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HW-83710

October 7, 1964

CONTROL OF UNDERGROUND RADIOACTIVE MATERIALS
IN DEACTIVATED REACTOR AREAS

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INTRODUCTION

This document provides guidance to those responsible for protecting the public from underground radioactive materials in deactivated reactor areas at Hanford. It is assumed access control to these areas will be maintained for at least five years. Prior to relaxation of access requirements, the condition of underground materials should be reviewed and the radiological control measures modified. This document recommends only those measures needed to protect the reasonably prudent but uninformed layman in the vicinity of a deactivated reactor. Particular attention was given to the first five years after deactivation.

Many recommendations here are based on Hanford standards. These standards were devised primarily to provide radiation control measures for waste burial in an operating area but have some application in preparing the sites for abandonment. Waste disposal facilities associated with the deactivation of DR Reactor were not given the same detailed consideration as facilities in 100-F and 100-H Areas because 100-D Area will remain in operation. Similarly, disposal sites in 100-F remaining in custody of the Biology Operation, Hanford Laboratories, were not considered in deriving recommendations of this report.

SUMMARY

The following items are recommended to protect the public from underground radioactive materials in deactivated reactor areas.

1. Review records of underground disposal facilities and update information such as locations, dimensions, and contents. Accuracy of data should be verified where practical. For example, boundaries of disposal sites should be plotted according to plant coordinates by a surveyor.
2. Backfill trenches and pits to normal grade. At least four feet of soil cover should be provided and the dose rate at the surface of the backfilled trench or pit should be less than 1 mrem/hour. Making a mound to obtain the recommended depth of cover or to reduce dose rate below the 1 mrem/hour is not permitted.
3. Remove fencing from around all burial sites, except those within the 105 exclusion areas. Equipment should not be stored above grade within abandoned solid waste burial grounds.

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4. Erect marker posts (AC-5-40) to define boundaries of those underground sites predicted to contain significant quantities of radioactive materials five years after reactor deactivation. The "Instructions for Use" of AC-5-40 should be followed in erecting the posts. New marker posts will not be required at any of the burial sites within a 105 exclusion area.
5. Backfill or seal off portions of the coolant effluent system to prevent spread of contamination.
6. Issue reports within two months after each area is abandoned, documenting condition of underground radioactive materials and providing advice on further control measures.

RECORDS

Radiological Engineering, Research and Engineering Section, maintain records on underground radioactive materials in the reactor areas. These records are based on a comprehensive review of the underground sites in 1956 and on notices of subsequent changes submitted by users. Although no effort is made to account for radioactivity on a curie basis, fair estimates of activity and/or potential consequences can be made from the description of the type of material released to ground or buried at any given site. The portion of the record pertaining to 100-F and 100-H is reproduced in Appendix A. This portion of the record needs to be updated by the custodians. It is recommended that the boundaries of disposal sites be rechecked and plotted according to plant coordinates by a surveyor. In some instances, descriptions of the contents should be rewritten according to best current knowledge.

A report should be issued by the area Radiation Monitoring Supervisor within two months after reactor deactivation to make the description of the buried radioactive material readily available to anyone interested in using the land. This report should not only document conditions of buried radioactive material but should provide advice on control measures needed to protect future land users.

MARKING AND BACKFILLING BURIAL GROUNDS

Radiation Control Standard 7.1 requires an abandoned burial trench or pit be backfilled to normal grade, providing at least two feet of dirt cover and a radiation level of not more than 1 mrem/hour at normal grade. Radiation protection engineers in Hanford Laboratories have recommended that at least four feet of soil cover be provided. It is likely that the standard will be changed soon to require the deeper cover, but even if the standard were not changed, a four-foot minimum cover would be prudent since the sites will be abandoned shortly after the final burials. It will not be necessary to add cover to previously backfilled trenches or pits, if radiation levels are less than 1 mrem/hour at the normal grade.

The current practice of storing contaminated equipment above grade in a solid waste burial ground will not be permitted when the site is abandoned, because the stored gear would be unsightly and require periodic surveys. All such material must be removed or buried.

Decisions must be made regarding the marking of burial site boundaries, such as the type of marker to be used, the sites needing marking, and the number of markers needed for each site. Marker posts intended for permanent marking of burial plots containing solid radioactive material are described in "Architectural-Civil Standards, AC-5-40." The standard as well as the "Instructions for Use" of AC-5-40 are reproduced in Appendix B. This marker should be the only type used to denote boundaries of the burial grounds in abandoned areas. Fencing or chain barricades currently around burial sites should be removed prior to abandonment to avoid necessity of maintaining or replacing later.

There are burial plots and liquid waste disposal sites that will not require erection of markers. These include the underground radioactive materials within the 105 exclusion area. Any excavation that will be done in this area after deactivation will require adequate control measures, including referring to records of buried radioactive materials. The 105 building itself and the fencing provide all the marking required. Furthermore, there are facilities outside of the 105 exclusion area where the potential consequences of the underground radioactive material do not warrant erection of markers. There are sites where small amounts of liquid waste were released to ground many years ago that no longer contain significant quantities of radionuclides. The quantity of radioactive material at each site should be estimated and the potential consequences of land use or disturbance evaluated. The following criteria is recommended: Marker posts need not be installed where it can be predicted that radiological control measures will be unnecessary for any conceivable use of the land five years after deactivation. The five-year period is based on the assumed time access control will be retained by operators of remaining Hanford reactors.

