US Army Corps
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ENGINEER DISTRICT

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RADIOLOGICAL HISTORICAL ASSESSMENT MAIN POST

Fort McClellan
Anniston, Alabama

FINAL REPORT

December 2001

Prepared by

US ARMY CORPS OF ENGINEERS

ST. LOUIS DISTRICT

FORT McCLELLAN
ANNISTON, CALHOUN COUNTY
ALABAMA

Administrative Copy

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1.0 GLOSSARY OF TERMS, ACRONYMS AND ABBREVIATIONS

GLOSSARY AND ACRONYMS

AA	Anti-Aircraft
AAF	Army Airfield
AAR	After Action Report
AFP	Artillery Firing Point
AOC	Area of Concern
AEC	Army Environmental Center
AFP	Artillery Firing Point
AGO	Adjutant General's Office
AIT	Advance Individual Training
AOC	Area of Concern
AP	Armor Piercing
APDS	Armor Piercing Discarding Sabot
APERS	Antipersonnel
APT	Armor Piercing with Tracer
ASP	Ammunition Supply Point
ASR	Archives Search Report
Aux	Auxiliary
B	Bivouac Area
BAR	Browning Automatic Rifle
BD	Base Detonating
BD/DR	Building Demolition/Debris Removal
BE	Base Ejection
BGR	Bombing and Gunnery Range
BIRTC	Branch Immaterial Replacement Training Center
BLM	Bureau of Land Management
BRAC	Base Realignment and Closure
CADD	Computer-Aided Design/Drafting
Cal	Caliber
CBDA	Chemical and Biological Defense Agency
CBDCOM	Chemical and Biological Defense Command
CBR	Chemical, Biological, Radiological
CDTF	Chemical Decontamination Training Facility
CMTC	Citizens Military Training Camps
CE	Corps of Engineers
CEHNC	Corps of Engineers, Huntsville Engineering and Support Center
CEHND	Corps of Engineers, Huntsville Division (Old)
CEMVS	Corps of Engineers, St. Louis
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CERFA	Community Environmental Response Facilitation Act
CFR	Code of Federal Regulations
cfs	Cubic Feet Per Second

COE	Chief of Engineers
COMP	Composition
CTG	Cartridge
CSM	Chemical Surety Material
CSM	Command Sergeant Major
CWM	Chemical Warfare Material
CWS	Chemical Warfare Service
CX	Center of Expertise
DA	Department of the Army
DARCOM	Development and Readiness Command
DERA	Defense Environmental Restoration Account
DERP	Defense Environmental Restoration Program
DERP-FUDS	Defense Environmental Restoration Program-Formerly Used Defense Sites
D&I	Detection and Identification
DoD	Department of Defense
DOE	Department of Energy
DOI	Department of Interior
EBS	Environmental Baseline Survey
EE/CA	Engineering Evaluation/Cost Analysis
EIS	Environmental Impact Statement
EOD	Explosives Ordnance Disposal
EPA	Environmental Protection Agency
ERDA	Environmental Restoration Defense Account
FDE	Findings and Determination of Eligibility
FFE	Flame Field Expedient
FFMC	Federal Farm Mortgage Corporation
FLCH	Flechette
FORSCOM	Forces Command
FS	Feasibility Study
FTMC	Fort McClellan
FWS	U.S. Fish and Wildlife Service
FUDS	Formerly Used Defense Sites
GIS	Graphic Information System
GSA	General Services Administration
HE	High Explosive
HEAT	High Explosive Anti-Tank
HEI	High Explosive Incendiary
HEP	Plastic
HE-S	Illuminating
HTRW	Hazardous Toxic and Radioactive Waste
HTW	Hazardous and Toxic Waste
IAS	Initial Assessment Study
IAIT	Infantry Advance Individual Training
ICM	Isotope Committee Meeting
INPR	Inventory Project Report

IRP	Installation Restoration Program
IRTC	Infantry Replacement Training Center
KD	Known Distance
LAW	Light Anti-Tank Weapons
MFP	Mortar Firing Point
MG	Machine Gun
MG	Major General
mm	Millimeter
MT	Mechanical Time
MTSQ	Mechanical Time Super Quick
NARA	National Archives and Records Administration
NAS	Naval Air Station
NBC	Nuclear, Biological, Chemical
NCDC	National Climatic Data Center
NCP	National Contingency Plan
NFS	National Forest Service
NG	National Guard
NGB	National Guard Bureau
NGVD	National Geodetic Vertical Datum
NOAA	National Oceanic and Atmospheric Administration
NOFA	No Further Action
NPRC	National Personnel Records Center
NRC	National Records Center
NRC	Nuclear Regulatory Commission
OE	Ordnance and Explosives
OEW	Ordnance and Explosive Waste
OP	Observation Point
ORC	Organized Reserve Corps
OSHA	Occupational Safety and Health Act
PA	Preliminary Assessment
PD	Point Detonating
PIBD	Point Initiating, Base Detonating
PL	Public Law
QASAS	Quality Assurance Specialist Ammunition Surveillance
R	Range
RA	Removal Action
RAC	Risk Assessment Code
RD	Remedial Design
RG	Record Group
RI	Remedial Investigation
RI/FS	Remedial Investigation/Feasibility Study
ROTC	Reserved Officers Training Corps
RTC	Recruit Training Center
SARA	Superfund Amendments and Reauthorization Act
SCS	Soil Conservation Service
SDZ	Surface Danger Zone

SLD	St. Louis District, Corps of Engineers
SOP	Standard Operating Procedure
SSHO	Site Safety and Health Officer
SSHP	Site Safety and Health Plan
SWMU	Solid Waste Management Units
T	Training Area
TA	Training Area
TAY	Toxic Agent Yard
TECOM	Test Evaluation Command
TEU	Technical Escort Unit
TMDE	Test Measuring and Diagnostic Equipment
TNT	Trinitrotoluene
TP	Target Practice
USA	United States of America
USACE	U.S. Army Corps of Engineers
USACHPPM	U.S. Army Center for Health Promotion and Preventive Medicine
USADACS	U.S. Army Defense Ammunition Center and School
USAED	U.S. Army Engineer District
USAEDH	U.S. Army Engineer Division, Huntsville, AL (Old)
USAESCH	U.S. Army Engineering and Support Center, Huntsville, Alabama
USATHMA	U.S. Army, Corps of Engineers, Toxic and Hazardous Materials Agency
USC	United States Code
USDA	U.S. Department of Army
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UTES	Unit Training Equipment Site
UXO	Unexploded Ordnance
WAA	War Assets Administration
WD	War Department
WNRC	Washington National Records Center

CHEMICAL GLOSSARY AND ACRONYMS

CG	Phosgene	Choking
DP	Diphosgene	Choking
GA	Tabun	Nerve
GB	Sarin	Nerve
GD	Soman	Nerve
VX	VX	Nerve
AC	Hydrogen Cyanide	Blood
CK	Cyanogen Chloride	Blood
SA	Arsine	Blood
HD	Distilled Mustard	Blister
HN-1	Nitrogen Mustard	Blister
HN-2	Nitrogen Mustard	Blister
HN-3	Nitrogen Mustard	Blister
CX	Phosgene Oxime	Blister
L	Lewisite	Blister
HL	Mustard-lewisite	Blister
PD	Phenyldichloro-arsine	Blister
ED	Ethyldichloro-arsine	Blister
MD	Methyldichloro-arsine	Blister
DA	Diphenylchloro-arsine	Vomiting
DM	Adamsite	Vomiting
DC	Diphenylcyano-arsine	Vomiting
CN	Chloroaceto-phenone	Tear
CNC	Chloroaceto-phenone in Chloroform	Tear
CNS	Chloroaceto-phenone and Chloropicrin in Chloroform	Tear
CNB	Chloroaceto-phenone in benzene and Carbon Tetrachloride	Tear
CA	Bromobenzylcyanide	Tear
CS	O-chlorobenzyl-malononitril	Tear
BZ	BZ	Incapacitating
BG	Bacillus globigii	Biological Simulants
SM	Serratia marcescens	Biological Simulants

OTHER CHEMICAL CORPS TERMS

BW	Biological Warfare
CBR	Chemical, Biological, Radiological
NBC	Nuclear, Biological, Chemical
Rad.	Radiological

2.0 EXECUTIVE SUMMARY

The purpose of the Radiological Historical Assessment is to identify buildings and areas which may have been associated with the use, storage, handling, disposal or burial of radioactive isotopes at Fort McClellan (Main Post). The U.S. Army Engineer District, St. Louis, used the Archives Search Report process to identify areas which, previous to this investigation, were unknown.

Buildings used by the Chemical School identified as being associated with radioactive materials are:

Building T-810 (Temporary Lab)
Building T-811 (Temporary Lab)
Building T-812 (Temporary Lab)
Building T-836 (Temporary Lab)
Building T-837 (Temporary Lab)
Building 812½ (Radioactive Storage)
Building 3192 (Permanent Hot Cell)
Building 3180 (Storage Vault)
Building 3182 (Radiological Lab)
Building 3181
Building 3185 (Personnel Decontamination Center)
Building 1081
Building 2281 (Edwin R. Bradley Radiological Laboratory)

Other areas and facilities used by the Chemical School identified as being associated with radioactive materials are:

Alpha Field
Bromine Field
Bromine Tanks
Liquid Waste Disposal Pit
Radioactive Waste Storage Yard
Original Rattlesnake Gulch Radiological Survey Area (Early 1950's)
Radiological Survey Area #1 (Late 1950's)
Field Hot Cell (Early 1950's)
Chemical School Radiological Burial Grounds
Range 25

Storage buildings identified as being associated with radioactive materials are:

Building 4416 (Ammo Storage)
Building 256
Building 257
Building 303A
Building 341
Building 345

Maintenance buildings (Vehicle & Calibration) identified as being associated with radioactive materials are:

Building 228
Building 335
Building 337
Building 338
Building 339
Building 350

Recommendations for these specific buildings and areas may be found in Section 8.0, Conclusions.

3.0 PURPOSE OF THE HISTORICAL SITE ASSESSMENT (SCOPE)

3.1 AUTHORITY

Since 1988, Congress has enacted legislation providing for the closure, in part or in whole, of military bases/facilities and the realignment of others. The principal mechanism for implementing the policy in both statutes has been an independent, bipartisan commission. Two of the most pressing issues are: (1) providing assistance to local communities economically impacted by base closures; and (2) establishing a cost-effective program of environmental cleanup at bases prior to their disposition.

Congress introduced base closure procedures in Public Law 100-526, enacted 24 October 1988. The statute established a bipartisan commission to make recommendations to Congress and the Secretary of Defense on closures and realignments, commonly referred to as the Base Closure and Realignment Commission (BRAC).

On 5 January 1989, the Secretary of Defense approved the commission's report, BRAC 88, recommending closure of 86 installations, partial closure of 5, and realignment of 54 others. Since the commission approach adopted by Congress was successful, new base closure legislation was introduced (Public Law 101-510) which again relied upon the services of an independent commission. The Defense Base Closure and Realignment of 1990 (1990 Base Closure Act), Public Law 101-510 established the process by which Department of Defense (DoD) installations would be closed and/or realigned. This commission, in accordance with a statutory provision, met in 1991, 1993 and 1995. Fort McClellan, Alabama, was among the installations that were recommended to be closed in the BRAC 95 report.

3.2 SUBJECT

Fort McClellan abuts the city of Anniston, Alabama and lies within Calhoun County. During the Spanish American War (1898), units stationed at Camp Shipp in the Blue Mountain area may have used the area for artillery training. Documented military use began in 1912 when the Alabama National Guard used part of the site as a Field Artillery Range. In 1917, Congress authorized the establishment of Camp McClellan. In 1929, the camp became officially designated as Fort McClellan. Following World War II, the Fort was put into an inactive status in June of 1947. The Fort was reactivated in January of 1950 and has remained an Active Army Installation. The U.S. Army Chemical School was a tenant activity from 1951 to 1973 and again from 1979 to 1999.

This report covers the main post and the Choccolocco Corridor only. It does not cover Pelham Range.

3.3 PURPOSE

This Radiological Historical Assessment compiles information obtained through historical research at various archives and records holding facilities, interviews with persons associated with Fort McClellan or its operations, and a team inspection of the site. The search directs efforts towards determining possible use or disposal of Radiological Materials on the site. The research places particular emphasis on establishing the types, quantities, and area of disposal. This process obtains information for use in developing recommendations for further action at Fort McClellan.

3.4 SCOPE

This investigation focuses on the potential that Radiological Contamination could remain on Fort McClellan's main post and the Choccolocco Corridor; however, no documents were found indicating that radioactive materials were ever present in the Choccolocco Corridor. The primary focus was the use of Radioactive Isotopes by the Chemical School from 1952 to 1973. Of specific interest was 1952 to 1957 timeframe, when the Chemical School was not required to have a license from the Atomic Energy Commission (AEC). This report presents the following:

- A brief history of Fort McClellan
- Historic use of Radioactive Isotopes
- A listing of related site investigations
- Findings of the site inspection
- Description of Radiological uses identified with the site

These factors represent the basis for the evaluation of potential Radiological Contamination and associated risks at Fort McClellan (Main Post).

4.0 PROPERTY IDENTIFICATION

4.1 PHYSICAL CHARACTERISTICS

4.1.1 NAME - Fort McClellan

4.1.2 LOCATION - Anniston, Alabama

4.1.3 TOPOGRAPHY - Not included as part of the scope of this Radiological Historical Assessment (see Fort McClellan Environmental Baseline Survey, dated January 1998).

4.1.4 STRATIGRAPHY - Not included as part of the scope of this Radiological Historical Assessment (see Fort McClellan Environmental Baseline Survey, dated January 1998).

4.2 ENVIRONMENTAL SETTING

4.2.1 GEOLOGY

Fort McClellan is located in the Tennessee section of the Appalachian Valley and Ridge province. Consolidated rocks that range in age from Precambrian to Pennsylvanian have been sharply folded into northeastward trending synclines and anticlines complicated by thrust faults that have a general northeastward trending strike and a southeasterly dip. The predominating features of the area are the thrust faults.

Metamorphic rocks have been thrust northwestward and overlie rocks of Cambrian and Ordovician age along the eastern edge of the county. Throughout the rest of the county, the presence of faults is indicated by repetition of formations and by the absence of formations. Secondary stresses resulting from the primary folding and thrust faulting, caused numerous high-angle faults that are of more local extent. Additionally, the faulting and the attendant folding and crushing of beds caused the distribution of formations near the town of Choccolocco (Causey and Warman 1962).

4.2.2 HYDROGEOLOGY

Not applicable in this report (see Fort McClellan Environmental Baseline Survey, dated January 1998).

4.2.3 HYDROLOGY

4.2.3.1 GROUNDWATER

Movement of groundwater is to the northwest toward the town of Weaver (U.S. Geological Survey Water Resources Investigation Report 88-4133 1989).

The fault zones of the area form reservoirs and conduits for large quantities of groundwater. Abundant supplies are available over much of the area from the many springs that discharge groundwater from the fault systems. Several hundred gallons per minute commonly can be developed from drilled wells that are finished in the Shady Dolomite and the Conasauga Formation. These formations are relatively thick and crop out in large parts of the area. Locally, the Cambrian and Ordovician dolomites supply several hundred gallons per minute of groundwater from springs, while drilled wells in these rocks produce much smaller yields. Additionally, the Fort Payne Chert and the Newala Limestone in places furnish supplies of several hundred gallons per minute, but these formations are relatively small and scarce in this area.

4.2.3.2 SURFACE WATER

Runoff from the main cantonment area flows into Cane Creek, which empties into the Coosa River. Water from the west slope of Bains Gap flows into Choccolocco Creek, which flows into the Alabama River. The Alabama River, at Montgomery, has a minimum flow of 52,000 cfs and a maximum flow of 284,000 cfs for the period of record 1886-1961.

4.2.4 METEOROLOGY

Based on climatological data at Birmingham Municipal Airport, summers are long and hot. On a typical mid-summer day, the temperature will be nearly 70 degrees at daybreak, approach 90 degrees at mid-day, and level off in the low 90s during the afternoon. It is not unusual for the temperature to remain 100 degrees for several days in a row. However, every few years an extended heat wave will bring temperatures over 100 degrees. July is normally the hottest month but there is little difference from mid-June to mid-August. Rather persistent high humidity adds to the summer discomfort.

January is normally the coldest month but there is not much difference from mid-December to mid-February. Overall, winters are relatively mild. Even in cold spells, it is unusual for the temperature to remain below freezing all day. Sub-zero cold is extremely rare, occurring only a very few times this century.

Snowfall is erratic. Sometimes there is a two or three year span with no measurable accumulation. On rare occasions, there may be a two to four inch snowstorm. The snow usually melts quickly. In a normal year, the last 32 degree minimum temperature in the spring is in mid to late March and the first in autumn is in November.

Rainfall is abundant and is fairly well distributed throughout the year. However, some of the wetter winter months, plus March and July have twice the rainfall of October, the driest month. Summer rainfall is almost entirely from scattered afternoon and early evening thunderstorms. Serious droughts are rare and most dry spells are not severe. The stormiest time of the year with the greatest risk of severe thunderstorms and tornadoes is in spring, especially in March and April.

The prevailing wind is south with a mean speed of 7.2 miles per hour.

5.0 HISTORICAL SITE ASSESSMENT METHODOLOGY

5.1 APPROACH AND RATIONALE

The approach used for this Historic Assessment is the same approach as used in preparing an Archives Search Report (ASR) for Explosive Ordnance or Chemical Warfare Materials. Various Record Groups at the National Archives are searched as well as National Holding Centers for records. State and local archive holdings are also searched. On site reviews of existing records and interviews with knowledgeable sources are conducted. Aerial photos from previous over flights are interpreted if available. A site survey is conducted to confirm the historic research.

5.2 BOUNDARIES OF SITE

All of the locations identified are within the boundaries of Fort McClellan (Main Post) with the exception of the Rattlesnake Gulch Area. This area is south of Summerall Gate Road and includes the northeast corner of the Anniston Community Center property.

5.3 DOCUMENTS REVIEWED

5.3.1 WASHINGTON NATIONAL RECORDS CENTER
4205 SUITLAND ROAD
SUITLAND, MD 20409
POC: VELICIA CHANCE
(301) 457-7010

Record Group 338 (Records of the US Army Commands)
- Accession 68A6001
  - Boxes 1 – 2
- Accession 70B0668
  - Box 1
- Accession 71A0491
  - Boxes 1 – 2
- Accession 72B1094
  - Box 1
- Accession 72C1094
  - Boxes 1 – 3
- Accession 72D1094
  - Box 1
- Accession 73B5398
  - Box 1
- Accession 73C5398
  - Box 1
- Accession 740688
  - Box 1

Accession 90-0174
Box 1
Accession 90176
Boxes 1 - 17 Destroyed in 1997.
Accession 93-0473
Boxes 1 – 5

5.3.2 NATIONAL ARCHIVES I

8TH AND PENNSYLVANIA
WASHINGTON, DC 20408
POC: MITCH YOCKELSON
(202) 501-5385

Record Group 77 (Records of the Chief of Engineers)
Entry 393
Boxes 138 - 140

5.3.3 NATIONAL ARCHIVES AT COLLEGE PARK

8601 ADELPHI ROAD
COLLEGE PARK, MD 20740
POC: KEN SCHLESSINGER
(301) 713-6800

Record Group 112 (Records of the Office of the Surgeon General)
Entry 31 Geographic Series, 1945-46.
Box 41 One folder on Fort McClellan.

Record Group 175 (Records of the Chemical Warfare Service)
Entry 1. U.S. Army Schools; Chemical Corps School.
Boxes 1 – 10. Fort McClellan.
The Chemical Corps School Fort McClellan, Alabama General Records, 1949-50.
Box 1
Records of the Office of the Chief Chemical Officer, 1948-60.
Boxes 11 – 13.
Accession 67A4900 Records of the Chief Chemical Officer, 1946-54.
Boxes 372, 373, 422, 479, 481.
General Correspondence, Miscellaneous Series, 1955-59.
Boxes 23 – 26, 45, 46, 49, 67, 68, 73, 74, 75, 82, 102.
General Correspondence, Subject Series, 1955-60.
Boxes 1 – 10, 124, 145 – 149, 166, 181, 182, 192 – 195, 197.
General Correspondence, Station Series, 1955-59.
Boxes 24 – 28, 37 – 44, 53 – 68, 75.
Historian Background Files, 1951-54.
Boxes 7 – 13.

Record Group 337 (Records of the Army Ground Forces)
Entry 1
Box 15 Two folders on Fort McClellan.

5.3.4 U.S. ARMY CORPS OF ENGINEERS
OFFICE OF HISTORY
7701 TELEGRAPH ROAD
FORT BELVOIR
ALEXANDRIA, VA 22315
POC: LISA WAGNER
(703) 428-6558

Copied Fort McClellan installation maps.

5.3.5 U.S. ARMY CENTER FOR HEALTH PROMOTION AND PREVENTIVE MEDICINE
HEALTH PHYSICISTS DEPARTMENT, BUILDING 5158
EDGEWOOD AREA, ABERDEEN PROVING GROUND, MD
POC: MR. HARRIS EDGE
(410) 436-8395

The research team copied several reports pertaining to Fort McClellan radiological studies.

5.3.6 U.S. ARMY CENTER FOR MILITARY HISTORY
103 3RD AVENUE
FORT MCNAIR, DC 20319-5058
POC: MARY HAYNES
(202) 685-4042

The research team carefully viewed the appropriate history and found no pertinent information.

5.3.7 NATIONAL PERSONNEL RECORDS CENTER
MILITARY PERSONNEL RECORDS
9700 PAGE AVENUE
ST. LOUIS, MO 63132-5100
POC: WILSON SULLIVAN
(314) 538-4085

Record Group 338 (Records of the U.S. Army Commands)
Accession 56A0434
Boxes 1 – 2 Copied documents on Talladega Forest Maneuver Area and Morrisville Training Area.
Accession 59A4097
Box 1 Decimals 010.3 – 674. Copied documents on Talladega Forest, HEW Demonstration Area, Pelham Fires.

Accession 69A4172
Box 1 Computer print out cards.
Accession 780758
Boxes 1 – 2 Vault boxes.

5.3.8 CHEMICAL SCHOOL LIBRARY
BUILDING 1081
FORT MCCLELLAN, AL 36205-4414
POC: RICHARD PASTORETT
(205) 848-4414

The research team carefully viewed all the pertinent files and made numerous copies.

5.3.9 U.S. ARMY CHEMICAL CORPS MUSEUM
BUILDING 2299
FORT MCCLELLAN, AL 36205-5020
POC: THOMAS MILLER
(256) 848-4449

The research team carefully viewed all the pertinent files and made numerous copies.

5.4 PROPERTY INSPECTIONS

During the investigation three site visits were made during 1999. All members of the site visit team had military backgrounds and at least one member on each visit had graduated from the Army Radiation Safety Course. The team looked for visual indications of use such as signage, fencing and burial mounds. Radiation detection equipment was not utilized. These site visits were made in May, September and November of 1999. Summaries of these visits are:

1. During 24-26 May the following radiological sites were visited:

   a. The area shown on the June 1967 Range Map as T-15 (USACMLS Area 15), negative results.

   b. The area shown on the June 1967 Range Map as B-1, negative results (no indication of radiological use).

   c. Naylor Field (T-6), no signs of radiological burials.

   d. Range 25, fencing used for testing of prototype actuators has been removed.

   e. Area behind the Anniston Community Center (FUDS), military pickets marking a path up a ravine. This may have been the first Rattlesnake Gulch radiological field survey area.

2. During 20-23 September the following radiological sites were visited:

   a. Radiological Survey Area #1. One possible storage container for a 3.5" Rocket was found. All debris related to radiological survey training has been removed.

   b. T-4. The biological training area was partially walked. One expended can of BG Simulant was found.

   c. The flat area just north of the top Iron Mountain was walked. Pin flags from the 1995 Radiological Survey were found. Evidence of radiological burials were not found.

   d. Part of the Anniston Community Center complex was walked. Two possible survey lanes were walked. At the end of the survey lanes approximately eight 4" pipes were found. Some of these were in a debris pile, which had been pushed up by a bulldozer.

   e. The area south of Range I was re-walked. No other signs of training other than the five 4" pipes were found.

3. During 1-4 November 1999 the following radiological sites were visited:

   a. T-4. The west side of the biological training area was extensively walked. Two expended cans of BG Simulant were found. Numerous metal rods with station numbers were found. These rods were ½" in diameter and had a shelf for contaminates.

   b. The northeast corner of the Anniston Community Center complex was extensively walked. Two possible survey lanes were walked. At the end of the survey lanes numerous 4" pipes were found. Three debris piles were found with more 4" pipes sticking out of the pile. Two of the debris piles also had hog wire and barb fencing exposed. Site dynamics suggest that a bulldozer pushed up these piles.

5.5 PERSONAL INTERVIEWS

Dr. John May (Health Physics Officer) of the U.S. Army Chemical School was informally interviewed for general information concerning the use of radioactive material at Fort McClellan. Information was also obtained from retired Sergeant Major Bart Truffa's interview done by USACHPPM (see Appendix B-Cited Documents). Bart Truffa (Chemical Corps NCO) was on site during the removal operations at Rattlesnake Gulch in 1971. In 1995 he assisted Dr. May in relocating the burial site.

Lieutenant Colonel Powell's information letter to Major Anderson (1971) was also helpful in locating Radioactive Survey Area #1, the Field Hot Cell and the Chemical School Radioactive Burial Grounds, all of which are in the Rattlesnake Gulch Area. His interview is part of Major Anderson's After Action Report on the Rattlesnake Gulch Cleanup.

6.0 HISTORY AND CURRENT USAGE

6.1 GENERAL HISTORY

6.1.1 AREA 8

In 1915 President Woodrow Wilson ordered 1,160 acres in Alabama reserved for military purposes, which soon became Fort McClellan. The Department of the Army established the Army Chemical Training Center at Fort McClellan in 1951 and academic instruction began at the U.S. Army Chemical Corps School in September 1952. The Radiological Safety Support Unit, established in 1953, was an organizational element of the Army Chemical Training Center at Fort McClellan. The Rad Unit, as it was commonly called, conducted radiological tests and research and development, which aided in the development of training and tactical doctrine. In 1963 the name of the U.S. Army Chemical Corps School changed to the U.S. Army Chemical Center and School (Brief 1954; Rosell 1960; St. Louis 1998).

Radiological training began at Fort McClellan in 1952. The original Radiological Laboratories were located in Post Area No. 8 and consisted of five buildings: T-810, T-811, T-812, T-836 & T-837 (Old T-836A). A concrete vault (T-812½) was used for the storage of radioactive materials, primarily Radium and $Cobalt^{60}$ (Radiological Defense Laboratories 1952).

6.1.2 RATTLESNAKE GULCH AREA

In 1952, field training in Radiological Surveys was initiated. The first course area was known as Rattlesnake Gulch and used 48 Curies of $Cobalt^{60}$ in sources of 2 to 4 Curies each. The course was located south of Summerall Gate Road near the western edge of main post. Approval was also granted for the use of 10 sources of $Cobalt^{60}$ to be used for the CBR Familiarization Course at Pelham Range (Isotopes Committee Meeting (ICM) #4).

In 1953, the Rattlesnake Gulch Survey Area was moved closer to Summerall Gate Road and re-named as Radiological Survey Area #1. A radioactive waste burial ground was established and designated as the Chemical School Radioactive Burial Ground with the following limitations:

1. All waste to be burned and sealed in bleach cans before burial.
2. No isotope of longer half-life than 90 days is to be buried.
3. The burial site is to be well marked with large "civilian type" signs.
4. All burials are to be recorded in the Health Physics Office as a permanent record.

In later years both the Radiological Survey Area #1 and Chemical School Radioactive Burial Ground were referred to as being part of the Rattlesnake Gulch Area. Radioactive waste from the first Rattlesnake Gulch Survey area was removed and buried in the new Chemical School Radiological Burial Ground. (ICM #7, 1953)

In the early 1950's a Field Hot Cell was constructed near Radiological Survey Area #1. The Field Hot Cell was constructed with blocks and sandbags and was used until a second Temporary Hot Cell was built in the Radiological Lab Building (Bldg. 3182). The Field Hot Cell was located near Summerall Gate Road, close to the fence of the Biological Training Area (Anderson 1971; Powell 1955).

During 1954 at least thirteen containers of radioactive waste were buried in the burial area. A radiological survey indicated that the radiation dose-rate at surface level at all points within the burial area did not exceed 7.5 mr/hr (Carroll 1954).

On 3 January 1955, two $Cobalt^{60}$ shipping containers were buried in six-foot pipes at the school burial ground. The Rad Unit buried radioactive tantalum and container in the Chemical Corps School Radioactive Materials Burial Ground on 18 October 1955. (Wood 1955)

In 1956, Radiological Survey Area #1 was re-configured with new grid lines and a new source pattern was planned (ICM #17, 1956).

A May 1957 Radiation Protection Survey performed by the USA Environmental Health Laboratory recommended making the Chemical School Radiological Burial Ground (Rattlesnake Gulch Area) inaccessible to children and that it be decontaminated. The Chemical School Radiological Burial Ground (Rattlesnake Gulch Area) at the time was surrounded by a 3 strand barbed wire fence. A new fence was to be built to encircle the existing one. The new fence was to consist of a 6' fence of hog wire topped by 3 strands of barbed wire and be built in September. By June of 1957 it was recommended that parts of the Chemical School Radiological Burial Ground (Rattlesnake Gulch area) be dug up and either shipped off post or re-buried at the Pelham Range burial ground. Work on digging up the burials was delayed due to the presence of water being in the pits (ICM #25, 1957; ICM #26, 1957; Johnson 1958; Progress Report 1957).

In August 1958, a granite marker was received for the radioactive materials burial ground (Rattlesnake Gulch Area). The marker was inscribed with the date the burial area was closed, the types and amounts of radioisotopes buried and the organization performing the burial. The After Action Report (AAR) on the 1971 clean up of this area does not indicate that this marker was present. An interview in the same report indicates that materials were removed around the 1958 timeframe and moved to the Pelham Range burial grounds (Knight, August 1958; Anderson 1971).

In 1971, Health Physics Division personnel removed radioactive waste from the Chemical School Radioactive Burial Grounds. In writing his After Action Report, Major Anderson calls the site Iron Mountain, due to its location near Iron Mountain. Remnants of the Field Hot Cell (Concrete Block and Sandbags) were also discovered buried on this site (Anderson 1971).

6.1.3 AREA 31

The Army Chemical School established the Radiological Facilities that included a Radiological Laboratory (Building 3182), a Nuclear Accident Training Facility (Alpha Field behind Building 3165). Other new buildings included the Radiological Laboratory (Building 3180), a Radiological Decontamination Training Facility (Bromine Field), a Personnel Decontamination Center (Building 3185), and an Isotope and Scaler Laboratory (Building 3181).

A second Temporary Hot Cell was constructed in the Radiological Laboratory Building to replace the temporary Field Hot Cell. In 1958, the Temporary Hot Cell in the Radiological Laboratory Building was dismantled (Isotope Committee Meeting 1958). The minutes of an Isotope Committee Meeting of 19 November 1958 states that the area had been monitored and found free of contamination (Knight, November 1958).

The second Temporary Hot Cell was replaced by the Hot Cell Facility (Building 3192). The new Hot Cell was connected to an underground drainage system leading to two underground storage tanks. A liquid waste disposal pit was also connected. Radioactive sources were sealed and leak tested at the Alpha Field. Training at the Hot Cell included $Cobalt^{60}$ sources. After the Chemical School closed in 1973, the Hot Cell had numerous decommissioning activities and was released by the NRC in 1998.

Training at the Radiological Laboratory (Building 3182) included radioactive sources and after 1973, the Fort McClellan Military Police used the building later for a museum, office space and classrooms.

The U.S. Army Chemical Center and School staff stored radioactive material in the Radioactive Vault (Building 3180). Building 3180 was demolished in 1989. Military personnel also used an additional radiological storage vault at building T-812½.

Training at the Bromine Field included decontamination of vehicles and personnel. Bromine tanks, used to store contaminated wastewater, were removed from the site in the late 1990's. The Navy also participated in Bromine Field training. Part of the Bromine Field activity included the 11F3A Facility. Located at the Bromine Field, the 11F3A Facility was used for de-contaminating military items (jeep, plane, etc.) in a controlled radiological training environment. Soldiers used Building 3185 as a Personnel Decontamination Center. Radiation sources were routinely present at the Isotope and Scaler Laboratory, Building 3181 (Lutz 1966; U.S. Army Chemical Center and School 1964).

The U.S. Army Chemical School also set up a Radioactive Waste Storage Yard in the Radiological Facilities Area. They temporarily stored Cobalt^{60} sources in 3 ton and 5 ton containers (U.S. Army Corps of Engineers 1990).

The U.S. Army Chemical School at Fort McClellan closed the Radiological Facilities in 1972 and removed the radioactive sources from all buildings and facilities. The Chemical Corps School was deactivated in 1973 (Baldino 1973).

6.1.4 RANGE 25

The U.S. Army Chemical School staff directed actuator tests on Range 25 (Old Bandholtz KD Range) on main post in 1963. The 12-week tests, which included Cobalt^{60} sources, helped the staff decide on major source well actuator purchases (Mayfield 1963; Speer 1963).

6.1.5 CHEMICAL SCHOOL BUILDINGS 1979-1999

After the U.S. Army Chemical School returned to Fort McClellan in 1979, the Edwin R. Bradley Radiological Laboratory (Building 2281) became the focus of radiation training where isotope sources were present. The U.S. Army Chemical School also stored radioactive materials in Building 4416(Thomassy 1988). The Radiological Calibration Facility was located in Building 228. Sibert Hall (Building 1081) was the last home to the nuclear, biological and chemical mission at Fort McClellan and included a radiological laboratory. These buildings were used up until the U.S. Army Chemical School closed and left Fort McClellan in 1999.

6.1.6 STORAGE, MAINTENANCE AND CALIBRATION BUILDINGS

During the history of Fort McClellan a variety of buildings have been used for general storage, calibration of equipment and vehicle maintenance that involve radioactive materials. These items would include Lensetic Compasses and Radium Dials used in vehicles. Storage Buildings include Buildings 256, 257, 303A, 341 & 345. Building 228 was used as a radiological calibration facility for Test Measuring and Diagnostic Equipment (TMDE) from the 1950's to the 1980's. Vehicle Maintenance Buildings include Buildings 335, 337, 338, 339 & 350 (Environmental Baseline Survey 1998).

6.1.7 LICENSES

In 1957, the U.S. Atomic Energy Commission began issuing Byproduct Material Licenses to the U.S. Army Chemical School at Fort McClellan for activities at Pelham Range Area and on main post. From 1957 to 1972 Fort McClellan had two licenses 01-02861-01 and 01-02861-02. The Atomic Energy Commission amended license number 01-02861-01 seventeen times and license number 01-02861-02 four times. Both of the licenses were renewed in 1972 with an expiration date of 1977. In 1959 the U.S. Army Chemical School received a Special Nuclear Material License No. SNM-344 for U-233 and plutonium. After the U.S. Army Chemical Corps School reopened at Fort McClellan in 1979, the Atomic Energy Commission issued license 01-02861-04. This license was amended, renewed and extended for several years and was terminated by the NRC in 1998. (Morgan 1957; Schwertner 1972; Layfield 1971; McAlduff 1970).

In 1960, the Atomic Energy Commission and U.S. Army Chemical Center and School entered into an Interagency Agreement for Enriched Uranium (SNM Interagency Agreement No. 1003) at Fort McClellan (McAlduff 1970). In 1971, the U.S. Atomic Energy Commission and the U.S. Army Chemical Center and School entered into agreement (No. 3039) for plutonium management at Fort McClellan Craig 1971).

Additional information on Fort McClellan Licenses may be found in Appendix D of this report.

6.2 CURRENT USAGE

The Fort McClellan Transition Force is currently transferring Fort McClellan assets to new users. Radiological Areas will be surveyed prior to being released.

6.3 ADJACENT LAND USAGE

Most of the radiological sites are contained within the boundaries of Fort McClellan. Parts of the Rattlesnake Gulch area including part of the Chemical School Radiological Burial Grounds are located on the Anniston Community Center land (City of Anniston) in an area used for hiking. This land was excessed during the 1970's.

Fort McClellan
Radiological Field Training Sites
&
Radiological Burial Sites

MAIN POST

RATTLESNAKE GULCH SITES

Rattlesnake Gulch
Radiological Survey Area
1952-1953
&
Radioactive Waste
1952-1953
All removed in 1953

Radiological Survey Area #1
1953 to 1958

Field Hot Cell
1953 to 1958

Chemical School Radiological
Waste Burial Ground
(Iron Mountain)
1953 to 1958
Partial Removal 1957-1959
Second Removal in 1971

PELHAM RANGE

Chemical School
Field Familiarization Course
10 Sources
(Range I, Range K &
Lima Pond)
1952 to 1958

Radiological Survey Area #3
1956 to 1965

300 Source Wells

Rideout Field
1965 to 1972

1024 Source Wells
(800 Used)

Pelham Range Radiological
Burial Site
1957 to 1972

7.0 FINDINGS

7.1 POTENTIAL CONTAMINANTS

Fort McClellan was licensed to obtain and use small quantities of Radioactive Isotopes. These are listed in the License Review (APPENDIX D). The two most common Radioactive Isotopes used in large quantities were $Cobalt^{60}$ and $Cesium^{137}$.

7.2 POTENTIAL CONTAMINATED AREAS

7.2.1 IMPACTED AREAS – KNOWN AND POTENTIAL

Based on known use, record searches, interviews and site visits; these buildings and areas on main Post property have a potential for Radiological Contamination. Detailed information on each one is listed in Section 8.0 - Conclusions.

Chemical School Buildings:

Building T-810 (Temporary Lab)
Building T-811 (Temporary Lab)
Building T-812 (Temporary Lab)
Building T-836 (Temporary Lab)
Building T-837 (Old T-836A) (Temporary Lab)
Building T-812½ (Radioactive Storage)
Building 3192 (Permanent Hot Cell)
Building 3180 (Storage Vault)
Building 3182 (Radiological Lab)
Building 3181
Building 3185 (Personnel Decontamination Center)
Building 1081
Building 2281 (Edwin R. Bradley Radiological Laboratory)

Chemical School Areas and Facilities:

Alpha Field
Bromine Field
Bromine Tanks
Liquid Waste Disposal Pit
Radioactive Waste Storage Yard
Original Rattlesnake Gulch Radiological Survey Area (FN 09885 28939)
Radiological Survey Area #1 (FN 099 296)
Field Hot Cell (FN 100 297)
Chemical School Radiological Burial Grounds (FN 099 292)
RANGE 25

Storage buildings:

Building 4416 (Ammo Storage)
Building 256
Building 257
Building 303A
Building 341
Building 345

Maintenance buildings (Vehicle & Calibration):

Building 228
Building 335
Building 337
Building 338
Building 339
Building 350

7.2.2 NON-IMPACTED AREAS

Based on this Radiological Historic Assessment, none of the other buildings or areas at Fort McClellan (Main Post) have had any activity associated with radioactive isotopes.

7.3 POTENTIAL CONTAMINATED MEDIA

A description of each location is in Section 8.0 - Conclusions.

7.4 RELATED ENVIRONMENTAL CONCERNS

As a precaution the above areas should be limited in access and use until cleared by proper authorities (Fort McClellan).

8.0 CONCLUSIONS

8.1 TEMPORARY LABS (BUILDINGS T-810, T-811, T-812, T-836 & T-837)
Plate 2, Figure 3, FN 133 315

The original Radiological Laboratories were located in Post Area No. 8 and consisted of five buildings: T-810, T-811, T-812, T-836 & T-837 (Old T-836A). These buildings were used from 1952 until the completion of the new permanent buildings in Area 31 (Circa 1954). Note: Only the foundation remains of building T-836.

In August of 2000 a MARSSIM Class III Survey on Buildings T-810, T-811, T-812 and the foundation of the demolished Building T-836 was completed. At the same time a MARSSIM Class II Survey was also completed on Building T-837.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated October 2000, and the results of the NRC inspection and confirmatory survey completed in February 2000 and documented in the NRC Inspection Report 01-02861-05/01-01, dated 9 March 2001, the NRC concluded that the buildings and areas meet the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.2 BUILDING T-812½
Plate 2, Figure 3, FN 133 315

Used as a Radium^{226} and Cobalt^{60} storage vault from the early 1952 to 1973. Documented in the EBS. Results of 1995 wipe tests were clean. Unrestricted use. Recommend no new surveys.

In November of 1999 a MARSSIM Class III Survey on Building T-812½ was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584). No further action under MARSSIM is recommended.

8.3 PERMANENT HOT CELL (BUILDING 3192)

Plate 2, Figure 2, FN 119 303

Building used from late 1950's to 1973. Documented in the Environmental Baseline Survey (EBS). Connected to an underground drainage system leading to two underground storage tanks. Liquid waste disposal pit also connected. Initial decontamination of building in 1973. In 1995 additional soil removed and cleaned up. Building is locked and fenced.

RECOMMENDED ACTION: Based upon Allied Technology Group, Remediation and Closeout Survey Report, dated December 1996, Industrial Radiation Survey No. 27-MH-6999-97 Facility Closeout Verification Survey, dated 6 February 1998 and NRC confirmatory surveys documented in NRC Inspection Report Nos. 01-02861-04/97-01, 98-01 and 98-02, dated 7 October 1997, 21 April 1998 and 22 May 1998, respectively, the NRC released Building 3192 and Surrounding Fenced Area (containing former Building 3180, Liquid Waste Disposal pit and Radioactive Waste Storage Yard) for unrestricted use as documented in the NRC letter dated 19 October 1998, Subject: Termination of License No. 01-02861-0401-02861-04(Reference: Control No. 257737; Docket No. 030-14759030-14759), no further action under MARSSIM is recommended.

8.4 STORAGE VAULT (BUILDING 3180)

Plate 2, Figure 2, FN 119 303

Used from the early 1950's to 1973. Documented in the EBS. Demolished in 1989. Debris removed. Released by the NRC in 1998.

RECOMMENDED ACTION: Based upon the results of the survey contained in the U.S. Army Chemical School, Final Survey Report, Radiological Laboratories Building 1081, dated March 2000, the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584), Building 1081 meets the criteria for unrestricted release delineated in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.5 RADIOLOGICAL LAB (BUILDING 3182)

Plate 2, Figure 2, FN 119 304

Used from the early 1950's to 1973. This building also housed a temporary Hot Cell prior to the building of the permanent hot cell. Documented in the EBS. Tiles removed from floor in 1995. Released by the NRC in 1998.

In August of 2000 a MARSSIM Class I Survey on Building 3182 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated October 2000, and the results of the NRC inspection and confirmatory survey completed in February 2000 and documented in the NRC Inspection Report 01-2861-05/01-01, dated 9 March 2001, the NRC concluded that the building meets the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.6 BUILDING 3181

Plate 2, Figure 2, FN 118 305

Scaler Lab T (Building 3181): Used from the early 1950's to 1973. Documented in the EBS. Released by the NRC in 1998.

Isotope Lab (Building 3181): Used from the early 1950's to 1973. Documented in the EBS. Released by the NRC in 1998.

Isotope Lab Vault (Building 3181): Used from the early 1950's to 1973. Documented in the EBS. Released by the NRC in 1998.

In November of 1999 a MARSSIM Class II Survey on Building 3181 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Commodity Site Survey Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979; Docket No. 030-17584), no further action under MARSSIM is recommended.

8.7 PERSONNEL DECONTAMINATION CENTER (BUILDING 3185)

Plate 2, Figure 2, FN 118 327

Students, while receiving training at the Bromine Pad used this building. Students changed clothes here and after the exercise went through personal decontamination procedures in the various rooms of the building. Use of this building in conjunction with the Bromine Field is from the late 1960's to the early 1970's.

In August of 2000 a MARSSIM Class III Survey on Building 3185 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated October 2000, and the results of the NRC inspection and confirmatory survey completed in February 2000 and documented in the NRC Inspection Report 01-2861-05/01-01, dated 9 March 2001, the NRC concluded that the building meets the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.8 BUILDING 1081 (Sibert Hall, Radiological Lab)

Plate 3, FN 118 327

The lab was used from original occupancy (late 1980's) to 1999. Documented in the EBS. No known releases or problems.

Building 1081 was surveyed in August-December 1999 in accordance with the Decommissioning Plan, U.S. Army Chemical School, dated March 1999.

RECOMMENDED ACTION: Based upon the results of the survey contained in the U.S. Army Chemical School, Final Survey Report, Radiological Laboratories Building 1081, dated March 2000, the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584), Building 1081 meets the criteria for unrestricted release delineated in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.9 BUILDING 2281, EDWIN R. BRADLEY RADIOLOGICAL LABORATORY

Plate 3, FN 113 323

After the U.S. Army Chemical School returned to Fort McClellan in 1979, the Edwin R. Bradley Radiological Laboratory (Building 2281) became the focus of radiation training with isotope sources. Use continued until the late 1980's when the Radiological Laboratory was established in Sibert Hall (Building 1081). Reported used for the storage of radiological materials (Weston 1990). The EBS found no other documentation. Released by Nuclear Regulatory Commission (NRC) for unrestricted use.

