START 9613470.0237

0042715

DOE\RL-95-108
Decisional Draft

Approach and Plan for Cleanup Actions in the 100-IU-2 and 100-IU-6 Operable Units of the Hanford Site

Environmental Excellence
HANFORD

JAN 1996
RECEIVED
EDMC

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

Bechtel Hanford, Inc.
Richland, Washington

For DOE\RL Review

TRADEMARK DISCLAIMER

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.

Printed in the United States of America

DISCLM-4.CHP (1-91)

9613470.0238

DOE\RL-95-108
Decisional Draft

Approach and Plan for Cleanup Actions in the 100-IU-2 and 100-IU-6 Operable Units of the Hanford Site

Date Published
December 1995

Environmental Excellence
HANFORD

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

Bechtel Hanford, Inc.
Richland, Washington

For DOE\RL Review

Focus

APPROACH AND PLAN FOR CLEANUP ACTIONS IN THE 100-IU-2 and 100-IU-6 OPERABLE UNITS OF THE HANFORD SITE

1.0 INTRODUCTION

An administrative approach similar to that recently developed for the 100-KR-2 and 100-FR-2 Operable Units (OU) will be used to reach cleanup decisions under the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA), also known as "Superfund," for the 100-IU-2 and 100-IU-6 OUs. The previous approach included production of a work plan, a limited field investigation report, a qualitative risk assessment, a focused feasibility study, and a proposed plan, all culminating in an interim action record of decision.

The current approach will use an abbreviated work plan, called a "focus package" (this document), as a scoping activity per Section 7.2.2 of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), to summarize the information gathered to date relating to the 100-IU-2 and 100-IU-6 OUs and to determine the extent of evaluation necessary to make cleanup decisions for identified sites. The current approach will combine the limited field investigation and qualitative risk assessment reports into the focused feasibility study. The focused feasibility study will analyze methods and costs for cleaning up waste sites. Consolidating the documents will reduce the time to complete the CERCLA process by 16 months, compared to the previous approach. The proposed plan, to be produced by the U.S. Department of Energy (DOE) based upon the focused feasibility study, will identify preferred alternatives for cleaning up waste sites. The record of decision will select a cleanup alternative.

Public participation in the planning and approach for cleanup of the 100-IU-2 and 100-IU-6 OUs is appreciated. If you would like to provide written comments on the information and approach presented in this focus package, write to the lead regulatory agency (U.S. Environmental Protection Agency [EPA]) for the 100-IU-2 and 100-IU-6 OUs. Please submit written comments on this focus package by XXXXXX, 1996, to the following:

Larry Gadbois
U.S. Environmental Protection Agency
712 Swift Blvd, Suite 5
Richland, Washington 99352

Information about the Hanford Site in general and the 100 Area in particular is available at the following locations:

PORTLAND: PORTLAND STATE UNIVERSITY
Branford Price Millar Library
Southwest Harrison and Park
Portland, Oregon 97207
Attn: Michael Bowman or Susan Thomas
(503) 724-4729

RICHLAND: WASHINGTON STATE UNIVERSITY-TRI-CITIES
Public Reading Room
100 Sprout Road
Richland, Washington 99352
Attn: Terri Traub
(509) 376-8583

SEATTLE: UNIVERSITY OF WASHINGTON
Suzzallo Library,
Government Publication Room
Seattle, Washington 98195
Attn: Eleanor Chase
(206) 543-4664

SPOKANE: GONZAGA UNIVERSITY
Foley Center
East 502 Boone
Spokane, Washington 99258
Attn: Lewis Miller
(509) 328-4220 Ext. 3125

2.0 100-IU-2 AND 100-IU-6 AREA INFORMATION

The 100-IU-2 OU is located at the site of the former town of White Bluffs, an agriculture-based community of about 500 people that existed before the Manhattan Engineering District project (MED) era. Many of the sites within the 199-IU-2 OU are remnants of that town and the surrounding farms. When the government took over the site, many of the houses were demolished and new temporary buildings such as blacksmith shops, receiving and storage warehouses, and offices were erected. While most government activities in 100-IU-2 ceased early in the 1950s, it was not until the 1970s that virtually all the remaining facilities were removed (Carpenter 1995).

