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Draft A

Proposed Plan for Interim Remedial Actions at the 100 Area Remaining Sites

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United States
Department of Energy
Richland, Washington

For External Review

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Proposed Plan for Interim Remedial Actions at the 100 Area Remaining Sites

Date Published
November 1997

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

For External Review

PROPOSED PLAN FOR INTERIM REMEDIAL ACTIONS AT THE 100 AREA REMAINING SITES

Hanford Site, Richland, Washington

EPA, ECOLOGY, AND DOE ANNOUNCE PROPOSED PLAN

This **Proposed Plan**[1] identifies the preferred alternative for **interim remedial actions** at **waste sites** in the 100 Areas of the Hanford Site (Figure 1). The waste sites subject to this Proposed Plan are referred to as the **100 Area Remaining Sites** and may consist of radioactively and chemically contaminated soils, structures, and associated debris located within 100 Area **Operable Units** on the Hanford Site. This contamination may present a risk to human health or the environment.

The U.S. Environmental Protection Agency (EPA), the lead regulatory agency; the Washington State Department of Ecology (Ecology), the support regulatory agency; and the U.S. Department of Energy (DOE), the responsible agency, collectively known as the Tri-Parties, are proposing a preferred alternative for the 100 Area Remaining Sites under the authorities of both the ***Comprehensive Environmental Response, Compensation, and Liability Act of 1981*** (CERCLA), also known as "Superfund," and the ***Resource Conservation and Recovery Act of 1976*** (RCRA). The Tri-Parties intend for this Proposed Plan to satisfy the public review requirements under both authorities. The process for achieving this end is described in the box on page 4. Integration of the requirements of the ***National Environmental Policy Act of 1969*** (NEPA) is also described in this box.

The Tri-Parties are proposing that the preferred alternative for the 100 Area Remaining Sites is to remove the contaminated soil, structures, and associated debris that pose a risk to human health and the environment, treat these wastes as required to meet disposal waste acceptance criteria (such as **land disposal restrictions**), dispose of the wastes at the Hanford Site **Environmental Restoration Disposal Facility** (ERDF), and backfill and revegetate[2] the excavated areas. This alternative is called the Remove/Treat/Dispose Alternative.

MARK YOUR CALENDAR

This Proposed Plan is being issued by the Tri-Parties. These agencies encourage you to comment during the public comment period on the approach toward remedy selection for the 100 Area Remaining Sites described in this Proposed Plan. Based on new information or public comments, the Tri-Parties may modify the remedy selection approach presented in this Proposed Plan.

A 45-day public comment period for this 100 Area Remaining Sites Proposed Plan will be from <*date*> to <*date*>. A public hearing on this Proposed Plan is scheduled to be held on

Send written comments to:

This Proposed Plan presents an innovative approach, called the **Plug-in Approach** for use in remedial decision-making at the 100 Area Remaining Sites. The EPA has used the Plug-in Approach at other **National Priorities List** (NPL) sites around the country and at the Hanford Site to enhance the efficiency of waste site cleanup. The Plug-in Approach will allow the same remedy to be applied to multiple similar, but separate sites at a facility. Cleanup actions can proceed under this approach without a re-evaluation of the same remedy through the entire CERCLA process (i.e., development of separate remedial investigation/ feasibility studies, proposed plans, and **Records of Decision** [RODs]).

The use of the Plug-in Approach for remedy selection at the 100 Area Remaining Sites is summarized in Figure 2. Under this approach, the Tri-Parties select a **standard remedy** (Step 1 of Figure 2) that has been determined to be cost-effective at remediating certain waste sites that exhibit similar physical and chemical

[1]Technical terms and other text in bold are defined in the glossary at the end of this document.

[2] Revegetation activities are neither part of nor necessary for completion of the preferred alternative. However, revegetation will provide overall environmental benefits to the site and will be accomplished at sites to be remediated.

Figure 1. Map of the Hanford Site Showing the Reactors in the 100 Areas and the Environmental Restoration Disposal Facility.

