necessary (refer to

Environmental Waste Compliance Guidance #27, *Lead-based Paint (LBP) and Lead-based Debris Disposal*)

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

Four samples of 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 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

Polychlorinated Biphenyls (PCBs)

Based on historical knowledge, several PCB issues needed to be evaluated, including the potential of PCB contamination around the B111 transformer (111-1), the potential of PCBs in the hydraulic fluid used in the elevator lift system, the potential presence of PCBs on floor paints in the B333 paint shop, 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
-- 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

There are multiple layers of paint on the B333 floor (from paint spills), and some of the paint may contain PCBs PCBs were historically added to paints applied to thermally hot surfaces PCB concentrations in the concrete floor may make the concrete subject to TSCA regulation Under routine characterization of other Type 1 facilities, sampling of paint on floors would not be necessary, however, because of the very thick paint layers in this particular building, K-H Environmental Systems and Stewardship concluded that application of a bulk debris rule to the concrete slab is not appropriate (see Environmental/Waste Compliance Guidance No 27, *Lead Based Paint (LBP) and LBP Debris Disposal,* and 40 CFR 257 and 258) Therefore, the 15 samples of concrete analyzed for RCRA constituents also were analyzed for PCBs In addition, the 4 samples of abrasive blasting waste were analyzed for total PCBs

Based on visual observations, the walls were painted much less frequently than the floors (i e , they were not impacted by paint spills) therefore the wall materials are subject to the debris rules previously discussed

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 sections 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 values provided in DOE Order 5400 5 and the RFETS Radiological Control Manual Some of the exterior survey units had some total surface activity measurements above the surface contamination values These results were suspected to be elevated due to naturally occurring radioactive material (NORM), specifically Po-210, deposited on the roof surface AP-2 results validated the presence of Po-210 and the absence of DOE-added material Radiological hazards are summarized in Table 4-1 and in the text below by facility Edit based on latest data

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

- Asbestos
- Beryllium,
- Lead and other metals,
- VOCs/SVOCs,
- 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 PCM-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

Physical hazards associated with B111 and B333 consist of those common to standard industrial environments and include hazards associated with energized systems, utilities, and trips and falls There are no unique 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

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?
Radiation	Field measurements were performed on B111 and B333, including AP-2 measurements on the B111 roof and carpeting 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 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
Lead in paint	No sampling is required for waste disposal, except for the floor in B333 (see Section 3 3)	RLC	Yes
PCBs	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 Light ballasts in B111 and B333 were inspected to identify PCB-containing and leaking ballasts No sampling for PCB in paint is required, except for the floor in B333 (see Section 3 3)	RLC	Yes

4.1 B111

4.1.1 Radiological Hazards

The RLC (serving also as the PDS) confirms that B111 (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 Some of the exterior survey units had some total surface activity measurements above the surface contamination values These results were suspected to be elevated due to naturally occurring radioactive material (NORM), specifically Po-210, deposited on the roof surface AP-2 results validated the presence of Po-210 and the absence of DOE-added material 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 Edit based on latest data

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

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 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

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 μg/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

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 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

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 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

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 are contained in the B111/B333 Closure Project RLC file

Historical data and process knowledge give no reason to suspect that any specialized paints or coatings containing PCBs were applied to any of the painted surfaces within B111 However, Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761 3 and 40 CFR 761 62 paragraph (b), and therefore, need not be sampled as long as restrictions outlined in 40 CFR 761 62 regarding their disposition are met

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 Some of the exterior survey units had some total surface activity measurements above the surface contamination values These results were suspected to be elevated due to naturally occurring radioactive material (NORM), specifically Po-210, deposited on the roof surface AP-2 results validated the presence of Po-210 and the absence of DOE-added material Refer to Attachments N – Q, R and T, and the B111/B333 Closure Project RLC file Edit based on latest data

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

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 contaminated Data are included in the B111/B333 Closure Project RLC file

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

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

4 2.2.4 PCBs

Analytical results indicate that B333 is not contaminated by PCBs PCB concentrations in the concrete floor were well below 25 ppm, which has been used as the agency-approved cleanup criterion for previous RFETS remediation projects (e g , Proposed Action Memorandum RF/ER-95-0066 UN) Metal concentrations in the abrasive blasting waste were also well below 25 ppm, which confirms that building surfaces are not contaminated, and indicates that the interior and exterior abrasive blasting equipment are not contaminated Data are included in the B111/B333 Closure Project RLC file

