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INFORMATION ON MIXED LAND DISPOSAL RESTRICTED WASTES AT THE DEPARTMENT OF ENERGY OAK RIDGE FACILITIES AND PADUCAH GASEOUS DIFFUSION PLANT TO SUPPORT A FEDERAL FACILITY COMPLIANCE AGREEMENT

APPROVAL FOR RELEASE

Document: # Unnumbered ; Date ND ;

Title/Subject Information on Mixed Land Disposal Restricted Wastes at the DOE OR Facilities ...

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K-25 Classification & Information Control Officer — Date 1/13/93

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Title: Information on Mixed Land Disposal Restricted Wastes at the DOE Oak Ridge Facilities and Paducah Gaseous Diffusion Plant to Support a Federal Facility Compliance Agreement
Authors: N/A
Abstract: Presents a summary of mixed waste streams from Oak Ridge facilities, including K-25, Y-12 and X-10. Includes amount, location, and type of waste in storage, map of waste storage facility locations, detailed description of the waste streams, and description of storage and treatment facilities.
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INFORMATION ON MIXED LAND DISPOSAL RESTRICTED WASTES AT THE DEPARTMENT OF ENERGY OAK RIDGE FACILITIES AND PADUCAH GASEOUS DIFFUSION PLANT TO SUPPORT A FEDERAL FACILITY COMPLIANCE AGREEMENT

ADDITIONAL INFORMATION ON MIXED LDR WASTE AS REQUESTED BY U.S. EPA REGION IV TO SUPPORT A FEDERAL FACILITY COMPLIANCE AGREEMENT

Information requested by the EPA Region IV Office by letter on September 10, 1991, is primarily contained in the following sections titled: Waste Stream Descriptions, Description of Storage Areas, and Description of Treatment Units. The charts initially presented to the EPA have been revised to more clearly depict amounts of waste streams which are in storage prior to the LDR regulations taking effect. This was accomplished by adding a storage column in the charts for pre-effective wastes. Additionally, a glossary of terms and codes used in the "Summary of Mixed Waste Streams" has been included as requested. Also, a footnote was added to indicate that the generation rate was approximated by reviewing the rate in recent past and predicting what the future generation rate will be considering anticipated waste minimization activities. The charts for the "Summary of Mixed Waste Streams" and the Description of Waste Streams have been expanded to included the Third/Third wastes. These can be identified by EPA waste codes.

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET, N.E.
ATLANTA, GEORGIA 30365

September 10, 1991

BY FACSIMILE

Mr. John S. Ford
Negotiating Team Leader
Waste Management and K-25
Operations Division
Department of Energy
Oak Ridge Operations
P.O. Box 2001
Oak Ridge, TN 37831

RE: LDR FFCA

Dear Mr. Ford:

I appreciate the effort that Department of Energy ("DOE") made to participate in the phone conference with the Environmental Protection Agency ("EPA") on August 20th, 1991. As we discussed in the phone conference, the information on the Paducah and Oak Ridge Facilities that DOE sent EPA on August 9th, 1991 is not sufficient for EPA to evaluate the scope of the proposed Federal Facility Compliance Agreements. As per our discussion, I am sending you a list of the additional information that EPA requested during the phone conference.

EPA needs detailed information in response to the issues that EPA raised in the July 10th, 1991 meeting at Oak Ridge which are summarized in DOE's memorandum of July 29th, 1991. In particular, EPA needs more detailed information than is presented in Attachment 2, "Summary of Mixed Waste Streams" of the data that DOE sent EPA on August 9th, 1991. Additional information requested from DOE on the mixed waste streams includes:

1) A timetable for research efforts and DOE decisions that will determine the treatment and disposal facilities for the wastes listed in Attachment 2, "Summary of Mixed Waste Streams."

2) A timetable for characterization of the ER waste codes.

3) The amount, location, and type of any waste that was in storage prior to the effective date that DOE plans to treat or manage.

4) A map of the Paducah and Oak Ridge facilities that marks the location of the storage facilities.

5) A glossary of terms and codes that are used in the "Summary of Mixed Waste Streams."

6) A detailed description of the waste streams. e.g. How are the spent solvent streams produced?

7) A description each of the storage facilities including size and construction materials.

8) A description of the treatment facility and permitting status of the TSCA incinerator.

9) A proposal from DOE of how wastes from the sources listed on the second and fourth pages of Attachment 2 will be delisted.

10) An explanation of the "annual" category in Attachment 2. Does the annual category include amounts from 1990 only? If so, what are the projected annual production amounts for the future?

11) Detailed information on mixed waste streams that will be subject to LDR when the National Capacity Variance for Third/Third wastes expires.

12) Estimates of ER generated wastes that will be subject to RCRA.

13) An explanation of why the K-25 facility has incinerated hydrochloric and sulfuric acids.

EPA requests that you provide this information, if at all possible by October 15, 1991. Thank you for your assistance in this matter. If you have any questions, please call either me at FTS 257-2335 ext. 2136 or Jeaneanne Gettle at FTS 257-7603.

Sincerely,

Virginia McGee

Virginia McGee
Assistant Regional Counsel
U.S. EPA, Region IV

DESCRIPTION OF WASTE STREAMS UNDER THE LDR FFCA

LDR FFCA WASTE STREAM DESCRIPTIONS

K-25 SITE WASTE STREAMS

Laboratory BMP Acid Waste: Approximately 22 m^3/year of laboratory corrosive acid wastes are generated from laboratory analysis and sample preservation at the K-25 Site. These wastes meet the LDR definition of a California List waste because of Ph and/or contamination with heavy metals (D006-009). As of December 31, 1990, 90 m^3 of these wastes were stored in drums in Building K-301 Vault 4.

Laboratory BMP Base Waste: Approximately 4 m^3/year of laboratory corrosive base wastes are generated from laboratory analysis and sample preservation at the K-25 Site. These wastes meet the LDR definition of a California List waste due to contamination with heavy metals (D006-009). As of December 31, 1990, 22 m^3 of these wastes were stored in drums in Building K-301 Vault 4.

Laboratory BMP Organic Waste: The K-25 Site generates approximately 7 m^3/year of mixed laboratory organic wastes from laboratory analysis and extractions using organic solvents that meet the LDR definition of a solvent waste because of contamination with F001-003 spent solvents. Some of these wastes may also be contaminated with EP Toxic metals. As of December 31, 1991, 20 m^3 of this waste were stored in drums at Buildings K-301 Vault 4 and K-711.

Paint Waste and Organic Sludges: The K-25 Site generates and/or receives from the Y-12 Plant a total of approximately 8 m^3/year of mixed paint waste, solvents, and organic sludges (F001-003) from equipment cleaning and painting operations. These wastes meet the LDR definition of a solvent waste and in some cases may be contaminated with D007-D009 constituents. As of December 31, 1990, 29 m^3 of this waste were in container or tank storage at Buildings K-711 and K-1425.

Spent Solvents and Waste Oils: The K-25 Site generates and/or receives from other DOE-OR facilities a total of approximately 200 m^3/year of mixed spent solvents (F001-003, F005) and waste oils that meet the LDR definition of a solvent waste. Some of these wastes may also be contaminated with D008 metals. These wastes are generated from various cleaning, degreasing, maintenance, and painting operations at the plastics shop, metal preparation shop, garage, and paints shop at the K-25 Site and other DOE-OR facilities. As of December 31, 1991, 1096 m^3 of these wastes were in container or tank storage at Buildings K-301 Vault 4B, K-306-1, K-711, K-1036-A, K-1202, K-1420A, and K-1425.

Spent Solvents and Sludges: The K-25 Site generates approximately 21 m^3 of spent solvents and sludges through cleaning and degreasing operations and from incinerator trial burn mixture preparations. These wastes meet the definition of solvent and/or California List LDR wastes due to contamination with F001-F003 solvents and/or heavy metals. As of December 31, 1990, 32 m^3 of these wastes were in storage at Building K-1420A Tank TNHW-37 and in Buildings K-1202, K-1425, and K-1435.

Solvent-Contaminated Rags: The K-25 Site stores spent solvent contaminated rags generated from cleaning operations at the Y-12 Plant. The Y-12 Plant generates approximately 1 m^3/year of rags that meet the LDR definition of a solvent waste due to contamination with F001-F003 spent solvents. As of December 31, 1990, 3 m^3 of these rags were stored at the K-25 Site in Buildings K-301 Vault 4 and K-711 while awaiting treatment.

Laundry Sludge: The K-25 Site generates approximately 2.2 m^3 of heavy metal sludges produced through the dewatering of waste water generated during the washing of employee uniforms. As of December 31, 1990, 36.4 m^3 of these sludges were stored at the K-25 Site in Building K-306-1 Vault 23.

K-1407-B & C Pond Sludges: RCRA closure of the K-25 Site's K-1407-B and -C settling ponds, which received wastewater treatment sludges from plant electroplating operations, resulted in the generation of 30,227 m^3 of sludges, which are contaminated with nickel and F006 constituents. Most of the sludge is stored in 89- and 96-gal drums, with approximately 16,000 gal in tank storage. As of December 31, 1990, these sludges were stored at Buildings K-303-1, K-305 Vault 19, K-305 Vault 19B, K-309-3, K-309 Vault 2A, K-310-1, K-1417, and K-1419. These sludges are being investigated as potential candidates for delisting.

Mercury-Contaminated Soil: In the past K-25 Site generated mercury-contaminated soil from remediation of past mercury spills. These wastes meet the definition of a Third Thirds LDR waste. As of December 31, 1990, 230 m^3 of these wastes were stored in Building K-302-4 at the K-25 Site.

Process Nitric Acid Waste: Approximately 4 m^3/year of process nitric acid wastes are generated at the K-25 Site from plating operations at the metal preparation shop and from decontamination activities. These wastes meet the definition of a California List waste because of pH and/or contamination with nickel. As of December 31, 1990, 18 m^3 of these wastes were in storage at Building K-1232 and K-301 Vault 4.

PCB-Contaminated Soils, with Mercury: As of December 31, 1990, the K-25 Site stored 20.4 m^3 of PCB- and mercury-contaminated soils, which meet the LDR definition of a California List waste. These soils were generated by past cleanup activities at the Y-12 Plant, and are currently stored in 4-ft by 6-ft by 6-ft boxes in Building K-302-4. These wastes, no longer generated, were placed in storage prior to the applicable LDR effective date.

TSCA Incinerator Ash: The K-1435 TSCA Incinerator is expected to generate an ash byproduct which, although processed to meet the treatment standards for F001-005 spent solvents, may meet the definition of a LDR solvent waste because residuals will potentially contain traces of listed wastes. This ash may also be contaminated with F006 and D004-011 constituents, depending on variations in feed stream characteristics. Initial production operation of the TSCA Incinerator will be limited to incineration of liquid wastes with low ash content, yielding a projected ash production volume of 9.4 m^3/year (based on 1990 generation rates). The feasibility of upgrading the TSCA Incinerator to process solid wastes is being evaluated. Should the incinerator be utilized for combustion of high ash solids in the future, the ash generation rate is projected to rise to 5400 m^3/year. As of December 31, 1990, 69.6 m^3 of ash were stored in drums at Buildings K-301 Vault 4 and K-301 Vault 4B.

TSCA Incinerator Sump/IWS Sludges: The K-1435 TSCA Incinerator will produce sludge by-products from the operation of the ash sump and the off-gas treatment system Ionizing Wet Scrubber (IWS). Because of possible trace contamination with listed wastes, these sludges may meet the LDR definition of a solvent waste even though the waste feed has been processed to meet LDR spent solvent treatment standards. In addition, D004-011 constituents may be present, depending on variations in incinerator feed stream characteristics. TSCA sludge generation during the incineration of liquid-only wastes is expected to be approximately 23 m^3/year. Should the incinerator be modified in the future to accept solid feed, solids incineration is expected to result in the generation of approximately 720 m^3/year of sludges. As of December 31, 1990, 85 m^3 of TSCA Incinerator sludges were in drum storage in Buildings K-301 Vault 4A, K-301 Vault 4B, and K-306-1.

Wastewater Treatment Sludges and Spent Carbon: The K-25 Site generates and/or receives approximately 242 m^3/year of sludges and spent carbon resulting from wastewater treatment operations at the Building K-1407H Central Neutralization Facility (CNF), Building K-1232 Wastewater Treatment Facility, and from wastewater treatment activities at the Y-12 Plant. These wastes are contaminated with spent solvents, and therefore meet the LDR definition of a solvent waste. F006 constituents may also be present in these wastes. Future sludge-generation rates may vary significantly depending on contributions from the K-1435 TSCA Incinerator. As of December 31, 1991, 715 m^3 of these wastes were stored at Buildings K-301 Vault 4A, K-301 Vault 4B, K-306-1, and K-306-1 Vault 23A.

Y-12 Radiogenic Lead: Radiogenic lead generated through past operations at the Y-12 Plant is stored at the K-25 site. This waste includes lead ingots, lead slag, and lead carbonate contaminated with low-level radioactive contaminants. As of December 31, 1990, 5 m^3 were in storage at Building K-311-1. No further wastes of this type are expected to be received at K-25 for storage.

ORNL WASTE STREAMS

7,12-Dimethylbenzanthracene: Approximately 0.0005 m^3 of 7,12-Dimethylbenzanthracene (U094) was previously generated as a result of cleanup of excess and/or expired chemicals at ORNL. As of December 31, 1990, this waste was in storage in Building 7654.

Barium: ORNL generates approximately 0.01 m^3/year of barium contaminated (D005) wastes from general laboratory operations. As of December 31, 1990, 0.11 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Benzene: ORNL generates approximately 0.01 m^3/year of benzene (U019) as a result of laboratory clean-out of excess and expired chemicals. As of December 31, 1990, 0.22 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Cadmium: ORNL generates approximately 0.3 m^3/year of cadmium (D006) contaminated solid wastes during laboratory clean-out of excess and expired chemicals. As of December 31, 1990, 0.208 m^3 of these wastes were in storage at Buildings 7507W, 7654, and 7823.

Cyanide: ORNL generates approximately 0.001 m^3/year of cyanide wastes (D003, P029) from laboratory clean-out of excess and expired chemicals. As of December 31, 1990, 0.0076 m^3 of these wastes were in storage at Buildings 7507W and 7654. These wastes were placed into storage prior to the applicable LDR effective date.

Corrosive-Liquids (Acids): ORNL generates an estimated 0.509 m^3/year of mixed corrosive (D002) laboratory acid wastes, including sulfuric and hydrochloric acids. Some of these will be excess chemicals with the remainder being process waste. Because of pH and potential contamination with heavy metals (D004, D006-008), some of these wastes (0.42 m^3/year) meet the LDR definition of a California list waste. As of December 31, 1990, 3.88 m^3 of these wastes were stored in Buildings 7654, 7507W, and 7823 (0.104 m^3, 3.663 m^3, and 0.114 m^3, respectively). Of this total, 2.94 m^3 were placed into storage after the effective date of July 8, 1987.

Corrosive-Solids (Acids): ORNL generates an estimated 0.05 m^3/year of corrosive (D002) solid acid wastes from spill cleanups and laboratory clean-out. As of December 31, 1990, 0.0643 m^3 of these wastes were in storage at Buildings 7507W, 7654, and 7823.

Corrosives-Liquids (Bases): ORNL generates approximately 0.2 m^3/year of corrosive (D002) liquid base wastes from general laboratory operations. These are primarily sodium hydroxide solutions. As of December 31, 1990, 0.3 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Corrosives-Solids (Bases): ORNL generates approximately 0.01 m^3/year of corrosive (D002) solid base wastes as excess chemicals. As of December 31, 1990, 0.004 m^3 of these wastes were in storage at Building 7654.

Scintillation Fluids (Spent Solvents), Spent Solvents with Scintillation Fluids, Spent Solvents and Scintillation Fluids (ORAU): ORNL generates approximately 6 m^3/year of mixed spent solvents and scintillation cocktail fluids that contain various F001-F005 spent solvents and which therefore meet the LDR definition of a solvent waste. These scintillation fluids are commonly used as carriers for the measurement of radioactive emissions. Waste solvents are generated from normal laboratory operation and clean-up. Waste scintillation fluids and solvents are generated by ORNL, Oak Ridge Associated Universities, and by ORNL activities at the Y-12 Plant. As of December 31, 1990, 43.90 m^3 of these wastes were in storage at ORNL in Building 7654 and the 7507W Facility (4.89 $m^3$3 and 39.01 m^3, respectively). Of this total, 43.45 m^3 were placed into storage after the effective date of November 8, 1986.

Phenol: ORNL generates about 0.02 m^3/year of phenol (U188) waste as a result of laboratory clean-out of excess or expired chemicals. As of December 31, 1990, 0.11 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Flammable Liquids: ORNL generates about 7.3 m^3/year of flammable liquids (D001) in laboratory processes and in decontamination and maintenance operations. As of December 31, 1990, 45.81 m^3 of these wastes were in storage at Buildings 7507W, 7654, and 7823. This volume includes 0.192 m^3 of halogenated organic compounds (0.170 m^3 of which were placed in storage after the effective date of July 8, 1987) and 0.002 m^3 of ignitable compounds with trace arsenic contamination, neither of which are currently generated.

Flammable Solids: ORNL generates about 1.04 m^3/year of flammable (D001) solids, primarily rags used for cleanup of spilled liquids. As of December 31, 1990, 3.75 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Solvent Waste: Approximately 19.0 m^3 of solvent wastes containing F001, F002, F003, F004, and F005 solvents, as well as mercury (D009), are currently stored in tank 7830A. These wastes were generated in the past through normal laboratory operations and had previously been stored in tank 7860A. These wastes have since been transferred to and combined with waste oils in tank 7830A as a result of closure of tank 7860A. This waste stream is no longer generated.

Methanol (Methyl Alcohol): Approximately 0.001 m^3/yr of methanol (U154) waste are generated at ORNL during laboratory clean-outs. As of December 31, 1990, 0.001 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Mercury (DOO9): ORNL generates about 0.09 m^3/year of solids contaminated with mercury (D009) from general laboratory operations and laboratory clean-up that is a mixed waste. As of December 31, 1990, 0.38 m^3 of this waste was in drum storage at ORNL at Buildings 7654 and 7507W. Most of this waste stream was placed into storage after the effective date. Only a small amount 0.0001 m^3 was placed into storage prior to the effective date.

Mercury (U151): ORNL generates about 0.66 m^3/year of liquid mercury (U151) from laboratory clean-outs. As of December 31, 1990, 0.66 m^3 of this waste was in drum storage at ORNL at Buildings 7654 and 7507W.

Reactives: Approximately 0.002 m^3/year of reactive (D003) wastes are generated at the ORNL Site as a result of general laboratory operations. As of December 31, 1990, 0.000048 m^3 of these wastes were in storage at Buildings 7507W and 7654.

Lead: Approximately 0.48 m^3/year of laboratory chemicals contaminated with lead (D008) are generated at ORNL as a result of general laboratory clean-up. As of December 31, 1990, 0.49 m^3 of these wastes were in storage at Buildings 7507W and 7654.

LLLW Collection Tanks Sludge: Liquid low-level waste (LLLW) originating from hot sinks and drains in R&D laboratories, radiochemical pilot plants, nuclear reactors, and the process waste water treatment plant at ORNL are collected in underground collection tanks near generator facilities. Alkaline LLLW sludge with potential heavy metals (D006-D009) contamination precipitates in these tanks because of in-tank caustic addition during waste treatment. These are active tanks with materials in process and, as such, sludge generation rates and inventories are not available.

Inactive Waste Storage Tank Contents-A, C, and D: Solvent (F001, F003, F005) and heavy metal (D006-D009) contaminated liquid and solid wastes generated at ORNL through past nuclear research activities (such as feed material and fuel separation pilot plant operations) are stored in what are now designated the Inactive Waste Storage Tanks. These solvent and/or California list LDR mixed wastes, were placed into storage tanks at Buildings 2026, 3019, 3500, 3503, 4500, 7852, and various other locations prior to the applicable LDR effective date. 1088 m^3 of LLW aqueous alkaline or acidic wastes are stored within the Inactive-"A" tanks; 62.4 m^3 of LLW heavy metal sludges from precipitation processes are stored in the Inactive-"C" tanks; and 110 m^3 of TRU solids (sludges) are stored in the Inactive-"D" tanks.

TRU Waste: Approximately 40 m^3/year of solid TRU waste consisting of filters, paper, metals, and other items is generated at ORNL through laboratory, pilot plant, and reactor operations. These includes both contact-handled (CH-) and remote-handled (RH-) TRU waste contaminated with lead (D008) and, in some cases, mercury (D009). As of December 31, 1990, 680 m^3 of these wastes were in retrievable drum storage at Buildings 7826 and 7834 and in TRU retrievable concrete cask storage at Building 7855.

Melton Valley Storage Tank Sludges: Liquid low-level radioactive waste generated throughout ORNL is collected and evaporated to reduce waste volume. The resultant concentrated liquid and sludge waste contains heavy metal (D006-D009) contamination. Approximately 4 m^3 of this waste are generated annually. As of December 31, 1990, 390 m^3 of these wastes were in storage in Melton Valley Storage Tanks W-24 through W-31 at Building 7830.

Evaporator Service Tank Sludges: Approximately 3 m^3/year of heavy metal (D006-D009) contaminated sludges are generated as a result of precipitation of liquid low-level radioactive wastes before and after evaporator concentration. As of December 31, 1990, 220 m^3 of these sludges were in storage in Evaporator Service Tanks W-21 through W-23.

Y-12 PLANT WASTE STREAMS

Cadmium-Contaminated Soil: As of December 31, 1990, 153 m^3 of cadmium-contaminated (D006) soil and construction debris were in storage at the East Chestnut Ridge Waste Pile (ECRWP). This material, containing depleted uranium, resulted from RCRA closure of a soil waste pile at the Y-12 Plant, and is no longer generated.

Chromium-Contaminated Waste: As of December 31, 1990, the Y-12 Plant stored 2.9 m^3 of a chromium-contaminated (D007) mixed waste at the Y-12 Plant Interim Drum Yard. This waste, generated from metal plating processes and meeting the definition of a California List waste, is not routinely generated.

Lead-Contaminated Waste: An estimated 1 m^3/year of lead-contaminated (D008) waste is generated at the Y-12 Plant from building decontamination and decommissioning activities. As of December 31, 1990, 2.0 m^3 of this waste were in storage at the Interim Drum Yard and Building 9720-31. This waste was previously sent to the K-25 Site for long-term storage, but this practice has been discontinued.

Mercury-Contaminated Waste: An estimated 20 m^3/year of mercury-contaminated (D009) waste is generated at the Y-12 Plant from building decontamination and decommissioning, environmental restoration activities, and storm sewer sludge clean-out. Some of this waste is also PCB-contaminated. As of December 31, 1990, 57.2 m^3 of this waste were in storage at Building 9201-4 and the Interim Drum Yard. Some of this waste has been sent to the K-25 Site for long-term storage at Building K-302-4, and is included in inventories reported for that facility.

Sodium-Potassium (NaK) Waste: Approximately 0.02 m^3/year of characteristically hazardous (D001, D003) sodium-potassium (NaK) waste is generated from maintenance of NaK-cooled equipment at the Y-12 Plant. This waste, treated as generated either by open burning or other reaction, is not held in long-term storage.

Mixed Waste Soil (Oil Pond or DARA Soil): Approximately 2850 m^3 of Disposal Area Remedial Action (DARA) soils are stored at the Y-12 Plant Contaminated Soil Storage Facility. These soils were excavated between July 1989 and November 1989 as part of an environmental restoration activity at the Bear Creek Burial Ground where spent solvents and PCB liquids have been applied to the ground in the past. The level of PCBs in the soils is expected to be less than 50 ppm. As the soils are potentially contaminated with F001 and F003 wastes, they are considered to meet the LDR definition of a solvent waste. Although placed in storage prior to the applicable LDR effective date, their current pre-effective status may change in the future.

Mixed Waste Soils (Oil Land Farm): The Y-12 Plant stores 284 m^3 of soils potentially contaminated with F001 and F003 solvents and which therefore meet the LDR definition of a solvent waste. These soils were excavated in November of 1988 as part of an environmental restoration activity at the Bear Creek Burial Ground where spent solvent and PCB liquids had been applied to the land in the past. The level of PCBs in the soils is expected to be less than 25 ppm. These soils, stored at the Y-12 Plant Oil Land Farm Storage Facility, were placed in storage prior to the applicable LDR effective date, but their current pre-effective status may change in the future.

PCB-Containing Spent Solvent (SS #1): The Y-12 Plant generates approximately 40 m^3/year of spent solvent (F001-003) contaminated soils and sludges, also contaminated with PCBs, which meet the LDR definition of a solvent waste. These are generated from machine cooling and machine cleaning operations associated with the forming and machining of nuclear weapon parts. As of December 31, 1990, the Y-12 Plant was storing 264.0 m^3 of this waste at the Waste Soil Solvent Facility, OD-9 in Building 9811-8.

Spent Solvent (SS #2): The Y-12 Plant generates approximately 30 m^3/year of spent solvent (F001, F003) contaminated liquids that meet the LDR definition of a solvent waste. These are generated from machine cooling and machine cleaning operations associated with the forming and machining of nuclear weapon parts. Due to an aggressive waste minimization effort, generation has been significantly reduced and is anticipated to be reduced to minimal quantities in the future. As of December 31, 1990, the Y-12 Plant was storing 203.5 m^3 of this waste at Building 9811-1 in Oil Dikes (OD-) 7 and 8, and at Building 9720-45 in OD-10. Some spent solvents generated at the Y-12 Plant are currently being stored at the K-25 Site at Building K-711 and the K-1435 TSCA Incinerator tank farm and container storage area. That volume is included in the K-25 Site inventory.

Solvent-Contaminated Debris: The Y-12 Plant generates approximately 14.9 m^3/year of solvent-contaminated (F001, F003) mixed waste debris consisting of wipes, rags, and absorbants used in cleaning and degreasing of machined parts. These wastes meet the LDR definition of a solvent waste. As of December 31, 1990, 37.4 m^3 of this waste were in drum storage at the Y-12 Interim Drum Yard.

Waste Soil From Closure (Drum Storage Area): As of December 31, 1990, the Y-12 Plant stored 500 m^3 of mixed waste soils at the East Chestnut Ridge Waste Pile. These soils were excavated during closure of an interim status drum storage area used to store F-listed waste solvents. The soils are considered contaminated with F001-003 spent solvents and therefore meet the LDR definition of a solvent waste. They were placed in storage after the effective date of November 8, 1986.

Wastewater Treatment Metal Sludges: Approximately 807 m^3/year of mixed wastewater treatment sludges are generated at the Y-12 Plant's Building 9616 West End Treatment Facility (WETF) and the Building 9623 Central Pollution Control Facility (CPCF). This waste stream is predominantly the secondary sludge resulting from the biological, physical, and chemical processing of Y-12 process wastewaters at the WETF, and are residuals from the treatment of the "Aqueous Acidic Waste" stream. A small fraction of this waste stream is the secondary sludges resulting from wastewater treatment at the CPCF. These sludges meet the LDR definition of a spent solvent waste due to contamination with F001 and F003 spent solvents (as well as F006 constituents). As of December 31, 1990, 5460.0 m^3 of these sludges were in storage at the Building 9616 West Tank Farm, 1.0 m3 in drums at the Building 9623 CPCF, and 2.3 m3 in drums at the Y-12 Plant Interim Drum Yard.

Wastewater Treatment Spent Carbon: As a result of wastewater treatment operations at the West End Treatment Facility (WETF), the Y-12 Plant generates approximately 217 m^3/year of F006-contaminated spent activated carbon from the polishing of waste water treatment effluent. These wastes may also be contaminated with F001-F005 constituents and trace amount of nickel and chromium (D007), particularly those wastes generated in past years prior to implementation of improved waste minimization and solvent substitution efforts. An active waste minimization program at the plant is expected to reduce the generation rate in the future. These wastes are placed in less-than-90 day storage on-site at Building 9616 and 9623 prior to being transferred to the K-25 Site for longer-term interim storage. There they are stored in Buildings K-301 Vault 4A, K-301 Vault 4B, K-306-1, and K-306-1 Vault 23A while awaiting treatment and/or disposal.

PADUCAH GASEOUS DIFFUSION PLANT (PGDP) WASTE STREAMS

Aqueous Cleaner - Mixed E.P. Toxic: Approximately 0.21 m^3/year of mixed acidic (D002) mixed E.P. Toxic aqueous cleaner wastes are generated at PGDP from equipment degreasing activities. These wastes typically contain lead (D008) contamination. As of December 31, 1990, 0.42 m^3 of these wastes were in storage at Buildings C-733 and C-746-Q.

Ash Receiver Residue: As of December 31, 1990 464.1 m^3 of mixed ash receiver residue, consisting of heel and/or cake ash from the fluorination of uranium tetrafluoride to produce uranium hexafluoride, was stored at the PGDP in Building C-746-Q. This waste, containing arsenic (D004) and chromium (D007) contamination, is no longer routinely generated.

Brass Chips, Turnings: An estimate 0.6 m^3 of mixed lead-contaminated (D008) brass chips and turnings are generated at PGDP from metal machine operations. As of December 31, 1990, 2.1 m^3 of these wastes were in storage at Building C-746-Q.

EP Toxic Mixed Waste (Technetium/Liq.): As of December 31, 1990, 6.29 m^3 of chromium-contaminated (D007) E.P. Toxic mixed waste liquids containing technetium were stored in Building C-746-Q at PGDP. This waste, generated from technetium precipitation processes for plant decontamination solutions and cylinder washings, is not routinely generated.

EP Toxic Mixed Waste (Technetium/Solids): As of December 31, 1990, 4.74 m^3 of chromium-contaminated (D007) E.P. Toxic mixed waste solids and/or sludges containing technetium were stored in Building C-746-Q at PGDP. This waste, generated from technetium precipitation processes for plant decontamination solutions and cylinder washings, is not routinely generated.

EP Toxic Sludges (Gold Dissolver and U.P.): Approximately 1.1 m^3/year of cadmium- and lead-contaminated (D006, D008) E.P. Toxic sludges are generated at PGDP from the lime precipitation of waste solutions. As of December 31, 1990, 3.6 m^3 of these mixed wastes were stored in Building C-746-Q.

Garage Wash Pit Sludge-EP Toxic Mixed: An estimated 0.63 m^3/year of EP Toxic mixed waste sludges generated from the cleaning of vehicles are collected in the Building C-750 garage wash pit. The sludges typically contain F001 solvent, lead (D008) and trace PCB contamination. As of December 31, 1990, 0.62 m^3 of these mixed wastes were stored in Building C-746-Q.

Glass Beads-EP Toxic Mixed: Approximately 0.42 m^3/year of mixed cadmium- and lead-contaminated (D006, D008) glass beads are generated at PGDP from the use of bead-blasting to decontaminate small metal parts. As of December 31, 1990, 2.10 m^3 of these mixed wastes were stored in Building C-746-Q.

Hot Water Rinse Tank Sludge: Approximately 1.7 m^3 of lead-contaminated (D008) mixed waste sludges were generated as tank bottoms from cleanup of a hot water tank at PGDP. This waste, not routinely generated, was in storage at Building C-746-Q as of December 31, 1990.

Laboratory Samples: Approximately 0.2 m^3/year of mixed miscellaneous lab samples from analytical activities are generated at PGDP. These wastes typically contain chromium (D007) and trace PCBs. As of December 31, 1990, 0.2 m^3 of these mixed wastes were stored in Building C-746-Q.

Magnesium Fluoride Pellets: An estimated 0.8 m^3/year of chromium-contaminated (D007) mixed spent magnesium fluoride pellets are generated at PGDP from the filtration of Technetium-99 from process gas streams. As of December 31, 1990, 1.9 m^3 of these mixed wastes were stored in Building C-746-Q.

Mineral Spirits: As of December 31, 1990, 0.21 m^3 of these mixed mineral spirit wastes (D001), generated from use as a solvent for parts degreasing, were stored in Building C-733. This waste is not routinely generated.

Miscellaneous Lead Solids: Approximately 0.2 m^3/year of miscellaneous mixed waste lead (D008) solids (weights, shot, or bricks) are generated at PGDP. As of December 31, 1990, 0.62 m^3 of these mixed wastes were stored in Building C-746-Q.

Miscellaneous Mercury-Contaminated Solids: Approximately 0.02 m^3/year of miscellaneous mercury-contaminated (D009) solids (glass, metal, plastic) are generated at PGDP. As of December 31, 1990, 0.62 m^3 of these mixed wastes were stored in Building C-746-Q.

Mixed Corrosive Waste-Filters: An estimated 0.5 m^3 of mixed waste filters from the C-400-C nickel stripper solution evaporation unit at PGDP are generated annually. These filters contain cadmium (D006), chromium (D007), and lead (D008) contamination, and are corrosive (D002) due to the alkaline nature (pH >12.5) of the stripper solution being evaporated. As of December 31, 1990, 2.75 m^3 of these mixed wastes were stored in Building C-746-Q.

Mixed Corrosive Waste (Ni Stripper)-Sludge: Approximately 1.5 m^3/year of mixed waste corrosive sludges are generated by the evaporation of nickel stripper solution at the C-400-C evaporation unit at PGDP. This sludge contains cadmium (D006), chromium (D007), and lead (D008) contamination, and is corrosive (D002) due to the alkaline nature (pH >12.5) of the stripper solution being evaporated. As of December 31, 1990, 4.19 m^3 of these mixed wastes were stored in Building C-746-Q. Of this total, 0.63 m^3 were placed into storage after the applicable LDR effective date.

Mixed EP Toxic Wastes: Approximately 0.02 m^3/year of mercury-contaminated (D009) mixed E.P. Toxic wastes are generated from maintenance on mercury manometers at PGDP. As of December 31, 1990, 0.08 m^3 of these mixed wastes were stored in Building C-746-Q.