The principal sites requiring markers at 100-F and 100-H are three solid waste burial grounds. These are large areas with perimeters totaling over 6000 feet. If the "Instructions for Use" of AC-5-40 were followed, 200 marker posts would be needed to define the boundaries of these three large burial grounds. There are efforts being made to revise the "Instruction" or obtain "an exception" in order that the number of posts to be installed can be substantially reduced. However, as of the date of this report, the number of posts required and the spacing between posts are as stated in the "Instructions for Use" of AC-5-40.

EFFLUENT SYSTEM

The coolant effluent system components are contaminated and control measures will be necessary. The radionuclide of greatest concern is Zn^{65} with a 250-day half life, although relatively small quantities of fission products with longer half lives will also be present. The control objective will be to prevent spread of contamination and to prevent personnel contact during the first five years after reactor deactivation. After the five-year period, no further control will be necessary, because the activity will be insignificant. Erection of marker posts to define locations of any effluent system component will be unnecessary. Furthermore, posts are not needed where effluent may have been released to ground or where effluent sludge was buried. However, all pertinent information on these sites should be documented in the report to be issued after deactivation.

The effluent pipes should be sealed to prevent contamination spread and personnel entry. Covering portions of the effluent pipe that are above ground is not

necessary. The junction boxes should be checked to determine if they are adequately sealed.

The sewage lift stations (1608) are to be locked and posted to prevent an unmonitored entry. If the pumps are removed from a 1608 building within five years of deactivation, the tank tops will have to be sealed to prevent dry contamination from spreading.

Seal the outfall structure (1904) pipe openings and fill with sufficient earth to cover and secure the contamination.

The cap walls and baffles should be pushed into the bottom of the retention basin (107). A four-foot deep earth fill should cover all contaminated surfaces. The depression left in the center of the basins would not be objectionable. However, the rupture effluent trench should be backfilled to grade.

PERTINENT STANDARDS

In an effort to collect all applicable information within the covers of this report, Radiation Protection Standard 7.1 is reproduced in Appendix C and Radiation Control Standard 8.2 is reproduced in Appendix D. Some of the individual items listed obviously do not apply to abandoned waste disposal facilities, but others are worthy of clarifying comment.

Radiation Protection Standard 7.1 requires the boundaries of the disposal areas to be identified both at the site and on master diagrams and plans. Conformance to this item is assured, if medallions on the marker posts are identified with numbers assigned by Radiation Protection Operation, HL, and these numbers are also shown on the report issued, within two months of deactivation.

Radiation Control Standard 8.2 requires solid waste pits and burial grounds being used exclusively for solid waste disposal and pits and cribs for liquid wastes being used exclusively for liquid wastes. The purpose of this item is to minimize leaching of radioactive material from solid wastes. A trench or pit originally made and used for liquid waste disposal, but is now essentially dry, could be used for disposal of solid waste just prior to backfilling and abandoning. However, such action should have concurrence of Radiological Engineering.

The weed control program as mentioned in RCS 8.2 may be desirable. This item should be specifically discussed in the document that is to be issued within two months after deactivation.

W. N. Koop

Radiological Engineering Unit
Research and Engineering Section

WN Koop:nmd

APPENDIX ARECORD OF UNDERGROUND RADIOACTIVE WASTE

PART I - 100-F REACTOR AREA

107-F RADIATION ZONE

Coolant effluent has contaminated surface ground area on the northwest and east side of the 107-F retention basin. All detectable surface contamination is within the posted radiation zone. Underground seepage from the 107-F basin to the river has spread radioactive material upstream to the 181-F Building and downstream, perhaps as far as five miles.

(Drawing - Reference 1)

107-F RUPTURE EFFLUENT TRENCH

The posted area includes a trench and a flume from the second generation effluent line. Trench was excavated in 1950 to dispose of coolant effluent containing rupture debris. However, since about 1958, no rupture effluent has been sent to this trench. During 1963, effluent was diverted to trench during an extended outage to permit pipe repair. No appreciable contamination was detected in this area in a 1964 survey.

(Drawing - Reference 2)

188-F ASH PIT

Minor quantities of radioactive material have been found in the pit. This contamination is probably from leaks in the effluent line. The area is marked with a chain fence.

(Drawing - Reference 3)

1608-F TRENCH

Trench was excavated in 1952 for disposal of outage effluent. The area is marked with a chain fence.

(Drawing - Reference 4)

105-F STORAGE BASIN TRENCH

Excavation date and exact location of the trench is uncertain. It was used to receive effluent during an early rupture outage. Sludge removed from the storage basin in 1951 was put in trench and then covered to grade with about eight feet of soil. The site is not marked.