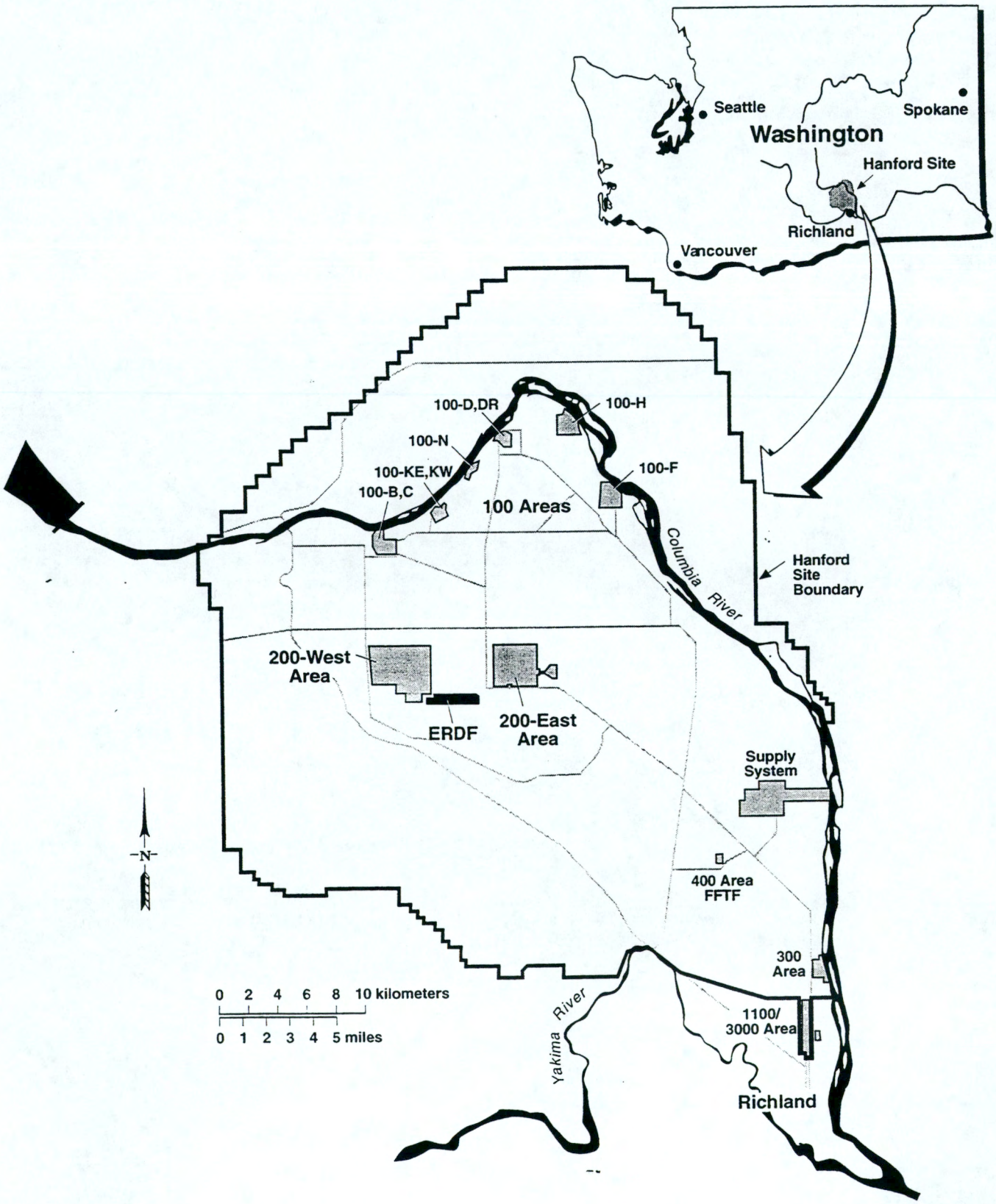

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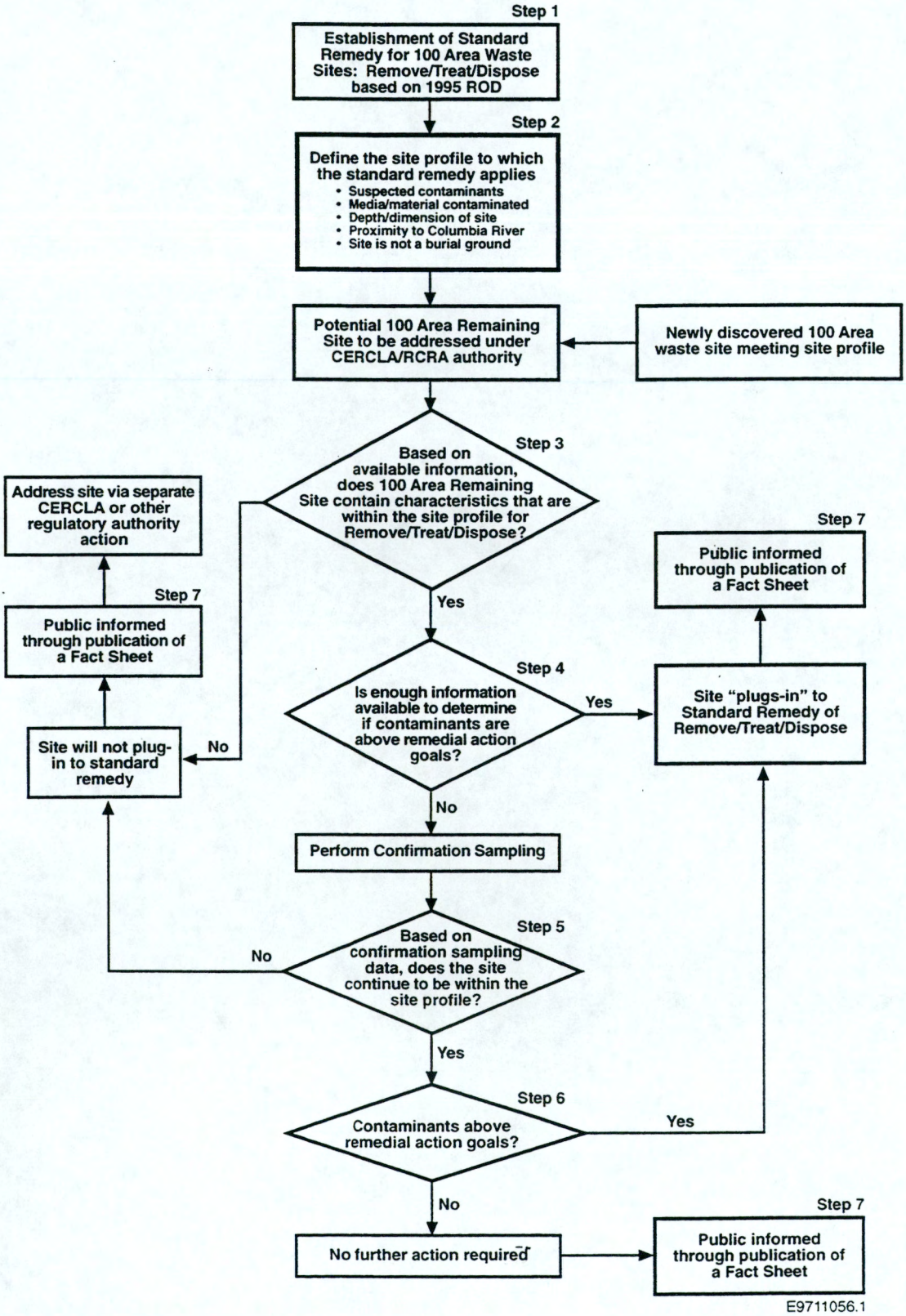
Figure 2. Application of the Plug-in Approach to 100 Area Remaining Sites.



INTEGRATING CERCLA, RCRA, AND NEPA THROUGH THE RECORD OF DECISION

The *Hanford Federal Facility Agreement and Consent Order*, also known as the Tri-Party Agreement, specifies that the Operable Units containing the 100 Area Remaining Sites will require cleanup under either the authorities of Section 3004(u) and 3005(e) of RCRA (as implemented through Washington Administrative Code [WAC] 173-303-646) or Section 117(a) of CERCLA. The Tri-Parties are issuing this Proposed Plan as part of their public participation responsibilities under both statutory authorities.

It is the intention of the Tri-Parties that the CERCLA public involvement process, including public notice and opportunity to comment, will satisfy the public involvement requirements for the RCRA process. The EPA will prepare a CERCLA ROD (following the CERCLA public involvement process), which, after signature by the Tri-Parties will authorize the selected remedial action. Authorization of the selected action under RCRA will occur through a subsequent modification to the Hanford Sitewide RCRA Permit at the next scheduled modification. This modification will incorporate by reference the CERCLA remedy selection ROD into the RCRA permit for the purpose of satisfying RCRA requirements.

The DOE is also issuing this Proposed Plan as part of its responsibility under NEPA. NEPA values include impacts to natural, cultural, and historical resources; socioeconomic aspects; and irreversible and irretrievable commitments of resources.