Oxalic Acid: As of December 31, 1990, 0.84 m^3 of uranium-contaminated oxalic acid (D002), generated from laboratory clean-out of excess/used chemicals, were stored in Building C-746-Q. This material is not routinely generated.

PCB/Chlorinated Solvents: As of December 31, 1990, 28.35 m^3 of PCB-contaminated mixed ignitable solvents (D001, F001) and waste oils, which meet the definition of an LDR solvent waste, were in storage in Building C-733. These wastes, generated from solvent cleaning of a waste oil tank, were placed into storage prior to the applicable LDR effective date, and are no longer generated.

PCB/Hexane Samples (Mixed): Approximately 0.42 m^3/year of ignitable (D001) mixed waste PCB and Hexane are generated at PGDP. The wastes are collected and placed in lab pack containers. As of December 31, 1990, 0.42 m^3 of these mixed wastes were stored in Buildings C-733 and C-746-Q.

Sodium Dichromate: As of December 31, 1990, 0.2 m^3 of sodium dichromate (D007) mixed wastes, generated form metal plating activities, were in storage at Building C-746-Q. These wastes are no longer generated.

Solvent-Laden Rags: Approximately 0.42 m^3/year of solvent-contaminated (F001-F005) rags are generated at PGDP from use in parts degreasing and cleanup activities in radiological areas. As of December 31, 1990, 0.3 m^3 of these mixed wastes were stored in Buildings C-733 and C-746-Q.

Spent Solvents (Xylene/Dibutyl Carbitol): An estimated 0.12 m^3/year of mixed xylene/dibutyl carbitol (D001, F003) wastes are generated at PGDP from use as extractant for radioactive analyses. These wastes meet the definition of a LDR solvent waste. As of December 31, 1990, 0.85 m^3 of these mixed wastes were stored in Buildings C-733. Of this volume, 0.43 m^3 were placed into storage after the applicable LDR effective date.

Spent Solvents I: As of December 31, 1990, 0.21 m^3 of mixed spent solvent liquids, consisting of methanol and acetone solutions (D001, F001, F003) generated from degreasing of radiologically contaminated parts, were in storage at PGDP in Building C-733. These liquids meet the definition of LDR solvent wastes. They are no longer generated.

Spent Solvents II: Approximately 2.72 m^3/year of mixed waste oils containing spent solvents (F001, D040) are generated at PGDP from degreasing activities. These liquids meet the definition of LDR solvent wastes. As of December 31, 1990, 40.24 m^3 of these wastes were stored in Buildings C-733. Of this total, 26.10 m^3 were placed into storage after the applicable LDR effective date.

TEHP Solution: Approximately 0.3 m^3/year of mixed ignitable (D001) tri-(2-ethylhexyl) phosphate (TEHP) and hexane waste is generated from performance of routine uranium hexafluoride toll samples at PGDP. As of December 31, 1990, 0.85 m^3 of these wastes were stored in Buildings C-733.

TRU and Tc Waste: As of December 31, 1990, 0.42 m^3 of chromium-contaminated (D007) TRU and technetium wastes were stored in Building C-746-Q at PGDP. This waste, previously generated from technetium and/or neptunium recovery processes, is no longer generated.

TRU Liquid: As of December 31, 1990, 0.65 m^3 of chromium-contaminated (D007) TRU liquids were stored in Building C-746-Q at PGDP. This waste, previously generated from technetium and/or neptunium recovery processes, is no longer generated.

TRU Solids: As of December 31, 1990, 0.84 m^3 of chromium-contaminated (D007) TRU solids were stored in Building C-746-Q at PGDP. This waste, previously generated from technetium and/or neptunium recovery processes, is no longer generated.

U-Contaminated Waste Oils-Mixed EP Toxic: An estimated 22.1 m^3/year of mixed E.P. Toxic uranium-contaminated waste oils are generated at PGDP. These wastes, which also contain lead- and mercury-contamination (D008, D009), result from various process and maintenance activities. As of December 31, 1990, 25.6 m^3 of these liquids were stored in Buildings C-733 and C-746-Q.

Vacuum Dust: During occasional compressor failures, dust and particulates are vacuumed and collected from off-line compressors. Approximately 0.2 m^3 of this waste, contaminated with lead (D008) and selenium (D010), is generated at PGDP annually. As of December 31, 1990, 0.42 m^3 of these liquids were stored in Building C-746-Q.

SUMMARY OF MIXED LDR WASTE STREAMS

EXPLANATORY NOTES:

1) EPA waste codes shown in the "Primary Constituents" column are based on current characterization efforts derived from knowledge of the processes/activities generating the wastes, sampling and analysis, or other means. Waste codes are not intended to be inclusive for all waste streams. Future characterization efforts may allow deletion of some constituents or reveal the presence of additional constituents other than those listed.

2) Mixed wastes addressed in the following tables include Solvent, California-List, and Third-Thirds Land Disposal Restricted (LDR) wastes. Annual generation rates given are approximations based on historical data as well future projections. LDR waste stream inventories have, where information was currently available, been segregated into those placed into storage prior to ("PRE.") or after ("POST") the applicable Solvent, California-List, or Third Thirds LDR effective date. Where both "PRE." and "POST" volumes are indicated for a given waste, the total in storage is the sum of the two. Volumes indicated in the "POST" column are in some cases a combination of both Solvent, California-List and Third-Thirds LDR wastes.

GLOSSARY:

a) "Be" - Beryllium.

b) "BMP" - Best Management Practice.

c) "CPCF" - Central Pollution Control Facility at the Y-12 Plant.

d) "DARA" - Disposal Area Remedial Action waste at the Y-12 Plant.

e) "IWS" - Ionizing Wet Scrubber. Part of the TSCA Incinerator exhaust gas treatment system.

f) "LLLW" - Liquid Low-Level Waste

g) "Ni" - Nickel

h) "OD" - Oil Dikes.

i) "PCB" - Polychlorinated Biphenyls.

j) "PWTF" - Process Waste Treatment Facility planned for the Y-12 Plant.

k) "S&SPF" - Sludge and Soils Processing Facility planned for the Y-12 Plant.

l) "Tc" - Technetium.

m) "TEHP" - Tri-(2-Ethylhexyl) Phosphate.

n) "TRU" - Transuranic waste that is contaminated with alpha-emitting radionuclides with half-lives greater than 20 years and concentrations greater than 100 nanocuries/gram at the time of assay.

o) "TSCA Incinerator" - Incinerator at the K-25 Site which is permitted to burn wastes subject to the Toxic Substances Control Act (TSCA) and Resource, Conservation, and Recovery Act (RCRA).

p) "U" - Uranium.

q) "U.P." - Uranium Precipitate.

r) "WETF" - West End Treatment Facility at the Y-12 Plant.

MIXED WASTES INCLUDED IN FFCA
OAK RIDGE K-25 SITE

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
LABORATORY BMP[2] ACID WASTE	D002, D007, D008, D009	22.0		90.0	K-301 Vault 4	Neutralization, Stabilization	K-1232	TBD
LABORATORY BMP[2] BASE WASTE	D002, D004, D006, D007, D008 PCB <50 ppm	4.0		22.0	K-301 Vault 4	Stabilization	K-1232	TBD
LABORATORY BMP[2] ORGANIC WASTE	D001-D003, D006, D008, D009, D011, F001-F003, F005	7.0		20.0	K-301 Vault 4, K-711	Incineration	TSCA Incinerator	TBD
PAINT WASTE AND ORGANIC SLUDGES	D001, D007, D008, D009, F001, F002, F003, F005	8.0		29.0	K-711, K-1425	Incineration	TSCA Incinerator	TBD
SPENT SOLVENTS AND WASTE OILS	D001, D008, F001, F002, F003, F005	200.0		1096.0	K-301 Vault 4B, K-306-1, K-711, K-1036A, K-1202, K-1420A, K-1425	Incineration	TSCA Incinerator	TBD
SPENT SOLVENTS AND SLUDGES	D001, D002, D006, D007-D009, D011, F001-F003, U154, U211, U228	21.0		32.0	K-1420A: TNHW-37, K-1202, K-1425, K-1435	Incineration	TSCA Incinerator	TBD
SOLVENT-CONTAMINATED RAGS	F001, F002, F003	1.0		3.0	K-301 Vault 4, K-711	Incineration	TSCA Incinerator	TBD
LAUNDRY SLUDGE	D007, D008	2.2		36.4	K-306-1 Vault 23	TBD	TBD	TBD
K-1407-B & -C POND SLUDGES	F006, Nickel	0		30227	K-303-1, K-309-3, K-310-1, K-1417, K-1419, K-305 Vault 19A, K-305 Vault 19B, K-309 Vault 2A	Stabilization (Delisting)	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.
[2]BMP - "Best Management Practice"

MIXED WASTES INCLUDED IN FFCA
OAK RIDGE K-25 SITE (Continued)

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
MERCURY-CONTAMINATED SOIL	D009	0		230.0	K-302-4	TBD	TBD	TBD
PROCESS NITRIC ACID WASTE	D002, Nickel	4.2		18.0	K-301 Vault 4, K-1232	Neutralization, Stabilization	K-1232	TBD
PCB-CONTAMINATED SOILS, WITH MERCURY	D009 PCB > 50 ppm	0	20.4		K-302-4	Incineration, Stabilization	TSCA Incinerator	TBD
TSCA INCINERATOR ASH	D004-D011, F001-F003, F005	9.4[2]		69.6	K-301 Vault 4, K-301 Vault 4B	Stabilization (Delisting)	TBD	TBD
TSCA INCINERATOR SUMP/IWS SLUDGES	D004-D011, F001-F003, F005, F006, F008	22.6[2]		85.0	K-301 Vault 4A, K-301 Vault 4B, K-306-1	Stabilization (Delisting)	TBD	TBD
WASTEWATER TREATMENT SLUDGES AND SPENT CARBON	F001, F002, F003, F004, F005, F006	242.0[3]		715.0	K-301 Vault 4A, K-301 Vault 4B, K-306-1, K-306-1 Vault 23A	Stabilization	TBD	TBD
Y-12 RADIOGENIC LEAD	D008	0		5.0	K-311-1	TBD	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.
[2]Annual generation rates for TSCA Incinerator Ash and Sump/IWS Sludges are highly dependent on incinerator feed. Rates given are those assumed for liquid waste processing.
[3]Includes 217.0 m^3/yr of "Wastewater Treatment Spent Carbon" generated at the Y-12 Plant.

MIXED WASTES . .LUDED IN FFCA
OAK RIDGE NATIONAL LABORATORY

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
7,12-DIMETHYL-BENZANTHRACENE	U094	0		0.0005	7654	Incineration	TSCA Incinerator	TBD
BARIUM	D005	0.01		0.11	7507W, 7654	Stabilization	TBD	TBD
BENZENE	U019	0.01		0.22	7507W, 7654	Incineration	TSCA Incinerator	TBD
CADMIUM	D006	0.3		0.208	7507W, 7654, 7823	Stabilization	TBD	TBD
CYANIDE	D003, P029	0.001	0.0076		7507W, 7654	Deactivation	TBD	TBD
CORROSIVES-LIQUIDS (ACIDS)	D002, D004, D006-D009	0.509	0.94	2.94	7507W, 7654, 7823	Neutralization	TBD	TBD
CORROSIVE-SOLIDS (ACIDS)	D002	0.05		0.0643	7507W, 7654, 7823	Neutralization	TBD	TBD
CORROSIVES-LIQUIDS (BASES)	D002	0.2		0.3	7507W, 7654	Neutralization	TBD	TBD
CORROSIVES-SOLIDS (BASES)	D002	0.01		0.004	7654	Neutralization	TBD	TBD
SCINTILLATION FLUIDS (SPENT SOLVENTS)	F003, F005	4.40	0.34	36.08	7507W, 7654	Incineration	TSCA Incinerator	TBD
SPENT SOLVENTS WITH SCINTILLATION FLUIDS	F001, F002, F003, F004, F005	1.26	0.10	6.90	7507W, 7654	Incineration	TSCA Incinerator	TBD
SPENT SOLVENTS & SCINTILLATION FLUIDS (ORAU)	F003, F005	0.12	0.01	0.47	7507W, 7654	Incineration	TSCA Incinerator	TBD
PHENOL	U188	0.02		0.11	7507W, 7654	Incineration	TSCA Incinerator	TBD
FLAMMABLE LIQUIDS[2]	D001	7.283	0.022	45.79	7507W, 7654, 7823	Incineration	TSCA Incinerator	TBD
FLAMMABLE SOLIDS	D001	1.04		3.75	7507W, 7654	Incineration	TSCA Incinerator	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.

[2]Includes 0.192 m^3 (0.022 m^3 pre-effective) of "Halogenated Organic Compounds" and 0.002 m^3 of "Arsenic Waste", stored at 7507W and 7654, respectively. These wastes are no longer generated.

MIXED WASTES . .LUDED IN FFCA
OAK RIDGE NATIONAL LABORATORY (Continued)

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
SOLVENT WASTE[2]	F001, F002, F003, F004, F005, D009	0		19.0	7830A	Incineration	TSCA Incinerator	TBD
METHANOL (METHYL ALCOHOL)	U154	0.001		0.001	7507W, 7654	Incineration	TSCA Incinerator	TBD
MERCURY (DOO9)	D009	0.09	.0001	0.38	7507W, 7654	Roasting/Retorting	TBD	TBD
MERCURY (U151)	U151	0.66		0.66	7507W, 7654	Amalgamation	TBD	TBD
REACTIVES	D003	0.002		0.000048	7507W, 7654	Deactivation	TBD	TBD
LEAD	D008	0.48		0.49	7507W, 7654	Macroencapsulation	TBD	TBD
LLLW COLLECTION TANKS SLUDGE	D002, D006, D007, D008, D009	N/A[3]		N/A[3]	ACTIVE LLLW COLLECTION TANKS	TBD	TBD	TBD
INACTIVE WASTE STORAGE TANK CONTENTS-A	D002, D006, D007, D008, D009, F001, F003, F005	0	1088.0 8.0 35.0 5.0 1.0 0.5 64.0 267.0 2.0 1.0 3.0 0.1 121.0 65.0 39.0 292.0 27.0 107.0 49.0 1.4		Bldg./Tank #: 7852: T-3 7852: T-4 7852: T-9 3503: TH-1 3503: TH-3 3500: TH-4 Var.: W-10 3019: W-13 3019: W-14 3019: W-15 2026: W-1A 3019: W-3 3019: W-4 Var.: W-5 Var.: W-6 Var.: W-7 Var.: W-8 Var.: W-9 4500: WC-17	Thermal Treatment	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.
[2]Includes 11.0 m^3 of former "Inactive Waste Storage Tank Contents-B" wastes from closure of Tank #7680, which were combined with waste oils in Tank #7830A.
[3]LLLW Collection Tanks are active process accumulation tanks, not storage vessels per se.

MIXED WASTES INCLUDED IN FFCA
OAK RIDGE NATIONAL LABORATORY (Continued)

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
INACTIVE WASTE STORAGE TANK CONTENTS-C	D006, D007, D008, D009	0	62.4 19.0 0.1 0.1 0.2 24.0 19.0		Bldg./Tank #: Var.: #W-6 4500: WC-17 7500: #7562 3550: #W-11 3500/3503: #TH-4 Var.: #W-5	TBD	TBD	TBD
INACTIVE WASTE STORAGE TANK CONTENTS-D	D006, D007, D008, D009	0	110.0 3.0 5.0 8.0 5.0 2.0 24.0 9.0 15.0 19.0 10.0 10.0		Bldg./Tank #: 7852: T-1 7852: T-2 7852: T-3 7852: T-4 7852: T-9 Var.: W-10 3019: W-3 3019: W-4 Var.: W-7 Var.: W-8 Var.: W-9	TBD	TBD	TBD
TRU WASTE	D008, D009	40.0		680.0 267.0 246.0 167.0	 7826 7834 7855	TBD	TBD	TBD
MELTON VALLEY STORAGE TANK SLUDGES	D002, D006, D007, D008, D009	4.0		390.0 49.0 48.0 45.0 49.0 49.0 50.0 50.0 50.0	Bldg. 7830, Tank #s: W-24 W-25 W-26 W-27 W-28 W-29 W-30 W-31	TBD	TBD	TBD
EVAPORATOR SERVICE TANK SLUDGES	D006, D007, D008, D009	3.0		220.0	W21-W23	TBD	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be

MIXED WASTES . . .LUDED IN FFCA
OAK RIDGE Y-12 PLANT

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
CADMIUM-CONTAMINATED SOIL	D006	0		153.0	East Chestnut Ridge Waste Pile (ECRWP)	TBD	TBD	TBD
CHROMIUM-CONTAMINATED WASTES	D007	0		2.9	Interim Drum Yard	TBD	TBD	TBD
LEAD-CONTAMINATED WASTE	D008	1.0		2.0	Interim Drum Yard 9720-31 (Long Term @ K-25)	TBD	TBD	TBD
MERCURY-CONTAMINATED WASTE	D009 PCB >50 ppm	20.0		57.2	9201-4 Interim Drum Yard	TBD	TBD	TBD
SODIUM-POTASSIUM (NaK) WASTE	D001, D003	0.02		N/A[2]	---[2]	Open Burning; Reaction	Interim Open Burn; Reactive Waste Treatment Fac.	TBD
MIXED WASTE SOIL (Oil Pond or DARA[3] Soil)	F001, F003 PCB <50 ppm	0	2850.0		Soil Storage Facility	PCB/U Extraction; Thermal Treatment	PWTF S&SPF; TSCA Incinerator	TBD
MIXED WASTE SOILS (Oil Land Farm)	F001, F003 PCB <50 ppm	0	284.0		Oil Land Farm Solid Storage Facility	U Separation; Thermal Treatment	PWTF S&SPF; TSCA Incinerator	TBD
PCB-CONTAINING SPENT SOLVENT (SS#1)	F001, F002, F003 PCB >50 ppm	40.0		264.0	9811-8: OD-9	U/Be Extraction; Thermal Treatment	PWTF S&SPF; TSCA Incinerator	TBD
SPENT SOLVENT (SS#2)	F001, F003	30.0		203.5	9811-1: OD-7 9811-1: OD-8 9720-45: OD-10	U/Be Extraction; Incineration	PWTF I Oil/Solvent Treatment Fac.; TSCA Incinerator	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.
[2]Not held in long-term storage; treated as generated.
[3]DARA - "Disposal Area Remedial Action"

MIXED WASTES . .LUDED IN FFCA
OAK RIDGE Y-12 PLANT (Continued)

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
SOLVENT-CONTAMINATED DEBRIS	F001, F003	14.9		37.4	Interim Drum Yard	Incineration	TSCA Incinerator	TBD
WASTE SOIL FROM CLOSURE (Drum Storage Area)	F001, F002, F003	0		500.0	East Chestnut Ridge Waste Pile (ECRWP)	Thermal Treatment	PWTF S&SPF; TSCA Incinerator	TBD
WASTEWATER TREATMENT METAL SLUDGES	F001, F003, F006	807		5463.3	9616: WETF 9623: CPCF <90 Day Interim Drum Yard	Stabilization; Delisting	PWTF	TBD
WASTEWATER TREATMENT SPENT CARBON	F006 (F001-F005, D007) (Nickel)	217.0		0[2]	9623: CPCF <90 Day 9616: WETF <90 Day (Long Term @ K-25)	Thermal Treatment	TBD (K-25)	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.
[2]Stored at K-25 while awaiting treatment(See Oak Ridge K-25 Site "Wastewater Treatment Sludges & Spent Carbon."

MIXED WASTES . .LUDED IN FFCA
PADUCAH GASEOUS DIFFUSION PLANT

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
AQUEOUS CLEANER - MIXED E.P. TOXIC	D002, D008	0.21		0.42	C-733, C-746-Q	TBD	TBD	TBD
ASH RECEIVER RESIDUE	D004, D007	0		464.1	C-746-Q	Lime Precipitation; Stabilization	TBD	TBD
BRASS CHIPS, TURNINGS	D008	0.6		2.1	C-746-Q	TBD	TBD	TBD
EP TOXIC MIXED WASTE (Technetium/Liq.)	D007	0		6.29	C-746-Q	Stabilization	TBD	TBD
EP TOXIC MIXED WASTE (Technetium/Solids)	D007	0		4.74	C-746-Q	Stabilization	TBD	TBD
EP TOXIC SLUDGES (Gold Dissolver & U.P)	D006, D008	1.1		3.6	C-746-Q	TBD	TBD	TBD
GARAGE WASH PIT SLUDGE - EP TOXIC MIXED	D008, D040, F001 PCB <50 ppm	0.63		0.62	C-746-Q	Stabilization	TBD	TBD
GLASS BEADS - EP TOXIC MIXED	D006, D008	0.42		2.10	C-746-Q	TBD	TBD	TBD
HOT WATER RINSE TANK SLUDGE	D008	0		1.7	C-746-Q	Stabilization	TBD	TBD
LABORATORY SAMPLES	D007 PCB <50 ppm	0.2		0.2	C-746-Q	TBD	TBD	TBD
MAGNESIUM FLUORIDE PELLETS	D007	0.8		1.9	C-746-Q	TBD	TBD	TBD
MINERAL SPIRITS	D001	0		0.21	C-733	Incineration	TSCA Incinerator	TBD
MISC. LEAD SOLIDS	D008	0.2		0.62	C-746-Q	TBD	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.

MIXED WASTES ... LUDED IN FFCA
PADUCAH GASEOUS DIFFUSION PLANT (Continued)

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE.	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
MISC. MERCURY-CONTAMINATED SOLIDS	D009	0.02		0.62	C-746-Q	TBD	TBD	TBD
MIXED CORROSIVE WASTE - FILTERS	D002, D006, D007, D008	0.5		2.75	C-746-Q	TBD	TBD	TBD
MIXED CORROSIVE WASTE (Ni Stripper) - SLUDGE	D002, D006, D007, D008	1.5	3.56	0.63	C-746-Q	Neutralization, Stabilization	TBD	TBD
MIXED EP TOXIC WASTES	D009	0.02		0.08	C-746-Q	Stabilization	TBD	TBD
OXALIC ACID	D002	0		0.84	C-746-Q	TBD	TBD	TBD
PCB/CHLORINATED SOLVENTS	D001, F001 PCB >50 ppm	0	28.35		C-733	Incineration	TSCA Incinerator	TBD
PCB/HEXANE SAMPLES (Mixed)	D001 PCB >50 ppm	0.42		0.42	C-733, C-746-Q	Incineration	TSCA Incinerator	TBD
SODIUM DICHROMATE	D007	0		0.2	C-746-Q	TBD	TBD	TBD
SOLVENT-LADEN RAGS	D040, F001, F002 F003, F004, F005	0.42		0.3	C-733, C-746-Q	Incineration	TBD	TBD
SPENT SOLVENTS (Xylene/Dibutyl Carbitol)	D001, F003	0.12	0.42	0.43	C-733	Incineration	TSCA Incinerator	TBD
SPENT SOLVENTS I	D001, F001, F003	0		0.21	C-733	Incineration	TSCA Incinerator	TBD
SPENT SOLVENTS II	D040, F001	2.72	14.14	26.10	C-733	Incineration	TSCA Incinerator	TBD
TEHP SOLUTION	D001	0.3		0.85	C-733	Incineration	TSCA Incinerator	TBD
TRU & Tc WASTE	D007	0		0.42	C-746-Q	Stabilization	TBD	TBD
TRU LIQUID	D007	0		0.65	C-746-Q	Stabilization	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.

MIXED WASTES INCLUDED IN FFCA
PADUCAH GASEOUS DIFFUSION PLANT (Continued)

WASTE IDENTIFICATION	PRIMARY CONSTITUENTS	VOLUMES (M^3) ANNUAL GEN.	STORAGE (@ 12/31/90) PRE	POST	STORAGE FACILITY	POTENTIAL[1] TREATMENT	TREATMENT[1] FACILITY	DISPOSAL[1] FACILITY
TRU SOLIDS	D007	0		0.84	C-746-Q	Stabilization	TBD	TBD
U-CONTAMINATED WASTE OILS - MIXED EP TOXIC	D008, D009	22.1		25.6	C-733, C-746-Q	TBD	TBD	TBD
VACUUM DUST	D008, D010	0.2		0.42	C-746-Q	TBD	TBD	TBD

[1]TBD - "To be determined:" Treatment methods and facilities for stabilization and thermal processing are under evaluation; Following treatment to applicable treatment standards, residuals will be placed in long-term storage pending evaluation and development of disposal facilities.

DESCRIPTION OF STORAGE AREAS

A description of each of the storage facilities including size and construction materials follows. Maps and drawings, where available, detailing the storage areas are attached with each site's description. Storage area locations are highlighted in an orange color on site maps.

K-25 WASTE SITE STORAGE AREAS

K-25 SITE

The K-1425 Container Storage Unit is a prefabricated metal building that is enclosed with roof, walls, and a diked secondary containment system; therefore, no precipitation is expected to be collected within the secondary containment system. The approximate dimensions of the unit are 41 ft by 60 ft. The foundation and floor consists of a 4 inch compacted, crushed stone base and a 4 inch reinforced concrete slab. The concrete slab has a live load capacity of 400 lbs per sq ft and is suitable for forklift truck loading. The floor slab is free of gaps and holes, but may contain minor cracks caused during the concrete curing and settling process at construction. A sealant, Amerlock 400 or equivalent, will be applied to the trench and sump. The sealant has good chemical resistance to spills, splashes, and fumes and to ambient weathering; therefore, leaks or spills will be contained. The floor of the unit slopes to an 18-inch wide grated trench which runs along the center of the building. There are no outlets or drains in the sump or the storage floor; therefore, any spilled material will be contained. The maximum storage capacity for the K-1425 container storage unit is 49,135 gal.

The K-1425 Tank Management Units consist of four identical, 22,500 gal, vertical, above-ground tanks and one 500 gal, stainless steel, open-top tank referred to as the reservoir tank. These units will be used for bulk storage and treatment of liquid wastes. The four 22,500 gal tanks are constructed of 100-mil, chopped mat, filament wound fiberglass with a furan resin binder and have a shell thickness of 0.75 in. at the bottom tapering to 0.375 in. at the top. The maximum loading capacity for each of the four 22,500 gal tanks, exclusive of the weight of the tanks, is 218,790 lbs. The four 22,500 gal tanks are designed to withstand an internal pressure of 10 in. of water column (w.c.). These four tanks are equipped with an inert nitrogen blanketing system and a pressure relief system that is designed and regulated to relieve at a pressure of 9.0 in. w.c. Tank level indicators have been installed on all four tanks. The tank systems will be operated at ambient temperature.

The K-1435 Container Storage Unit is an enclosed area with a roof, walls, and a diked secondary containment system; therefore, no precipitation is expected to collect in the secondary containment systems. The unit is divided into two container storage areas, one for polychlorinated biphenyl (PCB) waste and one for non-PCB waste. The PCB waste storage area has approximate dimensions of 42 ft by 109 ft and the maximum storage volume is 19,360 gal. The non-PCB storage area has approximate dimensions of 44 ft by 120 ft and the maximum storage volume is 27,280 gal. The foundation of the container storage areas is a 6 in., reinforced concrete slab overlying a compacted crushed stone base. The design live load of the floor slab is 500 lbs per sq ft and is suitable for forklift truck loading. The floor of the unit slopes to an 8 in. wide grated trench.

The K-1435 Tank Management Units consist of 17 covered tanks that provide storage and treatment for liquid wastes that are intended to be treated at the K-1435 Toxic Substances Control Act (TSCA) Incinerator. The 17 tanks are constructed of carbon steel, four of which are provided with a furan resin liner, to enable them to receive and manage aqueous wastes. The furan resin liner was chosen because of its compatibility to organic materials and its resistance to corrosive properties of the aqueous wastes. The maximum loading capacity for each of the tanks T-201, T-202, T-203, T-204, T-205, T-206, T-305A, T-305B, T-306A, T-306B, T-307A, and T-307B, exclusive of the weight of the tanks, is 48,620 lbs. The maximum loading capacity for each of the tanks T-207, T-208, and T-209, exclusive of the weight of the tanks, is 97,240 lbs. The maximum loading capacity for each of the tanks T-301 and T-302, exclusive of the weight of the tanks, is 8,751 lbs. The tanks are supported vertically above the floor by supporting legs. Each tank is equipped with an inert nitrogen blanketing system and flame arresting pressure relief valves to safely handle ignitable wastes. The pressure relief valve is designed and regulated to relieve at a pressure of 9.0 in. w.c. Tank level indicators have been installed on each tank.

The K-1419 Sludge Fixation Facility consists of a storage tank area for hazardous wastes and a series of storage tanks for non-hazardous mix materials, feed tanks, and mixer. The hazardous sludges and liquids are mixed with the non-hazardous materials (fly ash, concrete, sand, and clay) in the mixers. Hazardous wastes to be processed at the K-1419 sludge fixation facility will be stored in eight above-ground tanks. The wastes will be processed in two mixers. The tanks are used to receive, store and feed the waste materials to the fixation mixers. All of the waste sludges stored in the tanks are compatible with the materials of construction. All hazardous waste storage/feed tanks will be carbon steel (with the exception of F-4000) with design corrosion allowance sufficient to maintain the minimum shell thicknesses. The carbon steel tanks will also be lined with an epoxypolyamide coating in order to prevent corrosion of the tanks. The F-4000 tank will be constructed of fiberglass reinforced plastic, which is resistant to hydrochloric and sulfuric acids. Tank F-4020 is a 2,600 gal sludge receiving hopper with a diameter of 11.25 ft and ht of 14 ft. Tank F-4170 is a 3,000 gal high solids storage tank with a diameter of 11.5 ft and ht of 17 ft. Tank F-4080 is a 1,500 gal waste sludge feed hopper with a diameter of 10 ft and ht of 12 ft. Tank F-4030 is is a low solids storage tank and tank F-4630 is a remedial sludge storage tank. Tanks F-4030 and F-4630 each have an operating capacity of 15,000 gal, diameter of 12 ft, and ht of 18 ft. Tank F-4690 is a remedial sludge feed tank with an operating capacity of 2,000 gal, diameter of 6 ft, and ht of 10 ft. Tank F-4070 is a 1,500 gal liquid waste feed tank with a diameter of 6 ft and ht of 7 ft. Tank F-4000 is a 500 gal neutralization tank with a diameter of 4.5 ft and ht of 6 ft.

The K-310-1 Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 225 ft by 69 ft. The secondary containment system is subdivided by additional curbing into three separate areas. This unit will store a maximum of 385,340 gal of hazardous wastes.

The K-309 Vault 2A Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 252 ft by 49 ft. The secondary containment system is subdivided by additional curbing into three separate sections. This unit will store a maximum of 332,820 gal of hazardous wastes.

The K-309-3 Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 252 ft by 54 ft. The secondary containment system is subdivided by additional curbing into three separate sections. This unit will store a maximum of 291,440 gal of hazardous wastes.

The K-302-4 Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 360 ft by 54 ft. The secondary containment system is subdivided by additional curbing into three separate sections. This unit will store a maximum of 476,920 gal of hazardous wastes.

The K-303-1 Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and will be equipped with concrete curbing that provides secondary containment for the unit. The unit will have approximate dimensions of 327 ft by 52 ft. The secondary containment system will be subdivided by additional curbing into three separate sections. This unit will be able to store a maximum of 384,110 gal of hazardous wastes when the unit is modified. Prior to a permanent secondary containment system being provided, the maximum storage capacity for the unit is 384,110 gal for hazardous waste that does not contain free liquids being stored in compliance with 40 CFR 264.175 and the maximum storage capacity of the unit is 310,000 gal for hazardous wastes that contain free liquids when portable secondary containment systems are used, in compliance with TN Rule 40 CFR 264.175.

The K-305 Vault 19 Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 262 ft by 41 ft. The secondary containment system is subdivided by additional curbing into three separate sections, with approximate dimensions of 86.5 ft by 40.5 ft, 87.5 ft by 40.5 ft, and 87.5 ft by 40.5 ft. This unit will store a maximum of 240,430 gal of hazardous wastes. The three areas will store a maximum of 81,130 gal, 77,360 gal, and 81,940 gal, respectively.

The K-305 Vault 19B Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 281 ft by 54 ft. The secondary containment system is subdivided by additional curbing into three separate areas, with approximate dimensions of 86 ft by 54 ft, 87 ft by 54 ft, and 106 ft by 54 ft. This unit will store a maximum of 453,840 gal of hazardous wastes. The three areas will store a maximum of 108,390 gal, 110,420 gal, and 135,030 gal, respectively.

The K-306-1 PCB Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 143 ft by 19 ft. This unit will store a maximum of 65,170 gal of hazardous wastes. The unit is a flat concrete pad surrounded by a 6 in. high concrete curb, cement block walls, and a chain-link fence.

The K-306-1 Vault 23A Container Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This area is protected from precipitation because of its location inside the K-25 building. This unit has a 7 in. reinforced concrete floor and is equipped with concrete curbing that provides secondary containment for the unit. The unit has approximate dimensions of 288 ft by 44 ft. The secondary containment system is subdivided by additional curbing into three separate areas, with dimensions of 79 ft by 44 ft, 85 ft by 44 ft, and 121 ft by 44 ft. This unit will store a maximum of 259,460 gal of hazardous wastes. The three areas will store a maximum of 77,860 gal, 83,320 gal, and 98,280 gal, respectively. The unit is a flat concrete pad surrounded by a 8 in. high concrete curb.

The K-1036-A Hazardous Waste Storage Unit is an open shed, located in the north-central part of the K-25 Site. This unit consists of two concrete slabs enclosed by concrete curbing and is covered by a corrugated metal roof. This building has no walls. The larger of the two storage areas measures approximately 103 ft by 32 ft. The floor consists of a concrete slab. The larger area is completely surrounded by a 28 in. high concrete curb. This larger area will store a maximum of 77,170 gal of hazardous waste. The smaller area has approximate dimensions of 22 ft by 21 ft and consists of an elevated concrete slab with a 4 in. high concrete curb. The smaller area will store a maximum of 11,100 gal of hazardous waste.

