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Defense Waste Tank Storage at the Hanford Site

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Restoration and Waste Management

Westinghouse Hanford Company Richland, Washington

Hanford Operations and Engineering Contractor for the U.S. Department of Energy under Contract DE-AC06-87RL10930

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Example

Biological Remediation of Underground Storage Facilities, John D. Bogart and James R. League, Mo Tec, Inc., P.O. Box 338, Mt. Juliet, TN 37122-0338
Underground storage facilities take many forms. Any breach in the integrity of an underground system leads to serious problems. Mo Tec, Inc. has developed biological treatment techniques to remediate sites so contaminated. Virtually any organic material is biodegradable if treated appropriately. Mo Tec uses enhanced landfarm techniques, liquid solid contact digestion and a combination of techniques called the slurry hold drying bed process. This technology was commercially applied to a wood treating plant in Tennessee. The major target material to be treated was creosote sludge designated K-001 by the EPA. The process achieved 98-99% removal efficiency. Besides eliminating toxic materials, the physical bulk was diminished as 4500 cubic yards were treated in a pilot study. Only 9-15 cubic yards of residual material was measured.

Defense Waste Tank Storage Activities at the Hanford Site, Anthony J. DiLiberto, Westinghouse Hanford Company, P.O. Box 1970, Richland, Washington 99352

The defense liquid waste storage facilities at the Hanford Site in southcentral Washington State contain radioactive and hazardous chemical wastes generated by 45 yrs of nuclear fuel reprocessing. Twenty-eight double-shell tanks and 149 single-shell tanks contain approximately 20 Mgal and 37 Mgal, respectively, of liquids, sludges, and saltcake wastes. Current activities involve technology development for waste minimization, storage, treatment, and disposal. The DST waste will be retrieved, pretreated and separated into a high-level (HLW), transuranic (TRU), and low-level (LLW) fractions. The HLW and TRU fractions will be vitrified in a glass matrix and shipped to a geologic repository. The LLW fraction will be immobilized in grout and disposed of in a near-surface concrete vault on the Hanford Site. The SST wastes are being characterized to support technology development to define a final disposal alternative. An agreement for closure of all tanks by the year 2018 has been scheduled by the U.S. Department of Energy-Richland Operations Office, the U.S. Environmental Protection Agency, and Washington State Department of Ecology.

Defense Waste Tank Storage Activities at the Hanford Site

Anthony J. DiLiberto
Westinghouse Hanford Company
P.O. Box 1970
Richland, WA 99352

1.0 GENERAL SITE INFORMATION

1.1 Organization and Administration

The Hanford Site is administered by the U.S. Department of Energy (DOE) through the Richland Operations Office (DOE-RL) located in Richland, Washington.

Four contractors are involved in the operations of the Hanford Site: Hanford Environmental Health Foundation (HEHF); Kaiser Engineers Hanford (KEH); Pacific Northwest Laboratory (PNL), operated by Battelle Memorial Institute; and Westinghouse Hanford Company (Westinghouse Hanford). The Boeing Computer Services Richland, Inc., is subcontracted to Westinghouse Hanford. All of these contractor operations generate regulated waste, which is either radioactive and therefore subject to requirements pursuant to the *Atomic Energy Act of 1954*[1], or hazardous and therefore subject to the regulations pursuant to the *Resource Conservation and Recovery Act of 1976* (RCRA)[2]. Only PNL and Westinghouse Hanford are responsible for managing the treatment, storage, or disposal of regulated waste and for submitting permit applications for facilities performing these services. Both HEHF and KEH have 90-day storage capabilities.

Westinghouse Hanford, as the operating and engineering contractor for the Hanford Site, is directly responsible for the management of regulated waste. The PNL is responsible for research and development (R&D) associated with the management of regulated waste and has the lead responsibility for away-from-facility environmental monitoring.

The DOE-RL, in association with the Hanford Site contractors, interfaces with governmental agencies at both the federal and state level. These agencies include the U.S. Environmental Protection Agency (EPA) as well as the EPA Region 10 office in Seattle, Washington; the Washington State Department of Ecology (Ecology); and the U.S. Nuclear Regulatory Commission (NRC).

The EPA has authorized Ecology to regulate the treatment, storage, and disposal of hazardous waste and the hazardous constituents of mixed waste in accordance with a dangerous waste program of Washington State in lieu of the federal RCRA program (except RCRA requirements added by 1984 amendment). The DOE-RL negotiated an agreement with the EPA and Ecology to cover RCRA regulatory actions as well as *Comprehensive Environmental Response, Compensation, and Liability Act*[3] *and Superfund Amendments and Reauthorization Act of 1986*[4] (CERCLA/SARA) remedial actions. This agreement, the *Hanford Federal Facility Agreement and Consent Order*[5] (informally known as the Tri-Party Agreement), establishes the basis for a long-term regulatory compliance strategy and governs the conduct of the RCRA permitting activities and CERCLA remedial action activities.

The NRC has licensing jurisdiction for those facilities expressly authorized for subsequent long-term storage or disposal of high-level waste (HLW). Coordination is maintained with NRC as appropriate to ensure compliance with applicable regulations.

1.2 Guiding and Supporting Documentation

In August 1989, the U.S. Department of Energy-Headquarters (DOE-HQ) issued the *Environmental Restoration and Waste Management Five-Year Plan*[6] for a public review and comment period that started September 1 and concluded November 30, 1989. This document, along with the expected annual issuance of other DOE-HQ five-year plans, constitutes the guiding documentation for the Waste Management Program at the Hanford Site.