(Drawing - Reference 5)

105-F PLUTO CRIB

This crib was constructed for disposal of coolant from process tubes containing a ruptured fuel element. The construction date is uncertain, probably about 1950. The crib was covered with 10 to 12 feet of soil after the relatively short period of use. The location is identified by a vent pipe and a four-inch steel post.
(Drawing - Reference 6)

BALL WASHER CRIB

Wastes from the decontamination of boron balls in 1953 were buried and covered with several feet of soil. The site is marked with a chain fence.
(Drawing - Reference 7)

115-F PIT

The pit was excavated in 1949 to hold silica gel removed from a dryer room and promptly covered to grade with five or six feet of soil. The location is identified by a yellow steel post.
(Drawing - Reference 8)

MINOR CONSTRUCTION BURIAL GROUND #1

Irradiated gear, such as VSR thimbles and step plugs removed from the 105-F during 1952, was buried just outside exclusion area and covered with five feet of soil. The site is marked with nonstandard concrete monuments.
(Drawing - Reference 9)

SOLID WASTE BURIAL GROUND #2

This site was opened in 1955, and the boundaries were extended on two subsequent occasions. Three trenches running north and south contain miscellaneous contaminated waste. The center and western trench have been covered to grade with at least two feet of soil. The eastern trench is in current use. West of these trenches are a number of pits containing irradiated process tubing and dummy elements. Sandblasting facility is located in the northwest corner of the burial ground. A wire fence enclosing the entire area. Immediately adjacent to the southwest portion of this burial ground is a separate burial facility under the custody of the Biology Operation, Hanford Laboratories.
(Drawing - Reference 10)

MINOR CONSTRUCTION BURIAL GROUND #2

Solid wastes from 105-F construction work were put into two holes during 1954 and covered with soil to grade in late 1955 or early 1956. The area is marked with underground radiation signs on steel posts and is located adjacent to the north boundary of solid waste burial ground #2.
(Drawing - Reference 11)

LEWIS CANAL

Miscellaneous liquid wastes from 105-F and 190-F Buildings as well as decontamination wastes from 189-F Building are routinely released to this ditch. Occasionally contaminated coolant from the reactor front and rear faces also drain to this ditch. Effluent water drained to the river via this ditch during the Ball-3X outage in 1953. Significant contamination is limited to the bunks upstream or south of grid coordinate N-80000 (northern boundary of the 151-F substation). This portion of the ditch is marked with chain fencing.
(Drawing - Reference 12)

SOLID WASTE BURIAL GROUND #1

This was the original solid waste disposal site in 100-F Area. There are eight trenches containing miscellaneous solid waste from 105-F and one Biology solid waste trench. There are also several large cylindrical sleeves used for disposal of liquid wastes from 108-F. These trenches and sleeves were covered to grade with about six feet of soil in 1955. Subsequent excavations were made to recover dummy elements and as a result some dummies with relatively low radioactivity remain near the surface. Three horizontal control rods are buried under two feet of soil near the center of the burial ground. The entire area is enclosed with a wire fence.
(Drawing - Reference 13)

117-F CRIB

This crib was constructed in 1960 as part of the confinement system. Drainage from the filter seal would contain serious quantities of radioactive materials following some possible reactor accidents. To date, no significant quantity is known to have been drained to this site. The facility is identified by a vent pipe and four steel posts.
(Drawing - Reference 14)

PERF DECONTAMINATION DRAIN

Spent nitric acid and water rinses from the perf decontamination facility on the 105-F wash pad are released to this French drain. The site is marked by the three-foot vitreous tile conduit at the ground surface.
(Drawing - Reference 15)

CONCRETE BOX

A concrete box about eight feet deep has been used for storage of contaminated equipment. Contamination levels within the box are normally low.
(Drawing - Reference 16)

MISCELLANEOUS BIOLOGY ZONES (prior to 1956)

<u>Drawing Reference Number</u>	<u>Disposal Facilities</u>
17	Garden Near 1705-F Building
18	1705-F French Drain
19	108-F French Drain
20	Strontium-90 Garden

