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INTEROFFICE MEMORANDUM

TO Kent Dorr, K-H Project Management, Bldg T130F, X6034

FROM Doug Steffen, RMRS Project Management, Bldg T130F, X2164

DATE May 22, 1997

SUBJECT DOCUMENT TRANSMITTAL PROPOSED ACTION MEMORANDUM FOR THE DECOMMISSIONING OF BUILDING 123, REV 1

Attached are six (6) copies of the subject document Comments, which have been received from K-H, DOE and CDPHE via meetings and marked-up copies of Revision 0, have been incorporated

Cc (with attachment)
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Mary Aycock
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Project File

PROPOSED ACTION MEMORANDUM FOR THE DECOMMISSIONING OF BUILDING 123

May 21, 1997

Revision 1
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PROPOSED ACTION MEMORANDUM FOR THE DECOMMISSIONING OF BUILDING 123

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ACRONYMS

ACM	Asbestos Containing Material
ALARA	As Low As Reasonably Achievable
ARAR	Applicable or Relevant and Appropriate Requirements
BRCS	Building Radiation Cleanup Standard
CFR	Code of Federal Regulations
CCR	Colorado Code of Regulations
CDPHE	Colorado Department of Public Health and the Environment
CHWA	Colorado Hazardous Waste Act
CERCLA	Comprehensive Environmental Response and Liability Act
COC	Contaminates of Concern
DOE	Department of Energy
DPP	Decommissioning Program Plan
ED	External Dosimetry
EDE	Effective Dose Equivalent
GSA	General Services Administration
HPI	Health Physics Instrumentation
HRR	Historical Release Report
HUD	Housing and Urban Development (US Department of)
IH	Industrial Hygiene
IHSS	Individual Hazardous Substance Site
IWCP	Industrial Work Control Plan
LLM	Low Level Mixed Waste
LLW	Low Level Waste
MCL	Maximum Concentration Limit
mrem	millirem
MARSSIM	Multi-Agency Radiological Site Survey and Site Investigation Manual
NEPA	National Environmental Protection Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NRC	Nuclear Regulatory Commission
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
PCB	Polychlorinated Biphenyl
PAM	Proposed Action Memorandum
QA/QC	Quality Assurance/Quality Control
RMMA	Radioactive Material Management Area
RCA	Radiation Control Area
RWP	Radiation Work Permit
RLCR	Reconnaissance-Level Characterization Report
RCRA	Resource Conservation and Recovery Act

RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RMRS	Rocky Mountain Remediation Services
SAP	Sampling and Analysis Plan
SAA	Satellite Accumulation Area
SARA	Superfund Amendments Reauthorization Act
TBC	To-Be-Considered
TLD	Thermoluminescent Dosimeter
TSD	Treatment Storage Disposal
UBC	Under Building Contamination
WSRIC	Waste Stream Residue Identification Characterization

1.0 PURPOSE

This Proposed Action Memorandum (PAM) outlines the approach that will be taken and the applicable requirements that will be utilized in the decommissioning of Buildings 123, 113, and 114 as part of the site cleanup of the Rocky Flats Environmental Technology Site (RFETS) This action will be conducted as a non-time critical interim remedial action under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), and is in keeping with the Site's Ten Year Plan

The removal of the subject buildings is being conducted in accordance with the Rocky Flats Cleanup Agreement (RFCA) (DOE, 1996) and the applicable or relevant and appropriate requirements (ARARs) of Federal, State, and local regulations The management structure and scheme of this action is identified in the Decommissioning Program Plan (DPP), currently in draft, and the regulatory requirements are implemented through RFETS policies and procedures This action will be conducted in a manner which is protective of site workers, the public, and the environment and will utilize the site's Integrated Safety Management

2.0 PROJECT DESCRIPTION

This project will provide for the decommissioning of Buildings 123, 113, and 114 at Rocky Flats Environmental Technology Site, will eliminate one Individual Hazardous Substance Site, and partially close RCRA Unit 40 Items that are specifically covered by this PAM include demolition of the subject buildings, remediation of Individual Hazardous Substance Site (IHSS) 148, cleanup of under-building-contamination, partial closure of RCRA Unit 40 (buried process waste line sections P1, P2, and P3), decontamination of facility systems contaminated radiologically The Building 123 slab and foundation will be removed as required to remediate contamination beneath the building as dictated by sampling results In addition to these PAM-covered actions, there are preparation activities which are mentioned in this document to provide the reader with the full breadth of building removal activities These other activities include relocation of the building tenants, removal of furniture, equipment, and excess chemicals, characterization of the building hazards and contamination, and removal of all asbestos-containing material (ACM)

2.1 Background

Building 123 has housed analytical laboratory, dosimetry and instrument calibration functions since its construction in 1953 These activities are still being carried out in the building at this time However, the building is scheduled for removal as part of the RFETS Ten Year Plan and the building occupants, along with their functions are being relocated

During the past 44 years, building operations resulted in some radioactive and chemical contamination within the building For example, interviews with Building 123 occupants indicate that liquid containing cesium was spilled on the concrete floor in Room 109C The floor was sealed to immobilize the contamination The spill occurred in the late 1960's or early 1970's Also, leaks or spills have potentially contaminated the soil adjacent to and beneath the building (see Sections 2 1 1 through 2 1 3) Potential soil contamination has resulted in three area designations, 1) RCRA Unit 40, 2) IHSS 148, and 3) UBC 123 These are briefly described below

2.1.1 RCRA Unit 40

Sections of the process waste system associated with Building 123 (Sections P1, P2, and P3) are part of RCRA Unit 40 Building 123 was serviced by a process waste line of four-inch diameter buried beneath the north and east wings of the building The pipe was probably constructed of iron and was not double-contained Site personnel, with knowledge of this line, feel it probably leaked without them being aware of the leaks at the time (Historical Release Report for Rocky Flats Plant, June 1992 [HRR]) The original process waste line from Building 123 led to an underground tank system behind Building 441 From this tank system, the process wastes were pumped out for treatment The types of waste carried by the pipe consisted of laboratory wastes from analyses of urine, fecal and other bioassay samples Nitrates and low levels of radionuclides were associated with the waste carried in the process waste line

The original buried process waste lines were replaced prior to 1975 by either overhead lines or double-contained sections Abandonment was documented by completed engineering drawings Sections of the overhead waste system were subsequently replaced in 1995 The sections that were removed in 1995 were tested to determine how they should be managed Contamination was not found and the pipe sections were disposed in the onsite sanitary landfill The various sections of the waste system, including information on when the lines were replaced or abandoned, are shown in Figure 2-1

The overhead lines in the building will be sampled in July to define the degree of

contamination in the waste system Closure of RCRA Unit 40 will be conducted in accordance with the Site's Part B RCRA permit, utilizing the section on closures of piping sections, with documentation being submitted to the State in correspondence and in the administrative record prior to commencing

2.1.2 IHSS 148

Leakage from the process waste line and possible spills from operations in the building have potentially resulted in contaminated soil beneath and adjacent to Building 123 This contaminated soil has been designated Individual Hazardous Substance Site (IHSS)148 Interviews conducted in connection with the HRR, indicated that several small spills of nitrate-bearing wastes occurred around the outside of Building 123 These wastes could also have contained radionuclides Sampling of the area directly adjacent to the building provided no indication of any contamination (HRR) If present, such contamination would be limited to the area beneath and adjacent to the area where nitrate-bearing wastes were handled, and not necessarily under the entire building As discussed in the sampling and analysis plan for the soil beneath Building 123, core samples of the building slab and the soil beneath the slab will be taken to determine whether contamination exists and whether remediation of the slab and/or soil is required

2.1.3 UBC 123

Soil beneath identified buildings at the RFETS may have become contaminated due to the nature of the activities within those buildings In many Site buildings, indoor unplanned events and routine escapes have led to under building contamination (UBC) Leaking process waste lines also have been a source of contamination UBC 123 was identified in the HRR That document indicates that waste chemicals from the laboratory, such as nitric acid, were sometimes disposed out the window during the early years of plant operation This activity could have led to the presence of non-radioactive pollutants under the building In addition, the Health Physics Laboratory generates low-level radioactive and chemical liquid waste Leaks in the process waste line could have contributed to contaminated soil beneath the building

Removal of the Building 123 structure will make available, for final remediation, possible contamination beneath the building (including IHSS 148 and UBC 123) and partial closure of RCRA Unit 40 As discussed in Section 2 1 2, sampling beneath the building will be conducted once the building superstructure is removed Contaminated soil will be removed and prepared for disposal off site, should results indicate that such actions are necessary Low-level radioactive waste will be disposed at the DOE Nevada Test Site, while mixed waste

will be sent to the Envirocare facility at Clive, Utah

2.2 History of Buildings 123, 114,113, and 123S

2.2.1 Building 123

Building 123 was one of the first ten buildings constructed at Rocky Flats The building has always been used as an analytical laboratory and a dosimetry facility It also provides office space for radiation health specialists, storage for all radiological health records, a laboratory for calibration and repair of criticality alarms and other repair/calibration shops In the past, the building also housed medical research until those activities were relocated to Building 122

Building 123 is located on Central Avenue between Fifth and Fourth Street (Figure 2-2) Figure 2-3 shows the location of the building relative to other RFETS facilities. The building was built in three segments, the main section being completed in 1953, The west wing was added in 1968, and the computer room (located on the south east corner) in the 1970's. This facility covers approximately 19,000 square feet and is a single level building constructed on grade with approximately 14 foot ceilings Construction material is mostly concrete with a built-up asphalt roof A floor plan of the building is provided in Figure 2-4

The operation of the analytical laboratory generates approximately 95 percent of the building waste and stores the majority of hazardous chemicals, with minor contributions from the External Dosimetry (ED) and Health Physics Instrumentation (HPI) Sections Standard utility services have also generated small amounts of waste in the past

The analytical laboratory analyzes environmental (air, water, soil, and vegetation), biological (urine, fecal material, and nose swipes), health physics,(room air), and industrial hygiene samples (beryllium and organic vapors in room air), while the HPI Section repairs and calibrates radiation-detection instruments The ED Section processes the Thermoluminescent dosimeters (TLD's) and film badges The Radiological Records Section maintains occupational radiation exposure and dose records for radiation workers

The analytical laboratory procedures involve digesting samples to purify and concentrate the radiological constituents These sample preparation operations generated the bulk of the building waste Combustibles, rubber gloves, and broken glass generated in the Radioactive Materials Management Areas (RMMAs) were placed in accumulation areas for eventual handling and removal as low-level waste Some sample waste and rinse solutions were washed down the process drain for subsequent treatment in Building 774 (in Building 374 after 1983) Liquid organic wastes were placed in special bottles and stored in satellite accumulation areas