2.0 HANFORD SITE

2.1 Hanford Site History

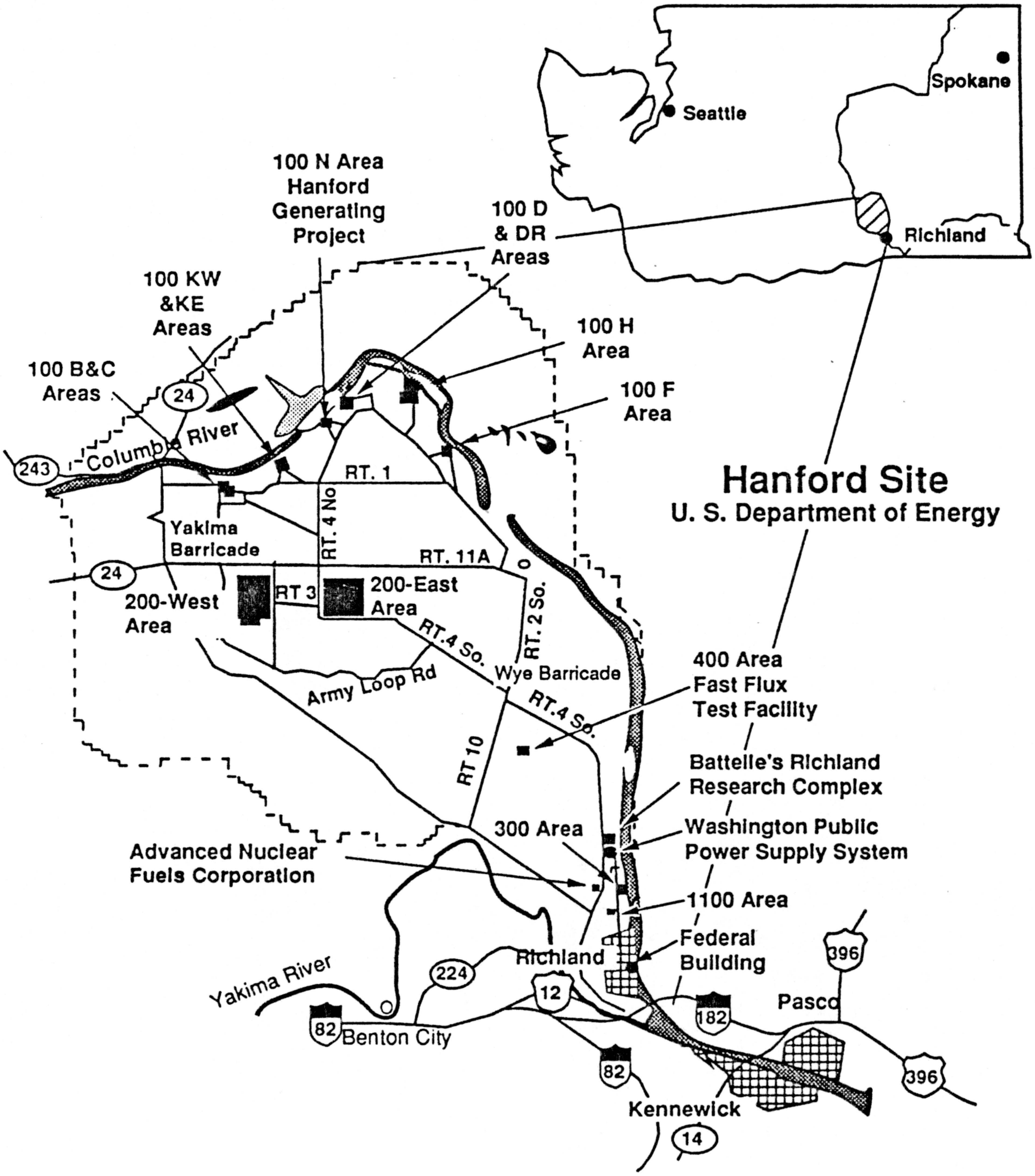
The Hanford Site, shown in Figure 1, is an approximately 560 mi^2 DOE installation occupying a semiarid region near the Columbia River in south-central Washington State. In 1943, the U.S. Army Corps of Engineers selected the area for producing nuclear materials, mainly plutonium, in support of the United States' World War II effort. This area has been dedicated since that time to the production of nuclear materials, research, and waste management activities as well as the generation of electricity. Hanford Site facilities, first built and run by the U.S. Army Corps of Engineers (known as the Manhattan Project), have been operated by the Atomic Energy Commission (1947-1974) and by its successors, the Energy Research and Development Administration (1974-1977) and DOE (since 1977).

Eight reactors were built (in the 100 Areas) in the 1940's and 1950's and produced plutonium until 1971 when the last reactor was shut down. Companion fuel fabrication plants (300 Area), chemical processing plants (the 200 Areas), and waste management facilities were constructed and operated. One plutonium production/steam generation (dual-purpose) N Reactor began operation in 1963 and operated until 1988. The steam was used by Washington Public Power Supply System to generate electricity. This reactor is currently being placed in a standby status.

2.2 Hanford Site Wastes

Irradiated uranium discharged from the reactors was processed to recover uranium and plutonium, resulting in the accumulation of a wide variety of radioactive and chemical wastes. Since the 1940's, most of the Hanford Site's nuclear defense wastes have been stored near surface on a remote plateau, a considerable distance from the Columbia River and well above groundwater. Most waste volumes are large, but have a relatively low concentration of radioactive material.

Figure 1. Location of the Hanford Site.



3.0 WASTE DESCRIPTION

The majority of the waste stored in the underground storage tanks was generated by the following chemical processing operations: the bismuth phosphate ($BiPO_4$) process, the reduction-oxidation (REDOX) process, the plutonium-uranium extraction (PUREX) process, the tributyl phosphate (TBP) process, and the B Plant waste fractionation process. The $BiPO_4$ process was a carrier-precipitation, chemical-separation scheme for the recovery of plutonium from irradiated reactor fuel; the TBP solvent-extraction process was designed to recover uranium from waste generated by the $BiPO_4$ process. These were the first chemical processing operations at the Hanford Site. The REDOX and PUREX processes are the second-and third-generation chemical processes that recovered plutonium, uranium, and neptunium from irradiated reactor fuel. Early reactor fuels were clad with aluminum. The N Reactor fuels are clad with Zircaloy, a zirconium alloy. Chemical removal of the fuel cladding produced decladding waste with high concentrations of these metals. The B Plant waste fractionation process separated the heat-generating ^{90}Sr and ^{137}Cs isotopes from the fuel reprocessing waste. Both strontium and cesium were later converted to fluoride and chloride salts, respectively, and doubly encapsulated in stainless steel and double-walled, high-nickel alloy cylinders. Before transfer to underground storage tanks, sodium hydroxide or sodium carbonate was added to make the waste from these processes alkaline to minimize tank corrosion. Sodium nitrite and nitrate have been added to some wastes to control tank corrosion. Thus, the processing of the irradiated fuels and treatment of the resulting waste have produced alkaline solids and liquids containing radionuclides and hazardous chemical constituents.