RECOMMENDED ACTION: Based upon survey results contained in Closeout Survey, Building 2281, Edwin R. Bradley Radiological Laboratories, dated November 1988, the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC Inspection Report No. 01-02861-05/99-01, dated 1 March 2000, Building 2281 meets the criteria for unrestricted release delineated in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.10 ALPHA FIELD

Plate 2, Figure 2, FN 118 302

Located southeast of Building 3192, site was used for Alpha surveys from around 1960 to 1972. Documented in the EBS. No leaks or contamination. Released for unrestricted use.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Commodity Site Survey Report, dated March 2000, no survey was required for the Alpha Field, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979; Docket No. 030-17584), no further action under MARSSIM is recommended.

8.11 BROMINE FIELD

Plate 2, Figure 2, FN 118 302

Located south of Building 3192, used jointly in the 1960's by army and navy personnel. Building 3185 now occupies part of the Bromine Field location. Documented in the EBS. No termination or closeout survey on file. No further action planned.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Commodity Site Survey Report, dated March 2000, no survey was required for the Bromine Field, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979; Docket No. 030-17584), no further action under MARSSIM is recommended.

8.12 BROMINE TANKS

Plate 2, Figure 2, FN 118 302

Located next to the Bromine Field and used to hold contaminated, waste water until safe to drain. Documented in the EBS. Used from the late 1960's to the early 1970's. Tanks have been removed and disposed of. No further action planned.

RECOMMENDED ACTION: These tanks have been removed. Recommend no new surveys.

8.13 LIQUID WASTE DISPOSAL PIT
Plate 2, Figure 2, FN 119 303

This pit was connected to the Permanent Hot Cell (Building 3192) and was located between the Permanent Hot Cell and Building 3180. Use is from the 1950's to 1973. Documented in the EBS. Released in 1998 by the NRC.

RECOMMENDED ACTION: Based upon the results of the survey contained in the U.S. Army Chemical School, Final Survey Report, Radiological Laboratories Building 1081, dated March 2000, the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584), Building 1081 meets the criteria for unrestricted release delineated in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.14 RADIOACTIVE WASTE STORAGE YARD
Plate 2, Figure 2, FN 119 303

This Yard was created when fencing was erected from the south side of Building 3182 around Buildings 3192 & 3180. The Chemical School temporarily stored $Cobalt^{60}$ sources in 3 ton and 5 ton containers. The NRC released the area in 1998.

RECOMMENDED ACTION: Based upon the results of the survey contained in the U.S. Army Chemical School, Final Survey Report, Radiological Laboratories Building 1081, dated March 2000, the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584), Building 1081 meets the criteria for unrestricted release delineated in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.15 RATTLESNAKE GULCH RADIOLOGICAL SURVEY AREA (1952)
Plate 2, Figure 1, FN 098 289

In 1952, field training in Radiological Surveys was initiated. The first course area was known as Rattlesnake Gulch and used 48 Curies of $Cobalt^{60}$ in sources of 2 to 4 Curies each. The course was located south of Summerall Gate Road near the western edge of main post. In 1953 the course was moved closer to Summerall Gate road and became known as Radiological Survey Area #1. During the site survey three rows of military pickets were found defining two long lanes, the center of which is FN 09885 28939. No other documentation or evidence found during the site survey pinpointed to the original survey area called Rattlesnake Gulch. The area is believed to be just east of the Anniston Community Center east parking lot, in a small ravine. In the lane area the noses of two

concrete practice bombs were found at FN 09852 28868. From the Isotope Committee Meeting Minutes all radioactive sources and radioactive waste were removed in 1953. The radiological sources were moved to the new Radioactive Survey Area #1, just south of Summerall Gate Road and the radioactive waste was buried in the Chemical School Radioactive Burial Ground.

In August of 2000 a MARSSIM Class III Survey on the Original Rattlesnake Gulch area was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated October 2000, and the results of the NRC inspection and confirmatory survey completed in February 2000 and documented in the NRC Inspection Report 01-02861-05/01-01, dated 9 March 2001, the NRC concluded that the area meets the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.16 RADIOLOGICAL SURVEY AREA #1 (1953-1958)

Plate 2, Figure 1, FN 099 296

This area replaced the original Rattlesnake Gulch Radiological Survey Area in 1953. The area is believed to be close to the south side of Summerall Gate Road, between the old Chemical Demonstration Area and the Biological Warfare Area (T-4). Over time it also became known as being part of the Rattlesnake Gulch Area. It was reconfigured at least once and was removed with the completion of Radiological Survey Area #3 at Pelham Range in 1958.

RECOMMENDED ACTION: Based upon the survey results contained in the Center for Health Promotion and Preventive Medicine, Industrial Radiation Study No. 27-MH-0987-RI-96, Iron Mountain and Rattlesnake Gulch Sites, and the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC Inspection Report 01-2861-05/99-01, dated 1 March 2001, the NRC concluded that the area meets the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.17 FIELD HOT CELL (FN 100 297)

Plate 2, Figure 1, FN 100 297

The Field Hot Cell was the first Hot Cell at Fort McClellan. It was used in the early 1950's until a second temporary hot cell was built in Building 3182. From the letter, written by Lieutenant Colonel Powell, in Major Anderson's AAR on the radiological cleanup of the burial grounds, the field hot cell was made of cinder blocks and sandbags. It was located close to Summerall Gate Road and near the fence that separated Radiological Survey Area #1 from the Biological training Area (T-4). During the

November 1999 site visit a shallow square excavation was found just west of T-4. The area was depressed about two feet and was approximately 12 feet square. An empty upright 55-gallon drum was found a little farther to the west.

RECOMMENDED ACTION: Based upon the survey results contained in the Center for Health Promotion and Preventive Medicine, Industrial Radiation Study No. 27-MH-0987-RI-96, Iron Mountain and Rattlesnake Gulch Sites, and the results of the NRC inspection and confirmatory survey completed in October 1999 and documented in the NRC Inspection Report 01-2861-05/99-01, dated 1 March 2001, the NRC concluded that the area meets the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.18 CHEMICAL SCHOOL RADIOLOGICAL BURIAL GROUNDS

Plate 2, Figure 1, FN 099 292

This area was used for radiological burials from 1953 to the 1957-1958 timeframe. In 1958 or 1959 some of the radioactive burials were removed and buried in a new burial ground located at Pelham Range. Documents indicate that Post Engineers received a granite marker, with the types and amounts, of burials. However with the partial removal of some of the burials the marker became obsolete. The first fence around the area consisted of 3 strands of barbed wire. A second fence was built to encircle the existing one. This second fence consisted of a 6' fence made of hog wire topped by 3 strands of barbed wire.

In 1971 this area was rediscovered. A second cleanup took place and materials recovered were removed off post (Pelham Range). At the end of the work the fencing was bull dozed and all radioactive signs removed. Sometime after 1971 Fort McClellan excessed part of the parcel that the Chemical School Radiological Burial Grounds occupied.

During the site surveys in September and November of 1999 little evidence was found on Fort McClellan property. However, numerous 4" pipes and mounds of pushed up fencing, mixed with 4" pipes were found in the northeast corner of the Anniston Community Center Property. Remnants of fencing, which is embedded in trees, indicate that the majority of the burial grounds may be off post. (See photos, Appendix C)

In August of 2000 a MARSSIM Class II Survey on the Chemical School Radiological Burial Ground was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated October 2000, and the results of the NRC inspection and confirmatory survey completed in February 2000 and documented in the NRC Inspection Report 01-2861-05/01-01, dated 9 March 2001, the NRC concluded that the area meets the criteria for unrestricted use as described in 10 CFR 20.1402, no further action under MARSSIM is recommended.

8.19 RANGE 25 (OLD BANDHOLTZ KD RANGE)
Plate 2, FN 140 303

In 1963 the Chemical School conducted a one-time test of prototype actuators to be used at the new Radiological Survey Area at Pelham Range. Five prototypes were tested for a period of six weeks. Fencing was installed between the 300-yard and 400-yard firing lines. No recorded evidence of leaking or burial.

RECOMMENDED ACTION: Based upon the information contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated October 2000, no survey was required for Range 25. The NRC determined that no further action was required as documented in the NRC Inspection Report 01-2861-05/01-01, dated 9 March 2001, no further action under MARSSIM is recommended.

8.20 BUILDING 4416 (AMMO MAGAZINE)
Plate 3, FN 135 325

Reportedly used for the storage of radiological materials sometime after the Chemical School was re-established in 1979 (Weston 1990). The EBS found no other documentation. Nor did this Historical Assessment. Wipe tested clean. No known releases or problems.

In November of 1999 a MARSSIM Class III Survey on Building 4416 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584). No further action under MARSSIM is recommended.

8.21 BUILDINGS 256, 257 & 303A
Plate 2, FN 131 315

These buildings were used to store materials such as lensetic compasses (timeframe unknown).

In November of 1999 a MARSSIM Class III Survey on Buildings 256, 257 & 303A was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584). No further action under MARSSIM is recommended.

8.22 BUILDINGS 341 & 345

Plate 3, FN 132 319

These buildings were used for general storage. No known radiological mission, use or disposal.

In November of 1999 a MARSSIM Class II Survey on Buildings 341 & 345 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Commodity Site Survey Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979; Docket No. 030-17584), no further action under MARSSIM is recommended.

8.23 BUILDING 228

Plate 2, FN 119 314

Used as a radiological calibration facility for Test Measuring and Diagnostic Equipment (TMDE) from the 1950's to the 1980's. Documented in the EBS. No indication of spills or releases. No further action planned.

In November of 1999 a MARSSIM Class III Survey on Building T-228 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584). No further action under MARSSIM is recommended.

8.24 BUILDINGS 335, 337 & 338
Plate 3, FN 128 317

These buildings were used for General Support Vehicle Maintenance Shops.

In November of 1999 a MARSSIM Class III Survey on Buildings 335, 337 & 338 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584). No further action under MARSSIM is recommended.

8.25 BUILDINGS 339 & 350
Plate 3, FN 131 318

These buildings were used for Vehicle Maintenance Shops.

In November of 1999 a MARSSIM Class III Survey on Buildings 339 & 350 was completed.

RECOMMENDED ACTION: Based upon the survey results contained in the Allied Technology Group, Select Commodity Site Areas, Final Radiological Status Report, dated March 2000, the NRC determined that no further action is required as documented in the NRC letter dated 27 July 2000, Subject: Transmittal and Explanation of Amendment to License No. 01-02861-05 (Reference Control No. 258979: Docket No. 030-17584). No further action under MARSSIM is recommended.

9.0 REFERENCES (Procedural)

The manuals below are not included in this report, but are listed as the "Procedural" documents only in the preparation of this report. They are on file at U.S. Engineer District, St. Louis (CEMVS-ED-P), for reference purposes.

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

HISTORICAL ASSESSMENT – MAIN POST
VOLUME II

REPORT APPENDICES

A Conceptual Model and Site Diagram showing Classifications (Chart)

B Cited Documents

C Photo Documentation Log
Original Photographs of the site and pertinent site features

D Licenses Listing

E Site Visits

F Distribution List

APPENDIX A

Conceptual Model and Site Diagram Showing Classifications (Chart)

Fort McClellan
Radiological Areas
Main Post

Index	Map Location	Military Grid	Name	Radionuclides	Recommendation
1	Plate 2 Figure 3	FN 133 315	Building T-810 (Temporary Lab)	Unknown	No New Surveys
2	Plate 2 Figure 3	FN 133 315	Building T-811 (Temporary Lab)	Unknown	No New Surveys
3	Plate 2 Figure 3	FN 133 315	Building T-812 (Temporary Lab)	Unknown	No New Surveys
4	Plate 2 Figure 3	FN 133 314	Building T-836 (Temporary Lab)	Unknown	No New Surveys
5	Plate 2 Figure 3	FN 133 314	Building T-837 (Temporary Lab)	Unknown	No New Surveys
6	Plate 2 Figure 3	FN 133 315	Building 812½ (Radioactive Storage)	$Radium^{226}$ $Cobalt^{60}$	No New Surveys
7	Plate 2 Figure 2	FN 119 303	Building 3192 (Permanent Hot Cell)	Multiple Radionuclides	No New Surveys
8	Plate 2 Figure 2	FN 119 303	Building 3180 (Storage Vault)	Multiple Radionuclides	No New Surveys
9	Plate 2 Figure 2	FN 119 304	Building 3182 (Radiological Lab)	Multiple Radionuclides	No New Surveys
10	Plate 2 Figure 2	FN 118 305	Building 3181	Multiple Radionuclides	No New Surveys
11	Plate 2 Figure 2	FN 119 300	Building 3185 (Personnel Decontamination Center)	$Bromine^{82}$	No New Surveys

Fort McClellan
Radiological Areas
Main Post

Index	Map Location	Military Grid	Name	Radionuclides	Recommendation
12	Plate 3	FN 118 327	Building 1081	Multiple Radionuclides	No New Surveys
13	Plate 3	FN 113 323	Building 2281 (Edwin R. Bradley Radiological Laboratory)	Multiple Radionuclides	No New Surveys
14	Plate 2 Figure 2	FN 118 302	Alpha Field	$Uranium^{233}$	No New Surveys
15	Plate 2 Figure 2	FN 118 302	Bromine Field	$Bromine^{82}$	No New Surveys
16	Plate 2 Figure 2	FN 118 302	Bromine Tanks	$Bromine^{82}$	No New Surveys
17	Plate 2 Figure 2	FN 119 303	Liquid Waste Disposal Pit	Multiple Radionuclides	No New Surveys
18	Plate 2 Figure 2	FN 119 303	Radioactive Waste Storage Yard	Multiple Radionuclides	No New Surveys
19	Plate 2 Figure 1	FN 098 289	Original Rattlesnake Gulch Radiological Survey Area	$Cobalt^{60}$	No New Surveys
20	Plate 2 Figure 1	FN 099 296	Radiological Survey Area #1	$Cobalt^{60}$	No New Surveys
21	Plate 2 Figure 1	FN 100 297	Field Hot Cell	Unknown	No New Surveys
22	Plate 2 Figure 1	FN 099 292	Chemical School Radiological Burial Grounds	Multiple Radionuclides	No New Surveys

Fort McClellan
Radiological Areas
Main Post

Index	Map Location	Military Grid	Name	Radionuclides	Recommendation
23	Plate 2	FN 140 303	Range 25	$Cobalt^{60}$	No New Surveys
24	Plate 3	FN 135 325	Building 4416 (Ammo Magazine)	Unknown	No New Surveys
25	Plate 2	FN 118 316	Building 256	$Radium^{226}$	No New Surveys
26	Plate 2	FN 119 315	Building 257	$Radium^{226}$	No New Surveys
27	Plate 2	FN 131 315	Building 303A	$Radium^{226}$	No New Surveys
28	Plate 3	FN 131 318	Building 341	$Radium^{226}$	No New Surveys
29	Plate 3	FN 132 319	Building 345	$Radium^{226}$	No New Surveys
30	Plate 2	FN 119 314	Building 228	Unknown	No New Surveys
31	Plate 2	FN 128 316	Building 335	$Radium^{226}$	No New Surveys
32	Plate 3	FN 128 317	Building 337	$Radium^{226}$	No New Surveys
33	Plate 3	FN 129 317	Building 338	$Radium^{226}$	No New Surveys

Fort McClellan
Radiological Areas
Main Post

Index	Map Location	Military Grid	Name	Radionuclides	Recommendation
34	Plate 3	FN 130 317	Building 339	$Radium^{226}$	No New Surveys
35	Plate 3	FN 131 318	Building 350	$Radium^{226}$	No New Surveys

APPENDIX B

Cited Documents

APPENDIX B – CITED DOCUMENTS

Anderson, Raymond L., Major, CmlC

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1956 Seventeenth Meeting, 15 March 1956. The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama.

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1958 Meeting, 8 January 1958, includes Disposition Form, 7 January 1958, Summary of Corrective Action. U.S. Army Chemical Corps School, Fort McClellan, Alabama.

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McAlduff, H. J., Jr. (Appendix D-Licenses Listing)

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Anderson, Raymond L., Major, CmlC
1971 Iron Mountain (Rattlesnake Gulch) Radioactive Material Burial Site, 29 July 1971. U.S. Army Chemical School, Fort McClellan, Alabama.

Report Title ----IRON MOUNTAIN (RATTLESNAKE GULCH)
RADIOACTIVE MATERIAL BURIAL SITE

Prepared by ---- RAYMOND L. ANDERSON
Major, CmlC
C, Health Physics Div, USACMLCS

(THIS REPORT IS TO BE RETAINED AS A PERMANENT RECORD)

HEALTH PHYSICS DIVISION
U. S. ARMY CHEMICAL CENTER AND SCHOOL
Fort McClellan, Alabama 36201

29 July 1971

IRON MOUNTAIN (RATTLESNAKE GULCH) RADIOACTIVE MATERIAL BURIAL SITE

Submitted by: Raymond L. Anderson
RAYMOND L. ANDERSON
MAJ, CmlC
Chief, Health Physics Division

Approved by: Stanley D. Fair
STANLEY D. FAIR
Colonel, CmlC
Commandant

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REPORT SUMMARY

On 18 February 1971, Health Physics Division personnel discovered an old burial grounds for radioactive material. The area was formerly known as Rattlesnake Gulch, however, the present name is Iron Mountain. A radiological survey of the area yielded a total of 22 hot spots on the surface of the ground. The survey results and a sketch of the area are contained in Section III of this report.

No records were available at the Chemical School indicating what was buried in this area or when it was buried. Several individuals were contacted who had knowledge of this area. Section IV contains a letter resulting from this contact.

Health Physics Division was given the mission of cleaning up this area and disposing of any radioactive material recovered in accordance with current AEC regulations.

As time allowed, Health Physics Division personnel explored the burial grounds with picks and shovels. Three beach cans filled with rad lab waste were uncovered. In addition, two lead cylinders were recovered containing quantities of cesium 137 and strontium 90. The earth in the vicinity of these containers was contaminated. Eighteen 55 gallon drums of contaminated dirt were removed.

On 19 July 1971, a back-hoe was used to trench the area to be sure all radioactive material had been recovered from the site. By 23 July, the trenching was completed. On 27 July, a bulldozer filled in the trenches. A health physics survey of the area failed to reveal significant surface contamination remaining. The fence around the area was removed and the area closed out.

The recovered material will be disposed of in accordance with AR 755-15. A copy of this report will be on file in the Chemical School library and one will be retained by the Health Physics Division.

II. MAP OF FORT MCCLELLAN AREA

III. HEALTH PHYSICS SURVEY RESULTS

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL	SUBJECT
ATSCM-H	Memo for Record - Iron Mountain Burial Site

TO | FROM C, Health Physics Div | DATE 22 Feb 1971 | CMT 1

1. This memo is to document the events surrounding the discovery of the Iron Mountain (Rattlesnake Gulch) radioactive material burial site. The location of this site is: Coordinates 103290, ref: Map - Anniston, sheet 3851 III, series V744, scale 1:50,000.

2. On 18 February 1971, SFC Pryor, SSG Truffa, and myself, decided to check an area for possible radiological contamination. This survey was undertaken due to rumors about an old burial grounds and also due to some references to this area on some old dosimetry records in the Health Physics Division files. No other records pertaining to this area could be found anywhere at the Chemical School. The general location of the area in question was thought to be in a gully behind the biological field sampling area off Summerall Gate Road. After surveying a sizable portion of the area, I finally found the area in question. It is on the side of a mountain, not in a gulch. The area is about 140 feet long and 80 feet wide. It is enclosed with a hog wire fence topped with 3 strands of barbed wire. There is a gate in the fence and radiation warning signs located every fifty feet along the fence. Inside this fence, there is another fence made of barbed wire. A quick survey of the area revealed at least six (6) hot spots with the highest reading being 5 mr/hr. Upon returning to the Chemical School, I informed LTC Habermehl of this event. He said he would pass the information on to the Asst Commandant, Col Startt. As far as guidance as to what action should be taken, I was instructed to retain this information within the Health Physics Division for the time being.

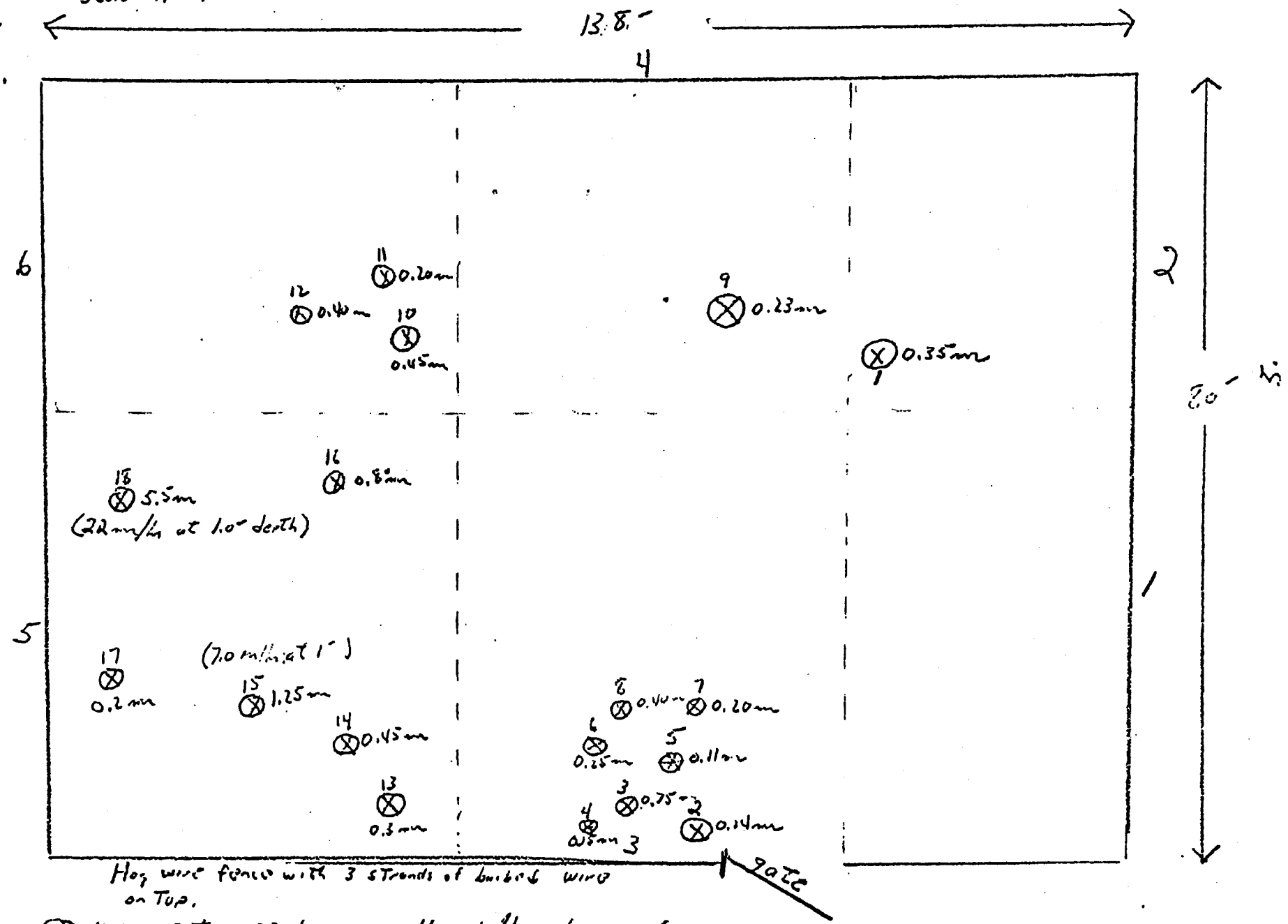
3. On 19 Feb 71, members of the Health Physics Division returned to the Iron Mountain site to make a detailed survey of the area. The equipment used included two AN/PDR 27, two E-510s, one AN/PDR-60, plastic bags, tape, tongs, shovels, and a film badge and dosimeter for everyone. The area was divided into six sections for the survey. A total of 18 hot spots were found on the surface of the ground. The highest reading was 5.5 mr/hr. At this spot a hole was dug to a depth of about one (1) foot. The reading at about the six (6) inch level was 22 mr/hr and then decreaded as the hole was made deeper. Numerous samples were taken throughout the area. These included soil, leaves, and bark from the trees in the area. Samples were also taken from the area outside the fence. Most of the samples were hot, however we did not get a sample that was hot enough for use in the single channel analizer. We suspect that the radioactive material in the area is cobalt 60 or cesium 137. These results were reported to LTC Habermehl, DOI, who in turn was to inform the Asst Commandant. He said that no decision had been made as of yet as to what to do about this area. Health Physics Division personnel are going to make another survey of the area. This will entail digging numerous holes to insure that no large containers of radioactive material are buried in the area.

Raymond L. Anderson

RAYMOND L. ANDERSON
Major, CmlC
C, Health Physics Div

DA FORM 2496 REPLACES DD FORM 96, EXISTING SUPPLIES OF WHICH WILL BE

Coordinates 103 240
Map: Anniston, sheet 3851 III
Series 6744
Scale 1:50,000



Health Physics Survey Worksheet

Iron Mountain

~~(Alpha Field~~ Survey)

Survey #_____

Date 19 Feb 71

Wipe Number	Plate Number	Location	Gross Count	Background	Net Count	DPM	Microcuries
1	—	1	47	26	21	249	1.12×10^{-4}
3	—	3	58	26	32	379	1.71×10^{-4}
6	—	6	26	26	0	0	0
8	—	8	24	26	0	0	0
9	—	9	37	26	11	130	5.87×10^{-5}
10-1	—	10-1	36	26	10	118	5.34×10^{-5}
10-2	—	10-2	32	26	6	71	3.20×10^{-5}
16-1	—	16-1	52	26	26	308	1.39×10^{-4}
16-2	—	16-2	33	26	7	83	3.73×10^{-5}
16-3	—	16-3	52	26	26	308	1.39×10^{-4}
16-4	—	16-4	52	26	26	308	1.39×10^{-4}
18-1	—	18-1 ~~16-4~~	34	26	8	95	4.26×10^{-5}
18-2	—	16-2	68	26	42	498	2.23×10^{-4}
18-3	—	18-3	52	26	26	308	1.39×10^{-4}
18-1-1	[illegible]	18-1-1	240	26	214	2525	1.82×10^{-3}
18-1-2	[illegible]	18-1-2	116	26	90	1068	4.8×10^{-4}

Ft McCl Fm 441-R
(20 Nov 70)

Performed by: RZL

Health Physics Survey Worksheet

Survey #_____

Fran Mountain

(~~Alpha Field~~ Survey)

Date _____

Wipe Number	Plate Number	Location	Gross Count	Background	Net Count	DPM	Microcuries
18-1-3		18-1-3	124	26	98	1163	5.23×10^{-4}
15-1	(1 ft depth)	15-1	38	26	12	142	6.41×10^{-5}
15-2	(2 in depth)	15-2	35	26	9	106.8	4.80×10^{-5}
15-3	(2 in depth)	15-3	36	26	10	118	5.34×10^{-5}
15-4	(2 in depth)	15-4	40	26	14	165	7.47×10^{-5}
15-5	(2 in depth)	15-5	56	26	30	355	1.60×10^{-4}

Performed by: R2u

Ft McCl Fm 441-R
(20 Nov 70)

DISPOSITION FORM

For use of this form, see AR 340-15; the proponent agency is The Adjutant General's Office.

REFERENCE OR OFFICE SYMBOL	SUBJECT
ATSCM-H	Iron Mountain Site - Memo for Record

TO Record File FROM DATE 23 Feb 71 CMT 1

In an effort to find individuals who had knowledge of the Iron Mountain Burial site and specifically what activities occurred there, a Mr. Philip W. La Vie was contacted by phone. He had formally worked in the Health Physics Division during the late 1 50s and early 60s. He is presently employed at the Norfolk Naval Shipyards (phone # 61-0111 ext 5886). The information recieved from Mr. La Vie reveals that this area was used in past times as a radiological training area. A Hot Cell had even been constructed out there. It was made of sand bags and a bromine window and utilized steel rods as manipulators. A burial grounds was established to dispose of waste from the radiological laboratories. Items were put in bleach can and buried at a depth of 6 to 8 feet. Materials buried included Co 60, thalium, radium 226, plus others he could not remember. In 1 60 upon returning to the Health Physics Div after an overseas tour of duty, Mr. La Vie inquired as to what ever became of Rattlesnake Gulch (Iron Mountain.) He was told by the Health Physics Officer a Major Corky Colgin, that the radioactive material buried there had been partially removed, Mr. La Vie got the impression that the subject of this area was not to be discussed and the whole subject was treated as a "hot potato".

A report was recieved from Mr. Corky Colgin via his wife who is employed at the USACMLCS. The report was not very useful. It consisted of confirmation that the area had been used for radiological activities but no details were provided. After confiring with Col Ladson, Commandant of the USACMLCS, he made the decision that whatever material was still at the burial site should be recovered, packaged properly, and shipped out of Fort McClellan for burial. HPD was given this task and given the instructions to handle it in a discrete manner.

In order to get information as to what might be buried at the site, I wrote a letter to LTC Powell, then stationed in Korea, requesting any information he might have concerning this matter. He had been assigned to the Radiological Division during the time the activities in question were occurring.

Raymond L. Anderson

RAYMOND L. ANDERSON
Major, CmlC
C, Health Physics Div

DA FORM 1 FEB 62 2496 REPLACES OD FORM 96, EXISTING SUPPLIES OF WHICH WILL BE ISSUED AND USED UNTIL 1 FEB 63 UNLESS SOONER EXHAUSTED. ☆ GPO 1970 O 397410

IV. LETTER FROM LTC POWELL, FORMER CHIEF, RADIOLOGICAL DIVISION, USACMLCS

ATSCM-H 24 February 1971

LTC William G. Powell
Nuclear-Chemical Opns Div, G-3
HQ, 8th U. S. Army
APO San Francisco 96301

Dear LTC Powell:

This letter is a request for information about an area on Fort McClellan that was once used as a radiological training area and as a disposal area for radioactive waste. The location is shown on the attached portion of map. I believe this area was formally known as Rattlesnake Gulch and was in use sometime during the time frame 1952 to 1960.

I rediscovered this area in February of this year. The area sits up on a hill and is surrounded by a fence with radiation warning signs on it. A survey of the area revealed at least eighteen (18) "hot" spots, the highest being about 22 millirad/hour.

Upon reporting this discovery to the front office, COL Ladson started at once to search for individuals who had knowledge of what type materials were buried there, how they were packaged, how they were buried, and whether or not the material originally buried was ever removed and shipped to another disposal site. No records at the Chemical School contain any information about this area. COL Ladson has already interviewed Mr. Roy Hirano, Mr. Ed Bradley, Mr. Hail and Mr. Moore. They did not provide much information of any value. COL Ladson also contacted a Corky Colgin and gained some information. I talked to a Mr. Philip LaVie who was formerly a member of the Health Physics organization at the School. This conversation was fruitful, however, Mr. LaVie did not know what ever became of the material that was disposed of at this site. The key questions now to be answered are: 1) what and in what approximate quantities was disposed of at this site, 2) how was the material buried, that is at what depth, and 3) was the material ever dug up and moved elsewhere?

ATSCM-H
LTC William G. Powell

24 February 1971

COL Ladson has tasked the Health Physics Division with cleaning this area up so that it is safe and will no longer be a "radiation area." Before tackling this task, we need information as to what we might be getting into. On behalf of the Commandant and the Health Physics Division, I sincerely request that you provide us with any information you might have regarding this matter.

Sincerely,

RAYMOND L. ANDERSON
MAJ, CmlC
Chief, Health Physics Division

P. S. SSG Bart Truffa, formerly of this Division, is on his way to Korea. Look him up and he can fill you in on the latest news at the USACMLCS.

ROUTING AND TRANSMITTAL SLIP

1 TO ~~Col Lapp~~	INITIALS	ACTION
	DATE	CIRCULATE
		COORDINATION
2 ~~Col Stuart~~ JMB	INITIALS	FILE
	DATE	INFORMATION
3 Major Anderson	INITIALS	NOTE AND RETURN
	DATE	PER CONVERSATION
4 1- Noted. Pl. continue in light of our other Talks. Comdt. has been informed	INITIALS	SEE ME
	DATE	SIGNATURE

REMARKS

2 For your information.

2 3- So far, HPD has removed only two (2) drums of material from area in question due to weather and work at Rideout Field.

3. We have ordered 35 specification containers to package the waste material we dig up.

4. Project is now at a standstill until we finish loading Rideout Field.

Try to clean up ASAP after Rideout Fld. loading JMStuart

Do NOT use this form as a RECORD of approvals, concurrences, disapprovals, clearances, and similar actions

FROM Maj. Anderson, C, Health Physics Div	DATE 9 Mar 71
	PHONE 3537

OPTIONAL FORM 41
AUGUST 1967
GSA FPMR (41CFR) 100-11.206

★ GPO : 1969 OF—352-829 5041-10

Pardon the , d written note, l typing assistance is at a premium over here. If you can't read this all I am sure Alice Noll or Ed Bradley can transl

LTC William G. Powell
Cml Br ASN Div G3
HQ Eighth US Army
APO 96301
6 March 1971

Dear Maj Anderson

The Rattlesnake Gulch area south of Summerall Gate road was in use as a training area in 1954 when I first became acquainted with it. From your description the fence seperating it from the bio training area on the east and another train area to the west you have it pretty well pegged. The area had about a dozen pipe type source wells with 0.5-2 curies of cobalt-60 when I was there. Col Carrol tells me that before 1954 there were some pigs used with strings to suspend sources from a pulley above them.

There was a radioactive waste burial point near the top of the

hill about where you have the dot on your map 103290. From what I was told and from what I put in there myself the waste consisted of: a. towels, paper and other laboratory junk from the sealer lab. b. tentalum-(?) with a half life in the order of 100 days. The Tantalum was purchased around 1952 for a field decon test but couldn't be used because there was no way to pick it up again after one dropped out the pellets from the bubble gum type dispenser shield. Therefore this stuff sat around and disentegrated (pellet to powder) and decayed. In about 1953-54 We cleaned out the pit and put the residual tantalum in a bleach can and buried it in this area about 6' down. c. There may be some cobalt-60 waste from encapsulating operations buried in this area but I do not recall ever putting any there.

Bleach cans were the container for all waste put in the area while I was there. This area had its own little barb wire fence and was so marked as a waste burial point. The Engineers post hole digger was frequently used to dig our holes.

Another activity took place in this area was cobalt encapsulat This was done I would gues in the vicinity of 102 295, or about one quarter of the way up the hill on the center road (which you probably cant find now) and to the east near the bio area fence. The hot cell consisted of cement block many sand bags, 2' thick water winds etc. This area is probably still identifiable from the sand bag residue, this area should be clear

The waste disposal area (and all sources we) I was told was moved to the pelham, ga

Ridout field area about 1959 and then a few years later the whole mess was dug up and moved to Oak Ridge for burial in an AEC burial pit. If these hot spots are located relatively close together 10-20' in the area indicated I would suspect that you have the old burial ground. If you dig and find bleach cans then the burial ground was not moved, at least not totally. If the area in nearer summerall gate road as the old hot cell was then nothing is barried but you may be finding some contamination that was missed in that clean up. In either case you should not encounter very high dose rates unless there was some cobalt-60 scrap (ruptured capsules 5/8" x 3" put in there around '58-'59.

Considering the 10 yr elapsed and the isotopes concerned [illegible] Sr 90 Cs 137 and perhaps [illegible] is probably your isotope. Sr 90 was used in lab but in [illegible]

quantities. There were some leaking Cs 137 capsules encountered in this time frame but this doesn't seem likely either. I would guess on what you would find I would expect that some Co-60 contamination will be found in the dirt of the old burial area, or the whole burial ground cans and all is still there. Happy digging.

At the moment I am finishing up my C&GS subcourse and have filed a letter of intent to attend Phase X at Lexington Ky on 13-26 Jun. I hope to take a couple weeks leave at this time and if you think I can be of any further help would be glad to come down for a day. [illegible] Truffa wrote me that he was leaving Conus on 26 [illegible] I have AG looking for him - [illegible] he hasn't got here yet. I plan to assign him to my office. [illegible] in a [illegible]

V. DAILY ACTIVITY LOG

Memo for record. 1 March 1971

SP4 Dahlman, SFC Pryor and Major Anderson went to the Iron Mountain Site this morning. Upon arriving at the site, a road was cut from a fire break into the disposal area. Next, the exploration of hot spots on the surface were explored. Points 15 and 16 was worked on first. The hot spot at point 16 was pretty well cleaned up, but point 15 seems to be getting hotter as the digging proceeded. After removing a considerable amount of dirt, the readings were still 2.5 mr/hr. Full drums of contaminated dirt were removed to the Waste Storage Yard behind Lab W.

6 March 71

A letter was recieved today from LTC Powell, former Radiological Division Chief. He was replying to the letter I had sent him previously. His reply indicated that the site in question had been used as a radiological training area during the period 52-56. A burial point was located near the top of the hill near coordinates 103290. The stated that the material put there included laboratory junk from the scaler lab, tantalum buried in a bleach can. He also thought that some Co 60 and Cs 137 had been buried there.

15 April 71

During March, the Helath Physics Division installed approximately 440 radioactive sources in Rideout Field so no work was done at the Iron Mountain Site. Today SP5 Dahlman and Major Anderson went to Iron Mountain and continued digging at point 15. Approximately one 55 gallon drum was filled with hot dirt. The area is still "hot".

20 April 71

Major Anderson, SFC Pryor, SP6 Roberts, and a PFC Perry (Fld Sup Co), went to the site. Digging at point 15 continued. Area is still hot. Major Ande dug at point 14 and uncovered three bleach can full of lab junk. The three bleach cans were buried at a depth of about six (6) inches only. Digging started at point 18. Area is still hot. Three 55 gallon drums of hot dirt and the bleach cans were recovered today.

After having a conversation with LTC Black and Col Ladson, it was decided that Col McKean, the Post Commander, should be told of the find on Iron Mountain. In the meantime HPD was to continue working at the site in a quiet manner.

MEMORANDUM FOR RECORD: 23 April 1971

TO: Chief, Health Physics Division
USACMLCS

SUBJECT: Radiological Materials

1. The matter of the Rattle Snake Gulch radiological materials was discussed this date with Colonel McKean. He was informed that the material would be further investigated and packaged for shipment and ultimate disposal. He agreed that this should be done quietly and without "fanfare" as a routine disposal matter.

2. Health Physics Division is hereby given the responsibility for the packaging and shipment. This should be done inhouse and without assistance from Post Headquarters unless heavy equipment is needed, in which case, permission to request the equipment should be obtained from the Commandant or Assistant Commandant.

Robert N. Ladson

ROBERT N. LADSON
Colonel, CmlC
Commandant

23 April 71

SFC Pryor and SP6 Roberts worked at the burial grounds today. They explored several hot spots. Most of them were removed with little digging required. They seemed to be mainly surface contamination. Points investigated include points # 13, 8, 6, 5, and work started on points #1, 7, and 9. There is still some work to do on point 13.

27 April 71

Major Anderson and SP5 Hunter worked at the site today. Work resumed at point 15. Two drums of radioactive dirt were removed. A metal container was recovered. It was about 3" in diameter and 8" long. The surface contact readings was 35 mr/hr. One end of the contained appeared to be open. Samples were taken to the lab for analysis. They proved to be Cs 137.

19 May 71

Major Anderson and SFC Pryor went to work at the site today. SFC Pryor and SP6 Roberts worked there yesterday. A trench was dug connecting points 15 and18. Not much was found. The bottom part of point 15 was enlarged and a vein of red clay followed. This vein was hot. The highest readings were 8 mr/hr. All the red clay was dug out until the readings dropped to normal background. We have no explanation as to why the vein of red clay was hot other than that the Cs 137 from the previously found container had leaked into the soil and been absorbed by the clay. Work continued on point 17. Nothing was found at this location yet. Preliminary work started in the vicinity of points 10, 11, and 12. Nothing found yet at these locations.

20 May 71

Points 2, 3, 3, and 7 were cleared today by SFC Pryor and SP5 Hunter. Only surface contamination was found. At point 12, a hot spot has been found. Red clay was found about 18 inches under the surface. Highest reading was about 3 mr/hr.

2 June 71

Major Anderson went to the site for a short while today. Work continued at point 12. A tree in the middle of this area was dug out by the roots since the readings seemed to be the highest under the tree. Not much was found. The contamination seems to have been cleared up. Still have to explore further points 10 and 11.

21 June 71

SP6 Roberts, SFC Pryor and Major Anderson want to the site to work today. They worked on points 10, 11, and 12. Only surface contamination was found. Work continued on point 15. Major Anderson found a small lead

pig at about the 5 foot level. Contact readings were 55 mr/hr. The area around the pig was hot. Quite a bit of dirt was dug up. Readings were still 1.8 mr/hr in the area being dug out. More work was done on point 18. Only surface contamination was found. At least six drums were loaded with radioactive dirt. The heat in the afternoons makes working on the mountain very miserable.

22 June 71

SP5 Hunter, SFC Pryor and Major Anderson worked at the site today. Digging at point 15 continued. Still digging deeper. At the 6 foot to 7 foot level an iron rod was found. It was about 15 inches long but was not attached to anything. Readings in the hole varied from 1.0 mr/hr to 1.5 mr/hr. We cannot locate the source of the readings. The hole is at least 8 feet deep now.

23 June 71

Mr. Bradley and CPT Quinn from the Radiological Division accompanied SP6 Roberts and Major Anderson to the site today to look over the situation. Major Anderson suggested that trenches be dug throughout the area with a ditch digger to see if any "hot" items can be recovered. Working by hand will be discontinued. Once the area is trenched and any hot objects removed, the area is to remain marked as a "restricted area due to radioactive contaminati and the area reported to the Range Division at Post so the area can be recorded in their records. HPD will continue to observe the area to see that the fence is maintained and the fire break kept in good shape. The fence will be marked with radiation warning signs. Mr. Bradley concurred with this suggestion.

25 June 71

HPD personnel went to the site today and brought back to the storage yard eight partially full drums of radioactive dirt.

28 June 71

Major Anderson talked with LTC Black about the site and recommended that ditch digging equipment be requested from Post Engineers. General situation was discussed. He will talk to Col Ladson. LTC Black is leaving the school in a couple of days. Col Ladson is due to leave in July also. The situation is to be discussed with Col Fair, the new Commandant when he takes over.

16 July 1971

Major Anderson briefed Col Ladson and Col Fair on the situation at Iron Mountain. Permission was requested from Col Ladson to use a ditch-digger at the site. This request was granted with the guidance that the operator of the equipment was to be a military man. After this, Major Anderson contacted LTC Bauer, CO, 2d Cml Bn about getting the necessary equipment and help. He in turn contacted LTC Warden the Post Engineer. In the afternoon, CPT Crawford, CO, Co.D, 83d Engineer Bn, arrived at the Health Physics Division to coordinate the necessary support. A Ford back-hoe would be used and SSGT Blackburn would be the operator. Col Ladson was again contacted and informed of the arrangements. He immediately notified Col Hines, Deputy Post Commander of what action was being taken. After this, the final approval to proceed was given.

23 July 1971

The back-hoe from the Engineer Company started to work at the site today. A power saw was used to remove trees that were hindering the digging. The area is to be trenched with trenches 5 to 6 feet deep and about 6 feet apart. Health Physics Division personnel were to be on hand during the digging to monitor the area and recover any objects dug up. On 20 July, a trench between points 15 and 7 yielded an old actuator assembly. It was the type with a pulley on top. A large area was dug up between points 15 and 16. About a dozen concrete blocks were dug up and a large quantity of sandy soil that was different from the surrounding soil. It is thought that this material might have been used in the walls of a hot cell that was reportedly constructed in this area. The sand and surrounding soil was slightly contaminated with radioactive material. The radiation intensity was around 1 mr/hr. This was the only contamination uncovered during this week of digging. On 23 July, the digging was completed. On 27 July, Post Engineers provided a bulldozer to back-fill the trenches. Once the area was recovered, a health physics survey was conducted. No contamination was found on the surface. The fence surrounding this area was then removed by the dozer and buried.

A total of 18 drums of low level contaminated dirt was removed from the burial site. In addition, three bleach cans full of lab waste and two lead containers containers filled with radioactive material were recovered. This material will be disposed of in accordance with AR755-15.

The bulldozer operator who filled in the trenches at the site, told SFC Pryor that he had worked in this same area 12 or 13 years ago. They had dug the area up and all the radioactive material they had recovered was taken to Rideout Field and placed in the burial grounds that are maintained there at the present time.

Baldino, Peter
1973 Letter to the U.S. Atomic Energy Commission, 20 June 1973. U.S. Army Chemical School, Fort McClellan, Alabama.

HPD

HEADQUARTERS
DEPARTMENT OF THE ARMY
Office of the Deputy Chief of Staff for Logistics
Washington, D. C. 20310

DALO-MAS-I

20 June 1973

U.S. Atomic Energy Commission
Directorate of Licensing
Materials Branch
Washington, D.C. 20545

Gentlemen:

The US Army Chemical Center and School at Fort McClellan, Alabama has been disestablished as a training facility. The radioactive material possessed by the school under USAEC Byproduct Material Licenses 01-02861-01 and -02; and Special Nuclear Material License SNM-344 have, for the most part, been transferred to the US Army Aberdeen Proving Ground.

There is some residual contamination. The attached application is forwarded for your approval to cover that material.