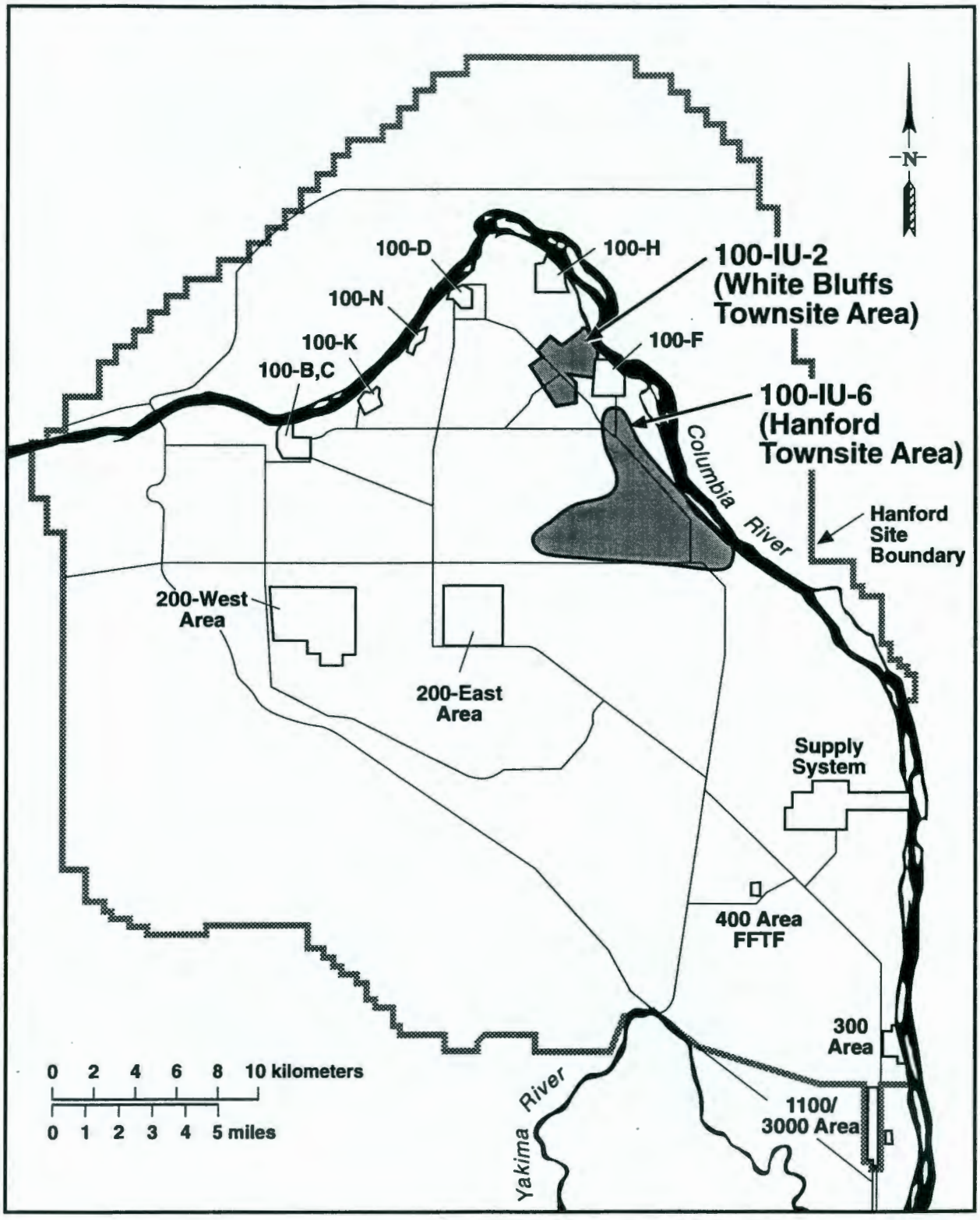
The 100-IU-6 OU is located at another former site of an agriculture-based town, called Hanford, that existed before the government takeover. By 1942, Hanford had grown to a few hundred farm families. After 1942, the area was used as a temporary housing camp for more than 45,000 construction workers. In general, the sites within the 100-IU-6 OU include surface debris, oil spills, trash dumps, building foundations, surface depressions, and ash piles, either from the pre-MED towns or MED-era activities. Except for graphite machining which continued until the early 1950s, government operations at the Hanford town- site had ceased by 1945.