Other wastes that were sent to the underground storage tanks in smaller volumes include research and development program wastes, facility and equipment decontamination wastes, laboratory wastes, and Plutonium Finishing Plant wastes. The Plutonium Finishing Plant uses a TBP solvent extraction process to further purify the plutonium product from the PUREX Plant or from plutonium scrap.

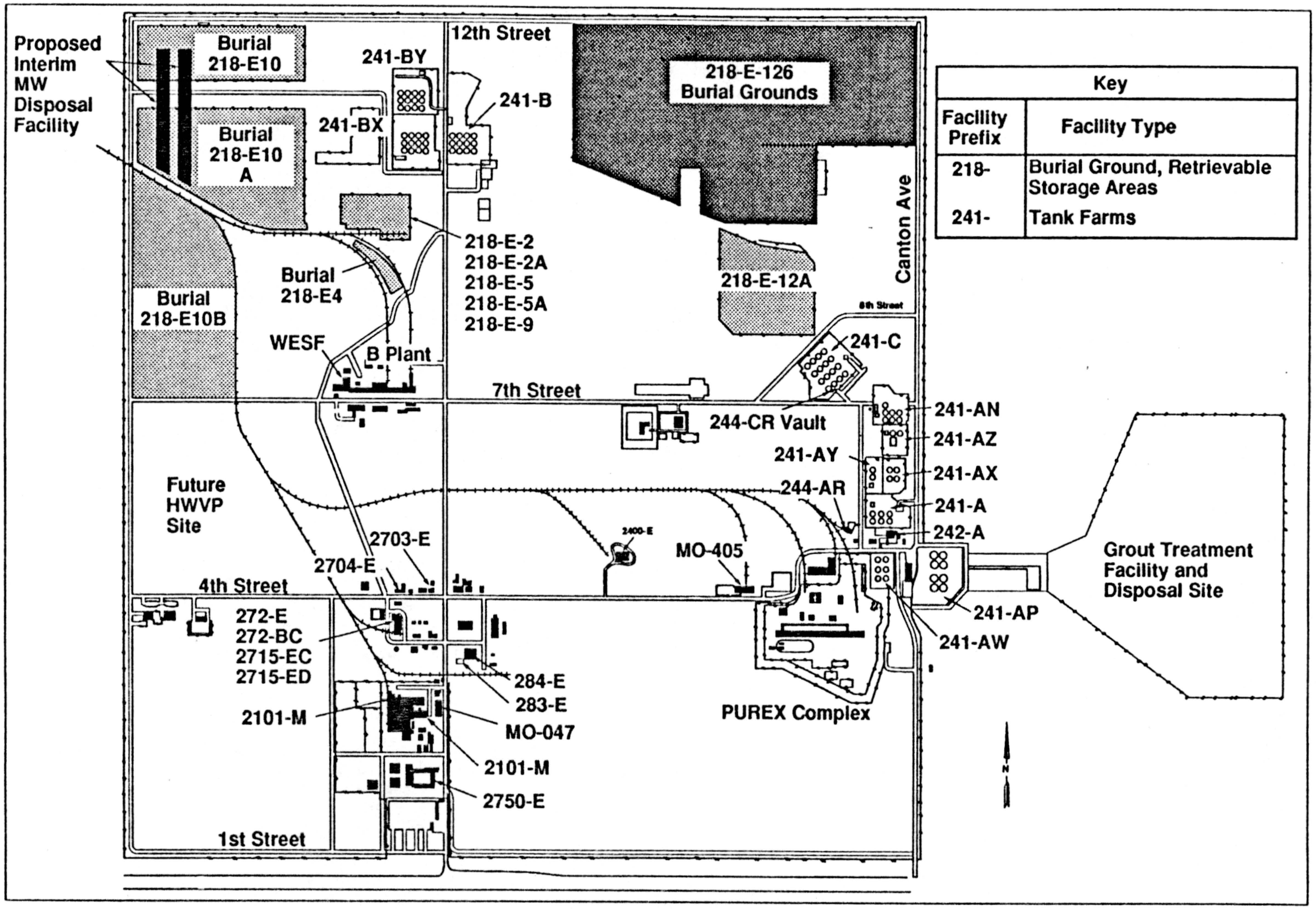
4.0 FACILITY DESCRIPTION

4.1 Single-Shell Tanks

Between 1943 and 1964, 149 single-shell tanks (SST) were built for the storage of radioactive waste at the Hanford Site. These SSTs are located in 12 tank farms (4 to 18 tanks each) in the 200 East and 200 West Areas on the Hanford Site (Figures 2 and 3). No waste has been added to the tanks since November 1980. However, water has been added to two tanks for evaporative cooling purposes. Pumpable interstitial liquid and supernatant waste are removed from SSTs and transferred to double-shell tanks (DST).

One hundred and thirty-three of the SSTs are 75 ft in diameter, 29.75 to 54 ft high (at their highest points), with nominal capacities of 500,000 to 1,000,000 gal. Sixteen of the tanks are smaller units of a similar design, 20 ft in diameter and 25.5 ft high, with 55,000 gal capacity (see Figure 4).

The SSTs are constructed of carbon steel, ASTM A-283 Grade C or ASTM A-201 Grade C, lining the bottom and side of a reinforced concrete shell. Typical features of these tanks are shown in Figure 5. The bottoms of most



200 East Area

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Figure 2. Hanford Site 200 East Area.