Sincerely yours,

SIGNED
PETER M. BALDINO
Chief, Support Division

1 Incl
As stated

Copies furnished:
DASG-HCH w incl 1
USAEHA w incl 1

USAEHA w incl 1

Brief

1954 Brief, Chemical Corps School, 30 November 1954. Record Group 175, Boxes 1 – 10, Chemical Corps School, National Archives II, College Park, Maryland.

Chem Corps
#1954
ASSIFIED
ND917652
ARA Date 4/6/78

CHEMICAL CORPS SCHOOL

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BRIEF

CHEMICAL CORPS SCHOOL

FORT MCCLELLAN, ALABAMA

DATE

30 NOVEMBER 1954

Instruction was divided into two departments. The Department of Technique of Chemical Warfare was concerned with the preparation, manufacture, and tactical use of chemical warfare [illegible]

HISTORY

The Chemical Corps School had its informal beginning during the period following the first World War. After gas warfare became a reality in World War I, responsibility for chemical warfare activities was divided among five different agencies within the U. S. War Department. Training of troops in offensive employment of toxics was given at an Army Gas School located at Camp A.A. Humphries, Accontink, Virginia by the Corps of Engineers. The need for establishment of a single agency with responsibility for all aspects of Chemical Warfare was recognized by publication of a War Department General Order which established the Chemical Warfare Service effective 1 July 1918. This new service was made responsible for research, development, procurement, supply, and training of the entire Army in offensive and defensive aspects of gas warfare.

Chemical warfare training under the Chemical Warfare Service was first conducted at Camp Kendrick, New Jersey located adjacent to Lakehurst Proving Ground. Special Regulation No. 18 published in 1920 established the Chemical Warfare School at Lakehurst Proving Ground, Lakehurst, N. J. Its objects were to give courses in instruction in chemical warfare to officers of the Chemical Warfare Service and such other officers as may be ordered to the school for instruction; to supervise such work in the above subjects as may be taken by officers of the Chemical Warfare Service at civilian educational institutions and commercial establishments when so authorized by the Director of the Chemical Warfare Service; to give instruction in the operations of the field service of the Chemical Warfare Service and such military training as may be found necessary. Two courses of instruction were to be given. A Regular Course of fourteen (14) weeks duration and special courses for line, staff, and reserve officers. The school was also to maintain a library which was to be open for the general use of personnel at the Lakehurst Proving Ground.

The Regular Course embraced every phase of Chemical Warfare with particular emphasis being given to offense methods and tactical uses of chemical warfare agents in the field. Instruction was also included in pertinent auxiliary subjects such as Meteorology, Intelligence, Reconnaissance, Map Reading, and Orders and Reports. Only one Regular Course of instruction was conducted at Lakehurst Proving Grounds. This course ended on 30 June 1920. The Chemical Warfare School was transferred on 20 September 1920 to Edgewood Arsenal, Edgewood, Maryland where it was operated by the Chemical Warfare Service as a Special Army Service School for the next thirty-one (31) years.

At Edgewood Arsenal, the first Regular Course of instruction given for officer students opened on 10 January 1921. There were twelve (12) students enrolled in the class, nine (9) of whom successfully completed the course. The school staff consisted of five (5) officers who conducted most of the instruction. Special instructors and guest lecturers were secured to supplement instruction given in manufacturing and technical chemical details of the course.

Instruction was divided into three major departments. The Department of Technique of Chemical Warfare was concerned with the properties, manufacture, and physiological action of chemical warfare agents; the construction and manipulation of chemical warfare apparatus; and pertinent auxiliary subjects. The Department of Military Art was principally concerned with application of the agents and apparatus studied in the course. The Department of History and Research studied the origin of chemical warfare, its use in past wars, history of the Chemical Warfare Service, and new developments.

On 18 April 1921, the first course for non-commissioned officers was started. This was a three-weeks course in Chemical Warfare Weapons for enlisted personnel of the First Gas Regiment. Their instruction included Stokes Mortars, Livens Projectors, Toxic Cylinders, Hand and Rifle Grenades, Smoke and Toxic Smoke Candles and Gas Defense. Methods of handling, cleaning, and firing were emphasized together with drills in use of the various pieces.

The first year of operation of the school at Edgewood Arsenal saw several notable events take place. While the first Regular Course was in progress, a Signal Corps Meteorological Station was established to furnish weather data to the school and other agencies. A Chemical Warfare Museum was established to be used for instructional and historical purposes. It consisted of chemical warfare materiel of friendly as well as enemy origin and demonstrated the development of protective apparatus including current developmental masks and parts. A school library for use by instructors and students was also set up.

The first home of the school was in the Fort Hoyle area of Edgewood Arsenal. A barracks building of the First Gas Regiment was used as the school plant. Housed on the first floor were staff offices and the museum. Located on the second floor were a classroom, library, meteorological station, and supply room. Even at this early date, the need for larger quarters was felt. Plans were formulated and suggestions made for building a suitable structure specifically designed to meet the growing needs of the Chemical Warfare School.

Fiscal Year 1922 saw the beginning of instruction specifically designed for U. S. Navy and U. S. Marine Corps personnel. A special course for Navy Chief Petty Officers and Marine Corps non-commissioned officers was given from 15 May through 10 June 1922. Thirty-nine students earned certificates for completing the course. From this beginning there developed other specialized courses for Navy and Marine Corps personnel which led to a Navy Board Report in 1924 recommending that the Chemical Warfare School receive the support of Navy funds and instructional personnel to assist in accomplishment of the school mission. To this end, the organization of the school for the school year 1926-1927 incorporated a Department of Naval Instruction composed of one (1) Navy and three (3) U. S. Marine Corps Officer instructors. They assisted in the development and presentation of a Line and Staff Officers Course which emphasized "Defense Against Chemical Warfare".

Fiscal Year 1922 also saw the beginning of school participation in the preparation of official training literature. Army Chemical Warfare Service Correspondence Courses known as the Red, White and Blue Courses and some Training Regulations on "Tactics for Special Gas Troops", "The Company (Gas "Defense Against Gas", and "Chemical Warfare by Air Service" were prepared and submitted. School instructional material also was prepared for dissemination and a bulletin entitled "Chemical Warfare" was edited. [illegible] number of courses and students trained has been on a reduced scale from that [illegible] During the following Fiscal Year, 1923, the first specialized instruction was given for Medical Officers. This was a short course under the supervision of the Medical Research Division for which two days of the instruction was conducted at the school in September 1946 and June 1947 for a class of twenty-one (21) students. In September 1950, the Black Chemical Officer [illegible] By the end of 1922, the school had outgrown its facilities in the Fort Hoyle area. In February 1923, its location was moved to Building 250 and the Museum, Meteorological Section and Duplicating Plant (which functioned for the Arsenal as well as the school) were moved to Building 249. The school remained in these buildings during the ensuing years.

[illegible] Department of the Army General Order Number 17 dated 2 April 1951 establ[illegible] Expansion and growth during the years preceding World War II brought with it many problems which materially affected the extent and effectiveness of the school in accomplishment of its mission. One of the most pressing problems was that of adequate personnel. In the early years emphasis was placed on securing Regular Army Officers for assignment to the school. This effort was abandoned in the years immediately prior to Work War II when many Reserve officers were assigned to the Staff and Faculty. Troops available for school support were those of the First Gas Regiment who were required to carry out normal training activities in addition to supporting demonstration and field problems for the school. Additional instructors and especially instructor representatives of the Infantry and Field Artillery could not be secured. School personnel were called upon to support Post functions such as preparation of mobilization plans for Edgewood Arsenal, furnishing an Assistant Post Executive Officer, serving on various Boards, and performing printing and reproduction work for the Arsenal. Another problem involved transportation and training areas. Vehicles of the required type were neither authorized nor made available for student transportation to training areas which were inaccessible by ordinary transportation during inclement weather. Training areas were seriously overcrowded during the summer months. Furthermore, the school had to depend on the Arsenal for such transportation as could be provided. Quarters for housing both student and staff personnel were scarce and inadequate. The school plant itself was not large enough. There was a constant need for revision of school texts and a Basic Field Manual was needed for the instruction of troops in the field. These and many other problems were faced by the school during the years between the wars. [illegible] personnel. This [illegible] complied with an authorized strength of one hundred twenty (120) officers [illegible] During World War II and the years immediately preceding, the school reacted to the emergency by rapidly expanding to meet the need for training large numbers of officer and enlisted personnel. Its basic organization was expanded and there were added to it School Troops, and an Officer Candidate

School which followed the general organizational pattern of the school. The number of classes conducted increased from thirty-six (36) officer and enlisted classes during school year 1940-41 to eighty-seven (87) such classes plus thirteen (13) Officer Candidate Classes during school year 1942. four hundred eighty-two (20,482) enlisted personnel.

In the years following World War II, the school has continued to fill need for technically trained personnel other than officer candidates. The number of courses and students trained has been on a reduced scale from tha of the war years but of a much larger extent than that of the pre-war years One notable academic advancement in the post-war years has been the develop ment of a nine-months Chemical Officer Advanced Course. The first such Advanced Course was given between September 1946 and June 1947 for a class of twenty-one (21) students. In September 1954, the Ninth Chemical Officer Advanced Class started with an enrollment of thrity-one (31) students. Another important post-war development was the elevation of the Chemical Warfare Service to the status of a Corps on 2 August 1946. The name of the school was changed accordingly to The Chemical Corps School.

Department of the Army General Order Number 17 dated 2 April 1951 esta lished the Army Chemical Training Center, a class II installation to be loc at Fort McClellan, Alabama effective 9 April 1951. The Chemical Corps Scho was designated as an activity of the ACTC effective 15 August 1951. The sc as such, ceased operations at Army Chemical Center (formerly Edgewood Arsen on 15 October 1951. The museum and printing plant were not moved to Fort McClellan.

From 15 August 1951 until 15 October 1954 the school was housed at For McClellan in a converted barracks building with laboratories, shops and personnel decontamination station in outlying buildings. Academic instruct began in September 1954. One of the first classes to receive regularly sch instruction was the Sixth Chemical Officer Advanced Class. Opening exercis were held on 17 September 1951 with General Leonard J. Greeley as the princi speaker.

Soon after the school started operations at Fort McClellan, construcli of a permanent school facility was started. This structure was made availa for beneficial occupancy on 4 October 1954 and all offices and activities o the Chemical Corps School were moved to its permanent home thirty-four (34) years after its inception.

Responsibility for training enlisted replacement stream input personn became an added responsibility of the school on 20 July 1953. Currently, t school conducts six courses of Advanced Individual Training for RSI personn and thirteen officer and enlisted courses for other personnel. This is ac complished with an authorized strength of one hundred twenty (120) officers (including one Warrant Officer), fifty-nine (59) enlisted, and one hundred twenty-three (123) civilian employees.

Chemical Corps School graduates from 1921 through October 1954 number twenty seven thousand thirty-four (27,034) officers of the U. S. Army, Navy and Marine Corps, two hundred twenty-one (221) officers from Allied Nations, one thousand three hundred nine (1,309) civilians, and twenty thousand four hundred eighty-two (20,482) enlisted personnel.

CHEMICAL COMMAND
Fort McClellan, Alabama

2. GENERAL ORDERS ESTABLISHING UNIT: Section II - General Orders
Department of the Army
dated 2 August 1951

3. ORGANIZATIONAL STATUS:

The Chemical Corps School is a Class II activity of the Chemical Corps Training Command, with station at Fort McClellan, Alabama.

4. MISSION:

a. The mission of the Chemical Corps School is to provide resid and non-resident education and training to the following:

(1) Officers, warrant officers, and enlisted men of the Chemical Corps (regular and reserve components) in the command and staff functions of the Corps.

(2) Officers, warrant officers, enlisted men, and selected civilian employees of the Armed Forces in chemical, biological, and radiological warfare.

b. Additional missions accomplished by the School include the development of new and revision of existing doctrine; the preparation and revision of Department of the Army, Chemical Corps and Chemical Corps School publications on appropriate technical and military subjects; and any special studies or support activities assigned by competent authority.

5. ADMINISTRATION:

Table of Distribution Number 04-9776-02 is assigned; Technical Service Unit 9776.

Carroll, George F., Captain, CmlC
1954 Letter to Isotope Committee, Report of Radioactive Burials, 16 December 1954. Health Physics Group, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama.

HEALTH PHYSICS GROUP
THE CHEMICAL CORPS SCHOOL
CHEMICAL CORPS TRAINING COMMAND
FORT McCLELLAN, ALABAMA

CMLTC-S-8

16 December 1954

SUBJECT: Report of Radioactive Burials

TO: Isotope Committee
The Chemical Corps School
Fort McClellan, Alabama

1. The following radioactive burials were performed during the last half of calendar year 1954 (1 Jul - 15 Dec 1954). All materials were buried in sealed containers (bleach cans). The radiation dose-rate at surface level at all points within the burial area did not exceed 7.5 mr/hr:

DATE OF BURIAL	NO. CONTAINERS
29 July 1954	3
10 Dec 1954	10

George F. Carroll

GEORGE F. CARROLL
Capt, Cml C
Radiological Safety Officer

Incl 9

Craig, P. **(Appendix D-Licenses Listing)**
1971 Interagency Agreement for Plutonium No. 3039. U.S. Army Chemical School, Fort McClellan, Alabama.

UNITED STATES ATOMIC ENERGY COMMISSION

INTERAGENCY AGREEMENT FOR PLUTONIUM

AGREEMENT NO. 3039

THIS INTERAGENCY AGREEMENT FOR PLUTONIUM (sometimes referred to as the "Agreement"), entered into this 1st day of January, 1971, by and between the UNITED STATES ATOMIC ENERGY COMMISSION (hereinafter called the "Commission") and U. S. ARMY CHEMICAL CENTER AND SCHOOL (hereinafter called "Agency"), an executive department or independent establishment of the Government of the United States of America or a bureau or office thereof;

WHEREAS, the parties hereto desire to establish the terms and conditions applicable to the distribution of plutonium to the agency, pursuant to the Atomic Energy Act of 1954, as amended, whether ordered and received directly from a Commission facility or transferred from a lessee of the Commission;

NOW, THEREFORE, the parties hereto do mutually agree as follows:

ARTICLE I - DEFINITIONS

A. The term "Act" means the Atomic Energy Act of 1954, as amended.

B. The term "base charges" means the dollar amount per unit of plutonium in standard form and specification in effect as of the time any particular transaction under this Agreement takes place, as set forth in schedules published by the Commission in the Federal Register from time to time.

C. The term "blending" means the altering of the isotopic composition of a quantity of an element by means other than through the irradiation of material in a nuclear reactor.

D. The term "Commission" means the United States Atomic Energy Commission or any duly authorized representative thereof.

E. The term "Commission facility" means a laboratory, plant, office, or other establishment operated by or on behalf of the Commission.

F. The term "Commission's established specifications" means the specifications for purity and other physical or chemical properties of plutonium, as published by the Commission in the Federal Register from time to time.

G. The terms "consumed" or "consumption" mean the destruction, burnup, loss or disposition of material in such manner that it cannot be economically recovered for further use, material unaccounted for, or changes in the composition of material due to blending of different assays of material or other alteration of the isotopic ratio resulting in the reduction in value of such material.

H. The term "established Commission pricing policy" means any applicable price or charge in effect at the time any particular transaction under this Agreement takes place (i) published by the Commission in the Federal Register, or (ii) in the absence of such a published figure, determined in accordance with the Commission's Pricing Policies. A statement of such Pricing Policies will be furnished Agency upon request. The Commission's published prices and charges, as well as its Pricing Policies, may be amended from time to time.

I. The term "lessee" means a person who is a party to a Special Nuclear Material Lease Agreement or Plutonium Lease Agreement with the Atomic Energy Commission. For the purposes of this Agreement, the term "lessee" also includes another Government agency which has executed an Interagency Agreement for Plutonium with the Commission.

J. The term "persons acting on behalf of the Commission" means employees and contractors of the Commission, and employees of such contractors, who implement or participate in the implementing of this Agreement pursuant to their employment or their contracts with the Commission.

K. The term "standard form" means the chemical form of plutonium, as published by the Commission in the Federal Register from time to time.

L. The term "value" means the dollar amount determined by multiplying the applicable base charge by the number of units, or fractions thereof, of plutonium involved, whether or not such material is in standard form or meets the Commission's established specifications.

ARTICLE II - SCOPE

A. Unless otherwise provided herein, or in a written agreement between the Commission and Agency, the terms and conditions contained herein shall apply to plutonium, hereinafter sometimes referred to as "material" and related services furnished to Agency by the Commission on and after the date of execution of this Agreement, and to the material, if any, subject to the Special Nuclear Material Interagency Agreement between the Commission and Agency, as of midnight, December 31, 1970, whether ordered and received directly from a Commission facility or obtained from another lessee of the Commission. Nothing herein shall be deemed to prevent Agency from shipping material covered by this Agreement to any person duly authorized by the Commission to process and use such material. Agency may be relieved of its obligations under this Agreement for such material only in accordance with the terms of this Agreement. Material received by Agency from any source shall be subject to the provisions of this Agreement only if such material is furnished pursuant to an order accepted by the Commission as provided in paragraphs B. and C. below.

B. Agency shall order material pursuant to this Agreement through the execution and submission of a plutonium order form prescribed by the Commission.

C. Acceptance of Agency's order for material by or on behalf of the Commission shall constitute the Commission's commitment to furnish the material specified in such order subject to the terms of this Agreement. When Agency orders material which is to be obtained from a lessee, this Agreement shall not be applicable to such material until such lessee and the Commission have agreed to the transfer of such material to Agency.

D. Nothing herein shall be deemed to obligate Agency to order material or to obligate the Commission to furnish material to Agency, or to provide services for Agency with respect to material.

ARTICLE III - TERM OF AGREEMENT, TERMINATION AND CANCELLATION

A. Except as otherwise provided herein, Agency shall have the right to possess and use the material covered by this Agreement until June 30, 1973; provided that material subject to this Agreement furnished to or received by Agency after December 31, 1970, shall not, unless otherwise authorized in writing by the Commission, be used in the course of activities under a license issued pursuant to Section 103 or 104b. of the Act.

B. Agency may cancel any order for material under this Agreement by notice in writing to the Commission at any time prior to delivery of the material; provided, Agency shall reimburse the Commission for the costs incurred by the Commission in connection with such order, as determined in accordance with established Commission pricing policy in effect at the time such costs are incurred.

C. The Commission may terminate or suspend in whole or in part this Agreement at no cost to the Commission at any time, by written notice to Agency in the event that (i) the right of Agency to possess material subject to this Agreement expires or is suspended or terminated by any authority having power to take such action, or (ii) Agency shall fail to perform its obligations hereunder and shall fail to take corrective action within 30 days of the date of the written notice of such failure to perform as provided above, unless such failure arises out of causes beyond the control and without the fault or negligence of Agency.

ARTICLE IV - MATERIAL TO BE FURNISHED BY THE COMMISSION

A. Except as otherwise agreed to in writing by the Commission and Agency, plutonium subject to this Agreement shall be furnished to Agency in standard form in accordance with the Commission's established specifications.

B. Agency shall pay the Commission's service charges, if any, for withdrawal and packaging, and for any other special service rendered pursuant to Agency's order. Unless such charge or charges are agreed to in the order executed by Agency and the Commission for material, Agency shall pay the Commission its charges for the services rendered pursuant to Agency's order as determined in accordance with established Commission pricing policy in effect at the time such services are rendered. Agency shall also pay the value of material consumed in the rendering of such special services.

C. If the material delivered by the Commission pursuant to an order executed by Agency and the Commission does not conform to the Commission's established specifications (or to the specifications set forth in an order executed by Agency and the Commission), the responsibility and liability of the Commission and persons acting on behalf of the Commission shall be limited solely to correcting such discrepancies by delivery of material which does conform to the applicable specifications. Neither the Commission nor persons acting on its behalf shall have any responsibility or liability for replacing or furnishing material which Agency obtains directly from a lessee of the Commission. The Commission will pay to the carrier the transportation charges for returning any material obtained directly from the Commission which does not conform to applicable specifications, as well as the transportation charges for shipping conforming replacement material. No service charges will be made with respect to such replacement material, and rental charges for Commission-owned containers in which such material shall be shipped will not commence until 30 days after date of shipment.

D. 1. The Commission, upon delivery to Agency of plutonium, subject to this Agreement, may direct that such plutonium not be blended with other plutonium.

2. In the case of blending of plutonium subject to this Agreement with privately owned plutonium, Agency agrees either (i) to secure the Commission's written agreement in advance as to the terms and conditions under which such material may be blended or (ii) to accept as conclusive and binding the Commission's determination in writing as to the consequences of any such blending including the disposition of any blended product and amounts due the Commission and Agency.

3. It is hereby agreed that Agency shall be responsible for handling any claims of third parties on account of rights alleged in or in connection with the plutonium used in blending.

E. 1. Agency shall maintain and make available to the Commission for examination, upon reasonable notice, complete and adequate records pertaining to its receipt, possession, use, location, movement, and physical inventories of material subject to this Agreement. Such records shall fully reflect physical measurements, consumption, actual inventories, and the transactions relating thereto. Agency will submit such transfer documents and reports reflecting quantities of material received, physically present, consumed and transferred, with respect to material subject to this Agreement as the Commission may prescribe. Agency will make at least one physical inventory of material subject to this Agreement and in the custody of Agency during each twelve months' period of the Agreement and will insure that such inventories are also made of material subject to this Agreement but in the custody of others.

2. Agency shall afford to the Commission, at all reasonable times, opportunity to inspect the material subject to this Agreement and the premises and facilities where such material is used or stored. Agency shall permit the Commission to perform such audit tests and inventory tests (which may include the taking of a reasonable number of samples for physical or chemical analyses but which does not include sampling and destructive testing of fabricated articles except as agreed to by Agency) as the Commission deems necessary for verification of the accuracy of any reports submitted by Agency to the Commission. The Commission agrees to perform any inventory tests with respect to material subject to this agreement so as to minimize interference to Agency's processing, delivery schedules, and third-party commitments regarding the material. Agency agrees that no charges for costs or value of any material samples, or for services or equipment, should such be furnished by Agency, provided in connection with the performance of audit tests and inventory tests, shall be made against the Commission; however, the Commission will allow full credit in Agency's account with the Commission for the value of the material included in the samples and the Commission will make no charge against Agency for reconversion of the material samples to standard form. In the event Agency should ship material subject to this Agreement to any other person, or cause such shipment of such material, Agency shall assure that the rights and privileges granted to the Commission under this paragraph shall not be affected by such shipment.

ARTICLE V - RETURN OF MATERIAL TO THE COMMISSION; SPECIAL CHARGES FOR COMMISSION SERVICES

A. Agency shall return all material subject to this agreement which has not been consumed upon the expiration or earlier termination of this Agreement, provided, however, that Agency shall have the right to return any such material at any time prior to such date.

B. Except as otherwise provided herein, material returned by Agency will be returned directly to the Commission in the standard form and in accordance with the Commission's established specifications for return of material in effect as of the date the material is returned.

C. Material subject to this Agreement transferred to a lessee of the Commission, regardless of the form or specification of such material, shall be deemed to have been returned to the Commission if such lessee, the Commission, and Agency have executed an order covering the material so transferred.

D. The Commission may at its sole discretion accept material in a form or specification other than as provided in B. above. In such cases, unless the Commission shall determine that acceptance of the material in its existing form is in the best interests of the Government, Agency shall pay a service charge for processing such returned material so as to enable it to meet the standard form and to satisfy the Commission's established specifications in effect at the time the material is returned. Such charge shall include the Commission's charge for processing, as determined in accordance with the established Commission pricing policy in effect at the time the material is returned and an amount as determined by the Commission, for the value of the material consumed during such processing.

E. All material returned directly to the Commission shall be delivered by Agency to the Commission facility or location specified by the Commission, f.o.b. commercial conveyance at such facility or location. Unless waived by the Commission, Agency shall give the Commission at least fifteen (15) days' written notice of intent to return material directly to the Commission. The Commission will notify Agency promptly after receipt of Agency's notice of intent to return material as to the Commission facility or location designated for return of the material. (Agency, at the time of shipment of material, shall notify the Commission facility or other location to which shipment is made of the date and method of shipment, and expected date of arrival.

ARTICLE VI - PAYMENT FOR MATERIAL CONSUMED

A. Except as otherwise provided herein, Agency shall be responsible for and shall reimburse the Commission for any consumption of material, whether or not such consumption is due to the fault or negligence of Agency or any other cause occurring from the time of delivery of such material to Agency and until such material has been returned to the Commission as provided herein.

B. Agency shall make reports to the Commission, on forms prescribed by the Commission, to accurately reflect all consumption of material as then known to Agency. In reporting material as consumed, Agency shall make reasonable effort to accurately fix the time of such consumption on the basis of a specific occurrence or in accordance with procedures and methods of calculating consumption accepted by the Commission.

C. Except as otherwise provided herein, the amount due the Commission for material consumed shall be the value of such material computed in accordance with this Agreement as of the time of such consumption. Agency may, and shall when required by the Commission, pay on a provisional basis for material consumed. Full custody to and responsibility for all consumed material shall be deemed transferred from the Commission to Agency upon final payment to the Commission of the amount due.

ARTICLE VII - OTHER AUTHORITY

Nothing in this Agreement shall be deemed to require Agency to pay the Commission's charges with respect to materials or services subject to this Agreement, or to observe other specific provisions of this Agreement, if the Commission, in accordance with statutory authority or other authority available to it, determines that such charges, or other provisions are not applicable.

ARTICLE VIII - ESTABLISHMENT OF PLUTONIUM ACCOUNT

A. The Commission will establish a plutonium account for Agency to which will be debited, as provided herein, the amount or amounts equal to the value of the material subject to this Agreement. Such account will be credited, as provided herein, with the amount or amounts equal to the value of the material returned or paid for in accordance with this Agreement. The value of material reflected in this account after credit for the value of material returned and for payments for material consumed shall represent the amount due to the Commission for material not returned or paid for. In the event material paid for provisionally as having been consumed is later re-established in Agency's account, said account shall be debited as of the date of refund (or appropriate setoff) of such payment to Agency as provided in paragraph C. of Article X hereof, with the amount or amounts equal to the value of such material at the time of such re-establishment in Agency's account.

B. Except as otherwise provided in this Agreement, Agency's account will be debited for material furnished as of the date material is delivered to Agency, provided that in the case of leased material transferred directly from a lessee of the Commission, the debit will be made as of the effective date specified in the order executed by Agency, the lessee, and the Commission for such material. Except as otherwise agreed to by the Commission, such effective date shall not precede the date of the Commission's execution of such order by more than 30 days and such date shall also be set forth in the applicable transfer document.

C. Agency's account will be credited for material returned to the Commission or transferred to a lessee only when material is returned or transferred in accordance with Article V. Except as otherwise provided in this Agreement, Agency's account will be credited for material returned directly to the Commission as of the date the material is delivered to a location specified by the Commission pursuant to this Agreement. Credit for material transferred to a lessee will be made as of the effective date specified in the order executed by the lessee, the Commission, and Agency. Credit for material paid for will be made as of the date payment is received by the Commission.

D. Whenever the Commission changes any applicable base charge as provided in Article IX below, the value of material recorded in Agency's account will be recomputed at the new base charge, provided that the value of material consumed as of the effective date of such change shall not be recomputed. Subsequent to the effective date of the change in the applicable base charge, the new base charge will be used in determining the value of material consumed.

E. Agency will be promptly notified of the debits and credits made to its account as the result of shipments, consumption, or transfers of material, and of any changes in the value of material in such account as the result of changes in the applicable base charges. Agency will promptly notify the Commission of any disagreement with, or alleged discrepancies, or errors in such notices.

ARTICLE IX - CHANGES IN BASE CHARGES AND SPECIFICATIONS

A. The base charges, standard form, and specifications for material furnished pursuant to this agreement are subject to change by the Commission in accordance with the Act.

B. Any increase in base charges or any changes in the standard form or in the Commission's established specifications shall require at least 180 days' notice to Agency by publication or otherwise.

ARTICLE X - PERFORMANCE OF AEC OBLIGATIONS - BILLING

A. The Commission may fulfill its obligations under this Agreement through the operator of any of its facilities. No such operator is authorized to modify the terms of this Agreement, waive any requirement thereof, or settle any claim or dispute arising hereunder.

B. Billings for amounts due the Commission under the Agreement will ordinarily be made

(1) following the performance of any service, and

(2) semiannually for consumption of material.

C. All billings and payments made on a provisional basis are subject to adjustment to recognize actual or calculated amounts, isotopic content, and specifications of material involved. Whenever Agency has provisionally paid for material reported as having been consumed and such material is later re-established in Agency's account, the Commission shall refund to Agency (or appropriately setoff against any amounts due the Commission) the amount paid by Agency for such material. The adjustments provided for in this paragraph will not subject Agency or the Commission to liability for interest.

D. All bills rendered by or on behalf of the Commission are due 30 days from the date of invoice.

ARTICLE XI - TIME OF DELIVERY

The Commission will make reasonable efforts to deliver material at the time or times stated in orders for material subject to this Agreement.

ARTICLE XII - DELIVERY - F.O.B. POINT

A. Material furnished directly from a Commission facility will be shipped f.o.b. Agency's vehicle or commercial conveyance at such Commission facility. Delivery of material or containers to Agency or its designee or to a carrier for the account of Agency or its designee shall be deemed delivery of such material or containers to Agency for the purposes of this Agreement.

B. Unless Agency furnishes a prepared bill of lading, all shipments by the Commission will be made collect on a commercial bill of lading to be converted at destination.

C. When Agency obtains material from a lessee of the Commission pursuant to this Agreement, the Commission shall not be responsible for costs of packaging, shipment, and handling.

ARTICLE XIII - CONTAINERS AND EQUIPMENT

A. All shipments of material from the Commission to Agency, and from Agency to the Commission, will be made in Agency-furnished containers; provided, however, that in the event the Commission determines that the required containers are not reasonably available from commercial sources, the Commission may furnish Commission-owned containers if such are available. Any Commission-owned containers to be used for shipment of material will be made available to Agency, f.o.b. Agency's vehicle or commercial conveyance, at a Commission facility designated by the Commission, unless otherwise agreed. Agency-furnished containers and equipment shall be delivered to a Commission facility designated by the Commission within a reasonable time specified by the Commission prior to the scheduled delivery of materials to be shipped to Agency in such containers and equipment. Agency-furnished containers or equipment will be used by the Commission only for the shipment of material from the Commission to Agency and for temporary storage of material shipped therein.

B. All containers and equipment, whether Commission-owned or Agency-furnished, must meet Commission regulations, specifications, and practices as to safety, design criteria, cleanliness, and freedom from contamination in effect at the time furnished, utilized, or returned, of which the Commission shall be the sole judge. In the event material is returned by Agency to the Commission in non-Commission-owned containers and other material is to be delivered to Agency, the Commission shall utilize to the extent practicable such non-Commission-owned containers for shipments of material if so desired by Agency. The Commission will promptly return to Agency non-Commission-owned containers and other equipment identified as "Returnable," but will not be responsible for any loss of or damage to such containers or equipment except as may result from its fault or negligence. Such return shipments by the Commission will be made f.o.b. Agency's vehicle or commercial conveyance at the Commission facility to which they were shipped.

C. Agency shall pay such rental charge, for such containers and equipment, as shall be established by the Commission for general application to users of such Commission-owned property. Agency will promptly return Commission-owned containers and equipment to the Commission facility from which received, f.o.b. Agency's vehicle or commercial conveyance at the Commission facility. Agency will not be responsible for any loss or damage to Commission-owned containers or equipment except as may result from the fault or negligence of Agency, its contractors, or agents. Commission-owned containers or equipment will be used only for shipment of material to and from the Commission and for temporary storage of material shipped therein.

D. Whenever material or containers are shipped to the Commission or Commission-owned containers are returned to the Commission, and the Commission elects to decontaminate the containers, railroad cars, trucks, or other shipping vehicles or the Commission's unloading area and machinery, because the containers, or the material or the method of shipment failed to meet the health and safety standards prescribed by the Commission or any other Federal or State agencies having jurisdiction over such matters, Agency shall pay the Commission the full cost of such decontamination as determined by the Commission in accordance with established Commission pricing policy. Any residual quantities of material in containers or equipment returned to the Commission will be deemed to have been consumed by Agency, and Agency shall pay for such material in accordance with this Agreement.

ARTICLE XIV - DETERMINATION OF MATERIAL QUANTITIES AND PROPERTIES

A. The Commission will furnish Agency a statement of the quantities and properties, including a statement of the weight of the material subject to this Agreement which is received by Agency directly from a Commission facility or returned directly to a Commission facility. The following provisions and procedures shall apply to the determination of the quantities and properties, including weight of the material:

1. Commission samples obtained at a Commission facility using the Commission's procedures will be binding upon the Commission and Agency unless the Commission and Agency agree upon the use of other samples, procedures or sampling locations.

2. The weight of the material will be determined prior to delivery to Agency or acceptance of delivery by the Commission, as the case may be, at a Commission facility using the Commission's procedures and facilities. The weight of the material determined by the result of such procedures shall be binding upon the Commission and Agency, unless the Commission and Agency agree upon other procedures or facilities.

B. Agency may, upon request to the Commission, observe the weighing of the material and the taking of samples by the Commission. The dates and places for the weighing and sampling will be established by the Commission and communicated to Agency upon receipt of Agency's request.

ARTICLE XV - TRANSFER OF MATERIAL

Transfer of material by Agency to a lessee with the approval of the Commission as provided in this Agreement shall not have the effect of relieving Agency of any obligation hereunder, except as to return of or payment for material so transferred.

ARTICLE XVI - OTHER CONTRACTS AND AGREEMENTS

This Agreement contemplates the possibility of separate agreements between Agency and the Commission with respect to materials which are subject to this Agreement, which may provide for suspension, termination, or revision of matters hereunder; and for reimbursement of charges incurred pursuant to this Agreement. Except as provided in such agreements, Agency's obligations under this Agreement for material subject to this Agreement shall continue notwithstanding the existence of such separate agreement or agreements.

ARTICLE XVII - NOTICES

A. Any notices required by this Agreement of Agency shall be submitted in writing to the Commission addressed to:

AEC Plutonium Leasing Officer
Richland Operations Office
United States Atomic Energy Commission
P. O. Box 550
Richland, Washington 99352

509-942-7378
P. Craig

B. Any notices required by this Agreement of the Commission shall be submitted in writing to Agency addressed to:

509-942-7275
Mrs. Rorsch

Commandant

U. S. Army Chemical Center and School

ATTN: Chief, Health Physics Division

Fort McClellan, Alabama 36201

IN WITNESS WHEREOF, the parties hereto have executed this Interagency Agreement the day and year first above written.

U. S. Army Chemical Center and School
(Agency)

BY: [signature]

TITLE: Assistant Commandant

THE UNITED STATES ATOMIC ENERGY COMMISSION

BY: P. R. Craig
(AEC Plutonium Leasing Officer)

Isotope Committee Meeting
1952 Fourth Meeting, 26 June 1952. The Chemical Corps School.

CMLTC-S-8

[redacted]

26 June 1952

MINUTES OF THE MEETING OF THE ISOTOPES COMMITTEE OF THE CHEMICAL CORPS SCHOOL

In accordance with Memorandum No. 1, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama, subject: "Isotopes Committee", dated 2 January 1952, pars 2 and 4, SO 14, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama, dated 31 January 1952, and at the call of the chairman of the Isotopes Committee, the fourth meeting of the Isotopes Committee was held at The Chemical Corps School on 25 June 1952.

The meeting was called to order by the committee chairman at 1000 hours. All members of the committee were present.

The minutes of the previous meeting were read by the recorder and presented to the committee for approval. The committee voted to approve the minutes as read.

First in the order of business was the status of any unfinished business.

Lt Pardee, the Radiological Safety Officer, reported that the radiological monitoring area "Rattlesnake Gulch" of The Chemical Corps School had been marked with radiological contamination symbols; 16 curies of Co^{60} had been received at the Raiological Laboratories and set up in the field monitoring area "Rattlesnake Gulch" for training personnel in the techniques of monitoring a radiologically contaminated area; The Chemical Corps School has a total of 48 curies of Co^{60} all of which is located in 2 and 4 curie point sources in the field monitoring area; these point sources have been changed from plastic to metal capsules which are dropped into wells in the ground when not being used and secured by lock and key; the Isotopes preparation room for storage and preparation of gamma, beta and beta-gamma emitting isotopes for training purposes had been completed as per recommendations made during a previous meeting, reference, minutes of Isotopes Committee Meeting of 28 March 1952; the Health Physics Office had been moved as per recommendations; several shipments of beta, gamma and beta-gamma emitting radioisotopes had been received from the Oak Ridge National Laboratory, Oak Ridge, Tennessee during the past three months and were stored in the storage area of the Isotopes preparation room; wash basins had been installed in the scaler room, top floor, laboratory "A", Bldg T-836 for students using radioisotopes to wash their hands before leaving the laboratory.

[redacted]

[redacted]

The next order of business was that of any new business.

A request for the purchase of radioisotopes made by the Military Arts Branch, The Chemical Corps School was presented to the committee by the Radiological Safety Officer for approval. The purchase order was for the purchase of 10 each Cobalt 60 sources having activities of 2 curies per source. These sources were to be used in the CBR Familiarization Course in the Pelham Range Area as a training aid. The sources were to be stored when not in use at the site at which they were used in a similar manner as that used in the radiological field monitoring area "Rattlesnake Gulch".

Col Thompson, the School Surgeon, brought up the question as to the radiation dosage which personnel would receive during such an exercise using this quantity of radioactive materials. Lt Pardee, the Radiological Safety Officer, informed the committee that during the operation of such an exercise a Health Physics representative was always present to enforce radiation safety measures and prevent the overexposure of personnel. Also, that RADIAC instruments used in such an exercise have been modified to register radiation intensities greater than the acutal intensity by a factor of 100.

The decision of the committee was to approve the purchase of the radioisotopes with the following recommendations, "Modified RADIAC instruments will be used during the exercise. However, personnel will be informed of this modification and all personnel will wear correct reading personnel dosage devices at all times during such an exercise."

The next order of business was that of D/A policy regarding the disposition of records of radiation exposure which are maintained by the Health Physics Group at The Chemical Corps School.

Since information regarding the D/A policy on the subject wasn't available the committee decided that a letter should be prepared for the Commandant's signature to The Adjutant General requesting the information regarding the policy of Maintenance of records of radiation dosage of personnel working with radioactive materials.

[redacted]

MINUTES OF THE MTG OF THE ISOTOPES COMMITTEE OF THE CML C SCH

[redacted]

There being no other business the meeting was adjourned by the chairman at 1025 hours.

George F Carroll

GEORGE F. CARROLL
1st Lt, Cml C
Recorder

APPROVED:

George F Carroll

for NELSON McKAIG, JR.
Colonel, Cml C
Chairman

Copies furnished:

Comdt, The Cml C School
Health Physics Group, The Cml C School

[redacted]

Isotope Committee Meeting
1952 Fifth Meeting, 15 October 1952. Record Group 338, Box 5, Accession 72A1094. Washington National Records Center, Suitland, Maryland.

CMLTC-S-8

15 October 1952

MINUTES OF THE MEETING OF THE ISOTOPES COMMITTEE
OF THE CHEMICAL CORPS SCHOOL

In accordance with Memorandum No. 1, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama, subject: "Isotopes Committee", dated 2 January 1952, pars. 2 and 4, SO 14, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama, dated 31 January 1952 and at the call of the Chairman of the Isotopes Committee, The Chemical Corps School, the fifth meeting of the Isotopes Committee was held at The Chemical Corps School on 15 October 1952.

The meeting was called to order by the Committee Chairman at 1000 hours. All members of the Committee were present.

The minutes of the previous meeting were read by the recorder and presented to the Committee for approval. The Committee voted to approve the minutes as read.

First in the order of business was the status of any unfinished business.

Lt. Pardee, the Radiological Safety Officer, reported that the shipment of Cobalt-60 to be used in the Pelham Range Area had been received at the Radiological Laboratories. The material is in the solid form sealed in capsules with each capsule containing 2 Curies of Activity. The total quantity received was 20 Curies.

Lt. Carroll, the Committee recorder, reported that a letter requesting the Department of Army policy re maintenance of Records of Radiation Dosage had been prepared and forwarded through channels as per recommendations of the Isotopes Committee, reference Minutes of the Isotopes Committee meeting dated 26 June 1952, and that a reply to the letter had been received. The Committee was informed of the contents of the letter. A copy of the letter has been filed in the Isotope Committee files.

The next order of business was that of any new business.

Lt. Pardee presented a new proposed arrangement of the Cobalt-60 sources in the radiological field monitoring area "Rattlesnake Gulch" for the approval of the Committee. The new arrangement would form a pattern of point sources such that the iso-intensity lines obtained would be much more realistic. Included in the new arrangement was a change in the method of suspending the sources when in use and storing the sources when not in use. This new arrangement has the suspension mechanism and well for storing welded into one unit. This unit would allow for faster and easier operation, reducing the time required for suspending the sources for use during an exercise and thus reducing the time of exposure of the operating personnel. The Committee voted unanimously to approve the new arrangement as proposed.

MINUTES OF THE MTG OF THE ISOTOPES COMMITTEE OF THE CML C SCH

The next point of business was that of the use of minute quantities of short half-lived radioisotopes (on the order of one microcurie) for demonstration purposes in the CBR Live Agents Decontamination Exercise, File No. T/758. The radioisotopes would be applied to one slip of a barrel of a field artillery piece in such quantities that the activity can be detected by a sensitive G-M type field survey meter. After detection, the field piece is decontaminated and the radioactive wastes buried in the ground. Military Contamination symbols would be used to mark the area. A Health Physics representative would always be present at each exercise to check the area after the exercise, check personnel for contamination, and check on the compliance of radiation safety measures and precautions. The Committee approved the use of the radioisotopes in the exercise.

The next point of business was the presentation of the purchase request for beta, gamma and beta-gamma emitting radioisotopes for use in the laboratory in the exercises "Decontamination of an Unknown Isotope" and "Decontamination". The purchase request was for isotopes for the school year 1952-53. The Committee approved the purchase of the radioisotopes.

Next in order of business was a recommendation for the appointment of another officer as a member of the Isotopes Committee. The reason for this recommendation was:

Two members of the Committee, Lt. Pardee and Lt. Carroll, are subject to change in assignment at the end of the school year 1952-53. The Isotopes Committee normally meets only once per quarter, which allows for only two meetings before June 1953. Therefore, it was felt that a new member should be appointed so that he can become acquainted with the duties, policies and procedures used by the Isotopes Committee. Then in case of loss of members the Committee could continue to carry out its functions efficiently.

The recommendation was that 1st Lt. Elwood A. Lloyd be appointed as the new member. Lt. Lloyd has been working with the Health Physics Group at the School for some time and has experience in radiation safety procedures as used at the Oak Ridge National Laboratory, Oak Ridge, Tennessee. It is anticipated that Lt. Lloyd would be with the School until 1954. The Committee approved the recommendation and requested necessary action be taken.

There being no other business, the meeting was adjourned by the Chairman at 1020 hours.

for Elwood A. Lloyd
GEORGE F. CARROLL
1st Lt, Cml C
Recorder

APPROVED:
Stoessel S. Barksdale
STOESSEL S. BARKSDALE
Colonel, Cml C
Chairman

Copies furnished:
Comdt, The Cml C School
Health Physics Group, The Cml C School

Isotope Committee Meeting
1953 Seventh Meeting, 20 February 1953. Record Group 338, Box 5, Accession 72A1094. Washington National Records Center, Suitland, Maryland.

THE ISOTOPE COMMITTEE
THE CHEMICAL CORPS SCHOOL
CHEMICAL CORPS TRAINING COMMAND
FORT McCLELLAN, ALABAMA

M I N U T E S

CMLTC-S-8

20 February 1953

The seventh meeting of the Isotopes Committee was held at The Chemical Corps School on 5 February 1953.

The meeting was called to order by the Committee Chairman at 1330 hours. Lt Col Rogers, Col Thompson, Maj MacWilliams, 1st Lt Pardee and 1st Lt Lloyd were present. Member absent was 1st Lt Carroll.

The minutes of the previous meeting were read by the recorder and presented to the committee for approval. The committee voted to approve the minutes as corrected.

First in the order of business was the status of any unfinished business.

The following items were reported by the recorder:

1. Authorization for isotope procurement for 1953 had been received.

2. Mr. Moore, civilian employee of the Radiological Laboratories, is attending the 30th ADO class as recommended.

3. Correction of minutes: Minutes of the third meeting of 28 March 1952 state: "Col McKaig, committee chairman, informed the committee that an official reprimand had been prepared, the commandant has signed same and a copy had been filed in the individual's personal file." This is not correct. Recommend the following substitution: "The individual was called to the Commandant's office and verbally reprimanded by the Commandant." Recommendation approved.

4. Lt Col Rogers asked that the committee be brought up to date on the disposition of the violations of the Health Physics SOP. Major MacWilliams reported that a meeting had been held. A letter which resulted from the meeting was read to the committee and the recommendations contained therein were endorsed by the committee. Subject letter is classified CONFIDENTIAL and is filed in the Secretary's Office as:

CMLTC-S-8 SUBJECT: Unsatisfactory performance of civilian employee

To: Commandant, The Cml C Sch From: Chief, Tech Instr Br Date: 5 Feb 53

5. Lt Pardee reported that the lost isotope had been recovered, and the case declared closed as of 3 February 1953 by CO, Cml C Tng Comd. It was recommended that the complete file concerning this subject be made a part of the committee files. Recommendation approved.