characteristics. These characteristics must fall within a set of characteristics that the Tri-Parties has determined to be appropriate for remediation using the standard remedy. This set of characteristics is called the **site profile** (Step 2 of Figure 2). The standard Remedy and the site profile that are being proposed for the 100 Area Remaining Sites are described in the following paragraphs.

The Tri-Parties selected Remove/Treat/Dispose as the preferred alternative in the September ROD and in the March 1997 **ROD Amendment.** The ROD included 37 waste sites in the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units and the ROD Amendment included 34 additional sites in the 100-BC-2, 100-DR-1, 100-DR-2, 100-FR-1, 100-HR-1 100-KR-1, and 100-KR-2 Operable Units (collectively called the 100 Area ROD Sites for the purposes of this Proposed Plan). Selection of Remove/Treat/Dispose relied upon extensive analyses of site risks and potential remedial alternatives for the 100 Area ROD Sites and has proven to be a successful remedy in the field as demonstrated through its implementation at waste sites in the 100 Areas. The Tri-Parties are, therefore, proposing to establish Remove/Treat/Dispose as the standard remedy for 100 Area Remaining Sites (Step 1 of Figure 2) that fall within the site profile as described below.

The characteristics that make up the site profile for Remove/Treat/Dispose were presented in the *100 Area Source Operable Unit Focused Feasibility Study,* (DOE/RL-94-61) (FFS), Appendix N. These characteristics are proposed for use in the Plug-in Approach. The site profile is defined by:

- Type of contaminants (radiological, chemical)
- Type of contaminated environmental media (soil)
- Type of contaminated waste material (e.g., concrete, metal, wood)
- Predicted depth of contamination
- Site is in proximity to the Columbia River
- Site is not a burial ground as determined by the Tri-Parties.