Key	
Facility Prefix	Facility Type
218-	Burial Ground, Retrievable Storage Areas
241-	Tank Farms

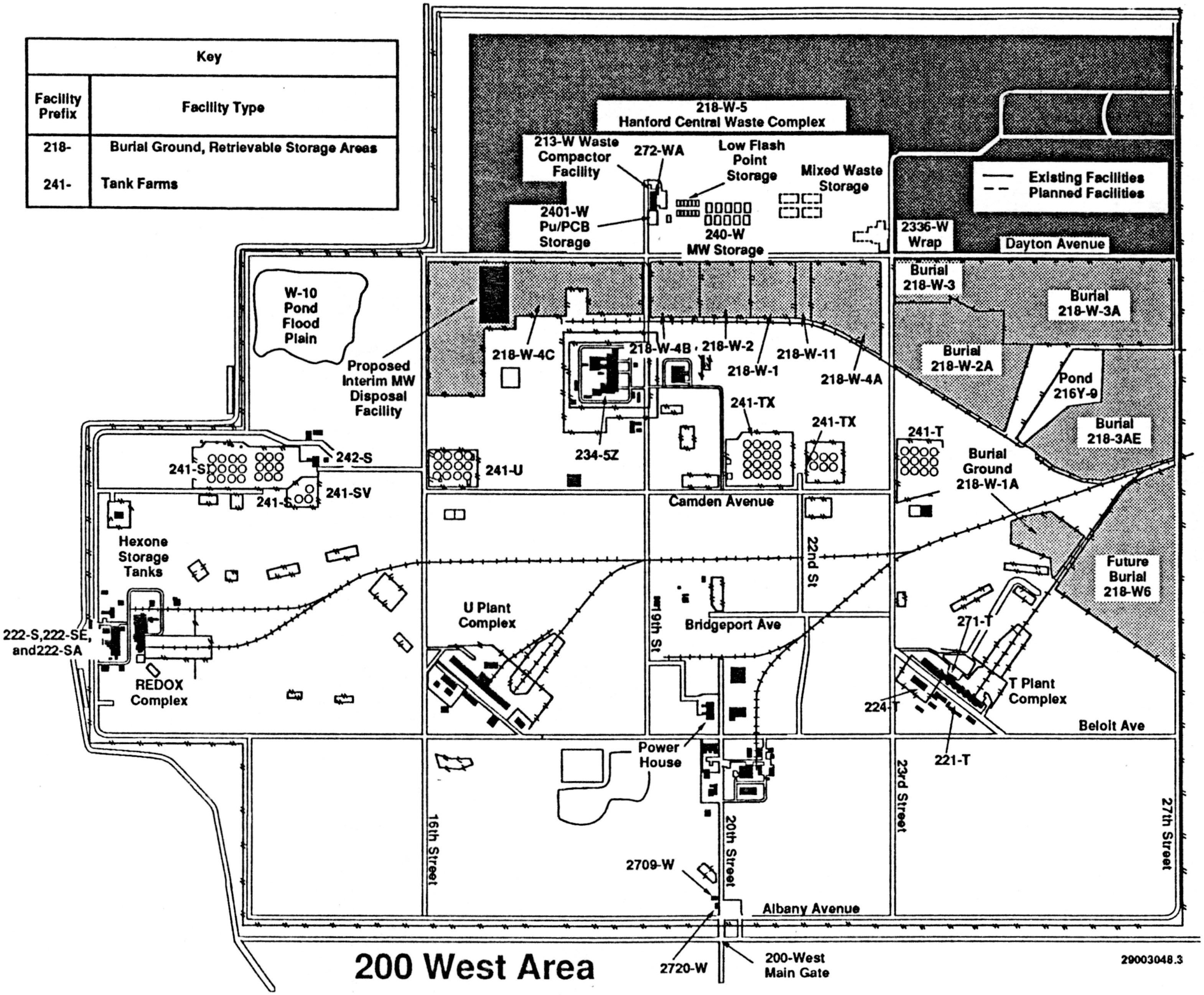

Figure 3. Hanford Site 200 West Area.

Cross-Sectional Views of Hanford Single-Shell Tanks

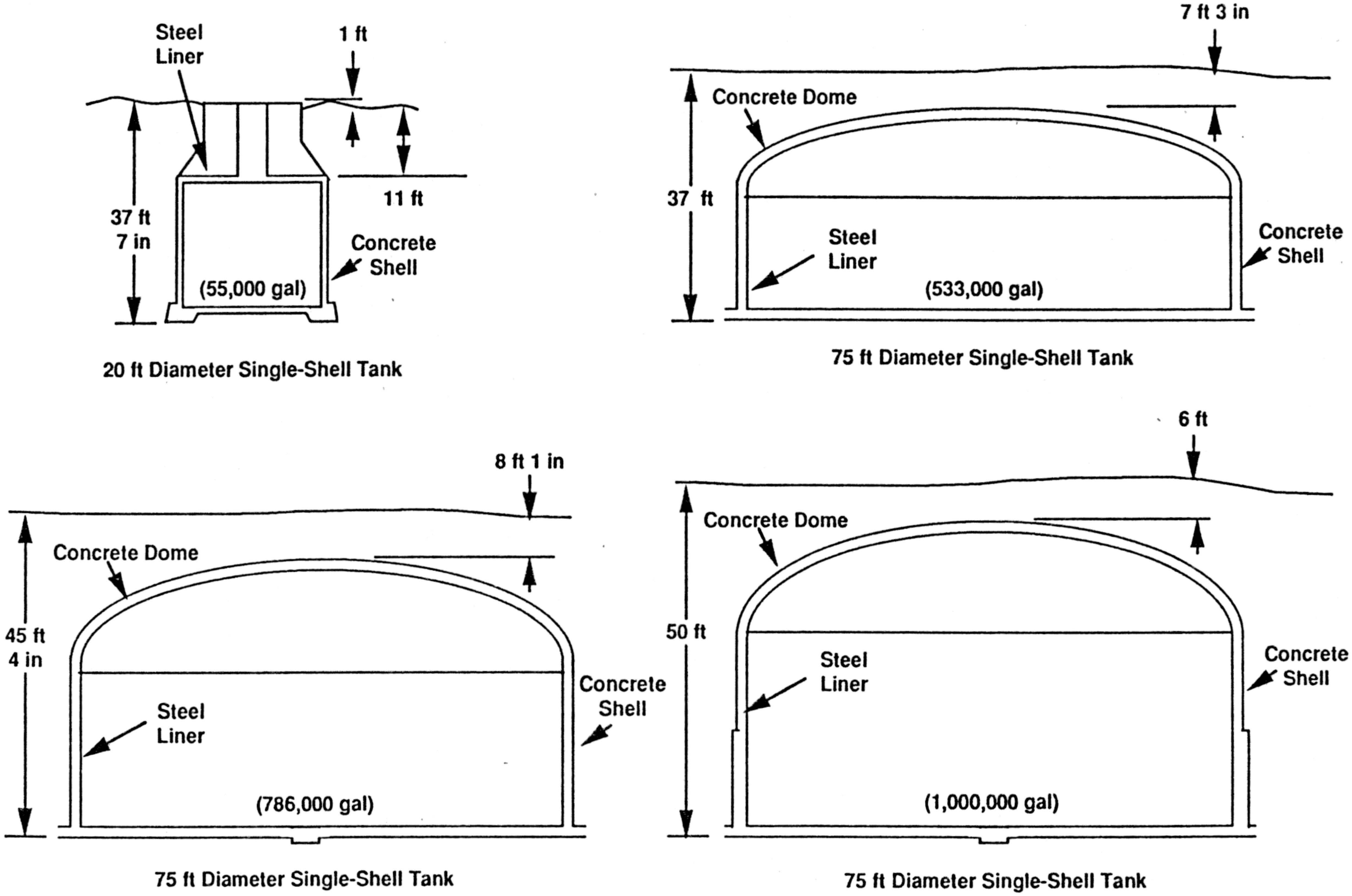

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Figure 4. Various single-shell tanks (typical dimensions).