6. Col Thompson recommended that some medical officer of Technical Instruction Branch Medical Section attend the four-week course offered at Oak Ridge in anticipation of replacing Col Thompson as the Medical Member of the Committee. Selection of subject officer and determination of availability for such TDY to be made by Chief, Technical Instruction Branch. Recommendation was approved.

7. Major MacWilliams recommended that 1st Lt Elwood A. Lloyd attend the eight-week Health Physics Course starting in April, provided the class load would permit his absence from the School. This to be coordinated with Chief, Technical Instruction Branch. Recommendation was approved.

Next in the order of business was that of any new business.

It is noted that Lt Col James E. Rogers has replaced Col S. S. Barksdale as Committee Chairman, per SO 2 , Paragraph 4 , The Chemical Corps School, dated 7 January 1953.

Lt Pardee reported that the new area for radiological surveys had been established, and requested approval of a new radioactive burial ground, to be located in the new area. All radioactive waste has been removed from the old area and is to be buried in the new area. Burial ground was approved with the following limitations:

1. All waste to be burned and sealed in bleach cans before burial.
2. No isotope of longer half life than 90 days is to be buried.
3. The burial site is to be well marked with large "civilian type" signs.
4. All burials are to be recorded in the Health Physics Office as a permanent record.

Lt Pardee also reported that the Co-60 sources which were in the old area had been removed, 32 curies installed in the new area and 16 curies stored in the vault awaiting completion of adequate source wells.

Lt Lloyd recommended that the records of the Isotope Committee be treated as CONFIDENTIAL material and kept in a locked file of the Radiological Section. This will supersede the instructions in the minutes of the second meeting. Recommendation was approved.

Lt Pardee reported that the support received from Training Aids Branch in the development of film badges was inadequate. At this time they are over three months behind in this work. Also the quality of the work is extremely poor. Major MacWilliams and Lt Lloyd were appointed to investigate and report at the next meeting on corrective action taken.

Lt Pardee reported that the first and second shipments of isotopes scheduled for delivery in 1953 had been received.

There being no further business, the meeting was adjourned by the chairman at 1415 hours.

Elwood A. Lloyd

ELWOOD A. LLOYD, 1st Lt, Cml C
Recorder

APPROVED:

James E. Rogers

JAMES E. ROGERS, Lt Col, Cml C
Chairman

Copies furnished:

Commandant, The Cml C Sch
Health Physics Group, The Cml C Sch

Isotope Committee Meeting
1956 Seventeenth Meeting, 15 March 1956. The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama.

THE CHEMICAL CORPS SCHOOL
CHEMICAL CORPS TRAINING COMMAND
FORT McCLELLAN, ALABAMA

MINUTES OF ISOTOPE COMMITTEE

10 April 1956

The seventeenth meeting of the Isotope Committee was held at The Chemical Corps School on 15 March 1956. The following members were present: Colonel Wood, Lt Colonel Brice, Lt Powell, and Lt Killen. Lt Colonel Cameron was absent.

The minutes of the previous meeting were read by the recorder and presented to the committee for approval. The minutes were approved as read.

It was recommended and approved that note be made of a series of informal meetings as follows:

a. The Isotope Committee met on 22 August 1955. It was noted that The Chemical Corps School has been directed by higher headquarters to conduct a feasibility study of methods for the survey of ground contamination resulting from the surface detonation of large weapons. Methods of conducting the study were discussed and estimates were made of the additional radioactive material required to establish a radiological study area. Detailed plans were made for construction and clearing of the area. Approval was given for an initial order of 750 curies of Cobalt 60.

b. The Isotope Committee met on 7 December 1955. Specific plans and assignment of personnel for the feasibility study was made. The use of new instruments and other equipment was discussed and it was noted that an initial $3500 has been alloted for the study. Plans for a new semi-permanent multi-curie cell were approved.

c. The Isotope Committee met on 5 and 6 January 1956. Final arrangements were made for logistical support of the feasibility study. Radiological safety measures were discussed and it was recommended that these be included in the study SOP.

First in the order of business was the status of the unfinished business.

1. Dosimetry Film Procurement. It was reported that 3300 film packets were received on 10 January 1956.

2. Progress Report on Pelham Range. Lt Powell reported that an additional 90 source wells have been placed in the Radiological Survey Area #3 (Pelham Range). It was also reported that an additional 100 source wells are ready for placement in the area.

3. Radiological Survey Area #1. A report was made on the rebuilding

of the Summerall Gate Road area. New grid lines have been established and clearing of the area has commenced. A new source pattern has been planned.

4. Civilian for Health Physics. It was reported that a civilian T/D position was authorized for Health Physics, but that this position was eliminated by the civilian cut-back. Because of this, temporary overstrength of one officer has been authorized.

5. Radioactive Materials Storage Vault Area. It was reported that a fence was constructed around the area and the area has been blacktopped.

6. Personnel for Health Physics. Sgt Arthur M Binkley has left as Dosimetry Technician. Pfc James R Courtright, Pvt James L Christensen, and Pvt John H Mitchell have been assigned vice Sgt LaVie, Sp 3 Clemons, and Sp 3 Rutledge.

7. Storage Vault. It was recommended and approved that work be iniated for altering the door of the Radioactive Materials Storage Vault so it can be unlocked from the inside.

8. Film Packet Holders. It was reported that the 400 cadmium shielded film holders have been replaced by lead shielded holders.

Next in order of business was the new business.

Pur chase of Radioactive Cobalt. It was requested that approval be granted for the purchase of 1000 curies of Cobalt-60 for the enlargement of the Pelham Range Radiological Survey Area. The request was approved.

There being no further business the meeting was adjourned at 1130 hours.

James R. Killen II

JAMES R. KILLEN II
1st Lt, CmlC
Recorder, Isotope Committee

APPROVED:

Edwin Van Keuren

EDWIN VAN KEUREN
Colonel, CmlC
Commandant

REPRODUCED AT THE NATIONAL ARCHIVES

Isotope Committee Meeting
1957 Twenty-Fifth Meeting, 14 June 1957. U.S. Army Chemical Corps School, Fort McClellan, Alabama.

US ARMY CHEMICAL CORPS SCHOOL
FORT McCLELLAN, ALABAMA

MINUTES OF ISOTOPE COMMITTEE

14 June 1957

The 25th meeting of the Isotope Committee was called to order at 0730 hours, 14 June 1957. The minutes of the last meeting were read and approved.

The list of discrepancies in the isotopes handling system at the Chemical Corps School listed by the inspection team from the Environmental Health Laboratories was presented and discussed.

A temporary storage site for radioactive material was proposed by Capt Habermehl. It will consist of ground storage wells behind the present concrete storage building.

The construction of a new hot cell was discussed. It was recommended that instead of designing a completely new hot cell perhaps the design could be gotten from Oak Ridge. Location of the new hot cell will probably be to the rear of the Radiological Laboratory. The building to house the new hot cell is at present 4th out of 60 projects within Chemical Corps Training Command.

The proposed three day high level course will probably preclude use of the hot cell within the Radiological Laboratory if it is brought to the Chemical Corps School, because one of the rooms inside the laboratory will probably be utilized for this purpose.

Marking of individual source and hazards of the survey field were discussed.

The meeting was adjourned at 0830.

Victor V. Johnson

VICTOR V. JOHNSON
2/Lt CmlC
Recorder

APPROVED:

C. V. Burke

CARL V. BURKE
Colonel, CmlC
Commandant

Recommended Improvements in Radiological Facilities
by Environmental Health Laboratories

1. Film badges should be sent to Lexington Signal Depot at intervals of approximately four months to check the accuracy and reliability of our film developing and reading equipment.

2. All source capsules should be identified as to size and contents by some suitable system such as color or numbers on the capsule.

3. There should be an inventory performed on all radioactive material at the Chemical Corps School to verify its location and to insure that none is missing.

4. New and larger storage facilities are needed most urgently because of the large quantity of radioactive material on hand. Present facilities are completely inadequate.

5. A new hot cell should be constructed, near the storage area, which is large enough to handle any amount of radioactive material which we may have on hand in the forseeable future.

6. The question was raised as to whether water which enters the source wells is enough to cover the source capsule. If it does has the capsule been suitably constructed so as to withstand being immersed in water?

7. In as far as safety to the student is concerned it was suggested by the Inspection Team that since the sources on our survey field are so large some type of marker should be shown when they are in the operating position.

8. A suitable fence (2 or 3 strand) and padlocked gates all of which are suitably marked should be erected around the Rad Survey area. This fence should be surveyed at least monthly to determine that everything is in order.

9. In view of the amount of radioactive waste which is anticipated at the School in the future it was recommended that we cease using our burial grounds and ship our waste, in 50 gal. drums, either to Edgewood, Døugway, or perhaps Oak Ridge. This opinion was aggravated by the condition of the old burial grounds at Rattlesnake Gulch.

10. The old burial grounds at Rattlesnake Gulch will have to be dug up, preferably by pick and shovel to localize contamination, and either shipped to a recommended burial ground or reburied on Pelham Range. Contamination level should reach approximately 1mr/hr before the pits are covered. This is to make reasonably sure there are no capsules or particles of radioactive material which a person could pick up if they were uncovered.

Isotope Committee Meeting
1957 Twenty-Sixth Meeting, 9 July 1957. U.S. Army Chemical Corps School, Fort McClellan, Alabama.

US ARMY CHEMICAL CORPS SCHOOL
FORT McCLELLAN, ALABAMA

MINUTES OF ISOTOPE COMMITTEE

9 July 1957

The 26th meeting of the Isotope Committee was called to order at 1030 hours, 9 July 1957. The minutes of the last meeting were read and approved.

The report, which was prepared and sent to Chemical Corps Training Command by the Environmental Health Laboratories, about the School's isotope facilities was discussed. The following points were brought up which it was decided must be acted upon as soon as possible.

1. The old burial grounds (Rattlesnake Gulch) is to be cleaned immediately. The date had previously been set as the 7th of July but due to water in the pits it will be delayed - approximately one week.

2. The type of marking or identification to be put on the capsules should be decided upon and the project started, this may be dependent upon the new reincapsulation process, however.

3. Reincapsulation of the present sources, which is to preclude any leakage, by removing the radioactive material from the old capsule into a new type capsule was discussed. It was recommended that perhaps one of the following alternatives would be easier than cutting the old capsules.

a. Insertion of the old capsule into a new copper or brass capsule which could then be soldered or brazed for a permanent seal.

b. To prevent leakage the old steel capsule could be dipped in molten zinc.

c. The use of a plastic waterproofing compound was suggested. This would enable the capsule to be dipped in a relatively cool solution. It was pointed out that A.O.D. used this process in waterproofing and protection of equipment. Capt. Habermehl is to locate some of the material so that its desirability can be determined.

d. This subject is left open to more ideas which are to be brought up at the next meeting.

4. A choice was given as to whether chain link fence should be built around the entire survey area or a 3 wire barbed wire fence erected at the 300 mr/hr line within the survey area. It was decided that the barbed wire fence at the 300 mr/hr line would be the most feasible from a safety and economic view.

5. Instead of designing a complete unit for the construction of the new hot cell it was thought that plans for a cell of our need could be gotten from one of the national laboratories. Steps are to be taken to get the necessary information and material.

The meeting was adjourned at 1140.

Victor V. Johnson

VICTOR V. JOHNSON
2/Lt CmlC
Recorder

APPROVED:

C. V. Burke

CARL V. BURKE
Colonel, CmlC
Commandant

US ARMY CHEMICAL CORPS SCHOOL
FORT McCLELLAN, ALABAMA

MINUTES OF ISOTOPE COMMITTEE

9 July 1957

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3. Reincapsulation of the present sources, which is to preclude any leakage, by removing the radioactive material from the old capsule into a new type capsule was discussed. It was recommended that perhaps one of the following alternatives would be easier than welding the old capsules.

a. Insertion of the old capsule into a new copper or brass capsule which could then be soldered or brazed for a permanent seal.

b. To prevent leakage the old steel capsule would be dipped in molten wax.

c. The use of a plastic waterproofing compound was suggested. This would enable the capsule to be dipped in a relatively cool solution. It was pointed out that A[illegible]D. used this process in waterproofing and protection of equipment. Capt. Mitchell is to locate some of the material so that its desirability can be determined.

d. This subject is left open to more ideas which are to be brought up at the next meeting.

4. A choice was given as to whether chain link fence should be built around the entire survey area or a 3 wire barbed wire fence erected at the 300 mr/hr line within the survey area. It was decided that the barbed wire fence at the 300 mr/hr line would be the most feasible from a safety and economic view.

Isotope Committee Meeting
1958 Meeting, 8 January 1958, includes Disposition Form, 7 January 1958; Summary of Corrective Action. U.S. Army Chemical Corps School, Fort McClellan, Alabama.

U.S. ARMY CHEMICAL CORPS SCHOOL

FORT McCLELLAN, ALABAMA

IN REPLY REFER TO:

MINUTES - ISOTOPE COMMITTEE MEETING

The meeting was called to order at 1400 hours, 8 January 1958. Those present were: Colonel Wood, Colonel Cameron, Lt Colonel Bacon, Major Beach, Captain Stamper and Lieutenants Knight and Johnson.

Major Puckett is now the new Radiological Safety Officer, and as such, is now a member of the Isotope Committee.

Lt Powell's membership in the Isotope Committee is discontinued due to a change of duty station.

Cesium capsules are in the process of being encapsulated in brass capsules. The plastic capsules which were leaking have been reencapsulated. The remainder will be encapsulated as soon as lead pigs of sufficient size are available from the machine shops.

The second test run on Lexington Film Badges will be returned to the Signal Depot within the week for checking the accuracy of our photodosimetry process.

The letter informing AEC of the amount of Sr^{90} that we have on hand has been forwarded. The By-Product License level is 100 millicuries. We have in our possession 335 millicuries.

DF's have been written requesting fencing and filling of the new burial ground, bulldozing and grading of the roads in the survey area and burning of the vegetation from the area. Colonel Wood stated that Major Hinman would procure the material needed for construction of a fence around the burial area.

Lt Knight stated that a brass marker had been designed for marking the burial ground. Colonel Wood said that Major Hinman could procure the necessary brass markers if we furnish him the design.

Brochures were presented on forthcoming scientific meetings. A Nuclear Congress is to be held in Chicago on 17-21 March 1958 and a Health Physics Society Meeting at the University of California in June. Contingent upon the availability of funds for this type of travel, a representative will be sent from the Isotope Committee.

Three alternatives and costs of each were presented on the design of a new "hot cell." It was agreed unanimously by the Isotope Committee that the "hot cell" should be made an addition to the southwest wing of the present Radiological Laboratory. Drawings of the proposed cell were presented and discussed. It was decided that the drawings should be taken to AEC at Oak Ridge for comments and approval. It was recommended that a telephone call be made to Mr. Hitch arranging a suitable meeting time. Lt Knight said that all drawings and plans necessary for going to Oak Ridge could be completed by Wednesday, 15 January 1958.

It was suggested that, if necessary, Colonel Allen, from the Chemical Corps Engineering Command, would assist us in making blueprints for the "hot cell." Colonel Wood suggested that a scale model of the proposed "hot cell" be constructed by Training Aids Branch for use as an aid in building the cell and also as a training aid in classes.

Meeting adjourned at 1530 hours.

Victor V. Johnson

VICTOR V. JOHNSON
2/Lt, CmlC
Recorder, Isotope Committee

APPROVED:

C. H. Wood.

C. H. WOOD
Colonel, CmlC
Chairman, Isotope Committee

3 Jan

ISOTOPE COMMITTEE MEETING AGENDA

1. Cesium capsules are in the process of being encapsulated in brass capsules. The plastic capsules which were leaking have been encapsulated. The remainder will be encapsulated as soon as lead pigs of sufficient size are available from the machine shops.
2. The second test run on Lexington Film badges will be returned to the Signal Depot within the week for checking our photodosimetry process.
3. The letter requesting an increase in the amount of Sr^{90} that we are licensed for has been forwarded to AEC. The By-Product license level is 100 millicuries. We have in our possession 335 millicuries.
4. DF's have been written requesting fencing and filling of the new burial ground, bulldozing and grading of the roads in the survey area and burning of the vegetation from the area.
5. A brass marker has been designed for marking the burial grounds. It is now being talked over with Training Aids Branch as to its construction.
6. Three alternatives are now available for constructing a new hot cell. A summary of the cost, feasibility, and convenience of each of the locations and structures follows.

    Three Alternatives:

    1. Completely new building and hot cell located in rear of Radl Lab.
    2. Remodeling of Building 3175 and construction.
    3. Construction of a room to contain a hot cell on the southwest wing of the Radl Lab.

COST OF MATERIALS FOR CELL	ALTERNATIVES		
	(1)	(2)	(3)
Total concrete for walls and floor slab	$5,000	$5,000	$5,000
Lead doors (lead available at Lab)	3,500	3,500	3,500
Shielding Window (Est.)	5,000	5,000	5,000
Stainless Steel covering in Cell	1,000	1,000	1,000
Steel for covering top of Cell	800	800	800
Utilities: Plumbing, Ventilation & Electrical (TID 5280) Page 290	5,000	5,000	5,000
Cost of outer building	26,000 (Butler)	** (See below)	
Walls		900	900
Roof		500	500
Total for Cell and Building without Equipment	46,000	21,700**	21,700

**The cost for alternative #2 does not include dost of:

1. Removing roof from present building.
2. Removing portions of walls so contractors can work inside building.
3. Extending all utilities to this area.

Alternative #1 must be excluded because of cost. Alternative #2 and #3 will cost approximately the same the differentiation being in the notes above.

The location of the hot cell within the Radl Laboratory also classes this as remodeling an existing structure.

This preliminary cost estimate does not take into consideration the cost of equipment to be used in operation of the cell.

SECURITY CI ICATION (If any)

DISPOSITION FORM

FILE NO.	SUBJECT
	Summary of Corrective Action

TO	FROM	DATE	COMMENT NO. 1
Isotope Committee	Rad Safe Officer	7 Jan 58	

The following is a summary of actions taken by the Radiological Branch in regard to the recommendations made by the U. S. Army Environmental Health Laberatery on 28 May 1957.

a. A locally designed metal tag has been forwarded to Purchasing and Contracting for local manufacture.

b. Same as sub paragraph a.

c. Accomplished by initiation of a daily inventory of sources.

d. Leakage tests on all radium sealed sources are being conducted every 3 months. Leakage tests at Pelham Range are conducted on 5-10% of the sources every 6 months.

e. "Hot Cell" design and location are still being studied.

f. Signs have been placed on all contaminated material and it is being safely stored.

g. No contaminated material used for training exists.

h. An adequate fence around Pelham Range has been erected.

i. Accomplished.

j. No action necessary.

k. Reference sub-paragraph "C".

l. Accomplished by erection of combination barbed—hog wire fence.

m. AEC does not consider it necessary to decontaminate old burial ground if isotope has a half-life of one (1) year or less. Material in old burial ground has been identified as Tantalum (half-life 115 days).

n. Fence materials have been requested.

U. S. GOVERNMENT PRINTING OFFICE: 1951 O - 900875

SUBJECT: Summary of Corrective Action (continued)

TO Isotope Committee FROM Rad Safe Officer DATE 7 Jan 58

o. Commanding General, Chemical Corps Material Command has disapproved use of new burial ground, therefore no new burials have been made.

p. Arrangements have been made with Lexington Signal Depot for quarterly accuracy checks. The first check has been completed and the second is now in progress.

Conrad M Knight

CONRAD M KNIGHT
1st Lt CmlC
RADL SAFE OFF

E X T R A C T

Hqs, USA Environmental Health Laboratory of the Army Medical Service, Army Chemical Center, Maryland - REPORT OF RADIATION PROTECTION SURVEY NO. 2672R75-57, THE CHEMICAL CORPS SCHOOL, CHEMICAL CORPS TRAINING COMMAND, FORT McCLELLAN, ALABAMA, 27, 28 MAY 1957..

* * * * *

5. RECOMMENDATIONS.

a. Label all radioactive sealed sources with serial numbers and radiation caution symbols; identify the radioactive material and specify the curiage and date of curiage determination.

b. Label all radioactive source holders as required by paragraph 20.203 of the AEC regulations.

c. Maintain an inventory of specific sources so that the location of each numbered source may be readily determined.

d. Conduct leakage tests of all radium sealed sources and other radioactive sealed sources as required by AEC regulations. The radium sources should be tested every 3 months. Records of test results should be maintained.

e. Construct a permanent, completely enclosed, "hot cell." The barriers should be of uniform density. Radiographic examinations should be made of all structural joints. The barriers should be of sufficient thickness to reduce the exposure rate at any accessible area outside the cell to not more than 100 milliroentgens per 40-hour-weekly-work-shift when the maximum anticipated quantity of the highest energy emitter likely to be handled is positioned in the cell in the most hazardous practical location. The curiage handling capacity of the cell should be posted in view of the operator so that he may know when operational time should be limited to prevent overexposure. Provisions should be made in the design of the cell for the routine or emergency handling of radioactive material which presents an internal radiation hazard.

f. Post conspicuous signs on all contaminated material and store the material in a safe place.

g. Decontaminate all contaminated material which is not being used for training purposes.

h. Either erect a 7' high, chainlink fence, or equal, around the present radiation area within Pelham Field; post the fence with signs as required by paragraph 20.203(c) of AEC regulations; and lock the entrance,

or lock the entrance to the present barbed wire enclosure; erect an additional fence around the sources at such a distance that the exposure rate at the fence line does not exceed 300 mr/hr; post the fence with signs as required by paragraph 20.203(c) of AEC regulations; and indicate the exposure rates on the signs.

E X T R A C T - MEDEI-R 726.2 Rpt of Rad Prot Sur #2672879-57 (Ft McClellan) dtd 27, 28 May 57

i. Remove a randomly selected low curiage sealed source from the Pelham Field area every three months and examine the source for leakage. If the source container shows signs of leakage or deterioration remove all the sources from Pelham Field and reincapsulate them.

j. Any source removed from Pelham Field area should be reincapsulated in the Chemical Corps School designed brass capsule prior to further use.

k. Provide a suitable storage site for the radioactive material. Insofar as practicable individual source holders should be provided. The source holders should be conspicuously posted to show the quantity of identity of the respective sources and the remote handling and shielding equipment required to effect a transfer from the source holder. The area should be of sufficient size and layout to permit the safe handling of sources and the source holders. The area should be inaccessible to unauthorized persons.

l. Render the old burial ground inaccessible to children pending completion of decontamination.

m. Decontaminate the old burial ground.

n. Fence and post the new burial ground.

o. Discontinue the use of the new burial ground until specific approval of its use has been obtained from the AEC and Commanding General, Chemical Corps Materiel Command (see par 7, AR 755-380).

p. Make arrangements with either the Lexington Signal Depot or the National Bureau of Standards to submit Chemical Corps School film badges for an annual accuracy check.

6. CONCLUSION. When the recommendations of this report have been effected all reasonable precautions will have been taken to protect persons from needless exposure to ionizing radiation and the radiologic protection program at the Chemical Corps School will be in consonance with the recommendations of the National Committee on Radiation Protection and Measurements, the pertinent Army Regulations, and the AEC regulations.

1 Incl
CmlC Sch - SOP
"Work Involving
Radiation Hazards"

/s/t/ CHARLES E. CONER
Captain, MSC
Chief, Radiologic Hygiene Division

APPROVED:

/s/ Edward J. Dehne
EDWARD J. DEHNE
Lt Colonel, MC
Commanding

16 August -

Tested by Lt Knight - 15 August

35 curies

Source strength! - 7 readings/hour

Attitude - Sergeant

Attitude - Sergeant

Attitude - Sergeant

Rattlesnake-gulch - 4 Atomic Bomb

Attitude - Sergeant

Attitude - Sergeant

Attitude - Sergeant

Isotope Committee Meeting
1958 Meeting, 13 August 1958. U.S. Army Chemical Corps School, Fort McClellan, Alabama.

U. S. ARMY CHEMICAL CORPS SCHOOL
Fort McClellan, Alabama

CMLTC-SDI-T

13 August 1958

MINUTES OF ISOTOPE COMMITTEE MEETING

The meeting was called to order at 1030 hours, 13 August 1958. Present were Colonel Cameron, Major Puckett, Major Gittes, Captain Stamper, Mr. Ogar, Lieutenants Knight and Johnson, and Major Carew (non-member).

A motion was passed for disposing of all radioactive material presently licensed to the School, with the exception of the sources located at Pelham Range and several laboratory sources required for calibration of RADIAC instruments. Mr. Ogar will determine the availability of obtaining funds and materials for the construction of appropriate shipping containers for disposing of this excess material.

All radioactive sources and wells have been removed from the Field Familiarization Course located at Pelham Range.

A granite marker for the radioactive materials burial ground has been received. The marker is inscribed with the date the burial area was closed, the types and amounts of radioisotopes buried, and the organization performing the burial.

The School's Radiological Safety SOP is being revised and will be circulated to all members of the isotope committee and the AEC By-product Licensing Branch for approval. Particular emphasis is being placed on the delineation of responsibilities of the Radiological Safety Office and Radiological Branch.

Lt Johnson's membership in the Isotope Committee is discontinued due to discharge from the service.

Meeting adjourned at 1140 hours.

Conrad M. Knight
CONRAD M. KNIGHT
1ST LT, CMLC
Recorder, Isotope Committee

RECOMMEND APPROVAL:

John A. Bacon Jr.
JOHN A. BACON, JR.
Lt Colonel, CmlC
Acting Chairman, Isotope Committee

APPROVAL:

Carl V. Burke
CARL V. BURKE
Colonel, CmlC
Commandant

Isotope Committee Meeting
1958 Minutes, 19 November 1958. Record Group 338, Box 5, Accession 72A1094. Washington National Records Center, Suitland, Maryland.

US ARMY CHEMICAL CORPS SCHOOL
Fort McClellan, Alabama

19 November 1958

MINUTES OF ISOTOPE COMMITTEE MEETING

The meeting was called to order at 1430 hours, 19 November 1958. Present were: Colonel Parks, Lt Colonels Bacon, Shapira and Carew; and Lt Knight. Non-member in attendance was: Mr. Ogar.

It was noted that recent correspondence from the Surgeon General's Office indicates that the new radiation exposure limits established by the International Committee on Radiation Protection are applicable to all military personnel. Therefore, all personnel exposed to ionizing radiation at the School will not exceed 3 roentgens in any 13 consective weeks. In so far as possible this dosage will be received uniformly throughout the period. The Health Physics Office is responsible for insuring that the established dosage is not exceeded.

The new "Radiation - Danger" signs have been received and placed at 50 foot intervals on the fence surrounding the Pelham Range radioactive area. In addition, patrol roads have been made both inside and outside this fence.

The temporary hot cell, located in the Radiological Laboratory Building, has been dismantled. The area has been monitored and found free of contamination.

It was moved and passed that a calibrated alpha source be obtained either from a civilian manufacturer or some military source. In addition, the possibility of having all existing radium sources re-encapsulated will be investigated by the Radiological Safety Officer.

Meeting adjourned at 1530 hours.

Conrad M. Knight

CONRAD M. KNIGHT
1st Lt, CmlC
Recorder, Isotope Committee

RECOMMEND APPROVAL:

L. A. Parks

L. A. PARKS
Colonel, CmlC
Chairman, Isotope Committee

APPROVAL:

C. V. Burke

CARL V. BURKE
Colonel, CmlC
Commandant

19 November 1958

MEMO FOR RECORD: Long Distance Phone Call from Mr Feasell, Safety Officer, OCCmlO, to Col Parks, USA CmlC Sch, 0945 hours, 19 Nov 58

SUBJECT: Conditions of New By-Product License

1. Mr Feasell referred to new license and covered each item as follows:

a. They are going to approve any by-product materials between Atomic Nos 3-83, with the following exceptions:

(1) Phosphorus 32, Cobalt 60 and Strontium 90.

(2) Phosphorus 32 may be had in any form, either chemical or physical (1,000 mc).

(3) Cobalt 60 can be had in any form, either chemical or physical (6,000 curies).

(4) Strontium 90 sealed sources only 335 mc.

(5) By-product materials 3-83 may be had in any form, either chemical or physical.

(6) Maximum amount of each is 100 mc.

b. The following are conditions of license as written in draft:

(1) By-product materials are to be used by, or under the direct supervision of, individuals designated by the Chairman, Isotope Committee, Colonel L. A. Parks.

(2) Sealed sources fabricated or acquired shall be tested for contamination of leakage and at intervals of not less than six months. However, records of leakage test results shall be maintained by the licensee. The USA CmlC School does not have to send this information to AEC. Mr Feasell believes we can interpret this to mean that 20% of this is covered by Title 10, CFR, Part 30. We should expand Condition 12.

(3) Except as provided herein, license shall be in accordance with Title 10, Part 20, Chapter 1.

(4) Pelham Range area need not be equipped with control device referred to in Section 20.3. Pelham Range radiation area shall be secured by fence as designated in publication by AEC on 5 October 1957. Fence should be six feet high, with four feet of hog wire, and at least three strands of barbed wire. Future control of access to this range

shall be provided by patrol road. (Scraping area around this.) (We have read outside and inside.) Entrance to area shall provide two gates which are secured against unauthorized entry, or by padlock.

(5) Each sealed source container - capsule used outside of shielded exposure device, shall be labeled or have permanently attached to it a durable and legible tag. Label or tag shall be attached directly to container capsule or attached by durable lettering. (Each sealed source that is not in Pelham Range.) (This paragraph is just as it was in the old license - par 18.)

(6) Sealed sources semi-permanently installed in the Pelham Range area shall not be removed from site of installation until facility for encapsulating sources in brass containers, sealing them with silver sodium and in accordance with Condition 15, is built.

(7) Everyone who handles radioisotopes will be given instructions according to SOP.

c. AEC has given Mr Fennell a "draft," and they have the privilege of "arguing" with them. They would like to know if we can "live" with these licenses which are effective until 30 November 1960.

d. Reference par 18, old license, Mr Fennell asked if Col Parks and Lt Knight agreed with his interpretation that each sealed source would be used outside a shielded exposure device. (Omitted in new license.) He asked if we needed the "hot cell." (Tested IM-108 radius instruments in tank - field - 100 roentgens.) Col Parks stated that when they do this, we will have to set up temporary field and use some large sources. Should Pelham Range be enlarged! (6,000 curies may not be large enough.) Mr Fennell stated that at that time we will have to ask for a waiver or renewal of license. He thinks they will go along with the necessary changes, and will advise them a bout the license.

e. Col Parks advised he thinks we can "live" with the new licenses.

f. Mr Fennell advised that AEC team are not coming to the School to make anticipated inspection since they have accepted his report in lieu of making the trip themselves.

g. Col Parks advised that metal signs are up on fence, and markings are correct according to physical security standpoint.

2. Mr Fennell asked that the following message be related to Capt Ogar: "Meeting of Command Safety Directors is scheduled for 10 Dec 58."

3. Mr Fennell advised that Col Cerer has latest information re "hot cell."

L. A. PARKS
Colonel, CmlC
Chairman, Isotope Committee

CMLTC-SDI

ColParks/ac/4162/3Nov58

SUBJECT: "Hot Cell" for U. S. Army Chemical Corps School

TO: Chief Chemical Officer
Department of the Army
Washington 25, D. C.
ATTN: Safety Officer

1. Reference telephone conversation 21 October 1958 between Mr McConaghy, Assistant Safety Officer, OCCmlO, and Colonel L. A. Parks, U. S. Army Chemical Corps School, subject as above.

2. The best information obtainable from Atomic Energy Commission sources at Oak Ridge, Tennessee, indicates that cost of re-encapsulating current sources and construction of an adequate storage area will approximate [redacted]. $77,440. (Corrected cy fwd'd)(Retyped)

a. Cost involved in removal of current sources at Pelham Range and shipment to Oak Ridge, Tennessee for re-encapsulation and tagging:

(1) Cost of re-encapsulation - $50 per capsule.

(2) Number of capsules on hand - 510.

(3) Total cost of re-encapsulation - $25,500.

(4) Transportation cost one way per pig - $200.

(5) Number of shipping pigs required - 21.

(6) Total cost of transportation - $8,400.

Sub-total of re-encapsulation and transportation - $33,900.

b. Cost relative to shipment and encapsulation of current raw isotopes (approximately 1,000 curies) being held in storage:

(1) Cost of encapsulation - $50 per capsule.

(2) Number of capsules - 200.

(3) Total cost of encapsulation - $10,000.

NOTE: Cost of capsules not included, since common to all alternatives.

(4) Cost of transportation (8x2x200) - $3,200.

Sub-total of encapsulation and transportation - $13,200.

c. Estimated cost of obtaining and encapsulating raw isotopes versus encapsulated material for work in radiological laboratories in FY 1960:

(1) Number of curies anticipated for use in radiological laboratories - 10.

(2) Cost for encapsulation by Oak Ridge ($2,000/curie) / ($35 per capsule x 10) = $20,350.

(3) Cost for encapsulation by USA CmlC School ($1,500/curie) / ($1/capsule x 10) = $15,010. Saving by encapsulation at the Chemical Corps School = ~~$5,190~~ $5,340. (Corrected cy fwd'd)(Retyped)

d. The proposed "hot cell" is actually a combination storage and handling area. If the proposed hot cell is not constructed, it is estimated that a minimum of $25,000 will be necessary to construct a suitable storage area for the radioactive materials presently on hand, and normally stored at the radiological laboratories.

3. The following additional information is submitted as further justification for the construction of the proposed hot cell:

a. Under the School's present operating methods, representatives of the AEC and USA Environmental Health Laboratories have stated that a suitable "hot cell" is mandatory.

b. If existing sources are sent to Oak Ridge for encapsulation, it must be considered that all instruction in monitoring will decrease appreciably for a period of time that the sources must be made available to Oak Ridge. To meet AEHL requirements, it is felt that all current sources must be inventoried, tagged and re-encapsulated this current fiscal year; a program spread over several years would be unacceptable.

c. The hot cell will also provide a valuable training aid in courses pertaining to facility handling of isotopes. At present, instruction would be given during the Radiological Safety Courses, to give the students at least a general idea of the safety requirements incident to the operation of a hot cell and the techniques and methods employed in handling radioactive isotopes.

4. Under the new expanded radiological warfare mission of the Chemical Corps, training in aerial survey techniques and methods is of extreme importance and serious consideration is being given to expanding the Pelham Range Survey Area to permit more effective practical instruction in the actual conduct of aerial survey over actual radioactive sources.

For each additional curie source that the Chemical Corps School would require for expansion of the Pelham Range facilities, a saving of 25% would be obtainable if encapsulation facilities were locally available. This is predicated on an estimated cost from Oak Ridge of $2,035 for each one curie encapsulated source against an approximate cost at Fort McClellan of $1,501. The cost for encapsulation at the Chemical Corps School may be considerably less if it is possible for the School to obtain non-pure sources since the price quoted is for chemical pure Co^{60}.

5. Based on the above discussion, it is believed that the cost involved in encapsulation and handling of radioactive materials by agencies other than the U. S. Army Chemical Corps School will exceed the projected construction cost of $70,000 for the hot cell, and that the effective and efficient training of military personnel in the handling, monitoring and safety aspects of radiological contamination justify the immediate construction, under a high priority, of the proposed structure.

L. A. PARKS
Colonel, CmlC
Chairman, Isotope Committee

RADIOLOGICAL SAFETY OFFICER'S REPORT TO ISOTOPE COMMITTEE, 12 NOVEMBER 1958

1. PROJECTS COMPLETED:

a. The temporary hot cell located in the Radiological Laboratory Building has been dismantled. The area has been monitored and found free of contamination.

b. The "Radiation Danger Signs" have been received and placed on the fence surrounding the Pelham Range radioactive area.

c. A road has been bulldozed inside and outside the fence around the radioactive area located at Pelham Range.

2. Correspondence:

A letter from the OCCmlO received 1[illegible] October 1958, states that when the AEC Licensee is transferred that the actual replacement together with required supporting information must be forwarded prior to the actual transfer.

CONRAD M. KNIGHT
1st Lt, CmlC
Radiological Safety Officer

SECURITY CLASSIFICATION (If any)

DISPOSITION FORM

FILE NO.	SUBJECT
CMLTC-CDI-T	Information Relative to Hot Cell

XOX FROM : Radl Safety Officer DATE : 31 Oct 1958 COMMENT NO. 1
THRU: Chief, Radl Branch
Chief, Technical Division
LtKnight/2-3183/mj

TO: Assistant Commandant
USA CmlC School

1. In compliance with telephone conversation between Colonel Parks, USA CmlC School, and Mr. Feazell, OCCmlO, 29 Oct 1958, the following information is submitted:

a. Cost involved in removal of current sources at Pelham Range and shipment to Oak Ridge, Tenn. for re-encapsulation and tagging:

(1) Cost of re-encapsulation - $50.00 per capsule.

(2) No. of capsules on hand - 510.

(3) Total cost of re-encapsulation - $25,500.

(4) Transportation cost one way per pig - $200.00.

(5) Number of shipping pigs required - 21.

(6) Total cost of transportation - $8,400.00.

Sub-total of re-encapsulation and transportation - $33,900.00.

b. Cost relative to shipment and encapsulation of current raw isotopes (approximately 1,000 curies) being held in storage:

(1) Cost of encapsulation - $50.00 per capsule.

(2) Number of capsules - 200.

(3) Total cost of encapsulation - $10,000.

NOTE: Cost of capsules not included, since common to all alternatives).

(4) Cost of transportation (8x2x200) - $3,200.00.

Sub-total of encapsulation and transportation - $13,200.00.

c. Estimation of cost of obtaining and encapsulating raw isotopes vs pre-encapsulated material for work in Radiological Laboratories and expansion of Pelham Range in FY60:

U. S. GOVERNMENT PRINTING OFFICE: 1952 O - 886875

SUBJECT: Information Relative to Hot Cell

(1) Number of curies anticipated for use in Radiological laboratories - 10.

(2) Cost of encapsulation by Oak Ridge ($2,000/curie) + ($35.00 per capsule X10) - ~~$23,500.00~~ $20,350.00

(3) Cost of encapsulation by USA CmlC School ($1,500/curie) + ($1.00/capsule X10) - $15,010.

(4) Number of curies anticipated for expansion of Pelham Range - $1500.00.

(5) Cost of material and encapsulation by Oak Ridge ($2,000/curie) + ($35.00/capsule X300) - $3,010,500.00.

(6) Cost of material and encapsulation by USA CmlC School ($1500/curie) + ($1.00/capsule X300) - $2,250,300.00.

Sub-total of material and encapsulation by Oak Ridge - ~~$3,044,000.00~~ $3,040,750 - 3250

Sub-total of material and encapsulation by USA CmlC School - $2,265,310.00.

d. Grand total of costs listed in paragraphs 1a, b, c:

Grand total of costs if all work is performed by Oak Ridge - $3,091,600.00. ~~-~~ 3,088,350

Grand total of costs if all work is performed by USA CmlC School (including cost of cell) $2,335,310.00.

2. The following additional information is submitted as further justification of the proposed "Hot Cell":

a. Under the School's present operating methods, the Atomic Energy Commission and Enviormental Health Laboratory representatives have stated that a suitable hot cell is mandatory.

b. In regard to sending existing sources to Oak Ridge (either all at once or piecemeal), it must be considered that all instruction in monitoring will decrease proportionately.

c. The proposed hot cell is actually a combination storage area and handling area. It is estimated that approximately $25,000.00 would be necessary to construct a suitable storage area for the radioactive materials presently on hand.

d. The hot cell would also provide a valuable training aid in courses pertaining to safe handling and storage of isotopes. At present, the Radiological Safety Course is the only course that would receive instruction as such in this area. However, it can

be predicted that more personnel will require this training in view of the Chemical Corps' mission in Radiological Defense.

3. Based on the above discussion, it is believed that the costs involved in encapsulating and handling radioactive materials by agencies other than the US Army Chemical Corps School will exceed the projected construction cost of $70,000.00.

CONRAD M. KNIGHT, 1st Lt, CmlC
Radl Safety Officer

LtWright/2-3183/mj/16Oct58

CMLEC-SDI-T

October 16, 1958

Prescribes general operational conditions for the Radiological Safety Officer.

CMLEC-SDI-T October 16, 1958

Approver of radiological storage and handling facilities and training areas.

The Atomic [redacted] from the Radiological Safety Officer and revi[redacted] and Regulations
Isotopes Branch
Washington [redacted] disciplinary action as required.
ATTN: Mr. J. W. Hitch

It is felt that in view of the Chemical Corps' newly assigned missi[redacted]diological Defense and from past experience, it is necessary that the School be authorized to have radioisotopes in any chemical or physical [redacted] to the liquid [redacted] in training of scheduled laboratory specialist courses.

Should any [redacted] is [redacted] of the following happy [redacted]rate.

Colonel Laverne A. [redacted],

Lt Colonel John A. [redacted], Jr., Chief, Technical Division

Lt Colonel Thomas [redacted] Effects Engineer

Colonel, CmlC

Lt Colonel Norman [redacted] Radiological Branch

MFR: Self explanatory.

Colonel Joseph M. [redacted] Medical Officer

CONRAD M. KNIGHT
1st Lt, CmlC

1st Lt Conrad M. [redacted] Radiological Safety Officer
ADI

[redacted] Bibliographies of the new members: Colonel Parks, Lt Colonels Shapira and Carew were forwarded on 25 September 1958, File No. [redacted]-SDI-T.

The Isotope Committee meets regularly the second Wednesday of each month. The committee has the following functions:

Insures standards for protection as set forth in AEC and Army Regulations are maintained.

Approves the procurement and utilization of radioisotopes.

Lt Knight/2-3183/mj/160ct58

CMLTC-SDI-T

October 16, 1958

Prescribes general operational conditions for the Radiological Safety Officer.

Approver of radiological storage and handling facilities and training areas.

Receives reports from the Radiological Safety Officer and reviews his records.

Recommends disciplinary action as required.

It is felt that in view of the Chemical Corps' newly assigned mission in Radiological Defense and from past experience, it is necessary that the School be authorized to have radioisotopes in any chemical or physical form. Presently, it is anticipated that small amounts of both liquid and solid radioisotopes will be used in the preparation of scaler sources and in training of scheduled laboratory specialist courses.

Should any further information be required, the School will be most happy to cooperate.

Very truly yours,

LAVERNE A. PARR
Colonel, CmlC
Chairman, Isotope Committee

MFR: Self explanatory.

APPROVAL:

Ch, Tech Div _____
ADI _____

CONRAD M. KNIGHT
1st Lt, CmlC
Rad Safety Officer

DATE: _____

Layfield, Robert L.
1971 Letter Amendment 1, to Mr. Allan W. Rehrig, Deputy Chief, PEMA Execution Division, 2 April 1971. U.S. Army Chemical School, Fort McClellan, Alabama.

UNITED STATES
ATOMIC ENERGY COMMISSION
WASHINGTON, D.C. 20545

APR 2 1971

DML:MB:RLL
(70-372)
SNM-344, Amendment 1

Department of the Army
Office of the Deputy Chief of Staff
for Logistics
ATTN: Mr. Allan W. Rehrig
Deputy Chief
PEMA Execution Division
Washington, D.C. 20310

Gentlemen:

Pursuant to Title 10, Code of Federal Regulations, Part 70, Item 8 of Special Nuclear Material License No. SNM-344, dated April 6, 1970, is hereby amended to read as follows:

8. Authorized Use

For use in accordance with the statements, representations and conditions specified in the licensee's application, dated August 4, 1960, and supplements dated May 11, 1961; March 26, and November 4, 1964; February 13, 1967; June 17, 1969; March 18, 1970; and March 22, 1971.

All other conditions of this license shall remain the same.

FOR THE ATOMIC ENERGY COMMISSION

Robert L. Layfield
Materials Branch
Division of Materials Licensing

601-07

Form AEC-401
9/68

UNITED STATES
ATOMIC ENERGY COMMISSION

SPECIAL NUCLEAR MATERIAL LICENSE

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter 1, Part 70, "Special Nuclear Material", a license is hereby issued authorizing the licensee to receive and possess the special nuclear material designated below; to use such special nuclear material for the purpose(s) and at the place(s) designated below; and to transfer such material to persons authorized to receive it in accordance with the regulations in said Part. This license shall be deemed to contain the conditions specified in Section 70.32(a) of said regulations, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee	3. License No. SNM-344
1. Name: Department of the Army	4. Expiration Date: March 31, 1975
2. Address: U. S. Army Chemical Center and School, Fort McClellan, Alabama 36201	5. Docket No. 70-372

6. Special Nuclear Material	7. Maximum quantity of special nuclear material which licensee may possess at any one time under this license
Uranium 233 and plutonium	25 milligrams of U-233 and 315 micrograms of plutonium as plated alpha sources.

8. Authorized use

For use in accordance with the statements, representations, and conditions specified in the licensee's application dated August 4, 1960, and supplements dated May 11, 1961; March 26 and November 4, 1964; February 13, 1967; June 17, 1969; and March 18, 1970.