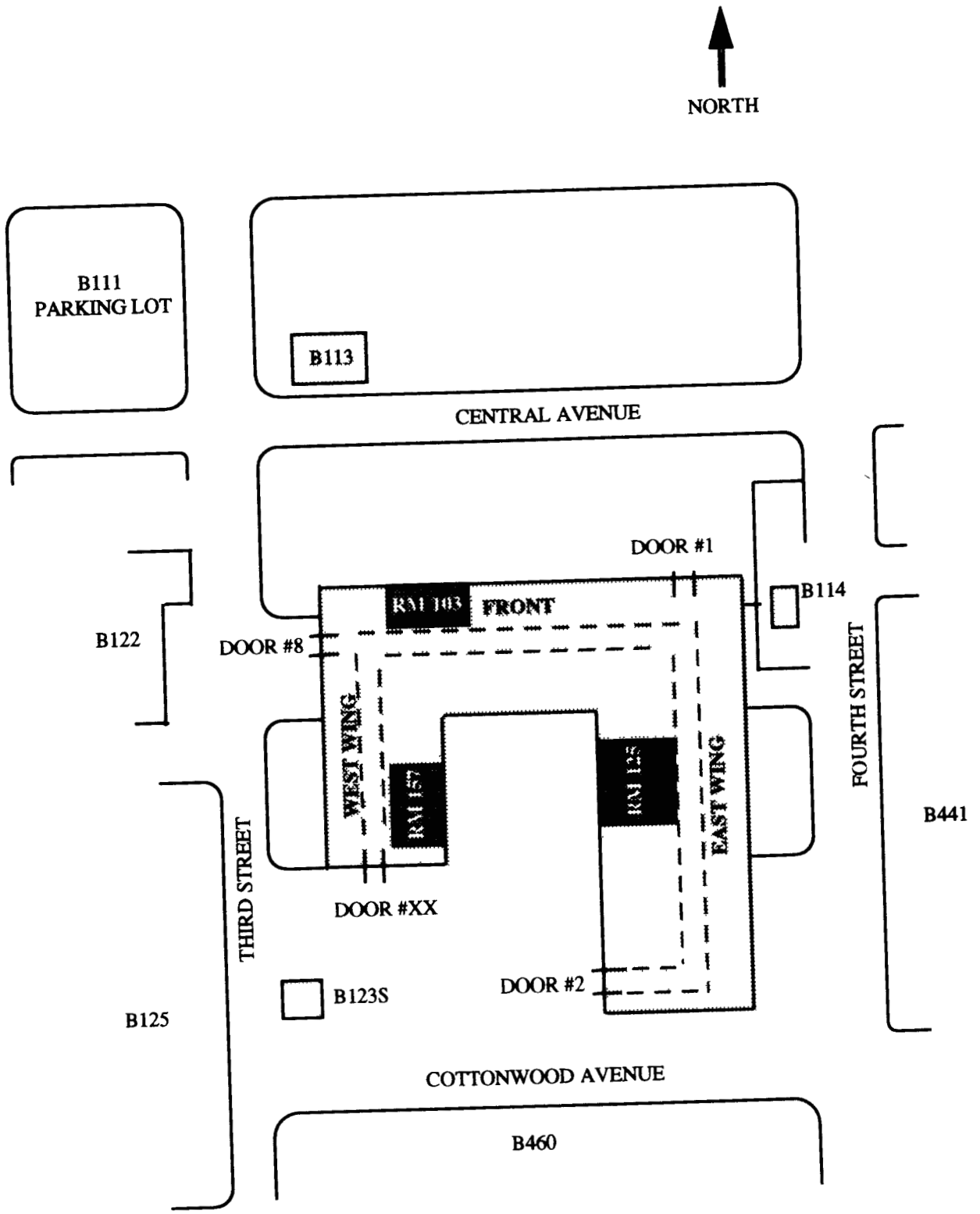


Figure 2-2 Building 123 Site Location

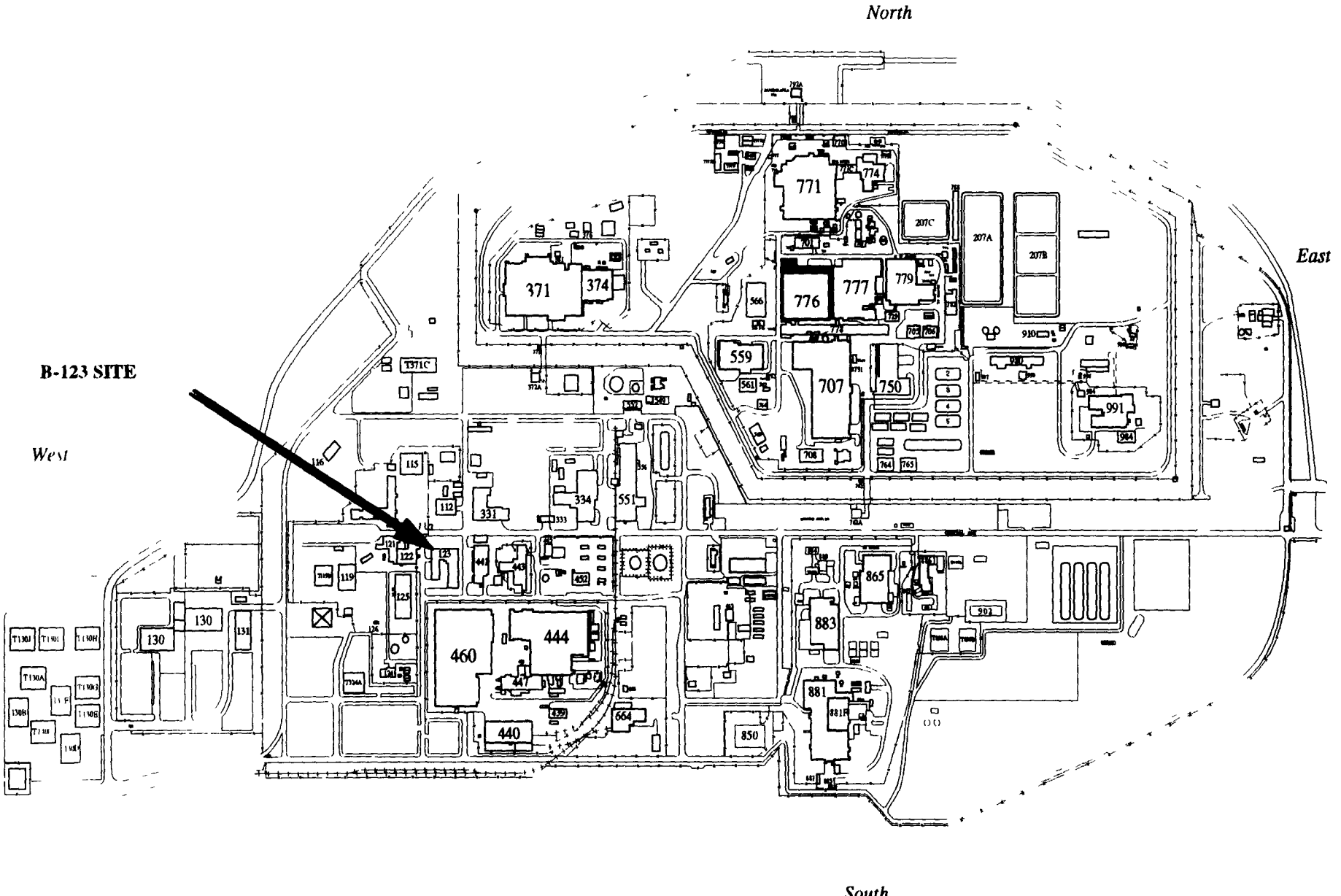


Figure 2-3 - Site Map

prior to transfer to the RCRA 90-day storage building and eventual shipment to Liquid Waste Operations RCRA wastes were also collected in Satellite Accumulation Areas, located in rooms 103A, 124, 125, 127, and 156 Wastes generated in non-RMMAs and monitorable lab trash were deposited in dumpsters for disposal in the RFETS landfill

As part of the RFCA process, and based on documentation which exists for operations in the building, a Reconnaissance Level Characterization Survey has been conducted to determine the potential for hazardous and radioactive contaminants in the building The results of this survey are given in Section 2 3 of this document Based on this preliminary investigation, the majority of Building 123 is considered to be "unaffected" (low potential for hazardous or radiological contamination) based on operational and process history The following rooms were previously, or currently, posted as Radiation Control Areas or RMMAs and are, therefore considered to be "affected" (potential for low-level contamination) and will require a more detailed survey prior to decommissioning Rooms 103A, 105, 112, 123, 124, 125, 126, 127, 135, 149, 155A, 156, 157, 158, and 163 (see Section 3 2 2)

In addition to radiological surveys, sampling and analysis will be done for the presence of beryllium, asbestos, lead, PCBs, and other potential contaminants Results from these surveys are summarized in Section 2 3. Hazardous chemicals associated with Building 123 operations included nitric acid, hydrochloric acid, hydrofluoric acid, oxalic acid, ammonium hydroxide, formic acid, perchloric acid, toluene, isopropyl alcohol, ammonium thiocyanate, methanol, mercury, lead, cadmium, beryllium, sodium hydroxide, and potassium permanganate Chemicals and waste materials are scheduled to be removed from the building prior to decommissioning

2.2.2 Building 114

Building 114 is a small shelter used by Site employees while they are waiting for their rides to go home The building encloses about 25 square feet It is constructed of masonry blocks with a flat roof There are no utilities associated with this building It was never used for anything other than a shelter

2.2.3 Building 113

Building 113 is a guardhouse that has been converted to office space (see Figure 2-1) Constructed of concrete with a flat roof, this building is similar to the four other guardhouses already removed at Rocky Flat No internal processes were located in this building A reconnaissance level characterization survey of this building has been conducted Issues to be addressed with this building will be the bulletproof glass and the potential for lead-based paint

on the blinds No asbestos or PCB issues could be identified other than PCB potential in the light ballast

2.2.4 Building 123S

Building 123S is a metal shed on a concrete slab The shed encloses approximately 60 square feet It was formerly used as a RCRA 90 day storage area by the laboratories in Building 123 Organic wastes such as toluene and DDCP were stored there The facility has been closed for approximately one year No waste or other material is currently stored in the shed. There are no utility hookups to the building A visual inspection of the shed did not reveal any hazards associated with the structure

2.3 Building Hazard Summary

The reconnaissance-level characterization survey identified no significant hazards associated with Buildings 113 and 114 Therefore, this discussion focuses on Building 123 Building 123 has approximately 75 rooms or areas which are utilized as laboratories, dosimetry areas, calibration areas, storage for records and equipment, and office space Potential hazards in the building are summarized below in Figure 2-5 These hazards were identified by a review of the facility's documents and a walk down of the building by project personnel, assisted by building personnel knowledgeable of the facility's past

Most of the potential hazards identified during the reconnaissance-level characterization survey will be removed or eliminated during the preparatory activities prior to this project

- All ACM will be removed by a separate licensed contractor prior to building decommissioning
- The fluorescent light ballast will be sampled for PCBs prior to building decommissioning Should the ballasts contain regulated levels of PCBs, they will be removed by the decommissioning contractor and packaged and shipped to a TCSA-regulated disposal facility by RFETS Waste Management
- The liquid nitrogen system will be deactivated and the pressurized cylinders removed at the time the building tenants are relocated
- Laboratory chemicals will be removed when the building tenants are relocated
- Any material left in the building after the tenants depart will be addressed as part of this project
- Once the buildings are ready for decommissioning, utilities and facility safety systems will be disconnected by Plant Power and Maintenance

Figure 2-5
Contaminants of Concern (COC)