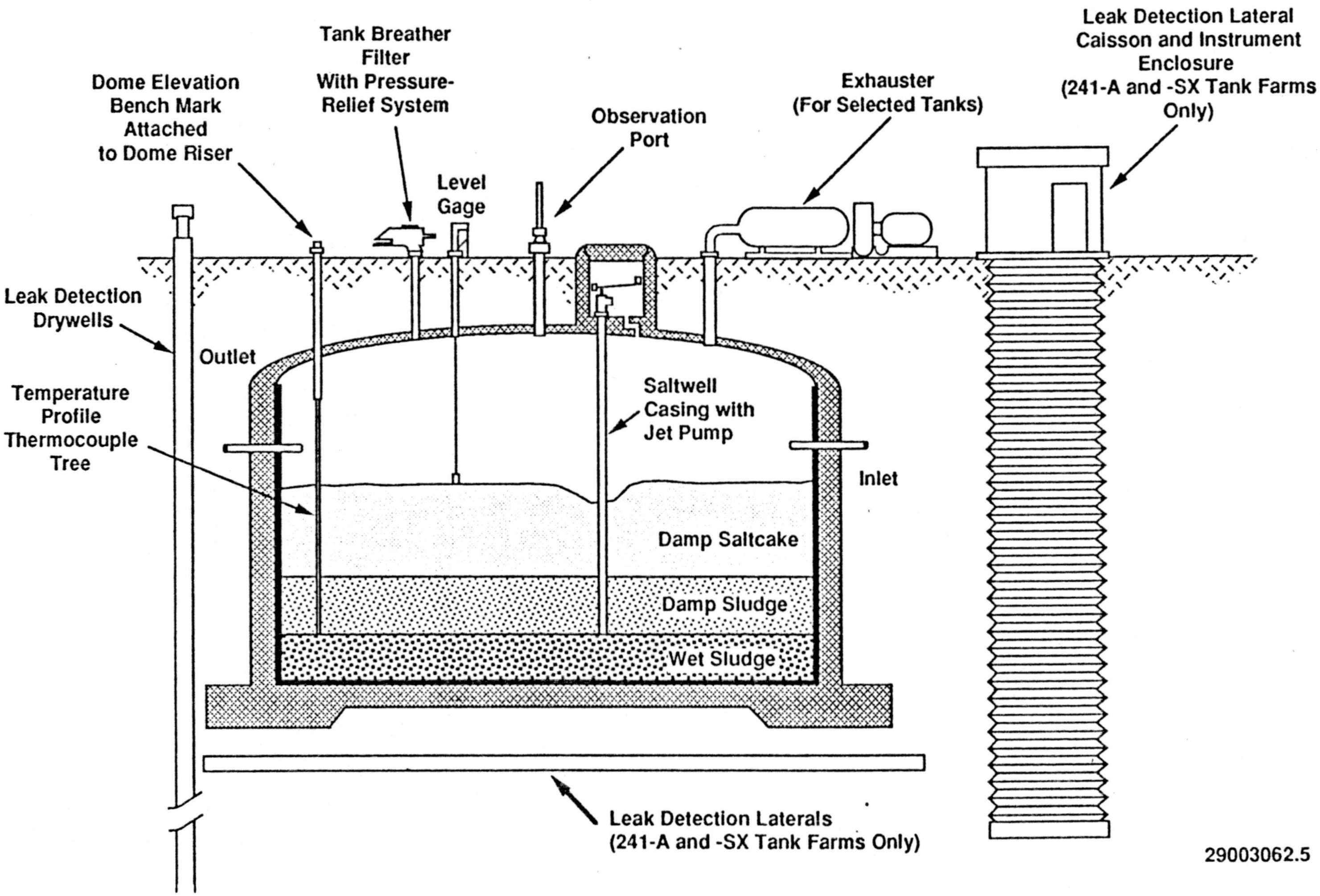

Figure 5. Typical single-shell tank.

tanks are dished slightly. The tanks are below grade with at least 6 ft of soil cover that provides shielding to minimize radiation exposure to operating personnel. Inlet and overflow lines are located near the top of the liner. Most of the 500,000 and 750,000 gal tanks were built in "cascades" of three or four tanks. Waste was transferred to the first tank of the cascade and allowed to overflow into successive tanks of the cascade through piping in the side walls.

Access to the tanks is provided by risers penetrating the domes of the tanks. Penetrations are required for liquid level, sludge level, and temperature measurements as well as photographic evaluations.

Active ventilation currently provides cooling for 11 tanks containing high-heat wastes. Continuous air monitors, which monitor radiation levels in the exhaust stream, are installed on the ventilation systems. Passive ventilation is provided for tanks that do not require cooling. The passive ventilation systems consist of "breather filters" installed on the tanks to allow air to flow into and out of the tanks in response to slight atmospheric pressure changes. All air leaving the tanks passes through a high-efficiency particulate air (HEPA) filtration system.

4.2 Double-Shell Tanks

Between 1968 and 1986, 28 DSTs were built for the storage of radioactive wastes at the Hanford Site. These DSTs are located in six different tank farms in the 200 East and 200 West Areas on the Hanford Site (Figure 2 and 3). A typical DST is shown in Figure 6. The DSTs, constructed as a tank-within-a-tank design, provide double containment of liquid and solid wastes and provide assurance that, in the event of a leak in the primary shell, the liquid will be fully contained by the outer shell. The steel inner tanks have been stress relieved to prevent failure from stress-corrosion cracking.