The K-711 Container Storage Unit is located southwest of the main K-25 Site. This unit consists of a building which has been equipped with curbing to provide secondary containment for the unit. The secondary containment system for this unit has approximate dimensions of 159 ft by 35 ft. The unit will store a maximum of 120,800 gal of hazardous waste. This building is equipped with a metal roof and two 8 ft by 10 ft access doors.

The K-301 Vault 4, 4A, and 4B Hazardous Waste Storage Unit is located on the ground floor of the K-25 process building at the center of the K-25 Site. This unit is protected from precipitation because of its location inside the K-25 building. The unit is 325 ft long by 160 ft wide and has a maximum storage capacity for approximately 22,800 drums or 1,254,000 gal. The storage area has a concrete floor slab 7 in. thick and is surrounded by an 8 in. high concrete curb. There are no drains or outlets in the storage floor; therefore, all liquids from spills or leaks will be contained. The container storage area floor slab is free of cracks and holes. The floor live load is 520 lbs per sq ft and is suitable for full forklift truck loading. The concrete and cement block are compatible with any of the wastes stored and would not be corroded or weakened if a spill occurred. The concrete floors and dikes have been sealed with concrete sealer.

The K-1420-A Flammable Liquids Tank Storage Unit is a 30,000 gal horizontal above-ground tank equipped with safety devices to allow storage of ignitable wastes. The tank has a 8 ft 7 in. nominal diameter and a 66 ft 4 in. straight side with ellipsoidal heads at each end. The design pressure of the tank is 200 psig, and the design temperature range is 0 to 120 degrees F. Normal operating conditions are 2 psig pressure and ambient temperature. The tank is equipped with a nitrogen blanket and a flame arrestor vent and a rupture disk to prevent pressure buildup. A heat-activated deluge system surrounds the tank. The surface of the tank is covered with reflective paint to minimize solar adsorption. The storage tank is grounded. The floor slab consists of 4 in of concrete with reinforcement bars and woven wire mesh. The tank is supported in a concrete saddle. Rainwater is removed from the containment system by opening a valve on a sump and draining the water to the storm sewer system. The valve on the sump is kept closed at all times except when removing rainwater. The tank is constructed of carbon steel. The shell thickness of the tank is 0.83 in.

The K-1202 Hazardous Waste Storage Unit is a 15,000 gal, horizontal, above-ground tank. The tank has a 10 ft nominal diameter and a 25 ft 9 in. length. The tank is vented and designed to operate at ambient pressure and temperature. The tank is contained within a 37 ft 2 in. long by 36 ft 2 in. wide by 2 ft. deep concrete containment basin. The basin walls are 6 in. thick concrete reinforced with steel bar. The floor slab consists of 4 in. of concrete reinforced with steel bar and woven wire mesh. The tank is supported in a concrete saddle. The capacity of the dike is 2,678 cubic ft or 20,033 gal which will contain 100 percent at the tank capacity. The storage tank is constructed of carbon steel. The shell thickness of the tank is 0.30 in. and the ends are 0.33 in. Rainwater is removed from the containment system by opening a valve on a sump and draining the water to the storm sewer system. The valve on the sump is kept closed at all times except when removing rainwater.

The K-1417 Concrete Block Casting and Container Storage Unit is approximately 8 acres in area and has a storage capacity of approximately 7,955,000 gal of waste. The K-1417 area includes a building used for the pouring and staging of concrete blocks, the cement truck washdown area, and a container storage yard. The area drains to three gutter inlets that connect to a 24 in. diameter pipe running along the south side of the area. The asphaltic concrete paving slopes at a 3 percent grade. The area is completely surrounded by 6 in. high concrete curbs to prevent drainage from the area except through the drain pipe. The 3 percent grade and drain pipe system are sufficient to remove precipitation from the pad during any storm event. This prevents standing liquids from accumulating around the containers.

The K-1232 Container Storage Unit is located in the K-1232 building which is a completely enclosed structure, thus preventing any run-on or rainfall from entering the storage area. The storage area is approximately 8400 sq ft, (60 x 140). The maximum number of containers stored at one time in K-1232 is 180 55-gal drums or 9900 gal. The means of secondary containment consists of a concrete pad with curbs. The foundation and floor slab consists of a 4 in. compacted crushed stone base (ASTM D448 size No. 57) and a 6 in. reinforced concrete slab. A full 6 in. high curb above the interior level of the floor surrounds the K-1232 area. The concrete base has a live load capacity of 400 lbs per sq ft.

The K-1232 Tank Storage Unit is located in the K-1232 building which is a completely enclosed structure, thus preventing any run-on or rainfall from entering the storage area. The unit consists of eight above-ground, closed-top tanks used to store and treat hazardous waste. Tank F-104A is constructed of 315L Stainless steel and has a 0.25 in. shell thickness Tanks F-104B, F-104C, F-104D, and F-105 are constructed of 316L Stainless Steel and have a 0.25 in. shell thickness. Tanks F110A and F110B are constructed of carbon steel and have a 0.438 in. shell thickness. Tank F-114 is constructed of carbon steel and has a 0.25 in. shell thickness. Each of the tanks F-104A, F-104B, F-104C, and F-104D have a diameter of 13 ft, a ht of 16 ft and an operating capacity of 16,000 gal. Both tanks F-110A and F-110B have a diameter of 9.5 ft, ht of 11 ft, and an operating capacity of 5,800 gal. Tank F-105 has a diameter of 7 ft, a ht of 7 ft, and an operating capacity of 2,000 gal. Tank F-114 has a diameter of 8.5 ft, a ht of 9.5 ft, and an operating capacity of 4,200 gal. The tanks in the K-1232 building are contained in a dike. All diking, foundations, and tank supports are constructed of reinforced concrete. The floor of the K-1232 building slopes to several sumps located throughout the treatment tank area; therefore, any spill material will be collected.

The K-311-1 Radiogenic Lead Storage Vault is located in the enclosed K-25 building that prevents precipitation and run-on from entering the storage area. K-311-1 has approximately 2,500 sq ft of storage area. Approximately 51 tons of lead wastes are stored in this area, all of which are solid wastes that do not contain free liquids.

K-25 SITE RCRA FACILITY MAP

LEGEND

TANK SITES

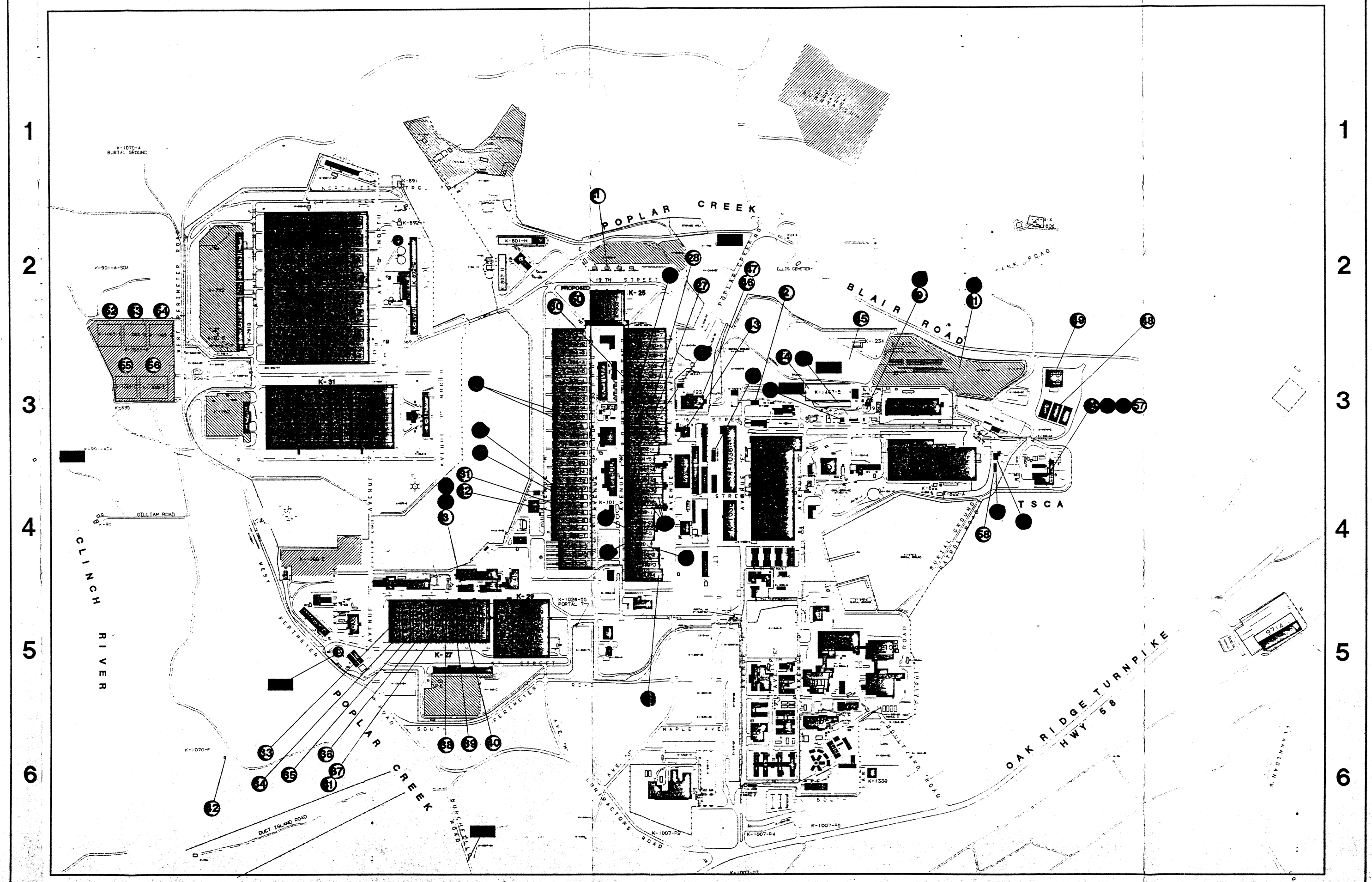
LINE NUMBER	BLDG	DESCRIPTION	GRID LOCATION
1	K-1025-C	STORAGE BUILDING S01	F2
2	K-1302	GAS CYLINDER STORAGE UNIT S01	E2
3	K-1232	TREATMENT FACILITY T01	F2
9	K-1419	SLUDGE FIXATION PLANT T04	D3
11	K-1417	BLOCK STORAGE YARD T04	D3
14	K-1435	RCRA/TSCA INCINERATOR T03	C4
27	K-302	VAULT 8A HWSU S01	E2
28	K-302-5	HWSU S01	E2
30	K-303-2	HWSU S01	E3
31	K-306-3	HWSU S01	F2
32	K-306-4	HWSU S01	F2
33	K-27	WITHDRAWAL ALLEY 3 IX S01	D5
34	K-27	WITHDRAWAL ALLEY 31 S01	D5
35	K-27	WITHDRAWAL ALLEY 31A S01	D5
36	K-27	WITHDRAWAL ALLEY 32 S01	D5
37	K-27	WITHDRAWAL ALLEY 32A S01	F5
38	K-27	WITHDRAWAL ALLEY 33 S01	F5
39	K-27	WITHDRAWAL ALLEY 33A S01	F5
40	K-27	WITHDRAWAL ALLEY 34 S01	F5
41	K-27	VAULT 32A HWSU S01	F2
42	K-900	BOTTLE SMASHER (CLOS. PLANNED) T04	H5
43	K-1413	TREAT TK (CLOSURE PLAN SUBMIT) T01	E3
44	K-1407-B	RETN BASIN (CLOSURE IN PROG) T02	D3
45	K-1407-C	RETN BASIN (CLOSURE IN PROG) S04	D3
46	K-1423	Y-12 DEMONSTRATION PROJ (COMP) T04	E3
47	K-1423	HAZD WASTE STOR & PROCESS UNIT S01	E3
48	K-1427	PRODUCTION WASTE STOR FAC/CONT S01	C3
49	K-1426	PRODUCTION WASTE STOR FAC/TANKS S02	C3
50	K-25	WITHDRAWAL ALLEYS (PROPOSED) S01	E2,F2
52	K-1065-A	DRUM STORAGE UNIT S01	F2
53	K-1065-B	DRUM STORAGE UNIT S01	F2
54	K-1065-C	DRUM STORAGE UNIT S01	F2
55	K-1065-D	DRUM STORAGE UNIT S01	F2
56	K-1065-E	DRUM STORAGE UNIT S01	F2
57	K-1435	RCRA/TSCA INCINERATOR T01	C4
58	K-1425	WASTE OIL/HAZ TREAT UNIT T01	D4

PROCESS CODES

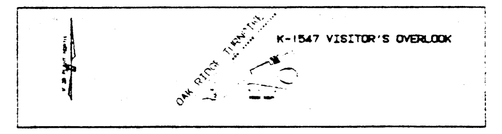
S01...CONTAINER STORAGE
S02...TANK STORAGE
S04...SORFACE IMPOUNDMENT
T01...TANK TREATMENT
T02...TREATMENT SURFACE IMPOUNDMENT
T03...INCINERATOR
T04...OTHER TREATMENT UNIT
HWSU..HAZARDOUS WASTE STORAGE UNIT

NPDES OUTFALLS

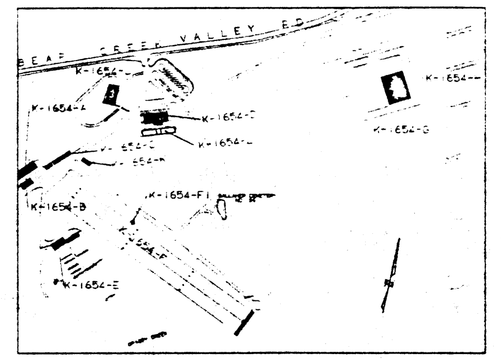
001	K-1700	NPDES PERMIT OUTFALL	E2
005	K-1203	NPDES PERMIT OUTFALL	G5
006	K-1007-P1	NPDES PERMIT OUTFALL	F6
007	K-901-A	NPDES PERMIT OUTFALL	H3
008	K-710	NPDES PERMIT OUTFALL (INACTIVE)	INSET E
009	K-1515-C	NPDES PERMIT OUTFALL	INSET D
010	K-1407E-F	NPDES PERMIT OUTFALL	D3
011	K-1407-J	NPDES PERMIT OUTFALL	D3



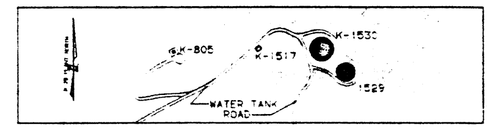
INSET A K-1547 AREA



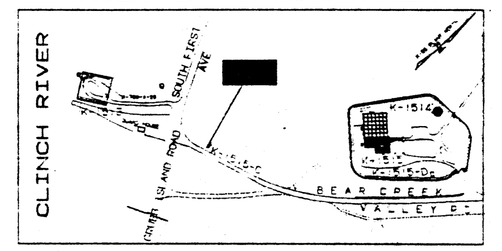
INSET B K-1654 AREA



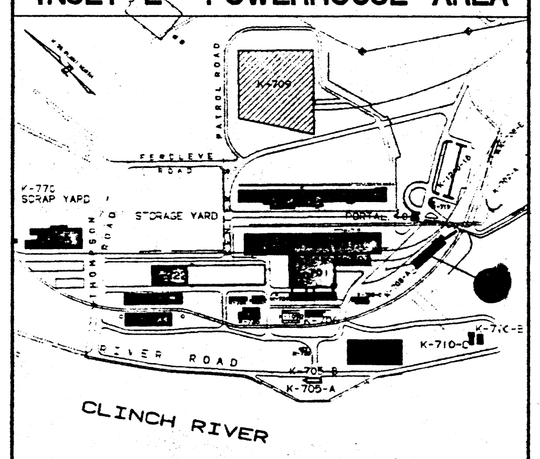
INSET C K-1530 AREA



INSET D K-1515 AREA



INSET E POWERHOUSE AREA



ENERGY SYSTEMS, INC.
OAK RIDGE, TENNESSEE • PADUCAH, KENTUCKY

K-25 SITE
RCRA PERMIT (PART "A")
FACILITY LOCATION MAP

PES/183/061291	(REV 01)
PREPARED BY PES GEODATA GROUP	6/12/91

0 400 800 1600
1 | | | |
SCALE THE GRID UNIT COORDINATES AS SHOWN REPRESENT THE K-25 PLANT GRID SYSTEM FEET

#253

ORNL WASTE STORAGE AREAS

Long-Term Hazardous Waste Storage Facility, Bldg. 7654

Building 7654 is approximately 1700 ft^2 (160 m^2) with dimensions of 39 ft by 42 ft 8 in. The building consists of insulated prefabricated panels built on a concrete floor surrounded by 6-in. -high curbing. The floor has been coated with an epoxy sealer. The inside of the building is divided into five storage areas, each with a centrally located sump and divided by curbing. An elevated aisle divides the building with three storage areas on one side and two storage areas on the other side (Fig. 17).

The building is used for storage of mixed hazardous/radioactive waste. The majority of the wastes are bulk scintillation fluids and scintillation fluid are toluene and/or xylene, culture medium, miscellaneous organics, and various radioisotopes, including ^{3}H, ^{14}C, ^{32}p, and ^{131}I. The flash point is normally less than 66½ C (140½ F), therefore they are classified as ignitable. Other wastes to be stored include organic wastes, carcinogenic wastes, mercury-contaminated solid wastes, waste oils, waste solvents, corrosives, poisons, and other process wastes.

The majority of mixed wastes arrive in 55-gal drums. Occasionally, 30-gal drums and smaller containers are received. Containers smaller than 30-gal are either combined with compatible waste in 55-gal drums or lab packed (one DOT approved 5-gal containers is stored in 7654).

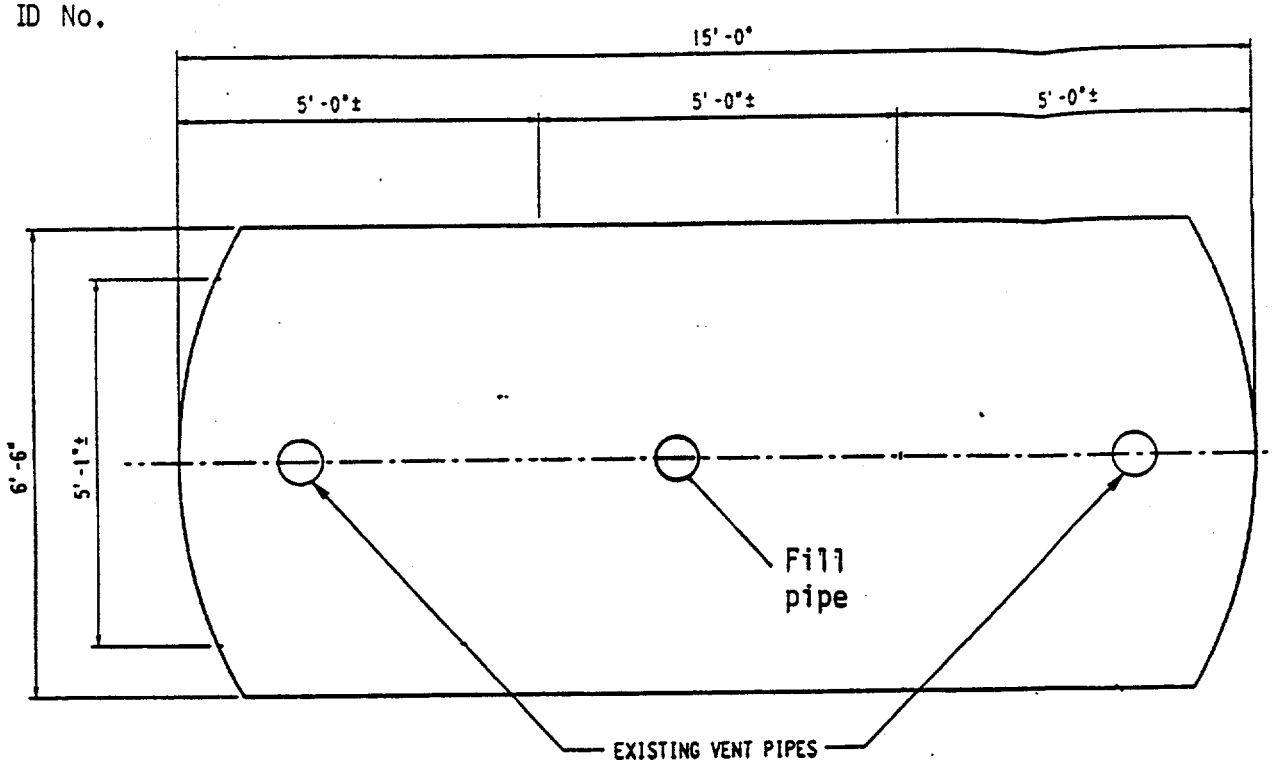
The maximum inventory of drums in storage at any given time is 300 with a total capacity of 16,500 gal. Double stacking of drums, if needed, maintains adequate aisle space. Pallets are placed between the double layers of drums. The capacity for the storage cells is shown below.

			55-gal drums	gal
Storage Area 1	-	Flammables	105	5,775
Storage Area 2	-	Flammables	105	5,775
Storage Area 3	-	Mixed corrosives	30	1,650
Storage Area 4	-	Poisons	30	1,650
Storage Area 5	-	Poisons	30	1,650
		Total	300	16,490

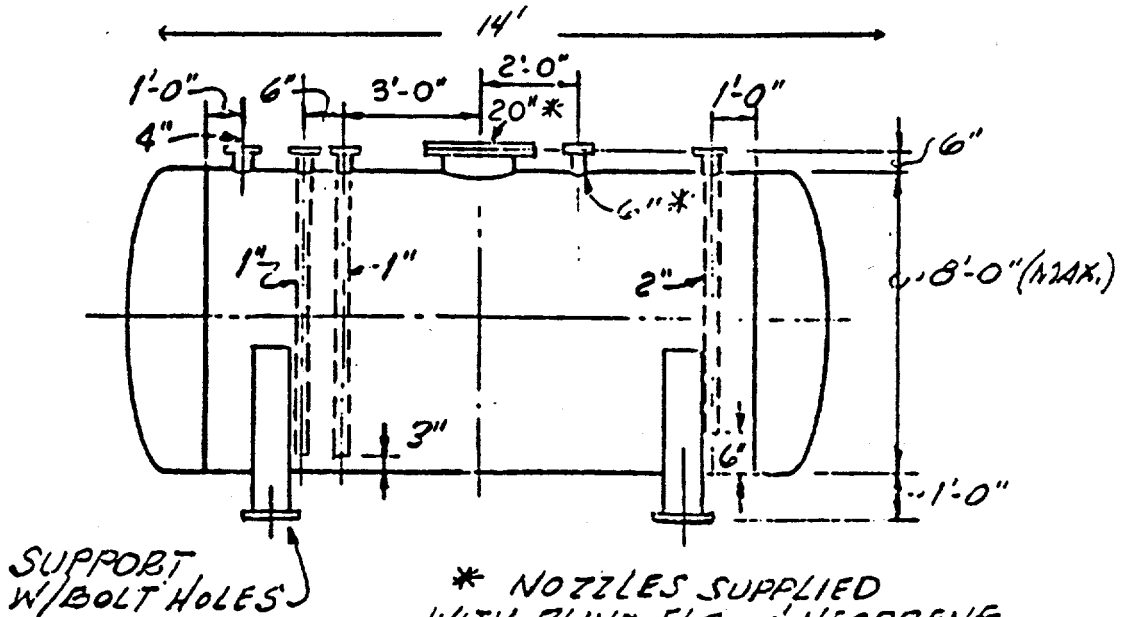
Tank 7830A

The tank, serial number J81-0014, was constructed in 1981 and 1982 by Addison Fabricators of Addison, Alabama, and was installed in a sub-grade vault inside Building 7830A at the Oak Ridge National Laboratory in 1982. The tank was designed as a pressure vessel but will be used for atmospheric storage of RCRA waste. From 1985 to 1991 the tank contained radioactively contaminated waste oils (2,900 gallons total). In September 1990, Energy Systems began managing radioactively contaminated waste oils as RCRA hazardous waste following implementation of TCLP. In 1991, a solvent contaminated (RCRA hazardous) waste oil was transferred from Tank 7860A to 7830A. The current waste inventory is approximately 4,300 gallons, and the maximum capacity of Tank 7830A is 5,000 gallons.

Tank 7830A has chemical and physical properties that meet the materials specification requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The design, construction, and workmanship of the tank conforms to ASME Rules, Section VIII, Division 1 (ASME 1980) and addenda to September 1981. In addition, the tank bears the "U" stamp indicating compliance with the ASME code. ASME form U-1A and other documentation are contained in Appendix D-1. The tank is designed for 15 psig hydrostatic pressure. The current and future operating pressure and temperature are 0 psig and 75 degrees F.



PLAN OF TANK 7860A
½"=1'-0"



NOT TO SCALE

TANK 7830A

Figure 17. Low-Level Waste Oil/Solvent Tanks

Lines 16 and 17, S02

Staging Facility for Contact Handled Transuranic Waste, Bldg. 7823

Building 7823 is a single-level, semiunderground building made from a welded steel frame structure with half-sections of large corrugated metal pipe used as siding (Fig. 20). The building is approximately 4200 ft^2 with a concrete and gravel floor, wire fabric ceiling, and metal roof. It is located at SWSA-5 and is used as the staging facility for waste containers. Small amounts of lead are believed to be stored in the drums and boxes making the waste a mixed waste. The facility will be upgraded with a sealed floor and dikes.

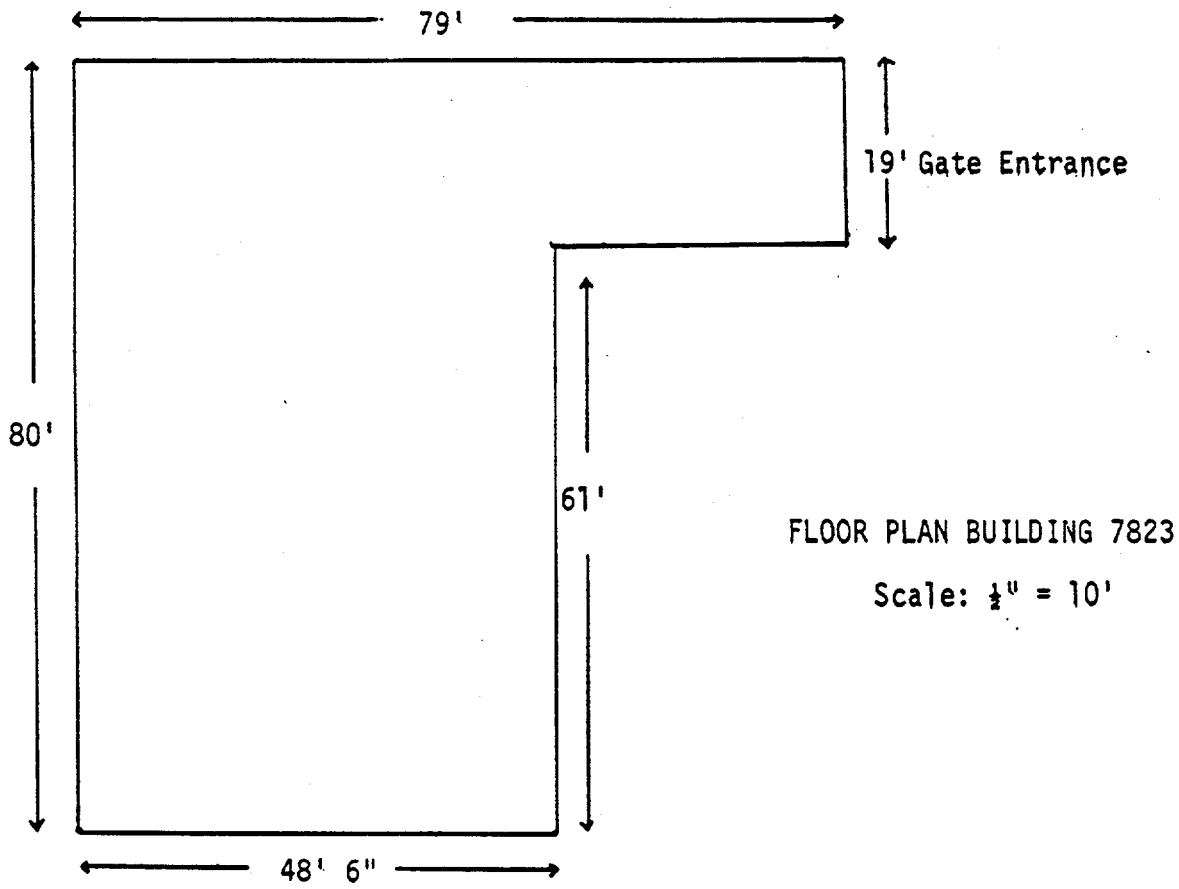


Figure 16. Staging Facility for CH-TRU Waste,
Building 7823
Line 15, S01

Mixed Waste Drum Storage Pad, 7507W

Facility 7507W is a tent-covered, 40-ft square concrete pad with a 4-in. elevation difference between the middle and the edge of the pad (Fig. 15). The middle of the pad contains a sump (1 ft wide by 4 ft long by 2 ft deep) where all liquids are contained.

The pad is used for storage of 55- and 30-gal drums of mixed hazardous radioactive waste; the maximum capacity is 22,000 gal. The drums are placed on pallets and double stacked, if required. They are arranged in rows to provide adequate aisle space for personnel and equipment.

Waste stored at this facility largely consists of scintillation counting vials containing organic and inorganic mixtures contaminated with low levels of radioactivity. Toluene and xylene are regular constituents of the mixtures. Radioisotopes present include ^{3}H, ^{14}C, ^{131}I. Other wastes stored include organic wastes, carcinogenic wastes, mercury-contaminated solid wastes, waste oils, waste solvents, and other process wastes. The storage pad has been largely replaced by the Long-Term Hazardous Waste Storage Facility, Bldg. 7654.