CONDITIONS

9. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

Date of issuance APR 6 1970

For the U.S. ATOMIC ENERGY COMMISSION

Robert L. Layfield
Division of Materials Licensing

Lutz, Charles M., Captain
1966 After Action Report, Test and Evaluation Program Radiological Decontamination Training Facility (Bromine Field), conducted July to December 1966. U.S. Army Chemical School, Fort McClellan, Alabama.

AFTER ACTION REPORT
Test and Evaluation Program
Radiological Decontamination Training
Facility (Bromine Field)

Project Officer:
CPT Charles M. Lutz
Chief, Health Physics Office
USACMLCS

HEALTH PHYSICS OFFICE
U.S. ARMY CHEMICAL CENTER AND SCHOOL
FORT McCLELLAN, ALABAMA

AJMCL-H

SUBJECT: Test and Evaluation Program, Radiological Decontamination Training Facility (Bromine Field)

TO: Commandant
U.S. Army Chemical Center and School
Fort McClellan, Alabama 36201

THRU: Chairman, Isotope Committee
U.S. Army Chemical Center and School
Fort McClellan, Alabama 36201

1. PURPOSE

This constitutes the after action report of the test and evaluation program conducted from July to December, 1966, on the Radiological Decontamination Training Facility (Bromine Field).

2. GENERAL

a. The Bromine Field will be used by the U.S. Naval Unit and the U.S. Army Chemical Center and School to train students in large area radiological field decontamination. The facility makes use of a short half life beta-gamma emitting radioisotope, Bromine 82. A complete description of the facility is inclosed as Annex A.

b. The test and evaluation program was initiated to test the design parameters of the Bromine Field, to evaluate the incorporated radiological safety procedures, and to train instructor and safety personnel in the proper conduct of the decontamination exercise.

3. CONDUCT OF TEST AND EVALUATION PROGRAM

a. A total of nine tests were conducted. Two initial tests used chemical simulants. Seven live tests were conducted using from 0.5 to 1.0 curies of radioactive Bromine 82. The last three live tests included the use of students at the Chemical Center and School (both Army and Navy) as participants in the exercise. A complete description of the tests conducted is inclosed as Annex B.

b. Instructor and radiological safety personnel from the Health Physics Office, Technical Division and the Naval Unit participated in a minimum of one simulated exercise and two live exercises (one of which was with students participating). A complete description of the training program is inclosed as Annex C.

c. The radiological field decontamination exercise is designed as a four hour block of instruction to include a safety orientation, dress out procedures, large area field decontamination, and hot line procedures. The radiological safety and control aspects of the lesson plan were evaluated as to their adequacy. The lesson plan used is inclosed as Annex D.

4. RESULTS OF TEST AND EVALUATION PROGRAM

a. Design parameters of the Bromine Field (to include the device, 11F3A) are generally adequate to insure safe mechanical operation of the field. However two deficiencies were noted:

(1) Dirt and debris collect in the drainage system and cause fouling of the valves by preventing them from sealing properly.

(2) Cracks have developed in the concrete pad which may eventually allow contamination to seep through to the soil. These cracks are not a problem at the present time.

b. The radiological safety procedures have been reduced to an initial safety orientation for the students and a series of checklists for the radiological safety personnel (see Annex D). These procedures have been more than adequate to properly orient all personnel on the radiological safety procedures to be followed.

c. All instructor and safety personnel listed are qualified in the proper conduct of the decontamination exercise (see Appendix 3, Annex B).

d. A general discussion of specific test results and back up data is inclosed as Annex E.

5. TRAINING EVALUATION

An evaluation of the training value of this exercise, to include what classes should receive the training and where similar facilities might be constructed, was made by the U.S. Naval Unit, Health Physics Office, and Technical Division. A brief summary of this training evaluation is as follows:

a. The basic decontamination exercise as outlined in Annex D is adequate for instructional needs.

b. Due to the weather requirements for the conduct of this exercise, it must be scheduled so as to be interchangeable with another four hour block. This would allow the exercise to be postponed for as long as forty eight (48) hours. After forty eight hours the activity of the Bromine is insufficient to conduct the exercise.

Annex A

RADIOLOGICAL DECONTAMINATION TRAINING FACILITY, (BROMINE FIELD)

1. Description of Device, 11F3A. The Radiological Trainer, Device 11F3A, has been developed for contaminating suitable areas or items with a short half-life radioactive isotope, Bromine-82. This isotope is a beta-gamma emitter with a half-life of 36 hours. It decays to a non-radioactive material. The device, 11F3A, consists of a ten gallon mixing tank, compressed air tanks, pressure gages, 100 feet of hose lines, and a spreading lance for spraying the contaminated solution.

The device can contaminate up to 5000 square feet of surface area on such items as aircraft, vehicles, and buildings. Its use provides a means for conducting realistic practical exercises in radiation monitoring, decontamination, and contamination-control techniques.

2. Radiological Decontamination Training Facility. The Radiological Decontamination Training Facility, (see Figure 1) is designed to provide a safe area where various items may be contaminated using the 11F3A. The concrete pad is designed to drain off all the contaminated water into holding tanks. Buckets, brushes, hoses, etc., which will be used to decontaminate the items are stored on the pad. Additional equipment will be available to monitor and decontaminate personnel and vehicles before leaving the Facility. The fence provides adequate security around the radiation area. During each exercise, air samples will be taken to determine the amount, if any, of airborne contamination released into the environment.

3. Conduct of the Exercise. The contamination of the equipment (¼-ton and 3/4-ton trucks, APC, and airframe) in the facility is accomplished by mixing two grams of irradiated (1 curie) Potassium Bromide (KBr) with five gallons of water in the device, 11F3A. The contaminated solution is then spread on the equipment by instructor personnel until a source strength of 100 millirad per hour at one meter is obtained. Prior to the actual exercise the students are briefed on the conduct of the exercise and on the radiological safety procedures to be followed. All instructor and student personnel participating in the exercise are completely dressed out in foul weather gear and protective masks. Film badges and low range dosimeters (IM 9) are worn by all participating personnel. The students then decontaminate the equipment until the dose rate at one meter is reduced to five mrad/hr.

When decontamination using scrub brushes, soap, and water is complete the students go through a hot line to remove their outer gear and are monitored again prior to leaving the facility. Should any student or instructor become contaminated, he will be completely decontaminated at the Personnel Decontamination Station (see figure 2). Waste water generated during the exercise is collected in four 4,000 gallon holding

tanks and allowed to decay to a safe level prior to being dumped into the sewage system. Every fifteen days the activity is reduced by a factor of one thousand.

4. Procurement of Bromine-82. Irradiated Bromine-82 was procured under Government contract from a commercial firm. The original supplier, Oak Ridge National Laboratories (ORNL), no longer provides this service. Specifications on the contract called for the encapsulation of 2 grams of potassium bromide (KBr) in an ORNL capsule, and the sealing and leak testing of the loaded capsule. The capsule, containing the KBr was then irradiated in a reactor for approximately 12 hours. This irradiation time would produce at least 1 curie of activity as of noon on the day of delivery to the Chemical Center & School. The cost is about $200 per exercise for the Bromine-82.

5. Operational Limits. The following will be considered as the limits for the conduct of any operation involving the use of Bromine-82:

(1) Contamination of areas and objects $\leq$ 100 mr/hr at 1 meter.

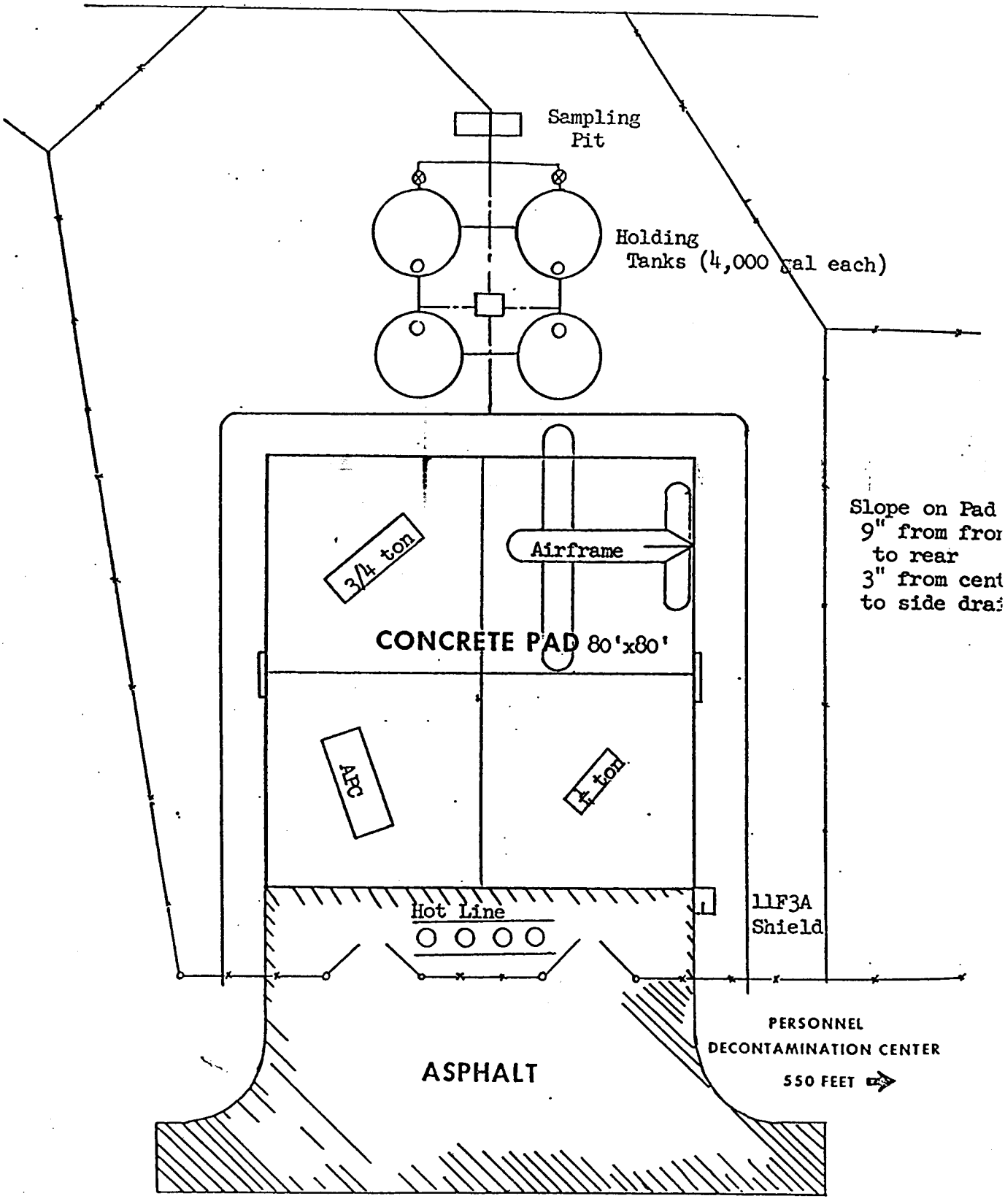
(2) After decontamination, areas and objects $\leq$ 5 mr/hr at 1 meter.

(3) Student exposures $\leq$ 50 mr/exercise.

(4) Staff & Faculty $\leq$ 100 mr/exercise-emergencies only.

(5) Dose-rate at perimeter fence $\leq$ 0.50 mr/hr.

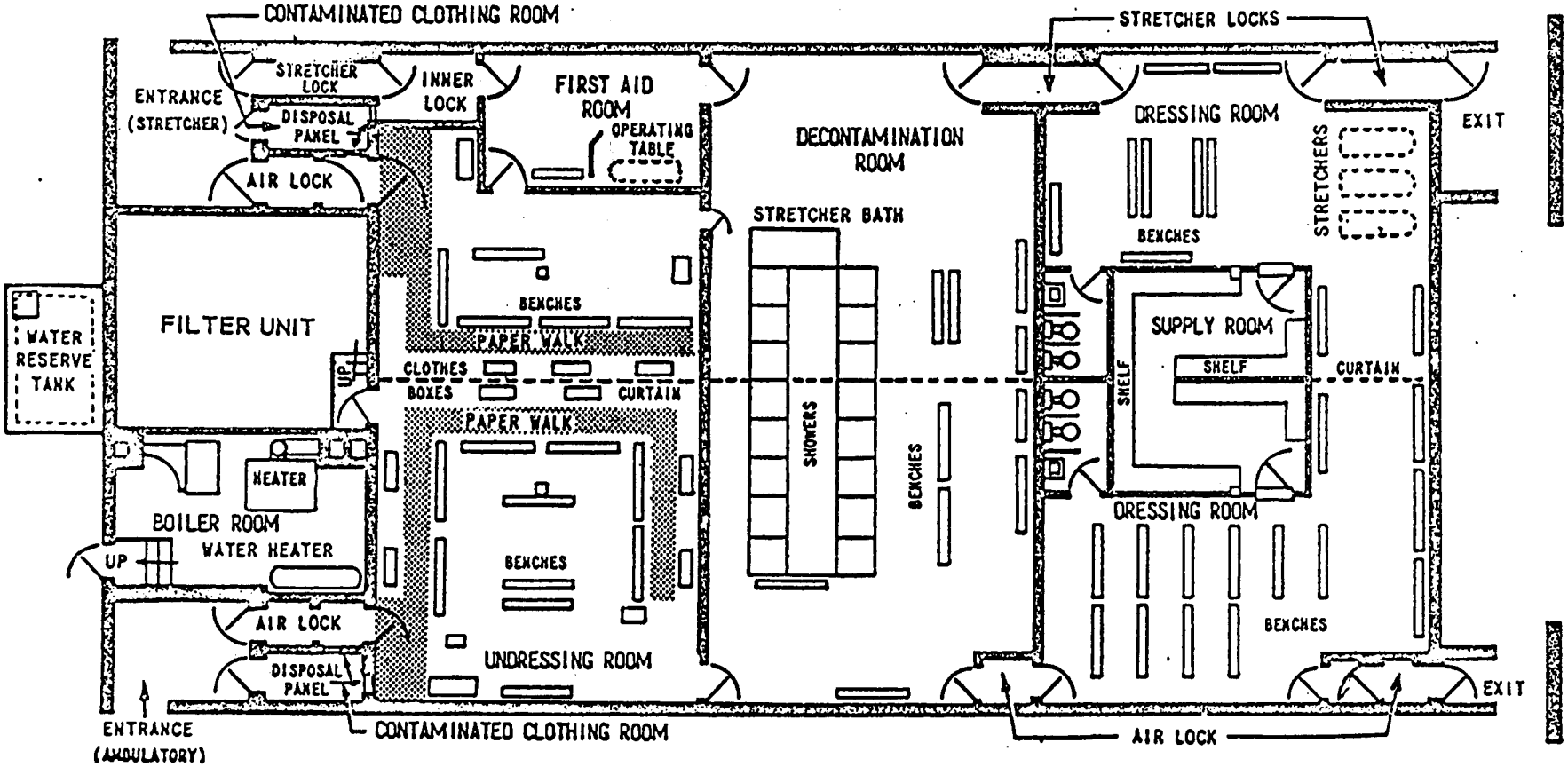
6. Summary. The Bromine Field offers realistic training in decontamination of large items of equipment. The students also have the opportunity to decontaminate different types of surfaces; i.e. metal, canvas, wood (painted and unpainted), rubber, and concrete. The radiological safety requirements are stringent enough to protect the participating personnel and yet they do not detract from the training value of the exercise.



RADIOLOGICAL DECONTAMINATION TRAINING FACILITY (11F3A)

Figure 1

PERSONNEL DECONTAMINATION CENTER



LOCATED 550 FEET SOUTH OF RADIOLOGICAL DECONTAMINATION TRAINING FACILITY 11F3A

ISOTOPE COMMITTEE
U.S. ARMY CHEMICAL CENTER AND SCHOOL
FORT McCLELLAN, ALABAMA

STANDING OPERATING PROCEDURES

Radiological Decontamination Training Facility (11F3A)

1. PURPOSE

To prescribe the policies and procedures necessary to insure proper and safe use of the Radiological Decontamination Training Facility (11F3A).

2. SCOPE

This SOP is applicable to all personnel who make use of the Facilit

3. GENERAL

a. Radiological Decontamination Training Facility.

The Radiological Decontamination Training Facility (see figure is designed to provide a safe area where various items may be contaminated using the 11F3A. The concrete pad is designed to drain off all the contaminated water into holding tanks. Buckets, brushes, hoses, etc., which are used for decontamination are stored on the pad. Additional equipment will be available to monitor and decontaminate personnel and vehicles before they are released.

b. Description of Device, 11F3A.

The Radiological Trainer Device, 11F3A, has been developed for contaminating suitable areas or items with a short half-life radioactive isotope, bromine-82. This isotope is a beta-gamma emitter with a half-life of 36 hours. It decays to a non-radioactive material. The device can contaminate up to 5000 square feet of surface area on such items as aircraft, vehicles, and buildings. Its use provides a means for conducting realistic practical exercises in radiation monitoring, decontamination, and contamination control techniques.

4. RESPONSIBILITIES

a. Isotope Committee

The Isotope Committee provides overall supervision of radiological operations of the school. In this capacity it will supervise the activities in the Facility following the procedures outlined in USACMLCS Memorandum 385-2.

Appendix V

RELEASE OF EFFLUENTS

1. General.

a. Title 10, Code of Federal Regulations, Part 20 prescribes the permissible concentrations of radionuclides in air and water. Radioactive material will not be released from the Facility if it exceeds these permissible concentrations. The liquid will be contained in a 10,000 or a 3,000 gal tank until the activity is well within limits. Normally three weeks. Experience at the Naval Schools Command, Treasure Island indicates that the airborne contamination will not be exceeded.

b. The exercise is designed for bromine-82. Although it is anticipated that a normal exercise will require approximately 1 to 2 curies of Br-82, it is possible that as much as 4 to 8 curies may be on hand during the testing phase. In addition, other isotopes will be present due to induced activity in the aluminum source can and impurities in the potassium bromide (KBr). The probable maximum activity of these isotopes is:

Isotope	Half-life	Activity
Br-82	35.9 hours	4.0 c
Br-80m	4.5 hours	less than 0.7 c
Br-80	18.0 minutes	" 0.5 mc
K-42	12.5 hours	" 0.36 c
Na-24	15.0 hours	" 0.10 c
Al-28	2.3 minutes	probably not detectable

c. The permissible concentrations in air and water should be calculated as specified in the notes at the end of Appendix B, 10 CFR 20. Since the concentrations of the other significant isotopes (K-42 and Na-24) are less than one-tenth that of Br-82, and since the permissible limits of the other isotopes are the same or less restrictive than that of Br-82, the exercise permissible limit will be based on Br-82. In air and water, it will be assumed that all contamination above background is Br-82.

2. Airborne Contamination.

a. During the mixing, spreading, decontamination, and associated operations, particles of bromine may become airborne. Once the material

is airborne, it can be inhaled resulting in internal contamination. The airborne material may also contaminate surfaces in adjacent areas that should normally be free of contamination. The permissible concentrations of Br-82 and other isotopes are listed in the following table.

Isotope	Type of Area	Air (μc/cc)
Br-82	Controlled Radiation	1×10^{-6}
	Unrestricted	4×10^{-8}
K-42	Controlled Radiation	2×10^{-6}
	Unrestricted	7×10^{-8}
Na-24	Controlled Radiation	1×10^{-6}
	Unrestricted	4×10^{-8}

b. Air sampling will be conducted during any exercise in which Br-82 is used. Health Physics Office will analyze the air samples to determine the airborne contamination leaving the fenced-in area.

3. Water Contamination.

a. All the water used in the exercise will be collected and stored in the holding tanks. The liquid will be held as long as possible, normally three weeks, before disposal. The maximum anticipated concentrations are:

Isotope	Activity	Dissolved in 2000gal water μc/cc	Concentration after 21 days μc/cc	Permissible Limits μc/cc
Br-82	4.00 c	0.53	3.1×10^{-5}	3×10^{-4}
K-42	0.36 c	0.05	4×10^{-14}	3×10^{-4}
Na-24	0.10 c	0.01	7×10^{-11}	2×10^{-4}

b. As indicated above, the contaminated wash water from an exercise may be released to the sanitary sewer if held for three weeks. In the event of an emergency, it may be released earlier if, when diluted by the water in the sanitary sewer, the concentration is within the permissible limits.

c. Health Physics Office is responsible for sampling the solution in the holding tanks. The liquid will be released to the sanitary sewer if all provisions of 10 CFR 20.303 are met.

4. Records.

All records and reports required by 10 CFR 20 will be performed by the Health Physics Office.

Appendix V

RELEASE OF EFFLUENTS

1. General.

a. Title 10, Code of Federal Regulations, Part 20 prescribes the permissible concentrations of radionuclides in air and water. Radioactive material will not be released from the Facility if it exceeds these permissible concentrations. The liquid will be contained in a 4,000 gal tank until the activity is well within limits. (Normally two weeks). Experience indicates that the airborne contamination limits will not be exceeded.

b. The exercise is designed for bromine-82. A normal exercise will require approximately 1 curie of Br-82. In addition, other isotopes will be present due to induced activity in the aluminum source can and impurities in the potassium bromide (KBr). The probable maximum activity of these isotopes is:

Isotope	Half-life	Activity
Br-82	35.9 hours	1 c
Br-80m	4.5 hours	less than 0.2 c
Br-80	18.0 minutes	" 0.1 mc
K-42	12.5 hours	" 0.1 c
Na-24	15.0 hours	25 mc
Al-28	2.3 minutes	probably not detectable

c. The permissible concentrations in air and water should be calculated as specified in the notes at the end of Appendix B, 10 CFR 20. Since the concentrations of the other significant isotopes (K-42 and Na-24) are less than one-tenth that of Br-82, and since the permissible limits of the other isotopes are the same or less restrictive than that of Br-82, the exercise permissible limit will be based on Br-82. In air and water, it will be assumed that all contamination above background is Br-82.

2. Airborne Contamination.

a. During the mixing, spreading, decontamination, and associated operations, particles of bromine may become airborne. Once the material

is airborne, it can be inhaled resulting in internal contamination. The airborne material may also contaminate surfaces in adjacent areas that should normally be free of contamination. The permissible concentrations of Br-82 and other isotopes are listed in the following table.

Isotope	Type of Area	Air (μc/cc)
Br-82	Controlled Radiation	1×10^{-6}
	Unrestricted	4×10^{-8}
K-42	Controlled Radiation	2×10^{-6}
	Unrestricted	7×10^{-8}
Na-24	Controlled Radiation	1×10^{-6}
	Unrestricted	4×10^{-8}

b. Air sampling will be conducted during any exercise in which Br-82 is used. Health Physics Office will analyze the air samples to determine the airborne contamination leaving the fenced-in area.

3. Water Contamination.

a. All the water used in the exercise will be collected and stored in the holding tanks. The liquid will be held as long as possible, normally two weeks, before disposal. The maximum anticipated concentrations are:

Isotope	Activity	Dissolved in 4000 gal water μc/cc	Concentration after 15 days	Permissible Limits μc/cc
Br-82	1.0 c	6.6×10^{-2}	6.6×10^{-5}	3×10^{-4}
K-42	0.10 c	6.6×10^{-3}	1.1×10^{-13}	3×10^{-4}
Na-24	25 mc	1.7×10^{-3}	1×10^{-9}	2×10^{-4}

b. As indicated above, the contaminated wash water from an exercise may be released to the sanitary sewer if held for two weeks. In the event of an emergency, it may be released earlier if, when diluted by the water in the sanitary sewer, the concentration is within the permissible limits.

c. Health Physics Office is responsible for sampling the solution in the holding tanks. The liquid will be released to the sanitary sewer if all provisions of 10 CFR 20.303 are met.

McAlduff, H. J., Jr. **(Appendix D-Licenses Listing)**
1970 Interagency Agreement for Enriched Uranium No. 1003. U.S. Army Chemical School, Fort McClellan, Alabama. This license was amended, renewed and extended for several years through 1973.

United States
Atomic Energy Commission

INTERAGENCY AGREEMENT FOR ENRICHED URANIUM

SNM INTERAGENCY AGREEMENT NO. 1003

THIS INTERAGENCY AGREEMENT (sometimes referred to as the "Agreement"), entered into this 24th day of November, 1970, by and between the UNITED STATES ATOMIC ENERGY COMMISSION (hereinafter called the "Commission") and US Army Chemical Center and School (hereinafter called the "Agency"), an executive department or independent establishment of the Government of the United States of America or a bureau or office thereof;

WHEREAS, the parties hereto desire to establish the terms and conditions applicable to the distribution of special nuclear material to the agency, pursuant to the Atomic Energy Act of 1954, as amended, whether ordered and received directly from a Commission facility or transferred from a lessee of the Commission;

NOW, THEREFORE, the parties hereto do mutually agree as follows:

ARTICLE 1 - DEFINITIONS

As used in this Agreement:

a. The term "Act" means the Atomic Energy Act of 1954, as amended.

b. The term "base charge" means the dollar amount per unit of normal or depleted uranium or special nuclear material in standard form and specification in effect as of the time any particular transaction under this Agreement takes place, as set forth in schedules published by the Commission in the Federal Register from time to time.

c. The term "blending" means the altering of the isotopic composition of a quantity of an element by means other than through the irradiation of a material in a nuclear reactor.

d. The term "Commission" means the United States Atomic Energy Commission or any duly authorized representative thereof.

e. The term "Commission facility" means a laboratory, plant, office, or other establishment operated by or on behalf of the Commission.

f. The term "Commission's established specifications" means the specifications for purity and other physical or chemical properties of normal or depleted uranium or special nuclear material, as published by the Commission in the Federal Register from time to time.

g. The terms "consumed" or "consumption" mean the destruction, burnup, loss or disposition of material in such manner that it cannot be economically recovered for further use, material unaccounted for, or changes in the composition of material due to blending of different assays of material or other alteration of the isotopic ratio resulting in the reduction in value of such material.

h. The term "depleted uranium" means uranium having a weight fraction U-235 of less than 0.00711.

i. The term "established Commission pricing policy" means any applicable price or charge in effect at the time any particular transaction under this Agreement takes place (i) published by the Commission in the Federal Register, or (ii) in the absence of such a published figure, determined in accordance with the Commission's Pricing Policies. A statement of such Pricing Policies will be furnished Agency upon request. The Commission's published prices and charges, as well as its Pricing Policies, may be amended from time to time.

j. The term "lessee" means a person who is a party to a Special Nuclear Material Lease Agreement with the Atomic Energy Commission. For the purposes of this Agreement, the term "lessee" also includes another Government agency which has executed a Special Nuclear Material Interagency Agreement with the Commission.

k. The term "normal uranium" means uranium having 0.00711 weight fraction U-235.

l. The term "persons acting on behalf of the Commission" means employees and contractors of the Commission, and employees of such contractors, who implement or participate in the implementing of this Agreement pursuant to their employment or their contracts with the Commission.

m. The term "source material" means (1) uranium, thorium, or any other material which is determined by the Commission pursuant to the provisions of Section 61 of the Act to be source material; or (2) ores containing one or more of the foregoing materials, in such concentration as the Commission may by regulation determine from time to time.

n. The term "special nuclear material" means (1) uranium-233, uranium enriched in the isotope 233 or in the isotope 235, and any other material which the Commission, pursuant to the provisions of Section 51 of the Act, determines to be special nuclear material, but does not include source material; or (2) any material artifically enriched by any of the foregoing, but does not include source material.

o. The term "standard form" means the chemical form of normal or depleted uranium or special nuclear material, as published by the Commission in the Federal Register from time to time.

p. The term "value" means the dollar amount determined by multiplying the applicable base charge by the number or units, or fractions thereof, or normal or depleted uranium or special nuclear material involved, whether or not such material is in standard form or meets the Commission's established specifications; provided, however, where uranium enriched in the isotope U-235 subject to this Agreement has its isotopic ratio altered by the generation of uranium isotopes U-232 and U-233 during irradiation of the material in a nuclear reactor, the term "value" for the purpose of determining provisional payments for consumption of such material, means the dollar amount determined by multiplying the number of grams of U-235 by the base charge per gram of U-235 calculated from subparagraph 3(a) of the Federal Register Notice entitled "Plutonium and Uranium Enriched in U-233; Guaranteed Purchase Prices," 30 F. R. 3886, March 25, 1965, as the same may be amended from time to time.

ARTICLE 2 - SCOPE

a. Unless otherwise provided herein, or in a written agreement between the Commission and Agency, the terms and conditions contained herein shall apply to special nuclear material and related services furnished to Agency by the Commission on and after the date of execution of this Agreement, and to the material, if any, subject to the Special Nuclear Material Interagency Agreement between the Commission and Agency, as of midnight, December 31, 1970, whether ordered and received directly from a Commission facility or obtained from another lessee of the Commission. Nothing herein shall be deemed to prevent Agency

from shipping material covered by this Agreement to any person duly authorized by the Commission to process and use such material. Agency may be relieved of its obligations under this Agreement for such material only in accordance with the terms of this Agreement. Material received by Agency from any source shall be subject to the provisions of this Agreement only if such material is furnished pursuant to an order accepted by the Commission as provided in paragraphs b. and c. below.

b. Agency shall order material pursuant to this Agreement through the execution and submission of a special nuclear material order form prescribed by the Commission.

c. Acceptance of Agency's order for material by or on behalf of the Commission shall constitute the Commission's commitment to furnish the material specified in such order subject to the terms of this Agreement. When Agency orders material which is to be obtained from a lessee, this Agreement shall not be applicable to such material until such lessee and the Commission have agreed to the transfer of such material to Agency.

d. Nothing herein shall be deemed to obligate Agency to order material or to obligate the Commission to furnish material to Agency, or to provide services for Agency with respect to material.

ARTICLE 3 - TERM OF AGREEMENT, TERMINATION AND CANCELLATION

a. Except as otherwise provided herein, the Agency shall have the right to possess and use the material covered by this Agreement until June 30, 1973; provided that material subject to this Agreement furnished to or received by Agency after December 31, 1970, shall not, unless otherwise authorized in writing by the Commission, be used in the course of activities under a license issued pursuant to section 103 or 104 b. of the Act.

b. Agency may cancel any order for material under this Agreement by notice in writing to the Commission at any time prior to delivery of the material; provided, Agency shall reimburse the Commission for the costs incurred by the Commission in connection with such order, as determined in accordance with established Commission pricing policy in effect at the time such costs are incurred.

c. The Commission may terminate or suspend in whole or in part this Agreement at no cost to the Commission at any time, by written notice to Agency in the event that (1) the right of Agency to possess material subject to this Agreement expires or is suspended or terminated by any authority having power to take such action,

or (2) Agency shall fail to perform its obligations hereunder and shall fail to take corrective action within 30 days of the date of the written notice of such failure to perform as provided above, unless such failure arises out of causes beyond the control and without the fault or negligence of Agency.

ARTICLE 4 - MATERIAL TO BE FURNISHED BY THE COMMISSION

a. Except as otherwise agreed to in writing by the Commission and Agency, special nuclear material subject to this Agreement shall be furnished to Agency in standard form in accordance with the Commission's established specifications.

b. Agency shall pay the Commission's service charges, if any, for withdrawal and packaging, and for any other special service rendered pursuant to Agency's order. Unless such charge or charges are agreed to in the order executed by Agency and the Commission for material, Agency shall pay the Commission its charges for the services rendered pursuant to Agency's order as determined in accordance with established Commission pricing policy in effect at the time such services are rendered. Agency shall also pay the value of material consumed in the rendering of such special services.

c. If the material delivered by the Commission pursuant to an order executed by Agency and the Commission does not conform to the Commission's established specifications (or to the specifications set forth in an order executed by Agency and the Commission), the responsibility and liability of the Commission and persons acting on behalf of the Commission shall be limited solely to correcting such discrepancies by delivery of material which does conform to the applicable specifications. Neither the Commission nor persons acting on its behalf shall have any responsibility or liability for replacing or furnishing material which Agency obtains directly from a lessee of the Commission. The Commission will pay to the carrier the transportation charges for returning any material obtained directly from the Commission which does not conform to applicable specifications, as well as the transportation charges for shipping conforming replacement material. No service charges will be made with respect to such replacement material, and rental charges for Commission-owned containers in which such material shall be shipped will not commence until 30 days after date of shipment.

d. It is recognized that material furnished under this Agreement as enriched uranium (U-235) may be consumed in such manner as to reduce the isotopic ratio thereof to the extent that the leased material is no longer special nuclear material as defined in this Agreement. Except as provided in this paragraph, or in paragraph e. below, the resulting normal or depleted uranium will be and remain subject to the provisions of this Agreement as if the material were special nuclear material. Agency's obligations for consumption of such material shall be computed using the value of the normal or depleted uranium. If, in lieu of returning such material directly to a Commission facility as provided in this Agreement, Agency desires to transfer such material to another person and terminate its obligations with respect thereto, the Commission may, at its option, require Agency to pay the value of such material and transfer full custody and responsibility of such material to Agency.

e. (1) The Commission, upon delivery to Agency of U-233, or uranium enriched in the isotope 233 subject to this Agreement, may direct that such U-233 or uranium enriched in the isotope 233 not be blended with other uranium.

(2) In the case of blending of normal, depleted or enriched uranium subject to this Agreement with privately-owned uranium other than U-233 or uranium enriched in the isotope 233:

(A) If, within one hundred twenty (120) days from the date of completion of the blending, the Commission receives the written agreement of all such parties thereto, and

1. The assay (weight percent U-235) of the blended product is higher than that of the Commission-furnished material used in blending, (a) the Commission shall debit Agency's account with the value of such portion of Agency's share of the blended product as does not exceed the value of Agency's Commission-furnished material used in the blending and credit Agency's account with the value of Agency's Commission-furnished material used in the blending; (b) full custody to and responsibility for the blended product so debited to Agency's account shall be deemed to be transferred to the Commission; and (c) Agency shall

pay to the Commission the amount, if any, by which the value of the credited material exceeds the value of the debited material, or

2. The assay (weight percent U-235) of the blended product is lower than that of the Commission-furnished material used in the blend, (a) the Commission shall debit Agency's account with the value of such portion of Agency's share of the blended product as has a feed component which does not exceed the feed component (assuming uranium having an assay of 0.711 weight percent U-235 was used as a feed material) of Agency's Commission-furnished material used in the blending and credit Agency's account with the value of Agency's Commission-furnished material used in the blending; (b) full custody to and responsibility for the blended product so debited to Agency's account shall be deemed to have been transferred to the Commission; and (c) Agency shall pay to the Commission the amount, if any, by which the value of the credited material exceeds the value of the debited material.

(B) If such written agreement has not been so received by the Commission, unless otherwise agreed to in writing by the Commission, lessees, and owners of privately owned uranium,

1. Agency shall be deemed to have acquired the material on its Agency account that was used in the blending and shall pay the Commission for the value of this material so acquired, and

2. Full custody to and responsibility for such material shall be deemed to have transferred from the Commission to Agency upon payment to the Commission of the amount due.

(3) In the case of blending of uranium subject to this Agreement with privately owned U-233 or uranium enriched in the isotope 233, Agency agrees either (A) to secure the Commission's written agreement in advance as to the terms and conditions under which such material may be blended or (B) to accept as conclusive and binding

the Commission's determination in writing as to the consequences of any such blending including the disposition of any blended product and amounts due the Commission and Agency.

(4) As used in subparagraph e. (2), the term "value" refers to value as of the date of completion of the blending. The feed components specified in subparagraph e. (2) (A) 2. shall be derived from the established Commission standard table of enriching services published from time to time by the Commission in the Federal Register and in effect as of the date of completion of blending.

(5) It is hereby agreed that Agency shall be responsible for handling any claims of third parties on account of rights alleged in or in connection with the source material or special nuclear material used in blending.

f. (1) Agency shall maintain and make available to the Commission for examination, upon reasonable notice, complete and adequate records pertaining to its receipt, possession, use, location, movement, and physical inventories of material subject to this Agreement. Such records shall fully reflect physical measurements, consumption, actual inventories, and the transactions relating thereto. Agency will submit such transfer documents and reports reflecting quantities of material received, physically present, consumed and transferred, with respect to material subject to this Agreement as the Commission may prescribe. Agency will make at least one physical inventory of material subject to this Agreement and in the custody of Agency during each twelve months' period of the Agreement and will insure that such inventories are also made of material subject to this Agreement but in the custody of others.

(2) Agency shall afford to the Commission, at all reasonable times, opportunity to inspect the material subject to this Agreement and the premises and facilities where such material is used or stored. Agency shall permit the Commission to perform such audit tests and inventory tests (which may include the taking of a reasonable number of samples for physical or chemical analyses but which does not include sampling and destructive testing of fabricated articles except as agreed to by Agency) as the Commission deems necessary for verification of the accuracy of any reports

submitted by Agency to the Commission. The Commisssion agrees to perform any inventory tests with respect to material subject to this Agreement so as to minimize interference to Agency's processing, delivery schedules, and third-party commitments regarding the material. Agency agrees that no charges for costs or value of any material samples, or for services or equipment, should such be furnished by Agency, provided in connection with the performance of audit tests and inventory tests, shall be made against the Commission; however, the Commission will allow full credit in Agency's account with the Commission for the value of the material included in the samples and the Commission will make no charge against Agency for reconversion of the material samples to standard form. In the event Agency should ship material subject to this Agreement to any other person, or cause such shipment of such material, Agency shall assure that the rights and privileges granted to the Commission under this paragraph shall not be affected by such shipment.

ARTICLE 5 - RETURN OF MATERIAL TO THE COMMISSION; SPECIAL CHARGES FOR COMMISSION SERVICES

a. Agency shall return all material subject to this agreement which has not been consumed upon the expiration or earlier termination of this Agreement, provided, however, that Agency shall have the right to return any such material at any time prior to such date.

b. Except as otherwise provided herein, material returned by Agency will be returned directly to the Commission in the standard form and in accordance with the Commission's established specifications for return of material in effect as of the date the material is returned.

c. Material subject to this Agreement transferred to a lessee of the Commission, regardless of the form or specification of such material, shall be deemed to have been returned to the Commission if such lessee, the Commission, and Agency have executed an order covering the material so transferred.

d. The Commission may at its sole discretion accept material in a form or specification other than as provided in b. above. In such cases, unless the Commission shall determine that acceptance of the material in its existing form is in the best interests of the Government, Agency shall pay a service charge for processing

such returned material so as to enable it to meet the standard form and to satisfy the Commission's established specifications in effect at the time the material is returned. Such charge shall include the Commission's charge for processing, as determined in accordance with the established Commission pricing policy in effect at the time the material is returned and an amount as determined by the Commission, for the value of the material consumed during such processing.

e. Material subject to this Agreement returned directly to the Commission in the form of uranium hexafluoride shall be shipped only in containers of appropriate size as specified by the Commission. The quantity of such material shipped in a container shall not be less than the Commission-established minimum loading for the type of container used.

f. All material returned directly to the Commission shall be delivered by Agency to the Commission facility or location specified by the Commission, f.o.b. commercial conveyance at such facility or location. Unless waived by the Commission, Agency shall give the Commission at least fifteen (15) days' written notice of intent to return material directly to the Commission. The Commission will notify Agency promptly after receipt of Agency's notice of intent to return material as to the Commission facility or location designated for return of the material. Agency, at the time of shipment of material, shall notify the Commission facility or other location to which shipment is made of the date and method of shipment, and expected date of arrival.

ARTICLE 6 - PAYMENT FOR MATERIAL CONSUMED

a. Except as otherwise provided herein, Agency shall be responsible for and shall reimburse the Commission for any consumption of material, whether or not such consumption is due to the fault or negligence of Agency or any other cause occurring from the time of delivery of such material to Agency and until such material has been returned to the Commission as provided herein.

b. Agency shall make reports to the Commission, on forms prescribed by the Commission, to accurately reflect all consumption of material as then known to Agency. In reporting material as consumed, Agency shall make reasonable effort to accurately fix the time of such consumption on the basis of a specific occurrence or in accordance with procedures and methods of calculating consumption accepted by the Commission.

c. Except as otherwise provided herein, the amount due the Commission for material consumed shall be the value of such material computed in accordance with this Agreement as of the time of such consumption. Agency may, and shall when required by the Commission, pay on a provisional basis for material consumed. Full custody to and responsibility for all consumed material, other than material the value of which has been reduced by alteration of its isotopic ratio, shall be deemed transferred from the Commission to Agency upon final payment to the Commission of the amount due.

ARTICLE 7 - OTHER AUTHORITY

Nothing in this Agreement shall be deemed to require Agency to pay the Commission's charges with respect to materials or services subject to this Agreement, or to observe other specific provisions of this Agreement, if the Commission, in accordance with statutory authority or other authority available to it, determines that such charges, or other provisions are not applicable.

ARTICLE 8 - ESTABLISHMENT OF SPECIAL NUCLEAR MATERIAL ACCOUNT

a. The Commission will establish a special nuclear material account for Agency to which will be debited, as provided herein, the amount or amounts equal to the value of the material subject to this Agreement. Such account will be credited, as provided herein, with the amount or amounts equal to the value of the material returned or paid for in accordance with this Agreement. The value of material reflected in this account after credit for the value of material returned and for payments for material consumed shall represent the amount due to the Commission for material not returned or paid for. In the event material paid for provisionally as having been consumed is later re-established in Agency's account, said account shall be debited as of the date of refund (or appropriate setoff) of such payment to Agency as provided in paragraph c. of Article 10 hereof, with the amount or amounts equal to the value of such material at the time of such re-establishment in Agency's account.

b. Except as otherwise provided in this Agreement, Agency's account will be debited for material furnished as of the date material is delivered to Agency, provided that in the case of leased material transferred directly from a lessee of the Commission, the debit will be made as of the effective date specified in the order executed by Agency, the lessee, and the Commission for such material. Except as otherwise agreed to by the Commission, such

effective date shall not precede the date of the Commission's execution of such order by more than 30 days and such date shall also be set forth in the applicable transfer document.

c. Agency's account will be credited for material returned to the Commission or transferred to a lessee only when material is returned or transferred in accordance with Article 5. Except as otherwise provided in this Agreement, Agency's account will be credited for material returned directly to the Commission as of the date the material is delivered to a location specified by the Commission pursuant to this Agreement. Credit for material transferred to a lessee will be made as of the effective date specified in the order executed by the lessee, the Commission, and Agency. Credit for material paid for will be made as of the date payment is received by the Commission.

d. Whenever the Commission changes any applicable base charge as provided in Article 9 below, the value of material recorded in Agency's account will be recomputed at the new base charge, provided, that the value of material consumed as of the effective date of such change shall not be recomputed. Subsequent to the effective date of the change in the applicable base charge, the new base charge will be used in determining the value of material consumed.

e. Agency will be promptly notified of the debits and credits made to its account as the result of shipments, consumption, or transfers of material, and of any changes in the value of material in such account as the result of changes in the applicable base charges. Agency will promptly notify the Commission of any disagreement with, or alleged discrepancies, or errors in such notices.

ARTICLE 9 - CHANGES IN BASE CHARGES AND SPECIFICATIONS

a. The base charges, standard form, and specifications for material furnished pursuant to this Agreement are subject to change by the Commission in accordance with the Act.

b. Any increase in base charges or any changes in the standard form or in the Commission's established specifications shall require at least 180 days' notice to Agency by publication or otherwise.

ARTICLE 10 - PERFORMANCE OF AEC OBLIGATIONS - BILLING

a. The Commission may fulfill its obligations under this Agreement through the operator of any of its facilities. No such operator is authorized to modify the terms of this Agreement, waive any requirement thereof, or settle any claim or dispute arising hereunder.

b. Billings for amounts due the Commission under the Agreement will ordinarily be made

(1) following the performance of any service, and

(2) semiannually for consumption of material.

c. All billings and payments made on a provisional basis are subject to adjustment to recognize actual or calculated amounts, enrichment, isotopic content, and specifications of material involved. Whenever Agency has provisionally paid for material reported as having been consumed and such material is later re-established in Agency's account, the Commission shall refund to Agency (or appropriately setoff against any amounts due the Commission) the amount paid by Agency for such material. The adjustments provided for in this paragraph will not subject Agency or the Commission to liability for interest.

d. All bills rendered by or on behalf of the Commission are due 30 days from the date of invoice.

ARTICLE 11 - TIME OF DELIVERY

The Commission will make reasonable efforts to deliver material at the time or times stated in orders for material subject to this Agreement.

ARTICLE 12 - DELIVERY - F.O.B. POINT

a. Material furnished directly from a Commission facility will be shipped f.o.b. Agency's vehicle or commercial conveyance at such Commission facility. Delivery of material or containers to Agency or its designee or to a carrier for the account of Agency or its designee shall be deemed delivery of such material or containers to Agency for the purposes of this Agreement.

b. Unless Agency furnishes a prepared bill of lading, all shipments by the Commission will be made collect on a commercial bill of lading to be converted at destination.

c. When agency obtains material from a lessee of the Commission pursuant to this Agreement, the Commission shall not be responsible for costs of packaging, shipment, and handling.