The DSTs are constructed of ASTM A-516, ASTM-515, or ASTM-537 carbon steel plate. The freestanding primary tank is 75 ft in diameter and is 45 ft high at the dome crown with a nominal capacity of 1 Mgal. The primary tank is contained within a steel-lined reinforced concrete structure. The concrete varies in thickness from 18 in. in the walls to 15 in. in the dome.

The secondary steel tank lines the reinforced concrete tank and extends to the primary tank dome. The secondary steel tank is 80 ft in diameter. There is an annular space of 2.5 ft between the primary tank and the secondary steel tank to allow for installation of liquid-level detection devices; inspection equipment such as periscopes, television cameras, and photographic cameras; ventilation air supply and exhaust ducts; and equipment for pumping liquid out of the annular space.

An 8-in. slab of insulating concrete (a castable refractory made with an aluminate cement and a slate aggregate) is sandwiched between the primary and the secondary tank bottoms. This slab protects the reinforced concrete foundation from excessive temperatures during the stress relief of the primary tank. During operation of the tanks, the annulus ventilation system routes air through slots in the insulating concrete to the annulus. This air flow cools the waste tank and would transport radioactive particulates

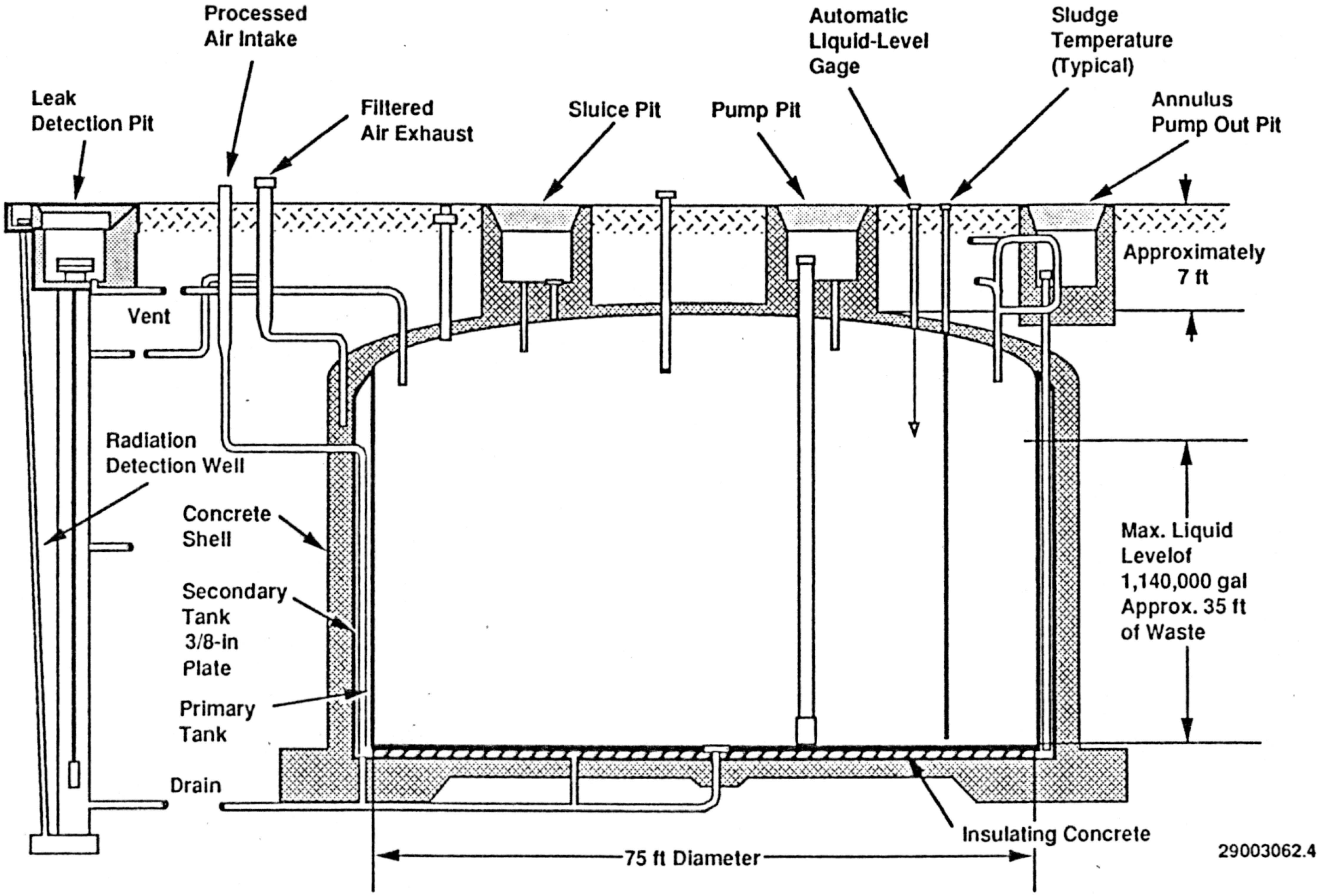

Figure 6. Double-shell storage tank.

to an air sampler in the event of a leak in the primary tank. The insulating concrete also has grooves for liquid drainage from beneath the primary tank to the annulus for detection and pumpout.

There are 64 tank dome penetrations in the primary tank and annulus for monitoring and processing activities. For the primary tank monitoring facilities, penetrations are required for liquid level, sludge level, temperature and pressure measurements, and for an observation port. Penetrations for the primary tank processing operation include vessel ventilation, slurry distribution, supernatant pumpout, drainage collection from various pits and encasements located on or near the tank, and spares.

Penetrations through the tank dome into the annulus area are required for annulus pumpout, ventilation air inlets and outlets, instrument leads, liquid level measurement, annulus inspection, and construction access. All tank penetrations terminating in risers above grade are located to permit crane access for all pit work.

The ventilation systems for each tank farm consist of two completely separate subsystems: the primary tank ventilation system, and the annulus ventilation system. The exhaust air streams from each system flow through a deentrainment pad, an electric heater, a prefilter and two HEPA filters in series before being released to the environment. The primary ventilation system is designed to remove vapors from the primary tank and to maintain a slightly negative pressure inside the tank.

The purpose of an annulus ventilation system is to cool the tanks, avoid moisture condensation in the annular space, and serve as a sensitive method of detecting leakage of radioactive materials from the primary tank.