The Tri-Parties have compared this site profile with known or suspected characteristics of the 100 Area Remaining Sites contained in Appendix A of this Proposed Plan and are proposing that these sites fall within it (Step 3 of Figure 2).

A comparison of 100 Area Remaining Sites contaminant concentrations against **remedial action goals** is required for use of the Plug-in Approach in order to determine whether the site will require remediation using the standard remedy (Step 4 of Figure 2). However, for some 100 Area Remaining Sites, not enough information exists to currently determine whether contaminants exceed remedial action goals. For these sites, **confirmation sampling** will be performed to determine contaminant types and concentrations. Actions resulting from confirmation sampling are described later in this Proposed Plan.

The standard remedy of Remove/Treat/Dispose is intended to reduce potential human health and ecological risks and ensure that contaminants present at these waste sites will not adversely impact groundwater beneath the sites or the Columbia River. Use of the Plug-in Approach using the standard remedy of Remove/Treat/Dispose is the initial recommendation of the Tri-Parties. The cleanup alternative will be selected only after the public has had the opportunity to comment on this recommendation and all comments have been reviewed and considered.

Further information detailing alternatives and supporting previous recommendations are included in the **Administrative Record**. A list of documents that contain this information is presented in the Supporting Documents portion of this Proposed Plan.

Comments may be made in person at the public meeting or may be submitted in writing (see box on page 1). Written comments must be submitted by

<*date*>. Responses to comments will be presented in a responsiveness summary that will be part of the ROD.

SITE BACKGROUND

The Hanford Site

The Hanford Site is located in southeastern Washington. It was established in 1943 to produce plutonium for nuclear weapons using reactors and chemical processing plants. The 100 Area of the Hanford Site is located along the Columbia River and includes nine inactive nuclear reactors used for plutonium production between 1943 and 1987 (Figure 1). Operations at the Hanford Site are now focused on environmental restoration and waste management. In November 1989, the EPA designated the 100 Areas of the Hanford Site as a Superfund site and placed it on the 100 Area NPL because of soil and groundwater contamination that resulted from past operation of the nuclear facilities. To organize cleanup efforts under Superfund, contaminated areas at the nine inactive reactors were subdivided into eleven 100 Area Operable Units.

Current Remedial Actions in the 100-B/C, 100-D, 100-H, 100-F, and 100-K Areas

Full-scale remediation in the 100 Areas began in July 1996. Currently, there are eleven 100 Area ROD sites in the 100-B/C and 100 D/DR Areas that are being actively remediated using the Remove/Treat/Dispose Alternative. To date, these actions have resulted in the disposal of over 625,000 tons of contaminated soil and debris to ERDF. Using this alternative, the 116-B-5 waste unit has been successfully remediated to contaminant levels that are protective of human health and the environment. Remedial design is currently in progress for many other waste sites in the 100-B/C, 100-D, 100-H, 100-F, and 100-K Areas.

The 100 Area ROD Sites are undergoing remediation using what was defined in the ROD as the **observational approach.** The observational approach relies on information from historical process operations and limited field investigations on the nature and extent of contamination, combined with a "characterize and remediate in one step" methodology. This latter methodology utilizes **field screening** for contaminants. Remediation (excavation) proceeds until it can be demonstrated, through a combination of field screening and sampling and analysis, that the site is cleaned up. The observational approach enhances the efficiency of remediation efforts by combining **characterization** and remediation steps to maximize the use of resources.

The 100 Area Remaining Sites

The 100 Area Remaining Sites are described in Appendix A of this Proposed Plan. Site locations are shown in Figures A-1 through A-7 of the appendix. Appendix A summarizes information on each site and breaks sites into two categories:

- Those for which adequate information exists to conclude that contaminant concentrations are above remedial action goals and will plug-in to the standard remedy of Remove/Treat/Dispose (Table A-1)
- Those that will need confirmation sampling to determine whether contaminant levels are above or below remedial action goals (Table A-2).

For each site in Tables A-1 and A-2, information is provided on the current knowledge of the site, the environmental media or material that could be contaminated, and suspected contaminants.

SCOPE AND ROLE OF ACTION

100 Area Remaining Sites

This Proposed Plan presents interim remedial actions for contaminated soil, structures, and debris at the 100 Area Remaining Sites. The objectives of the proposed interim remedial actions are to identify and reduce potential future threats to human health and the environment from waste site contaminants. These remedial actions are consistent with ongoing cleanup actions in the 100 Areas and utilize the same remedy as is being applied at the 100 Area ROD Sites.

