

Appendix K
Historical Waste Records and Inventories of Solid Waste Disposal

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K1 Background

Records and inventories of waste burials in the 200 Areas from 1944 to 1967 are incomplete or nonexistent. Initial volume and radiological inventory estimates of buried solid waste were developed from limited records and process knowledge in the late 1960s to early 1970s. The estimates indicate volume; general source facility of waste disposed; and beta-gamma, uranium, and plutonium inventories. These inventories were created on a year-by-year basis, one for each year that the landfill was in operation. Estimates were created for all pre-1968 landfills within the scope of the 200-SW-2 Operable Unit (OU) work plan except for two that were thought at the time to have been used only for aboveground storage of equipment and large boxes (218-E-2A and 218-E-9).

An intense effort was undertaken from 2003 to 2008 to search for historical information about waste buried in the 200-SW-2 OU landfills, particularly waste that was buried before 1968 and had incomplete records. Of the thousands of documents and photographs examined, those that have been the most useful are handwritten burial logbooks, equipment disposal records, close-in photos of individual burials, and aerial photographs of landfills.

Very early records, from the 1940s and 1950s, related solely to discards of equipment; these disposal records describe the waste form, burial date, and sometimes the contamination levels, but they contain no information on where the burials are located. In 1960, burial logs began to be kept. Most early log records pertain to burials in the 200 West Area. Few early records are available for the 200 East Area. The logs contain hand-recorded estimates of container types, radiation dose rates, waste volumes, source facilities, presence of plutonium or uranium, and vehicles and equipment used to transport and empty waste into the trenches. Early records for unusual burials tend to contain additional information, such as whether the waste was generated offsite, weight of the containers, a general description of the waste form (e.g., gloveboxes, palletized barrels, desks, and boxed filters), and sometimes the exact location of the burial. For about 10 to 20 early burials, photographs and burial records corroborate each other.

As an example, a December 20, 1960, 200 West Area logbook entry indicates a “special burial of waste from 221T canyon misc. trash-800 cu. ft – dumped by crane. Waste box carried by low boy truck and tractor.” A photograph taken the same day shows a burial exactly as described (Figure K-1). The 284-W power plant in the background of the photograph suggests that the burial is in the 218-W-4A Landfill.



Figure K-1. 1960 Waste Burial in the 218-W-4A Landfill

1 Beginning on January 1, 1968, burial records were kept in a more systematic fashion. These records are
 2 captured in a database now called the Solid Waste Information Tracking System. One record was created,
 3 per burial container, with a standard set of information including, but not limited to, waste volume; source
 4 facility; burial date and location; container type; and beta-gamma, plutonium, and uranium inventories.
 5 A general indication of currently regulated materials that were potentially disposed to a particular location
 6 is sometimes available. The materials include, but are not limited to, oils absorbed in sawdust, silver,
 7 boron, nitrate, uranium, plutonium, and lead.

8 The precise quantity of radionuclides in the waste is unknown due to incomplete or nonexistent records
 9 prior to 1968. Isotopic information is generally not available.

10 Early packaging of dry waste was designed for transport from the source facility to the burial grounds.
 11 The container was intended to provide confinement until burial and not intended to provide containment
 12 after burial. Early radiological waste, including most alpha-contaminated waste, was typically wrapped in
 13 burlap or paper or contained in metal, concrete, or wooden or cardboard boxes (Figure K-2).



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 15 Note: The masked worker is preparing a waste disposal package in the 234-5Z Building in 1952. The cardboard
 16 barrel is marked with a dose rate of 230 mr/hr. The trench full of waste boxes is probably in the 218-W-2 Landfill.
 17 Photograph is dated 1955. These photographs depict typical dry waste and alpha dry waste disposal packaging in the
 18 1940s through the 1970s.

19 **Figure K-2. Early Disposal Practices and Alpha-Contaminated Dry Waste**

20 Steel boxes, concrete boxes, and 208 L (55 gal) drums were occasionally used as additional packaging,
 21 especially after 1960. Early industrial waste with high dose rates, such as process tubes and jumpers, was
 22 often packaged in concrete boxes or large concrete tombs to mitigate dose-rate handling problems and
 23 prevent leakage from the container. Some smaller, lower dose-rate waste was directly dumped from
 24 trucks into trenches with no packaging (Figure K-3).

25 The practice of using durable containers, rather than cardboard or wooden boxes, became more
 26 common over time. The use of cardboard boxes for disposal to the landfills was discontinued in 1984
 27 (WHC-EP-0912, *The History of the 200 Area Burial Ground Facilities*). The waste was considered dry
 28 waste and did not contain significant volumes of liquid (HW-77274, *Burial of Hanford Radioactive Wastes*).



Note: Date of photograph is unknown.

Figure K-3. Small, Low-Dose-Rate Waste Directly
Dumped from Trucks into Trenches

Disposal practices were established by facility management. Radiation measurements were generally taken primarily for personnel protection but were not always recorded. The disposal site was considered the location for final disposition of solid waste. Waste containing plutonium was buried when plutonium recovery was not technically or economically practical (HW-59645, *Disposition of Plutonium to Burial 234-5 Building*).