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N82000

N81000

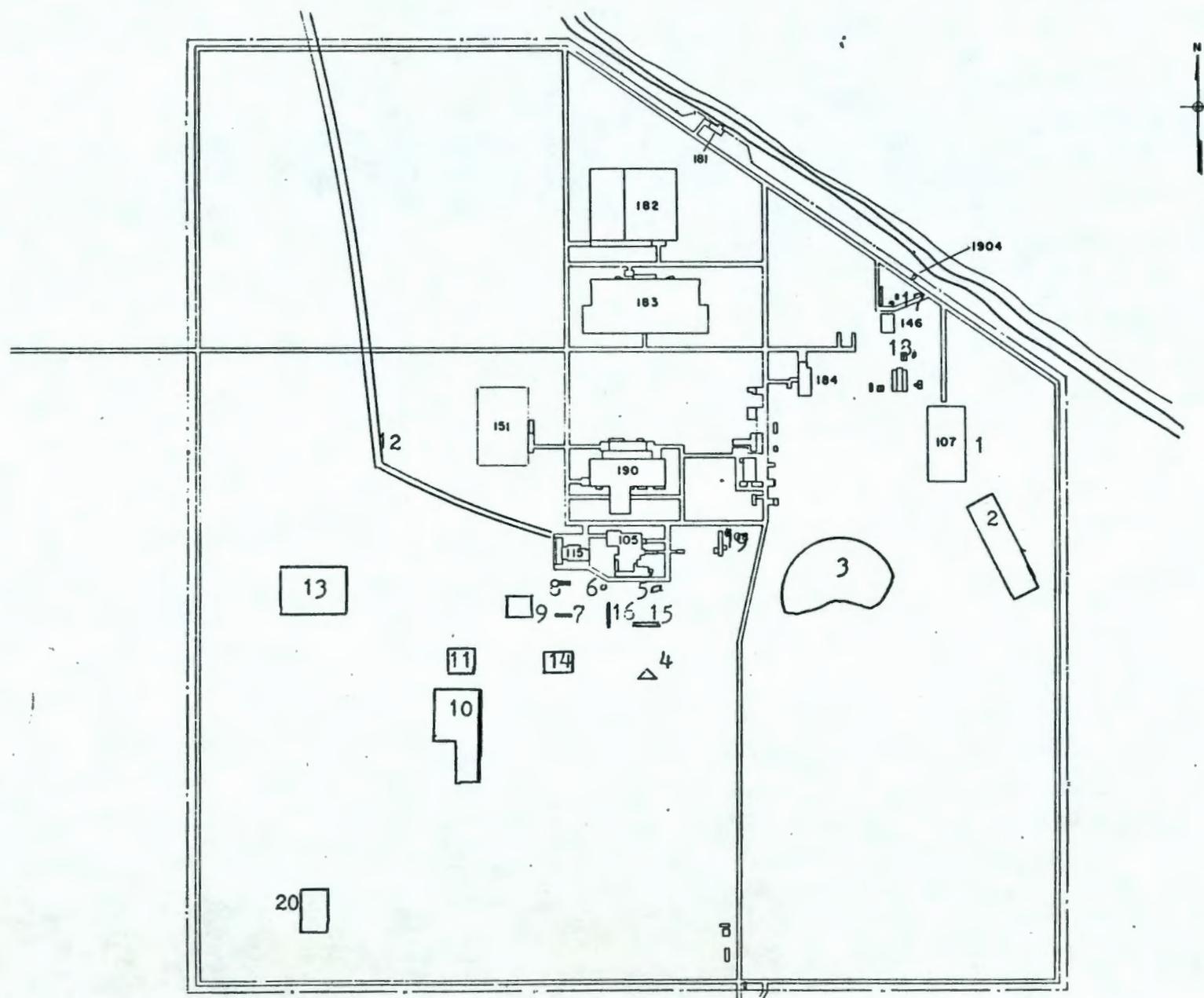
N80000

N79000

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N77000

00082M



SCALE IN FEET

100-F AREA

PART II - 100-H REACTOR AREA

107-H BURIED SLUDGE

Sludge and waste from the 107-H basin were buried in 1953. The trench is covered with five feet of soil to grade and is marked with nonstandard monuments.
(Drawing - Reference 1)

107-H RUPTURE EFFLUENT TRENCH

Trench was excavated in 1952 to dispose of coolant effluent containing rupture debris. Since about 1958, no rupture effluent has been sent to this trench. The entire trench area is enclosed with a chain fence.
(Drawing - Reference 2)

BURIED CONTAMINATED PIPE

Several sections of 16-inch pipe used in 1953 as chutes for removal of thimbles from 105-H were buried and the two trenches covered with six feet of soil. The location is marked by nonstandard concrete monuments.
(Drawing - Reference 3)

1608-H TRENCH

This trench was excavated in 1953 to receive effluent during the Ball-3X outage and was subsequently backfilled to grade. The area is marked with nonstandard concrete monuments.
(Drawing - Reference 4)

BURIED THIMBLE FROM X-LEVEL

A thimble assembly from "B" hole 105-H was buried during 1953 in a trench and back-filled to grade. The trench location is marked with nonstandard cement monuments. The site is under the custody of Irradiation Testing Unit.
(Drawing - Reference 5)

105-H PLUTO CRIB

This crib was excavated in 1950 to dispose of effluent from tubes containing a ruptured fuel element. This facility was covered to grade with about 10 feet of soil during 1952. The area is marked by monuments.
(Drawing - Reference 6)

BALL-3X BURIAL GROUND

Irradiated gear, such as VSR thimbles and guides, was removed from 105-H and buried in a trench during 1953. The trench was covered to grade with about five feet of soil, and the location was marked with monuments.

(Drawing - Reference 7)

SOLID WASTE BURIAL GROUND

This burial ground was opened in 1949 and enlarged in 1955. There are three large trenches that have been backfilled to grade with six feet of soil and one open trench currently receiving miscellaneous waste. There are also a number of pits for disposal of process tubing and dummy elements. Portions of several horizontal control rods were buried in slit trenches with from two to four feet of soil cover. The entire burial ground is enclosed with a chain fence.