COC	Location	Implementation
Asbestos Containing Material (ACM)	Present in floor and ceiling tiles, wall board, and on piping in most rooms	To be remediated by a State certified Asbestos Abatement Contractor See section 2 3 1
Beryllium	Rooms 111&112	See section 2 3 2
Chemicals	Chemicals utilized in laboratory work have been identified	All Chemicals will be gathered and removed from the building by the chemical handling group prior to any decommissioning See section 2 3 3
RCRA hazardous waste in Satellite Accumulation Area (SAA)	Rooms 103A, 124, 125, 127, and 156	Each waste stream will be handled for its hazardous waste components See section 2 3 4
Perchloric acid fume hoods	Present in room 157, 127, 112, and 105	See section 2 3 5
Pressurized gas cylinders and liquid Nitrogen	In laboratory areas	See section 2 3 6
Polychlorinated biphenyls (PCBs)	Fluorescent light ballasts	See section 2 3 7
Radiological Contaminated Materials	Found in piping, in room 109B, and on hoods and laboratory counter tops	See section 2 3 8
Metals Arsenic, Cadmium, Lead Lead-based Paint, & Silver	Lead bricks and shielding, lead base paint, lead and silver solder, NiCd and lead acid batteries, and silver from negatives	See section 2 3 9

2.3.1 Asbestos

Asbestos Containing materials (ACM) were inspected by a State certified inspector the week of April 7, 1997 This inspection is documented in Asbestos Characterization Report Addendum to Building 123 Inspection (April 1997) The inspection and evaluation was conducted in accordance with the guidelines specified in Asbestos Hazard Emergency Response Act (AHERA) and in compliance with the US Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and the State of Colorado regulations covering asbestos inspections Abatement will be conducted by a contracted State qualified abatement company

The following ACM sources and approximate volumes will be abated prior to the initiation of decommissioning Thermal System Insulation (900 linear feet), Cementitious Wall Board (3,450 square feet), Drywall with tape and compound (4,000 square feet), Resilient Flooring (10,600 square feet), Gray Paper Duct Insulation (100 square feet), and Mastic under Counter (40 square feet) Building 123 Asbestos Characterization Report, a subpart of the building's Reconnaissance Characterization Report, documents this complete process

2.3.2 Beryllium

Two laboratories, rooms 111 and 112, processed beryllium contaminated samples as part of environmental soil sampling tests These areas were sampled (39 samples taken) by qualified beryllium sampling technicians and sent to an external analytical laboratory for analysis No samples identified the presence of beryllium The absence of beryllium on the samples, indicates that no further action is required for this facility for beryllium The sample results are documented in the Building 123 Reconnaissance-Level Characterization Report (RLCR)

2.3.3 Chemicals

The analytical chemicals in Building 123 are associated with the operations currently within that facility They are being tracked by the RFETS Chemical Tracking Group under the "Right-to-Know" provisions of SARA and are being managed by the laboratories These chemicals will be removed at the time active laboratory operations cease Any chemicals remaining will be addressed by the RFETS Chemical Tracking Group which will utilize or lab-pack for disposal The current inventory of the building includes nitric acid, hydrochloric acid, hydrofluoric acid, oxalic acid, ammonium hydroxide, formic acid, perchloric acid, toluene, isopropyl alcohol, DDCP, ammonium thiocyanate, methanol, mercury, lead, cadmium, beryllium, sodium hydroxide, and potassium permanganate

2.3.4 RCRA Hazardous Waste in SAAs

The Satellite Accumulation Areas (SAAs) contain RCRA hazardous waste that was generated by the operations within the room in which it is stored This waste will be characterized by "Process Knowledge" because the custodian is knowledgeable of all material that went into each SAA waste stream and has kept each waste segregated since generation These waste streams are further tracked by the Site's SAA tracking system and is audited internally This waste must be properly containerized, labeled, and shipped for storage or disposal prior to closing the accumulation areas

Representative waste types for each area are summarized as follows

- Room 103A - Combustibles, waste isopropynol, DDCP/toluene
- Room 124 - Liquid waste methanol, isopropynol
- Room 125 - DDCP/toluene, isopropynol contaminated with toluene
- Room 127 - Hydrochloric acid, hydrofluoric acid, ethanol
- Room 156 - Combustibles, waste toluene/DDCP, isopropynol

2.3.5 Perchloric Acid

Perchloric acid hoods (5) occupy four rooms (105, 112, 127 and 157(2)) within Building 123 Over the years, perchloric acid may have crystallized in the hoods The crystalline form may be shock sensitive and represents a potential physical hazard to the workers To mitigate this hazard, the hoods and duct work will be flushed and the rinsate directed to the Site waste water treatment plant

2.3.6 Pressurized Gas Cylinders and Liquid Nitrogen

Pressurized gas cylinders are used by the laboratories Removal of these cylinders prior to the decommissioning effort will be conducted by the laboratory personnel when they are relocated The liquid nitrogen system will also be disconnected and removed as part of this project by RFETS personnel when the utilities are disconnected

2.3.7 Polychlorinated Biphenyls (PCBs)

PCBs may have been utilized in the light ballasts Thus far, no other system has been identified in Building 123 with the potential of having PCBs present in the components The light ballasts will be sampled for PCBs once the building has been vacated and the lights are no

longer needed Should the light ballasts contain regulated concentrations of PCBs the decommissioning contractor will be required to remove the ballasts They will be packaged and shipped by RFETS Waste Management

2.3.8 Radiological Contaminated Materials

Radiological assessments have been conducted in Building 123 by RFETS Radiological Safety The following areas have Radiological Material management Areas (RMMA) mostly in laboratory hoods Rooms/labs 103A, 105, 112, 124, 125, 156, 157, and 163 Radiological Contamination Areas (RCAs) are in room/labs 103A, 105, 112, 123, 124, 125, 126, 127, 135, 149, 155A, 156, 157, 158, 163 Radiological sources are kept in 123, 126, and 155A All of these areas are being managed for their radiological characteristics

2.3.9 Metals

Metals (specifically lead, chromium, cadmium, and arsenic) were sampled from selected painted surfaces in Building 123 for industrial hygiene purposes Site historical knowledge and the accredited inspector's knowledge were utilized in the sampling process Twenty-one samples were taken and analysis was conducted by Atomic Absorption Spectroscopy by a third independent party All paints indicated detectable levels of one or more of the metals. The RLCR documents these findings

Lead bricks and shielding are located through the radiological areas to lower the background and protect personnel The largest volume of lead is used to shield detectors and sources This material will be removed by the source owners or dispositioned through the RFETS Property Utilization and Disposition Department

3.0 PROJECT APPROACH

Building 123 will be decommissioned using the approach outlined in the Draft Decommissioning Program Plan (DPP) and this PAM A sequence will be followed that provides an integrated scope, schedule, and cost control system Responsibilities and interfaces will be identified such that all project personnel are familiar with the project approach All required documentation and plans will be prepared and approved by RFETS Demolition and Decommissioning Management to ensure that decommissioning is conducted in a safe and compliant manner As part of this PAM, the building will be taken down, and the debris and waste disposed at appropriate off-site facilities This constitutes the decommissioning of the building Once the building is ready for decommissioning, utilities and facility safety systems will be disconnected In addition, sampling of soils beneath and

adjacent to the building will be conducted using the methods described in a sampling and analysis plan prepared for this project Remediation of contaminated soil will be completed using the results of the analyses.

3.1 Objectives

The primary decommissioning objective is to safely dismantle or decommission the building structure and systems, and remediate the surrounding contaminated soil in a manner that is protective of human health and the environment After proper characterization, all building rubble and contaminated soil will be disposed in appropriate off-site facilities This project will use standard industry decommissioning practices, but will also incorporate lessons learned from previous demolition projects at RFETS to improve the process Trained personnel, with expertise in decontamination and decommissioning of facilities will be used After the building has been removed, the objective of the IHSS remediation, is to safely decontaminate, remove, or stabilize contaminated soil and piping in accordance with this PAM and the Rocky Flats Cleanup Agreement (RFCA)

3.2 Proposed Action

Activities that support the Proposed Action can be divided into four general areas The are (1) Planning and Engineering, (2) Characterization, (3) Building Removal, and (4) Remediation of Contaminated Soil and Pipelines The scope includes the removal of all internal piping, ventilation, and process waste systems All rubble and materials removed are to be recycled or disposed of in a suitable off site facility

3.2.1 Planning and Engineering

Regulatory activities are completed as part of this action to ensure that the action is conducted in a manner consistent with the Rocky Flats Cleanup Agreement (RFCA) and the regulations of the State of Colorado This includes ensuring public involvement, and mitigating, to the extent practical, impacts to the environment These objectives will be accomplished through project scoping meetings with CDPHE and EPA, and approval of the PAM document, which includes public comment Other regulatory activities include General Services Administration (GSA) and Housing and Urban Development (HUD) notifications, establishment of the CERCLA administrative record, and notification of asbestos abatement

Specific planning documents include, the Reconnaissance-Level Characterization Report, a Health and Safety Plan, a Waste Management Plan, an IHSS Sampling and Analysis Plan and Integrated Work Control Plans (IWCPs) These documents will be provided to the prospective

decommissioning contractors as part of the project procurement package A job walk-down will be done to provide information for planning the demolition activities A design package will be prepared for decommissioning activities This package will include locations and configurations of active and inactive utility systems, sampling data summaries, as-built drawings and engineering estimates for building decommissioning

3.2.2 Characterization

Characterization activities governed by the PAM include the sampling and analysis of the soil surrounding the process waste lines, the IHSS 148 areas surrounding the building, and the survey of interior building surfaces Suspect lines can be found under the building slab, and underground south of the building Once the building superstructure has been removed, samples will be taken through the slab to determine whether soil remediation will be required A sampling and analysis plan (SAP) will be written to guide characterization activities in these areas The SAP will be finalized prior to the award of the decommissioning contract The SAP will incorporate a review of existing records to establish the location of potentially contaminated areas and to define sampling protocol Sample locations, depth and frequency will include recommendations from the RFETS Statistical Applications Group Current planning calls for 30-50 soil cores beneath the slab of Building 123 and from areas surrounding the buried, abandoned process waste lines Samples will be taken from depths below the bottom of the pipe to locate any contamination that may have leaked from the lines. Samples will be analyzed for Volatile Organic Compounds (VOCs), Target Analyte List (TAL) Metals, and radionuclides Data quality requirements supporting the analysis effort will conform to criteria established in *Guidance for the Data Quality Objective Process,* EPA QA/G-4 (EPA 1994)

Radiological characterization and final survey for Building 123 will be performed in accordance with the decommissioning guideline in Interagency Multi-Agency Radiological Site Survey and Site Investigation Manual (MARSSIM) a draft decommissioning document developed by the NRC, DOD, and the DOE in conjunction with Draft NRC NUREG/CR-5849, "Manual For Conducting Radiological Surveys In Support of License Termination" The purpose of this final survey will be to verify that demolition rubble can be released to a commercial sanitary or demolition landfill The survey will be completed after the asbestos has been removed