Remedial actions to be defined in the ROD subsequent to this Proposed Plan will complete the majority of cleanup decisions yet to be determined for land-based waste sites in the 100 Areas. Cleanup action decisions remaining in the 100 Areas include remedial actions for 100 Area Burial Grounds and the 100-N Reactor Area (each of these decisions will be determined through separate CERCLA ROD processes). Continuing decontamination and decommissioning actions will also be required for structures and buildings associated with the 100 Area Reactors; closure of RCRA treatment, storage, and disposal units; and cessation and closure of active operations in the 100 Areas. Eventually, a final ROD for the entire 100 Areas will be required to prepare for removal of the 100 Areas from the Superfund NPL.

To determine whether contaminants pose a threat to human health, the type of future land use (and therefore the amount of time an individual may be exposed to contaminants) must be defined. However, the final land

use for the 100 Areas has not been determined. Therefore, for the purpose of this Proposed Plan (consistent with the assumption used in the 1995 ROD and the 1997 ROD Amendment), the Tri-Parties have agreed to remediate sites, to the extent practicable, such that future use of the land is not precluded by contamination left from past Hanford operations. This would be accomplished by remediating the sites to minimize potential direct exposure effects, air and groundwater releases, and by minimizing ecological and cultural impacts. **Remedial action objectives** and cleanup goals will be reevaluated if future land use and groundwater use determinations are inconsistent with this assumption.

Petroleum Sites

In addition to sites that may be remediated under CERCLA or RCRA corrective action, Table A-2 identifies sites that may require remediation due solely to petroleum contamination. Petroleum sites are exempt from CERCLA statutory requirements. Sites that are contaminated solely by petroleum that are within Operable Units under CERCLA authority would therefore not be subject to remedy selection described in this Proposed Plan. Sites within Operable Units under RCRA corrective action authority, however, may require remediation under this authority if individual constituents within the petroleum contamination exceed cleanup standards as determined through confirmation sampling.

At a minimum, petroleum sites will be remediated to meet cleanup standards established by the State of Washington **Model Toxics Control Act** (MTCA) regulations (WAC 173-340). While petroleum site remediation does not require an alternatives analysis and remedy selection process under CERCLA, and may not under RCRA, they have been included in this Proposed Plan to inform the public of remedial actions planned at these sites. The candidate petroleum sites that are included as part of the 100 Area Remaining Sites in Table A-2 are anticipated to be relatively shallow sites that can be remediated using the standard remedy of Remove/Treat/Dispose. However, should further investigations of these sites through confirmation sampling conclude deep contamination or contamination to groundwater, the Tri-Parties will reevaluate other potential remedial alternatives.

SUMMARY OF SITE RISK

The *Hanford Past Practice Strategy* presents a strategy for prioritizing cleanup work at Hanford. In this document, high-priority sites were considered by the Tri-Parties to pose a risk to human health and the environment sufficient to recommend action before that of the low-priority sites. This ordering of sites was based on the collective knowledge of the Tri-Parties and on information contained in existing Operable Unit work plans. The 100 Area ROD Sites were designated as high-priority sites and, therefore, were the subject of earlier remedial decision making. These sites generally received high volumes of effluent with a greater concentration of radionuclides than those of the 100 Area Remaining Sites, which were designated as low-priority waste sites.

The evaluation of risk posed by the 100 Area Remaining Sites is general in nature due to the limited information available for these sites. The assessment of risk at these sites will be made at the time of excavation by use of the observational approach. Risk will be based on the presence of contaminants at concentrations in the soils, structures, and associated debris above levels considered protective of human health and the environment.

Risk-based remedial action goals will be established in accordance with **Applicable or Relevant and Appropriate Requirements** (ARARs) or **To Be Considered** (TBC) requirements for all applicable exposure pathways (air, soil, groundwater, and the river) and for all potential land uses at the 100 Areas. Specific remedial action goals for suspected contaminants that might be encountered during cleanup will be developed during the remedial design phase and will consist of numerical concentration limits for each contaminant of concern within each pathway.

Remedial action goals will be consistent with ongoing remediation at the 100 Areas. Updates and revisions to the *Remedial Design/Remedial Action Work Plan*, (DOE/RL-96-17) will document remedial action goals agreed to by the Tri-Parties. When site-specific information is gathered during remediation, it will be compared to these remedial action goals to determine the extent or necessity of cleanup.

Risk-based remedial action goals will include, but are not limited to, the following major ARARs and TBCs:

- 1995 ROD radiation dose standard of 15 millirem per year above natural background
- MTCA Method B standards
- Maximum contaminant levels (drinking water standards)
- Ambient water quality criteria (river protection standards)
- Draft DOE standards for terrestrial animals.

An assumption made in earlier 100 Area ROD site decision documents is that the potential for direct human exposure to contaminants in soil at a depth

greater than 4.6 m below a surrounding grade (or to the bottom of the engineered structure, whichever is greater) is unlikely. However, these deeper contaminants could migrate to groundwater, and eventually, to the river. Therefore, soils below 4.6 m will take into consideration only groundwater and river protection standards, whereas soils above 4.6 m will take into consideration human exposure, groundwater and river protection standards. This same assumption will be applied to the preferred alternative.