Both of these OUs are source units concerned with hazardous substances that have been released, or have the potential to be released, into the soil rather than into the groundwater. The groundwater under these OUs has been evaluated through results of ongoing well monitoring at the 100-FR-3 OU, and through monitoring isolated wells in the 600 area such as wells 81-38, 83-36, 70-23, 66-23, and 65-22, and through other recent characterization work completed for the 100-FR-3 OU (Jacques 1995).

Figure 1 shows the general locations of the 100-IU-2 and 100-IU-6 OUs. Because of the large number of reported sites in each OU, maps showing precise locations of the individual sites within these OUs are not included. More detailed information on the locations and descriptions of the sites, as well as the history of these OUs, can be found in the technical baseline reports for the 100-IU-2 Area (Carpenter 1995) and for the 100-IU-6 Area (Deford 1995). Background information on geology and meteorology used to evaluate the sites can be found in the 100-FR-1 and 100-FR-3 Work Plans (DOE-RL 1992a and DOE-RL 1992b, respectively).

The ecological and cultural resource concerns for these areas have been shaped by their past uses. These areas were abandoned shortly after World War II. Most of the houses and facilities were removed, and the sites have had almost 50 years to naturally revegetate. In many places, the sites have returned to shrub-steppe vegetation. Other areas, such as the old cultivated fields, have remained in cheatgrass and tumblemustard with varying amounts of other weeds or bunchgrasses. The return of native shrub-steppe appears to depend on the soil quality, amount of previous disturbance, proximity of native seed sources, and depth of the water table. In addition, many trees remaining from the early townsites provide shelter for

Figure 1. Location of the 100-IU-2 and 100-IU-6 Operable Units



E9512009.1

mule deer, birds, and other wildlife. Bald eagles roost in trees along the river in winter. Ecological concerns during cleanup activities will depend in large part on what habitat is present at a site at the time of cleanup actions. For example, the loss of cheatgrass stands is less critical than the loss of recovered shrub-steppe.

The 100-IU-2 and 100-IU-6 OUs are located in a pre-historically and historically rich area of the Hanford Site. Native American Tribes in the Mid-Columbia region frequented this area as early as 7,000 years ago during seasonal hunting, gathering, and fishing rounds, establishing camp and village locations. During the late 1800s, the area was inhabited by Euro-American settlers who established ranches, farms, and the towns of Hanford and White Bluffs.

Many pre-historic and historic archeological sites have been identified in these OUs. Potential cultural resource concerns include cleaning up historic archeological artifacts and features, disturbing archeological site integrity, following state requirements for proper recording of archeological sites , determining eligibility for listing on the National Register of Historic Places, and determining mitigation efforts. Such issues will need to be addressed through involvement with the cultural resources staff and tribal representatives.

3.0 WASTE SITES

The 100-IU-2 and 100-IU-6 sites are identified in the Waste Information Database System (WIDS) and/or the technical baseline reports for these areas (Deford 1995 and Carpenter 1995). These sites, or types of sites (such as building foundations and oil spills) and general descriptions, are listed in Table 1 for 100-IU-2 and Table 2 for 100-IU-6.

4.0 SITE SCOPING

4.1 System for Categorizing Sites

The prior use of these OUs was virtually all residential and light industrial such as warehouses, ice plants, graphite milling, and pipe fabrication. The exception to this is the P-11 site where criticality experiments were conducted in a converted farmhouse. The site was remediated (except for the septic system) after a fire in 1951. Most activities at these OUs were concluded before the 1950s. Thus, the types of sites, and expected hazards, are substantially different from those associated with OUs around production reactors where significant amounts of liquid and solid radioactive wastes were disposed to the soil.