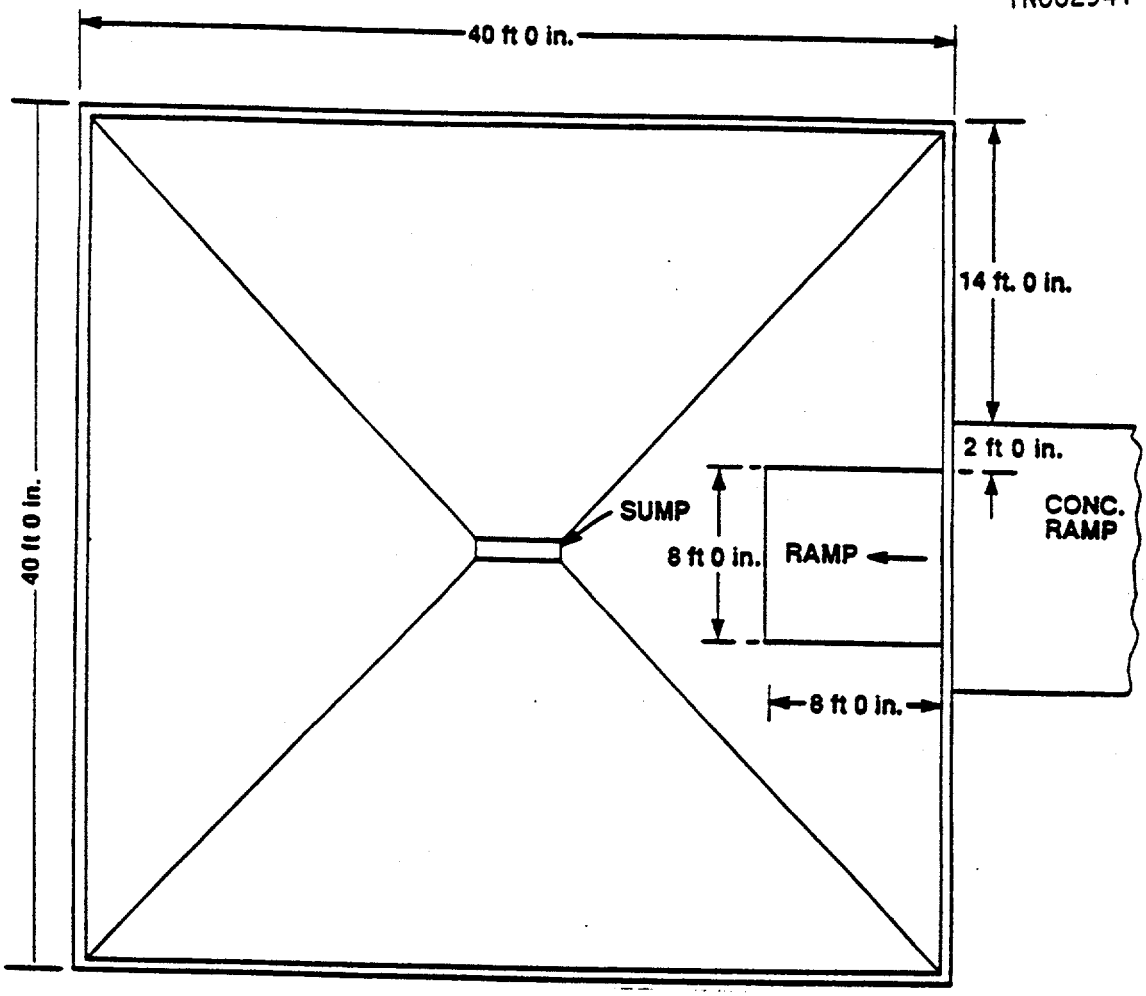
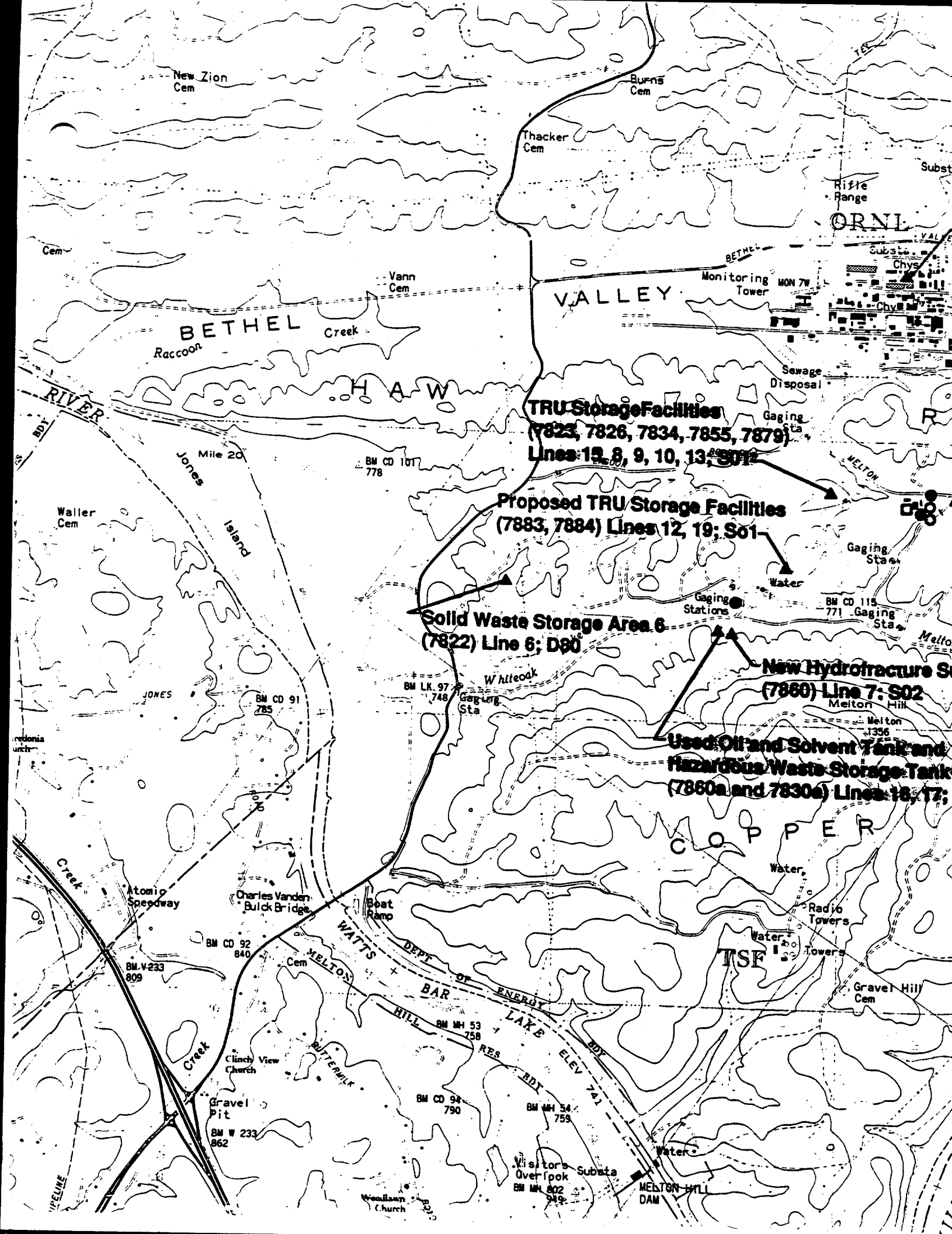
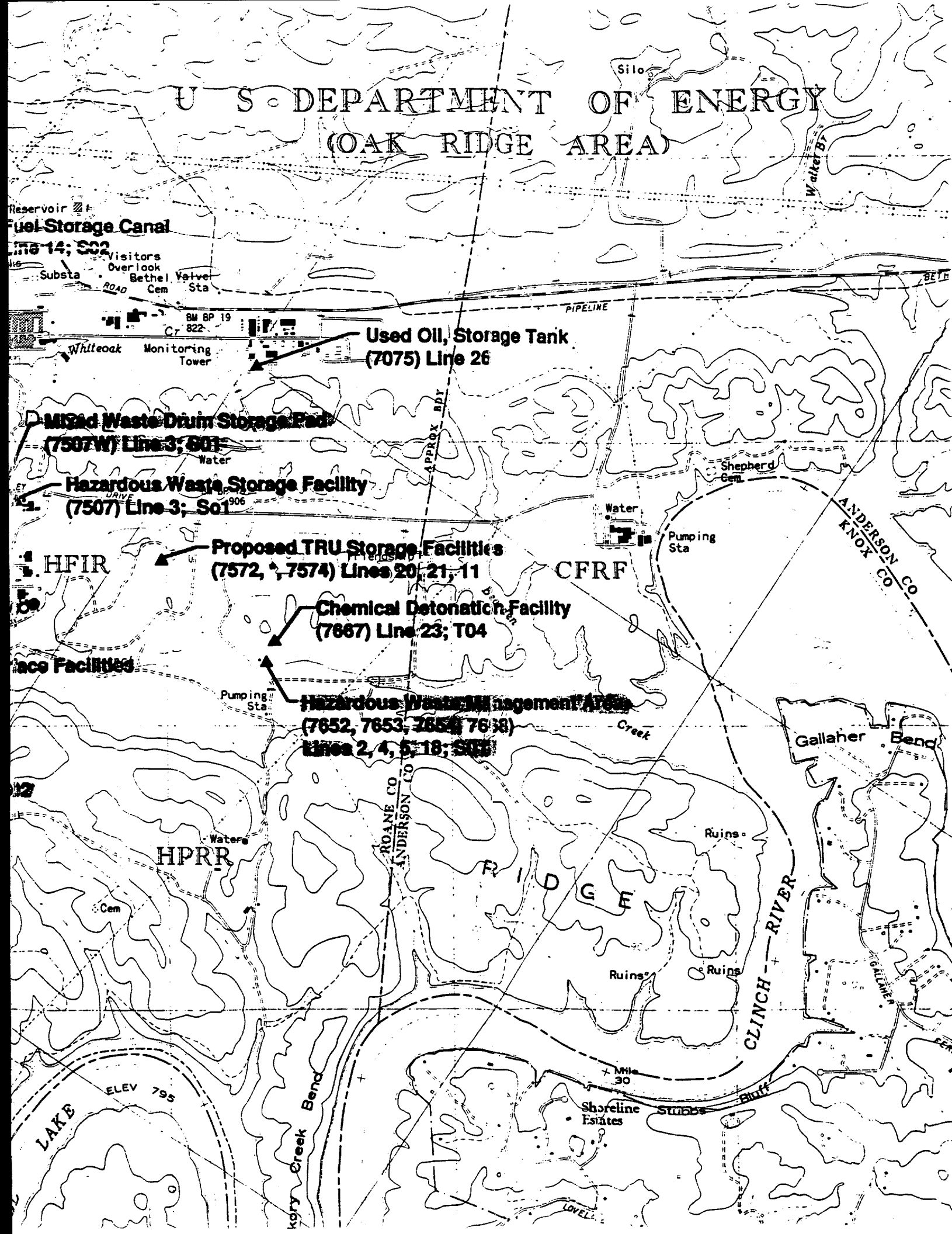


Figure 4. Mixed Waste Drum Storage
Pad (7507W)
Line 3, S01


TRU Storage Facilities
(7823, 7826, 7834, 7855, 7879)
Lines 13, 8, 9, 10, 13; S01
Proposed TRU Storage Facilities
(7883, 7884) Lines 12, 19; S01
Solid Waste Storage Area 6
(7822) Line 6; D90
New Hydrofracture S
(7860) Line 7; S02
Used Oil and Solvent Tank and
Hazardous Waste Storage Tank
(7860a and 7830a) Lines 16, 17;
TSF
ORNL
BETHEL VALLEY
COPPER
RIVER
Jones Island
Melton Hill
Melton Hill Dam
Watts Bar Lake
Dept of Energy
Monitoring Tower MON 7W
Sewage Disposal
Gaging Sta
Water
Radio Towers
Gravel Hill Cem
Gravel Pit
Atomic Speedway
Charles Vanden Bulck Bridge
Boat Ramp
Clinch View Church
Woodlawn Church
Visitors Overlook
Substa
Rifle Range
New Zion Cem
Burns Cem
Thacker Cem
Vann Cem
Waller Cem
Mile 20
Raccoon Creek
Whiteoak Creek
Buttermilk Creek
Elev 741
Res Rdy
BM CD 101 778
BM LK 97 748
BM CD 91 785
BM CD 92 840
BM V 233 809
BM W 233 862
BM CD 94 790
BM MH 53 758
BM MH 54 759
BM MH 802 949
BM CD 115 771


U S DEPARTMENT OF ENERGY
(OAK RIDGE AREA)
Reservoir
Fuel Storage Canal
Line 14; S02
Visitors Overlook
Substa
Bethel Valley Sta
ROAD
Cem
PIPELINE
BM BP 19
822
Whiteoak
Monitoring Tower
Used Oil, Storage Tank
(7075) Line 26
Mixed Waste Drum Storage Pad
(7507W) Line 3; S01
Water
Hazardous Waste Storage Facility
(7507) Line 3; S01
APPROX
Shepherd Cem
Water
Pumping Sta
ANDERSON CO
KNOX CO
HFIR
Proposed TRU Storage Facilities
(7572, 7574) Lines 20, 21, 11
CFRF
Chemical Detonation Facility
(7667) Line 23; T04
Hazardous Waste Management Area
(7652, 7653, 7654, 7638)
Lines 2, 4, 5, 18; S03
Pumping Sta
Creek
Gallaher Bend
ROANE CO
ANDERSON CO
HPRR
Water
Ruins
RIDGE
CLINCH RIVER
Cem
Ruins
Ruins
GALLAHER
Mile 30
Shoreline Estates
Stubbs Bluff
LAKE
ELEV 795
Bend
Creek
LOVELL

Y-12 PLANT WASTE STORAGE AREAS

RCRA AND MIXED WASTE STORAGE AND STAGING BUILDING (9720-31)

RCRA and Mixed Waste Storage and Staging Building (S-028)

The RCRA and Mixed Waste Storage and Staging Building (Facility S-028: Building 9720-31) is used to consolidate the storage of hazardous and mixed (contaminated with uranium) wastes previously stored in other Y-12 locations. It consists of seven rooms for storage and seven rooms for staging. The location of S-028 is indicated on Figure B-2. The building is located on the south side of West 3rd Street, east of the existing Fire Training Facility. RCRA material contaminated with depleted uranium is stored only in the storage rooms. This building does not have any tank storage, and all containers (drums and lab containers) are assumed to contain free liquids.

The small lab quantities of RCRA wastes go into the staging rooms. Larger containers of wastes go into the larger storage rooms. These may be hazardous or mixed waste being sent to K-25, or they may be lab packs from the staging rooms that are awaiting shipment to a commercial disposer. No enriched uranium is handled at this facility. The hazardous wastes stored in the building are in 55-gallon drums or small laboratory-sized containers. Compatible laboratory quantity wastes are placed into drums with absorbent material so that only 55-gallon drums are sent off-site for disposal. Occasional emergency use of an 85-gallon overpack drum may be required.

Materials for the facility are separated according to the following seven designated areas:

1. Caustics room
2. Acids room
3. Toxic materials room
4. Flammable liquids and combustible rooms (2)
5. Reactive metal and metal compounds room
6. Reactive organics room
7. Oxidizer room

Basic Design Parameters, Dimensions and Materials of Construction

The building is constructed of lightweight concrete block masonry walls and partitions. It has a precast concrete roof deck and a concrete floor slab on grade. The building is partitioned into seven storage and seven staging rooms to segregate the classes of material, as shown in Figure B-3. The building has covered loading docks and a paved access and truck maneuvering area. The staging rooms have an approximate total floor area of 3,000 square feet and a volume of 31,000 cubic feet. The storage rooms have an approximate total floor area of 3,700 square feet and a volume of 40,000 cubic feet. Two doors are provided on opposite ends of each room. Because drums are moved by hand trucks and fork-lifts, ramps are provided for all entrances with the exception of the Reactive Metals and Metal Compounds Storage and Staging Rooms. Materials are handled manually and with special care in these two areas.

Waste classifications such as caustics, acidics, nonreactive toxic, low-flash-point solvents, reactive metals and metal compounds, reactive organics, and oxidizing agents are assigned to wastes received at this facility.

Table C-1

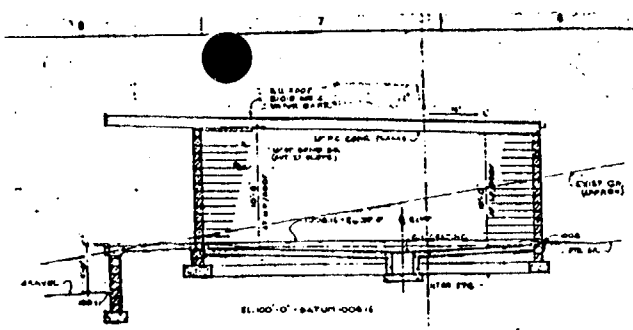
Characteristics for Hazardous and Mixed Waste Classification and Segregation

Parameter	Examples of Materials/Compounds[1]	General EPA Waste Codes[2]
Caustics	Sodium hydroxide, potassium hydroxide	D002
Acidics	Sulfuric acid, hydrochloric acid	D002[3]
Low-Flash-Point Solvents	Alcohols, ketones, short-chain paraffins	D001, F003
Reactive Metals and Metal Compounds	Lithium hydride, sodium metal	D003[3]
or		
Reactive or Halogenated Organics	Unsaturated hydrocarbons, nitrated organics, halogenated hydrocarbons	D003, F001, F002
Oxidizing Agents	Chlorates, chlorites, chromic and nitric acids, nitrates, peroxides, permanganates, hypochlorites	D001[3]

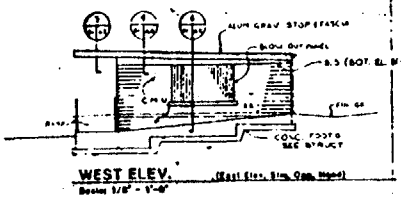
[1] Any of these may be mixed wastes which are contaminated with uranium.

[2] P or U listed wastes could fall into any of these categories.

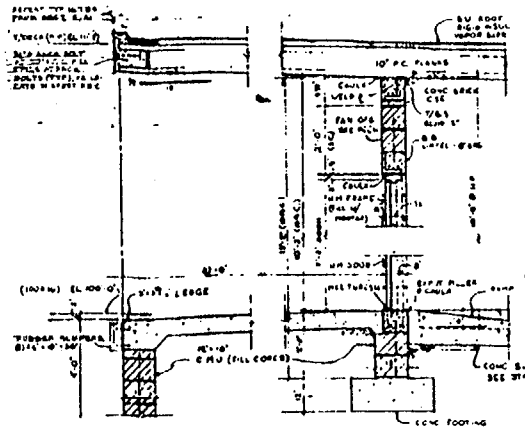
[3] Waste codes for these categories may also include EP toxic metals such as D004 thru D011.



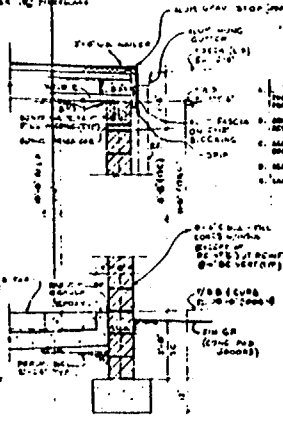
SECTION



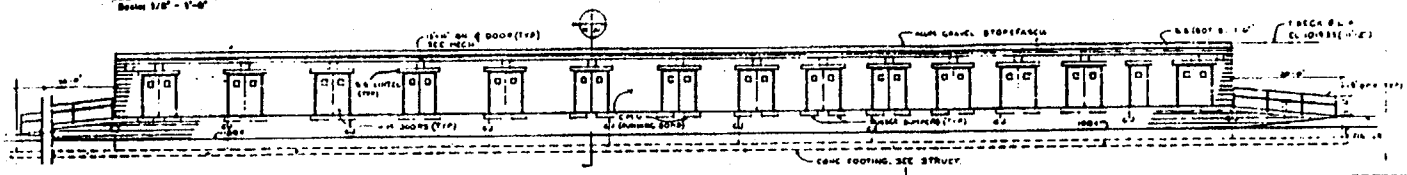
WEST ELEV.



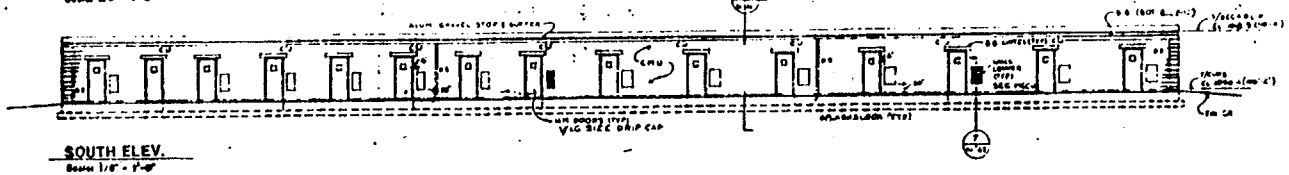
SECT. DOCK & CANOPY



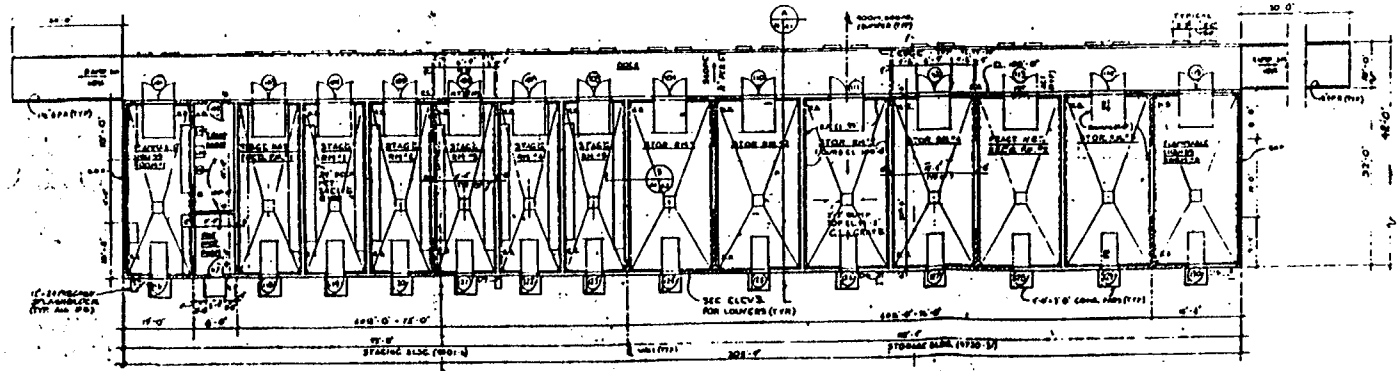
SECT. - SOUTH WALL



NORTH ELEV.



SOUTH ELEV.



Floor Plan

NOTE: ALL INTERIOR PARTITIONS ARE RATED.

General Notes

Abbreviations

REFERENCE DRAWINGS

Section Identification

Symbols

Drawing No. Key

Wilson & Associates, Inc.
Architecture • Engineering • Planning
6630 Rowing Road
Cincinnati Ohio 45229 513-641-2006

RCRA MIXED WASTE STORAGE FACILITIES

PLAN, ELEVATIONS & DETAILS A1

RCRA ARCH PL ELEV & DETS

A2E121765

WASTE OIL/SOLVENT STORAGE (OD-9)

Waste Oil/Solvent Storage Unit: OD-9

This facility receives and stores nonignitable and nonreactive waste oil/solvents that may contain water, may be contaminated with PCBs and uranium, and may contain chlorinated organic solvents. The liquid wastes are stored at OD-9 in tanks and drums until sufficient volume is accumulated for transportation to an outside facility for recovery or disposal.

The OD-9 unit is also known as Building 9811-8 and is located west of Building 9720-58, southwest of Building 9616-7 along Old Bear Creek Road.

The unit includes a concrete diked area with concrete pads to support six 40,000 gallon storage tanks, associated process pumps, auxiliary piping, sump and sump pump, and instrumentation. The facility currently has five tanks (F1, F2, F3, F4, and F5) constructed with a base already in place for the sixth tank. The five tanks have dimensions of approximately 13.5 feet in diameter and 40 feet in height. These tanks are enclosed in a concrete retention basin with an internal width of 42 feet and an internal length of 73.5 feet. The approximate basin wall height of the basin is 5.6 feet.

This unit also includes a truck transfer station utilized for the loading and unloading of wastes. The transfer station is built on a concrete slab of approximately 73.5 x 22 feet that is sloped downward from both ends towards the center of the station. The containment structure has been constructed with a slope that diverts all spills into the diked area. The station loading platform

is constructed of structural steel and is elevated into position on the concrete pad. Transfer pumps and auxiliary piping are positioned within the curbed transfer station. A container storage area within the truck transfer station has been provided for a total capacity of 8,800 gallons. Polyethylene tanks containing free liquids may also be stored in this area.

Waste Composition

The wastes stored at the Waste Oil/Solvent Storage Facility consist of oil which may contain some water and which may be contaminated with PCBs and uranium. These wastes may also contain chlorinated organic solvents such as perchloroethylene, trichloroethylene, and Freon-113, as well as trace quantities of toluene, xylene, hexane, and methylene chloride. These oil/solvent waste mixtures are not ignitable because their flash points are above 140° F. The chlorinated solvents have the EPA waste codes F001 and F002.

The oil/solvent wastes are divided into the following categories based on the concentration of PCBs:

Tanks F-1, F-2, and F-3: Waste oil contaminated with chlorinated solvents and/or uranium.

Tanks F-4 and F-5: Waste oil contaminated with PCBs and/or chlorinated solvents, and/or uranium.

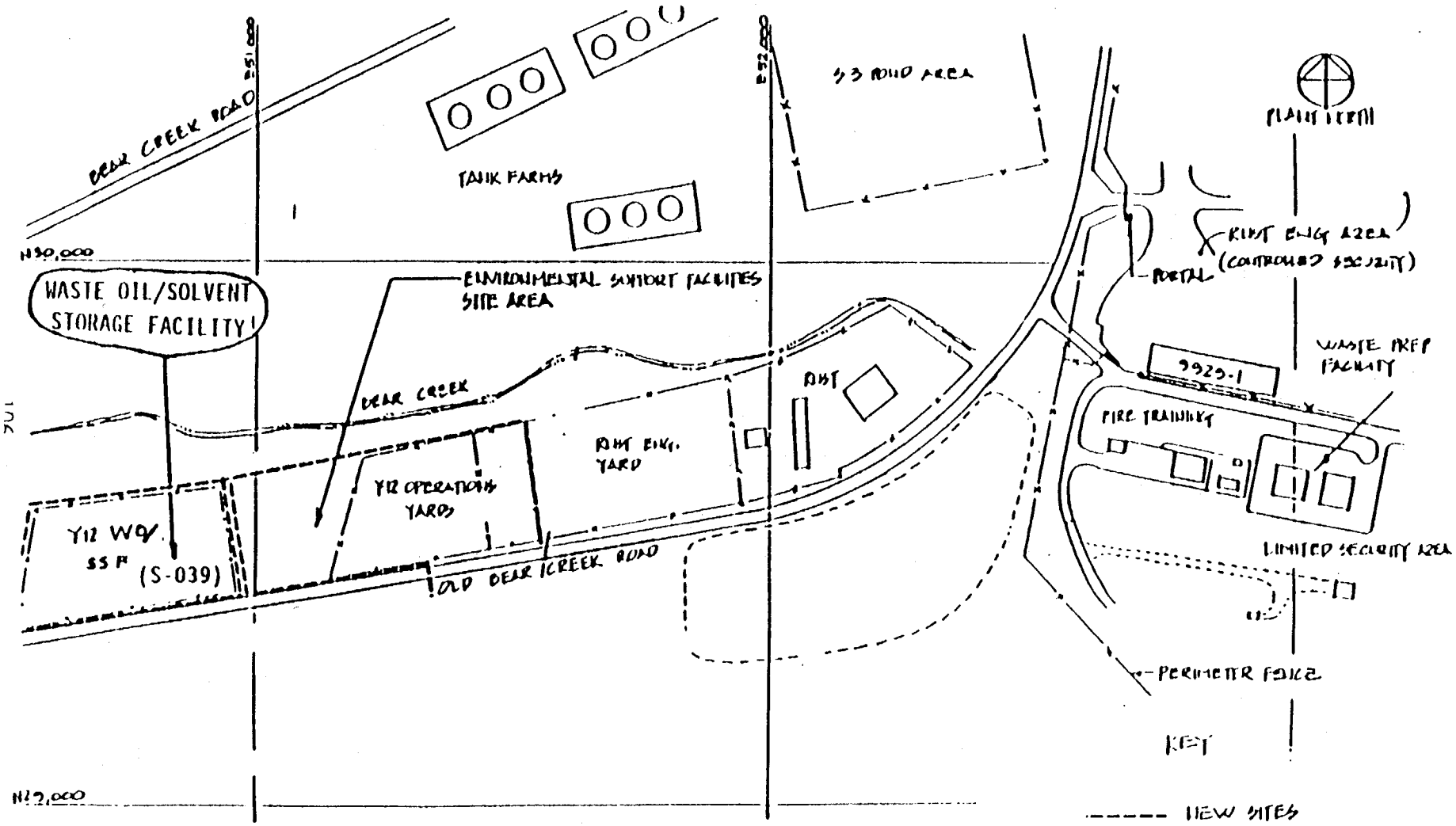


Figure I-1. Location of Waste Oil/Solvent Storage Facility (S-039).

March 25, 199
Revision No.

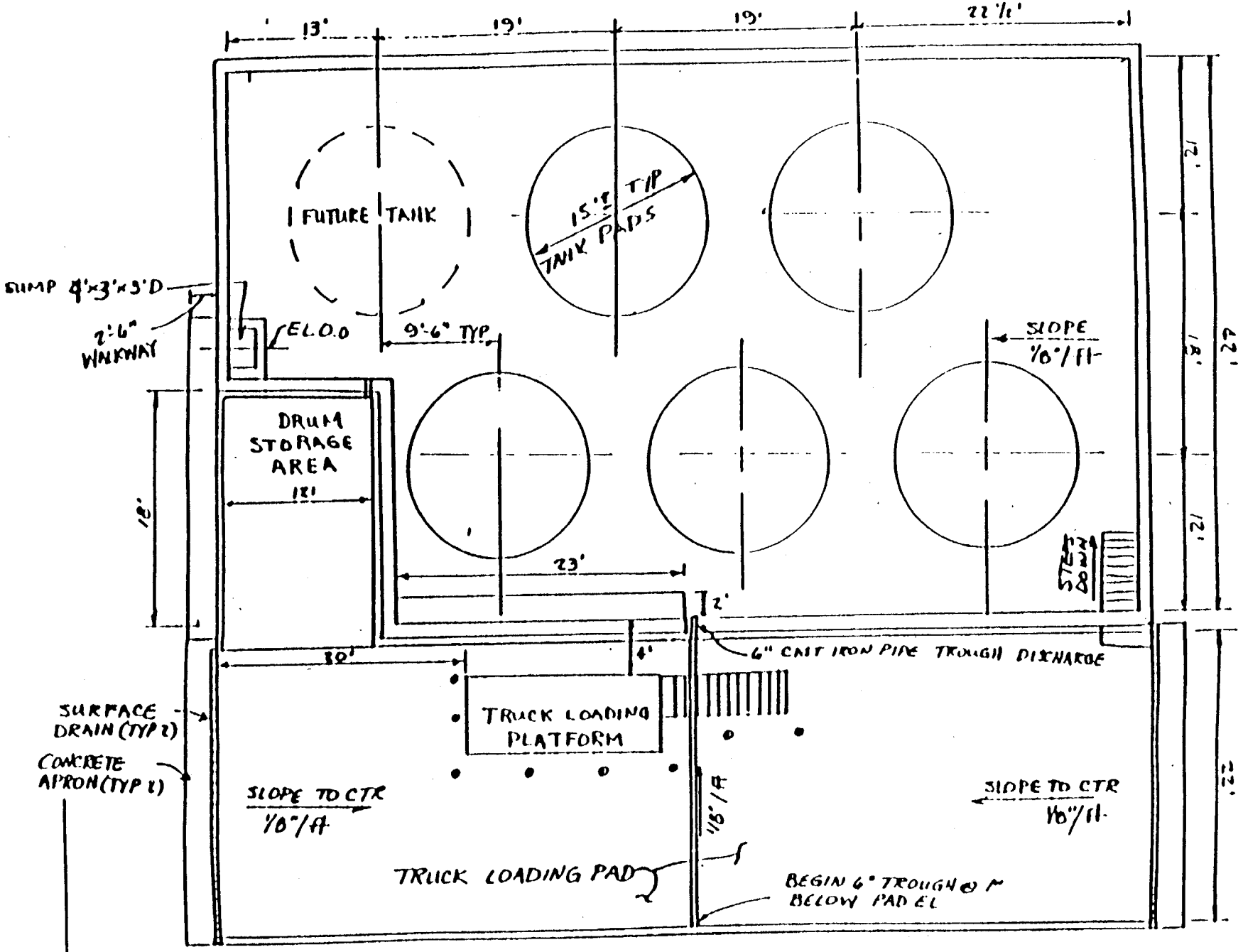


FIGURE 1-2. WASTE OIL/SOLVENT STORAGE FACILITY (S-039) PLAN
(Scale: 3/32 = 1'-0")

LIQUID ORGANIC SOLVENT STORAGE UNIT: OD-10

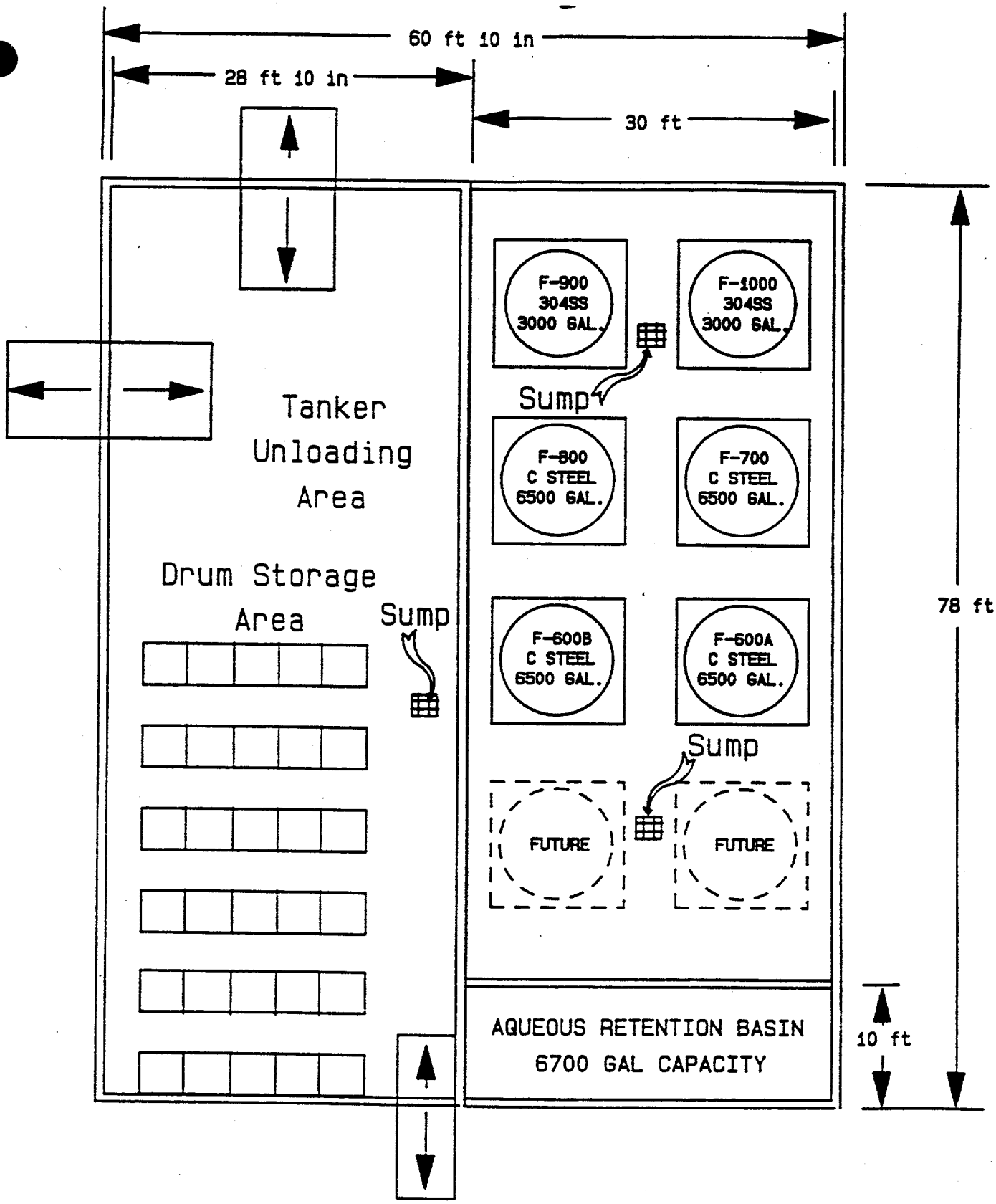
Liquid Organic Solvent Storage Unit: OD-10

This unit receives and stores liquid organic wastes generated in the Y-12 Plant and is currently operating in accordance with RCRA Permit Number TNHW-20. These wastes include waste oil and combustible and flammable waste liquids that may contain trace quantities of uranium. The OD-10 is located on the Y-12 Reservation northwest of the West End Treatment Facility, on the north side of Bear Creek Road, approximately 400 feet east of the western intersection of New and Old Bear Creek Roads (northwest corner of the new salvage yard). The entire unit, including the new salvage yard, is enclosed by a chain link fence.