For sites where contamination above remedial action goals is found 4.6 m below the ground surface, the extent of remediation may be balanced against several factors. These factors include reduction of risk by decay of radionuclides, protection of human health and the environment, costs, sizing of ERDF, worker safety, presence of ecological and cultural resources, the use of **institutional controls**, and long-term monitoring costs. The application of the criteria for the balancing factors, and the process for determining the extent of remediation for contamination below 4.6 m will be specified during remedial design for the 100 Area Remaining Sites. Remedial design occurs after the public and the Tri-Parties have selected the remedial alternative and issued the ROD.

PREFERRED STANDARD REMEDY

The preferred standard remedy for the 100 Area Remaining Sites is Remove/Treat/Dispose which is the same remedy as that chosen in the 1995 ROD, as modified through the 1997 ROD Amendment. Contaminated soil and/or structures and debris would be excavated using the observational approach. Contaminated waste would then be transported, and disposed at the ERDF in accordance with ERDF's waste acceptance criteria. Any material that exceeds the ERDF waste acceptance criteria would be stored on site consistent with ARARs until treated to meet acceptance criteria. Should it be impossible to treat waste to meet ERDF waste acceptance criteria, it will be stored on site and a disposal decision for it reevaluated through a separate CERCLA decision document. As the contaminated material is excavated, it would be characterized and segregated before transportation. Excavation would continue until all contaminated material exceeding the remedial action goals is removed. The site would then be backfilled and revegetated.

The Tri-Parties have determined that each of the sites identified in Table A-1, Appendix A of this Proposed Plan, have adequate existing information to conclude that they can be plugged-in to the standard remedy (i.e., contaminant levels are suspected to be above remedial actions goals, which would limit future land use) (Step 4 of Figure 2).

For the 100 Area Remaining Sites identified in Table A-2, Appendix A of this Proposed Plan, available information is insufficient to conclude whether contamination exists above remedial action goals. At these sites, where it is determined to be cost-effective (in other words, the benefits of sampling would outweigh the cost of excavating without prior characterization data), confirmation sampling will be performed (Step 4 of Figure 2). If confirmation sampling is not cost-effective, the site will be remediated using the Plug-in Approach.

The results of confirmation sampling will be used to determine whether the site fits the established site profile (Step 5 of Figure 2). If sampling determines that the site does not fit the site profile, it will be remediated through a separate CERCLA process (e.g., a ROD **Explanation of Significant Difference** or ROD Amendment, or **Action Memorandum**). It is unlikely, in the opinion of the Tri-Parties, however, that sites will be encountered that cannot be plugged-in. For sites that fit the site profile, a determination as to whether it will plug-in to the standard remedy will be made based on contaminant concentrations (Step 6 of Figure 2). If contaminants are below remedial action goals, no further remedial action will be required. If contaminants are above these levels, the site will plug-in to the Remove/Treat/Dispose standard remedy.

It is the intent of the Tri-Parties to inform the public of remedial decisions made regarding each remaining site that is taken through the Plug-in Approach process described in Figure 2. The public will be notified through routine publication of fact sheets (identified variously as Step 7 of Figure 2). Sites that are determined to plug-in to the standard remedy, as well as sites that are determined to require no action because they contain contaminants below remedial action goals, will be listed in the fact sheets. Sites that are determined to require remediation through a separate CERCLA/RCRA pathway or through a separate regulatory authority will also be listed in the fact sheets. The frequency of publication of fact sheets will be identified in the ROD for the 100 Area Remaining Sites but will occur, at a minimum, on an annual basis.

Newly discovered 100 Area waste sites may be identified after the ROD or subsequent decision documentation is signed and the Hanford RCRA Permit is modified to include the 100 Area Remaining Sites that are presented in Tables A-1 and A-2. Where these newly discovered sites are determined by the Tri-Parties to plug-in to the Remove/Treat/Dispose Alternative, it is the expectation of the Tri-Parties that they will be

remediated under this proposed Plug-in Approach. The public will be informed of the disposition of newly discovered sites as part of the routine fact sheet publications or through a separate CERCLA or other regulatory authority action if a site cannot plug-in to the standard remedy.

SELECTION OF REMOVE/TREAT/DISPOSE IN THE 1995 ROD AND ROD AMENDMENT

The Remove/Treat/Dispose Alternative was chosen in the 1995 ROD and 1997 ROD Amendment by the Tri-Parties after extensive analysis of remedial alternatives applicable to 100 Area waste sites. Remedial alternatives were:

- No Action
- **Institutional Controls**
- **Containment**
- Remove/Treat/Dispose[3]
- **In Situ Treatment**.