To establish the scope of work necessary to reach cleanup decisions for these OUs under the Tri-Party Agreement, the sites previously identified in the 100-IU-2 and 100-IU-6 OUs have been categorized into groups based on the likelihood of the existence of a CERCLA release and the extent of evaluation required for a site-specific cleanup decision. This categorization

activity is consistent with the scoping activity provisions of Section 7.2.2 of the Tri-Party Agreement and with the *Hanford Past-Practice Strategy* (DOE-RL 1991). The *Hanford Past-Practice Strategy* encourages a "bias for action" that helps to initiate and complete cleanup actions earlier than usual for Superfund projects and makes maximum use of existing data.

The system for categorizing the potential for hazardous substance releases and risk for each site was developed through field visits and discussions between the DOE and EPA, so that the numerous sites could be categorized logically and consistently. Definitions for the scoping categories follow:

- **Scoping Category 1:** Sites whose existence has been documented (in the case of these OUs, in the technical baseline reports, Carpenter 1995; Deford 1995), but for which there is no evidence of a CERCLA release, and for which there is no evidence of any substantial use or storage of a hazardous substance that could have been released.

  Sites in this category include such non-hazardous human-generated sites as holes, depressions, building foundations, and individual household debris dumps. These sites are not subject to CERCLA or *Resource Conservation and Recovery Act of 1976* (RCRA) action and further evaluation is not required. The existence of potential physical hazards shall be addressed through non-Tri-Party Agreement programs as appropriate.

- **Scoping Category 2:** Sites for which evidence of a prior CERCLA release (or potential release) exists, but which have either been cleaned up or characterization data show to be currently uncontaminated. No further action under CERCLA is required. These sites will be designated in WIDS as already remediated, and based on a risk evaluation, will be proposed for no further action in the proposed plan and record of decision.

- **Scoping Category 3:** Sites where a CERCLA release (or potential release) poses a potential threat to human health or the environment under current land use. These sites would be interim remedial measure (IRM) candidates.

- **Scoping Category 4:** Sites where evidence of a CERCLA release (or potential release) exists, but where there is no apparent threat to human health or the environment under current land use, although such a threat might exist under a different future land use. When future land use decisions are made and the potential uses are known, future risks to human health and the environment will be evaluated, and cleanup actions for these sites determined. The schedule for performing the CERCLA risk evaluation and remedial alternative analysis process for these sites will be agreed to when future land use decisions have been made.

- **Scoping Category 5:** Sites for which there is no specific evidence of a CERCLA release, but at which there was some use, storage or disposal of a hazardous substance

that could have been released. These are sites at which the likelihood of a CERCLA release appears to be low and no action under CERCLA is likely to be required. Based on a risk evaluation, these sites are likely to be proposed for no action in the proposed plan and record of decision.

4.2 Assignment of Sites to Categories

The individual waste sites and groups of waste sites identified in the technical baseline reports for these OUs have been evaluated and assigned to a scoping category as shown in Table 1 (for sites in 100-IU-2) and Table 2 (for sites in 100-IU-6). Because of the nature of the past activities at these OUs, no IRM sites (Scoping Category 3) have been identified. Several Scoping Category 4 sites, which may warrant evaluation of cleanup alternatives, have been identified. However, the current human health and environmental risks for these sites appear to be low enough that cleanup actions do not need to be developed until a future land use has been decided. At that time, risks can be evaluated and cleanup decisions made based on the land use for these low-priority sites.

Other sites have been determined to show no potential for past release of hazardous substances (for example, sites listed because of surface trash or physical hazards). These Scoping Category 1 sites can be handled through appropriate programs outside of the CERCLA/RCRA programs in the Tri-Party Agreement. Scoping Category 2 and 5 sites appear to pose little likelihood of an existing release subject to response under CERCLA or RCRA corrective actions. Based on a risk evaluation, these sites are likely to be proposed for no action in the proposed plan and record of decision.

5.0 SCHEDULE

Once public review of this focus package has been completed and future land use has been decided for the OUs, the proposed milestones for identifying any necessary site characterization work and submitting a focused feasibility study and proposed plan will be finalized as needed.

Table 1. Summary of Sites Described in the 100-IU-2 Technical Baseline Report (Carpenter 1995), with Proposed Dispositions.