(Drawing - Reference 8)

H-1 LOOP BURIAL AREA

This burial area is under the custody of the Irradiation Testing Unit. Two concrete-lined vaults are located in a line. The east vault contains a stainless steel double tube removed from the reactor in 1955 after several years' irradiation. The west vault was constructed in 1958 to receive a smaller facility still in the reactor. Within the area, there are also some solutions used to clean up the tube and some miscellaneous capsule components. The area is marked with a chain fence.

(Drawing - Reference 9)

PERF DECONTAMINATION DRAIN

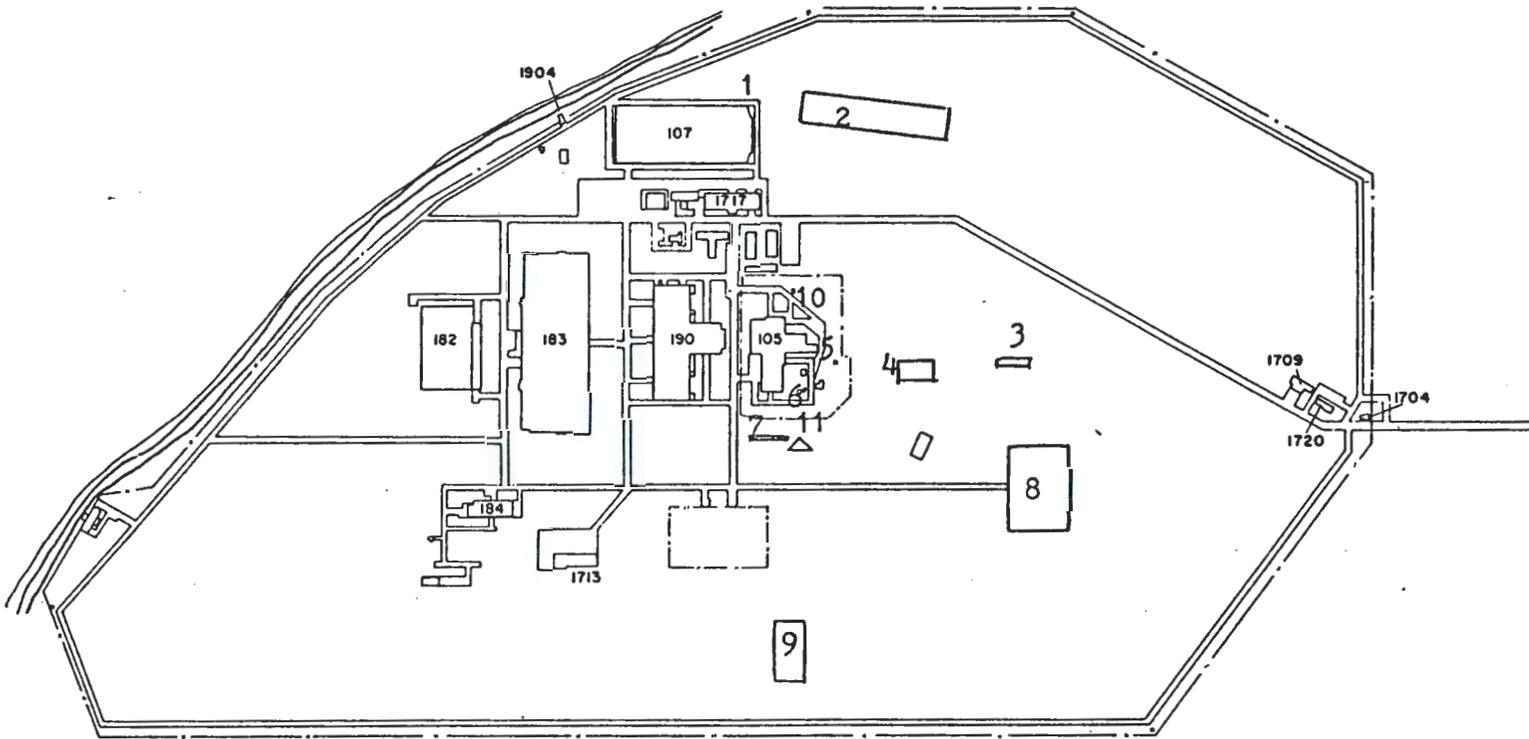
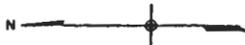
Spent nitric acid and water rinses from the perf decontamination facility on the 105-H wash pad are released to this French drain. The site is marked by the three-foot vitreous tile conduit at the ground surface.

(Drawing - Reference 10)

117-H CRIB

This crib was constructed in 1960 as part of the confinement system. Drainage from the filter seal would contain serious quantities of radioactive materials following some possible reactor accidents. To date, no significant drainage has been experienced at this site. The facility is identified by a vent pipe and four steel posts.