Instrumentation systems for each tank are provided to monitor operating parameters such as liquid level, temperature, leak detection, and radiation detection.

5.0 CURRENT WASTE MANAGEMENT ACTIVITIES

The waste management activities at Hanford site have recently changed from a program based on interim storage and management of the tank wastes to one that is proceeding to treatment and final disposal. The activities can be divided into the following four main actions:

- Waste Minimization
- Waste Storage
- Waste Treatment
- Waste Disposal.

5.1 Waste Minimization

Facility specific waste minimization and pollution prevention plans are being formulated into a formal program plan that will be issued during fiscal year 1990 and be updated every three years. The plan will contain schedules for achievement of specific program activities.

5.2 Waste Storage

5.2.1 Storage in Single-Shell Tanks. The SSTs store approximately 37 Mgal of waste consisting of supernate, damp saltcake and sludge. Within the interstices of the saltcake and sludge, there are about 5 Mgal of interstitial liquor. Interstitial liquor is removed by "saltwell" pumping. Removal of pumpable liquid to the DST system is called interim stabilization. Interim stabilization is scheduled to be completed by September 1996 (Tri-Party Agreement milestone).

The SST waste represents an accumulation from 1944 at the initiation of operations at the Hanford Site until 1980 when all transfers of newly generated waste were directed to DSTs. Waste management operations have created a complex intermingling of the tank wastes. Natural processes have caused settling, stratification, and segregation of waste components. Earlier processing included removal of water by pumping supernatant from the tanks for evaporation and returning the concentrated salt solution back to the tanks. The early fuel reprocessing activities did not remove uranium; therefore, it was sent to the tanks. During the late 1950's, a major program was undertaken to recover the uranium. Programs implemented in the late 1960's removed the bulk of the radiocesium and radiostrontium for encapsulation.

Surveillance is required to provide identification of failure of containment. Monitoring and leak detection systems are incorporated in the engineered system to serve this purpose. Liquid-level monitoring, where a liquid surface exists, is used as the primary means of leak detection. Manual tapes or automatic liquid-level sensors use conductivity probes to identify liquid or solid surface. Liquid observation wells have also been installed in any tank that contains or has the potential to contain more than 50,000 gal of interstitial liquor. These observation wells are fiberglass or steel pipes sealed at the lower end (drywells) and that extend to the bottom of the tank. Probes are lowered into these drywells to detect liquid levels in the tanks. A series of drywells located external to the tanks are routinely monitored to detect any change in gross gamma-ray radiation. Tanks in which high temperatures could occur are equipped with thermocouples for temperature measurements.

Area radiation monitors are located within the tank farms to provide indication of a gross loss of confinement, which would represent an immediate radiation hazard to personnel. All engineered systems undergo preventative maintenance, inspection, and calibration in accordance with approved procedures.

Current plans for SST surveillance include continued monitoring and leak detection. In addition, groundwater monitoring wells are being installed and monitored as part of a site-wide system. Major activities will continue as follows:

- Collection of surface-level and temperature data
- Analysis of data and resolution of anomalies
- In-tank photography
- Operations of tank ventilation systems
- Maintenance of SST farm equipment and instruments
- Removal of the drainable portion of interstitial liquid by pumping.

5.2.2 Storage in Double Shell Tanks. The DSTs currently are storing approximately 20 Mgal of waste in the form of liquids, sludge and slurries. Additional waste will be added to this inventory from continued defense and waste management operations, with the primary source coming from continued PUREX Plant operations.

Neutralized current acid waste from the PUREX Plant is capable of self-boiling because of the heat content. This waste can be stored in any of four DSTs that are specially designed to contain this waste. Only two aging-waste tanks currently contain neutralized current acid waste.

A unique feature of aging-waste tanks is the incorporation of air-lift circulators to control the heat distribution in the waste resulting from radiolytic decay. Circulators are necessary to prevent pressure surges, minimize entrainment of radionuclides in the gaseous effluent caused by uneven boiling, and prevent overheating of tanks from sludge hot spots.

The remaining 24 tanks are designed to store low-heat waste and are called "non-aging waste tanks."

Several million gallons of dilute low-level wastes (LLW) are received annually from operating facilities throughout the Hanford Site. The streams from the 200 Areas are transferred by underground piping and collected in the DST system. The streams from the 100, 300, and 400 Areas are delivered to the 204-AR unloading facility and transferred to the DST system. These dilute LLW streams are received and concentrated in the 242-A Evaporator-Crystallizer. The concentrated bottoms product from evaporation of DST supernatants and SST interstitial liquors are referred to as double-shell slurry.

Current operations for DSTs focus on the following activities:

- Ensuring safe storage
- Providing surveillance of DSTs to comply with DOE Order 5820.2A[7] requirements
- Evaporating the condensate from NCAW and the decanted supernatant from other waste to store a concentrated slurry in the least amount of space.

Current waste volume reductions forecast a potential tank space shortage in the mid-1990's. This potential space shortage has given increased importance to the maximum operation of the 242-A Evaporator-Crystallizer and the Grout Treatment Facility in the next 5-yr period.

5.3 Waste Treatment

5.3.1 Waste Treatment in Single-Shell Tanks. One hundred and one of the SSTs have been stabilized by transferring pumpable liquid to the DSTs. Of the 101 SSTs stabilized, 91 have been isolated. Future plans include completion of interim stabilization and isolation of all 149 SSTs in 1996. Interim stabilization is the process of removing interstitial liquid from the wet solids in SSTs. The tanks are treated by installing a saltwell screen in the saltcake/sludge waste, placing a pump into the saltwell and removing drainable liquid. This process is considered treatment in a regulatory sense because it removes pumpable liquid from within the solids, thus changing the solid-liquid ratio.

The process of interim isolation includes the removal of unnecessary pipelines, the blanking of remaining lines, and the sealing of openings to prevent inadvertent inward leakage of liquid, primarily rain water or snow melt. Only lines required for surveillance are left in place.

Future plans for retrieval of SST waste and treatment are being evaluated. Decisions regarding future treatment of SST wastes are dependent on the results of the characterization activity.

5.3.2 Waste Treatment in Double Shell Tanks.

5.3.2.1 242-A Evaporator-Crystallizer Operation. Liquid radioactive waste and mixed waste currently undergo evaporation in the Evaporator-Crystallizer Facility. Approximately 5 to 10 Mgal of waste volume reduction are achieved annually during normal operations.