Site Type or Facility Name	Section (Carpenter 1995)	Description	Proposed Category*
Pre-Manhattan Engineering District (MED) Community Dump Site (Section 4.1 in Carpenter 1995)	4.1	This several-acre area is scattered with debris from the White Bluffs town and Manhattan Engineering District activities (e.g., barrels, oil cans, electrical parts). Groundwater contamination by TCE (to 29 ppb) may have originated from barrels in this dump.	Category 2 for TCE barrels: In a July 13, 1995, meeting, the 100-FR-3 team (ERC/DOE/EPA/Ecology) concluded that low, widespread, levels of TCE posed no risk and an IRM was not justified. Source of TCE not positively identified, draft report appears to indicate barrels (now empty) at trash dump were possible cause. Category 4 for trash.
White Bluffs City Landfill White Bluffs Landfill White Bluffs City Dump Other MED-era trash dumps and debris	4.2.3, 4.2.7, 4.8, 6.14	Former townsite and MED-era landfills and trash dumps. Historical information on pre-MED activities and site surveys of debris (e.g., non-hazardous plumbing fixtures, wooden and metallic debris) indicate little likelihood of a CERCLA release.	Category 5
Farm, Domestic, and MED-era Debris, building sites and foundations	4.2.1, 4.2.4, 4.2.6, 4.2.7, 4.2.9, 4.13, 4.14, 4.16, 5.1, 5.7, 5.8, 5.9, 6.1, 6.3, 6.5, 6.13	Building foundations and sites with no evidence for or likelihood of a release of a hazardous substance (as determined through field surveys and historical information). Scattered debris includes non-hazardous porcelain plumbing fixtures, pipes, glass, metal fragments, and wood.	Category 1
600-52 White Bluffs Surface Basin	4.5	Site received waste water from the ice house facilities, and overflow from the adjacent Pickling Acid Crib (100-IU-5), which is expected to soon have a no-action interim Record of Decision.	Category 2
Oil, Solvent, and paint drain and dump sites, burn pits, asbestos, fumigation building site	4.2.2, 4.2.5, 4.2.10, 4.2.12, 4.2.13, 4.3, 4.4, 4.9, 4.10, 4.12, 4.15, 4.17, 4.18, 5.3, 5.4, 5.6, 6.2, 6.4, 6.6, 6.7, 6.8, 6.9, 6.10, 6.11	Across the OU are many burn pits and sites where oil cans were drained or spilled, or where waste solvents and paint were drained. Because of the age of these sites (about 50 years), there is little potential for volatile or semi-volatile petroleum products to remain.	Category 4
Ash piles	4.7, 5.2	Ash piles have been found in several locations. Sampling of other ash piles indicates no hazardous levels of metals in the ash.	Category 4
Surface depressions	4.2.8, 4.11, 6.12	The OU has numerous surface depressions, dug for irrigation reservoir, overflow water or other, unknown, purposes.	Category 1
Physical hazards	4.2.11, 5.5, 5.10	Several potential physical hazards have been identified, such as a cistern and underground structures (e.g., valve boxes) that are caving in.	Category 1

* See document text for description of categories

Table 2. Description and Proposed Disposition of 100-IU-6 Sites Listed in the Technical Baseline Report (Deford 1995). (Page 1 of 2)