Historical data and process knowledge give no reason to suspect that any specialized paints or coatings containing PCBs were applied to any of the non-floor surfaces within B333 However, Environmental Waste Compliance Guidance #25, *Management of Polychlorinated Biphenyls (PCBs) in Paint and Other Bulk Product Waste During Facility Disposition*, has directed that applied dried paints, varnishes, waxes, or other similar coatings or sealants are acceptable for disposal (with notification) in a non-hazardous solid waste landfill as PCB Bulk Product Waste under 40 CFR 761 3 and 40 CFR 761 62 paragraph

(b), and therefore, need not be sampled as long as restrictions outlined in 40 CFR 761 62 regarding their disposition are met

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 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 All wastes can be disposed of as sanitary waste, except asbestos containing material and PCB ballasts There will be no radioactive or hazardous waste Asbestos and PCB ballasts will be managed pursuant to Site asbestos abatement and waste management procedures

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

Facility	Concrete	Wood	Metal	Corrugated/ Sheet Metal	Wall Board	ACM	Other Waste
B111	43,500 cu ft	1,000 cu ft	10,000 cu ft	1,000 cu ft	1,000 cu ft	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 - 8,000 linear feet Exterior window caulking - 1,000 individual windows Roof flashing above auditorium - 500 sq ft Roof patches - 400 sq ft	Fiber glass insulation - 1,000 cu ft Carpet - 13,000 sq ft
B333	4,500 cu ft	None	1,000 cu ft	50 cu ft	37 cu ft	Thermal system insulation - 300 liner feet White caulking compound and tape - 50 sq ft Roof flashing - 500 sq ft	Paint booth filter media – 27 cu ft Cement block - 2,200 cu ft

6.0 DATA QUALITY ASSESSMENT (DQA)

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 applicable K-H corporate policies (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 RLCR 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 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
- Appendix N, Data Validation using Data Descriptors

DQA was performed on measurement and sample results obtained from the Survey Units listed Table 3-1 These Survey Units are traceable to specific building locations

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 three subsets

1 Radiological scans,
2 Static surveys for removable and total contamination, and
3 Analytical data resulting from samples taken

Consistent with similar PDS reports at the RFETS, verification will confirm the following

- 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 will also address 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 RLC

6.3 Validation Of Results

Validation consists of a technical review of all data that directly support the PDS decisions, so 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

1 The DQOs of the project as defined in Section 3 1 (i e , did the final data achieve the initial DQOs of the project?), and
2 Quality criteria discussed throughout various sections in the MARSSIM (sections noted previously)

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 DPP classification criteria are defined as follows

- **Type 1** facilities are considered "free of contamination"
- **Type 2** facilities contain no significant or contamination or hazards, but are in need of decontamination The extent of contamination is such that routine methods of decontamination should suffice and only a moderate potential exists for environmental releases during decommissioning
- **Type 3** facilities contain significant contamination and/or hazards

B111 and B333 are classified as Type 1 facilities These facilities are not contaminated, and present no radiological or physical hazards The facilities contain asbestos and PCB ballasts However, the presence of asbestos and PCB fluorescent light ballasts does not make a facility a Type 2 as long as asbestos and ballasts are removed pursuant to Site asbestos abatement and waste management procedures

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

8.0 REFERENCES

ANSI-N323A-1997, *Radiation Protection Instrumentation Test and Calibration*

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

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

DOE Order 414 1A, "Quality Assurance "

EG&G, 1995 *Technical Memorandum No 2, OU 12, 400/800 Areas*, February 1995

EPA, 1994 "The Data Quality Objective Process," EPA QA/G-4

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, 1999 Decontamination and Decommissioning Characterization Protocol, MAN-077-DDCP, Rev 1, June 19, 2000

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

K-H, 2000a Reconnaissance Level Characterization Package for Group B Trailers, Rev 0, IWCP Work Control No T0102834, February 2000

K-H, 2000b Characterization Package for Sampling and Analysis of Roofing Material from Groups B & C for Isotopic Analysis, March 16, 2000

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*

RF/RMRS-97-044, Closeout Report for the Source Removal of Polychlorinated Biphenyls, RMRS, July 1997