The Liquid Organic Solvent Storage Facility, OD-10, consists of a 4,500 square feet concrete slab and foundation of which half (2,250 sq. ft.) is contained by a 3-foot-high concrete dike for location of bulk storage tanks. Four 6,500-gallon carbon steel tanks (F-700A, F-700B, F-900A, and F-900B), and two 3,000-gallon stainless steel tanks (F-600A and F-600B) are located within the diked area, with space available for two additional tanks. The remaining 2,250 square feet of the unit is curbed and contained under a 14-foot-high canopy. This covered area houses the various pumping and piping systems, a tanker loading/unloading station, an electrical grounding grid, and approximately 2,100 square feet of storage and sampling area for received drums. Sumps with pumps are located in the diked and curbed areas for collection and transfer of collected material to the aqueous retention basin.

The 2,100 square feet of container storage is designed to handle additional container storage. Steel drums and polyethylene tanks that are used to transport the wastes to OD-10 may also be used for storage at the facility. The liquids received at this facility are pumped into the tanks for storage until sufficient quantity is accumulated for final disposal or recovery.

B-2 TOPOGRAPHIC MAP



B-4 LIQUID ORGANIC WASTE STORAGE FACILITY PLAN

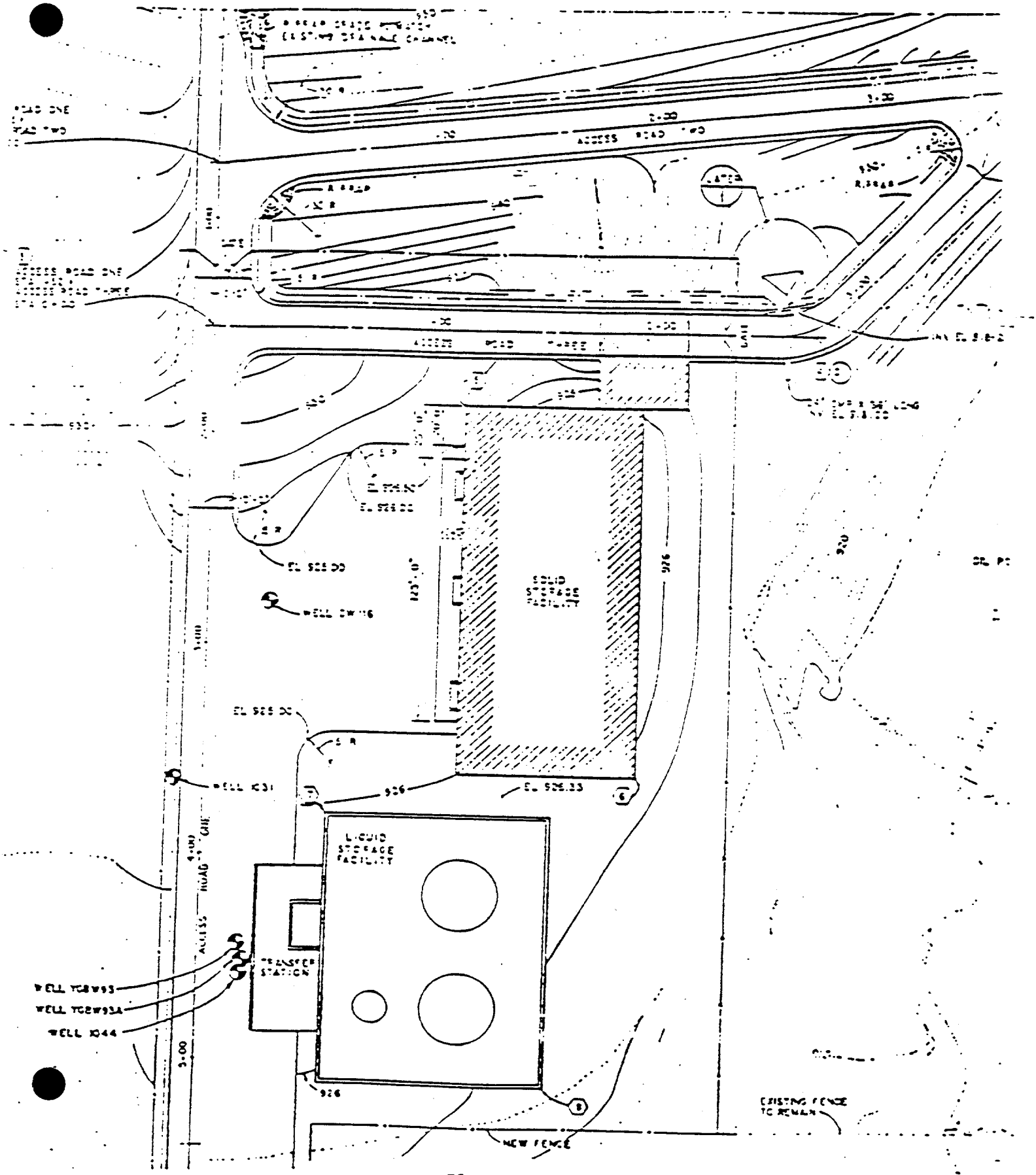
(OD-10)

SB88087B

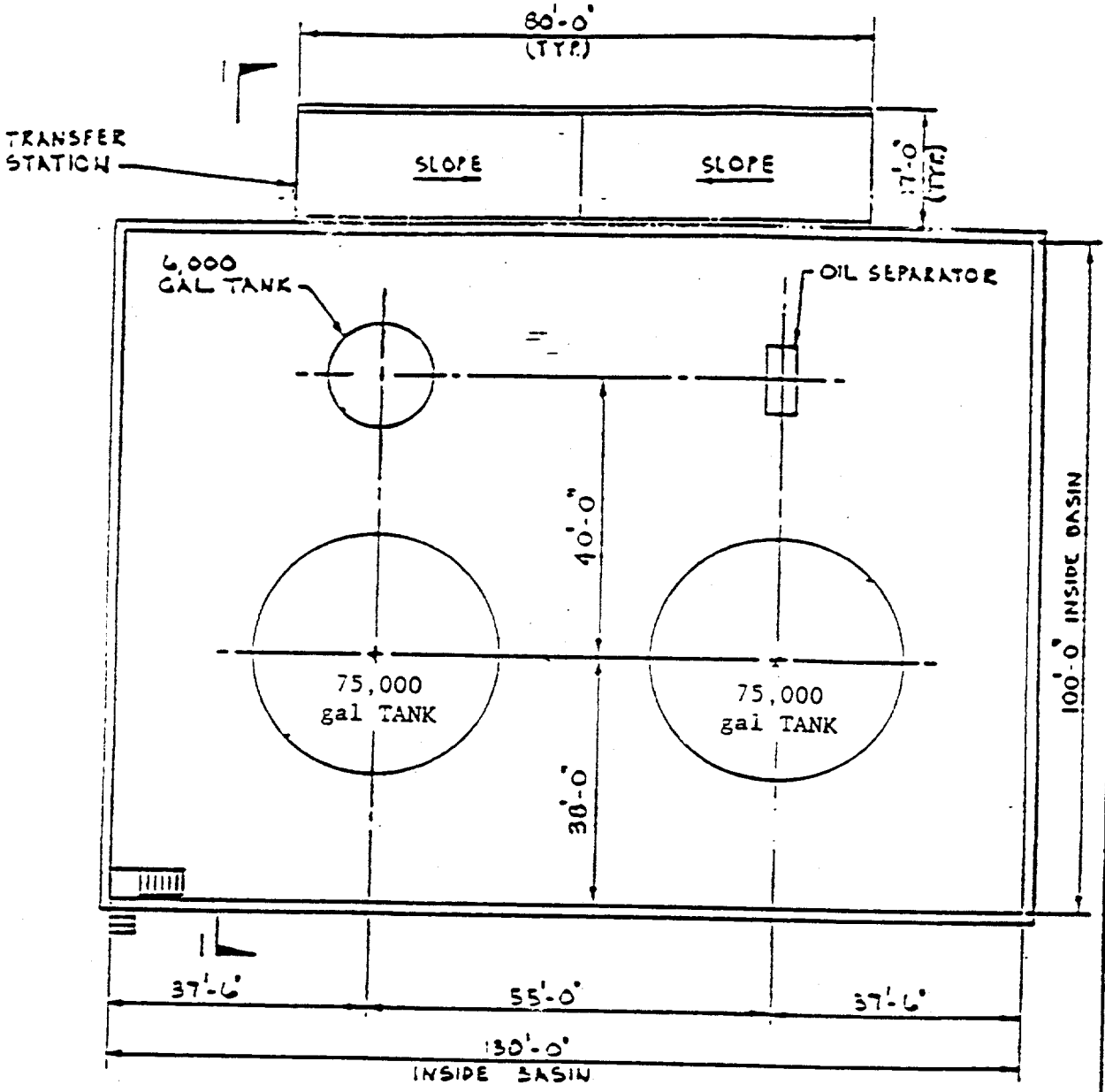
DISPOSAL AREA REMEDIAL ACTION SOLIDS STORAGE FACILITY (S-051)

Disposal Area Remedial Action (DARA) Solids Storage Facility (S-051)

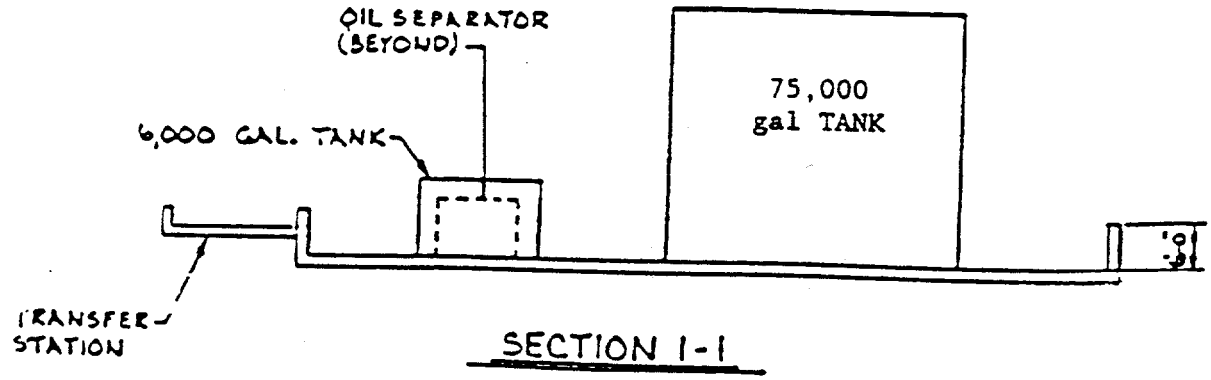
A storage facility has been built to store contaminated soils and debris taken from the cleanout of Oil Pond 1 and 2 and other activities in the Bear Creek Burial Grounds at the Y-12 Plant. The storage facility can be described as a totally enclosed waste pile, with the maximum capacity of the storage facility being 4,000 cubic yards of contaminated soil. It is anticipated that the soil may be contaminated with oil, spent solvents, and possibly liquids containing polychlorinated biphenyls (PCBs). No current storage facility at the Y-12 Burial Grounds has the capacity to store a large volume of contaminated soil for the long time frame anticipated until the soil can be sent to the ORGDP TSCA/RCRA Incinerator. The original estimated cost of the DARA Solids Storage Facility was approximately $1.1 million. Costs for in-place treatment operations which would meet RCRA requirements would be approximately three times more expensive. A Part B Permit application was submitted to TDHE in November 1988 for the facility.



Plan View of the DARA SSF.



PLAN



SECTION 1-1

MARTIN MARIETTA ENERGY SYSTEMS

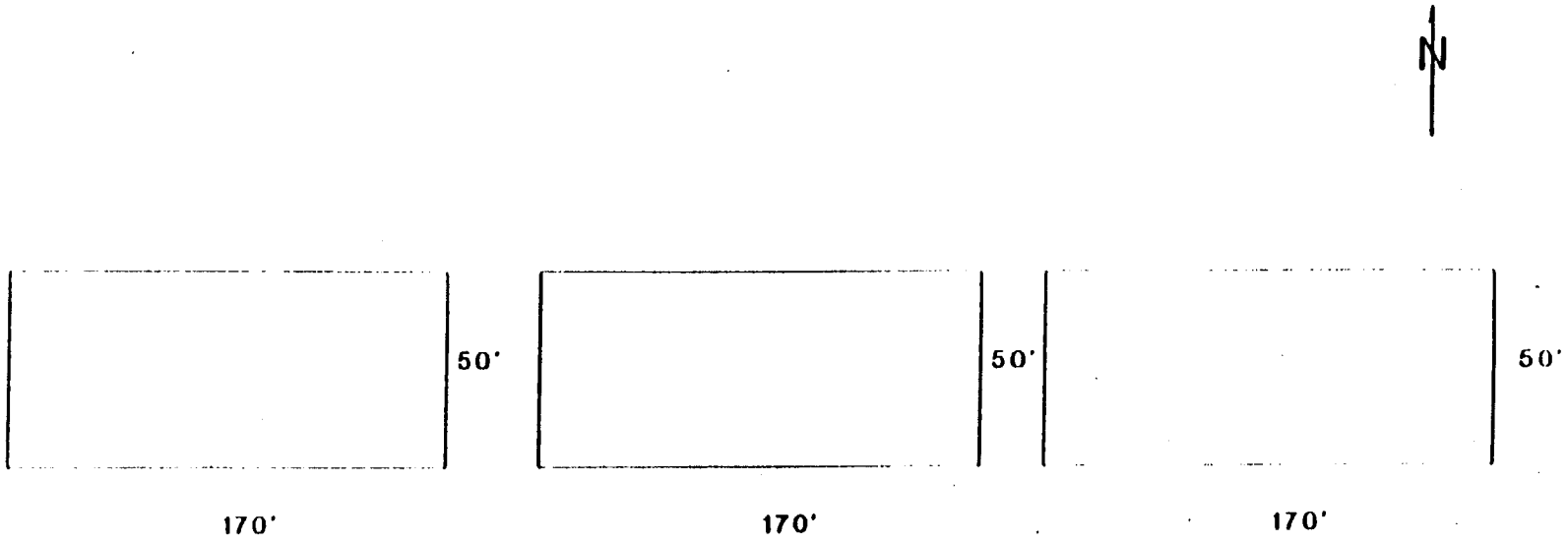
FIG. B1 - LIQUID STORAGE FACILITY

CONTAINERIZED WASTE STORAGE AREA (S-045)

Containerized Waste Storage Area (S-045)

The process code and capacity for the Contaminated Soils Storage Area (CSSA), on line 37 in Section III(C) of the application, should be S01 (storage in containers) and 810,000 gallons, respectively. The original Process Code S03 (storage in a waste pile) and capacity of 9,000 cubic yards should be changed to reflect that the unit is no longer a waste pile. Land Disposal Restrictions (LDR) and anticipated storage needs for various mixed wastes necessitate changing this unit to a container storage area.

Existing Powerline



East Chestnut Ridge Patrol Road

Containerized Waste Storage Area
(S-045)

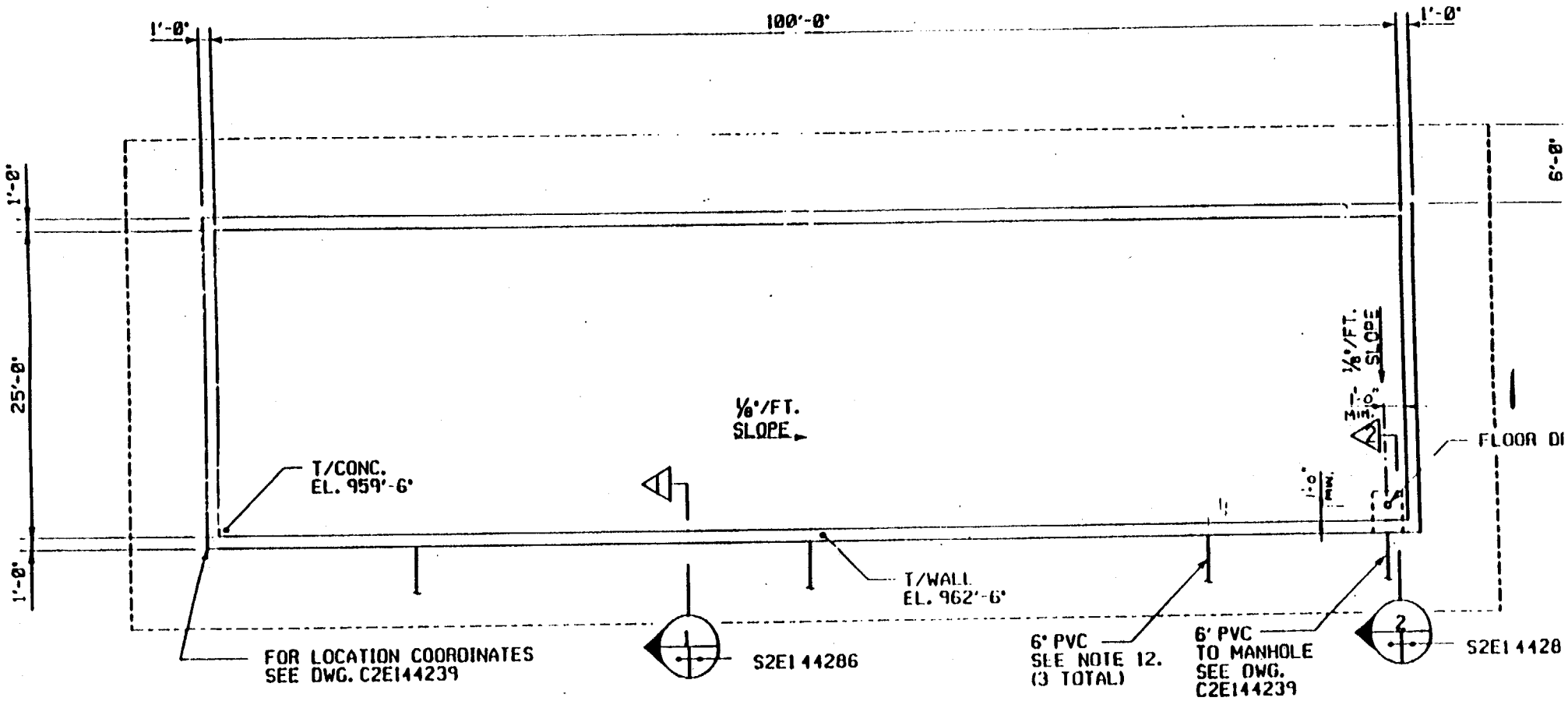
NOTE: The total design capacity of the three identical container storage pads is 810,000 gallons

OIL LANDFARM SOILS CONTAINMENT PAD (S-050)

Oil Landfarm Soils Containment Pad (S-050)

A storage facility has been built to store contaminated soils taken from the Oil Landfarm and other closure projects in the Bear Creek Burial Grounds at the Y-12 Plant. The storage facility is classified as a waste pile and consists of a concrete pad with diking to contain the soils stored on the pad, with a maximum capacity of 550 cubic yards. The storage pad serves as a storage area for the contaminated soils from the Oil Landfarm and other areas, providing storage for the soils until they can be scheduled for incineration at the Oak Ridge Gaseous Difussion Plant (ORGDP) Toxic Substances Control Act/RCRA (TSCA/RCRA) Incinerator or for other treatment, if available. The soils containment pad is located in close proximity to the existing Oil Landfarm closure site and was originally estimated to cost approximately $100,000 to build. This storage pad was needed in early 1989 to allow compliance with the closure schedule for the Oil Landfarm closure activities. A Part B Permit application was submitted to TDHE in November 1988 for the facility.

Revision: July 1990



CONTAINMENT PAD PLAN

SCALE: 1/8" = 1'-0"

Oil Landfarm Soils Containment Pad Plan View.

INTERIM DRUM YARD

1.0 Facility Description

The Interim Drum Yard (S-030) is an outdoor storage area for containerized hazardous waste. The location of the yard at the Y-12 Plant is given in Figure 1. The dimensions are shown in Figure 2. The yard is constructed of gravel on native soil and has no liner or containment system. Drums of waste are stored on wooden pallets. A list of wastes that are or have been stored at this facility is given in Table 1.

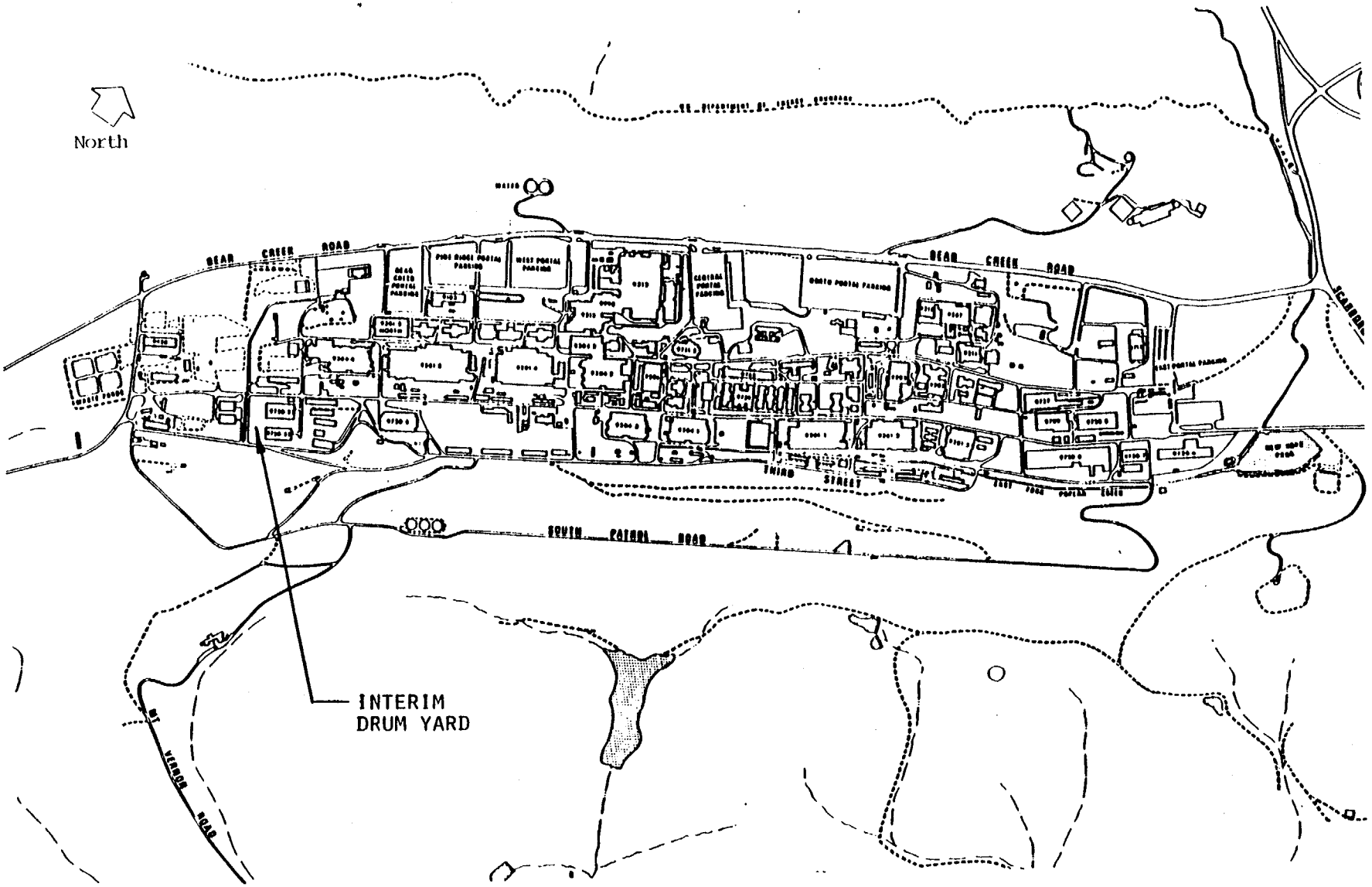


FIGURE 1. SITE PLAN

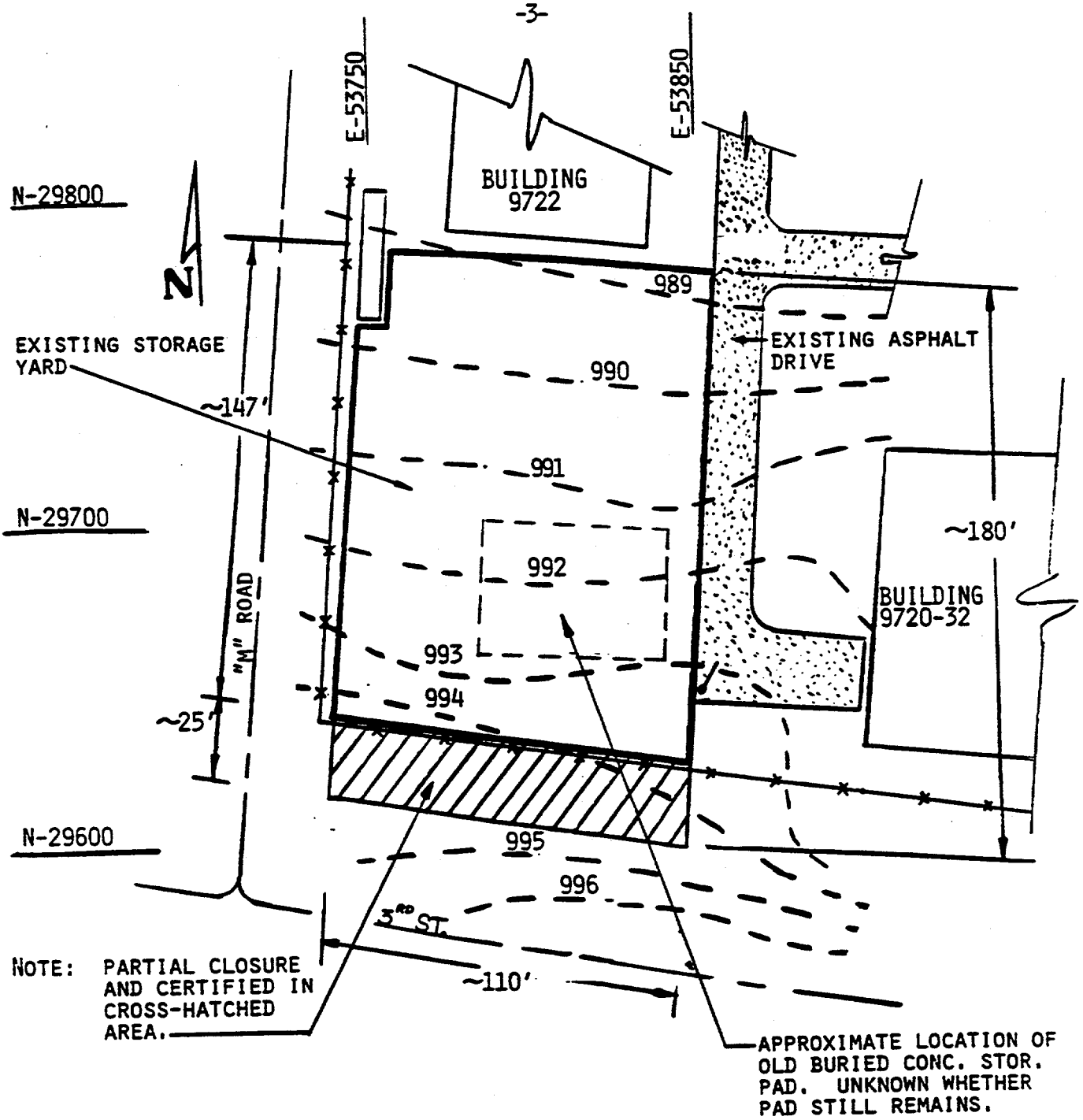


FIGURE 2. INTERIM DRUM STORAGE YARD (S-030)

TABLE 1. WASTES STORED AT INTERIM DRUM YARD

1.	Electrochemical machining (ECM) sludge (mainly sodium nitrate which contains chromium and nickel)
2.	Mercury-contaminated metal
3.	Mercury-contaminated solids
4.	Mercury sludge
5.	Pump shop sludge (contains Hg)
6.	Contaminated construction spoils and sludge from cooling tower (possible Cr)
7.	Acetonitrile (ACN)
8.	Cadmium cyanide plating solution
9.	Methylene chloride/methanol floor stripping solution
10.	PCB-contaminated materials
11.	Perchloroethylene
12.	Freon-113
13.	Asbestos waste
14.	1,1,1-trichloroethane
15.	Wastewater treatment sludges and solids
16.	Sodium hypochlorite, and hypochlorite solution filters
17.	Emulsifier
18.	Uranyl nitrate
19.	Chlorinated hydrocarbon sludges
20.	Waste penetrant solution

3.0 Partial Closure

A 25-foot-wide strip on the south edge of the Interim Drum Yard (see Figure 2) was closed in 1987. The partial closure was accepted by TDEC (Reference 4). This plan addresses final closure of the remaining Interim Drum Yard (S-030).

4.0 Maximum Waste Inventory

The maximum waste inventory at the Interim Drum Yard is approximately 55,000 gallons, or 1,000 drums.

EAST CHESTNUT RIDGE WASTE PILE

D-3c Liner System Requirements

D-3c(1). Liner Description

The synthetic liner is a standard PVC sheet of 30-mil thickness. Its chemical properties and physical strength are described in Exhibit D-1. The manufacturer's literature is included as Exhibit D-2.

The area where the waste pile is located was previously a grassy moderately-sloped field free of trees and large shrubs. The site was cleared of vegetation, and drainage facilities were constructed around the site to prevent runon. The site was graded so that the waste pile would provide adequate storage capacity for approximately 5,000 cubic yards of contaminated soils.

The dimensions of the pile are approximately 200 feet by 100 feet. The bottom of the pit was graded and sloped to provide positive drainage. Particular care was taken to ensure that the supporting soil did not contain sharp stones or stones larger than 1 inch. The surface was prepared such that there were no irregularities, loose earth, abrupt changes in grade, or any other conditions which might damage the integrity of the liner.

A synthetic liner was placed on the bottom and walls of the waste pile site. A sand bedding was used under the bottom of the liner to prevent damage from the subbase. The liner is constructed of 30-mil polyvinyl chloride sheet which has the appropriate chemical properties and sufficient strength to prevent failure due to physical contact with the contaminated soil, installation stress and the stress of daily operation. A 12-inch-thick sand layer separates the waste from the liner.

The synthetic liner was sized such that two panels were sufficient for coverage of the entire ECRWP with only one field seam required. Upon completion of the placement of the waste, similar liner material will be used as a temporary cover until the new facility is completed and the waste can be moved there. A protective soil layer will be installed over the top of the cover liner sheet.

In order to assure a high degree of probability that the waste pile systems, including the liner and leachate collection systems, would perform as expected, an appropriate construction quality assurance (CQA) program was implemented. The CQA program will assure that the completed systems meet or exceed the specifications and design criteria. The quality assurance program includes the following items:

- Inspection of the liner during construction for uniformity, damage, and imperfections
- Inspection of the liner after construction to ensure tight seams and no imperfections
- Inspection of the leachate collection system construction
- Other general inspections during construction
- The operator (WTSD Department) is responsible for quality assurance
- A WTSD Department registered professional engineer will oversee CQA.

D-3d Leachate Detection, Collection, and Removal System Requirements

A leachate collection system was installed over the impermeable liner. The collection system consists of perforated PVC pipe laid in a 12-inch deep bed of sand. The rows of perforated pipe connect into a collection header which connects to a collection manhole with a capacity of 500 gallons. A layer of synthetic filter fabric was placed on top of the sand to separate it from the stored waste and to prevent soil particles from clogging the sand layer.

Extreme care is exercised to ensure the integrity of the leachate collection system during waste emplacement operations. Construction equipment, vehicles, and tools which could puncture, tear, or otherwise damage the system will be prohibited from being placed on or driven on the waste pile. Any damage to the leachate collection system will be repaired.

D-3e Control of Runon and Runoff

Diversion channels and ditches have been constructed around the facility to intercept and divert surface runon away from the facility. Any runoff from the active part of the site will be caught in a runoff-collection basin for sampling and treatment or discharge. The basin is sized for the runoff from a 25-year, 24-hour rainfall event over one-half of the waste pile. Areas disturbed during construction of the drainage system were seeded with grass, fertilized and mulched.

During the active operation of the facility, a synthetic sheet is used to cover the contaminated soil during precipitation events and at the end of each working day. The synthetic cover prevents the erosion of the contaminated soil and minimizes the generation of leachate.