ARTICLE 13 - CONTAINERS AND EQUIPMENT -

a. All shipments of material from the Commission to Agency, and from Agency to the Commission, will be made in Agency-furnished containers; provided, however, that in the event the Commission determines that the required containers are not reasonably available from commercial sources, the Commission may furnish Commission-owned containers if such are available. Any Commission-owned containers to be used for shipment of material will be made available to Agency, f.o.b. Agency's vehicle or commercial conveyance, at a Commission facility designated by the Commission, unless otherwise agreed. Agency-furnished containers and equipment shall be delivered to a Commission facility designated by the Commission within a reasonable time specified by the Commission prior to the scheduled delivery of materials to be shipped to Agency in such containers and equipment. Agency-furnished containers or equipment will be used by the Commission only for the shipment of material from the Commission to Agency and for temporary storage of material shipped therein.

b. All containers and equipment, whether Commission-owned or Agency-furnished, must meet Commission regulations, specifications, and practices as to safety, design criteria, cleanliness, and freedom from contamination in effect at the time furnished, utilized, or returned, of which the Commission shall be the sole judge. In the event material is returned by Agency to the Commission in non-Commission-owned containers and other material is to be delivered to Agency, the Commission shall utilize to the extent practicable such non-Commission-owned containers for shipments of material if so desired by Agency. The Commission will promptly return to Agency non-Commission-owned containers and other equipment identified as "Returnable," but will not be responsible for any loss of or damage to such containers or equipment except as may result from its fault or negligence. Such return shipments by the Commission will be made f.o.b. Agency's vehicle or commercial conveyance at the Commission facility to which they were shipped.

c. Agency shall pay such rental charge, for such containers and equipment, as shall be established by the Commission for general application to users of such Commission-owned property. Agency will promptly return Commission-owned containers and equipment to the Commission facility from which received, f.o.b. Agency's vehicle or commercial conveyance at the Commission facility. Agency will not be responsible for any loss or damage to Commission-owned containers or equipment except as may result from the fault or negligence of Agency, its contractors, or agents. Commission-owned containers or equipment will be used only for shipment of material to and from the Commission and for temporary storage of material shipped therein.

d. Whenever material or containers are shipped to the Commission or Commission-owned containers are returned to the Commission, and the Commission elects to decontaminate the containers, railroad cars, trucks, or other shipping vehicles or the Commission's unloading area and machinery, because the containers, or the material or the method of shipment failed to meet the health and safety standards prescribed by the Commission or any other Federal or State agencies having jurisdiction over such matters, Agency shall pay the Commission the full cost of such decontamination as determined by the Commission in accordance with established Commission pricing policy. Any residual quantities of material in containers or equipment returned to the Commission will be deemed to have been consumed by Agency, and Agency shall pay for such material in accordance with this Agreement.

ARTICLE 14 - DETERMINATION OF MATERIAL QUANTITIES AND PROPERTIES

a. The Commission will furnish Agency a statement of the quantities and properties, including a statement of the weight of the material subject to this Agreement which is received by Agency directly from a Commission facility or returned directly to a Commission facility. The following provisions and procedures shall apply to the determination of the quantities and properties, including weight of the material:

1. Commission samples obtained at a Commission facility using the Commission's procedures will be binding upon the Commission and Agency unless the Commission and Agency agree upon the use of other samples, procedures or sampling locations.

2. The weight of the material will be determined prior to delivery of Agency or acceptance of delivery by the Commission, as the case may be, at a Commission facility using the Commission's procedures and facilities. The weight of the material determined by the result of such procedures shall be binding upon the Commission and Agency, unless the Commission and Agency agree upon other procedures or facilities.

b. Agency may, upon request to the Commission, observe the weighing of the material and the taking of samples by the Commission. The dates and places for the weighing and sampling will be established by the Commission and communicated to Agency upon receipt of Agency's request.

ARTICLE 15 - TRANSFER OF MATERIAL

Transfer of material by Agency to a lessee with the approval of the Commission as provided in this Agreement shall not have the effect of relieving Agency of any obligation hereunder, except as to return of or payment for material so transferred.

ARTICLE 16 - OTHER CONTRACTS AND AGREEMENTS

This Agreement contemplates the possibility of separate agreements between Agency and the Commission with respect to materials which are subject to this Agreement, which may provide for suspension, termination, or revision of matters hereunder; and for reimbursement of charges incurred pursuant to this Agreement. Except as provided in such agreements, Agency's obligations under this Agreement for material subject to this Agreement shall continue notwithstanding the existence of such separate agreement or agreements.

ARTICLE 17 - NOTICES

a. Any notices required by this Agreement of Agency shall be submitted in writing to the Commission addressed to:

AEC Materials Leasing Officer
Oak Ridge Operations Office
United States Atomic Energy Commission
Post Office Box E
Oak Ridge, TN. 37830

b. Any notices required by this Agreement of the Commission shall be submitted in writing to Agency addressed to:

Commandant, US Army Chemical Center and School

ATTN: Chief, Health Physics Division

Fort McClellan, AL 36201

IN WITNESS WHEREOF, the parties hereto have executed this Interagency Agreement the day and year first above written.

US Army Chemical Center and School
Agency

BY: R. C. ARBUCKLE, Colonel, CmlC

TITLE: Assistant Commandant

THE UNITED STATES ATOMIC ENERGY COMMISSION

BY:
AEC Materials Leasing Officer

H. J. MCALDUFF, JR.

Mayfield, W.G.
1963 Letter to Engineered Equipment Corporation, 8 February 1963. U.S. Army Chemical School, Fort McClellan, Alabama.

SALSU-PP/FJS

8 February 1963

Engineered Equipment Corp.
1207 East 23rd Street
Chattanooga, Tennessee

Gentlemen:

Reference is made to paragraph 7a of our request for proposals covering Cobalt "60" Source Wall Actuators for Fort McClellan, Alabama.

Radioactive source capsules will be installed in all models no later than 18 February 1963 for the 12 week accelerated test.

Installation and all necessary adjustments and modifications on your model must be completed by 18 February 1963.

Sincerely yours,

W. G. MAYFIELD
Chief, Supply Division

Copy:
Major Speer, Ft. McClellan, Ala.
Mr. Todt, Ft. McClellan, Ala.
Mr. Collier, Engrg. Div.
Mr. Grandy, Engrg. Div.
Mr. Blankenship, Engrg. Div.

Morgan, G.W. **(Appendix D-Licenses Listing)**
1958 Byproduct Material License No. 01-02861-01, 21 October 1957. U.S. Army Chemical School, Fort McClellan, Alabama.

U. S. ATOMIC ENERGY COMMISSION

BYPRODUCT MATERIAL LICENSE

This Copy is For Your Files

Pursuant to the Atomic Energy Act of 1954 and Title 10, Code of Federal Regulations, Chapter I, Part 30, Licensing of Byproduct Material, and in reliance on statements and representations heretofore made by the licensee, a license is hereby issued authorizing the licensee to receive, acquire, own, possess, transfer and import byproduct material listed below; and to use such byproduct material for the purpose (s) and at the place (s) designated below. This license shall be deemed to contain the conditions specified in Section 183 of the Atomic Energy Act of 1954, and is subject to all applicable rules, regulations, and orders of the Atomic Energy Commission now or hereafter in effect and to any conditions specified below.

Licensee	
1. Name	Department of the Army
2. Address	U. S. Army Chemical Corps School Fort McClellan, Alabama

Amended in its entirety - see Amendment #2, 2 Dec 58

3. License number: 1-2861-1

4. Expiration date: October 31, 1958

5. Reference No.:

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
A. Polonium 210	A. Gold Foil	A. 100 millicuries
(See page 2)	(See page 2)	(See page 2)

9. Authorized use

A. RESEARCH AND DEVELOPMENT as defined in Section 11(q) of the Atomic Energy Act of 1954 and application dated April 10, 1957 and related correspondence.

(See page 2)

CONDITIONS

10. Unless otherwise specified, the authorized place of use is the licensee's address stated in Item 2 above.

11. Byproduct materials are to be used by, or under the supervision of, individuals designated by the radioisotopes committee; Colonel C. H. Wood, Chairman.

12. Byproduct materials as sealed sources may be transported to and used at military installations as designated by the licensee and under the control of the radioisotope committee, U. S. Army Chemical Corps School, Fort McClellan, Alabama.

13. Byproduct material shall not be used in:
A. or on human beings;
B. products distributed to the public.

14. Leak testing of sealed sources containing beta and/or gamma-emitting byproduct material (except those containing Iridium 192, Tantalum 182, and Gold 196 in discrete metallic form) shall be carried out at intervals of six months and records of the leak test results shall be furnished the Atomic Energy Commission upon request.

(See page 3)

For the U. S. Atomic Energy Commission

Date October 21, 1957

by F. W. Morgan

Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

Encl 1-1

6. Byproduct material (element and mass number)	7. Chemical and/or physical form	8. Maximum amount of radioactivity which licensee may possess at any one time
B. Any byproduct material between Atomic Nos. 3 and 83, inclusive	B. Any	B. 100 millicuries of each byproduct material between Atomic Nos. 3 and 83, inclusive, with the following exceptions: See Amendment #1
Strontium 90	Sealed Sources	No source to exceed 5 millicuries: Total ~~100~~ 535 millicuries
Cesium 137	Sealed Sources	20,000 millicuries
Cobalt 60	Any	6,000,000 millicuries
Antimony 122	Any	500 millicuries
Bromine 82	Any	300 millicuries
Chromium 51	Any	200 millicuries
Copper 64	Any	500 millicuries
Gold 198	Any	3,000 millicuries
Iodine 131	Any	300 millicuries
Iridium 194	Any	300 millicuries
Mercury 197	Any	4,500 millicuries
Mercury 203	Any	600 millicuries
Osmium 191	Any	300 millicuries
Palladium 109	Any	3,000 millicuries
Phosphorous 32	Any	1,000 millicuries
Potassium 42	Any	400 millicuries
Rhenium 186	Any	250 millicuries
Rubidium 86	Any	350 millicuries
Selenium 75	Any	300 millicuries
Cross Fission Products	Any	50 millicuries

9. Authorized use

B. RESEARCH AND DEVELOPMENT as defined in Section 11(q) of the Atomic Energy Act of 1954 and application dated April 10, 1957 and related correspondence.

For the U. S. Atomic Energy Commission

Date October 21, 1957

by J. W. Morgan
Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

Encl 1-2

CONDITIONS (continued)

15. Leak testing of sealed sources containing alpha-emitting byproduct material shall be carried out at intervals of three months and records of leak test results shall be furnished the Atomic Energy Commission upon request.

16. Written administrative instructions covering appropriate radiological protection phases of operational procedures and establishing responsibility for radiological protection, control, and security of the byproduct material shall be supplied individuals using or having responsibility for use of such material.

17. A curie of Ir-192 is defined as that quantity of activity which presents a radiation intensity of 0.55 roentgens per hour at a meter.

18. Each sealed source container (capsule) of licensed material to be used outside of a shielded exposure device or within a restricted field shall be labelled or have permanently attached to it a durable, legible, and visible tag. The label or tag shall be attached directly to the container (capsule), or by the use of a durable chain or leader. The label or tag shall be at least one square inch in area and shall bear a radiation caution symbol in conventional colors, magenta or purple on a yellow background, and a minimum of the following instructions: "Danger - Radioactive Material - Do Not Handle - Notify Military Authorities if Found."

19. Notwithstanding Section 20.203(c)(2), Pelham Range Area need not be equipped with a control device referred to in this section.

20. Statements and representations contained in the following documents submitted by the licensee are incorporated by reference as conditions of this license:

A. Application (Forms AEC-313 and 313b) and enclosures thereto dated January 29, 1957 signed by Colonel C. H. Wood, Chairman, Isotopes Committee.

B. Memorandum No. 5, and Operational Directives No. 1 through No. 9, dated October 9, 1957 concerning radiological safety procedures.

C. Pelham Range radiation area shall be secured by a fence as described in specifications furnished the AEC Representatives on October 5, 1957. Such a fence shall be six feet high (four feet hog wire topped by at least three strands of barbed wire). Further control of access to this range shall be provided by patrol road adjacent to fence. Entrance to area shall be through two gates, both of which are secured against unauthorized entry by padlock or military guard.

End of License

For the U. S. Atomic Energy Commission

Date October 21, 1957

by H. W. Morgan

Director, Isotopes Extension
Division of Civilian Application
Oak Ridge, Tennessee

Encl 1-3

Powell, William G., Second Lieutenant, CmlC
1955 Letter to Isotope Committee, Pelham Range Radiological Survey Area, 4 February 1955. Health Physics Group, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama.

FOR [redacted] ONLY

HEALTH PHYSICS GROUP
THE CHEMICAL CORPS SCHOOL
CHEMICAL CORPS TRAINING COMMAND
FORT McCLELLAN, ALABAMA

4 February 1955

SUBJECT: Pelham Range Radiological Survey Area

TO: Isotope Committee
The Chemical Corps School
Fort McClellan, Alabama

1. Project: To construct a larger and more realistic radiological survey training area at Pelham Range.

2. Work Completed:

a. Approximately 60 source wells have been completed by Training Aids Branch.

b. A shipment of 500 curies of Cobalt-60 was received on 24 December 1954. The cobalt was sealed in 5 shipping capsules.

c. On 3 January 1955 one of the five shipping capsules was emptied, and the contents were encapsulated in 30 source capsules of 2 - 4 curies each. The First Radiological Safety Support Unit supported this operation. Two of the remaining four shipping capsules were placed in the storage well of the radioactive materials vault. The other two shipping capsules were buried in six foot pipes at the School burial ground.

3. Work Pending:

a. Approximately 130 source wells are awaiting hinges and hasps in order to be completed by Training Aids Branch.

b. Four shipping capsules of the cobalt remain to be emptied. The source capsules required are either on hand or are being constructed by Training Aids Branch.

c. 105 holes to accomodate the source wells are to be drilled by Post Signal as soon as their mechanical auger is repaired.

FOR [redacted]

[redacted]

Subject: Pelham Range Radiological Survey Area

d. Engineer support for towing 10 tanks to the new area is still pending. A follow-up has been made.

e. A fence to enclose the new area is being requisitioned.

William G. Powell

William G. Powell
2d Lt, CmlC

[redacted]

Radiological Defense Laboratories

1952 Introduction to Laboratory Procedures, Section I, ST 3-168, The Chemical Corps School, Chemical Corps Training Command, Fort McClellan, Alabama, October 1952,. Record Group 175, Box 1, Entry; U.S. Army Schools National Archives II, College Park, Maryland.

SECTION I

ST 3-168

Student No._____

RADIOLOGICAL DEFENSE LABORATORIES

INTRODUCTION TO LABORATORY PROCEDURES

INSTRUCTOR_____

THE CHEMICAL CORPS SCHOOL
CHEMICAL CORPS TRAINING COMMAND
FORT McCLELLAN, ALABAMA
OCTOBER 1952

INTRODUCTION TO LABORATORY PROCEDURES

I. INTRODUCTION

The purpose of this pamphlet is to give the student information regarding the procedures which are used when practical exercises are conducted in the Radiological Laboratories.

These exercises are designed to give the student practice in the application of the methods and procedures used in measuring radiations produced by radioactive materials, in the determination of the shielding effects of various common materials on these radiations, and in the operation of instruments which are used to measure radiations. These instruments are called RADIAC instruments. RADIAC is an abbreviation for Radioactivity Detection, Identification and Computation.

II. THE RADIOLOGICAL LABORATORIES

A. Location

The Radiological Laboratories are located in Post Area No. 8 approximately one mile northeast of the main school building, Building 144. The Laboratories consist of five buildings: Bldg. No's T-810, T-811, T-812, T-836, T-836A, and a concrete vault for the storage of radioactive materials, primarily Radium and Cobalt-60, used as standards in RADIAC instrument calibration. The

buildings are labeled as laboratories A,B,C,D, and E.

B. Description and Use

The laboratory buildings consist of classrooms or briefing rooms, laboratories for calibrating RADIAC instruments, instrument maintenance shop, and storage areas for instruments and radioactive materials. For identification purposes, each of the briefing rooms is named after some scientist whose work was instrumental in the development of atomic energy.

Laboratory A, Bldg. T-836 (See figure 1) is the main laboratory building. Located in this building are storage areas for all RADIAC instruments, the instrument maintenance shop, main supply room, the office of the Laboratory Director, and one briefing room. This briefing room is called the Geiger Room and is located on the second floor of the building. All instruments which are used during a laboratory exercise are issued to the students in this building.

Laboratory B, Bldg. T-836A (See figure 1) contains three briefing rooms, the Curie and Rutherford Rooms on the first floor and the Becquerel Room on the second floor. The office of the Health Physics Group (See section IV) and a room for the storage and preparation of radioactive isotopes are located in this building also. The Becquerel Room is also used as a control center for the radiological monitoring exercises.

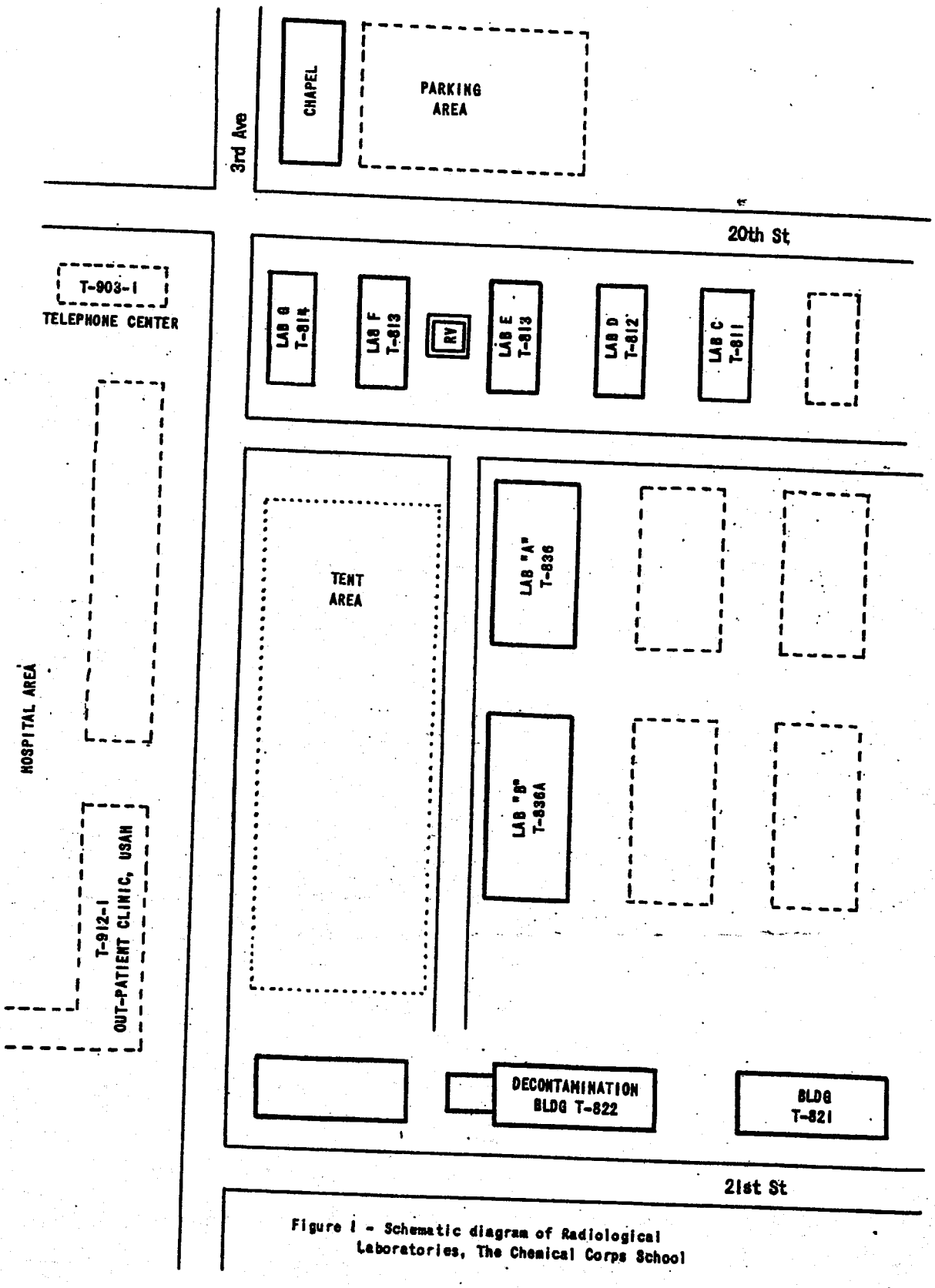


Figure 1 - Schematic diagram of Radiological Laboratories, The Chemical Corps School

Laboratories C, D, and E, Bldgs. T-810, T-811 and T-812, respectively, are used as calibration laboratories for RADIAC instruments.

C. Facilities

The facilities in the laboratory are limited due to a more or less temporary arrangement of the laboratories in temporary buildings. None of the buildings used as laboratories contain latrines. Male personnel make use of the latrine and wash room facilities in Bldg. T-821 located approximately 100 yards southeast of laboratory B (See figure 1). Restrooms are available to female personnel in Building T-913-1, Out-Patient Clinic USAH, in the hospital area across 3rd Avenue from the laboratory area (See figure 1).

There are water fountains located in Laboratories A and B and a soft-drink dispenser located on the first floor of Laboratory A. NOTE: Soft-drink bottles will not be carried from the first floor of Laboratory A. (See Section IV).

Government transportation is furnished all students from the main School Building, Bldg. 144, to the Radiological Laboratories and return for all exercises conducted in the laboratory area. Vehicles will be standing by at the school to transport the students to the laboratory area at the end of the class period prior to the exercise period. Students will board the vehicles immediately following the class period.

D. Personnel

The Radiological Laboratories are operated by personnel assigned to the Radiological Defense Section, Technical Instruction Branch, The Chemical Corps School. Military personnel include a Laboratory Director, Property Officer, officer and enlisted instructors, and a Health Physics Group which is responsible for radiation safety measures in the laboratory area. The Laboratory instrument maintenance shop is operated by civilian technicians. Figure 2 shows the personnel organization of the Radiological Laboratories.

III. THE LABORATORY EXERCISE

A. General Information

The number of laboratory exercises given in the program of instruction varies depending upon the particular course or sub-course taught at the School. The time allotted for an exercise varies also from one exercise to another.

There are no break periods officially scheduled for the laboratory exercises which are more than one hour in length. This is due to the variation in the time required to complete any one phase of the exercise. Students are allowed to take their breaks whenever they choose after the briefing on the exercise has been completed.

RAD LABS - PERSONNEL ORGANIZATION CHART

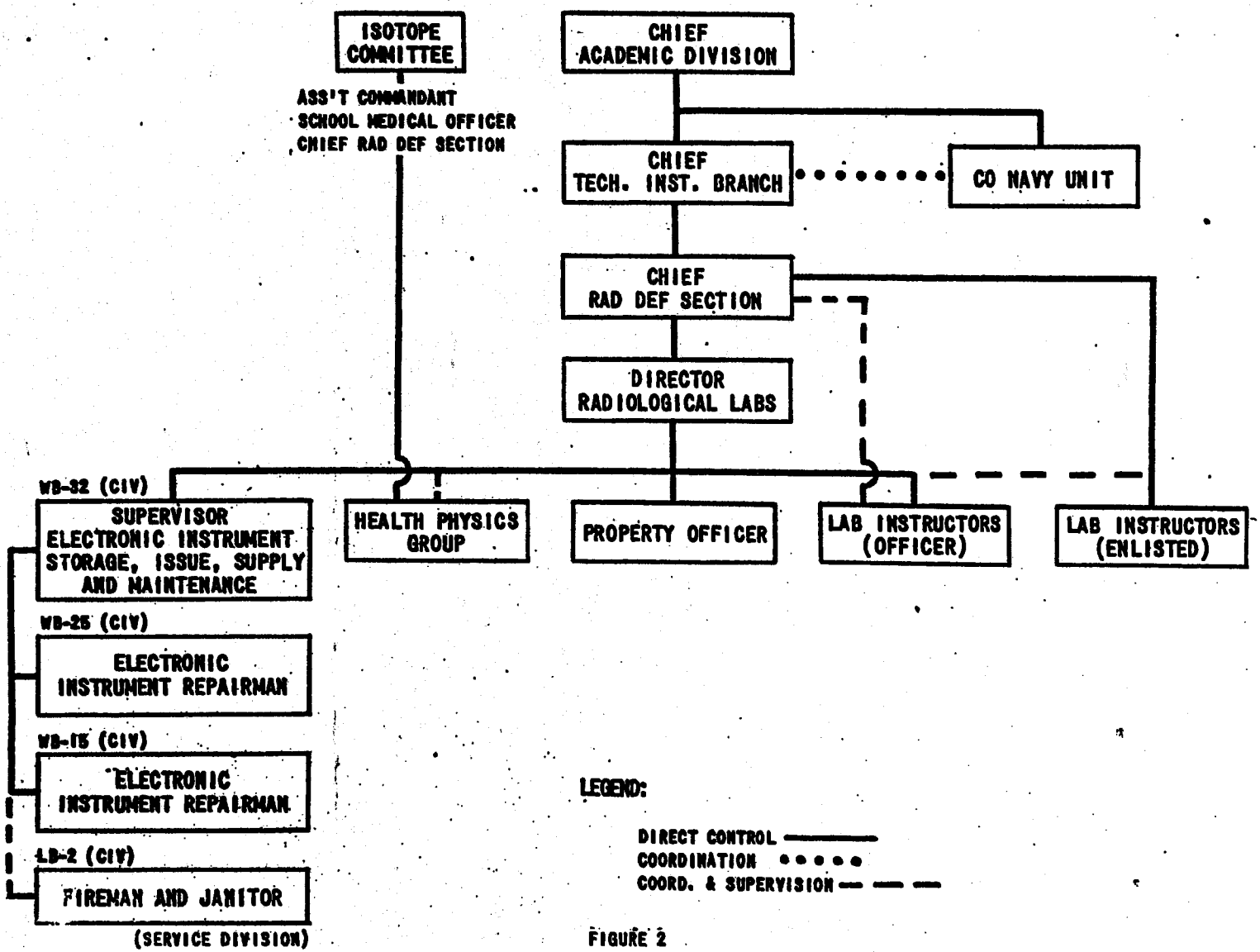


FIGURE 2

B. The Exercise Pamphlet

Pamphlets have been prepared for each exercise given in the laboratory. These pamphlets serve as an advance sheet for study prior to the conduction of the exercise, a guide, work sheet and notebook during the exercise and as a future reference for the student. The exercise pamphlets are listed as sections of the RADIAC Instruments Laboratory Manual, The Chemical Corps School, Special Text 3-168 (Revised). All data taken and results obtained from the exercise are placed in the pamphlet and turned in for grading at the end of the exercise period. Upon completion of grading, the exercise pamphlets are returned to the student for retention.

The work done by the student in the pamphlet must be neat and orderly. Data and results may be entered either in ink or pencil. No erasures are permitted in the pamphlet. When an error is discovered, corrections will be made by drawing a single horizontal line through the erroneous entry and placing the correction either above or below it. Failure to comply with these procedures may result in loss of points when the exercise is graded.

Each exercise pamphlet is divided into sections. Listed below are the sections in the order in which they appear in a pamphlet:

Section 1: Object of the exercise.

Section 2: Materials used in the exercise.

Section 3: Brief theory.

Section 4: Description and operation of equipment.

Section 5: Laboratory procedure.

Section 6: Calculations.

Section 7: Data.

Section 8: Results.

Section 9: Questions.

The exercise pamphlet cover sheet contains the following information: Laboratory exercise number, title of the exercise and the number of grade points allotted to the exercise. Identified blank spaces are provided for the student number, title and number of the course which student is attending, and date exercise is completed. Students are responsible for filling in these blank spaces prior to turning in the exercise for pamphlet. Two other identified blank spaces, the grade (point score) made by the student on the exercise and the instructor's initials, appear on the cover sheet. These blanks are filled in by the instructor.

1. Object

This is a one or two sentence paragraph stating the purpose of the exercise and/or the objective to be attained in the performance of the exercise.

2. Materials

All the materials listed in this section are furnished the student at the laboratory for the purpose of completing the exercise, or for radiological safety. Other materials needed but not issued at the laboratory include pencils or pen, straight edge, Handbook for Radiological Defense Sub-courses, (RDS-1B, issued to the student at the beginning of the course) and a slide rule, if available. Students are responsible for having these items in their possession for each exercise. (Students attending certain courses are issued slide rules for use while attending that particular course.)

3. Brief Theory

As the title implies, this section consists of a brief presentation of the theory of the instrument and/or concept on which the applicatory exercise is based. This is more or less a review of the main points of the theory which are presented in the classroom. Included in this section are references in which more details on the theory may be obtained.

4. Description and Operation of Equipment

This section includes a description of the instruments and equipment used in the exercise along with photographs and diagrams. Certain important features and operating controls are labeled on the

photographs and diagrams to assist the student in learning the operation of the instruments. Standing operating procedures for the operation are also included. RADIAC instruments are sensitive, delicate and costly. They must be handled with care. Personnel should be familiar with the operation of instruments before attempting to use them. Students are expected to familiarize themselves with the standing operating procedure presented in the exercise pamphlet for the operation of instruments to be used in any exercise prior to the time the exercise is conducted. No adjustments will be made by students on any RADIAC Instrument issued in the laboratory until they are instructed to do so by the instructor in charge of that particular exercise.

5. Laboratory Procedure

This section describes the procedure used to complete the exercise. The description includes the method(s) used to: procure the necessary data, make the proper calculations, and state the results obtained. All mathematical formulas which are used in the exercise are included in this section. Students are expected to study this procedure prior to the beginning of the exercise so that they understand how the exercise is performed. <u>For each exercise conducted in the laboratory the students should be prepared to take a short quiz covering the sections: brief theory, description and operation of equipment, and laboratory procedure of the exercise.</u>

6. Data

The data sheet has been constructed and arranged in such a manner that the necessary information can be tabulated neatly and conveniently by the student, can be easily interpreted by both student and instructor, and will make a handy, well organized future reference. However, for this to be true the data must be taken in accordance with the instructions set forth in the laboratory procedure section and those given by the instructor at the briefing. All measurements should be made as accurately as possible. Wherever applicable, the units used in the measurements must be shown in the appropriate place on the data sheet.

Since the transposing of data from one sheet to another creates an additional source of error, all data taken in the laboratory must be recorded on the data sheet as it is taken. The use of scratch paper to record data is not permitted.

7. Calculations.

The calculation section is provided to show how the mathematical formulas are used in the exercise. The approved procedure for the use of this section is as follows: State each formula used in the exercise clearly and show all units of measurement where applicable. Make one sample calculation using each formula by substituting, in the appropriate place, data taken in the laboratory. Show each step required to make the proper calculation.

Only one sample calculation of each formula will appear in the calculation section. Other calculations may be made in spaces provided for rough calculations and student notes.

8. Results

The results obtained from the laboratory exercise will depend among other things on the accuracy used in obtaining the data and making the calculations. In several of the exercises, the results are obtained using mathematical solution, while in others the graphical solution is used. In a few cases both methods are used.

All results using the mathematical solution must be shown with the proper units in which the results are expressed.

When the results are obtained by the graphical solution, care must be taken to insure complete identification of the graph. A graph is an expression of the results obtained using one particular set of data and is of little value unless it is identified as such. For complete identification the following features of the graph must be properly labeled (See figure 3):

a. There must be a title indicating what has been done on the graph. Examples:

(1) Graph showing time (years) vs. Radiation Intensity (mr/hr) for the radio-isotope Co^{60} using the "half-life" formula $I = I_o e^{-\lambda t}$.

CALIBRATION CURVE FOR THE IONIZATION CHAMBER TYPE SURVEY METER

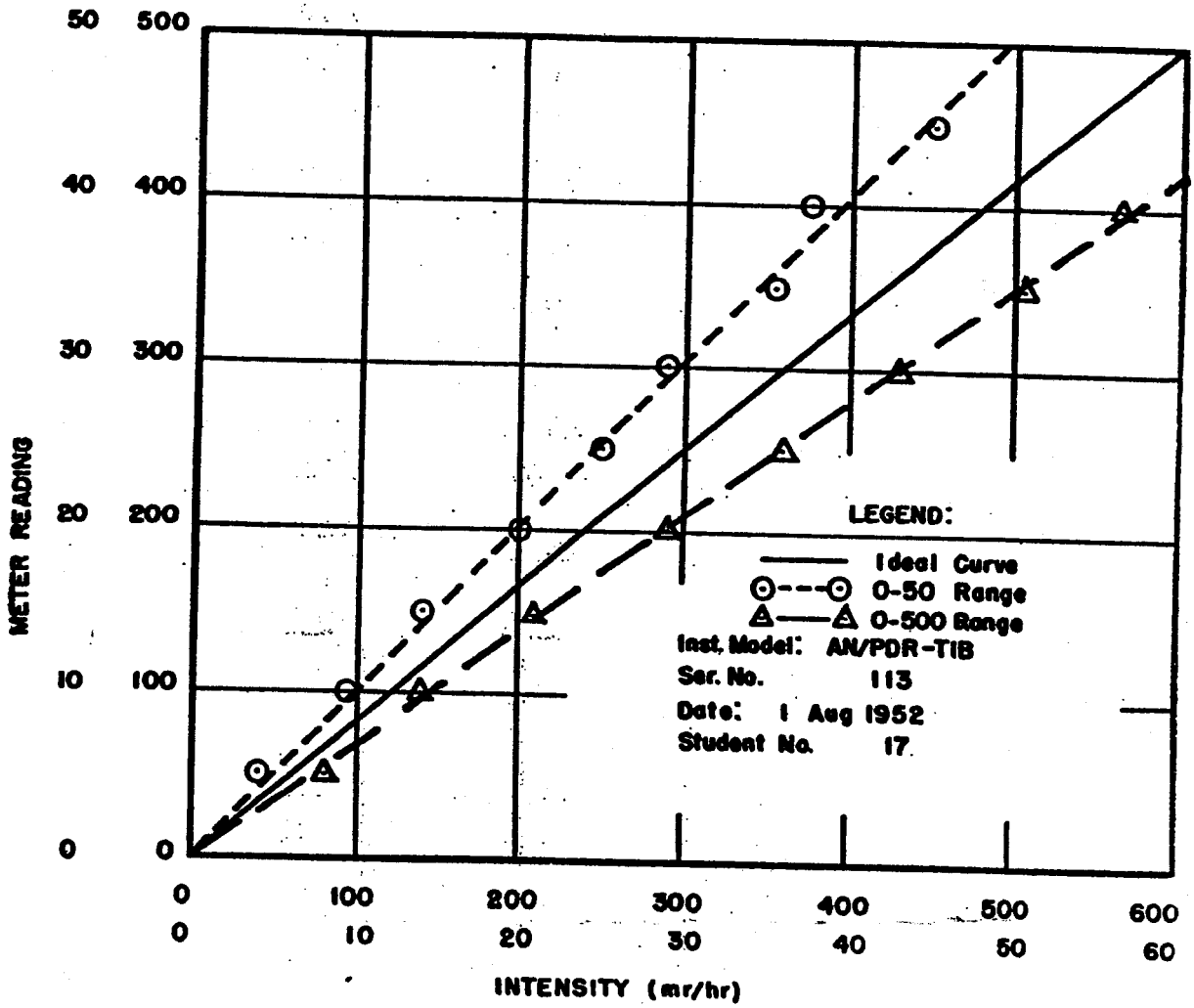


Figure 3 - Sample Calibration Curve

(2) Calibration curve for a Geiger-Mueller Type Survey Meter showing intensity (mr/hr) vs. meter reading (scale units).

b. The axes of the graph must be properly labeled showing the correct values and proper units in which the values are expressed. Examples:

(1) Time (days).

(2) Thickness of material (inches).

If more than one set of values and/or units is used on the axes, each set must be specifically indentified.

c. Points for each set of values plotted on the graph and curves produced by these points must be identified.

d. The following additional information must appear on the graph in the form of a legend:

(1) Identification of all curves.

(2) Type(s) of equipment used.

(3) Model(s) of the equipment used.

(4) Serial number of the particular equipment used.

(5) Date graph was prepared.

(6) Identification of person preparing the graph.

NOTE: In the laboratory the assigned student number is always used for identification purposes.

9. Questions

The questions are placed in the last section of the exercise to emphasize the main points of the

exercise and to permit the student to make use of the information obtained during the exercise. This section serves more or less as a summary or critique.

It is recommended that the students study the questions in this section and try to answer as many as possible prior to the exercise period.

C. Briefing for Exercise

A short portion of the exercise period is devoted to a briefing on the exercise procedures by the instructor. The students should be seated in the briefing room before the scheduled time for the exercise period to begin so that the briefing can start on time.

In the briefing the instructor reviews the main points of the theory involved in the exercise, explains the use of all mathematical formulas applicable to the exercise, displays and/or describes the instruments and equipment used in the exercise, instructs the class in the correct procedures for operating the instruments by going through the standing operating procedure step by step, reviews the procedures given in the Laboratory Procedure section of the exercise pamphlet, gives the class any additional information or procedures necessary for the conduct of the exercise, and answers any questions the students may have regarding the exercise.

D. Completing the Exercise

There is sufficient time allotted to each

exercise to allow the student to finish, provided some study of the exercise pamphlet is made prior to time of exercise, and consequently, the student has some understanding of the procedures to be followed.

Students are required to turn in the exercise pamphlet at the end of the exercise period, except under certain circumstances in which the student has a valid excuse for not being able to complete the exercise on time. In this case, the student must get the instructor's permission to turn in the exercise pamphlet late. The instructor will initial the exercise pamphlet to verify that permission has been granted.

There are racks containing numbered slots located in laboratories A and B which are used to store the completed exercise pamphlets. Upon completion of the exercise the student will place the exercise pamphlet in the slot bearing his student number. Students are <u>not</u> required to remain in the laboratory until the exercise period is over if they finish the exercise before such time. However, any student completing the exercise before the end of the period should report to the instructor before filing his exercise pamphlet in the rack. The instructor checks the racks at the end of the period to see that all exercise pamphlets are present or accounted for.

E. Grading

Each of the exercises have been assigned a number of points for grading purposes. The number of points allotted to any particular exercise is shown in the space provided on the cover sheet of the exercise pamphlet. When the exercise is graded, the number of points missed is subtracted from the maximum possible score and recorded by the instructor in the space provided on the cover sheet.

The total number of points made by the student on the exercises and the total possible points are forwarded to the Research & Analysis Section of the School, where they are averaged with the scores from examinations, training plans, etc.

The percentage of the final grade allotted to the laboratory exercises varies depending upon the particular course or sub-course. The instructor will inform your class of the relative value of the laboratory phase for your sub-course.

Students in the Chemical Officers Advanced Course, Atomic Defense Officers Course, Radiological Defense Officers (Res Comp) Course, and Navy Indoctrination Course are given a final laboratory examination. This is a practical examination covering all the material given in the laboratory exercises. The scores made on the examination are added in with those from the laboratory exercises to obtain the final laboratory grade.

IV. RADIATION SAFETY PRECAUTIONS

A. Radiation Hazards

To properly train personnel in the use and operation of RADIAC Instruments, radioactive materials are used in many of the exercises conducted in the Radiological Laboratories. Radium and Cobalt are used for the calibration of RADIAC Instruments. Various beta, gamma, and beta-gamma emitting radio-isotopes are used to teach the student methods and procedures for determining or identifying a particular radio-isotope.

There is a health hazard involved when these radioactive materials are used. Safety measures have been prescribed so that these hazards may be reduced to what is thought to be a safe limit. An organization has been set up to insure that these safety measures are carried out. This organization is known as the Health Physics Group.

B. Safety Procedures

1. The fundamental purposes for radiation safety measures are:

a. To prevent ingestion, inhalation, or other mode of entry of radio-isotopes into the body.

b. To maintain the amount of external exposure to ionizing radiations below permissible limits.

2. The prescribed radiation safety precautions used at The Chemical Corps School include the following:

a. Personnel will wear film badges and pocket dosimeters for all laboratory periods. Students are issued one film badge and two pocket dosimeters for use during each laboratory exercise. These instruments are issued to the students on the first floor of Laboratory A. The student is responsible for reading the pocket dosimeters each time they are used and recording the exposure value on an exposure sheet which is provided by the Health Physics Group. Film badges and pocket dosimeters will not be removed from the laboratories. Records of radiation exposures are made for all personnel who are exposed to radiations at the school. These records are kept on permanent file in the office of the Health Physics Group.

b. No smoking, drinking or eating at any time is permitted in the presence of radioactive materials. Areas in the laboratories in which these safety precautions are enforced include the calibration laboratories, laboratories C, D, and E, and that portion of the second floor in laboratory A used for the determination or identification of unknown radioisotopes.

c. Hands will be washed prior to each departure from the laboratory when alpha and/or beta emitters have been used. Use wash basins on the second floor of Laboratory A for this purpose.

REPRODUCED AT THE NATIONAL ARCHIVES

d. Radioactive materials used for the calibration of RADIAC Instruments will not be handled or tampered with in any way by unauthorized personnel.

Rosell, Fred E., Jr., Major and Egan, Daniel J., Specialist 4
1960 Article, The U.S. Army Chemical Corps Radiological Unit, U.S. Army Chemical Corps Training Command. *Armed Forces Chemical Journal,* January -February 1960. (Edgewood, Maryland).

12 FEB 1960

14 EDGEWOOD

ARMED FORCES CHEMICAL JOURNAL

JANUARY-FEBRUARY 1960

THE U. S. ARMY CHEMICAL CORPS RADIOLOGICAL UNIT

An Army Approach to the Problem of Protection Against Radiation

Soldiers of Ft. McClellan Unit, wearing protective clothing and masks, operate radiac instruments in training exercise to determine the amount of radioactivity, if any, contained in their clothing and equipment following exposure.

By MAJOR FRED E. ROSELL, JR., AND SP4 DANIEL J. EGAN
U.S. Army Chemical Corps Training Command

DURING the field testing of nuclear devices, the protection of personnel against radioactivity is a major undertaking. To cope with the many safety requirements imposed by this activity and to provide systematic protection for personnel and equipment against radioactive contamination during field testing, the U.S. Army Chemical Corps organized in 1953 the U.S. Army First Radiological Safety Support Unit. This unit, which was recently redesignated the U.S. Army Chemical Corps Radiological Unit, is the only one of its type in the Armed Services.

The Rad Unit, as the unit is commonly called, is an organizational element of the U.S. Army Chemical Corps Training Command located at Fort McClellan, Alabama. While the unit is generally designed to provide radiological safety support for Joint Task Forces and the Defense Atomic Support Agency (formerly Armed Forces Special Weapons Project) at nuclear sites in the United States and the mid-Pacific area, it also assists in the radiological tests and other activities which aid in the development of training and tactical doctrine.

Staffed with twelve officers and seventy-five enlisted men, the Rad Unit is organized into a Unit Headquarters and three platoons—service, dosimetry, and operations (see Chart I). The Operations Platoon is further organized into three sections—monitoring, decontamination, and rad-chem laboratory; the Service Platoon is organized into two sections—instrument repair and supply. Because of its single function, the Dosimetry Platoon is not further subdivided. The Dosimetry Platoon and each of the sections of the other two platoons represent important functions in providing radiological

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Major Rosell was commissioned in the Corps of Engineers in 1942, and served in that branch until 1956 when he was detailed in the Chemical Corps, transferring to that service in 1958. Before his present assignment as Nuclear Advisor, USA Chemical Corps Training Command, he had served with the USA Chemical Corps Field Requirements Agency, and as a Commanding Officer of the USA First Radiological Safety Support Unit, participating in radiological safety activities during the nuclear tests of Operations PLUMBBOB and HARDTACK. He is a graduate of the U.S. Military Academy, the Engineer School, the Airborne School, the Chemical Corps School, and the Command and General Staff College. He received an MS degree in civil engineering at California Institute of Technology and an MS degree in physics at the U.S. Naval Postgraduate School.

Sp4 Daniel J. Egan entered the Army in April 1957. A native of Pennsylvania, he attended the University of Detroit, majoring in Civil Engineering, prior to his entry on active serivce. During his tour of duty as a member of the U.S. Army First Radiological Safety Support Unit, he participated in radiological safety activities during the nuclear tests of Operations PLUMBBOB and HARDTACK.

(Continued on Page 10)

safety services to personnel engaged in nuclear weapons testing or other radiological activities.

Basic to any radiological safety system are the radiological detection instruments. At present, two principal types of these instruments are assigned to the Rad Unit; they are the AN/PDR 27, with probe, and the AN/PDR-39. The "27" meter will detect and compute gamma radiation, and will detect, but not compute, beta emissions. It is used primarily to monitor personnel. The "39" meter will detect, identify, and compute only gamma radiation and is especially designed for surveys of large surfaces, such as land areas, with readings being taken by monitors on foot or in surface transportation.

OTHER items essential to the operation of the Rad Unit are the personnel film badges, used to record individual radiation exposure, and film densitometers used in reading the exposed film badges to determine the specific number of roentgens to which the film and its wearer have been exposed. The latest model densitometers employ computing machines with memory units that record and store data secured from the film badges. The computing units have the capability of providing cumulative exposure data on personnel and units engaged in test operations.