The methodology used to classify radiological areas of the building is described below *Impacted Area Classifications* Class 1 Impacted Areas are areas that have or had a potential for radioactive contamination (based on site operating history), or known radioactive contamination (based on previous radiological surveys) that exceeds the applicable limits This

would normally include areas where previous remediation occurred, where records indicate leaks and spills are known to have occurred, former disposal or burial sites, waste storage sites and areas with contaminants in discrete solid pieces of material and high specific activity Class 2 Impacted Areas are areas that have , or had, a potential for radiological contamination or known contamination, but are not expected to exceed the applicable limits Typical areas that should be classified as Class 2 are areas where radioactive material existed unsealed, potentially contaminated transport routes, upper walls and ceilings of buildings or rooms subjected to airborne contamination, areas downwind from stack release points, areas where low concentrations of radioactive material were handled, perimeter areas of former contamination control areas Class 3 Impacted Areas are any areas that are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a very small fraction of the applicable limits, based on site operating history and previous radiation surveys Examples of Class 3 areas include buffer areas around Class 1 and Class 2 areas and areas of very low potential for residual contamination , but insufficient information to justify a non-impacted classification

Non-Impacted Areas are areas that have no potential for residual radiological contamination Characterization/scoping surveys will be used to determine to what extent Building 123 should be classified (Class 1, Class 2, or Class 3 impacted or non-impacted) Impacted areas will require the performance of extensive radiological surveys based on requirements for Class 1, Class 2 or Class 3 (Areas initially classified as Class 1, Class 2 or Class 3 impacted, based on potential radiological contamination from historical reviews versus actual contamination, shown on previous surveys) may be re-evaluated if initial characterization indicates no radiological contamination exists above the applicable limits A comprehensive, but less extensive survey will be performed on all other building surfaces that are considered Class 2 or Class 3 impacted Class 1 Impacted Areas will be divided into one square meter grids, and a minimum of one fixed and one removable contamination measurement for beta/gamma and alpha will be obtained for each grid location In addition, a 100% scan for beta/gamma and alpha will be performed on all accessible surface areas Class 2 Impacted Areas will be divided into one square meter grids, and a minimum of one fixed and one removable contamination measurement for beta/gamma and alpha will be obtained for each grid location A 10% scan for beta/gamma and alpha will be performed on all accessible surface areas Class 3 Impacted Areas will be surveyed at a minimum frequency of one fixed and one removable contamination measurement for beta/gamma and alpha for each 9 square meters of the accessible surface areas In addition, 10% of all accessible surface areas will be scanned for beta/gamma and alpha contamination Non-Impacted Areas will not require a radiological survey

Unconditional Radiological Release Criteria

In accordance with the Rocky Flats Cleanup Agreement (RFCA), residual radioactive contamination levels present on building surfaces, equipment and demolition materials will be reduced to a level that will not cause the maximally exposed member of the public to receive, through all potential pathways, an effective dose equivalent (EDE) of 15 mrem above background in any single year The RFETS Building Radiation Cleanup Standard (BRCS) will delineate the specific levels of residual radioactive materials contained in remaining building surfaces, equipment and demolition debris that is compliant with the 15 mrem limit and appropriate ALARA considerations The BRCS is currently being developed in coordination with the EPA, CDPHE, NRC and DOE

Until such time as the Building Radiation Cleanup Standard is approved, criteria contained in DOE Order 5400 5 and associated RFETS radiation protection procedures will be used to determine if building surfaces, equipment and demolition debris is acceptable for unconditional release

The unrestricted release of equipment removed from RFETS will comply with DOE Order 5400 5, RFETS Radiological Control Manual and associated RFETS radiation protection implementing procedures When 10 CFR Part 834 is approved, the practices and procedures for the release of property and waste materials will be appropriately modified to ensure compliance

3.2.3 Building Removal

Prior to decommissioning, all utilities and charged systems will be disconnected and capped as required The scope of building decommissioning includes removal of all interior piping, ventilation and above-slab waste systems The building superstructure will be removed using mechanical shears, loaders and a crane for heavy lifts or to remove roof-based systems Use of heavy equipment will minimize worker exposures to hazards associated with demolition Fugitive airborne emissions will be minimized using water sprays The building will be surveyed for radiological contamination prior to decommissioning and a determination made as to where the building rubble will be disposed The debris will be disposed off site, either at a facility licensed to accept low-level radioactive waste or a commercial landfill

3.2.4 Remediation of Soil and Pipelines

The soil and buried pipe system beneath Building 123 will be characterized using the SAP and

methods summarized in Section 3 2 2 If results of the sample analyses meet the "action level" criteria defined in the RFCA, no further remedial action will be recommended Should radioactive or chemical contamination be identified through the sampling efforts, remediation of the soil will be done. Remediation of small, easily contained areas will be done by excavating the soil in those spots, and replacing it with clean soil Depending upon the extent of contamination underground, different remedies could be pursued Clean up of underground contamination could include removal of the pipelines and surrounding soil, or if no contamination is found, the pipelines could be filled with foam, capped and left in place.

3.3 Worker Health and Safety

Due to the scope of work and the potential dangers associated with this decommissioning action, this project will comply with the Occupational Safety and Health Administration construction standard for Hazardous Waste Operations and Emergency Response, 29 Code of Federal Regulations (CFR) 1926 In accordance with this standard, the *Building 123 Decommissioning Project Health and Safety Plan, Rev 0* (May 1997) has been developed to address the safety and health hazards of each phase of site operations and specify the requirements and procedures for employee protection In addition, the DOE Order for Construction Project Safety and Health Management, 5480 9A, applies to this project This order requires the preparation of Activity Hazard Analyses to identify each task, the hazards associated with each task, and the cautions necessary to mitigate the hazards These requirements will be integrated wherever appropriate

This project could potentially expose workers to physical, chemical, and low levels of radiological hazards The physical hazards associated with decommissioning activities include the use of heavy equipment, electrical shock, noise, heat stress, and work on elevated surfaces Physical hazards will be mitigated by appropriate use of PPE, pre-engineering evaluation, briefing, training, and administrative controls Chemical hazards will be mitigated by the use of PPE, removal of sources, and administrative controls Appropriate skin and respiratory personal protective equipment will be worn throughout the project as directed by Industrial Hygiene (IH) personnel Based on employee exposure evaluations, the Site Health and Safety Officer may downgrade personal protective equipment requirements, if appropriate If field conditions vary from the planned approach, an Activity Hazard Analysis will be prepared for the existing circumstances and work will proceed according to the appropriate control measures Data and controls will be continually evaluated Radiological Work Permits will be generated for areas of contamination and will identify the areas of potential surface contamination, appropriate PPE, and airborne radioactivity controls, if necessary As required by 10 CFR 835, Occupational Radiation Protection, all applicable implementing procedures will be followed to insure protection of the workers Finally, dust suppression techniques will

be used to minimize resuspension or fugitive dust emissions

Decommissioning activities which require dismantlement of radiologically contaminated systems will be conducted using Level C PPE This level includes full-face respirator, steel toe safety shoes, hard hat, anti C Tyvek coveralls, gloves, disposable shoe covers, and hearing protection (if applicable) Decommissioning of uncontaminated systems or structures will be done using Level D PPE, which includes safety glasses or face shield, but does not include a respirator or Tyvek coveralls as described above

3.4 Quality Assurance

A commitment to a quality program and a continuous improvement philosophy are applied from project start through completion This commitment to quality is instilled at all levels, and adherence to this commitment is instrumental in the project's success All project personnel are responsible for following approved QA program requirements and participating in quality improvement activities

Quality Assurance/ Quality Control personnel are involved at the initial planning stages of the project, during site preparation and during project execution The Quality Assurance organization assumes a proactive role during the project by identifying and/or preventing potential problems or shortcomings, offering solutions and assisting in corrective action steps QA personnel administer and perform duties in accordance with approved QA program requirements QA personnel are also responsible for objectively verifying that management/DOE directions and policies are being effectively implemented by the responsible organizations. The QA/QC role includes

- Assurance that engineering and administrative procedures are adhered to and are consistent with other project/DOE requirements
- Performance of audits and surveillances
- Review of applicable procurement and work documents
- Assurance of document review and approval requirements
- Review data gathering methodologies
- Determine compliance with procedures
- Inspection of waste packaging
- Inspection of incoming materials
- Performance of facility walkdowns
- Monitor project for potential improvements
- Monitor corrective action initiatives

3.5 Waste Management

It is anticipated that decontamination, dismantlement, and decommissioning of Building 123, and the remediation of the surrounding areas will generate less than 300 cubic yards of rubble and contaminated soil. The waste may be designated as radioactive, mixed, hazardous or industrial waste and must be managed in accordance with State and Federal regulations Waste management activities for the project are described in *Building 123 Decommissioning Project Waste Management Plan, Rev. 0* (May 1997) It is expected that most of the waste from decommissioning the building will be standard industrial type of waste that can be disposed in an off site landfill Contaminated soil and pipelines, if found, will also result in waste from the remediation activities This waste will also be segregated, categorized, and packaged according to the specifications for disposal in permitted low level, hazardous, or mixed waste disposal facilities

During the decommissioning activities, small amounts of contamination may be found that will have to be disposed of as hazardous, low level waste (LLW), or low level mixed (LLM) waste Localized areas of contamination within the building will be isolated and decontaminated, nearly eliminating the generation of LLW and hazardous waste

Waste verification activities will be conducted by RFETS Waste Management personnel assigned to the project Waste characterization data and packaging requirements for low level wastes will meet the procedures and policies for managing low-level wastes are outlined in the RFETS Low-Level Waste Management Plan (Low Level Waste Management Plan 44-RWP /EWQA - 0014, Rev 1, 1996)

The subcontractor who is awarded the decommissioning contract will be responsible for loading and disposing of all non-contaminated waste Working under the direction of RMRS, the qualified and trained subcontractor will also load all hazardous, LLW, and LLM waste into approved containers RMRS Waste Management personnel will monitor the subcontractor's activities, and make certain that all regulatory requirements are met RMRS Waste Management will arrange for transportation to an appropriate off-site facility Manifests will be the responsibility of RFETS Traffic Department

Release of non-contaminated material, debris, and equipment from a site contaminated with hazardous materials is accomplished by demonstrating that the materials or wastes do not exhibit any of the characteristics of hazardous waste as identified in Subpart C of 6 CCR 1007-3 SS261, are not listed wastes, or are excluded under the provisions in Subpart D Process knowledge and operating history related to the facilities can also be used to segregate

hazardous contaminant areas from unaffected areas

LLW and LLM wastes generated by the project will be sorted at the time of removal The waste will then be packaged and staged for further decontamination, survey, recycle, processing or packaging Waste Operations, in conjunction with the project, will designate the temporary storage location for LLW, LLM, or hazardous waste Non-contaminated recyclable materials, such as scrap metal, may be placed in approved crates and later segregated into PU&D supplied bins for ease of removal Additional items may be placed onto pallets for shipment to PU&D In general, standard waste crates will be used

4.0 ENVIRONMENTAL IMPACTS

The National Environmental Policy Act requires that actions conducted at the RFETS consider potential impacts to the environment An Environmental Checklist has been prepared for this action and is being evaluated No adverse impacts to the natural environment resulting from this action are anticipated

The Rocky Flats Cleanup Agreement (RFCA) states (Paragraph 95) that Site CERCLA decision documents will incorporate NEPA values This PAM is the CERCLA decision document for decommissioning Building 123 The NEPA values relevant to decommissioning Building 123 are the same as those for decommissioning most other Site buildings These are described and considered in the Site's Decommissioning Program Plan, a draft of which, at this writing, is about to submitted to the regulatory agencies for approval This PAM includes by reference the NEPA values section (section 6 3) of that Plan The expected environmental effects of decommissioning Building 123 are encompassed within the environmental effects described in the DPP In addition, this PAM includes by reference the Site's Cumulative Impacts Document describing the overall environmental effects of deactivating, decommissioning and cleaning up the entire Site