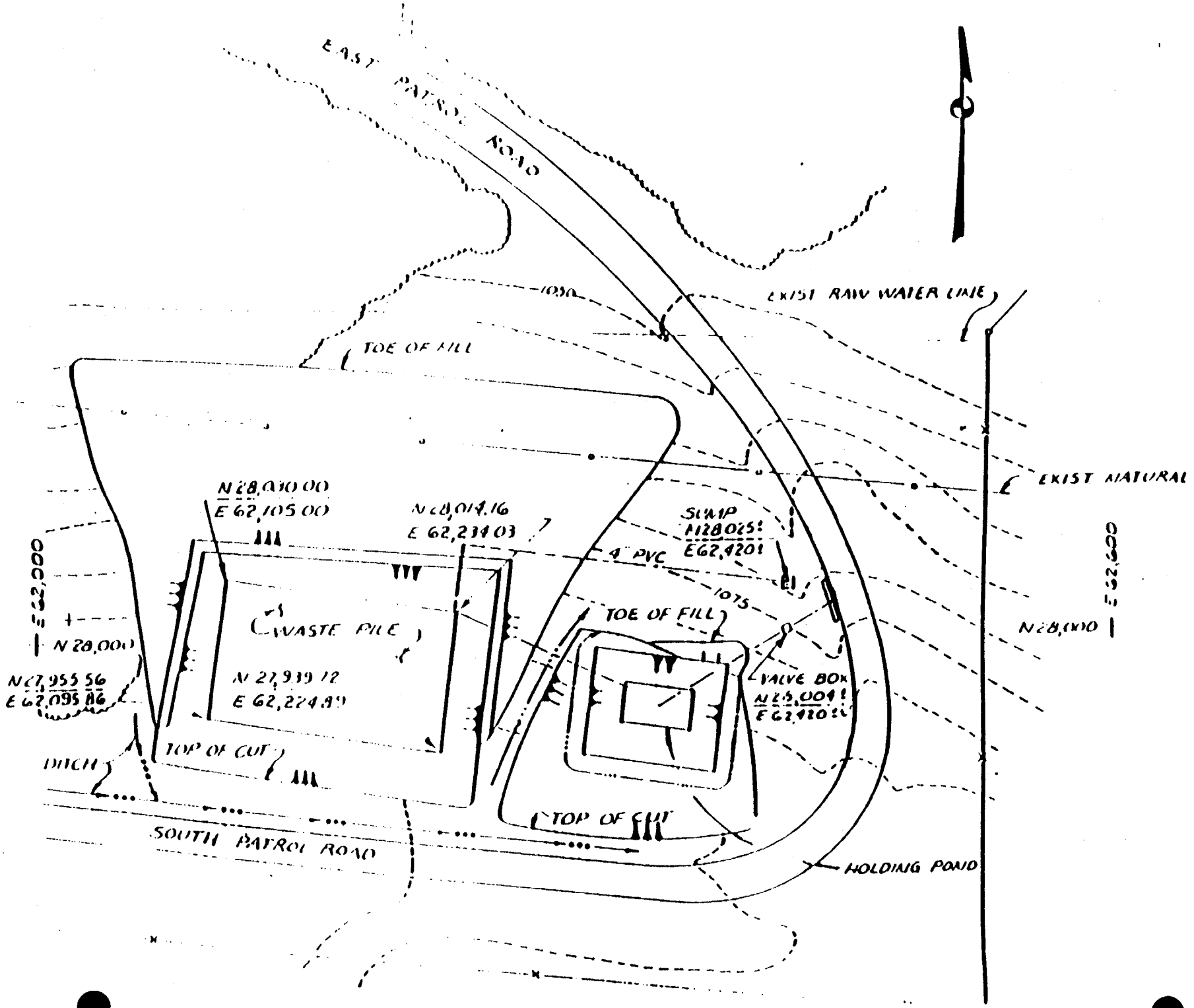
During the active operation of the facility, the exposed contaminated soil is graded to drain runon to the collection basin. Only the active working area is graded to drain to the collection basin; the rest of the facility does not contain any waste and is covered temporarily with an impermeable synthetic sheet. Any runon which is caught in the collection basin will be tested to determine if it contains hazardous constituents. If the collected liquid is not hazardous, it will be discharged in accordance with any applicable discharge limits. If the liquid is hazardous, it will be removed for treatment.

D-3f Units Associated with Runon and Runoff Control Systems

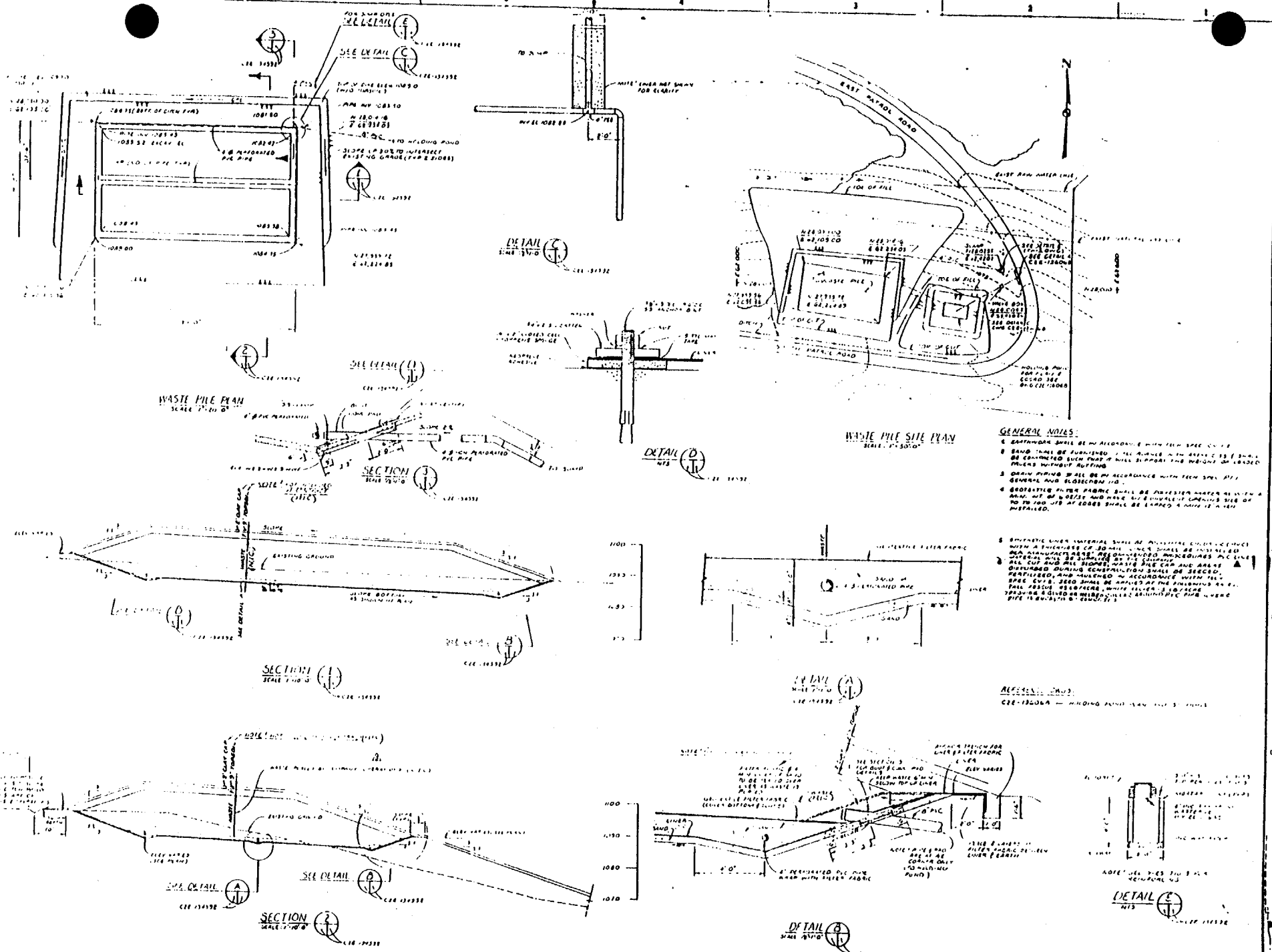
The units associated with runon and runoff control systems are described in Section D-3e.

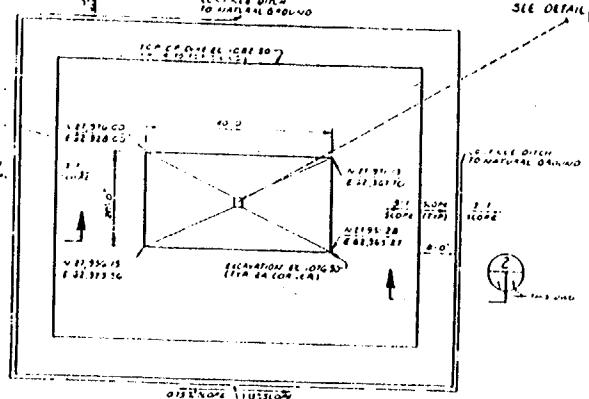
D-3g Particulate Control

Wind dispersal of wastes is controlled by the temporary synthetic cover placed over the wastes.

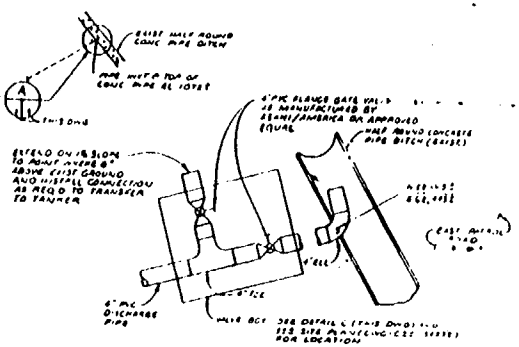


PLAN VIEW OF EAST CHESTNUT RIDGE WASTE PILE (S-043)

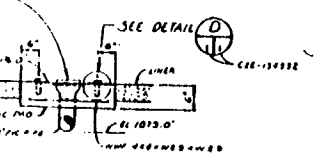

WASTE PILE PLAN
SECTION
SECTION
SECTION
DETAIL
DETAIL
DETAIL
DETAIL
DETAIL
WASTE PILE SITE PLAN
GENERAL NOTES:
EAST PATROL ROAD
EAST CHESTNUT RIDGE
TEMPORARY WASTE PILE
PLANS & SECTIONS
E CHSNT RD TEMP WASTE PILE



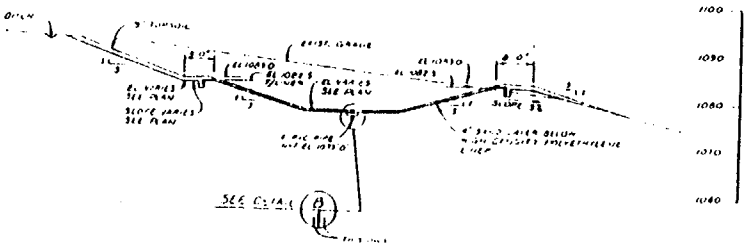
HOLDING POND PLAN
SCALE 1"=10'-0"



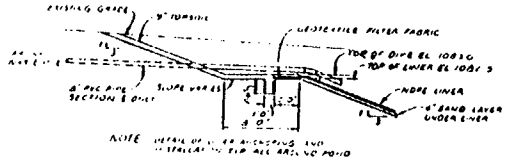
DETAIL A
SCALE 1"=5'-0"



DETAIL B
SCALE 1"=5'-0"

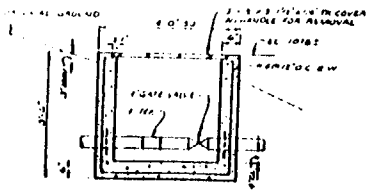


SECTION 3
SCALE 1"=10'-0"



SECTION 1
SCALE 1"=5'-0"

SECTION 2
SCALE 1"=5'-0"



DETAIL C
SCALE 1"=5'-0"

NOTES:

1. FOR GENERAL NOTES SEE DRAWING CZE-134594.

REFERANCE DWGS.

CZE-134598 — WASTE PILE PLANS & SECTIONS

EAST CHESTNUT RIDGE
TEMP WASTE PILE HOLDING POND
PLAN & SECTIONS

C CH RG TM WAST PL HOLD POND

BUILDING 9811-1 STORAGE FACILITY (OD-7 AND OD-8)

GD-8

The other storage area is the western half of the building which will be used for container (55-gallon drum) storage. The container storage area will consist of a 65-foot by 75-foot, 4-inch high curbed concrete pad. The area is designed to store approximately 1,000 55-gallon drums. The wastes to be stored in drums will also be solvent/oil/water mixtures.

The main purpose of the new facility will be storage and staging. When wastes arrive in 55-gallon drums or tank trucks, they will be analyzed and identified. If the wastes are compatible with the function of the RCRA Storage Facility, they will be processed and stored. If the waste is found to be incompatible with the designated purpose of the facility, it will be shipped to another appropriate facility.

Building 9811-1 Storage Facility (S-021)

The container storage portion of this facility should be listed as 55,000 gallons on line 28 in Part III of the application. The tank storage portion of the facility should be listed as 150,000 gallons due to a planned expansion of 74,000 gallons additional storage tank capacity for mixed, radioactive hazardous waste. This additional capacity is needed to replace capacity at Building 9409-5, which no longer has interim status. The increased capacity is necessary to allow storage for mixed, radioactive hazardous waste due to the lack of commercial disposal facilities for mixed wastes.

9811-1 Tank Storage Unit: OD-7

This unit is an interim status storage area and has been designated as the primary storage unit for nonignitible and nonreactive uranium contaminated waste oils and solvents. The OD-7 is located southwest of Building 9204-4 at the intersection of West Second Street and K Road.

The storage tank area of the unit consists of a 51 x 58-foot concrete diked area. Positioned within the diked area are four 30,000 gallon tanks (F-1, F-2, F-3, and F-4), and one 10,000-gallon tank (F-7). Two additional 10,000-gallon tanks (F-5 and F-6) will be installed at a future date.

Waste mixtures are transported to the facility in 55-gallon drums, polyethylene tanks, or tanker trucks. The tank truck loading/unloading station is at the southeast corner of the unit. Three sides of the loading/unloading station are diked, and the open entrance to the station is provided with a 3-inch high curb. Facility or portable pumps are used to transfer the waste oil/solvent/water mixture from the drums, polyethylene tanks, or tanker trucks to one of the tanks.

The wastes stored at this unit consist of mixtures of oils and chlorinated organics. Some solvents may contain trace quantities of uranium and beryllium, as well as significant quantities of water. PCB contaminated oils, as well as non-chlorinated solvents and some additional metals contaminated wastes, may also be accepted at the unit.

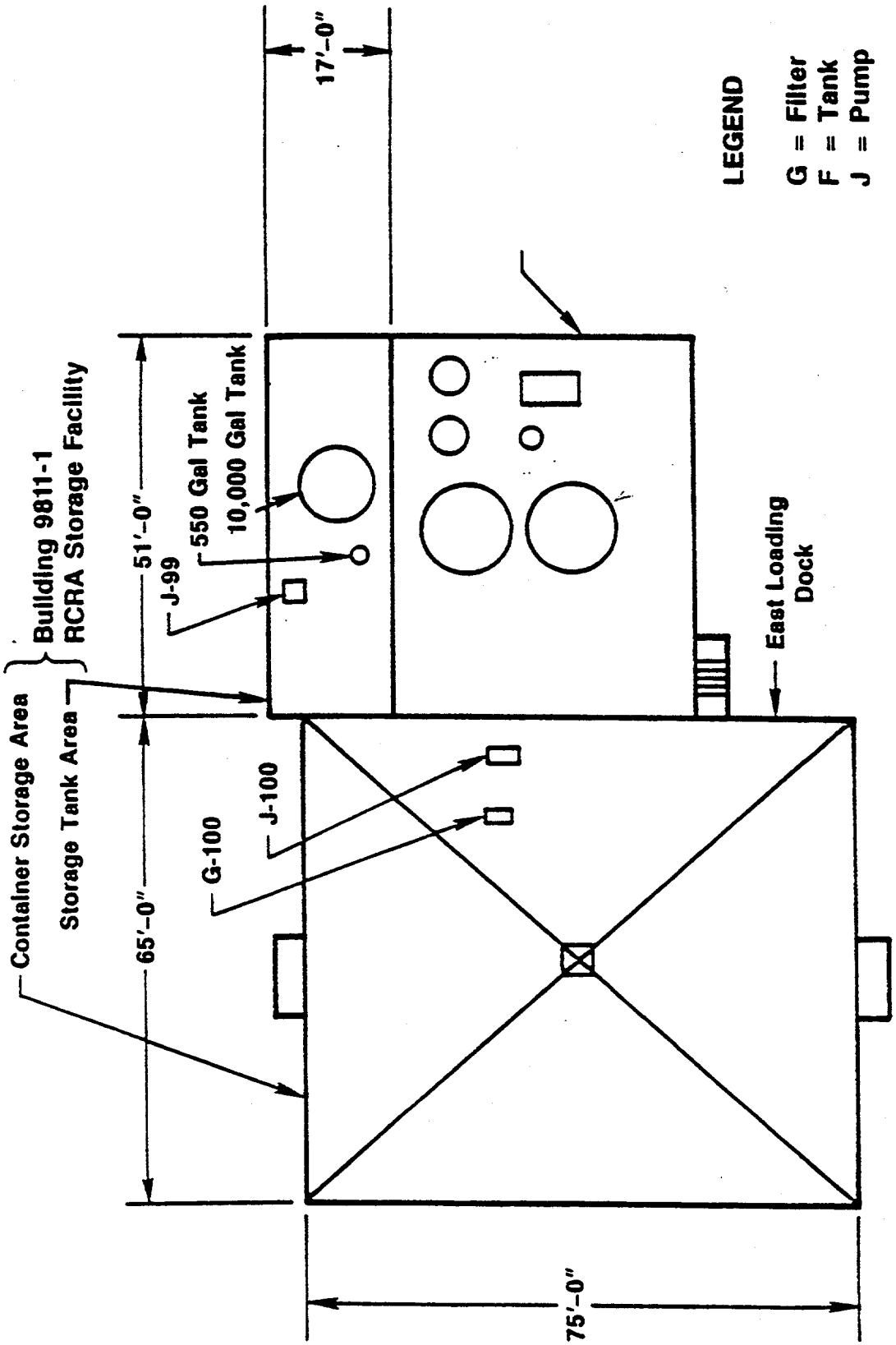


FIGURE B-3. PLAN VIEW OF BUILDING 9811-1 RCRA STORAGE FACILITY.

STARTING DATE: 9/11/91	DATE LAST REV.:	DRAFT. CHCK. BY: J. HUBBARD	INITIATOR: D. ERIKSON	DRAWING NO.: 409772-A-C03
DRAWN BY: S. CARDWELL	DRAWN BY:	ENGR. CHCK BY: D. ERIKSON	PROJ. MGR.: S. THOMAS	PROJ. NO.: 409772

40977203 09/13/91 4:03pm STC

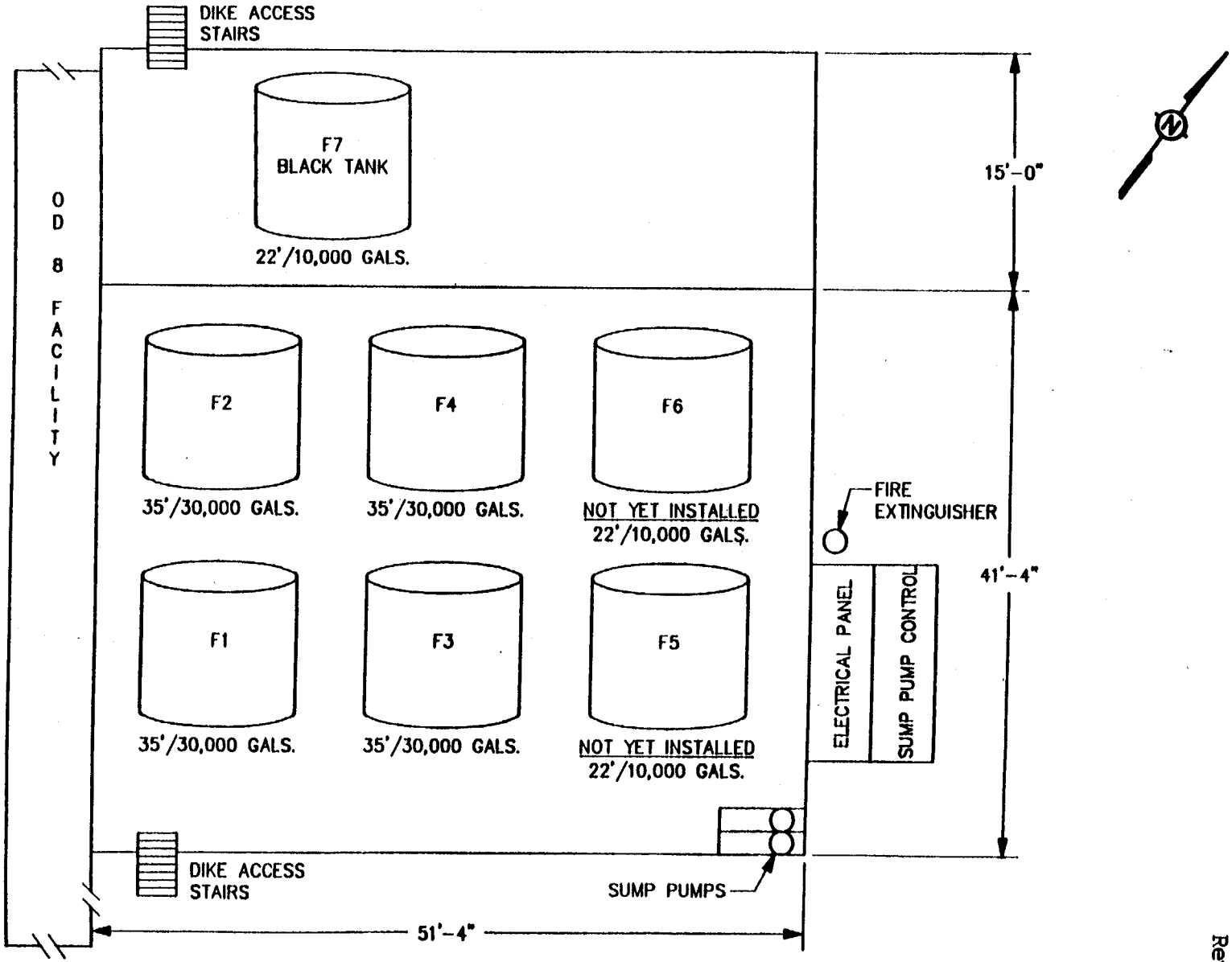


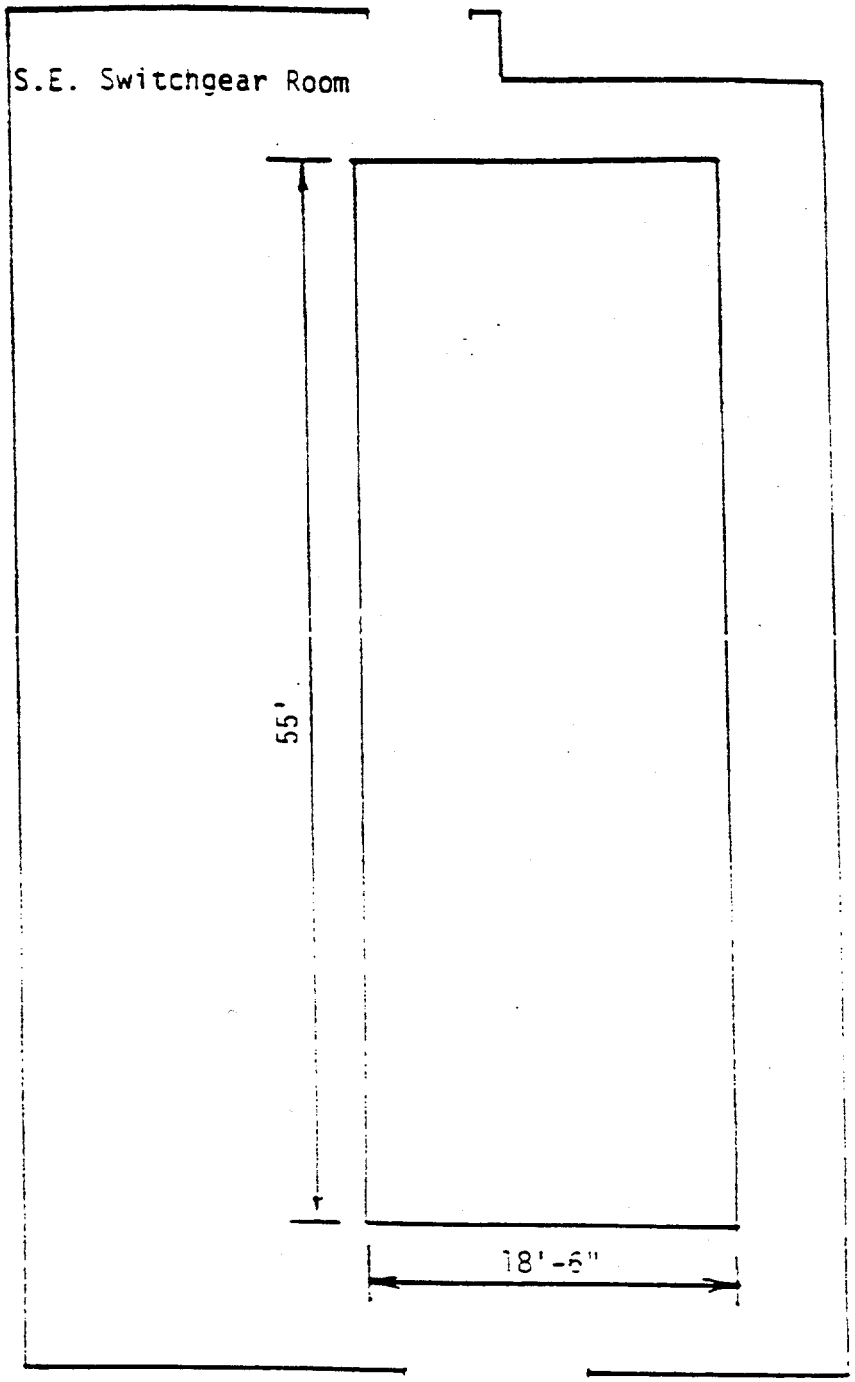
FIGURE D-3
BUILDING 9811-1 STORAGE TANK UNIT LAYOUT (OD-7)

9/16/91
Rev. 2.2

BUILDING 9201-4 CONTAINER STORAGE AREA (S-059)

Building 9201-4 Container Storage Area (S-059)

The Building 9201-4 Container Storage area will be used to provide interim storage for mixed, radioactive, mercury-contaminated wastes. One area of an existing building will be modified to provide storage for 17,160 gallons.



Building 9201-4 Container Storage Area

WEST END TREATMENT FACILITY

West End Tank Farm

F-1	Biodenitrification Reactor	500,000	AWWA D-100-79-C	Mild Steel	Shell thickness varies from 3/8 in. at bottom to 1/4 in. at top; no corrosion allowance; inside coated with Carboline 191
F-2	Biodenitrification Reactor	500,000	AWWA D-100-79-C	Mild Steel	Shell thickness varies from 3/8 in. at bottom to 1/4 in. at top; no corrosion allowance; inside coated with Carboline 191

TABLE D-1. TANK DATA FOR WEST END TREATMENT FACILITY
Page 4

Tank Number	Usage	Capacity (Gallons)	Design code	Material	Remarks
West End Tank Farm (continued)					
F-3	Biodenitrification Reactor	500,000	AWWA D-100-79-C	Mild Steel	Shell thickness varies from 3/8 in. at bottom to 1/4 in. at top; no corrosion allowance; inside coated with Carboline 191
F-4	Biodenitrification Reactor	500,000	AWWA D-100-79-C	Mild Steel	Shell thickness varies from 3/8 in. at bottom to 1/4 in. at top; no corrosion allowance; inside coated with Carboline 191
F-5	Biodenitrification Reactor	500,000	AWWA D-100-79-C	Mild Steel	Shell thickness varies from 3/8 in. at bottom to 1/4 in. at top; no corrosion allowance; inside coated with Carboline 191
F-6	Biodenitrification Reactor	500,000	AWWA D-100-79-C	Mild Steel	Shell thickness varies from 3/8 in. at bottom to 1/4 in. at top; no corrosion allowance; inside coated with Carboline 191
F-7	Sludge Storage	500,000	AWWA D-100-79-C	Mild Steel	1/4 in. increase from the original shell thickness
F-8	Sludge Storage	500,000	AWWA D-100-79-C	Mild Steel	1/4 in. increase from the original shell thickness
F-9	Sludge Storage	500,000	AWWA D-100-79-C	Mild Steel	1/4 in. increase from the original shell thickness

September 12, 1985
Revision

OAK RIDGE Y-12 PLANT
LOCATION OF TREATMENT, STORAGE AND DISPOSAL FACILITIES FOR HAZARDOUS AND MIXED WASTES

SITE LOCATION

1. T-055 - INTERIM REACTIVE WASTE TREATMENT AREA
[redacted]
3. S-052 - DARA LIQUID STORAGE FACILITY
4. D-024 - BEAR CREEK BURIAL GROUNDS
5. T-008 - OIL RETENTION POND NO. 1
6. T-056 - INTERIM GROUNDWATER TREATMENT UNIT
7. T-009 - OIL RETENTION POND NO. 2
[redacted]
9. T-014 - OIL LANDFARM
10. D-024-HC - HAZARDOUS CHEMICAL TREATMENT AREA
[redacted]
[redacted]
[redacted]
14. T-053 - GROUNDWATER TREATMENT FACILITY (LOCATED @ WETF)
15. PERIMETER FENCES
16. T-004 - S-3 PONDS
[redacted]
18. S-046 - CLASSIFIED WASTE STORAGE FACILITY
[redacted]
20. S-020 - SALVAGE YARD OIL/SOLVENT DRUM STORAGE
21. T-054 - URANIUM TREATMENT UNIT (LOCATED NEXT TO SALVAGE YARD
22. S-015 - ACN DRUM YARD
[redacted]
24. T-001 - PRENCO INCENERATOR
25. T-005 - CYANIDE TREATMENT
26. T-003 - WASTE MACHINE COOLANT BIODEGRADATION FACILITY
27. T-048 - REACTIVE WASTE TREATMENT FACILITY
28. NPDES DISCHARGE POINT 002
29. S-031 - BUILDING 9720-9 STORAGE FACILITY
30. T-006 - CENTRAL POLLUTION CONTROL FACILITY
31. S-041 - BUILDING 9212 TANK FARM
32. T-002 - BIODENITRIFICATION FACILITY
33. S-061 - 9212 CONTAINER STORAGE AREAS
34. S-060 - 9206/9720-17 CONTAINER STORAGE AREAS
35. T-057 - 9206 INCINERATOR AND ASSOCIATED EQUIPMENT
36. INTERSECTION OF LATITUDE 35°59'09" & LONGITUDE 84°15'20"
37. D-023 - SECURITY PITS
38. S-047 - REACTIVE WASTE STORAGE FACILITY
39. S-029 - OLD STEAM PLANT BUILDING 9401-1
40. S-017 - BUILDING 9409-5 STORAGE FACILITY
[redacted]
42. S-019 - GARAGE UNDERGROUND STORAGE
43. NPDES DISCHARGE POINT 003
44. T-010- NEW HOPE POND
45. T-049 - SHOCK SENSITIVE WASTE TREATMENT FACILITY
46. NPDES DISCHARGE POINT 001
47. T-012 - KERR HOLLOW QUARRY
48. D-025 - CHESTNUT RIDGE SEDIMENT DISPOSAL BASIN
[redacted] 49 Bldg 9720-4 Container Storage Area
50 East Chestnut Ridge Waste Pile
[redacted]

Y-12 PLANT LOCATION OF WASTE TREATMENT, STORAGE AND DISPOSAL SITES

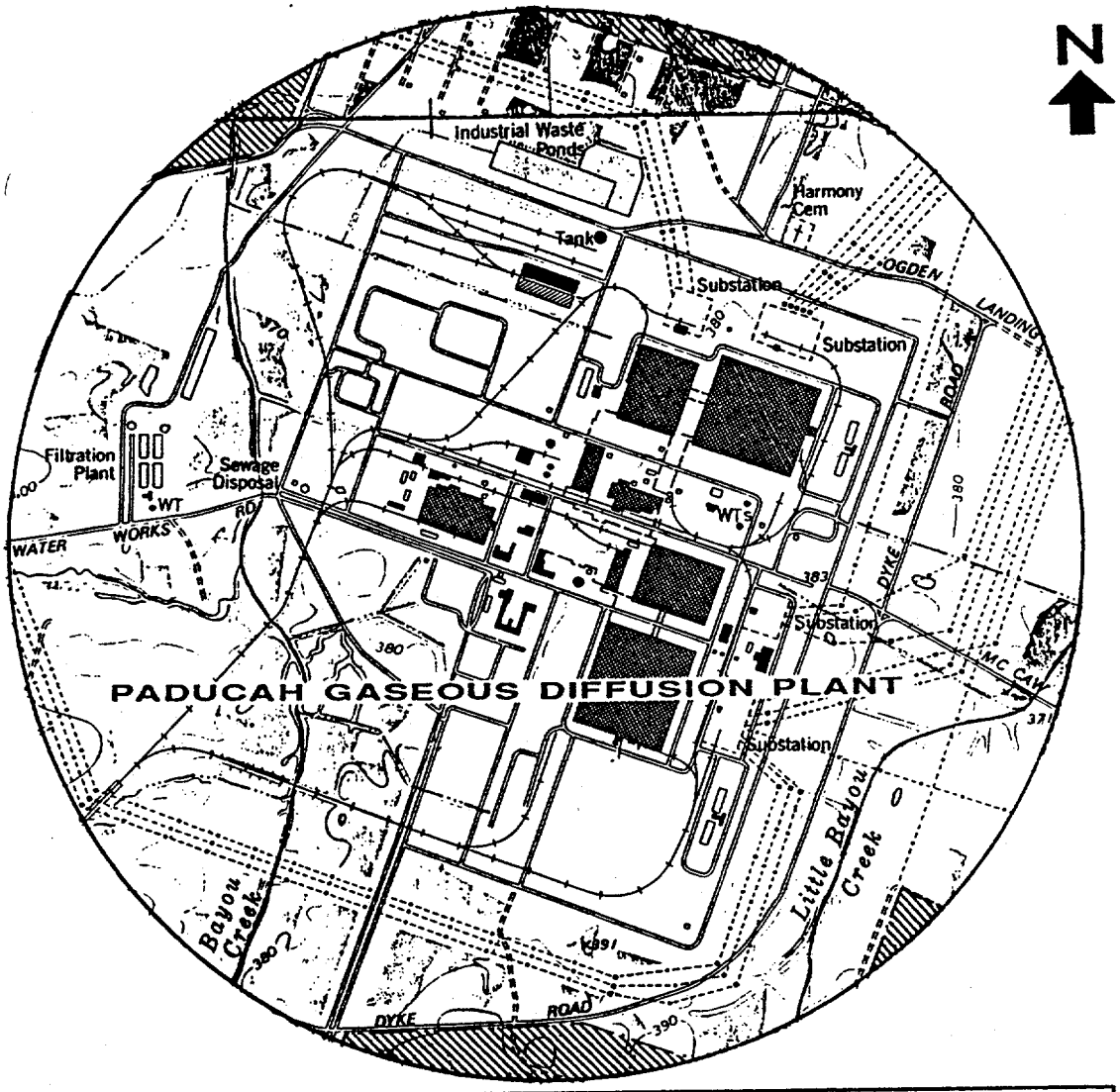
SCALE 0 1000 2000 4000 FEET

PES/180/040591 (REV 0)