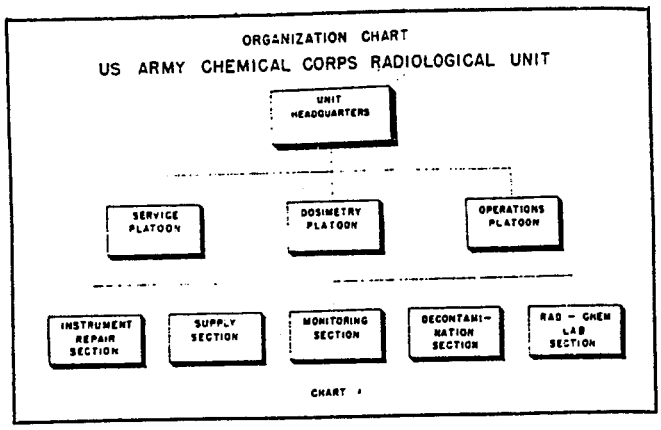
In conducting its operations at a test site, the Rad Unit establishes a standard radiological safety control and processing system applicable to all personnel working in areas subjected to induced radioactivity or appreciable fallout from a nuclear explosion. The system contains five elements: orientation of personnel, issuance of anti-contamination clothing and detection equipment, control of personnel entering and leaving a contaminated area, decontamination, and radiation exposure control.

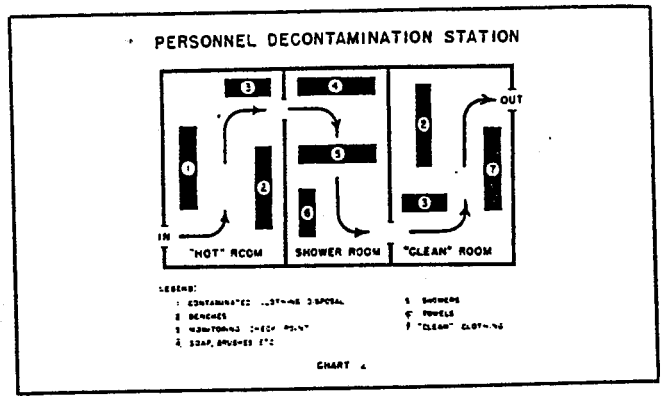
As a first step in this process, all personnel engaged in test work receive a safety orientation conducted by briefing officers of the Monitoring Section. At this orientation, the prevailing radiological situation, as established by aerial and ground surveys, is presented along with data covering the safety restrictions under which personnel must work. Following the orientation, personnel are issued required anti-contamination clothing, respirators, survey instruments, and film badges.

To control the movement of personnel and equipment in a contaminated area, radiation monitors from the Monitoring Platoon maintain check points at points of entry and departure. All personnel are logged in and out of the area, and departing personnel are instructed to report to a personnel decontamination station. At the time of departure, film badges are collected from personnel and sent to the Dosimetry Platoon for developing and analysis.

At the decontamination station (see Chart 2) personnel are required to remove anti-contamination clothing, and place it in containers located in the "hot" room. Personnel are then monitored to determine the extent of contamination, if any, and then shower to remove any radioactive residue. Showering is repeated as necessary until the individual is determined by monitoring to be free from contamination. Personnel are then issued clean clothing and released. In a similar procedure, equipment used in a contaminated area is processed through an equipment decontamination station and returned to normal use if possible.

THE Dosimetry Platoon, staffed with specialists in photographic laboratory procedures and film densitometer operations, are put to work developing the film packets. The film used is of the dental X-ray type,





and will record exposures to gamma radiation ranging from 0 to 600 or 1000 roentgens, depending on the actual type used. By using a densitometer with an automatic computer, several thousand film badges may be processed in a few hours and the results made available for timely exposure control of personnel.

Keeping the radiac survey instruments at an acceptable level of operation is the primary mission of the Instrument Repair section. In accomplishing its mission, this section establishes facilities for testing, repairing, and calibrating these instruments. The Supply Section maintains stocks of anti-contamination clothing, respirators, towels, and all other types of items required by the Rad Unit; in addition, it may operate facilities for laundering contaminated clothing.

The smallest section of the Rad Unit is the Rad-Chem Lab, which is primarily concerned with radioactive analysis of earth and water samples. It is staffed by four U.S. Navy personnel attached to the unit during test operations.

Although the work accomplished by the Rad Unit is demanding, the various nuclear test sites are organized to provide maximum recreation facilities for test personnel. The Pacific test sites—especially Eniwetok and Bikini Atolls—located in the Marshall Islands approximately 2500 miles southwest of Hawaii, have facilities for fishing, skin diving, skeet shooting, swimming, shell hunting, and many other activities, thus bridging the gap between work and recreation.

Though the Rad Unit performs its mission of radiological safety under relatively controlled conditions, the lessons learned by such operations have provided the U.S. Chemical Corps with many answers to the problem of radiological protection on the nuclear battlefield. The experience gained by the Rad Unit is continually subjected to testing and analysis by the U.S. Army Chemical Corps Training Command in its program to provide the combat arms and other services with the latest instruction and doctrine on radiological warfare, radiological defense, and radiological safety.

Schwertner, Larry J., Captain, CmlC
1972 Letter, Renewal of Atomic Energy Commission Byproduct Material Licenses No. 01-02861-01 and 01-02861-02, 29 February 1972. U.S. Army Chemical School, Fort McClellan, Alabama.

DEPARTMENT OF THE ARMY
U S ARMY CHEMICAL CENTER AND SCHOOL
FORT MC CLELLAN, ALABAMA 36201

COG

ATSCM-H

29 FEB 1972

SUBJECT: Renewal of Atomic Energy Commission Byproduct Material Licenses No. 01-02861-01 and 01-02861-02

THRU: ~~Commanding Officer, US Army School/Training Center, Fort McClellan, Alabama 36201~~
~~Commanding General, Third US Army, ATTN: AJAGL-D-S-S, Fort McPherson, Georgia 30330~~
Commanding General, US Continental Army Command, ATTN: ATLOG-S/GS, Fort Monroe, Virginia 23351

TO: HQDA (DALO-MAE) WASH DC 20310

1. References:

a. Title 10, Code of Federal Regulations, Part 30.

b. AR 700-52, Licensing and Control of Sources of Ionizing Radiation.

c. AEC Byproduct Material License 01-02861-01, with Amendments 1 through 17.

d. AEC Byproduct Material License 01-02861-02, with Amendments 1 through 4.

2. Request that the licenses in references 1c and 1d be renewed for a three-year period.

3. AEC-313 Forms are attached as Inclosure 1 and 2 showing applicable information pertaining to these licenses. The same safety program and facilities that are presently being utilized under our current license will remain in effect, thus no copies of the Radiation Safety Program are included with this application.

ATSCM-H

SUBJECT: Renewal of Atomic Energy Commission Byproduct Material Licenses No. 01-02861-01 and 01-02861-02

4. Inclosures 3 and 4 contain updated information as requested in Blocks 8, 9 and 10 of AEC Form 313.

FOR THE COMMANDANT:

4 Incl
as

LARRY J. SCHWERTNER
CPT, CmlC
Assistant Secretary

Speer, James B., Major, CmlC
1963 Letter to District Engineer, U.S. Army Engineer District, Mobile, Actuator Test-RORTAP, 31 May 1963. U.S. Army Chemical School, Fort McClellan, Alabama.

U. S. ARMY CHEMICAL SCHOOL
Fort McClellan, Alabama

AJMCL-V

31 January 63

SUBJECT: Actuator Test - RORTAP

TO: District Engineer
U. S. Army Engineer District, Mobile
P. O. Box 1169
Mobile, Alabama

1. The purpose of this report is to present a summary of the twelve-week operational test conducted on the proposed actuators for use in the Remotely Operated Radiation Training Area, Pelham Range (RORTAP). This test was conducted by the U. S. Army Chemical School for the Mobile District Engineer as established by the request for technical proposals dated 7 September 1962 and revised 5 October 1962 (Inclosure 1).

2. The test was conducted by Major James B. Speer, CmlC, assisted by SMaj Phillip W. LaVie, SSgt Elmer N. Self, and Pfc Ronald H. Ullerich. (Inclosure 2).

3. Sandbolts ED Range, Fort McClellan, was designated as the test site. A temporary radiation area was established using barbed wire for fencing and posting appropriate radiation signs every 20 feet along the fence line. This fencing was placed at a point surrounding the field so that a reading not greater than 2 mrad/hour could be obtained with all units in the "up" position.

4. a. Five offerors submitted prototypes for test:

(1) Tracerlab, Inc.
1601 Trapelo Road
Waltham 54, Massachusetts

(2) Nuclear Safeguards, Inc.
509 Crain Highway, S. E.
Glen Burnie, Maryland

(3) Engineered Equipment Corporation
1207 E. 23d Street
Chattanooga, Tennessee

(4) Atomic Energy of Canada, Ltd.
Commercial Products Division
P. O. Box 93
Ottawa, Canada

(5) Electro Manufacturing & Research, Inc.
2052 East Main Street
Bridgeport, Connecticut

b. Of the five, three satisfactorily completed the test. Number (3), above, was removed from the test on 19 March 1963. Number (4), above, was removed from the test on 9 May 1963. These removals were ordered by the Mobile District Engineer either as a result of complete unacceptability (3) or a forced stoppage (4).

5. a. On 3 December 1962, a letter was transmitted by the Mobile District Engineer to all offerors accepting their technical proposals and instructing offerors to have their prototypes submitted so as to reach Fort McClellan by 28 January 1963. All complied with the exception of (5). This unit was delayed by a common carrier and did not arrive at the test site until 2 February 1963. A shipping document in the possession of the offeror indicated shipment was made on 25 January 1963.

b. The request for technical proposal required that each offeror be allowed a period of 10 normal 8-hour working days to operate and make any final adjustments or modifications on his model before testing began. The period was established between 4 February and 18 February. Each offeror was afforded the same facilities and assistance during this period.

6. Three models (2), (3) and (4), were submerged on 31 January 1963, in a 3000 gallon water tank containing water to a level of two feet above the highest point of the unit when laid on the floor of the tank (Figures E-1, E-2 and E-3). On 3 February 1963, (1) was submerged; (5) was submerged on the following day. The results of this test are reported individually in the respective annex.

7. a. The Post Engineer, Fort McClellan, at the request of the Mobile District Engineer emplaced five (5) sections of 24-inch concrete culvert pipe in which were placed pattern forms made to accept a particular unit. As all units were different, five (5) separate pattern forms had to be fabricated. These forms were then poured with concrete establishing a firm base upon which to install the units for the test.

b. The Post Engineer also had an operations shed moved onto the site for test control panels. Electric power was brought to the shed and an automatic programmer installed. Units (1), (2), (4) and (5) were electrically hooked up to this programmer and were maintained on

this for the test period. Unit (3) had his own AGASTAT timer so there was no necessity for connecting it to the government furnished programmer. Power was brought from the operations shed to the actuators by waterproof cables laid either on the ground or by direct burial. All electrical lines and electrical equipment were installed by personnel assigned to the Post Engineer.

8. During the period 4 February to 18 February 1963, each offeror was allowed to install, and make necessary adjustments to, his unit and system. The dummy capsule issued each offeror was removed from the actuator and replaced with a capsule containing radioactive material (15 curies cobalt-60) on 19 February. While handling the "hot" capsules with the 10-foot tongs, two were allowed to roll into the sand surrounding the concrete foundations. These were picked up, placed in (1) and (2), and apparently a small amount of sand was picked up as well. The capsules were removed, replaced in the large shield container and the units cleaned to remove the sand. After clean-up, the capsules were replaced; the units cycled to check out the operation and it was determined that the unit would operate properly. There was no trouble at any time during the test that could be directly caused by the admission of this small amount of sand.

9. a. The twelve-week test commenced at 0630 hours, 20 February 1963, and consisted of the following test schedule:

(1) Monday through Thursday, each week
0630 - 1430 hours - cycling test
1430 - 1730 hours - individual tests
1730 - 0630 hours - hold in "up" position

(2) Friday each week
0630 - 1430 hours - cycling test
1430 - 1730 hours - individual tests
1730 - 0630 hours following Monday - all power off

b. Actual motor running time for each unit is stated in the respective annex.

c. During the test period, varying weather conditions were experienced. The temperature ranged from -70F to 920F; icy conditions were observed during the early stages of the test; extremely heavy rains and standing water were also observed. In May, the temperature and humidity on numerous occasions were very high. Winds up to 45 knots per hour carrying heavy dust and sand were noted. The weather during the test period is considered to cover the extreme conditions under which these units will be required to operate.

d. The twelve-week test was completed at 0630 hours, 14 May 1963.

AMCL-4
SUBJECT: Actuator Test - RORTAP

10. During the period 14 - 17 May 1963, each of the units satisfactorily completing the test, i.e., (1), (2) and (5), was dismantled by test personnel in the presence of the respective offeror.

11. Attached as annexes are the findings of the test. Recommendations and conclusions are integrated into each annex.

12. Request disposition instructions on the four units, (1), (2), (4) and (5), which are being held at the test site.

7 Incl
1. Request for Technical Proposal, Sep 62
2. Ltr assigning Major Speer as Test Officer
3. Figures E-1, E-2, E-3
4. Annex A
5. Annex B
6. Annex C
7. Annex D

JAMES B. SPEER
Major, CmlC
Test Officer

Thomassy, Fernand A., Colonel, CM
1988 Memorandum, dated 29 November 1988, with attachment, Closeout Survey, Building 2281, Edwin R. Bradley Radiological Laboratories, November 1988. U.S. Army Chemical School, Fort McClellan, Alabama.

DEPARTMENT OF THE ARMY
US ARMY CHEMICAL SCHOOL
FORT MCCLELLAN, ALABAMA 36205-5020

REPLY TO
ATTENTION OF:

ATZN-CM-AHP (385-11N) 29 NOV 1988

MEMORANDUM THRU:

Commander, U.S. Army Training and Doctrine Command, ATTN: ATOS, Fort Monroe, VA 23651-5000

Commander, Army Materiel Command, ATTN: AMCSF-P, 5001 Eisenhower Avenue, Alexandria, VA 22333-0001

FOR: U.S. Nuclear Regulatory Commission, 101 Marietta Street NW, Suite 2900, Atlanta, GA 30323

SUBJECT: Partial Closeout of BML 01-02861-05

1. The U.S. Army Chemical School has completed the move from building 2281 to building 1081 on Fort McClellan. In accordance with the conditions of BML 01-02861-05, the closeout survey is forwarded for approval.

2. The methodology of the survey is explained in detail in the attached. Basically, the areas in which the higher intensity and unsealed sources were used received detailed scrutiny, while an expanded grid was used in the other areas. There was no contamination, either fixed or removable, found in the lab area. Most readings were at the background level, and no reading was over twice background.

3. Based upon the results of the survey, the U.S. Army Chemical School is ready to release the area for unrestricted use. Request approval of the closeout survey so that the space may be utilized.

4. POC is Mr. Gregory R. Komp, extension 205-848-5044 or AUTOVON 865-5044.

FOR THE COMMANDANT:

Atch

FERNAND A. THOMASSY
Colonel, CM
Assistant Commandant

CLOSEOUT SURVEY

BUILDING 2281

EDWIN R. BRADLEY RADIOLOGICAL LABORATORIES

NOV 1988

CLOSEOUT SURVEY OF BUILDING 2281

1. BACKGROUND. Building 2281 has been in use as a radiological laboratory since 1980 when the Chemical School moved to Ft McClellan. It was officially designated as the Edwin R. Bradley Radiological Laboratories after the death of Ed Bradley in 1982. The primary type of sources used in the labs were exempt sources used to train students on the use of low-level radiac instruments. Other sources used in the labs were primarily Army standard sources, and occasionally unsealed short-lived isotopes. Tab A lists the authorized sources, and in which lab they were used.

2. SURVEY METHODOLOGY.

A. General. All of the lab areas were surveyed for alpha, beta, and gamma contamination. The primary means of survey was with portable instruments and periodic taking of swipes. The approach to surveying the labs was that monthly surveys had been taken in the labs since they were put into operation, and since no contamination has been found, this survey would serve to verify that data. Swipes were taken on a 3' x 3' grid. Each lab was divided into 1' x 1' grids. This was relatively easy since the floor tiles are 1' x 1'. Maps are provided for each lab (see tab C).

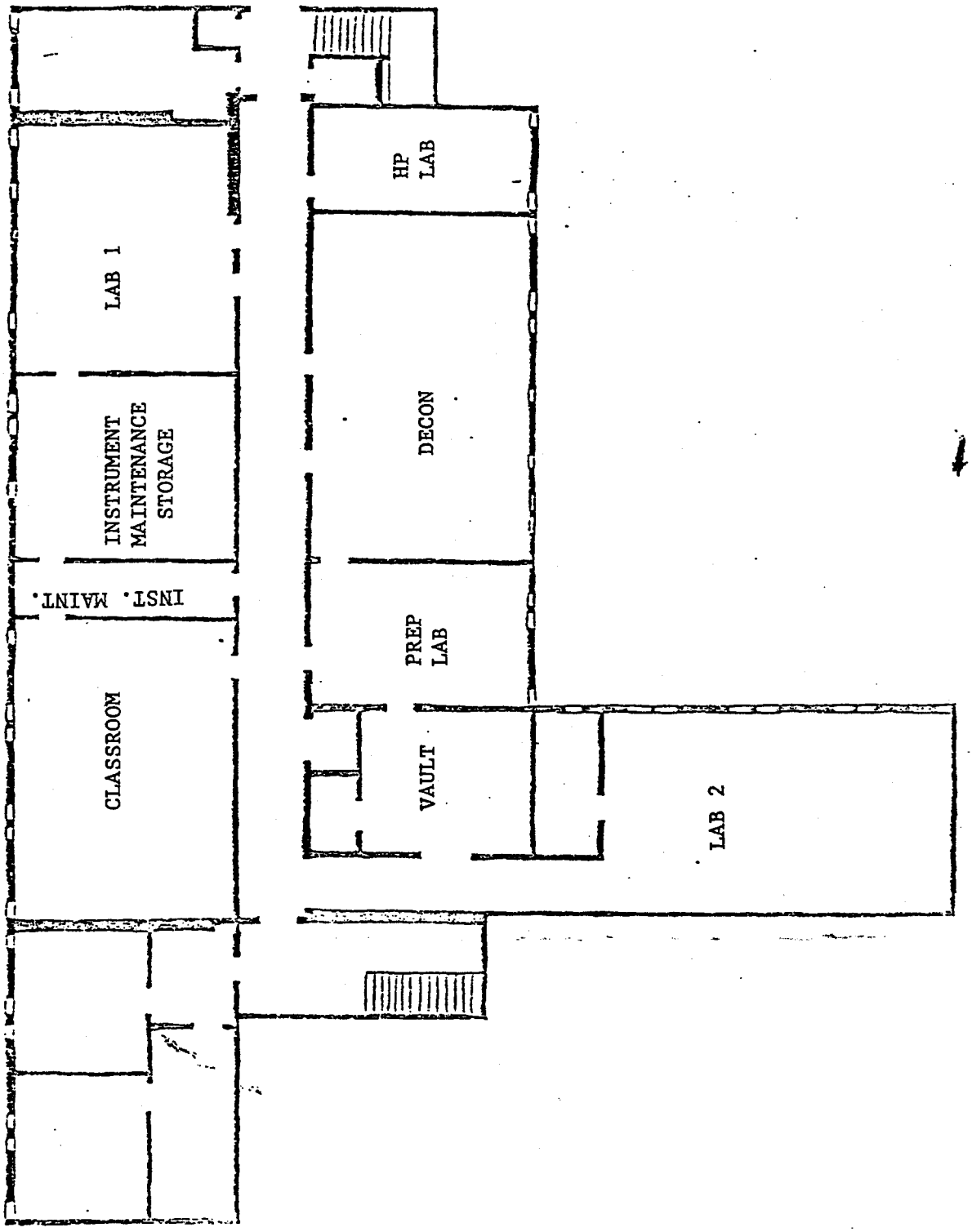
B. Instrument Survey. The points selected for measurements depended upon the prior use of the lab. The labs in which only exempt sources were used, were measured using a 3' x 3' grid. The other labs received a detailed survey with the results reported for every 1'x 1' grid. The results of the survey are provided at tab C. Three surveys were done for each grid. Alpha at contact, beta/gamma at one centimeter, and gamma at one meter from the surface. Results are reported in dpm/100cm for alpha, urad/hr for beta/gamma, and urad/hr for gamma.

C. Instrument Quality Control. All instruments were calibrated to health and safety standards using sources traceable to NBS. Prior to each use, the instruments were checked using an exempt source. Detailed information on instrument calibration and the performance check is located at tab B.

D. Swipe Survey. Since no contamination was detected with the instrument survey, the probability of finding removable contamination, was very low. Swipes were therefore taken on a 3' x 3' grid. The swipes used were 4.25 cm filter disks which were moistened then wiped across a 100 cm^2 area. The swipes were then loaded into a Tennelec automatic alpha/beta/gamma counter and counted for ten minutes. The background was subtracted, and the results reported in dpm/100 cm^2. All counts were below LLD for the counter which is 1.53 dpm for alpha, 9.35 dpm for beta, and 42.27 for gamma. Results of the smears is at tab D.

E. Results. The survey of the laboratories indicated that there is no radioactive contamination present. Instrument surveys were all close to background, with no reading above twice background. All swipes were below the lower limit of detection (LLD). The labs can be released for unrestricted use.

EDWIN R. BRADLEY LABORATORIES



TAB A

RADIOACTIVE SOURCES
USED IN THE
EDWIN R. BRADLEY LABORATORIES

ISOTOPES USED IN ERB LABS

TYPE	ISOTOPE	QUANTITY	LABS SOURCE(S) USED IN
EXEMPT BAGS	CO-60 CA-45	<1 uCi	ALL
EXEMPT DISKS	CO-60 CS-137 AG-110M CA-45 FE-55	<1 uCi	ALL
MX-7338	KR-85	5 mCi	ALL
AN/UDM-6	PU-239	200 uG	PREP, VAULT, DECON
M3A1	CO-60	120 mCi	PREP, VAULT, DECON, LAB 2
AN/UDM-2	SR-90	100 mCi	PREP, VAULT, DECON
AN/UDM-7C	PU-239	81.9 uG	PREP, VAULT, DECON
SOLID SOURCE	CS-137	500 mCi	PREP, VAULT, DECON
LIQUID, UNSEALED	AU-198	<10 mCI	PREP, VAULT, DECON
LIQUID, USSEALED	TC-99M	<10 mCi	PREP, VAULT, DECON
EXEMPT PLANCHETS	CA-45	<1 uCI	PREP, VAULT, DECON, LAB 2, HP
EXEMPT CHECK SOURCES	VARIOUS	<10 uCI	ALL
CS-12	TH-230	<1 uCi	ALL
LIQUID SOURCES	RB-86 CE-141 AG-110M CA-45 CO-60 CS-137 S-135 SC-46 P-32 C-14 FE-55	10 mCi	VAULT, PREP

TAB B

INSTRUMENT QUALIITY CONTROL

INSTRUMENT QUALITY CONTROL

INSTRUMENTS USED	CALIBRATION DATES
EBERLINE 520 W/HP270 SN 3812, 3813	22 JUL 1988, 20 OCT 1988
AN/PDR-60 W/AC-3 PROBE SN 1007, 1248	29 JUL 1988, 7 OCT 1988
EBERLINE ESP-1 W/ SPA-3 SN 969	20 OCT 1988

PERFORMANCE CHECKS

The performance check is accomplished by placing the probe on the check source holder with the source in the third slot or directly on the source mount which is slightly recessed. The instrument is then turned to either the lowest or second lowest scale (depending on which configuration is used), and the reading is compared to the standard. If the readings are within 10% of one another, the instrument is considered to be working. The readings are entered into a logbook as a permanent record. Sources used are exempt CO-60 and TH-230. All readings were within 10% during this survey period.

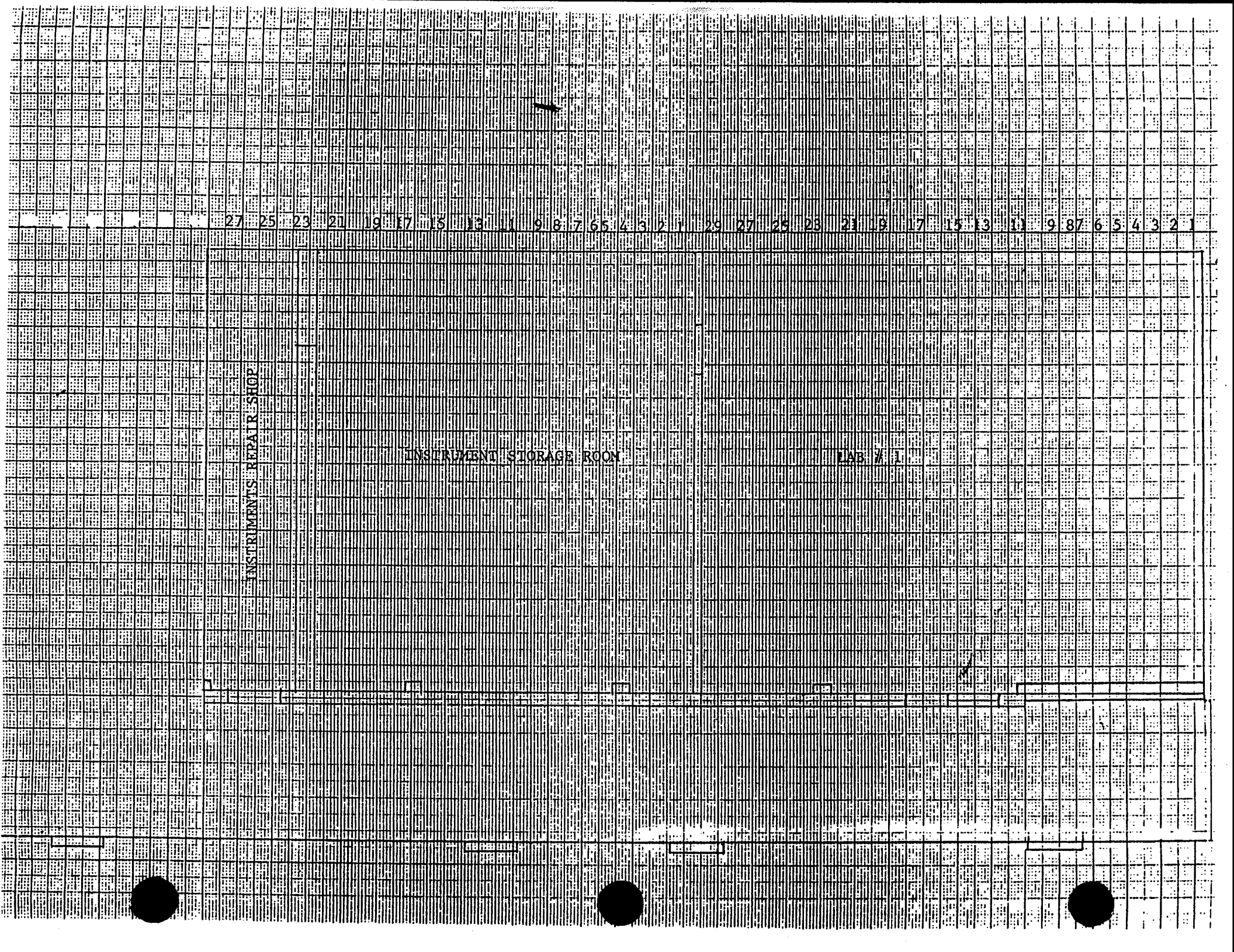
TAB C

INSTRUMENT SURVEYS

CLOSEOUT SURVEY
LAB 1

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	20 uR/hr
GAMMA	1.8 uR/hr


27 25 23 21 19 17 15 13 11 9 8 7 6 5 4 3 2 1 29 27 25 23 21 19 17 15 13 11 9 8 7 6 5 4 3 2 1
INSTRUMENTS REPAIR SHOP
INSTRUMENT STORAGE ROOM
LAB # 1

LAB 1

ALPHA

	C	F	G	I	L	O	R	U	X	Z
3	<135	<135		<135	<135	<135	<135	<135	<135	
6	<135	<135		<135	<135	<135	<135	<135	<135	
9	<135	<135		<135	<135	<135	<135	<135	<135	
12	<135	<135		<135	<135	<135	<135	<135	<135	<135
15	<135	<135		<135	<135	<135	<135	<135	<135	
16										<135
18	<135	<135		<135	<135	<135	<135	<135	<135	
19										<135
21	<135	<135		<135	<135	<135	<135	<135	<135	<135
24	<135	<135		<135	<135	<135	<135	<135	<135	
27	<135	<135		<135	<135	<135	<135	<135	<135	<135
29			<135							

BETA/GAMMA

	C	F	G	I	L	O	R	U	X	Z
3	<20	<20		<20	<20	<20	<20	<20	<20	
6	<20	<20		<20	<20	<20	<20	<30	<20	
9	<20	<20		<20	<20	<20	<20	<30	<20	
12	<20	<20		<20	<20	<20	<20	<20	<20	<20
15	<20	<20		<20	<20	<20	<20	<20	<20	
16										<20
18	<20	<20		<20	<20	<20	<20	<20	<20	
19										<20
21	<20	<20		<20	<20	<20	<20	<20	<20	<20
24	<20	<20		<20	<20	<20	<20	<20	<20	
27	<20	<20		<20	<20	<20	<20	<20	<20	<20
29			<20							

GAMMA

	C	F	G	I	L	O	R	U	X	Z
3	<1.8	<1.8		<1.9	<1.9	<1.8	<1.9	<2.0	<1.9	
6	<1.8	<1.8		<1.8	<1.8	<1.8	<2.0	<2.2	<1.9	
9	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.9	<1.9	
12	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
15	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	
16										<1.8
18	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	
19										<1.8
21	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
24	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	
27	<1.8	<1.8		<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
29			<1.8							

CLOSEOUT SURVEY
LAB 2 / VAULT

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	30 uR/hr
GAMMA	1.8 uR/hr

LAB # 2
(ANALYSIS LAB)

VAULT

GRAPHIC CONTROLS CORPORATION
BUFFALO, NEW YORK
PRINTED IN U.S.A.

LAB 2/VAULT— ALPHA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
2	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
3	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
4	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
5	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
6	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
7	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
8	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
9	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
10	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
11	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
12	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
13	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
14	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
15	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
16	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
17	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
18	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
19	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
20	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
21	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
22	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
23	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
24	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
25	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
26	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
27	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
28	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
29	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
30	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
31	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
32	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
33	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
34	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
35	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
36	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
37	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
38	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
39	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
40	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
41	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
42	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	(135	(135	(135	(135	(135	(135	(135
43	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
44	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
45	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(136	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
46	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
47	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
48	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
49	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
50	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
51	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	(135	(135	(135	(135	(135	(135	(135
52	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
53	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
54	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
55	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
56	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
57	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
58	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
59	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
60	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
61	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
62	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
63	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
64	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
65	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
66	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
67	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
68	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
69	wall	wall	wall	wall	wall	wall	wall	wall	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
70								wall	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
71								wall	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
72								wall	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135
73								wall	(135	(135	(135	(135	(135	(135	(135	wall	(135	(135	(135	(135	(135	(135	(135

LAB 2/VAULT--BETA-GAMMA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
2	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
3	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
4	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
5	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
6	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
7	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
8	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
9	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
10	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
11	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
12	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
13	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
14	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
15	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
16	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
17	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
18	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
19	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
20	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
21	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
22	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
23	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
24	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
25	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
26	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
27	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
28	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
29	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
31	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
32	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
33	(20	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
34	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
35	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
36	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
37	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
38	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
39	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
40	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
41	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
42	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	(30	(30	(30	(30	(30	(30	(30
43	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
44	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
45	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
46	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
47	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
48	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
49	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
50	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	wall	(30	(30	(30	(30	(30	(30	(30
51	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	(30	(30	(30	(30	(30	(30	(30
52	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
53	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
54	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
55	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
56	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
57	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
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59	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
60	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
61	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
62	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
63	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
64	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
65	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
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68	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
69	wall	wall	wall	wall	wall	wall	wall	wall	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
70								wall	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
71								wall	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
72								wall	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30
73								wall	(25	(25	(25	(25	(25	(25	(25	wall	(30	(30	(30	(30	(30	(30	(30

LAB 2/VAULT—GAMMA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W
1																							
2																							
3			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8		
4																							
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6			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8		
7																							
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9			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8		
10																							
11																							
12			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8		
13																							
14																							
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28																							
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39			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8			<1.8		
40																							
41																							
42	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall							
43			<1.8			<1.8			<1.8			<1.8			<1.8	wall		<1.8			<1.8		
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46			<1.8			<1.8			<1.8			<1.8			<1.8	wall		<1.8			<1.8		
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50																wall							
51	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall	wall		<1.8			<1.8		
52																wall							
53																wall							
54			<1.8			<1.8			<1.8			<1.8			<1.8	wall		<1.8			<1.8		
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59																wall							
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61																wall							
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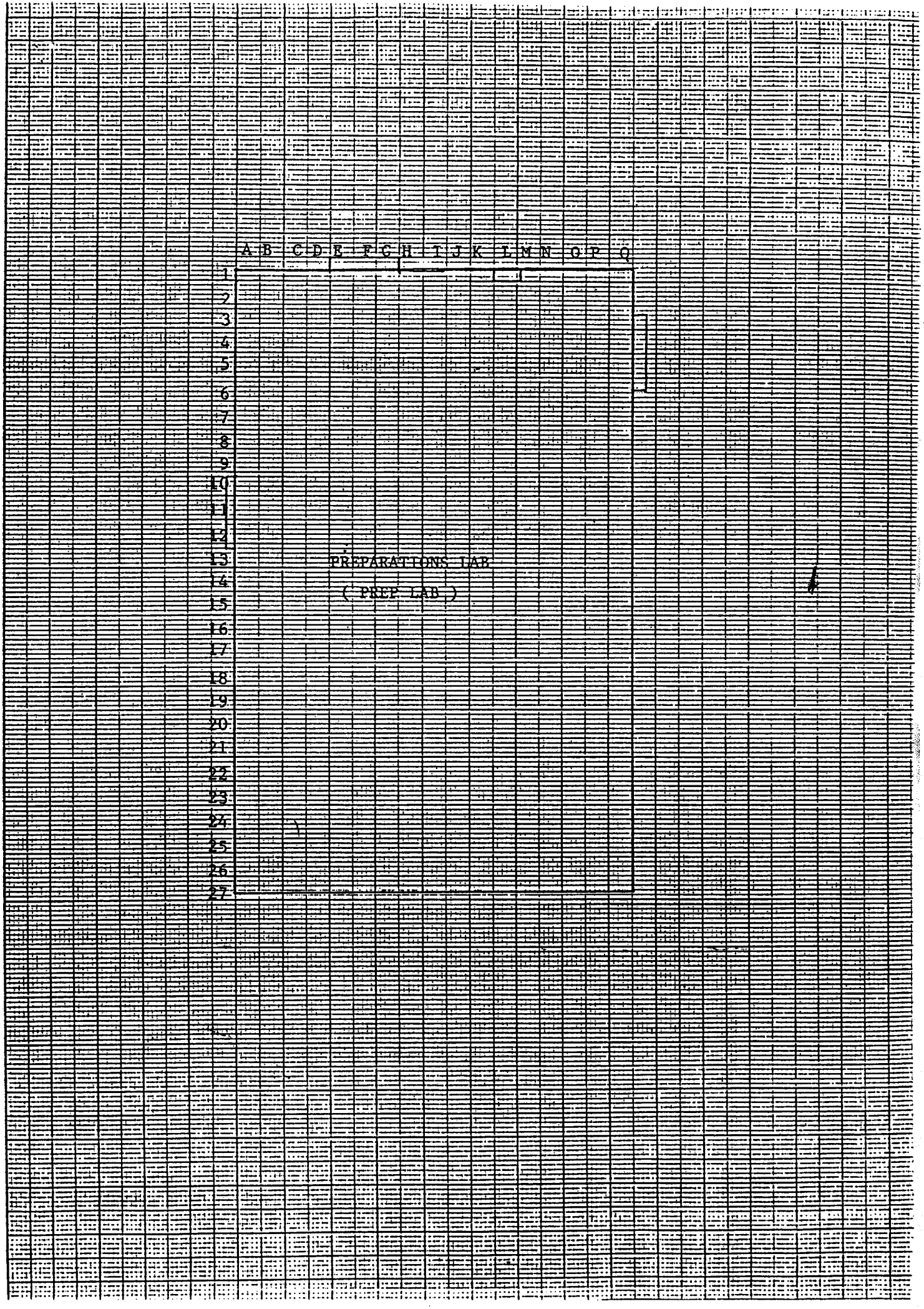
72								wall	<1.8			<1.8			<1.8	wall							
73								wall								wall		<1.8			<1.8		

CLOSEOUT SURVEY
PREP LAB

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	30 uR/hr
GAMMA	1.8 uR/hr


A B C D E F G H I J K L M N O P Q
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PREPARATIONS LAB
(PREP LAB)

PREP LAB ALPHA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
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PREP LAB BETA/GAMMA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
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4	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
5	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
6	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
7	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
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PREP LAB GAMMA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q
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2																	
3			<2.0			<1.8			<1.8			<1.8			<1.8		
4																	
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14																	
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18			<1.8			<1.8			<1.8			<1.8			<1.8		
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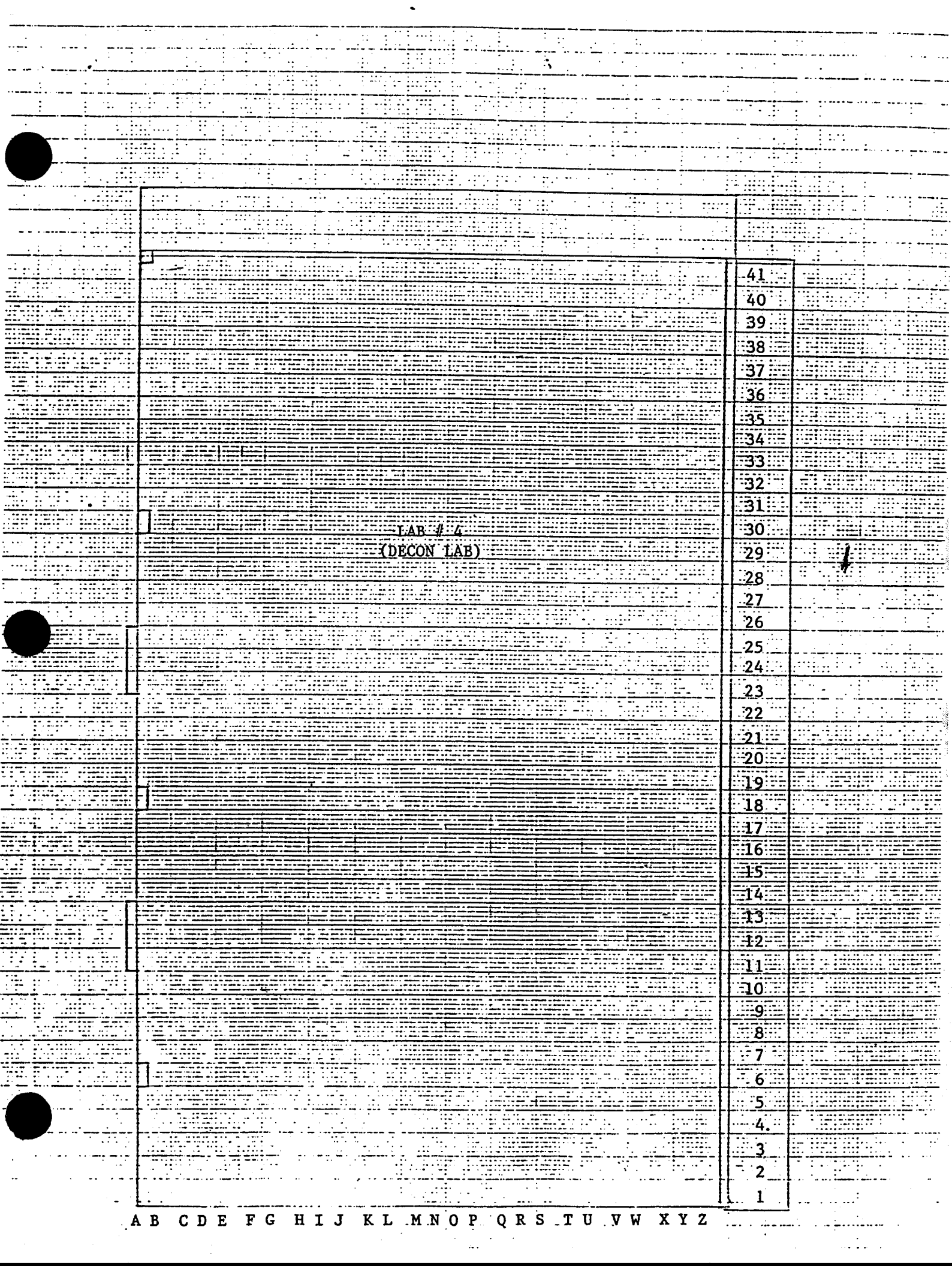
25																	
26																	
27			<1.8			<1.8			<1.8			<1.8			<1.8		

CLOSEOUT SURVEY
LAB 4
(DECON)

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	30 uR/hr
GAMMA	1.8 uR/hr


LAB # 4
(DECON LAB)
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3
2
1
A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

ALPHA

	A		C	D	E	F	G	H	I	J	K	L	M		O	P	Q	R	S	T	U	V	W	X	Y		M
1	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
2	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
3	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
4	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
5	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
6	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
7	XXX	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
8	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
9	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
10	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
11	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
12	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
13	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
14	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
15	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
16	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
17	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
18	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
19	XXX	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
20	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
21	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
22	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
23	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
24	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
25	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
26	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
27	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
28	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
29	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
30	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
31	XXX	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
32	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
33	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
34	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
35	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
36	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
37	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
38	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
39	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
40	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
41	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	XXX	XXX
42	(135	(135	(135	XXX	XXX	XXX	(135	(135	(135	(135	(135	(135	XXX	XXX	XXX	(135	(135	(135	(135	(135	(135	XXX	XXX	XXX	XXX	XXX	XXX
43	XXX	(135	(135	XXX	XXX	XXX	(135	(135	(135	(135	(135	(135	XXX	XXX	XXX	(135	(135	(135	(135	(135	(135	XXX	XXX	XXX	XXX	XXX	XXX

BETA/GAMMA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X	Y	Z	AA
1	(30	[illegible]	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
2	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
3	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
4	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
5	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
6	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	40	(30	(30	(30	(30	(30	(30	(30	(30
7	XXX	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	40	[illegible]	(30	(30	(30	(30	(30	(30	(30	(30
8	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
9	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
10	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
11	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
12	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
13	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
14	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
15	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
16	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
17	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
18	40	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
19	XXX	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
20	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	40	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
21	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
22	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
23	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
24	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
25	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
26	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
27	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
28	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
29	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
31	XXX	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
32	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
33	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
34	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
35	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	40	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
36	(30	(30	(30	(30	(30	(30	(20	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
37	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	40	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
38	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
39	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
40	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30
41	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	(30	XXX	XXX
42	(30	(30	(30	XXX	XXX	XXX	(30	(30	(30	(30	(30	(30	XXX	XXX	XXX	(30	(30	(30	(30	(30	(30	(30	XXX	XXX	XXX	XXX	XXX
43	XXX	(30	(30	XXX	XXX	XXX	(30	(30	(30	(30	(30	(30	XXX	XXX	XXX	(30	(30	(30	(30	(30	(30	(30	XXX	XXX	XXX	XXX	XXX

[redacted]

[redacted]

GAMMA

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2																								
3			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
4																								
5																								
6			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
7																								
8																								
9			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
10																								
11																								
12			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
13																								
14																								
15			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
16																								
17																								
18			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
19																								
20																								
21			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
22																								
23																								
24			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
25																								
26																								
27			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
28																								
29																								
30			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
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33			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
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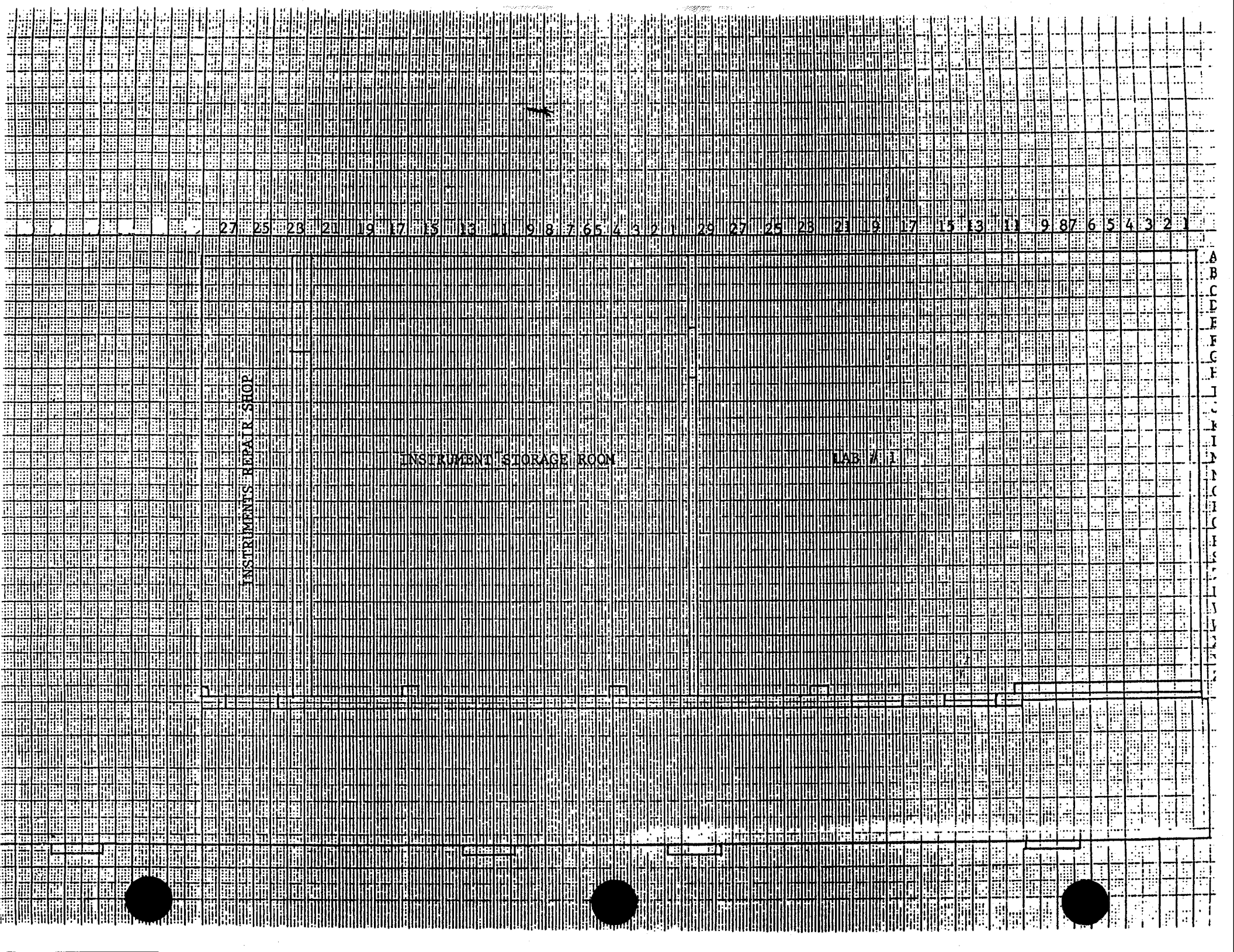
35																								
36			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0
37																								
38																								
39			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0			<1.0