(Drawing - Reference 11)



100-H AREA



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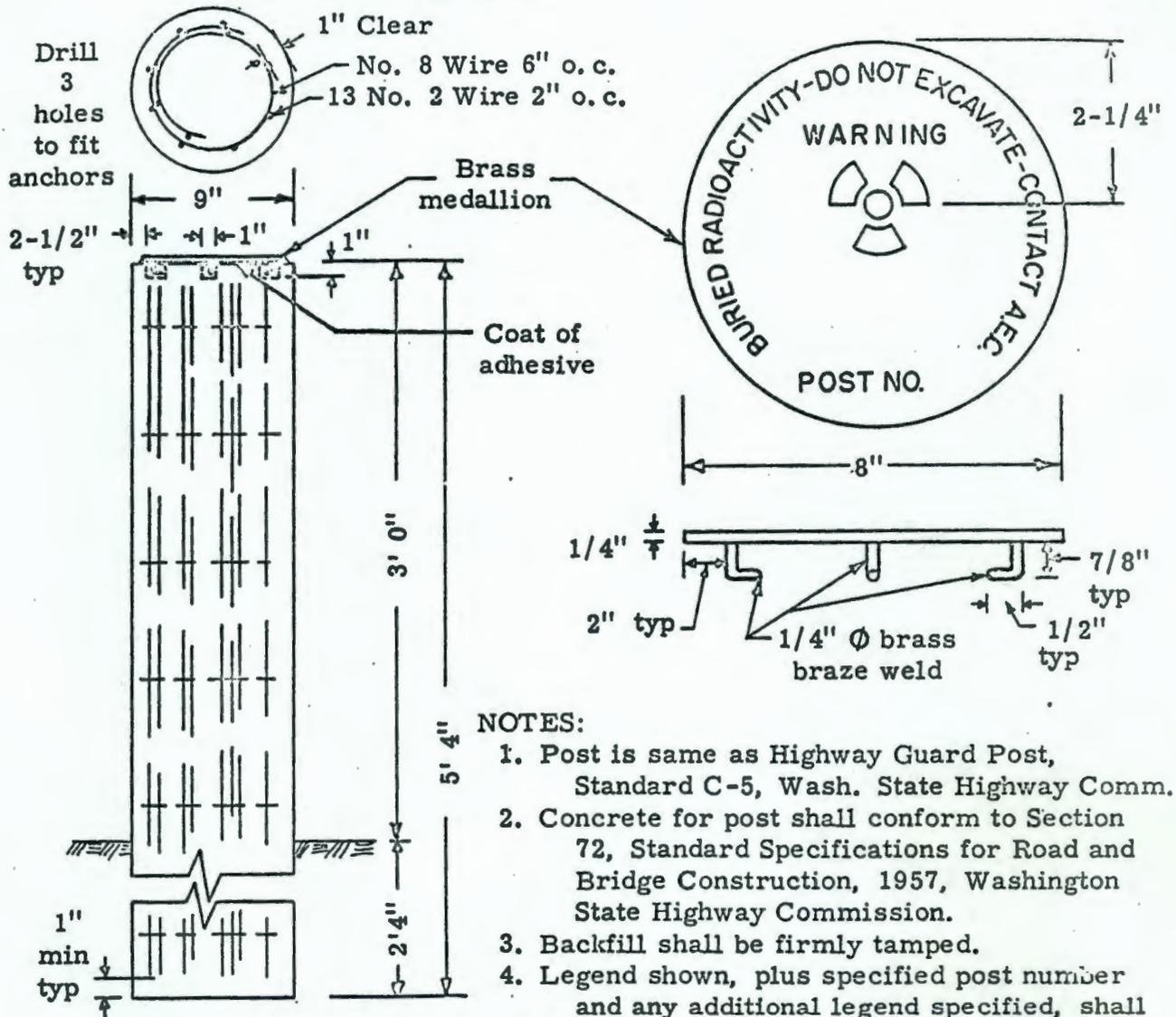
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APPENDIX B



NOTES:

1. Post is same as Highway Guard Post, Standard C-5, Wash. State Highway Comm.
2. Concrete for post shall conform to Section 72, Standard Specifications for Road and Bridge Construction, 1957, Washington State Highway Commission.
3. Backfill shall be firmly tamped.
4. Legend shown, plus specified post number and any additional legend specified, shall be stamped or engraved with 1/4" high, gothic letters. Radiation symbol shall be 1-1/2" dia, proportioned according to ASA N2.1-1960. (See Std AC-3-20). Outline of radiation symbol shall be engraved or stamped.
5. Adhesive shall be Permagine Corp of America, Permagine "S", or approved equal.
6. Clean top of post and back of medallion of oil, dust or moisture. Roughen back of medallion with coarse emery cloth. Fill holes in top of post with adhesive and spread a 1/16" coat on top of post and back of medallion.
7. Form a 1/8" cant of adhesive between edge of medallion and post.