The rationale for selecting Remove/Treat/Dispose from these alternatives was presented in the 1995 ROD and 1997 ROD Amendment and will not be revisited in this Proposed Plan. In summary, the Tri-Parties concluded in the ROD that Remove/Treat/Dispose was protective of human health and the environment, that it complied with ARARs, and that it was a cost-effective, implementable, alternative for remediation of waste sites in the 100 Areas.

EVALUATION OF THE STANDARD REMEDY

In this Proposed Plan, the public is asked to provide comments on the proposal to use the Plug-in Approach and the standard remedy of Remove/Treat/Dispose as opposed to a decision of no remedial action (The No Action Alternative) for the 100 Area Remaining Sites. The CERCLA evaluation criteria described in the box on the next page have been used for comparison of the No Action Alternative[4] against the Remove/Treat/Dispose Alternative. This comparative analysis is a requirement of CERCLA. The proposed standard remedy is believed to provide the best balance of tradeoffs among the alternatives with respect to the CERCLA evaluation.

The criteria are divided into three categories of weighted importance: threshold, balancing, and modifying criteria. The first two criteria (Overall Protection of Human Health and the Environment and Compliance with ARARs) are threshold criteria: only those remedial alternatives that provide adequate protection of human health and the environment and comply with ARARs (or justify a waiver) are eligible for consideration. The five balancing criteria help describe relative technical and cost differences among the remedial alternatives. The two modifying criteria (State and Community Acceptance) may prompt modification of the remedial alternatives based on community comments and concerns. The Community Acceptance modifying criterion will be considered after all public comments on this Proposed Plan have been received. State Acceptance of the Plug-in Approach and standard remedy has been achieved through the publication of this Proposed Plan.

The No Action Alternative has been evaluated to provide a baseline for comparison to the standard remedy. It represents a hypothetical scenario where no restrictions, controls, or active remedial actions are applied to a site. The No Action Alternative would limit future use of the 100 Areas.

Overall Protection. The No Action Alternative does not meet this criterion because contaminant concentrations would be left that exceed human health and environmental protection standards. The Remove/Treat/Dispose Alternative would provide overall protection of human health and the environment.

Compliance with Applicable or Relevant and Appropriate Requirements. The No Action Alternative would not meet the principal ARARs (e.g., cleanup standards) for sites where contaminants exceeded remedial action goals. The Remove/Treat/Dispose Alternative would comply with the ARARs. If wastes subject to land disposal restrictions under RCRA are encountered, they would be treated before disposal or a treatability variance or CERCLA waiver could be requested.

Long-Term Effectiveness and Permanence. The No Action Alternative would not meet remedial action goals and, therefore, would not provide for long-term effectiveness. The Remove/Treat/Dispose Alternative would provide for long-term effectiveness and

[3] The 1995 ROD presented two separate alternatives: Remove/Dispose and Remove/Treat /Dispose, the latter requiring soil washing for volume reduction, as appropriate. Both alternatives required treatment in order to meet disposal unit acceptance criteria. The 1997 ROD Amendment excluded soil washing because it was proven to not be cost-effective for 100 Area waste sites. This determination made both of the original alternatives the same for the purposes of comparison. The Remove/Treat/Dispose Alternative represented in this Proposed Plan thus corresponds to both of these original alternatives.

[4] The No Action Alternative is distinguished from a "no further action" decision in that the No Action Alternative constitutes the remedial action for the site or sites. The "no further action" decision occurs when a remedial alternative, such as Remove/Treat/Dispose, has been initiated and, during remediation, it is determined that no contaminants are left that are above a remedial action goal.

EXPLANATION OF CERCLA EVALUATION CRITERIA

1. *Overall Protection of Human Health and the Environment* is the primary objective of the remedial action and addresses whether a remedial action provides adequate overall protection of human health and the environment. This criterion must be met for a remedial alternative to be eligible for consideration.
2. *Compliance with Applicable or Relevant and Appropriate Requirements* addresses whether a remedial action will meet all of the applicable or relevant and appropriate requirements and other federal and state environmental statutes, or provides grounds for invoking a waiver of the requirements. This criterion must be met for a remedial alternative to be eligible for consideration.
3. *Long-Term Effectiveness and Permanence* refers to the magnitude of residual risk and the ability of a remedial action to maintain long term reliable protection of human health and the environment after remedial goals have been met.
4. *Reduction of Toxicity, Mobility, or Volume Through Treatment* refers to an evaluation of the anticipated performance of the treatment technologies that may be employed in a remedy. Reduction of toxicity, mobility, and/or volume contributes toward overall protectiveness.
5. *Short-Term Effectiveness* refers to evaluation of the speed with which the remedy achieves protection. It also refers to any potential adverse effects on human health and the environment during the construction and implementation phases of a remedial action.
6. *Implementability* refers to the technical and administrative feasibility of a remedial action, including the availability of materials and services needed to implement the selected solution.
7. *Cost* refers to an evaluation of the capital, operation and maintenance, and monitoring costs for each alternative.
8. *State Acceptance* indicates whether the state concurs with, opposes, or has no comment on the preferred interim alternative based on review of the corrective measures study and the proposed plan.
9. *Community Acceptance* assesses the general public response to the Proposed Plan, following a review of the public comments received during the public comment period and open community meetings. The remedial action is selected only after consideration of this criterion.

permanence by containing and isolating wastes further away from affected groundwater and the Columbia River at the ERDF.