CLOSEOUT SURVEY
INSTRUMENT MAINTENANCE/STORAGE

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	20 uR/hr
GAMMA	1.8 uR/hr


INSTRUMENTS REPAIR SHOP
INSTRUMENT STORAGE ROOM
LAB # 1

INSTRUMENT STORAGE

ALPHA

	C	F	I	L	O	R	U	X	Z
3	<135	<135	<135	<135	<135	<135	<135	<135	<135
6	<135	<135	<135	<135	<135	<135	<135	<135	<135
9	<135	<135	<135	<135	<135	<135	<135	<135	<135
12	<135	<135	<135	<135	<135	<135	<135	<135	<135
15	<135	<135	<135	<135	<135	<135	<135	<135	<135
18	<135	<135	<135	<135	<135	<135	<135	<135	<135
20				<135	<135	<135	<135		
21	<135	<135	<135					<135	
22	wall	wall	wall	wall	wall	wall	wall	wall	wall
23	<135	<135	<135	<135	<135	<135	<135	<135	<135
25	<135	<135	<135	<135	<135	<135	<135	<135	<135
27	<135	<135	<135	<135	<135	<135	<135	<135	<135

BETA/GAMMA

	C	F	I	L	O	R	U	X	Z
3	<20	<20	<20	<20	<20	<20	<20	<20	<20
6	<20	<20	<20	<20	<20	<20	<20	<20	<20
9	<20	<20	<20	<20	<20	<20	<20	<20	<20
12	<20	<20	<20	<20	<20	<20	<20	<20	<20
15	<20	<20	<20	<20	<20	<20	<20	<20	<20
18	<20	<20	<20	<20	<20	<20	<20	<20	<20
20				<20	<20	<20	<20		
21	<20	<20	<20					<135	
22	wall	wall	wall	wall	wall	wall	wall	wall	wall
23	<20	<20	<20	<20	<20	<20	<20	<20	<20
25	<20	<20	<20	<20	<20	<20	<20	<20	<20
27	<20	<20	<20	<20	<20	<20	<20	<20	<20

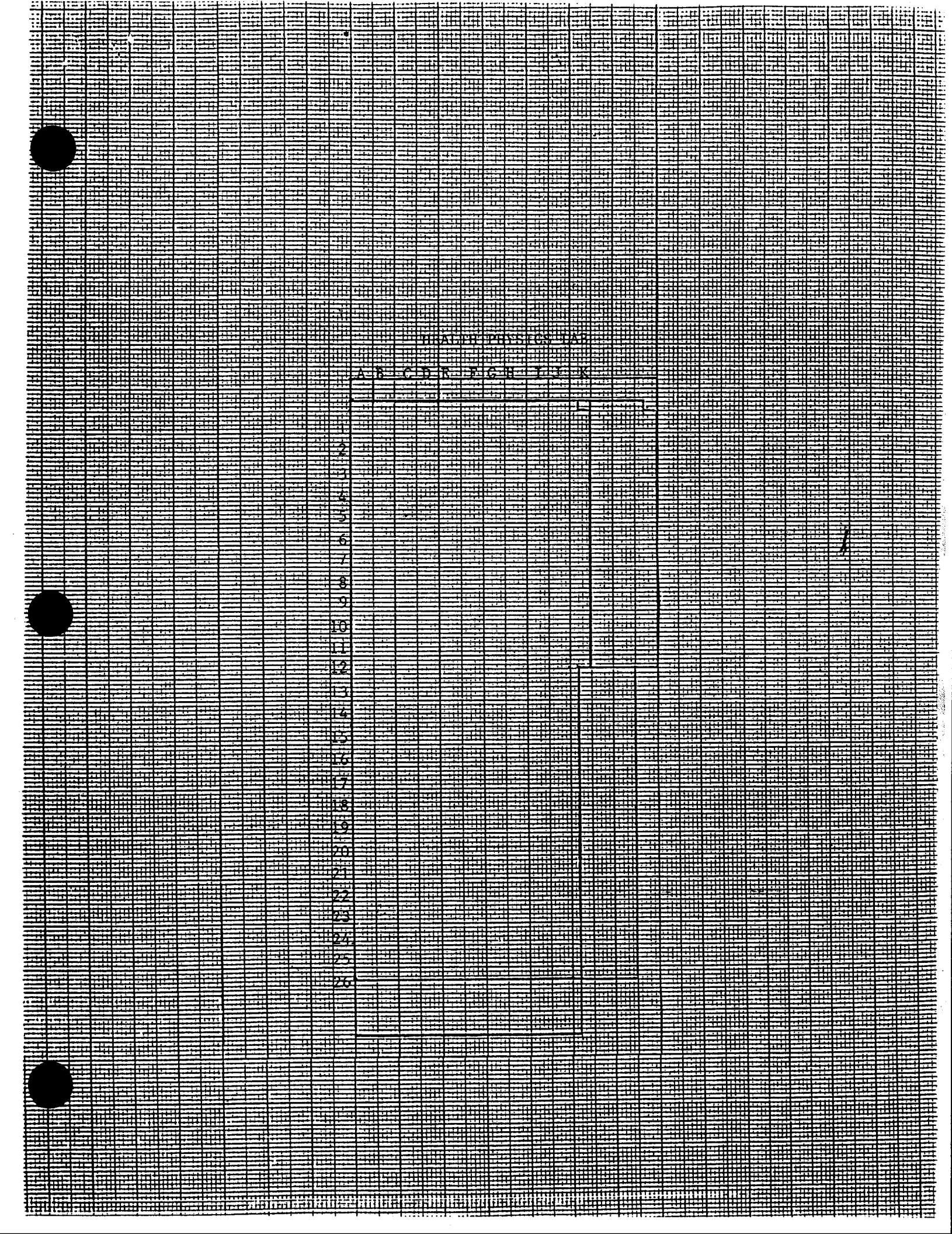
GAMMA

	C	F	I	L	O	R	U	X	Z
3	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
6	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
9	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
12	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
15	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
18	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8
20				<1.8	<1.8	<1.8	<1.8		
21	<1.8	<1.8	<1.8					<1.8	
22	wall	wall	wall	wall	wall	wall	wall	wall	wall
23	<1.8	<2.0	<2.4	<2.0	<2.4	<1.9	<1.8	<1.9	<2.3
25	<1.8	<2.1	<2.0	<2.2	<2.1	<1.8	<1.8	<2.0	<2.1

CLOSEOUT SURVEY
HP LAB

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	30 uR/hr
GAMMA	1.8 uR/hr


HIGH FIT PHYSICS LAB
A B C D E F G H I J K
1
2
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21
22
23
24
25
26

ALPHA

	A	B	C	D	E	F	G	H	I	J	K
1	(135	(135	(135	(135	(135	(135	(135	(135	(135		
2	(135	(135	(135	(135	(135	(135	(135	(135	(135		
3	(135	(135	(135	(135	(135	(135	(135	(135	(135		
4	(135	(135	(135	(135	(135	(135	(135	(135	(135		
5	(135	(135	(135	(135	(135	(135	(135	(135	(135		
6	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
7	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
8	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
9	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
10	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
11	(135	(135	(135	(135	(135	(135	(135	(135	(135		
12	(135	(135	(135	(135	(135	(135	(135	(135	(135		
13	(135	(135	(135	(135	(135	(135	(135	(135	(135		
14	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
15	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
16	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
17	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
18	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
19	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
20	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135	(135
21	(135	(135	(135	(135	(135	(135	(135	(135			
22	(135	(135	(135	(135	(135	(135	(135	(135			
23	(135	(135	(135	(135	(135	(135	(135	(135			
24	(135	(135	(135	(135	(135	(135	(135	(135	(135		
25			(135	(135	(135	(135	(135	(135	(135		
26			(135	(135	(135	(135	(135	(135	(135		

BETA/GAMMA

	A	B	C	D	E	F	G	H	I	J	K
1	<30	<30	<30	<30	<30	<30	<30	<30	<30		
2	<30	<30	<30	<30	<30	<30	<30	<30	<30		
3	<30	<30	<30	<30	<30	<30	<30	<30	<30		
4	<30	<30	<30	<30	<30	<30	<30	<30	<30		
5	<30	<30	<30	<30	<30	<30	<30	<30	<30		
6	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
7	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
8	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
9	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
10	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
11	<30	<30	<30	<30	<30	<30	<30	<30	<30		
12	<30	<30	<30	<30	<30	<30	<30	<30	<30		
13	<30	<30	<30	<30	<30	<30	<30	<30	<30		
14	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
15	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
16	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
17	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
18	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
19	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
20	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30	<30
21	<30	<30	<30	<30	<30	<30	<30	<30			
22	<30	<30	<30	<30	<30	<30	<30	<30			
23	<30	<30	<30	<30	<30	<30	<30	<30			
24	<30	<30	<30	<30	<30	<30	<30	<30	<30		
25			<30	<30	<30	<30	<30	<30	<30		
26			<30	<30	<30	<30	<30	<30	<30		

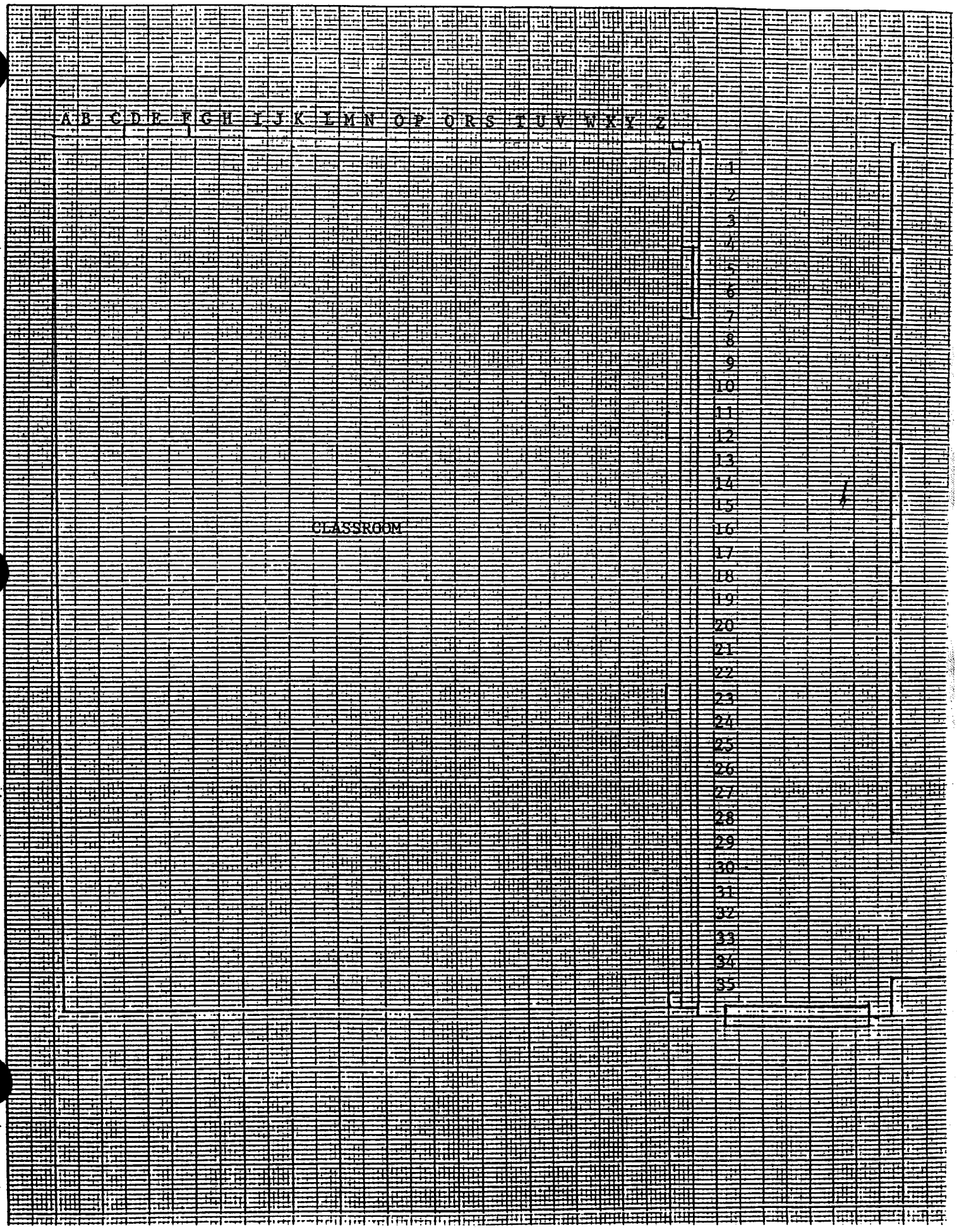
GAMMMA

	A	B	C	D	E	F	G	H	I	J	K
1											
2											
3			<1.8			<1.8			<1.8		
4											
5											
6			<1.8			<1.8			<1.9		
7											
8											
9			<1.8			<1.8			<1.8		
10											
11											
12			<1.8			<1.8			<1.9		
13											
14											
15			<1.8			<1.8			<1.8		
16											
17											
18			<1.8			<1.8			<1.8		
19											
20											
21			<1.8			<1.8			<1.8		
22											
23											
24			<1.8			<1.8			<1.8		
25											
26											

CLOSEOUT SURVEY
CLASSROOM

BACKGROUND

ALPHA	135 dpm/100 cm^2
BETA/GAMMA	30 uR/hr
GAMMA	1.8 uR/hr


A B C D E F G H I J K L M N O P Q R S T U V W X Y Z
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35
CLASSROOM

CLASSROOM

ALPHA

	C	F	I	L	O	R	U	X	Z
3	<135	<135	<135	<135	<135	<135	<135	<135	<135
6	<135	<135	<135	<135	<135	<135	<135	<135	<135
9	<135	<135	<135	<135	<135	<135	<135	<135	<135
12	<135	<135	<135	<135	<135	<135	<135	<135	<135
15	<135	<135	<135	<135	<135	<135	<135	<135	<135
18	<135	<135	<135	<135	<135	<135	<135	<135	<135
21	<135	<135	<135	<135	<135	<135	<135	<135	<135
24	<135	<135	<135	<135	<135	<135	<135	<135	<135
27	<135	<135	<135	<135	<135	<135	<135	<135	<135
30	<135	<135	<135	<135	<135	<135	<135	<135	<135
33	<135	<135	<135	<135	<135	<135	<135	<135	<135

BETA/GAMMA

	C	F	I	L	O	R	U	X	Z
3	<30	<30	<30	<30	<30	<30	<30	<30	<30
6	<30	<30	<30	<30	<30	<30	<30	<40	<30
9	<30	<30	<30	<30	<30	<30	<30	<30	<30
12	<30	<30	<30	<40	<30	<30	<30	<30	<30
15	<30	<30	<30	<30	<40	<30	<30	<30	<30
18	<30	<30	<30	<30	<30	<40	<30	<30	<30
21	<30	<30	<30	<30	<30	<30	<30	<30	<40
24	<30	<40	<30	<30	<30	<30	<30	<30	<40
27	<40	<30	<30	<40	<30	<30	<30	<30	<30
30	<30	<30	<30	<30	<30	<30	<30	<30	<30
33	<30	<30	<30	<30	<30	<30	<30	<30	<30

GAMMA

	C	F	I	L	O	R	U	X	Z
3	<1.8	<1.9	<1.9	<2.0	<2.0	<1.9	<1.9	<2.0	<2.0
6	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
9	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
12	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
15	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
18	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
21	<1.8	<1.8	<1.8	<1.8	<1.9	<1.8	<1.8	<1.8	<2.0
24	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
27	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
30	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<1.8	<2.0
33	<1.9	<1.9	<1.9	<1.8	<1.9	<2.0	<1.9	<2.0	<2.0

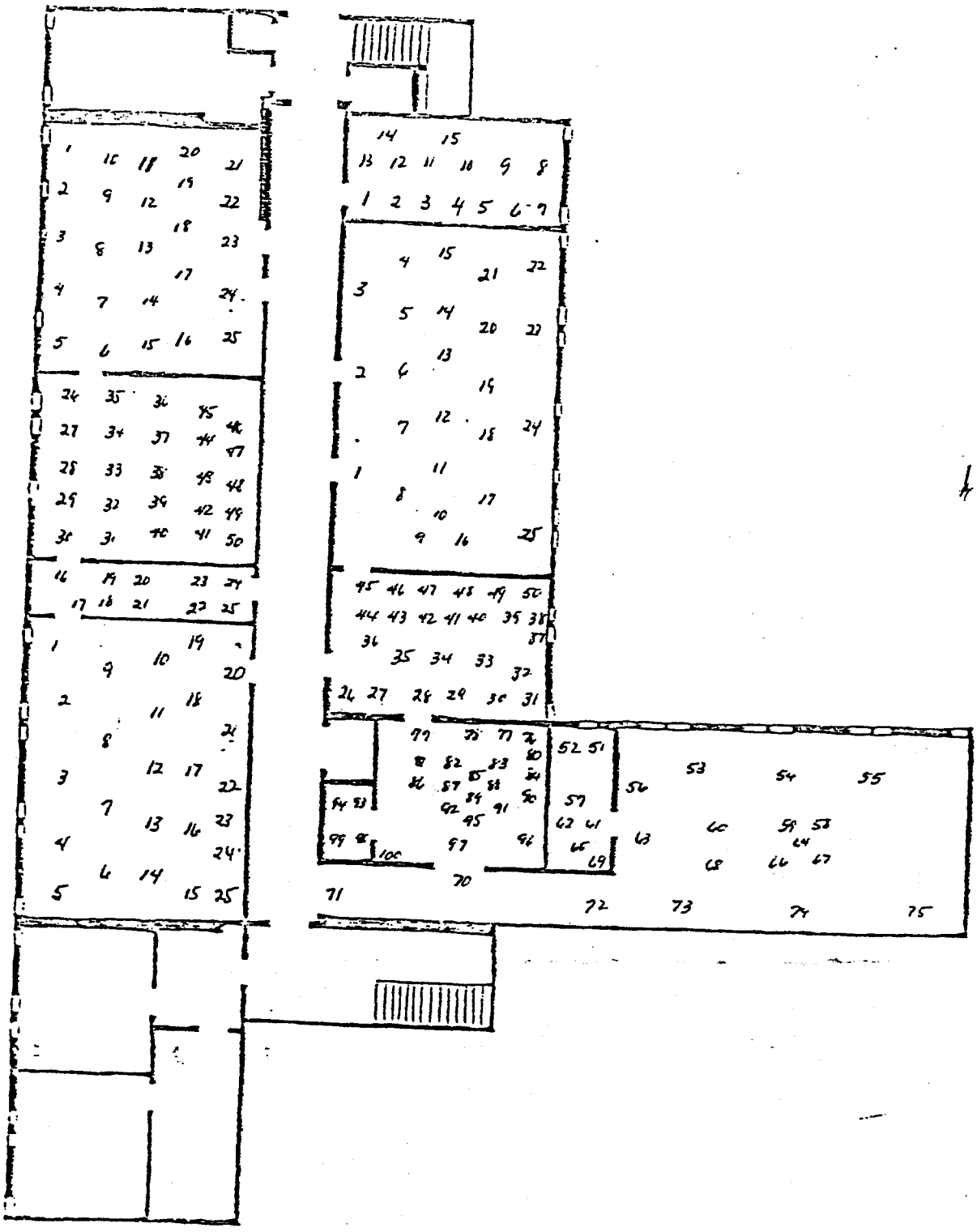
TAB D

SWIPE SURVEYS

CLOSEOUT SURVEY
SWIPE TEST

LOWER LIMIT OF DETECTION

ALPHA	1.53 dpm/100 cm^2
BETA/GAMMA	9.35 dpm/100 cm^2
GAMMA	42.27 dpm/100 cm^2



LAB 1

INST STORAGE

	ALPHA DPM	BETA DPM	GAMMA DPM
1	0.00	0.61	0.00
2	0.00	0.00	9.18
3	0.00	0.05	0.00
4	0.00	0.00	0.00
5	0.00	0.00	0.00
6	0.36	3.41	6.25
7	0.00	0.00	3.69
8	0.00	2.29	0.00
9	0.10	0.00	7.35
10	0.00	3.41	5.52
11	0.00	0.61	11.74
12	0.00	1.17	4.42
13	0.00	0.61	0.00
14	0.00	0.61	0.00
15	0.10	0.00	1.13
16	0.62	1.73	0.00
17	0.00	0.00	0.40
18	0.10	3.41	0.76
19	0.00	0.00	0.00
20	0.00	0.00	0.00
21	0.00	1.73	0.40
22	0.62	1.73	0.00
23	0.00	2.29	4.05
24	0.36	3.41	2.59
25	0.00	3.97	0.00
26	0.00	2.29	0.00
27	0.00	1.73	7.71
28	0.10	0.00	0.00
29	0.10	0.00	0.00
30	0.00	0.00	13.56
31	0.10	0.00	0.00
32	0.00	0.61	0.00
33	0.36	1.17	0.00
34	0.36	0.00	0.00
35	0.00	0.00	0.00
36	0.00	3.97	0.00
37	0.00	0.05	0.00
38	0.00	0.05	24.90
39	0.00	4.53	23.07
40	0.00	6.76	15.39
41	0.10	0.00	20.15
42	0.00	3.97	11.37
43	0.00	2.85	20.51
44	0.88	7.32	16.49
45	0.00	5.64	10.64
46	0.00	0.00	22.71
47	0.10	3.97	15.76
48	0.10	0.00	5.15
49	0.00	0.00	0.40
50	0.10	0.00	0.00

		ALPHA DPM	BETA DPM	GAMMA DPM
LAB 2	51	0.00	1.17	0.00
	52	0.10	2.85	0.00
	53	0.00	0.00	0.00
	54	0.10	0.05	0.00
	55	0.10	0.00	0.00
	56	0.00	3.41	0.00
	57	0.00	4.53	0.00
	58	0.10	0.00	0.00
	59	0.00	0.05	0.00
	60	0.00	0.00	0.00
	61	0.00	2.29	0.00
	62	0.10	0.00	0.00
	63	0.10	0.00	0.00
	64	0.00	1.17	2.59
	65	0.00	0.00	0.00
	66	0.00	1.17	3.32
	67	0.10	1.17	0.00
	68	0.00	0.05	0.00
	69	0.36	0.00	5.52
	70	0.00	0.00	0.00
	71	0.00	0.05	1.86
	72	0.10	0.05	0.00
	73	0.10	0.00	0.00
	74	0.00	0.00	0.00
	75	0.00	0.05	0.00
VAULT	76	0.36	5.08	0.00
	77	0.00	0.00	0.00
	78	0.00	1.73	0.00
	79	0.00	2.85	2.23
	80	0.62	1.73	0.00
	81	0.00	2.29	0.00
	82	0.00	0.61	0.00
	83	0.10	4.53	4.42
	84	0.00	0.00	0.00
	85	0.00	0.00	10.27
	86	0.10	2.85	4.42
	87	0.00	0.00	0.00
	88	0.10	2.85	0.00
	89	0.10	1.17	0.76
	90	0.00	1.17	0.00
	91	0.10	0.05	0.76
	92	0.00	0.00	0.00
	93	0.62	2.29	0.00
	94	0.62	0.05	0.00
	95	0.00	0.00	0.00
	96	0.00	5.08	0.00
	97	0.00	0.61	0.00
	98	0.36	1.17	0.00
	99	0.88	3.97	4.42
	100	0.00	5.08	10.64

		ALPHA DPM	BETA DPM	GAMMA DPM
DECON LAB	1	0.00	0.00	0.00
	2	0.62	0.00	0.00
	3	0.10	0.00	1.13
	4	0.00	0.61	12.47
	5	0.00	3.97	0.00
	6	0.10	0.00	0.00
	7	0.00	0.61	0.00
	8	0.88	0.00	0.00
	9	0.00	0.61	1.13
	10	0.10	1.73	0.00
	11	0.10	0.61	0.00
	12	0.36	0.00	5.15
	13	0.00	0.00	0.00
	14	0.10	0.61	0.00
	15	0.00	2.85	0.00
	16	0.10	0.05	0.00
	17	0.00	1.17	0.03
	18	0.10	0.00	0.00
	19	0.00	0.00	0.00
	20	0.00	0.00	0.00
	21	0.00	0.00	0.00
	22	0.10	2.29	16.49
	23	0.00	0.00	0.00
	24	0.10	0.61	0.76
	25	0.36	0.00	0.00
PREP LAB	26	0.10	0.00	0.00
	27	0.00	3.97	0.03
	28	0.00	0.61	16.49
	29	0.00	0.00	0.00
	30	0.36	21.86	0.00
	31	0.00	1.17	0.00
	32	0.00	0.05	7.35
	33	0.10	0.00	10.27
	34	0.00	0.05	0.00
	35	0.00	0.61	0.00
	36	0.00	0.00	2.59
	37	0.36	2.29	9.18
	38	0.10	0.05	0.40
	39	0.00	0.61	0.00
	40	0.00	0.00	0.00
	41	0.36	0.05	0.76
	42	0.00	4.53	0.00
	43	0.00	1.73	0.00
	44	0.10	1.17	0.00
	45	0.10	0.61	0.00
	46	0.00	1.17	10.27
	47	0.00	1.17	0.00
	48	0.00	0.00	0.00
	49	0.10	0.00	19.05
	50	0.10	1.73	0.00

		ALPHA DPM	BETA DPM	GAMMA DPM
HP LAB	1	0.00	1.73	12.10
	2	0.00	0.00	2.59
	3	0.00	0.05	0.00
	4	0.10	0.00	0.00
	5	0.00	0.00	13.56
	6	0.00	4.53	6.98
	7	0.00	0.05	6.98
	8	0.00	0.00	1.49
	9	0.36	0.05	0.00
	10	0.00	1.73	0.00
	11	0.00	0.00	2.96
	12	0.36	0.05	1.13
	13	0.00	0.61	0.40
	14	0.00	1.17	6.62
	15	0.00	0.00	0.00
INST REPAIR	16	0.00	2.29	0.00
	17	0.00	0.05	0.00
	18	0.10	1.17	0.00
	19	0.10	0.00	0.00
	20	0.09	0.61	17.95
	21	0.62	3.41	4.42
	22	0.00	0.00	0.00
	23	0.00	0.00	0.00
	24	0.00	1.73	1.86
	25	0.00	0.00	4.05
CLASSROOM	1	0.10	0.61	0.00
	2	0.62	2.29	0.00
	3	0.36	4.53	0.00
	4	0.00	3.97	0.00
	5	0.10	0.05	0.00
	6	0.00	0.05	0.00
	7	0.36	0.00	0.03
	8	0.00	0.05	0.00
	9	0.10	0.05	6.98
	10	0.00	0.61	0.00
	11	0.00	2.29	9.18
	12	0.10	0.00	8.08
	13	0.00	0.05	0.00
	14	0.00	2.29	10.27
	15	0.00	1.73	0.00
	16	0.10	0.00	0.00
	17	0.00	3.41	2.23
	18	0.00	3.97	26.37
	19	0.00	0.00	2.96
	20	0.00	1.17	2.96
	21	0.36	0.00	0.00
	22	0.00	0.00	11.00
	23	0.00	1.73	0.00
	24	0.00	0.61	2.96
	25	0.10	0.00	18.69

Truffa, Bart, Sergeant Major, USA, Retired
1999 Interview by Bridgette Lyons, U.S. Army Center for Health Promotion and Preventive Medicine, Aberdeen Proving Ground, Maryland.

Interview with Bart Truffa, Sgt. Major, USA, Retired. Worked at Rideout Field 1969-1971 & 1972 until the field closed.
Phone (410)273-7259

Rattlesnake Gulch & Iron Mountain material moved to Pelham Range & buried. The material was buried in the same location as sources.

When Old Rideout Field was abandoned, Mr. Truffa is not sure is all the sources were removed. Sources were raised & lowered with chains, if a chain broke the source was left in the ground. Due to high dosage the practice of physically raising & lowering sources was stopped.
All rad. teams for the U.S. Army & other agencies trained at Pelham Range. The field was used to simulate fallout.

Possibly 5 Co-60 sources in the burial mound (based on rad. survey by CHPPM). Smaller burial holes in old field area.

Open air training with agents stopped in the 1970s.

Rad. Training Facility. No sources were stored at Rideout Hall. Three source sets may have been taken to the Hall & returned to Main Post. The parking lot at Rideout Hall was hard ground, the lot was regraded several times. When asked if he had knowledge of the location of the bleachers in the past (for G-shoots) Mr. Truffa said the bleachers were skid mounted & moved from location to location.
The fence line around Rideout Field was defoliated with 2,4,D and 2,4,5, T

Mr. Truffa heard of mustard being used in Training Area 10B.

Mr. Truffa heard stories of AAD bringing agent onto Pelham Range for burial. Used the back gate (Gate 14), may have used Gate 13.

Some of the home made sources used at Rideout Field were made at the Hot Cell at Rattlesnake Gulch.

There is a current troop assembly area in Rideout Field that is approximately 100 meters NNE of the burial mound.

U.S. Army Chemical Center and School
1964 Memorandum Number 385-2, Radiological Safety Program, 15 September 1964. Record Group 175, Box 5, Entry 1. National Archives II, College Park, Maryland.

Entry 1
Box 5

US ARMY CHEMICAL CENTER AND SCHOOL
Fort McClellan, Alabama

MEMORANDUM
NUMBER 385-2 Suppl 1 dtg 65

15 September 1964

Effective until rescinded or superseded

RADIOLOGICAL SAFETY PROGRAM

	Paragraph
Purpose	1
Scope	2
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Responsibilities	6
Radiological Safety Procedures	7

1. Purpose. To prescribe the policies and procedures necessary to minimize the exposure of personnel to nuclear radiation and to insure safe use of radioactive material in the various instructional programs.

2. Scope. This memorandum provides implementing instructions for Radiological Safety, Annex E, Pamphlet 2, U. S. Army Chemical Center and School. It is applicable to all personnel who, by working or visiting this installation, come into an environment influenced by radioactive material in the possession of the U. S. Army Chemical Center and School.

3. Objective. To prescribe procedures necessary to insure:

a. Control of exposure to external and internal sources of ionizing radiation emanating from radioactive material.

b. Containment of radioactive material and radiological contamination.

c. Compliance with pertinent regulations and directives of the U. S. Atomic Energy Commission and Department of the Army and the provisions of the Byproduct Material and Special Nuclear Material Licenses issued to the U. S. Army Chemical Center and School.

This Memorandum supersedes USACMLCS Memorandum 385-2 dated 26 June 1964.

TELEPHONE LISTINGS

Chief, Health Physics Branch	3083	3639
Sergeant Major, Health Physics Branch	3083	4409
Safety Officer, U. S. Army Chemical School	4735	
Chief, Radiological Branch	3712	3566
Alternate (Mr. Edward Bradley)	4322	236-1095
Chief, Technical Division	3431	4886
Assistant Commandant	4162	
Commandant	4161	
Duty Officer, U. S. Army Chemical School	3141	

LOCATION OF RADIOACTIVE MATERIAL STORAGE FACILITIES

Radiological Laboratory	Bldg 3182
Vault Radiological Laboratory	Bldg 3180
Room 35, Isotope Laboratory	Bldg 3181
Room 36, Sacler Laboratory	Bldg 3181
Radiological Training Area	Pelham Range
Alpha Field	Behind Bldg 3165
Hot Cell	Bldg 3192

Inclosure #1 to MEMO 385-2, USACMLCS, dated 15 September 1964

RADIOACTIVE WASTE DISPOSAL

1. Solid.

a. Radioactive waste (filters, filter papers, wipes, rags, metal objects, dirt, etc.) will be packaged in polyethylene wrapping and stored in covered 55-gallon drums. When required, the drums will be lined with lead or concrete to afford necessary shielding. These drums will be kept in the temporary storage area next to the loading platform (see attached schematic) within the fenced-in area, between the Radiological Laboratory and the Hot Cell Building. The amount of radioactive waste in temporary storage is limited to a quantity which will not produce a dose-rate greater than 100 mrad/hr in any part of the storage area.

b. Drums will be sealed and labeled in accordance with I.C.C. regulations.

c. When sufficient containers are available to constitute one shipment (40 radiation units), a request for disposition instructions will be made to the Commanding General, U. S. Army Edgewood Arsenal, Maryland.

2. Liquid.

a. General. Liquid radioactive waste generated in operations and/or procedures, other than in the Hot Cell Facility, will be collected in appropriately labeled polyethylene containers reserved for this purpose and turned in to the Health Physics Branch for further disposition. Normally, the volume and activity of this waste is so low that it can be consolidated and stored until such time that it can be mixed with concrete used in lining the 55-gallon containers utilized in shipment of the solid radioactive waste.

b. Hot Cell Facility.

(1) The Hot Cell Facility (Bldg #3192) is designed with a liquid radioactive waste disposal system as an integral part of the facility. It consists of two retention tanks, one of 1500-gallon capacity and an auxiliary tank of 100-gallon capacity. These tanks are buried underground away from the Hot Cell Building and are joined to the building with underground piping and valving.

(2) The liquid waste disposal system receives its effluent from the following areas:

(a) Hot Cell Table Drain

(b) Hot Cell Floor Drain

(c) Hot Cell Door Rail Pit Drain

(d) Lavatory Drain

(e) Shower Drain

(f) Work Area Floor Drains

(3) The drain lines from the Hot Cell enter the 1500-gallon tank. This drain line operates by gravity flow and has a by-pass arrangement for entering the auxiliary 100-gallon tank. This tank may serve the purpose of collecting highly radioactive wastes in the event this is expected. It can then be diluted a little at a time with the liquid in the rest of the system by mixing inside of the larger tank or if so desired it can be channeled directly to the outlet valves on the loading dock where it can be transferred into containers not connected with the system.

(4) The outlet valves of the 1500-gallon tank are kept secured at all times and the tank is supplied with two float switches. The high level switch actuates a visible and audible alarm at the master control panel when the tank is filled to 90% capacity. The low level switch serves to protect the rotary pump when the tank has been pumped dry. Prior to the discharge of any of the tank's contents, a sample of the effluent must be obtained and analyzed to determine the radioactive contamination. There are three (3) sampling points in the system, one samples the tank, one after the liquid passes through the Kleer-Flo Particulate Filter and one immediately after the Ion Exchanger Units where the liquid can be directed either back into the tank or to the loading dock or sanitary sewer, whichever the case may be. When the activity level is such that it is below the AEC established limits for release, the outlet valve will be turned on by the Health Physicist or his designated representative, the rotary pump put into operation and the tank discharged into the sanitary sewer system. If the level of activity is in excess of these limits, and it is due to short-lived isotopes, the liquid will be held until the activity has decayed to an acceptable level. If the activity is due to long-lived isotopes, the liquid will be circulated through the filter and/or Ion Exchanger Units until it is safe to discharge. Any contaminated filters and/or ion exchange resins will be disposed of as solid waste material.

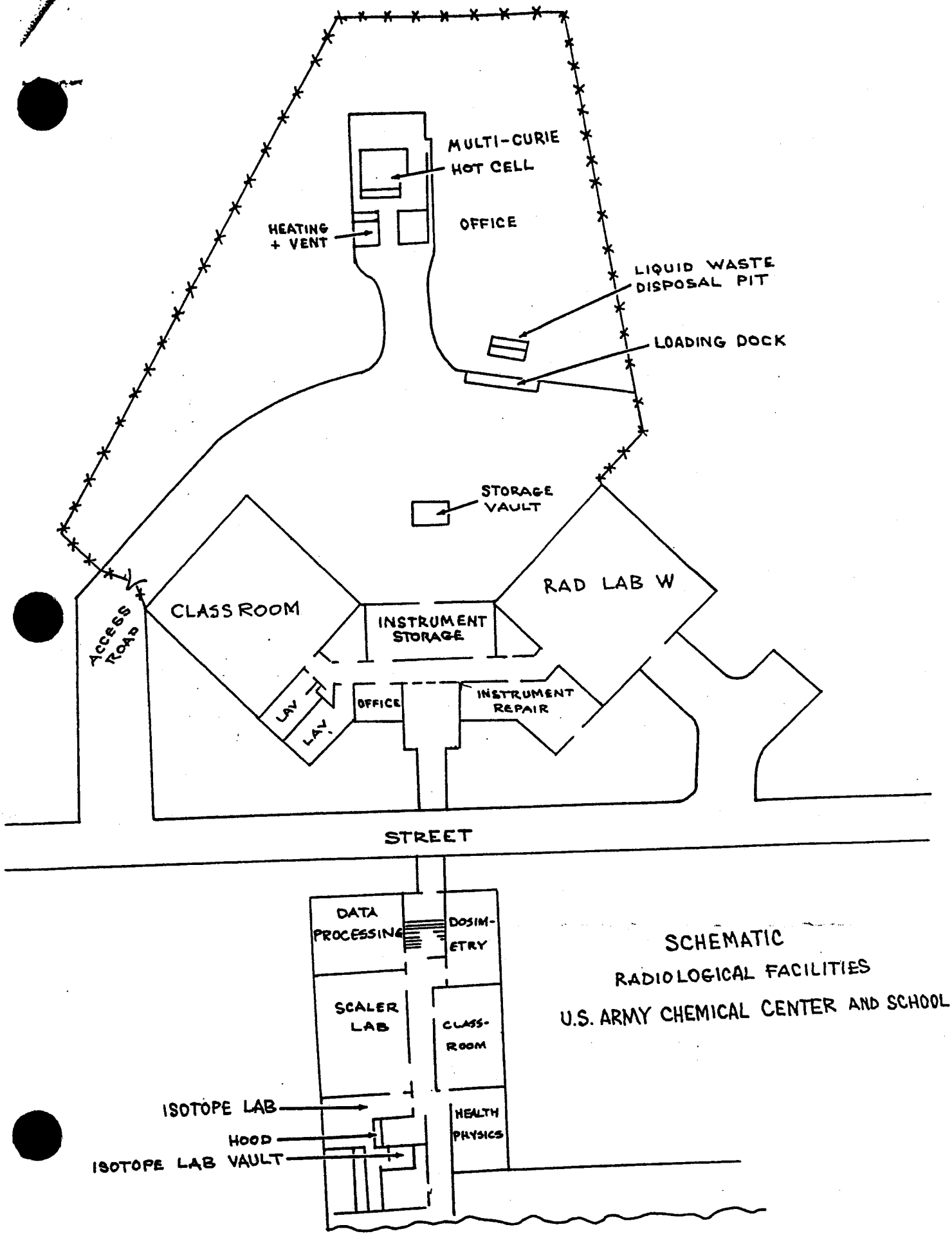
3. Records. In accordance with pertinent directives of the U. S. Atomic Energy Commission and Department of the Army, the following permanent records will be maintained and kept on file in the Health Physics Branch:

a. Radioactive Waste (Solid). All correspondence requesting disposition instructions and completed actions (shipping documents).

ONAL ARCHIVES

b. Radioactive Waste (Liquid). A documentary log recording all activity released to the Sanitary Sewer System showing quarterly and annual totals.

c. Receipt of Radioactive Waste and Disposition. All correspondence from other branches, agencies, etc., requesting turn-in of radiological waste for further disposition by the Health Physics Branch, and record of completed action.



SCHEMATIC

RADIOLOGICAL FACILITIES

U.S. ARMY CHEMICAL CENTER AND SCHOOL

U.S. Environmental Health Laboratories

1957 Progress Report on Summary of Action on Recommendation, Report of Radiation Protection Survey Number 2672R75057, 27-28 May 1957. Army Chemical Center, Maryland.

PROGRESS REPORT ON SUMMARY OF ACTION ON RECOMMENDATION MADE IN REPORT OF RADIATION PROTECTION SURVEY NR 26-72-75057, 27-28 MAY 1957, BY INSPECTING TEAM, US ARMY ENVIRONMENTAL HEALTH LABORATORIES, ARMY CHEMICAL CENTER, MARYLAND

Para 5a,b&c: Arrangements are being made to acquire tags from commercial sources. Metal tags with the necessary information are to be attached to the radioactive sources with a metal fastener. Identifying, labeling and inventory of the sources are to be accomplished at the same time. This procedure will prevent remanding of the radioactive material for each task, thus reducing the dosage received by personnel performing the operations.

Inventory is maintained as to location and quantity. As soon as the above tags are received this inventory will list individual sources by tag number.

An inventory of Pulham Range field sources has been accomplished according to the requirements set up by Mr. Hitch, AEC, during the conference held with him on 7 August 1957.

Para 5d: Accomplished. See reference 1a, 3d Ind.

Para 5e: Use of present "hot cell" has been discontinued.

Para 5f: Accomplished. See reference 1a, 3d Ind.

Para 5g: Accomplished. See reference 1a, 3d Ind.

Para 5h: A request for a 6 foot fence consisting of a 4 foot hog wire fence, topped by 3 strands of barbed wire, has been submitted to Third Army for budgeting. Fence will be erected by post personnel when funds are made available.

Para 5i: According to the requirements set up by Mr. Hitch, AEC, on 7 August for leakage tests, 20 randomly selected Pulham Range field sources have been tested for leakage. No leakage was found.

Para 5k: See reference 1a, 3d Ind.

Para 5l: The old burial ground presently is fenced with 3 strands of barbed wire and adequately posted. On 25 September 1957 work will be started on the construction of a 6 foot fence consisting of 4 foot hog wire, topped by 3 strands of barbed wire, around the old burial ground. The necessary supplies are on hand for this job.

Para 5n: See reference 1a, 3d Ind.

Para 5o: Use of the new burial ground has been discontinued. Future waste will be disposed of in accordance with the provisions of AR 755-380.

PROGRESS RPT ON RADIATION PROTECTION SURVEY NR 2672R75-57 (Cont'd) :

Para 5p: Arrangements have been made with Lexington Signal Depot for conducting accuracy tests. A test as outlined in reference 1a, 3d Ind is currently being conducted and will be completed on 30 September 1957.

The US Army Chemical Corps School SOP for handling radioactive material is completed in draft form. The SOP has been staffed through AEC By-Product Licensing Isotope Extension Division of Civilian Applications. All suggestions and recommendations made by them have been incorporated in the present Standing Operating Procedures.

Wood, C.H., Colonel, CmlC
1955 Letter to Chemical Corps Training Command, Fort McClellan, Final Disposition of Radioactive Tantalum and Container, 23 November 1955. Record Group 175, Box 7, Entry: Chemical Corps School. National Archives II, College Park, Maryland.

...ED AT THE NATIONAL ARCHIVES

CMLTC-S-8 400.2

23 NOV 1955

SUBJECT: Final Disposition of Radioactive Tantalum and Container

TO: Commanding Officer
Chemical Corps Training Command
Fort McClellan, Alabama
ATTN: Director of Logistics

1. References: Ltr CMLTC-S-8, Subject: Disposition of Radioactive Tantalum and Container, To: CO, CMLCTNGCOM, dtd 29 Dec 54.

2. The First Radiological Safety Support Unit, supervised by the Health Physics Group, disposed of the radioactive tantalum on 18 October 1955. The material was buried in sealed cans in The Chemical Corps School Radioactive Materials Burial Ground.

3. The tantalum container has been salvaged for use by the Radiological Branch, The Chemical Corps School.

4. All prescribed radiological safety measures have been observed.

C. H. Wood

C. H. WOOD
Col, CmlC
Chairman, Isotope Committee
APPROVED:
Chief, Health Physics Group CSB
Chairman, Isotope Committee CHW

MEMO FOR RECORD:
Letter from CMLCTNGCOM, dtd 10 Jan 55, authorizes disposition of tantalum and container by The Chemical Corps School, and requests notification of final disposition.

P701

400.2

FILE. NOV 30 1955