An air evaluation was conducted on the scope of the PAM The only issue dealt with the excavation of the soils associated with the IHSSs Additional sampling will have to be taken prior to the start of excavation to identify any source materials currently in the soils This testing is identified in the Reconnaissance Characterization Report and will be accomplished prior to the excavation Methodology and locations will also be specified in that report This cannot be accomplished prior to the commencement of decommissioning due to the location of the system components below the slab

Ground water sampling will be monitored utilizing the current monitoring wells associated with the industrial area In addition, site run-off will be monitored by portable collection

devices Any impact, though none is expected, will be reflected by these methods

This facility is part of the Historical Preservation Society list of facilities that need to be documented for its impact This process is on going at the Rocky Flats Site for numerous building that supported the "cold war" efforts The proper organization has been contacted in the Department of Energy, Rocky Flats Field Office (DOE, RFFO) to address this documentation issue Records, documents, and photos are being collected of this facility to document its missions and support to the over all effort for peace

5.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

RFETS decommissioning actions performed under a PAM must attain, to the maximum extent practicable, Federal and State applicable or relevant and appropriate requirements (ARARs) For that reason, the substantive attributes of the Federal and State ARARs are identified in the draft DPP (Section 2.2) for all decommissioning actions conducted at RFETS ARARs associated with this PAM are a subset of those requirements and are identified below

Substantive requirements are those requirements that pertain directly to actions or conditions in the environment Examples of substantive requirements include quantitative health- or risk-based restrictions upon exposure to types of hazardous substances or "chemical specific" (e g , MCLs establishing drinking water standards for particular contaminants), technology-based requirements for actions taken upon hazardous substances or "action specific" (e g , incinerator standards requiring particular destruction and removal efficiency), and restrictions upon activities in certain special locations or "location specific" (e.g , standards prohibiting certain types of facilities in flood plains) ARARs

5.1 Chemical-Specific Requirements and Considerations

Chemical specific requirements include quantitative health or risk-based restrictions This project will encounter conditions that will be regulated by the following chemical specific restrictions These restrictions will be incorporated in this project planning effort and will be assured by following Site procedures or direct inclusion in the Integrated Work Control Plan (IWCP) with a stop point

5.1.1 Airborne

The 40 CFR 61 92 is applicable and requires that no member of the public receive more than 10 mrem per year above background from airborne sources of radiation Demonstration of compliance with 40 CFR 61 92 is performed on a sitewide basis taking into consideration all

RFETS sources Stack monitoring is required for all release points which could contribute greater than 0 1 mrem/year Based upon preliminary estimates, monitoring will not be required A formal analysis will be prepared Colorado Air Pollution Regulation are also applicable requirements Emission Controls for Particles (5 CCR 1001-1) and Emissions of Volatile Organic Compounds (5 CCR 1001-9) may be applicable with the excavation of the IHSS depending on what is found in the soils Fugitive dust emissions are appropriate for the demolition

5.1.2 Radiological Protection

Radiological standards 10 CFR 835 is applicable and controls exposure to site workers This regulation is implemented through the Rocky Flats Radiological Control Manual and procedures

5.2 Action-Specific Requirements and Considerations

The technology based standards and requirements are utilized when ever applicable or relevant and appropriate, to that specific action, to eliminate as many problem areas as possible This project will encounter conditions that will be regulated by the chemical specific restrictions identified in section 5 2 1 These restrictions will be incorporated in this project planning effort and will be assured by following Site procedures

5.2.1 RCRA

Requirements governing the identification and characterization of hazardous wastes are applicable to the requirements in Colorado Hazardous Waste Act (CHWA)(See 6 CCR 1007-3, 261) The implementation of generator standards (6 CCR 1007-3 262) will be completed utilizing the WSRIC program and Waste Management Procedures Based upon process knowledge and characterization data, the waste that will be generated will be that covered by the Universal Rule (i e florescent bulbs, batteries) and chemicals

5.2.2 Low Level Waste

The State of Colorado Low Level Waste program (6 CCR 1007-14) is incorporated in Waste Management Operation procedures (1100-1104)

5.2.3 OSHA

This project will comply with the Occupational Safety and Health Administration construction standard for Hazardous Waste Operations and Emergency Response, 29 Code of Federal Regulations (CFR) 1926 This is integrated in the Health and Safety Plan and the IWCP

5.3 Location-Specific requirements and Considerations

There are no location specific requirements associated with this scope of work

5.4 To-Be-Considered (TBC)

TBCs are used in determining the necessary level of cleanup for the protection of human health and the environment The March 8, 1990 preamble to the final NCP rule (see 55 FR 8746) indicates that the use of TBCs is discretionary rather than mandatory, however, their incorporation is recommended and identified in this PAM

5.4.1 TBC Guidance

Radiological standards identified in DOE Order 5400 5 and 5820 2A are contractual guidance for the protection of the public and the environment and for the control of radiological waste and decommissioning project activities, respectively This guidance is implemented through the Rocky Flats Radiological Control procedures and the DPP

6.0 IMPLEMENTATION SCHEDULE

The level 1 schedule for this project is attached as Figure 6-1 In keeping with the requirements of the PAM process, less than six months will elapse between the time the decommissioning contractor mobilizes and the project is complete

7.0 REFERENCES

K-H, 1997, *Decommissioning Program Plan, (DRAFT)*

DOE, 1996, *RFETS Ten Year Plan*

RMRS, 1997, *Building 123 Reconnaissance-Level Characterization Report,* May 1997

EPA, 1994, *Guidance for the Data Quality Objective Process,* EPA, QA/G-4

Draft NRC NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination"

RMRS, 1997, *Building 123 Decommissioning Project Health and Safety Plan, Rev. 0*

RMRS, 1997, *Building 123 Decommissioning Project Waste Management Plan, Rev. 0*

RMRS, 1996, *Low Level Waste Management Plan 44-RWP /EWQA - 0014, Rev. 1*

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO

DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Rocky Flats Environmental Technology Site, Golden, CO

K-H, 1996, *Rocky Flats Environmental Technology Site Radiological Control Manual*, June

DOE, *Waste Stream and Residue Identification and Characterization for Building 123.*

on the blinds No asbestos or PCB issues could be identified other than PCB potential in the light ballast

2.2.4 Building 123S

Building 123S is a metal shed on a concrete slab The shed encloses approximately 60 square feet It was formerly used as a RCRA 90 day storage area by the laboratories in Building 123 Organic wastes such as toluene and DDCP were stored there The facility has been closed for approximately one year No waste or other material is currently stored in the shed There are no utility hookups to the building A visual inspection of the shed did not reveal any hazards associated with the structure

2.3 Building Hazard Summary

The reconnaissance-level characterization survey identified no significant hazards associated with Buildings 113 and 114 Therefore, this discussion focuses on Building 123 Building 123 has approximately 75 rooms or areas which are utilized as laboratories, dosimetry areas, calibration areas, storage for records and equipment, and office space Potential hazards in the building are summarized below in Figure 2-5 These hazards were identified by a review of the facility's documents and a walk down of the building by project personnel, assisted by building personnel knowledgeable of the facility's past

Most of the potential hazards identified during the reconnaissance-level characterization survey will be removed or eliminated during the preparatory activities prior to this project

- All ACM will be removed by a separate licensed contractor prior to building decommissioning
- The fluorescent light ballast will be sampled for PCBs prior to building decommissioning Should the ballasts contain regulated levels of PCBs, they will be removed by the decommissioning contractor and packaged and shipped to a TCSA-regulated disposal facility by RFETS Waste Management
- The liquid nitrogen system will be deactivated and the pressurized cylinders removed at the time the building tenants are relocated
- Laboratory chemicals will be removed when the building tenants are relocated
- Any material left in the building after the tenants depart will be addressed as part of this project
- Once the buildings are ready for decommissioning, utilities and facility safety systems will be disconnected by Plant Power and Maintenance

Figure 2-5
Contaminants of Concern (COC)

COC	Location	Implementation
Asbestos Containing Material (ACM)	Present in floor and ceiling tiles, wall board, and on piping in most rooms	To be remediated by a State certified Asbestos Abatement Contractor See section 2 3 1
Beryllium	Rooms 111&112	See section 2 3 2
Chemicals	Chemicals utilized in laboratory work have been identified	All Chemicals will be gathered and removed from the building by the chemical handling group prior to any decommissioning See section 2 3 3
RCRA hazardous waste in Satellite Accumulation Area (SAA)	Rooms 103A, 124, 125, 127, and 156	Each waste stream will be handled for its hazardous waste components See section 2 3 4
Perchloric acid fume hoods	Present in room 157, 127, 112, and 105	See section 2 3 5
Pressurized gas cylinders and liquid Nitrogen	In laboratory areas	See section 2 3.6
Polychlorinated biphenyls (PCBs)	Fluorescent light ballasts	See section 2 3 7
Radiological Contaminated Materials	Found in piping, in room 109B, and on hoods and laboratory counter tops	See section 2 3 8
Metals Arsenic, Cadmium, Lead Lead-based Paint, & Silver	Lead bricks and shielding, lead base paint, lead and silver solder, NiCd and lead acid batteries, and silver from negatives.	See section 2 3 9

2.3.1 Asbestos

Asbestos Containing materials (ACM) were inspected by a State certified inspector the week of April 7, 1997 This inspection is documented in Asbestos Characterization Report Addendum to Building 123 Inspection (April 1997) The inspection and evaluation was conducted in accordance with the guidelines specified in Asbestos Hazard Emergency Response Act (AHERA) and in compliance with the US Environmental Protection Agency (EPA), Occupational Safety and Health Administration (OSHA), and the State of Colorado regulations covering asbestos inspections Abatement will be conducted by a contracted State qualified abatement company

The following ACM sources and approximate volumes will be abated prior to the initiation of decommissioning Thermal System Insulation (900 linear feet), Cementitious Wall Board (3,450 square feet), Drywall with tape and compound (4,000 square feet), Resilient Flooring (10,600 square feet), Gray Paper Duct Insulation (100 square feet), and Mastic under Counter (40 square feet) Building 123 Asbestos Characterization Report, a subpart of the building's Reconnaissance Characterization Report, documents this complete process

2.3.2 Beryllium

Two laboratories, rooms 111 and 112, processed beryllium contaminated samples as part of environmental soil sampling tests These areas were sampled (39 samples taken) by qualified beryllium sampling technicians and sent to an external analytical laboratory for analysis No samples identified the presence of beryllium The absence of beryllium on the samples, indicates that no further action is required for this facility for beryllium. The sample results are documented in the Building 123 Reconnaissance-Level Characterization Report (RLCR)

2.3.3 Chemicals

The analytical chemicals in Building 123 are associated with the operations currently within that facility They are being tracked by the RFETS Chemical Tracking Group under the "Right-to-Know" provisions of SARA and are being managed by the laboratories. These chemicals will be removed at the time active laboratory operations cease. Any chemicals remaining will be addressed by the RFETS Chemical Tracking Group which will utilize or lab-pack for disposal The current inventory of the building includes nitric acid, hydrochloric acid, hydrofluoric acid, oxalic acid, ammonium hydroxide, formic acid, perchloric acid, toluene, isopropyl alcohol, DDCP, ammonium thiocyanate, methanol, mercury, lead, cadmium, beryllium, sodium hydroxide, and potassium permanganate