Prior to 1965, waste in trenches was covered with approximately 0.6 m (2 ft) of soil. After 1965, this waste was covered with approximately 1.2 m (4 ft) of soil cover, but by the late 1960s the soil stabilization standard was changed to approximately 2.4 m (8 ft).

The solid waste landfills were not used for disposal of bulk liquids. Occasionally, small volumes of bottled and highly contaminated liquids were placed inside a 208 L (55 gal) drum, and the drum was filled with concrete to provide shielding and stabilize the liquid waste (DOE/RL-96-81, *Waste Site Grouping for 200 Areas Soil Investigations*).

Since the mid-1960s, increasing attention to reduce potential contamination to groundwater

led to a decision to send all low-level waste from all Hanford Site facilities for burial within the 200 Areas, 60 to 90 m (200 to 300 ft) above groundwater. The last 300 Area landfill (618-7 Burial Ground) was closed in 1972. The last 100 Area landfill closed in 1973 (WHC-EP-0912). Figure K-4 is a timeline illustrating the operational periods for the various landfills and processes, as well as key regulatory milestones.

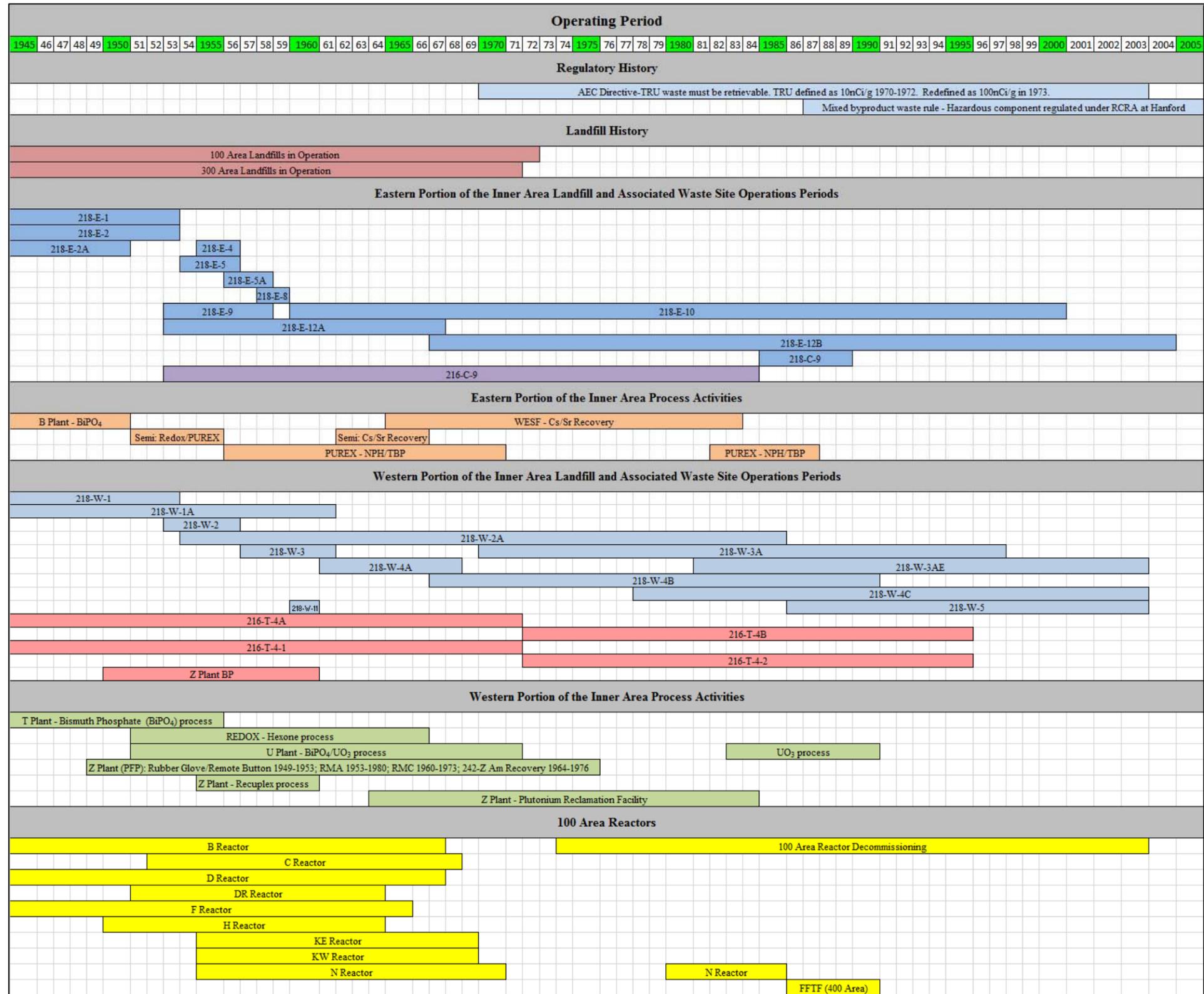
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1 HW-77274, 1963, *Burial of Hanford Radioactive Wastes*, General Electric Company, Richland,
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Figure K-4. Timeline Illustrating Operations for Landfills and Associated Disposal Sites with Key Regulatory Milestones

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