Ref Hanford Stds: AC-3-20

NO.	REVISION	APP'D	DATE	ARCHITECTURAL-CIVIL STANDARD		SUCH. BY	DES. BY
1	Medallion	hes	5-29-6	IDENTIFICATION MARKER FOR BURIED RADIOACTIVE MATERIAL		hes	gpt
APPROVED BY ENGINEERING STANDARDS COUNCIL						AC-5-40	
H. E. Struck, SECRETARY, DATE 8-25-60							

GENERAL ELECTRIC
HANFORD ATOMIC PRODUCTS OPERATION

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INSTRUCTIONS FOR USE OF AC-5-40
IDENTIFICATION MARKER FOR
BURIED RADIOACTIVE MATERIAL

When Standard AC-5-40 is used, the following should be observed:

1. These marker posts are intended for permanent marking of burial plots containing solid radioactive material.
2. There should be a minimum of four marker posts per burial site, one at each corner. Additionally, marker posts shall be installed on twenty-foot centers for the first 60 feet away from any corner or change of direction point. The remaining marker posts between line of sight locations may be at 40-foot centers. All marker posts should conform to Standard AC-5-40. Marker posts should be at least two feet offset from edge of the trench.
3. Specify in supplemental instructions, specifications or drawings, the number of the post to be stamped on the medallion and any additional legend that may be required. The number for each post must be obtained from Radiation Protection Operation, Hanford Laboratories Operation.
4. Whenever these marker posts are used, Radiation Protection Operation should be contacted to obtain specific requirements for each case. In addition, post installation data must be furnished to Radiation Protection Operation for their master log.
5. For additional requirements on the use of these posts refer to RPS 7.1, "Solid Waste Disposal", in the Radiation Protection Standards Manual, HW-25457, latest revision.

NO.	REVISION	APP'D	DATE	ARCHITECTURAL-CIVIL STANDARD	SUBDR. BY	DES. BY
2	Notes 2 & 3	hes	11-9-61	INSTRUCTIONS FOR USE OF AC-5-40	hes	spt
APPROVED BY ENGINEERING STANDARDS COUNCIL					DI-AC-5-40	
H. P. Struck		SECRETARY, DATE 8-25-60				

GENERAL ELECTRIC

HANFORD ATOMIC PRODUCTS OPERATION RADIATION PROTECTION STANDARDS

APPENDIX C

ISSUED BY THE MANAGER RADIATION PROTECTION	SUBJECT: RADIOACTIVE SOLID WASTE DISPOSAL	CLASSIFICATION: Radioactive Waste Disposal
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I. POLICY

Solid radioactive waste disposal shall be accomplished by underground burial where practicable.

II. RESPONSIBILITY

1. The operation or group generating the waste is responsible for instituting procedures that allow for the disposal of solid waste with a minimum of casual exposure to personnel.
2. The group responsible for local radiation monitoring is responsible for establishing routine and periodic survey schedules to determine that waste disposal storage and burial are undertaken with minimal personnel exposures.
3. The Radiation Protection Operation is responsible for being aware of the location of established waste disposal facilities.
4. The Chemical Effluents Technology Operation is responsible for developing technology for the containment or disposal of radioactive wastes and effluents, including criteria for facilities, process controls, and the monitoring of effluent constituents.
5. The landlord responsibilities for waste disposal facilities shall be in accordance with OPG 8.1.

III. STANDARDS

1. Solid radioactive waste is defined as material that is essentially dry or whose fluids are of small volume and adequately contained.
2. Each process area should have permanently designated solid waste disposal locations and an adequate number of intermediate waste disposal locations. These shall be posted as Radiation Zones.
3. Solid waste containers or packages shall be individually identified with a radiation symbol where practicable.
4. Open trenches used to receive waste shall be backfilled at a frequency sufficient to minimize dispersal of radioactive contaminants by wind, rain, wildlife, etc.
5. Terminal conditions for direct ground disposal trenches:
 - a. Backfill with a minimum of 2 feet of dirt cover.
 - b. Surface dose rate not to exceed 1 mr/hour.
 - c. Permanent identification of boundaries of disposal areas both at the site and on master diagrams and plans.
 - d. Physical isolation of the disposal grounds throughout the use of the disposal grounds.
6. Isolation of alpha and beta-gamma type contaminants should be practiced.
7. Fire, explosive and toxic byproduct hazards should be considered before placing waste in its common trench.

DATE ISSUED 3-1-60	SUPERSEDES ISSUE DATES 7-1-57	PAGE 1 OF 2	NO. 7.1
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- 8. Buried and underground radioactive material, not otherwise demarcated, may be identified by signs bearing the approved radiation symbol and the word "Underground". This means should be used to designate locations where Radiation Zone conditions might be created by disturbance of the ground surface.

PAGE	SUPERSEDES ISSUE DATED	DATE ISSUED
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APPENDIX D

HANFORD ATOMIC PRODUCTS OPERATION
 RADIATION CONTROL STANDARD
 IRRADIATION PROCESSING DEPARTMENT

DOCUMENT NO.
HW - 45374COPY NO. PAGE NO.
1 of 2STANDARD NO.
8.2DATE ISSUED
6/9/58

SUPERSEDES ISSUE DATED

New

ISSUED BY
P. B. Jerman

APPROVED BY

APPROVED BY

ACCEPTED BY

SUBJECT

UNDERGROUND RADIOACTIVE WASTE DISPOSAL FACILITIES

Basis

This standard is designed to provide long term control of radioactive materials stored underground. It is necessary to maintain good marking and records to allow deliberate excavation for recovery of materials and to prevent accidental excavation. Control of the location, depth or size of a facility and the material placed in it is necessary to assure operation of cribs and burial grounds in a manner that will best accomplish their intended function which is to provide permanent storage of radioactive materials.