2.3.4 RCRA Hazardous Waste in SAAs

The Satellite Accumulation Areas (SAAs) contain RCRA hazardous waste that was generated by the operations within the room in which it is stored This waste will be characterized by "Process Knowledge" because the custodian is knowledgeable of all material that went into each SAA waste stream and has kept each waste segregated since generation These waste streams are further tracked by the Site's SAA tracking system and is audited internally. This waste must be properly containerized, labeled, and shipped for storage or disposal prior to closing the accumulation areas

Representative waste types for each area are summarized as follows

- Room 103A - Combustibles, waste isopropynol, DDCP/toluene
- Room 124 - Liquid waste methanol, isopropynol
- Room 125 - DDCP/toluene, isopropynol contaminated with toluene
- Room 127 - Hydrochloric acid, hydrofluoric acid, ethanol
- Room 156 - Combustibles, waste toluene/DDCP, isopropynol

2.3.5 Perchloric Acid

Perchloric acid hoods (5) occupy four rooms (105, 112, 127 and 157(2)) within Building 123 Over the years, perchloric acid may have crystallized in the hoods The crystalline form may be shock sensitive and represents a potential physical hazard to the workers. To mitigate this hazard, the hoods and duct work will be flushed and the rinsate directed to the Site waste water treatment plant

2.3.6 Pressurized Gas Cylinders and Liquid Nitrogen

Pressurized gas cylinders are used by the laboratories Removal of these cylinders prior to the decommissioning effort will be conducted by the laboratory personnel when they are relocated The liquid nitrogen system will also be disconnected and removed as part of this project by RFETS personnel when the utilities are disconnected

2.3.7 Polychlorinated Biphenyls (PCBs)

PCBs may have been utilized in the light ballasts Thus far, no other system has been identified in Building 123 with the potential of having PCBs present in the components The light ballasts will be sampled for PCBs once the building has been vacated and the lights are no

longer needed Should the light ballasts contain regulated concentrations of PCBs the decommissioning contractor will be required to remove the ballasts They will be packaged and shipped by RFETS Waste Management

2.3.8 Radiological Contaminated Materials

Radiological assessments have been conducted in Building 123 by RFETS Radiological Safety The following areas have Radiological Material management Areas (RMMA) mostly in laboratory hoods Rooms/labs 103A, 105, 112, 124, 125, 156, 157, and 163 Radiological Contamination Areas (RCAs) are in room/labs 103A, 105, 112, 123, 124, 125, 126, 127, 135, 149, 155A, 156, 157, 158, 163 Radiological sources are kept in 123, 126, and 155A All of these areas are being managed for their radiological characteristics

2.3.9 Metals

Metals (specifically lead, chromium, cadmium, and arsenic) were sampled from selected painted surfaces in Building 123 for industrial hygiene purposes Site historical knowledge and the accredited inspector's knowledge were utilized in the sampling process Twenty-one samples were taken and analysis was conducted by Atomic Absorption Spectroscopy by a third independent party All paints indicated detectable levels of one or more of the metals The RLCR documents these findings

Lead bricks and shielding are located through the radiological areas to lower the background and protect personnel The largest volume of lead is used to shield detectors and sources This material will be removed by the source owners or dispositioned through the RFETS Property Utilization and Disposition Department

3.0 PROJECT APPROACH

Building 123 will be decommissioned using the approach outlined in the Draft Decommissioning Program Plan (DPP) and this PAM A sequence will be followed that provides an integrated scope, schedule, and cost control system Responsibilities and interfaces will be identified such that all project personnel are familiar with the project approach All required documentation and plans will be prepared and approved by RFETS Demolition and Decommissioning Management to ensure that decommissioning is conducted in a safe and compliant manner As part of this PAM, the building will be taken down, and the debris and waste disposed at appropriate off-site facilities This constitutes the decommissioning of the building Once the building is ready for decommissioning, utilities and facility safety systems will be disconnected In addition, sampling of soils beneath and

adjacent to the building will be conducted using the methods described in a sampling and analysis plan prepared for this project Remediation of contaminated soil will be completed using the results of the analyses

3.1 Objectives

The primary decommissioning objective is to safely dismantle or decommission the building structure and systems, and remediate the surrounding contaminated soil in a manner that is protective of human health and the environment After proper characterization, all building rubble and contaminated soil will be disposed in appropriate off-site facilities. This project will use standard industry decommissioning practices, but will also incorporate lessons learned from previous demolition projects at RFETS to improve the process Trained personnel, with expertise in decontamination and decommissioning of facilities will be used After the building has been removed, the objective of the IHSS remediation, is to safely decontaminate, remove, or stabilize contaminated soil and piping in accordance with this PAM and the Rocky Flats Cleanup Agreement (RFCA)

3.2 Proposed Action

Activities that support the Proposed Action can be divided into four general areas The are (1) Planning and Engineering, (2) Characterization, (3) Building Removal, and (4) Remediation of Contaminated Soil and Pipelines The scope includes the removal of all internal piping, ventilation, and process waste systems All rubble and materials removed are to be recycled or disposed of in a suitable off site facility

3.2.1 Planning and Engineering

Regulatory activities are completed as part of this action to ensure that the action is conducted in a manner consistent with the Rocky Flats Cleanup Agreement (RFCA) and the regulations of the State of Colorado This includes ensuring public involvement, and mitigating, to the extent practical, impacts to the environment These objectives will be accomplished through project scoping meetings with CDPHE and EPA, and approval of the PAM document, which includes public comment Other regulatory activities include General Services Administration (GSA) and Housing and Urban Development (HUD) notifications, establishment of the CERCLA administrative record, and notification of asbestos abatement

Specific planning documents include, the Reconnaissance-Level Characterization Report, a Health and Safety Plan, a Waste Management Plan, an IHSS Sampling and Analysis Plan and Integrated Work Control Plans (IWCPs) These documents will be provided to the prospective

decommissioning contractors as part of the project procurement package A job walk-down will be done to provide information for planning the demolition activities A design package will be prepared for decommissioning activities This package will include locations and configurations of active and inactive utility systems, sampling data summaries, as-built drawings and engineering estimates for building decommissioning

3.2.2 Characterization

Characterization activities governed by the PAM include the sampling and analysis of the soil surrounding the process waste lines, the IHSS 148 areas surrounding the building, and the survey of interior building surfaces Suspect lines can be found under the building slab, and underground south of the building Once the building superstructure has been removed, samples will be taken through the slab to determine whether soil remediation will be required A sampling and analysis plan (SAP) will be written to guide characterization activities in these areas The SAP will be finalized prior to the award of the decommissioning contract The SAP will incorporate a review of existing records to establish the location of potentially contaminated areas and to define sampling protocol Sample locations, depth and frequency will include recommendations from the RFETS Statistical Applications Group Current planning calls for 30-50 soil cores beneath the slab of Building 123 and from areas surrounding the buried, abandoned process waste lines Samples will be taken from depths below the bottom of the pipe to locate any contamination that may have leaked from the lines Samples will be analyzed for Volatile Organic Compounds (VOCs), Target Analyte List (TAL) Metals, and radionuclides Data quality requirements supporting the analysis effort will conform to criteria established in *Guidance for the Data Quality Objective Process,* EPA QA/G-4 (EPA 1994)

Radiological characterization and final survey for Building 123 will be performed in accordance with the decommissioning guideline in Interagency Multi-Agency Radiological Site Survey and Site Investigation Manual (MARSSIM) a draft decommissioning document developed by the NRC, DOD, and the DOE in conjunction with Draft NRC NUREG/CR-5849, "Manual For Conducting Radiological Surveys In Support of License Termination" The purpose of this final survey will be to verify that demolition rubble can be released to a commercial sanitary or demolition landfill The survey will be completed after the asbestos has been removed

The methodology used to classify radiological areas of the building is described below *Impacted Area Classifications* Class 1 Impacted Areas are areas that have or had a potential for radioactive contamination (based on site operating history), or known radioactive contamination (based on previous radiological surveys) that exceeds the applicable limits This

would normally include areas where previous remediation occurred, where records indicate leaks and spills are known to have occurred, former disposal or burial sites, waste storage sites and areas with contaminants in discrete solid pieces of material and high specific activity Class 2 Impacted Areas are areas that have , or had, a potential for radiological contamination or known contamination, but are not expected to exceed the applicable limits Typical areas that should be classified as Class 2 are areas where radioactive material existed unsealed, potentially contaminated transport routes, upper walls and ceilings of buildings or rooms subjected to airborne contamination, areas downwind from stack release points, areas where low concentrations of radioactive material were handled, perimeter areas of former contamination control areas Class 3 Impacted Areas are any areas that are not expected to contain any residual radioactivity, or are expected to contain levels of residual radioactivity at a very small fraction of the applicable limits, based on site operating history and previous radiation surveys Examples of Class 3 areas include buffer areas around Class 1 and Class 2 areas and areas of very low potential for residual contamination , but insufficient information to justify a non-impacted classification

Non-Impacted Areas are areas that have no potential for residual radiological contamination Characterization/scoping surveys will be used to determine to what extent Building 123 should be classified (Class 1, Class 2, or Class 3 impacted or non-impacted) Impacted areas will require the performance of extensive radiological surveys based on requirements for Class 1, Class 2 or Class 3 (Areas initially classified as Class 1, Class 2 or Class 3 impacted, based on potential radiological contamination from historical reviews versus actual contamination, shown on previous surveys) may be re-evaluated if initial characterization indicates no radiological contamination exists above the applicable limits A comprehensive, but less extensive survey will be performed on all other building surfaces that are considered Class 2 or Class 3 impacted Class 1 Impacted Areas will be divided into one square meter grids, and a minimum of one fixed and one removable contamination measurement for beta/gamma and alpha will be obtained for each grid location In addition, a 100% scan for beta/gamma and alpha will be performed on all accessible surface areas Class 2 Impacted Areas will be divided into one square meter grids, and a minimum of one fixed and one removable contamination measurement for beta/gamma and alpha will be obtained for each grid location A 10% scan for beta/gamma and alpha will be performed on all accessible surface areas. Class 3 Impacted Areas will be surveyed at a minimum frequency of one fixed and one removable contamination measurement for beta/gamma and alpha for each 9 square meters of the accessible surface areas In addition, 10% of all accessible surface areas will be scanned for beta/gamma and alpha contamination Non-Impacted Areas will not require a radiological survey

Unconditional Radiological Release Criteria

In accordance with the Rocky Flats Cleanup Agreement (RFCA), residual radioactive contamination levels present on building surfaces, equipment and demolition materials will be reduced to a level that will not cause the maximally exposed member of the public to receive, through all potential pathways, an effective dose equivalent (EDE) of 15 mrem above background in any single year The RFETS Building Radiation Cleanup Standard (BRCS) will delineate the specific levels of residual radioactive materials contained in remaining building surfaces, equipment and demolition debris that is compliant with the 15 mrem limit and appropriate ALARA considerations The BRCS is currently being developed in coordination with the EPA, CDPHE, NRC and DOE

Until such time as the Building Radiation Cleanup Standard is approved, criteria contained in DOE Order 5400.5 and associated RFETS radiation protection procedures will be used to determine if building surfaces, equipment and demolition debris is acceptable for unconditional release