PREPARED BY PES GEODATA GROUP 4/8/91

#253

PADUCAH GASEOUS DIFFUSION PLANT (PGDP)
WASTE STORAGE AREAS



SCALE 1:24 000

1 0 1 MILE

1/2

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 .5 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

NATIONAL GEODETIC VERTICAL DATUM OF 1929

LAND USE MAP

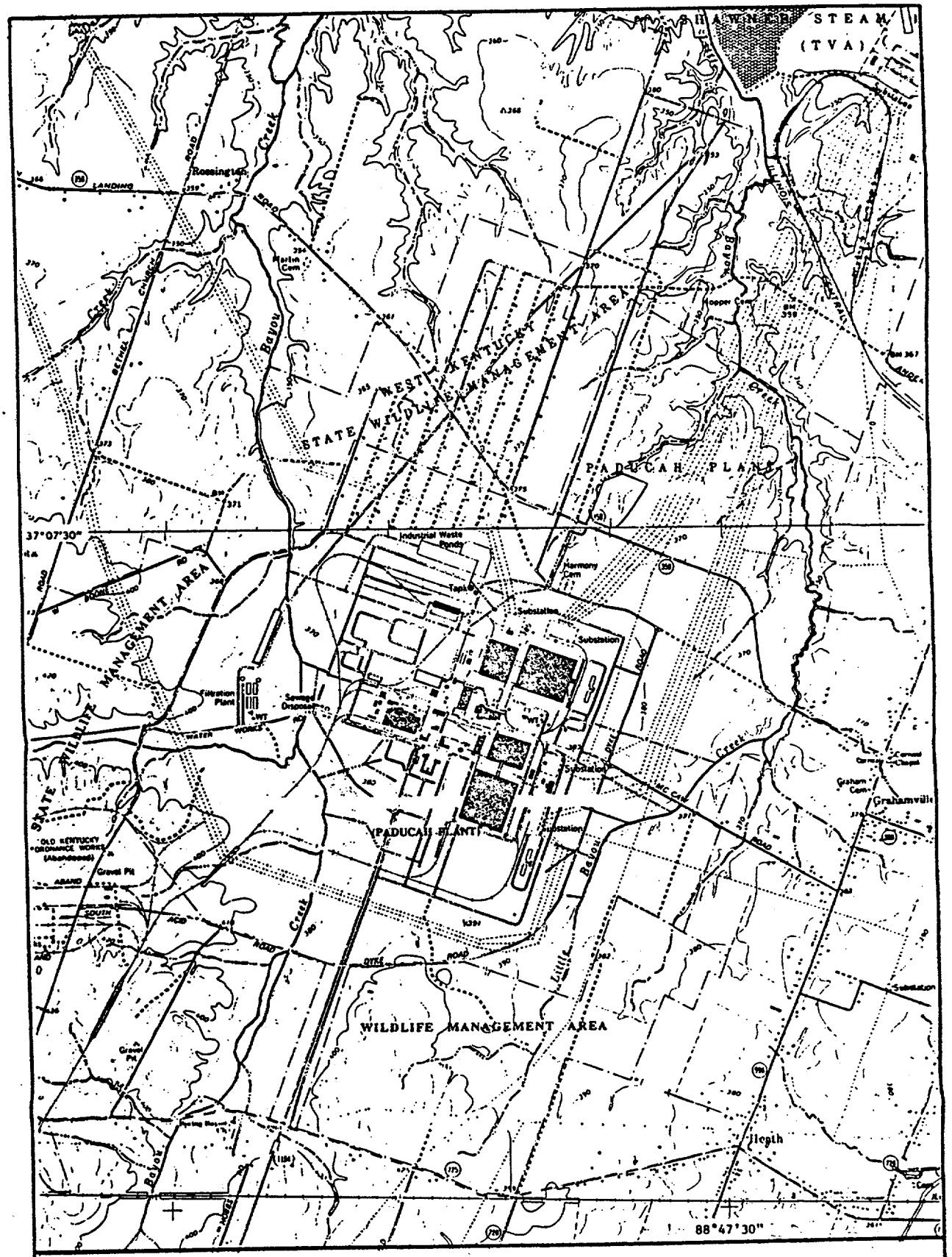
LAND USE CLASSIFICATION

WILDLIFE AREA

NO - AGRICULTURAL AREA

NO - COMMERCIAL FACILITIES

NO - URBAN / BUILD-UP



USGS Map Heath, Ky. (1978) and
Joppa, Ill. - Ky (1982) Quadrangles

RCRA Permit "B"
Map 2 Appendix B

Location Map
U.S. DOE - Paducah Gaseous Diffusion Plant
Paducah, Ky.

UTM GRID AND 1975 MAGNETIC NORTH DECLINATION AT CENTER OF SHEET

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 0 1 KILOMETER

CONTOUR INTERVAL 10 FEET

Table E-4. Hazardous waste facilities.

Location	Designation	Storage (s) Treatment (t) Capacity[a]	Drainage Ditch
C-400-B	Waste Solution Storage Tank	5000 gal (s)	K008, K001
C-400-C	Nickel Stripper Evaporation Unit	100 gpd (t)	K008, K001
C-400-D	Lime Precipitation Unit	400 gph (t)	K008, K001
C-404	LLRW Burial Ground	5 acres (s)*	K015, K001
C-409	Hazardous Waste Pilot Plant	1000 gpd (t)	K008
[redacted]	Hazardous Waste Storage Area	50500 gal (s)	K008
C-746-A	Hazardous and Mixed Waste Storage Area	525000 gal (s)**	K001
C-746-B	Waste Chemical Storage Area	4000 gal (s)***	K001
[redacted]	Hazardous and Mixed Waste Storage Area	35000 gal (s)	K012
C-746-R	Waste Solvent Storage Area	28000 gal (s)	K012
C-710, Rm-143	RCRA 90-Day Storage Area	290 gal (s)	K009

a when multiple tanks are utilized the amount shown is the total
* unit closed with waste in place and awaiting issuance of Part B post closure permit
** applied for interim status
*** interim status unit intends to undergo closure within one year

column, solvent recovery system, filter press, and related storage and chemical-feed equipment. Work at the facility includes laboratory development and small-scale production type activities.

G-1e C-400-B Waste Solution Storage Tank

The C-400-B waste solution storage tank is a new tank. The tank can be used for the storage of a wide variety of waste materials. It is a 5000-gal, 304 L stainless steel tank that is diked to contain any possible spills.

G-1f C-400-D Lime Precipitation Unit

The C-400-D lime precipitation unit is used to remove dissolved metals and particulate material from waste water and acidic waste streams. The unit consists of a mixing tank, a rotary vacuum filter, and effluent storage tanks. The system is directly connected to several processes that generate acidic waste streams and is usually operated as a totally enclosed treatment unit. The unit is also used for the treatment of wastes generated in other processes which are hazardous because of metals content or corrosivity.

G-1g C-746-Q Hazardous Waste Storage Area

The C-746-Q Hazardous Waste Storage Area is located in the western end of the C-746-Q building. The building is a roofed, diked building with a concrete floor. The unit is used to store hazardous wastes including incompatible wastes. No ignitable or reactive wastes are stored in the building. The area is delineated with the appropriate warning signs.

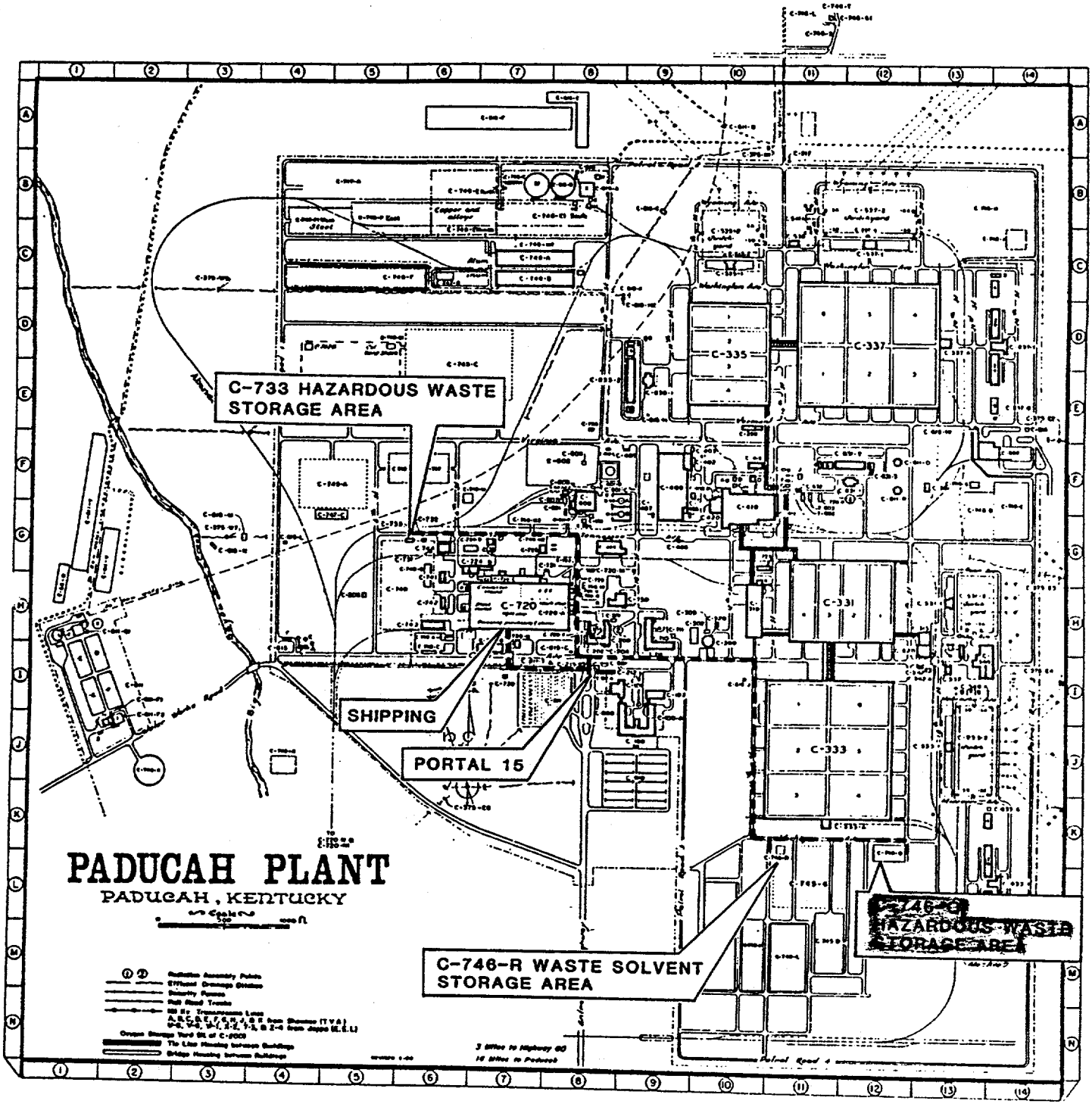
G-1h C-746-Q Low-Level Waste Storage Area

The C-746-Q Low-Level Waste Storage Area is located in the C-746-Q building. This area is used to store solid waste contaminated with uranium and other radionuclides. The maximum U-235 assay allowed in this area is one percent. This area is delineated with the appropriate warning signs.

This plan establishes policy and creates procedures for spill prevention, containment, and countermeasures to minimize any adverse impact to the environment, to reduce safety and health hazards, and to meet standards which define the acceptable management of hazardous wastes. The standards in this plan apply to all areas of PGDP that handle chemicals and treat or store hazardous waste.

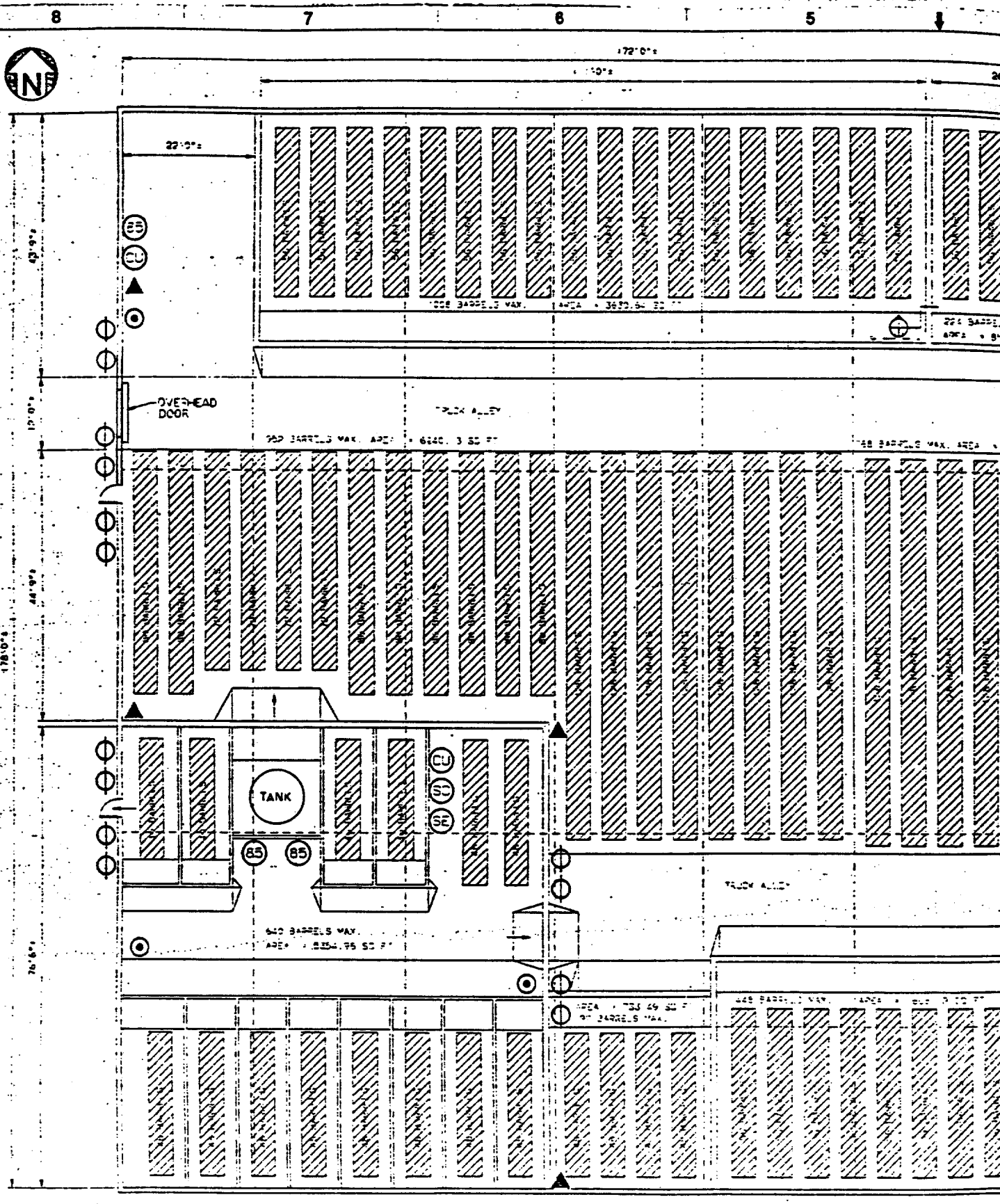
The plan is written to utilize past experience and best management practices to minimize hazards to human health or the environment from fires, explosions, or any unplanned release of hazardous waste to air, soil, or surface water. The provisions of this plan are to be carried out immediately whenever there is a fire, explosion, chemical spill, or release of hazardous waste constituents which could threaten human health or the environment.

Information on the hazardous properties of the various chemicals used in the plant, the safeguards to protect personnel from exposure, and the proper handling, storage, and disposal of the hazardous materials is available on-site. Copies of the contingency plan are available on-site.



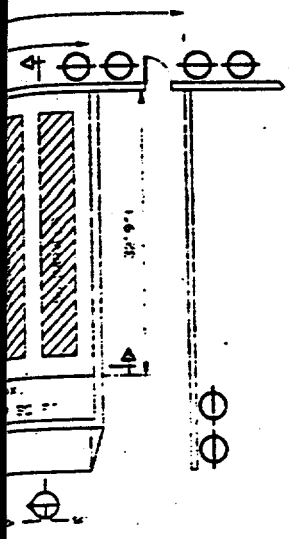
HAZARDOUS WASTE TRANSPORTATION ROUTE

Figure B-2

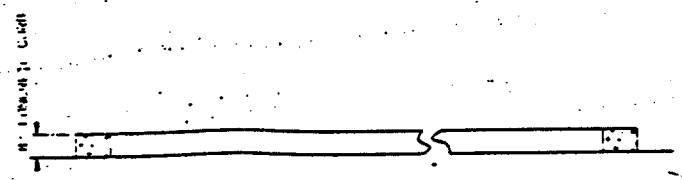


WASTE STORAGE LAYOUT C-746-C

DO NOT REVISE MANUALLY



TYP. SECT. AT DIKED AREAS (1)



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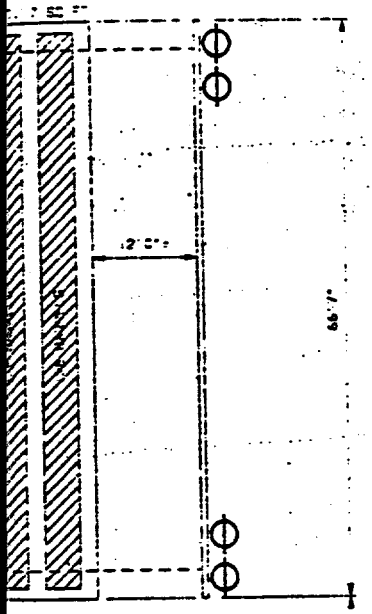
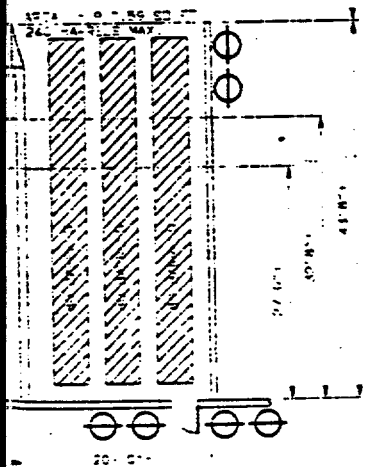
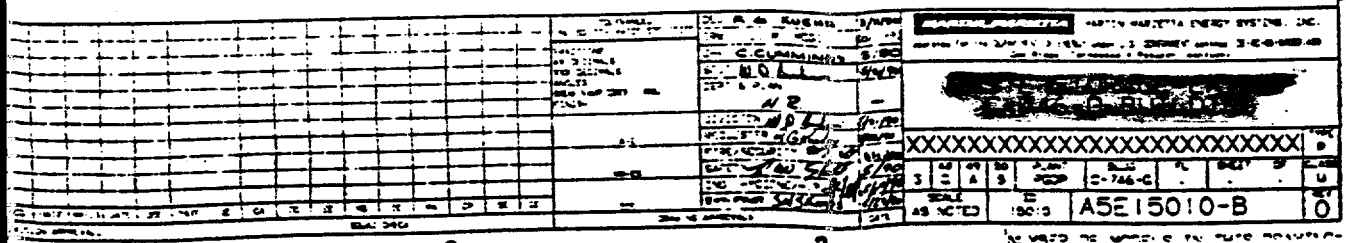




LEGEND

- EXIT
- FIRE EXTINGUISHER
- WARNING SIGN
- SAFETY SHOWER/EYE WASH UNIT
- (85) PALLET WITH 3 EMPTY 85 OVERPACKS
- (55) PALLET WITH 4 EMPTY 17-E DRUMS
- (CU) MISC. CLEAN-UP EQUIPMENT
- (SC) MISC. STORAGE CABINET
- (SE) SAFETY EQUIPMENT STORAGE CABINET



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SCALE AS NOTED | A5E15010-B | REV 0

Date: May 18, 1990
Revision No. 3

SECTION G
CONTINGENCY PLAN

The information contained herein is submitted in accordance with the requirements for a contingency plan, as contained in the Kentucky requirements of 401 KAR 38:090 Section 2(7) and 401 KAR 34:040.

G-1 GENERAL INFORMATION

This contingency plan is for the DOE PGDP, owned and operated by DOE and managed by Energy Systems. PGDP is located in McCracken County, Kentucky, near U.S. Highway 60 in a federally-owned reservation. Figure G-1 shows a plan of the facility including the location of hazardous waste facilities. The plant manager is D. J. Bostock; and the facility contact for DOE is D. R. Allen, Paducah site manager, telephone 502-441-6800.

PGDP is engaged in the enrichment of uranium as fuel to nuclear reactors. To support the uranium enrichment cascade, numerous plant facilities provide services, some of which generate hazardous wastes. In addition to the emergency procedures that are followed in a plant emergency, this plan addresses some of the specific actions that are taken at the following hazardous waste facilities.

G-1a C-746-R Waste Solvent Storage Area

The C-746-R Waste Solvent Storage area is an outside-diked storage area used to store spent solvents (i.e., 1,1,1-trichloroethane and trichloroethylene. The area is also used as a staging area for sampling both hazardous- and nonhazardous-drummed waste.

G-1b C-733 Hazardous Waste Storage Area

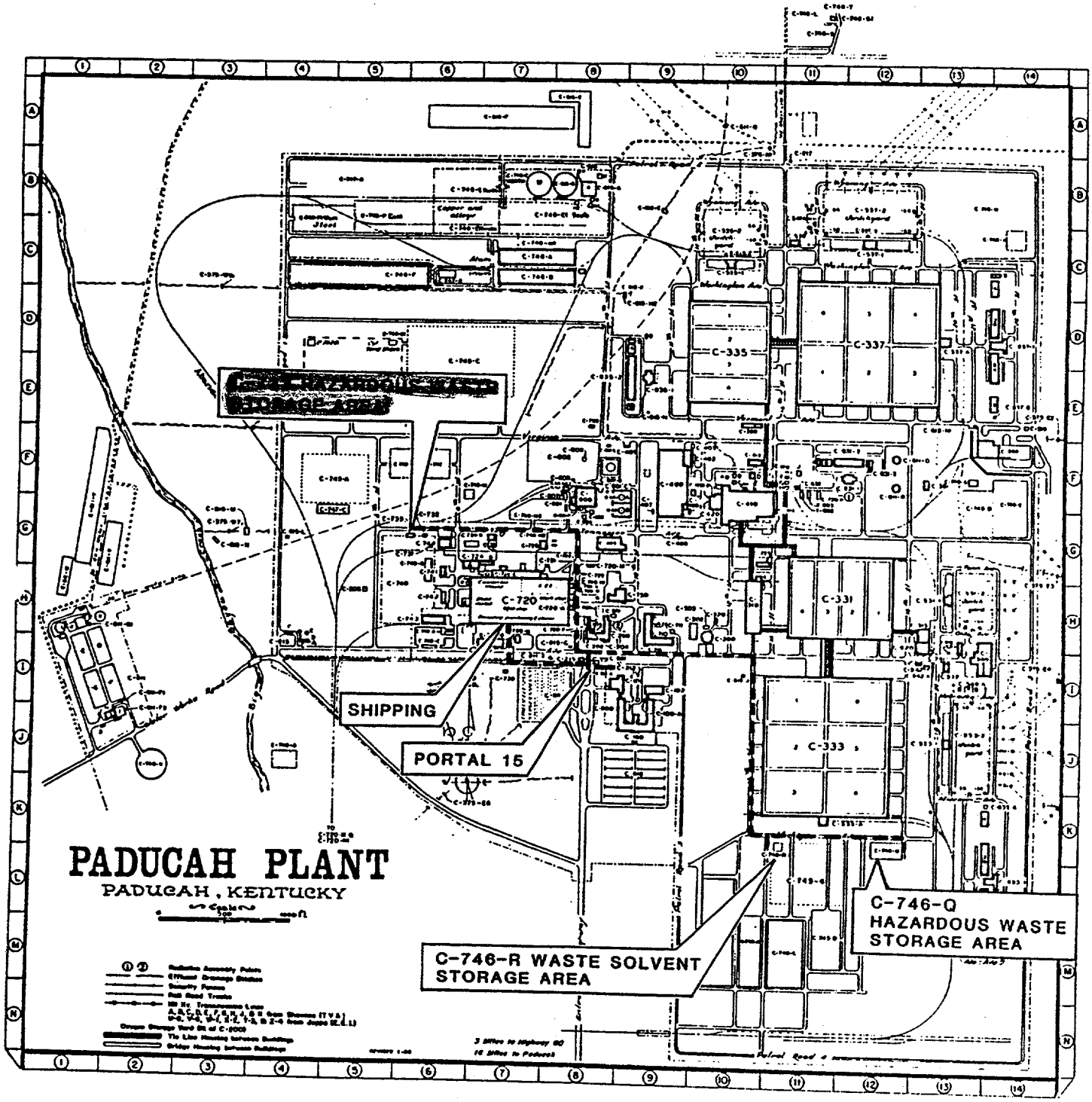
The C-733 Hazardous Waste Storage Area is a roofed and diked storage area used to store spent solvents, painting wastes, mineral spirits, containers of waste chemicals, and other miscellaneous waste materials. PCB wastes are also stored in tanks at C-733.

G-1c C-400-C Nickel Stripper Evaporation Unit

The C-400-C nickel stripper evaporation unit is a system used to strip nickel plating from process parts. The 110-gal process tank is constructed of stainless steel and is utilized as a batch operation with estimated annual volume of 2600 gal. After settling occurs, water is evaporated leaving a sludge which is drummed and stored at C-733 prior to being shipped off-site for incineration.

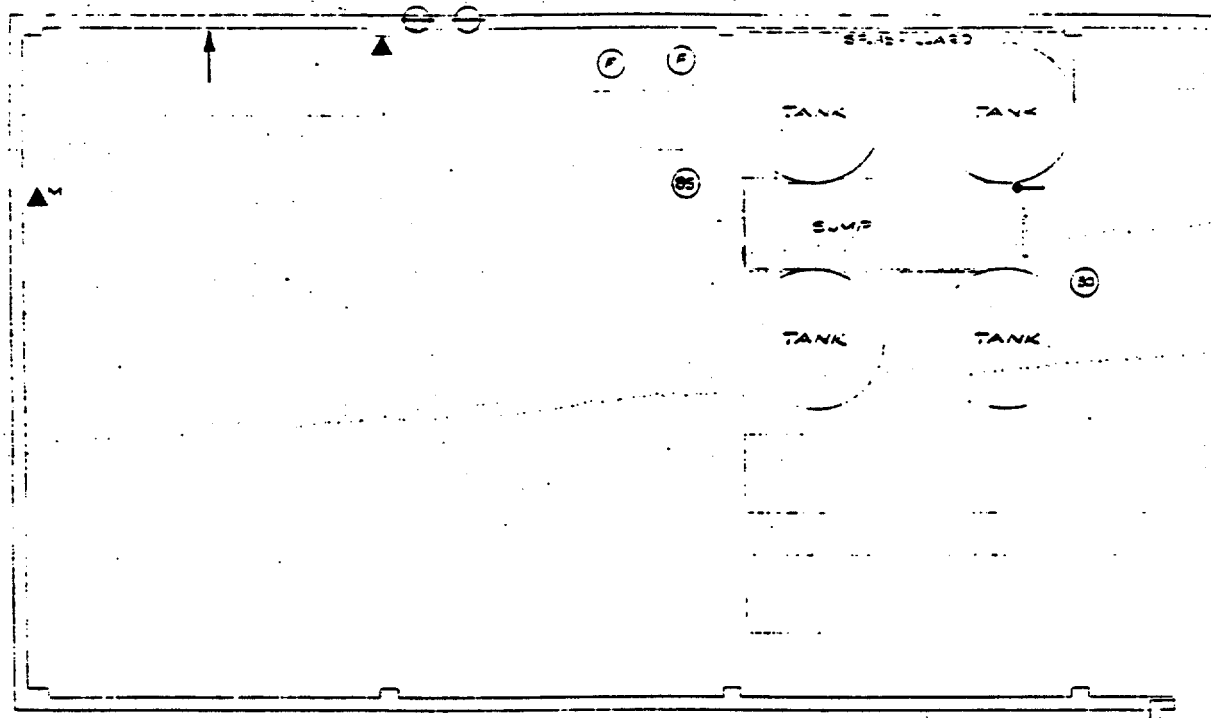
G-1d C-409 Hazardous Waste Pilot Plant

The C-409 hazardous waste pilot plant is a facility utilized for recovery and treatment of hazardous waste streams. Equipment at the facility includes a thin film evaporator, centrifuge, rotary vacuum filter, extraction



HAZARDOUS WASTE TRANSPORTATION ROUTE

Figure B-2



PLAN - SLDG.

SECTION & DETAIL LEGEND

SECTION NUMBER OR DETAIL LETTER

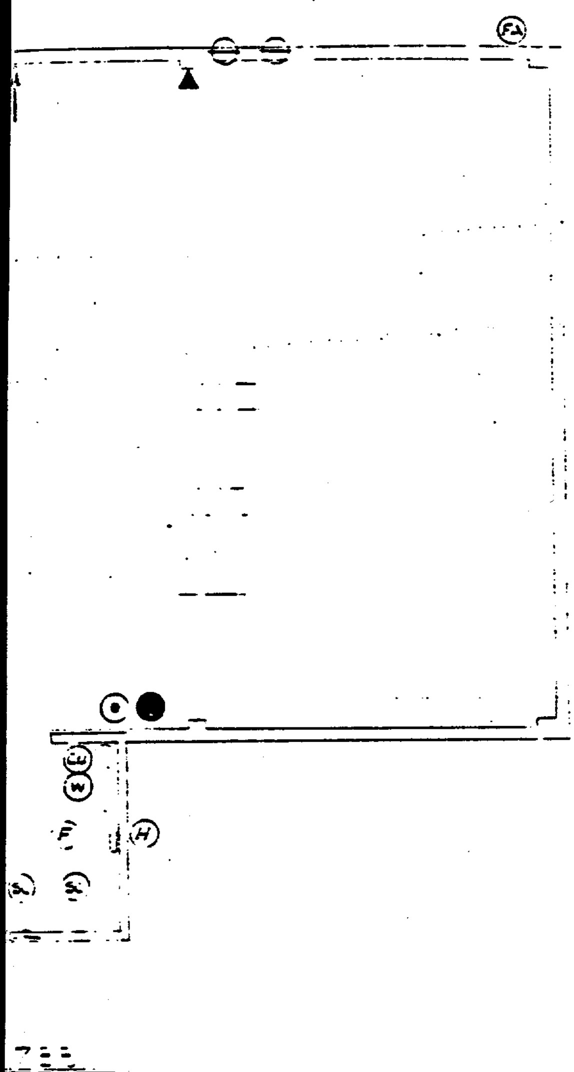
SHEET WHERE DETAIL OR SECTION IS CUT

SHEET WHERE DETAIL OR SECTION IS SHOWN

AS BUILT

BY	DATE	SECT

REV	DESCRIPTION	BY	CHK	APP
1	REV SEC. NOS. NUMBERS & TITLE	DFS	RM	



LEGEND

- (W) WATER SUPPLY
- (FA) FIRE ALARM PULL BOX
- (H) HEATER
- (F) FLAMMABLE STORAGE CABINET
- ← EXIT
- STORM DRAIN
- ▲ FIRE EXTINGUISHER
- ▲M MET-L-X FIRE EXTINGUISHER
- VENT FAN
- SUMP PUMP
- SAFETY SHOWER
- EYE WASH
- (CE) MISC CLEANING EQUIPMENT
- (SC) MISC STORAGE CABINET
- (SE) SAFETY EQUIPMENT STORAGE CABINET
- (30) 30 GAL OIL CAN
- (55) 55 GAL EMPTY OVER PACK CONTAINER
- WARNING SIGN

REVISION OR ISSUE APPROVALS

SQUAD CHECK

DRAWING APPROVALS

MARTIN MARIETTA ENERGY SYSTEMS INC

[redacted]

PLANT	BLDG
PGDP	C-755

SCALE: NOTED

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REV 1

DESCRIPTION OF EXISTING AND PLANNED TREATMENT FACILITIES AND DELISTING ACTIVITIES AT THE OAK RESERVATION AND PADUCAH GASEOUS DIFFUSION PLANT

DESCRIPTION OF EXISTING AND PLANNED TREATMENT FACILITIES AT THE OAK RIDGE RESERVATION AND PADUCAH GASEOUS DIFFUSION PLANT

The facilities at the Oak Ridge Reservation (ORR) and the Paducah Gaseous Diffusion Plant (PGDP) currently have only limited mixed waste treatment facilities. However, plans are currently being made to address the ultimate treatment and disposal of many of the mixed waste streams at the ORR facilities. First, a draft report, Evaluation and Selection of Treatment Processes for Large Volume Solid Radioactive Mixed Wastes, which is nearing completion, will outline the potential treatment technologies for the solid mixed waste produced at the sites. Pending available funding, plans are being made to complete both a Waste Characterization Plan and a Treatment Plan for the mixed waste generated at the ORR and PGDP. Also, a Mixed Waste Disposal Feasibility Plan is to be completed by September 30, 1992, which will explore the possibility of locating mixed waste disposal on the ORR.