Waste concentration has reduced the storage space requirements for DSTs by more than 100 Mgal. The 242-A Evaporator-Crystallizer is the cornerstone of waste management's treatment facilities in that it maximizes the use of available DST space and minimizes the need to construct additional DSTs.

The 242-A Evaporator-Crystallizer is undergoing a capital life extension upgrade to ensure liquid waste treatment capabilities (by concentration) for an additional 10 yr. In addition, an interim storage process condensate basin will be constructed during 1990. Plans are being made to install process condensate treatment by 1992.

5.3.2.2 Pretreatment of Double-Shell Tank Waste in 244-AR Vault and B Plant. Future plans are to pretreat 7 to 8 Mgal of DST waste to separate it into HLW, transuranic (TRU) waste, and LLW fractions. The low volume HLW and TRU waste fractions will be stored in DSTs for future vitrification in the Hanford Waste Vitrification Project (HWVP). The high-volume LLW fraction will be immobilized in grout at the Grout Treatment Facility.

Four wastestreams will be pretreated in the 244-AR Vault and B Plant:

1. High-level neutralized cladding acid waste from the reprocessing of spent fuel at the PUREX Plant

2. The neutralized cladding removal waste from the fuel decladding process at the PUREX Plant

3. The complexant concentrate waste resulting from past strontium recovery operations

4. The Plutonium Finishing Plant TRU waste from plutonium reclamation and processing.

The potential pretreatment processes include solid-liquid separation and sludge washing, ion-exchange, TRU solvent extraction, selective leaching, and organic destruction. Solid-liquid separation and sludge washing of neutralized current acid waste solids will be accomplished in the 244-AR Vault. The remaining pretreatment processes will be performed in B Plant.

5.3.2.3 Grout Treatment Facility Operation. Liquid LLW stored in DSTs is processed in the Grout Treatment Facility before disposal in near-surface concrete vaults. The Grout Treatment Facility consists of the Dry Materials Facility and Grout Treatment Equipment. The Grout Treatment Equipment blends liquid LLW with cement, fly ash, and blast furnace slag from the Dry Materials Facility to make a slurry that is pumped to the near-surface vaults where it solidifies into a solid grout. This process results in a waste form that ensures protection of public health and safety, and the environment by chemically and physically immobilizing radionuclides and hazardous chemicals.

The Grout Treatment Facility processes liquid LLW in 1-Mgal campaigns. A Tri-Party Agreement milestone has been established to complete 14 Grout Treatment Facility campaigns by the end of fiscal year 1994.

Meeting the 1994 milestone will recover enough DST space to avoid construction of new DSTs.

A demonstration campaign in the Grout Treatment Facility was initiated in August 1988 and completed in July 1989. In this campaign, 1 Mgal of a nonhazardous LLW, phosphate-sulfate waste from the decontamination of N Reactor process systems, was grouted and disposed of in a near-surface grout vault. Following the construction of new vaults and preparations for the next campaign in fiscal year 1991, the double-shell slurry, which contains chemically hazardous waste, will be disposed of as grout. Thereafter, the LLW fractions from pretreatment will be grouted.

5.3.2.4 Treatment of High-Level Waste and Transuranic Waste Fractions from Double-Shell Tank Waste. The HLW and TRU waste fractions of DST waste will be sent to the HWVP and treated by combining them with glass-forming materials in a glass melter, thereby immobilizing the waste in glass. The glass will be packaged in stainless steel canisters that will be stored onsite until a geologic repository is available to dispose of this waste permanently.

Current HWVP design activities are important to meet the Tri-Party Agreement milestone for the initiation of HWVP construction (July 1991). Other related Tri-Party Agreement milestones are the completion of construction (June 1998) and the initiation of treatment operations (December 1999). Evaluations are being undertaken to accelerate the HWVP construction schedule by 2 yr. The HWVP is designed with a 40-yr life, which should allow for the vitrification of SST waste if the decision is made to retrieve some or all of this waste.

5.4 Waste Disposal

The final disposal alternatives for HLW, TRU and tank waste are evaluated in the *Environmental Impact Statement Disposal of Hanford Defense High-Level, Transuranic and Tank Wastes Hanford Site, Richland, Washington*[8] (HDW-EIS). The HDW-EIS record of decision, issued in April 1988, identified geologic disposal as the approved alternative for DST wastes and further disposal technology development and evaluation for SST wastes.

5.4.1 Single-Shell Tank Waste Disposal. The HDW-EIS record of decision stated that the DOE will continue present SST waste management practices while conducting additional technology development and evaluation for SST waste disposal. A strategy has been defined with the intent to achieve closure of all 149 SSTs by fiscal year 2018. The SSTs have been recognized by the DOE, EPA, and Ecology as active hazardous waste (storage) units requiring an approved closure plan and corrective action work plan.

A SST waste characterization program has been developed and initiated. Characterization will be conducted in a manner approved by the regulatory agencies and will include determining how hazardous waste characterization protocols apply to mixed waste. There are a series of yearly milestones for core samples, culminating with a September 1998 milestone to complete analyses of at least 2 complete core samples from each SST.

Other technology development includes waste retrieval, waste pretreatment, waste packaging, performance assessment and criteria development, and long-term barriers.

The DOE is committed to issuing a supplemental environmental impact statement on alternatives for disposal of SST that will be reviewed by the public and governmental agencies prior to making any final disposal decisions. The issuance of the supplemental environmental impact statement is scheduled for July 2002 as outlined in the Tri-Party Agreement.

5.4.2 Double-Shell Tank Waste Disposal. As discussed in the DST Treatment section, DST waste will be pretreated in the 244-AR Vault and in B-Plant to separate the waste into HLW, LLW and TRU fractions. The HLW and TRU fractions will be vitrified in the HWVP and eventually shipped to a geologic repository. The LLW fraction will be immobilized in grout in the Grout Treatment Facility and disposed in a near-surface concrete vault. These processes define the final disposal for DST waste.

References

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2. Resource Conservation and Recovery Act of 1976, as amended, Public Law 94-580, 90 Stat. 2795, 42 USC 6901 et seq.

3. Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended, Public Law 96-510, 94 Stat. 2767, 42 USC 9601 et seq.

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