The unrestricted release of equipment removed from RFETS will comply with DOE Order 5400 5, RFETS Radiological Control Manual and associated RFETS radiation protection implementing procedures When 10 CFR Part 834 is approved, the practices and procedures for the release of property and waste materials will be appropriately modified to ensure compliance

3.2.3 Building Removal

Prior to decommissioning, all utilities and charged systems will be disconnected and capped as required The scope of building decommissioning includes removal of all interior piping, ventilation and above-slab waste systems The building superstructure will be removed using mechanical shears, loaders and a crane for heavy lifts or to remove roof-based systems Use of heavy equipment will minimize worker exposures to hazards associated with demolition Fugitive airborne emissions will be minimized using water sprays The building will be surveyed for radiological contamination prior to decommissioning and a determination made as to where the building rubble will be disposed The debris will be disposed off site, either at a facility licensed to accept low-level radioactive waste or a commercial landfill

3.2.4 Remediation of Soil and Pipelines

The soil and buried pipe system beneath Building 123 will be characterized using the SAP and

methods summarized in Section 3 2 2 If results of the sample analyses meet the "action level" criteria defined in the RFCA, no further remedial action will be recommended Should radioactive or chemical contamination be identified through the sampling efforts, remediation of the soil will be done Remediation of small, easily contained areas will be done by excavating the soil in those spots, and replacing it with clean soil Depending upon the extent of contamination underground, different remedies could be pursued Clean up of underground contamination could include removal of the pipelines and surrounding soil, or if no contamination is found, the pipelines could be filled with foam, capped and left in place

3.3 Worker Health and Safety

Due to the scope of work and the potential dangers associated with this decommissioning action, this project will comply with the Occupational Safety and Health Administration construction standard for Hazardous Waste Operations and Emergency Response, 29 Code of Federal Regulations (CFR) 1926 In accordance with this standard, the *Building 123 Decommissioning Project Health and Safety Plan, Rev. 0* (May 1997) has been developed to address the safety and health hazards of each phase of site operations and specify the requirements and procedures for employee protection In addition, the DOE Order for Construction Project Safety and Health Management, 5480 9A, applies to this project This order requires the preparation of Activity Hazard Analyses to identify each task, the hazards associated with each task, and the cautions necessary to mitigate the hazards These requirements will be integrated wherever appropriate

This project could potentially expose workers to physical, chemical, and low levels of radiological hazards The physical hazards associated with decommissioning activities include the use of heavy equipment, electrical shock, noise, heat stress, and work on elevated surfaces Physical hazards will be mitigated by appropriate use of PPE, pre-engineering evaluation, briefing, training, and administrative controls Chemical hazards will be mitigated by the use of PPE, removal of sources, and administrative controls Appropriate skin and respiratory personal protective equipment will be worn throughout the project as directed by Industrial Hygiene (IH) personnel Based on employee exposure evaluations, the Site Health and Safety Officer may downgrade personal protective equipment requirements, if appropriate If field conditions vary from the planned approach, an Activity Hazard Analysis will be prepared for the existing circumstances and work will proceed according to the appropriate control measures Data and controls will be continually evaluated Radiological Work Permits will be generated for areas of contamination and will identify the areas of potential surface contamination, appropriate PPE, and airborne radioactivity controls, if necessary As required by 10 CFR 835, Occupational Radiation Protection, all applicable implementing procedures will be followed to insure protection of the workers Finally, dust suppression techniques will

be used to minimize resuspension or fugitive dust emissions

Decommissioning activities which require dismantlement of radiologically contaminated systems will be conducted using Level C PPE This level includes full-face respirator, steel toe safety shoes, hard hat, anti C Tyvek coveralls, gloves, disposable shoe covers, and hearing protection (if applicable) Decommissioning of uncontaminated systems or structures will be done using Level D PPE, which includes safety glasses or face shield, but does not include a respirator or Tyvek coveralls as described above

3.4 Quality Assurance

A commitment to a quality program and a continuous improvement philosophy are applied from project start through completion This commitment to quality is instilled at all levels, and adherence to this commitment is instrumental in the project's success. All project personnel are responsible for following approved QA program requirements and participating in quality improvement activities

Quality Assurance/ Quality Control personnel are involved at the initial planning stages of the project, during site preparation and during project execution The Quality Assurance organization assumes a proactive role during the project by identifying and/or preventing potential problems or shortcomings, offering solutions and assisting in corrective action steps QA personnel administer and perform duties in accordance with approved QA program requirements QA personnel are also responsible for objectively verifying that management/DOE directions and policies are being effectively implemented by the responsible organizations The QA/QC role includes

- Assurance that engineering and administrative procedures are adhered to and are consistent with other project/DOE requirements
- Performance of audits and surveillances
- Review of applicable procurement and work documents
- Assurance of document review and approval requirements
- Review data gathering methodologies
- Determine compliance with procedures
- Inspection of waste packaging
- Inspection of incoming materials
- Performance of facility walkdowns
- Monitor project for potential improvements
- Monitor corrective action initiatives

3.5 Waste Management

It is anticipated that decontamination, dismantlement, and decommissioning of Building 123, and the remediation of the surrounding areas will generate less than 300 cubic yards of rubble and contaminated soil The waste may be designated as radioactive, mixed, hazardous or industrial waste and must be managed in accordance with State and Federal regulations Waste management activities for the project are described in *Building 123 Decommissioning Project Waste Management Plan, Rev. 0* (May 1997) It is expected that most of the waste from decommissioning the building will be standard industrial type of waste that can be disposed in an off site landfill Contaminated soil and pipelines, if found, will also result in waste from the remediation activities This waste will also be segregated, categorized, and packaged according to the specifications for disposal in permitted low level, hazardous, or mixed waste disposal facilities.

During the decommissioning activities, small amounts of contamination may be found that will have to be disposed of as hazardous, low level waste (LLW), or low level mixed (LLM) waste Localized areas of contamination within the building will be isolated and decontaminated, nearly eliminating the generation of LLW and hazardous waste

Waste verification activities will be conducted by RFETS Waste Management personnel assigned to the project Waste characterization data and packaging requirements for low level wastes will meet the procedures and policies for managing low-level wastes are outlined in the RFETS Low-Level Waste Management Plan (Low Level Waste Management Plan 44-RWP /EWQA - 0014, Rev 1, 1996)

The subcontractor who is awarded the decommissioning contract will be responsible for loading and disposing of all non-contaminated waste Working under the direction of RMRS, the qualified and trained subcontractor will also load all hazardous, LLW, and LLM waste into approved containers RMRS Waste Management personnel will monitor the subcontractor's activities, and make certain that all regulatory requirements are met RMRS Waste Management will arrange for transportation to an appropriate off-site facility Manifests will be the responsibility of RFETS Traffic Department

Release of non-contaminated material, debris, and equipment from a site contaminated with hazardous materials is accomplished by demonstrating that the materials or wastes do not exhibit any of the characteristics of hazardous waste as identified in Subpart C of 6 CCR 1007-3 SS261, are not listed wastes, or are excluded under the provisions in Subpart D Process knowledge and operating history related to the facilities can also be used to segregate

hazardous contaminant areas from unaffected areas

LLW and LLM wastes generated by the project will be sorted at the time of removal The waste will then be packaged and staged for further decontamination, survey, recycle, processing or packaging Waste Operations, in conjunction with the project, will designate the temporary storage location for LLW, LLM, or hazardous waste Non-contaminated recyclable materials, such as scrap metal, may be placed in approved crates and later segregated into PU&D supplied bins for ease of removal Additional items may be placed onto pallets for shipment to PU&D In general, standard waste crates will be used

4.0 ENVIRONMENTAL IMPACTS

The National Environmental Policy Act requires that actions conducted at the RFETS consider potential impacts to the environment An Environmental Checklist has been prepared for this action and is being evaluated No adverse impacts to the natural environment resulting from this action are anticipated

The Rocky Flats Cleanup Agreement (RFCA) states (Paragraph 95) that Site CERCLA decision documents will incorporate NEPA values This PAM is the CERCLA decision document for decommissioning Building 123 The NEPA values relevant to decommissioning Building 123 are the same as those for decommissioning most other Site buildings These are described and considered in the Site's Decommissioning Program Plan, a draft of which, at this writing, is about to submitted to the regulatory agencies for approval This PAM includes by reference the NEPA values section (section 6.3) of that Plan. The expected environmental effects of decommissioning Building 123 are encompassed within the environmental effects described in the DPP In addition, this PAM includes by reference the Site's Cumulative Impacts Document describing the overall environmental effects of deactivating, decommissioning and cleaning up the entire Site

An air evaluation was conducted on the scope of the PAM The only issue dealt with the excavation of the soils associated with the IHSSs Additional sampling will have to be taken prior to the start of excavation to identify any source materials currently in the soils This testing is identified in the Reconnaissance Characterization Report and will be accomplished prior to the excavation Methodology and locations will also be specified in that report This cannot be accomplished prior to the commencement of decommissioning due to the location of the system components below the slab

Ground water sampling will be monitored utilizing the current monitoring wells associated with the industrial area In addition, site run-off will be monitored by portable collection

devices Any impact, though none is expected, will be reflected by these methods

This facility is part of the Historical Preservation Society list of facilities that need to be documented for its impact This process is on going at the Rocky Flats Site for numerous building that supported the "cold war" efforts The proper organization has been contacted in the Department of Energy, Rocky Flats Field Office (DOE, RFFO) to address this documentation issue Records, documents, and photos are being collected of this facility to document its missions and support to the over all effort for peace

5.0 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

RFETS decommissioning actions performed under a PAM must attain, to the maximum extent practicable, Federal and State applicable or relevant and appropriate requirements (ARARs). For that reason, the substantive attributes of the Federal and State ARARs are identified in the draft DPP (Section 2 2) for all decommissioning actions conducted at RFETS ARARs associated with this PAM are a subset of those requirements and are identified below

Substantive requirements are those requirements that pertain directly to actions or conditions in the environment Examples of substantive requirements include quantitative health- or risk-based restrictions upon exposure to types of hazardous substances or "chemical specific" (e g , MCLs establishing drinking water standards for particular contaminants), technology-based requirements for actions taken upon hazardous substances or "action specific" (e g , incinerator standards requiring particular destruction and removal efficiency), and restrictions upon activities in certain special locations or "location specific" (e g , standards prohibiting certain types of facilities in flood plains) ARARs

5.1 Chemical-Specific Requirements and Considerations

Chemical specific requirements include quantitative health or risk-based restrictions This project will encounter conditions that will be regulated by the following chemical specific restrictions These restrictions will be incorporated in this project planning effort and will be assured by following Site procedures or direct inclusion in the Integrated Work Control Plan (IWCP) with a stop point

5.1.1 Airborne

The 40 CFR 61 92 is applicable and requires that no member of the public receive more than 10 mrem per year above background from airborne sources of radiation Demonstration of compliance with 40 CFR 61 92 is performed on a sitewide basis taking into consideration all

RFETS sources Stack monitoring is required for all release points which could contribute greater than 0 1 mrem/year Based upon preliminary estimates, monitoring will not be required A formal analysis will be prepared Colorado Air Pollution Regulation are also applicable requirements Emission Controls for Particles (5 CCR 1001-1) and Emissions of Volatile Organic Compounds (5 CCR 1001-9) may be applicable with the excavation of the IHSS depending on what is found in the soils Fugitive dust emissions are appropriate for the demolition

5.1.2 Radiological Protection

Radiological standards 10 CFR 835 is applicable and controls exposure to site workers This regulation is implemented through the Rocky Flats Radiological Control Manual and procedures

5.2 Action-Specific Requirements and Considerations

The technology based standards and requirements are utilized when ever applicable or relevant and appropriate, to that specific action, to eliminate as many problem areas as possible This project will encounter conditions that will be regulated by the chemical specific restrictions identified in section 5 2 1 These restrictions will be incorporated in this project planning effort and will be assured by following Site procedures.