Standard

1. Solid waste pits and burial grounds shall be used exclusively for solid waste disposal and pits and cribs for liquid wastes shall be used exclusively for liquid wastes.
2. Records of the locations, dimensions and contents of all waste disposal sites in the 100 Areas shall be maintained by Radiological Engineering, Research and Engineering Operation.
3. Whenever a new waste disposal trench, pit or crib is planned the using operation shall notify Radiological Engineering, Research and Engineering Operation of the proposed exact location, dimensions and intended use. The concurrence of Radiological Engineering shall be required in all cases prior to actual use of the facility.
4. The ability of any material introduced into a crib to release the radioactive contamination contained in that crib shall be destroyed or neutralized before that material is discharged into the crib.
5. Upon termination of use, or when filled to capacity, burial trenches and pits shall be backfilled to normal grade, providing at least 2 feet of dirt cover and a radiation level of not more than 1 mrem/hr at normal grade. Erection of a mound to meet these requirements is not permitted.
6. Future use of ground areas utilized for burial purposes must be permanently controlled. For this reason and to facilitate possible future recovery of materials, it is necessary to define the actual trench area with permanent markers.

The minimum permanent identification of a filled burial trench shall be steel posts with signs attached indicating the presence of radioactive material underground. These posts shall be located so as to satisfy the following conditions:

1. A maximum of 50 feet between posts.
2. A post on each corner and on the centerline at the ends of the trench.

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HANFORD ATOMIC PRODUCTS OPERATION
 RADIATION CONTROL STANDARD
 IRRADIATION PROCESSING DEPARTMENT

DOCUMENT NO.

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2 of 2

STANDARD NO.

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SUPERSEDES ISSUE DATED

New

SUBJECT

UNDERGROUND RADIOACTIVE WASTE DISPOSAL FACILITIES

Standard

6. (cont'd)

3. At least three signs must be visible from any direction of approach except when the burial area is small as in the case of pits.

No effort should be made to locate and mark trenches that are closed and are no longer definitely marked. Instead, the area including all such trenches shall be marked at the four corners and at approximately 50 foot intervals along the sides. In order to avoid cave-ins, vehicular traffic shall be prohibited over closed trenches.

7. When a waste disposal trench, pit or crib is closed, the using operation shall notify Radiological Engineering, Research and Engineering Operation of the date of closure and the nature of the waste buried.
8. Some weeds have tap roots long enough to reach contaminated material and in addition are able to concentrate certain radioisotopes stored there. In order to avoid this problem and to prevent concealing signs, a soil sterilization program shall be carried out.
9. An annual inspection of each waste disposal site shall be made to see that signs are in place, readable and unobstructed and to see that weed control and other radiological control measures are effective.

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HANFORD ATOMIC PRODUCTS OPERATION
RADIATION CONTROL CHANGE AUTHORIZATION
IRRADIATION PROCESSING DEPARTMENT

DOCUMENT NO.
HW-45674

COPY NO.	PAGE NO.
	Addendum
REF. STD. NO.	DATE ISSUED
82	6-9-58
RCCA ISSUE DATE	RCCA EXPIRES
10-15-64	3-1-65

SUBJECT

UNDERGROUND RADIOACTIVE WASTE DISPOSAL FACILITIES

REFERENCE SECTION: Basis

To define the purpose of permanent marker posts at closed burial sites and to clarify intent of the Standard on enclosure of an active burial ground, the following statement should be added to the Basis:

"The Standard permits use of fencing that is equal to or better than the specified chain barricade which is the minimum acceptable enclosure of a solid waste disposal facility. Permanent marker posts are required on boundaries of an officially closed burial site to aid in the control of future land use and to facilitate possible recovery of buried materials."

REFERENCE SECTION: Standard

Parts 6 and 7

The method of marking boundaries of Hanford burial grounds was standardized in 1960, making items 6 and 7 obsolete. Therefore, these parts are replaced by the following:

- "6. Each solid waste disposal facility shall be an identified "Radiation Zone." A chain barricade, described in Architectural Civil Standard AC-5-2, shall be the minimum acceptable enclosure for such a burial ground."
- "7. Permanent marker posts, described in Architectural Standard AC-5-40, shall be installed according to Instructions for Use of AC-5-40 to define the boundaries of plots containing underground radioactive material. These markers shall be installed at the time each waste disposal site is officially closed. No further disposal nor any storage of radioactive material will be permitted at the site after the posts are erected. Radiological Engineering shall be notified by the disposal facility custodian when marker posts are to be installed."

APPROVED

[Signature]
DESIGN AND ENGINEERING SECTION

ACCEPTED

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MANUFACTURING SECTION

ACCEPTED

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PRODUCTION FUELS SECTION

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