Not all mixed waste treatment options are in the feasibility planning stage. There are active mixed waste treatment facilities as well as planned facilities which have a reasonably well defined technical basis. The following narratives provide the latest information available as to the status of mixed waste treatment and planning at the ORR and PGDP.

Oak Ridge K-25 Site Active Treatment Facilities

The K-25 TSCA Incinerator. The TSCA incinerator system consists of a liquid, solid, and sludge waste feed system and a rotary kiln and secondary combustion chamber. The system also has a state of the art off-gas-handling system. The facility has been operated successfully since the end of March, 1991. Additional information from the TSCA Incinerator's Part B is attached.

The permitting status of the TSCA Incinerator follows:

- TSCA approval letter from Region IV EPA received March, 1989 and expires March, 1992.
- RCRA operating Permit (final, TDEC) September 28, 1987.
- Last trial burn completed June, 1987.
- Received final State of Tennessee air permit October 2, 1991.
- NESHAPS - Included under the five emission sources within the Oak Ridge Reservation (ORR). The reservation limit is 10 millirems to maximum affected individual.
- Waste water generated from the TSCA Incinerator is treated at the K-25 site Central Neutralization Facility under the K-25 site NPDES permit.

The K-1232 Wastewater Treatment Unit consists of twelve tanks that provide pH adjustment and chemical precipitation for hazardous wastes that include nitric acid waste, other acid waste, basic wastes, and mop water and rinse waters. Information about the eight above-ground tanks is provided in item three above, description of storage facilities. The above-ground tanks include four reaction tanks, three equalization tanks, and one holding tank.

The K-1407-H Central Neutralization Facility (CNF) is a wastewater treatment unit consisting of several tanks used to treat various wastewaters generated at the K-25 Site. The treatment processes at the Central Neutralization Facility (CNF) are neutralization, chemical addition, coagulation, flocculation, sludge thickening and settling, centrifugation, filtration, and carbon adsorption. Two 25,000 gal reaction tanks receive acidic and basic wastewater streams and are constructed of 0.188 in. carbon steel with high density polyethylene liner. The sludge thickening tank is a 60,000 gal tank which receives neutralized waste that contains suspended matter and is constructed of 0.313 in. carbon steel. The waste is neutralized by the addition of lime or hydrochloric or sulfuric acid. The sludge from the sludge thickening tank is dewatered by the centrifugation process and the concentrate is returned for further treatment. The sludge is containerized and managed as a hazardous waste. The supernatant liquid from the sludge thickener is pumped into settling basins for further removal of suspended matter. The effluent from the settling basins will be further treated through pressure filtration and carbon adsorption systems prior to discharging through a National Pollutant Discharge Elimination System (NPDES) permitted discharge point.

The 1407-A Central Neutralization Facility (CNF) is a wastewater treatment unit consisting of one 28,000 gal tank used for pH adjustment with lime and sulfuric acid and chemical precipitation. This tank serves as a backup unit for the 1407-H wastewater treatment unit. The 1407-A tank is constructed of reinforced concrete, acid proof bricks, and an Atlastiseal coating.

Y-12 Plant Active Treatment Facilities

The Central Pollution Control Facility (CPCF) is a batch treatment facility which uses process reactors, settlers, filters, a mop water treatment system, chrome reduction unit, hydrated lime system, sludge dewatering, and effluent polishing to treat non-nitrated wastes.

Y-12 Planned Treatment Facilities

PWTF I (Oils/Solvents Treatment Facility) will be a facility which will take spent solvents derived from machine cooling and machine cleaning operations as part of forming and machining nuclear weapons parts. This facility will be designed to remove uranium and beryllium for these waste solvents so that they will meet the Waste Acceptance Criteria at the TSCA Incinerator. It is expected that the facility will use pH adjustment, filtration, and distillation (to allow recycle of some portion of the solvents). Currently, there are two treatability studies in progress which will allow the final selection of the required unit operations. The treatability studies will be complete in early CY-1992. This facility is expected to be a 1996 line item project and will be operational in approximately 2003.

PWTF II (Sludge and Soils Processing Facility) will be a facility which will treat contaminated soils, waste water treatment sludges, and some selected heterogenous construction debris generated primarily at the Y-12 facility. The process will consist of a thermal desorption step followed by uranium extraction and stabilization. Three treatability studies have been completed and two more are scheduled for completion in early CY-1992. This project is planned to be a 1995 line item and should be operational by approximately 2003.

Reactive Waste Treatment Facility will be a facility which will treat up to five gallons of sodium/potassium alloy waste in oil. The unit will consist of a burn chamber fitted with an off gas treatment system. The facility is planned to be completed in FY-1993 or FY-1994 pending NEPA approval.

DELISTING ACTIVITIES
AT THE OAK RIDGE RESERVATION

TSCA Incinerator Ash and TSCA Incinerator Sump/IWS Sludges. A TSCA Incinerator residuals management plan is under development and should be completed within the next two years. Currently, there is a schedule of activities being finalized and will be made available to the TDEC within the next two months.

K-1407-B & -C Pond Sludges. A sampling program is being developed to sample the fraction of the drums which are known to be solidified (approximate 44,000 of 76,000) with intention of demonstrating treatment to LDR standards. The sampling plan will be implemented over the next year. After the sampling results are analyzed, a delisting petition will be developed and submitted to the appropriate regulatory office.

West End Treatment Facility (WETF Sludges). Currently, a program is underway and being funded by the DOE Office of Technology Development to develop a sampling procedure for the waste currently contained in the WETF storage tanks. Once an acceptable sampling procedure is developed, a delisting petition will be submitted. The expected completion date of the sampling activity is in 1994.

TSCA INCINERATOR
PART B INFORMATION

fluctuations as described in the Incinerator Guidance Manual (p.4-3)[1] also need to be considered in setting these permit conditions.

During the startup/shakedown period, fugative emissions will be controlled by maintaining a negative pressure in the combustion zones whenever hazardous wastes are being fed to the incinerator. The prime mover is an induced draft fan described in Section D-5b(2)(b).

During the startup/shakedown period, hazardous wastes will not be fed to the system unless the conditions as described above are within the acceptable operating limits. The flow of hazardous waste to the incinerator will be stopped if operating conditions deviate from the established limits.

D-5b(2)(a) Incinerator Performance

Based upon engineering judgment DOE feels that the conditions specified in Section D-5b(1) for the start-up/shake-down period, and in Section D-5b(2)(d) for the trial burn will be adequate to ensure compliance with the performance standards of 40 CFR 264.343 for any combination of feed materials.

D-5b(2)(b) Detailed Engineering Description

1. Manufacturer's Name and Model Number
   The DOE-ORO incinerator system was custom designed to meet the requirements of this particular facility, and as such, has no model number. The manufacturer is International Waste Energy Systems, Inc. of St. Louis, Missouri.

2. Type of Incinerator
   The RKI system consists of a liquid, solid, and sludge waste feed system, a RKI and a secondary combustion chamber (SCC). Components of the system include a rotary kiln with liquid injection burners firing into the kiln, a mixing chamber, a SCC, a water spray quench column, a venturi scrubber, a packed-column acid gas absorber followed by an ionizing wet scrubber, an induced draft fan, and an exit stack.

A block flow diagram of the RKI system is shown on Figure D-9. The block flow diagram begins where the waste and auxiliary fuel is injected into the primary chamber and then traces the flow of the hot combustion gases to the SCC, quench tower, and other pollution control devices with all discharge points noted.

3. Linear Dimensions of the Incinerator Unit Including the Cross-Sectional Area of the Combustion Chamber

The RKI system has two combustion chambers separated by a gas mixing chamber. The rotary kiln dimensions are 7 feet 6 inches outside diameter (OD) by 25 feet long. The kiln shell thickness is 5/8 inch. The kiln is lined with 9 inches of Superduty refractory. The inside diameter (ID) is therefore 5 feet 11 3/4 inches. The exact dimensions and geometry of the mixing chamber are not known at this time. The SCC is comprised of a vertical cylindrical chamber, a downstream horizontal rectangular duct, and a cylindrical downcomer to the quench. All three secondary combustion chamber sections are lined with 2 inches of block insulation and 6 3/4 inches of refractory brick. The approximate inside dimensions of each section are as follows:

- Vertical chamber 8 feet 9 inches ID by 40 feet long
- Horizontal duct 4 feet by 4 feet by 12 feet long
- Downcomer 4 feet ID by 26 feet long.

The volume of the RK is about 702 cubic feet. The volume of the SCC is about 2924 cubic feet.

4. Description of the Auxiliary Fuel Systems

The SCC auxiliary fuel burner system will consist of one dual fuel combination gas/liquid burner. The burner will be a North American Model 6514-8B for natural gas/No. 2 fuel oil and will be located at the SCC inlet. The auxiliary fuel burner is temperature controlled. Combustion air is supplied to the burner by a forced draft blower, rated at 16 ounces per square inch (osi). Vendor information on the auxiliary fuel burner is given in Appendix D-8. An identical auxiliary fuel system is mounted in the faceplate of the RK.

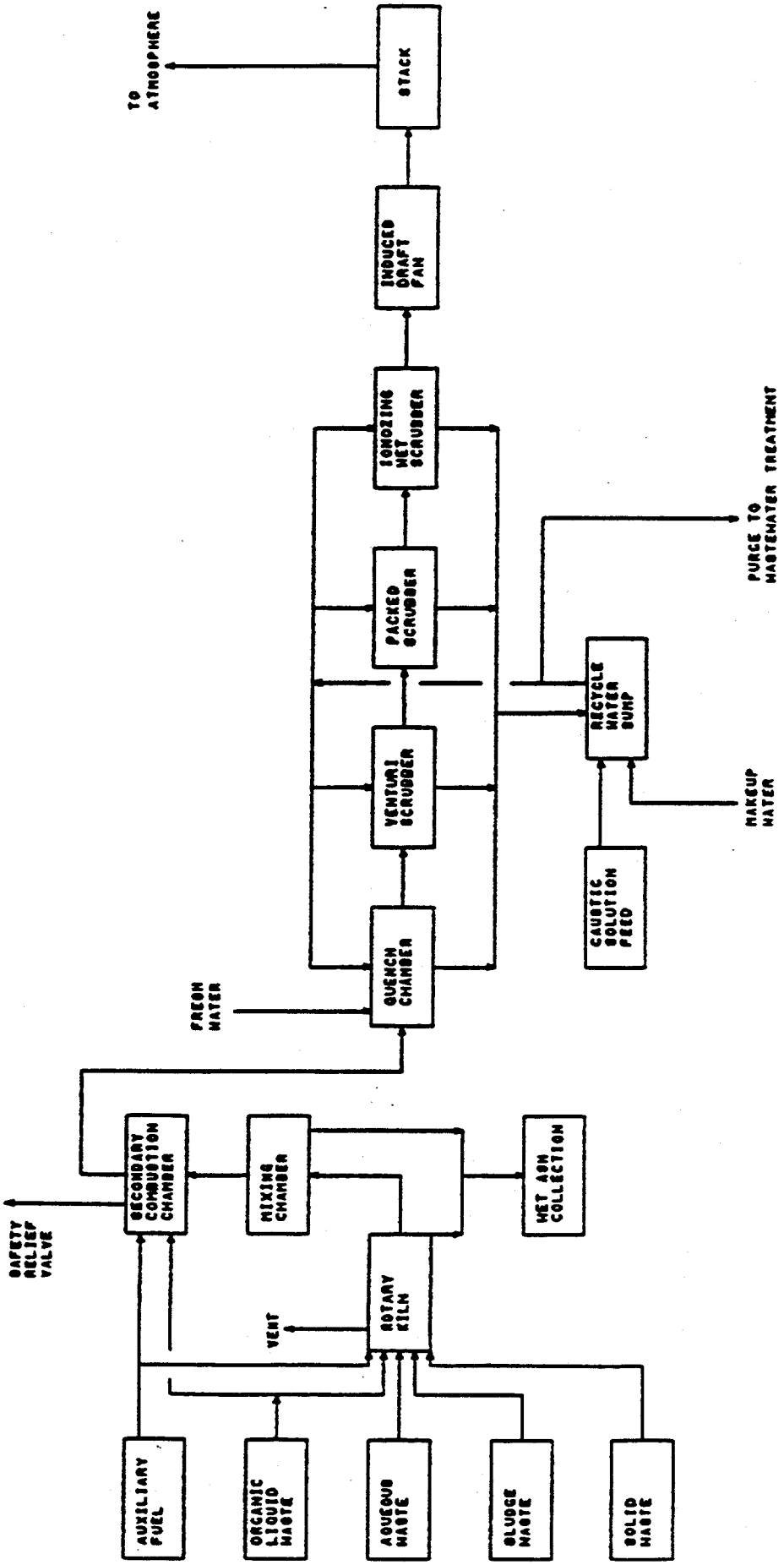

Figure D-9. Block Flow Diagram of Incineration System

5. Capacity of Prime Mover

The RKI system prime mover is a Ceilcote Model CH-30 FRP centrifugal fan which operates as an induced draft (ID) fan. The ID fan is capable of producing a negative pressure in the incinerator, and is rated at about 18,000 acfm. The ID fan has a 125 horsepower (hp) motor. Vendor information on the ID fan is given in Appendix D-8.

6. Description of Waste Feed System

Four general types of waste material will be fed to the DOE-ORO RKI: organic liquids, aqueous liquids, sludges, and solids. Organic liquids can be fed to either the RK or SCC from any of several agitated feed tanks. Provisions also will exist for feeding organic liquids directly from tank trucks if necessary. Separate organic liquid waste burners equipped for steam or air atomization are located in the RK and SCC. These are described in Section D-5b(2)(b)9. The burner feed systems are equipped with "grinder" pumps and in-line strainers to prevent oversized solids from entering the burners.

Aqueous wastes are fed from tanks to an aqueous nozzle located in the RK. This nozzle is equipped for either steam or air atomization of the aqueous waste. Sludges are pumped from a storage container and are lanced, with optional steam atomization, into the RK. Solids are fed to the kiln by a ram feeder.

7. Description of Automatic Waste Feed Cutoff System

The primary function of the waste feed cut off interlocks is to prevent the feeding of material during incineration conditions that are outside the RCRA permit limits. During the startup and shutdown of the incinerator or during process upsets, the interlock system automatically stops all waste feed systems and prevents their restart until the incinerator is at proper operating conditions and the interlock is manually reset.

The process parameters identified in Table D-7 are tied into an alarm panel and will also automatically cut off the waste feed if the permit conditions for these parameters as stated in 40 CFR 264.345(e) are

Table D-7. Automatic Liquid and Solid Waste Feed Cutoff Parameters

WASTE FEED CUTOFF INTERLOCK SYSTEM

INTERLOCK INITIATOR	Kiln Organic Liquid Waste	Aqueous Waste	Sludge Waste	Solid Waste	SCC Organic Liquid Waste	SCC Aux Fuel Burner	SCC Safety Relief Vent
Kiln Low-Low Temperature	OFF	OFF	OFF	OFF			
Kiln High Pressure (Time Delay)	OFF	OFF	OFF	OFF			
Kiln Organic Liquid High-High Flow	OFF						
Kiln Organic Liquid Low Atomization Media Pressure	OFF						
Kiln Waste Burner Flameout	OFF						
Aqueous Waste High-High Flow		OFF					
Aqueous Waste Low Atomization Media Pressure		OFF					
Sludge Waste High-High Flow			OFF				
Solid Waste High-High Flow				OFF			
SCC Low-Low Temperature	OFF	OFF	OFF	OFF	OFF		
SCC Organic Liquid High-High Flow					OFF		
SCC Organic Liquid Low Atomization Media Pressure					OFF		
SCC Waste Burner Flameout					OFF		
Quench High-High Outlet Temperature	OFF	OFF	OFF	OFF	OFF	ON	OPEN
Venturi Low-Low Pressure Differential	OFF	OFF	OFF	OFF	OFF		
Packed Bed Low-Low Flow	OFF	OFF	OFF	OFF	OFF		
IDS Low Peak Voltage (Time Delay)	OFF	OFF	OFF	OFF	OFF		
Combustion Gas High-High Velocity	OFF	OFF	OFF	OFF	OFF		
Stack Gas High CO (Time Delay)	OFF	OFF	OFF	OFF	OFF		
Stack Gas High-High CO	OFF	OFF	OFF	OFF	OFF		
Kiln Vent Opens	OFF	OFF	OFF	OFF			
SCC Safety Relief Vent Opens	OFF	OFF	OFF	OFF	OFF	ON	OPEN
Fan Failure	OFF	OFF	OFF	OFF	OFF	ON	OPEN
Power Failure	OFF	OFF	OFF	OFF	OFF	OFF	OPEN

exceeded. The waste feed cut off parameter permit condition values for permitted operation under 40 CFR Subpart O will be negotiated between the Tennessee Department of Health and Environment (TDHE), EPA Region IV, and the DOE based on the results of the RCRA trial burn. A discussion of the automatic waste feed cut-off parameters follows:

- Primary Chamber and SCC Temperatures -- The primary chamber and SCC temperatures are normally controlled to within 50°F below the temperature setpoint. It is expected that the 50°F temperature variation below the minimum temperatures will be encountered during normal operation and should not be cause for automatic waste feed cut-off.

- Carbon Monoxide -- Carbon monoxide (CO) concentrations are measured in the stack. The DOE suggests that the CO automatic waste feed cut-off system be a two-tier system. The two-tier CO system is suggested as an approach to reducing waste feed cut-off situations which are caused by CO spikes. CO spikes are a common occurrence in incinerators during the feeding of liquid and solid wastes. The two-tier CO approach has previously been accepted by EPA Region III.[2] The two-tier CO approach allows the use of a delay timer which starts if the CO level exceeds the first tier level, but not the second tier level. If at the end of a negotiated time the CO has not dropped below the first-tier level, the waste feeds are automatically cut off. If, however, the CO drops below the first tier level before the time has elapsed, the waste feeds are not cut off. If the second tier, however, is exceeded, the waste feeds are instantaneously cut off.

- Combustion Gas Velocity Indicator (CGVI) -- The continuous measurement of flow rate in a hot, particulate-laden combustion gas or a cool flue gas with condensing moisture is a difficult and complex engineering problem. In order to select an accurate and reliable CGVI system, DOE will evaluate several methods of combustion gas flow measurement during the startup/shakedown period. The methods under consideration include monitoring of the venturi throat damper position, monitoring the induced draft fan differential pressure, monitoring the induced draft fan electrical current demand, and direct measurement of the stack gas flow rate using a thermal dispersion sensor, or differential pressure device.

  One of the CGVI systems will always be operating and tied into the automatic waste feed cutoff interlocks whenever hazardous wastes are introduced into the RKI during the startup/shakedown period. The output of each system will be reported in terms of stack gas velocity in feet per second. DOE will supply detailed information and data concerning the selected CGVI method before conducting the trial burn.

- Kiln Pressure -- A negative pressure will be maintained in the combustion zones of the incinerator to control fugative emissions.

The pressure at the feed end of the rotary kiln will be continuously monitored. Waste feeds to the kiln will be stopped automatically if the kiln pressure exceeds atmospheric pressure. A 15-second time delay will be incorporated into the automatic waste feed cutoff interlock to allow for normal short duration pressure changes which can occur during the ram feeder cycles.

- Atomization Media Pressure -- The pressure of the atomization media (air or steam) delivered to the kiln liquid waste burner, SCC liquid waste burner, and the aqueous nozzle will be maintained at or above a set minimum. If the atomization media pressure falls below the permitted minimum for any given feed system, the waste feed to that system will be stopped.

- Quench Chamber Temperature -- The quench chamber cools and saturates the hot gases exiting the SCC. This allows downstream gas cleaning equipment to be made of materials that do not need to withstand high temperatures. If the gases leaving the quench chamber exceed a safe temperature, the waste feeds will be automatically cut off.

- Venturi Pressure Differential -- The variable throat venturi scrubber pressure differential is controlled at or above a minimum value to ensure efficient particle collection. The waste feeds will be automatically cut off if the venturi pressure differential falls below the minimum permitted value.

- Packed Bed Scrubber Flow -- The packed bed scrubber is used for acid gas absorption into a recirculating liquid scrubbing solution. The waste feed will be automatically stopped if the minimum permitted recyle flow rate to the packed bed scrubber is not maintained.

- Ionizing Wet Scrubber -- The two-stage IWS unit operates on the principal of electrostatic particle collection. A minimum peak voltage is maintained in the transformer/rectifier set of each stage to ensure effective particle capture. The waste feeds will be automatically cut off if the minimum voltage is not maintained.

  Each IWS stage undergoes a programmed collection plate wash cycle for up to five minutes each hour, during which the unit is deenergized. To accommodate the wash cycle, the waste feed cut off interlock will be equipped with a delay timer which will start on a low voltage signal from either IWS stage. If the IWS voltage does not return to its normal state within the prescribed time, the waste feeds will be automatically cut off.

- Safety Relief Vent -- The secondary combustion chamber is equipped with a safety relief vent as described in Section D-5b(2)(b)8. Whenever this safety relief vent is open, all waste feed systems will be automatically stopped. To the greatest extent possible the SCC auxiliary burner will maintain the temperature in the SCC when the safety relief vent is open.

- Waste Feed Rates -- Each waste feed stream will be controlled at or below a maximum permitted feed rate. Organic liquid, aqueous, and

sludge waste feed rates are continuously monitored and recorded. The individual waste stream will be automatically cut off if the maximum feed rate for that stream is exceeded.

Solid wastes are fed by a ram on a programmed cycle which is controlled by the operator. The weight of each charge is recorded as well as the number of charges in any given time period. This information is totaled by a computer over a specified time interval, thus generating a feed record in terms of weight per unit time, such as pounds per hour. The ram feed system is controlled to feed solid wastes at or below a specified maximum rate. If the solid feed rate exceeds the permitted maximum rate, the ram will be automatically disabled until the beginning of the next totalizing interval.

- Power Failure -- The DOE-ORO incineration system is supplied from a dual ended substation, which provides backup power to the entire incinerator facility. In the unlikely event of a power failure, all waste feeds are immediately cut off. This is accomplished by providing each feed system with instrumentation and controls which fail to the "safe" (closed or off) position. This feature will also cause individual waste feed streams to be cut off in the event of local power or instrument failure.

8. Stack Gas Monitoring and Pollution Control Equipment

Continuous monitoring of the off-gas will be conducted for the CGVI and CO analyses. Levels of CO will be recorded continuously in the control room. The CGVI will be monitored and recorded in the control room.

The RKI air pollution control equipment (APC) is shown in Figure D-9. The APC system includes the following equipment:

- Quench chamber
- Venturi scrubber/demister
- Packed absorber column
- Ionizing wet scrubber
- Induced draft fan
- Recycle water systems.

In the quench chamber, combustion gases are cooled from the incinerator exit temperature to approximately 160 to 200°F by contact with fresh water and recycle water streams. Excess water collects in the separator in the base of the column while the saturated gas phase is routed to the inlet of the venturi scrubber.

The automatic variable-throat venturi scrubber for particulate removal is located between the quench chamber and the absorber column. The venturi assembly consists of converging and diverging cones with an adjustable throat to allow the pressure drop to be varied. Venturi pressure drop normally is controlled in the 8 to 12 inch w.c. range. Scrub solution is injected through a nozzle located upstream of the throat. The venturi scrubber has a Chevron demister on the outlet section to remove entrained liquid and drainage to a sump.

Hydrochloric acid (HCl) is removed from the gas phase by cross-current contact with recycled scrub solution in the packed-bed absorber.

An ionizing wet scrubber (IWS) system is included for removal of sub-micron particulate matter. The IWS provides cross-flow contact of the flue gases with recycled scrub solution. The IWS consists of an ionizer module, where particles are electrically charged by corona discharge electrodes, and a charged particle scrubber where the particulate matter is collected on wetted surfaces.

A scrub solution recycle system is used to minimize liquid blowdown from the off-gas cleaning system. To control scrub solution acidity, an alkaline solution is added. The addition rates are controlled by pH sensors on the outlet of the process sump tanks.

To protect the APC system from damage caused by high inlet temperature, a high temperature actuated system by-passes the exhaust gas from the SCC to the atmosphere through a safety relief valve. When by-pass occurs, the waste feeds are automatically stopped, auxiliary fuel is started to maintain the temperature in the SCC, and an alarm sounds to notify the operator that there is a problem. As soon as the temperature returns to a safe level, the safety relief valve is shut and the exhaust is routed back through the APC system. This by-pass of the APC system is an infrequent operation to protect the APC system and is not a malfunction of the combustion equipment.

9. Nozzle and Burner Design

The details of the auxiliary fuel burner are given in Section D-5b(2)(b)4 and Appendix D-8. Waste burner and nozzle systems are also located in both the primary and secondary combustion chamber and will be identical dual fuel combination North American Model 6514-8B units with 5622-01A steam or air atomizing assemblies for firing auxiliary fuel (natural gas) and waste liquids. One burner will be located on the RK faceplate and the other at the SCC inlet. The burner atomization system operates on pressure differential based on the pressure of the waste liquid. The minimum required atomization media pressure is 25 psig at a waste fluid pressure of 15 psig. Solids of up to 50 mesh can pass through the burner nozzles at concentrations exceeding 5 percent by weight. Each burner has a turndown ratio of 5 to 1. Additional details of the burners are given in Appendix D-8.

Combustion air will be provided to the burners by a pair of blowers; one for the RK waste burner and auxiliary fuel burner and one for the SCC waste burner and auxiliary fuel burner.

Both a sludge lance and an aqueous waste nozzle will be provided in the faceplate of the RK. The sludge will be pumped into the RK through a pipe with optional steam atomization, and the aqueous waste can be atomized with either air or steam.

10. Construction Materials

The construction materials for the incinerator system components are as follows:

COMPONENT	CONSTRUCTION MATERIALS
Rotary kiln (primary chamber)	Carbon steel shell Internal high density refractory (Superduty)
Mixing chamber, secondary chamber, and high temperature duct	Carbon steel shell Internal block insulating refractory Internal refractory brick
Quench chamber	FRP shell Internal acid resistant refractory

COMPONENT	CONSTRUCTION MATERIALS
Venturi scrubber, packed scrubber, IWS housing, and connecting duct	Fire retardant FRP materials
APC system wetted metal parts	Hastelloy C-276
Induced draft fan, ductwork to fan and from fan to vent stack, vent stack	Fire retardant FRP materials

11. Location of Temperature, Pressure, and Flow Indicating and Control Devices

The discussion in this section is based on Figure D-10. The numbers given at the end of each heading refer to the equipment location in Figure D-10.

a. Primary and Secondary Combustion Chamber Temperatures (1,2) -- The combustion gas temperatures of the primary and secondary combustion chambers are each measured with thermocouples. The primary chamber thermocouple is located at the entrance to the mixing chamber. The SCC thermocouples are located in areas of the vertical chamber and in the downcomer section of the SCC high temperature duct. The discharge temperature sensor is used for control.

b. Waste Liquid Flow (3,4) -- Waste liquid flows are measured by a Micro-Motion®, mass flow meter. The Micro-Motion flow meter provides a measurement of instantaneous mass flow rate of the waste liquid being fed to the burner. A detailed description of this flow meter is given in Appendix D-8.

c. Sludge Waste Flowrate (5) -- Sludge is pumped to the incinerator from drums with a diaphragm pump. The sludge flow rate will be continuously monitored and recorded whenever this system is in use.

d. Solid Waste Flowrate (6) -- Solid waste, such as contaminated soil will be fed to the RK by a ram feed system. The ram feeder pushes a charge of solid waste into the kiln on a timed cycled which can be manually or

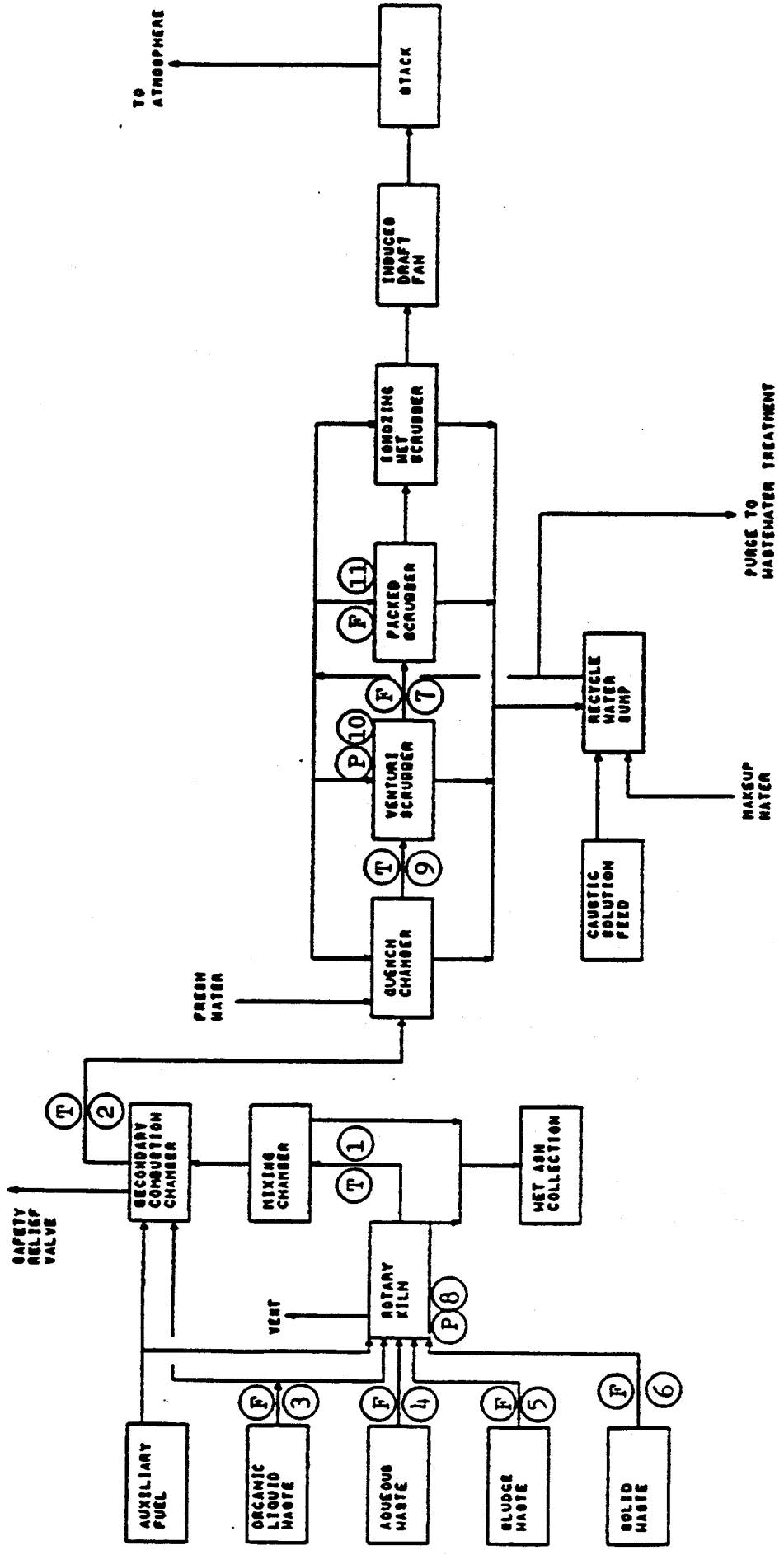

Figure D-10. Location of Temperature, Pressure, and Flow Indicating and Control Devices

automatically overridden if necessary. Each time the ram feeds a charge of waste into the kiln, a permanent record of the event will be made. The ram has a capacity of approximately 4 to 6 cubic feet per cycle. A continuous weigh-cell will be used to monitor the solid waste feed rate.

e. Combustion Gas Flowmeter (7) -- The combustion gas flowrate will be monitored either by correlation with the venturi damper position, fan characteristics, or an annubar. See Section D-5b(2)(b)7. This measurement will be the combustion gas velocity indicator.

f. Rotary Kiln Pressure (8) -- The pressure at the feed end of the rotary kiln will be measured by a pressure transducer. Indication of a negative pressure at the kiln feed end, which is the farthest point upstream of the system prime mover, demonstrates that the entire combustion zone is being kept at a negative pressure.

g. Quench Chamber Outlet Temperature (9) -- The temperature of the gases leaving the quench chamber is continuously monitored with a thermocouple.

h. Venturi Scrubber Pressure Differential (10) -- The pressure drop across the venturi scrubber is continuously measured by a differential pressure sensor with taps at the inlet and the outlet of the venturi.

i. Packed Bed Recycle Flow (11) -- Flow of recycled scrubbing solution to the packed bed is continously monitored by a non-contact flow sensor, located on the recycle pump outlet line.

D-5b(2)(c) Detailed Description of Sampling, Analysis, and Monitoring Procedures
The objective of a trial burn test is to obtain process data that will:

- Permit calculation of POHC destruction and removal efficiency, HCl removal efficiency, and particulate emission concentrations
- Confirm the fate of POHCs fed to the system; that is, destroyed by thermal oxidation, discharged in ash residues and/or the scrubber purge water, or emitted in the stack gases
- Document the test process feed and operating conditions that will be used in establishing operating permit conditions.