Site Type\ Facility designation	Section (Deford 1995)	Site Purpose	Proposed Category*
Trash Dumps\			
600-3 Excess Material Storage Yard\Paint Pit	3.3	Large area (about 34 acres) of overlapping dump and burial sites; received various classes of refuse. Site contains metal scrap, paint cans, electrical parts, transite, and other debris. Some areas with stained soil and no vegetation. Possibly subsurface debris. Radiation survey in 1992 detected no contamination.	Category 4
600-26 Hanford Townsite Burn Pile	3.9	Dumping area for Hanford Townsite; reportedly contains construction refuse burn pile and possibly asbestos and barrels. 8 ft deep pit near Tank cleaning site (see above), west of Hanford Townsite. Reported to be nonhazardous and nonradioactive (Deford 1995). Deford could not locate.	
Hanford Townsite Landfill Hanford Townsite Landfill 2 Hanford Trailer Camp Landfill	3.6, 3.7, 4.8	Trash dumps from the Hanford Townsite; contain domestic and light industrial wastes (concrete scraps, rebar). Historical information and site surveys of debris (e.g., non-hazardous glass, metal fragments, fabric, rubber, concrete) indicate a low likelihood of a release or presence of CERCLA hazardous materials.	Category 5
Burn pits and Industrial Trash Dumps	4.13, 4.2, 4.3	Four Burn and Burial Pits, Burn and Burial Trench, 101 Building Graphite Dump Site Landfills (Trash Dumps) and burn pits mostly received some pre-1944 household trash, but as burn pits may have also received oils, solvents, or paints, may also contain industrial trash (e.g., graphite scraps)	Category 4
Petroleum Wastes\ UPR-600-18 Gasoline Spill near 100-F	3.12	Unplanned Release 600-18. In 1987 a fuel tanker truck overturned 1/2 mile south of 100-F reactor site, spilling an estimated 1,344 L (355 gallons) of gasoline, diesel, and ethylene glycol. Site cleanup was planned in 1987, involving excavation of 20 yd^3 of soil. However, no record discovered if accomplished. Site unable to be located; no evidence of accident or spill remains in area.	Category 2
Septic Facilities	4.1, 4.4, 4.10	213J and 213-K Guard House Toilet Pit, Septic Tanks and Sewage Treatment Plants, Honey Dump Stations. Received domestic wastes, no evidence of hazardous materials.	Category 1
Septic Facilities\ Septic Tanks and Drain Field, P-11 Site	4.14	Suspect Site. Two septic tanks and a drain field were used at the Critical Mass Laboratory, and probably have not been removed. One tank is of pre-Manhattan-era origin. The replacement tank is 500 gallons, with a 60-ft long drain field.	Category 4
Underground Storage Tank\ Service Stations and Potential Underground Tanks	4.9	Suspect Sites. Four automobile service stations are reported to have been at the Hanford Construction Camp. Deford (1995) reports that three are locatable, and two (at least) had underground fuel tanks. These three sites are currently grassy fields, with some asphalt rubble, but no other obvious evidence of facilities. Ground Penetrating Radar scans and site surveys with former residents indicate that the tanks no longer exist.	Category 2
Non-Hazardous\Non-Radioactive Waste Sites\ 213-J and 213-K Plutonium Storage Vaults	3.1	Concrete vaults, each 12 ft wide, 40 ft deep under Gable Mtn, 8-ft ceiling. Steel door, concrete loading dock, four ventilation ducts above each vault. Used 1944 to present; initially built to store plutonium, but used only briefly (if at all) for that purpose. Used for storage of explosives and radioactive-sodium-contaminated hardware. Now used for seismic testing and soil sample storage.	Category 5
Non-Hazardous\Non-Radioactive Waste Sites\ 213-J and 213-K Crib Sites	3.2	1944-? Drained loading docks; no evidence of drains to the cribs from inside the vaults. Were located on each side of the 213 Storage Vault entrance. Cribs have been surveyed and removed.	Category 2 with appropriate documents, Category 4 if not

Table 2. Description and Proposed Disposition of 100-IU-6 Sites Listed in the Technical Baseline Report (Deford 1995). (Page 2 of 2)