5.2.1 RCRA

Requirements governing the identification and characterization of hazardous wastes are applicable to the requirements in Colorado Hazardous Waste Act (CHWA)(See 6 CCR 1007-3, 261) The implementation of generator standards (6 CCR 1007-3 262) will be completed utilizing the WSRIC program and Waste Management Procedures. Based upon process knowledge and characterization data, the waste that will be generated will be that covered by the Universal Rule (i e florescent bulbs, batteries) and chemicals.

5.2.2 Low Level Waste

The State of Colorado Low Level Waste program (6 CCR 1007-14) is incorporated in Waste Management Operation procedures (1100-1104)

5.2.3 OSHA

This project will comply with the Occupational Safety and Health Administration construction standard for Hazardous Waste Operations and Emergency Response, 29 Code of Federal Regulations (CFR) 1926 This is integrated in the Health and Safety Plan and the IWCP

5.3 Location-Specific requirements and Considerations

There are no location specific requirements associated with this scope of work

5.4 To-Be-Considered (TBC)

TBCs are used in determining the necessary level of cleanup for the protection of human health and the environment The March 8, 1990 preamble to the final NCP rule (see 55 FR 8746) indicates that the use of TBCs is discretionary rather than mandatory, however, their incorporation is recommended and identified in this PAM

5.4.1 TBC Guidance

Radiological standards identified in DOE Order 5400 5 and 5820 2A are contractual guidance for the protection of the public and the environment and for the control of radiological waste and decommissioning project activities, respectively This guidance is implemented through the Rocky Flats Radiological Control procedures and the DPP

6.0 IMPLEMENTATION SCHEDULE

The level 1 schedule for this project is attached as Figure 6-1 In keeping with the requirements of the PAM process, less than six months will elapse between the time the decommissioning contractor mobilizes and the project is complete

7.0 REFERENCES

K-H, 1997, *Decommissioning Program Plan, (DRAFT)*

DOE, 1996, *RFETS Ten Year Plan*

RMRS, 1997, *Building 123 Reconnaissance-Level Characterization Report,* May 1997

EPA, 1994, *Guidance for the Data Quality Objective Process,* EPA, QA/G-4

Draft NRC NUREG/CR-5849, "Manual for Conducting Radiological Surveys in Support of License Termination"

RMRS, 1997, *Building 123 Decommissioning Project Health and Safety Plan, Rev. 0*

RMRS, 1997, *Building 123 Decommissioning Project Waste Management Plan, Rev. 0*

RMRS, 1996, *Low Level Waste Management Plan 44-RWP /EWQA - 0014, Rev. 1*

DOE, 1992, *Historical Release Report for the Rocky Flats Plant*, Rocky Flats Plant, Golden, CO

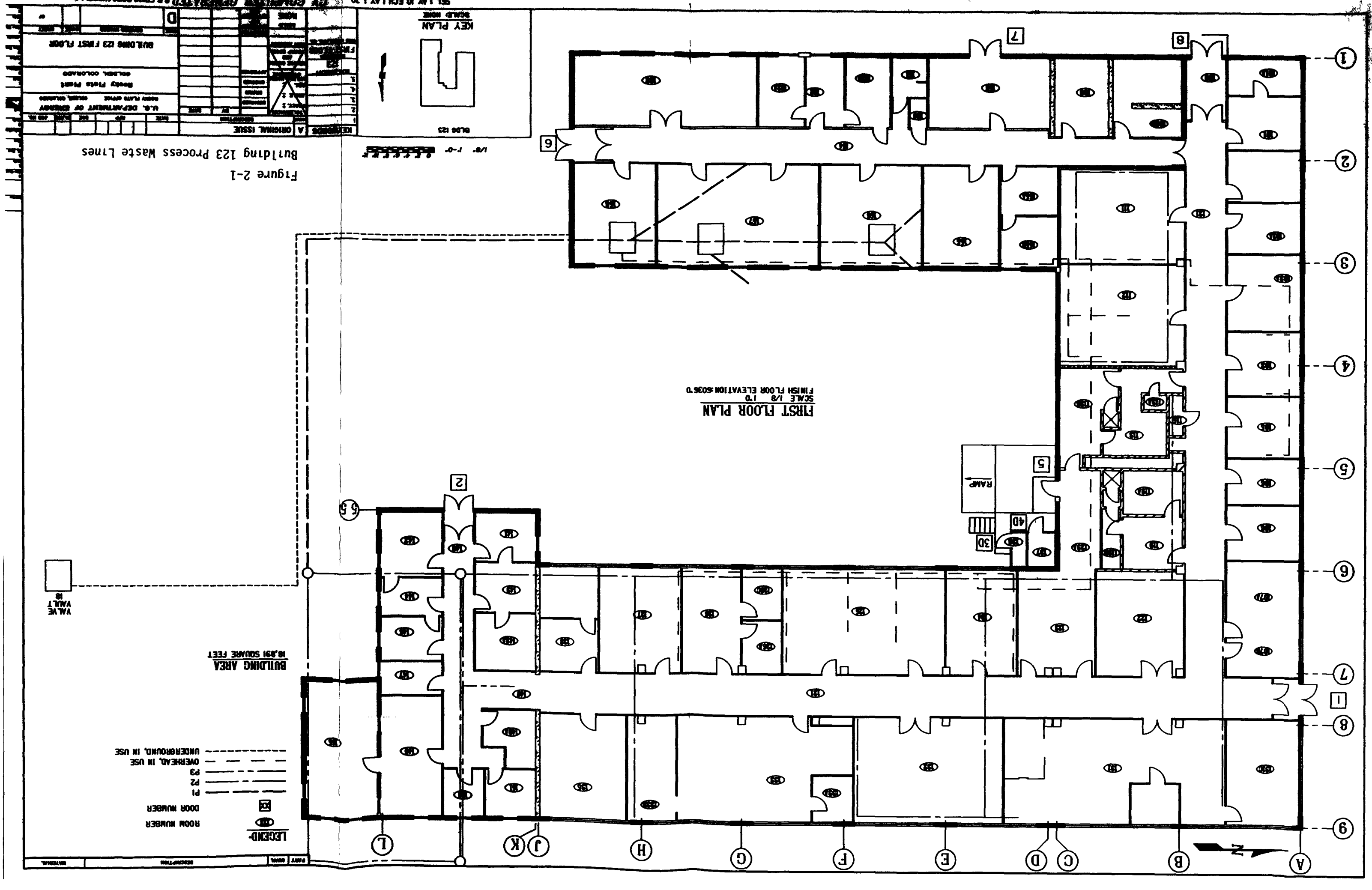
DOE, 1996, *Final Rocky Flats Cleanup Agreement*, Rocky Flats Environmental Technology Site, Golden, CO

K-H, 1996, *Rocky Flats Environmental Technology Site Radiological Control Manual*, June

DOE, *Waste Stream and Residue Identification and Characterization for Building 123.*

Figure 2-1

Building 123 Process Waste Lines



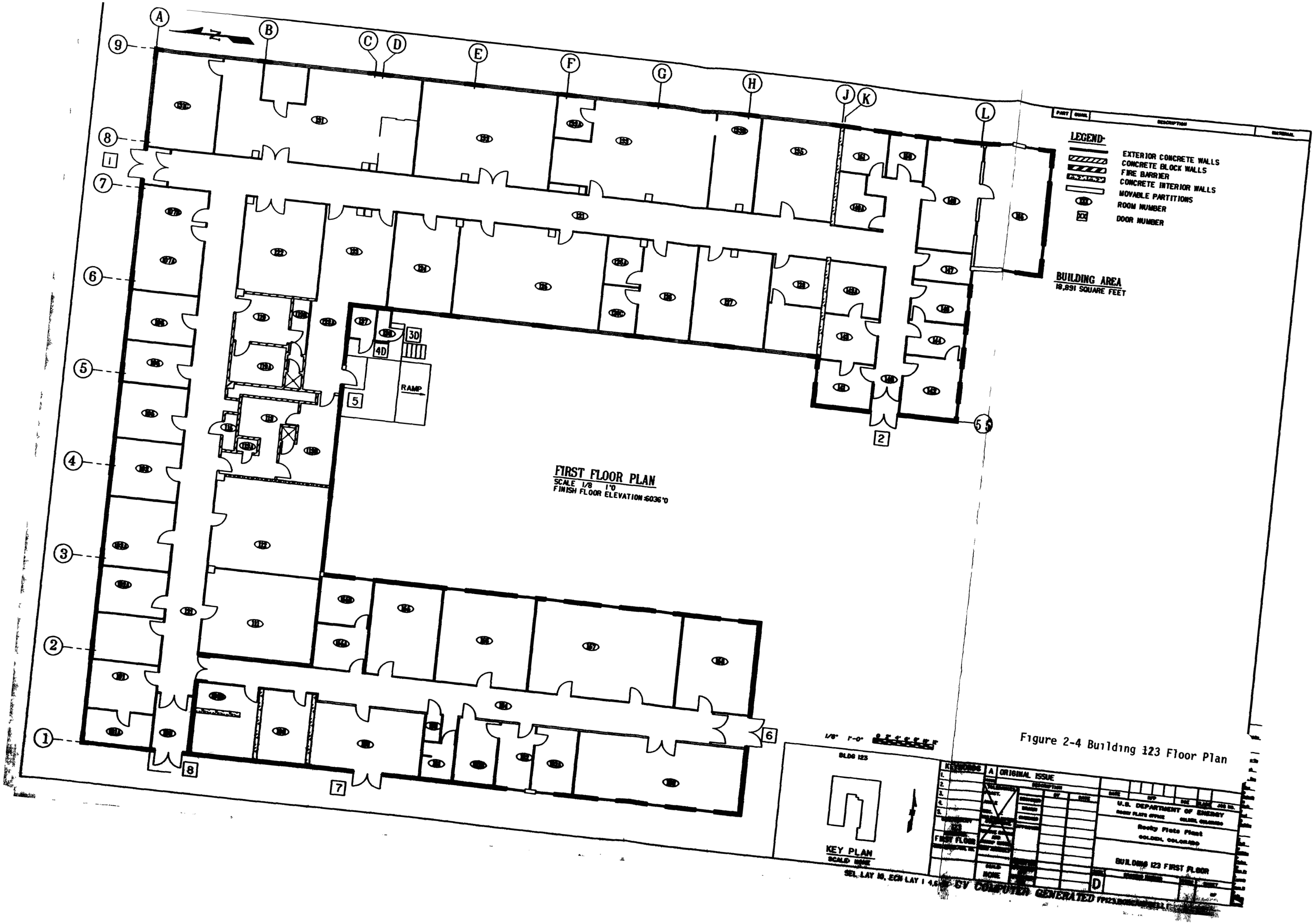


Figure 2-4 Building 123 Floor Plan