Site Type\ Facility designation	Section (Deford 1995)	Site Purpose	Proposed Category*
Non-Hazardous\Non-Radioactive Waste Sites\ 600-24 Anti-Aircraft Artillery Compound and Dump Site	3.4	Inactive dumping site; foundations, well sites, and surface debris visible. Some D&D has been done, and unexploded ammunition detonated	Category 5
Non-Hazardous\Non-Radioactive Waste Sites\ 600-20 Tank Cleaning Site	3.8	Two, 3,000 gallon tanks held asphalt. Site is adjacent to railroad tracks 300 m west of Route 2. Tanks above ground on concrete cradles. Site is nonhazardous and nonradioactive (Deford 1995). Nearby pit (3 x 3 x 1-m deep) has waste asphalt.	Category 5
Non-Hazardous\Non-Radioactive Waste Sites\ Power House Ash Pile	4.6	Ash pile about 250 x 60 x 10 ft deep, characteristic of power house ash and probably from coal-fired power houses used at Hanford Construction Camp from 1943 to 1945. Smaller ash pile northwest of large pile.	Category 4
Non-Hazardous\Non-Radioactive Waste Sites\ Construction Camp Boiler House Ponds	4.7	Eighteen power plants generated steam for construction camp; some had liquid waste disposal ponds for waste water and most likely water softener brine (salt). Ponds are about 60 x 20 x 5 ft deep, filled in with tumbleweeds.	Category 1
Miscellaneous\ 600-27 Well and Volatile Organics Site	3.5	Inactive monitoring wells (one in which volatile organics were detected). Small amounts of transite and debris in general area, possibly herbicides	Category 4
Miscellaneous\ P-11 Site - Critical Mass Laboratory Site and Crib	3.10	Site of Hanford's first Critical Mass Laboratory and liquid waste crib. Criticality event and fire damaged building and spread plutonium (see below). Building was demolished and removed, as was associated crib. Crib had up to 30,000 dpm (plutonium) in soil on bottom. No contamination found below 3 inches. Laboratory location marked with concrete benchmark. Site released from radiation zone status.	Category 2 with appropriate documentation; if not, Category 4
Miscellaneous\ UPR-600-16-P-11 Fire and Contamination Spread	3.11	Unplanned release 600-16. A 1951 fire at Critical Mass Laboratory spread contamination through building and to 180 x 100- ft area around building. Area stabilized with 2 ft of clean soil, which was later removed along with contaminated soil, in 1974. Removed from radiation zone status. Unplanned release UPR-600-16 received Hazardous Ranking system score of 16.25	Category 2
Miscellaneous\ UPR-600-19 Lime sulfur Spill	3.13	Wooden barrel of insecticide, abandoned in 1943, rotted and spilled about 100 pounds of lime sulfur on ground. Lime sulfur is a topical antiseptic, insecticide, and used to treat mange and scabies. Location is about 1/4 mile west of Route 2 north, between Hanford Townsite and 100-F Area, in front of house foundation. Deford (1995) also reports physical hazards nearby, such as open pits from toilets, collapsing irrigation pipe, and cellar.	Category 5 for lime sulphur spill; Category 1 for physical hazards
Miscellaneous\ Fumigation Chamber	4.5	Originally a small wooden building protected by barbed-wire security fence. Deford (1995) hypothesizes that fumigation, which may have involved methyl bromide and sulfuryl fluoride, was used on bedding materials for construction camp. Building and foundation have been removed, site is now grass field.	Category 4
Miscellaneous\ Three Trenches	4.11	Three isolated trenches, with adjacent spoil piles, dug for no known purpose, located about 100 ft west of Avenue A extension.	Category 1
Miscellaneous\ Small Arms Range	4.12	A small-arms target range, about 2 miles from the Construction Camp, operated from mid 1940s through 1950s. Used for handguns, rifles, shotguns, machine guns, hand grenades, etc. Hillside behind target areas laden with expended rounds, mostly lead, with steel, brass, and other metals. Potential risk from unexploded ordinance that might remain.	Category 4

* See document text for descriptions of categories

6.0 REFERENCES

Carpenter, R. W. 1995, *White Bluffs, 100-IU-2 Operable Unit Technical Baseline Report*, BHI-00448, Bechtel Hanford, Inc. Richland, Washington.

Deford, D.H. 1995, *100-IU-6 Operable Unit Technical Baseline Report*, BHI-00146, Bechtel Hanford, Inc. Richland, Washington.

DOE-RL, 1991, *Hanford Past-Practice Strategy*, DOE/RL-91-40, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1992a, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-1 Operable Unit, Hanford Site, Richland, Washington*, DOE/RL-90-33, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE-RL, 1992b, *Remedial Investigation/Feasibility Study Work Plan for the 100-FR-3 Operable Unit, Hanford Site, Richland, Washington*, DOE/RL-91-53, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

Jacques, I. D, 1995, 1995, *100-FR-3 Groundwater/Soil Gas Supplemental Limited Field Investigation Report*, BHI-00436, Bechtel Hanford, Inc. Richland, Washington.