Reduction of Toxicity, Mobility, or Volume Through Treatment. The No Action Alternative would not reduce the mobility, toxicity, or volume of the contaminants through treatment. The Remove/Treat/ Dispose Alternative may reduce the mobility, toxicity, or volume of a waste where treatment is required to meet ERDF waste acceptance criteria.

Short-Term Effectiveness. The No Action Alternative would not present any adverse effects on human health and the environment during implementation; however, this alternative would not achieve protection. The Remove/ Treat/Dispose Alternative would pose a risk of release of contaminants and worker exposure during excavation, transport, possible treatment, and disposal of contaminated soil and structures. Remediation activities would need to be carefully planned to minimize the associated risk.

Implementability. The No Action Alternative would be easy to implement both technically and administratively. The Remove/Treat/Dispose Alternative is implementable.

Costs. The No Action Alternative would not require additional costs to implement. The Remove/Treat/ Dispose Alternative costs for sites addressed in this Proposed Plan (Appendix A, Tables A-1 and A-2) are estimated to total about $88 million. This estimate is considered accurate within a range of +50 to -30 percent of the actual remediation cost for each waste site. The total estimate is composed of the following cost components:

- Sites proposed for remediation using the standard remedy ($30.2 million)
- Sites requiring confirmation sampling ($8.1 million) (approximately 50 percent of these sites will require no further action)
- Application of the standard remedy to those sites found to require remediation after confirmation sampling ($50 million) (this estimate assumes 50 percent of the sites would require remediation based on sampling).

The final cost for addressing all Remaining Sites is dependent upon the actual number of confirmation sampling sites that fall into the various possible categories based on sample results as described below:

- Sites where contaminant concentrations do not exceed remedial action goals and will not require remediation,
- Sites that require confirmation sampling to determine whether site meets site profile (i.e., if site plugs-in),
- Sites that require both confirmation sampling and remediation using the standard remedy,
- Sites that require remediation using another remedy (i.e., cannot be plugged-in to the standard remedy).

NATIONAL ENVIRONMENTAL POLICY ACT EVALUATION

The NEPA regulations require an evaluation of the environmental consequences of federal actions. NEPA values used to compare alternatives include potential effects on ecological, cultural, and historical resources; socioeconomic aspects; and identification of irreversible and irretrievable commitment of resources. The following summary compares how the No Action and Remove/Treat/Dispose Alternatives for the 100 Area Remaining Sites impact NEPA values.

The No Action Alternative may require an irreversible and irretrievable commitment of natural resources by restricting the availability of surface use of the sites, although this could be reversed by later taking action at the sites and lifting the controls.

The Remove/Treat/Dispose Alternative would result in short term impacts to resources, such as increased Hanford Site truck traffic, but these impacts would be resolved at the end of remediation. This alternative would have an irreversible and irretrievable commitment of natural resources at the disposal unit (i.e., the ERDF) and borrow sites used to obtain materials for fill of the excavated sites and cover at the ERDF. Contaminated soils would be removed from a site and transported to the ERDF; therefore, there would be a commitment to use portions of that disposal unit for long-term waste management.

With the Remove/Treat/Dispose Alternative, excavated material would be replaced with clean fill and topsoil, and then revegetated. Because waste sites to be remediated are located within areas previously disturbed by reactor operations and agricultural activities, remediation and revegetation actions will likely result in improving, rather than degrading, ecological conditions in the area. Short term, indirect impacts to wildlife from excavation and treatment activities may occur, but would be largely mitigated through the required planning of activities around sensitive breeding and rearing seasons. Excavation could disturb cultural resources located at a site; therefore, careful adherence to cultural resource mitigation planning would be required. **Cumulative impacts** may occur at borrow sites and transportation routes.

SUPPORTING DOCUMENTS

The public is encouraged to read the following documents to gain a better understanding of the 100 Area Remaining Sites:

Hanford Past Practices Strategy (DOE/RL-91-40)

Interim Remedial Action Record of Decision for the 100-BC-1, 100-DR-1, 100-HR-1 Operable Units (EPA 1995)

Amendment to the Interim Remedial Action Record of Decision for the 100-BC-1, 100-DR-1, 100-HR-1 Operable Units (EPA 1997)

100 Area Source Operable Unit Focused Feasibility Study (DOE/RL-94-61) (A complete reference list of Work Plans, Limited Field Investigations, Qualitative Risk Assessments, and Proposed Plans for each Operable Unit containing 100 Area Remaining Sites is contained in Appendix N of this document)

100 Areas Feasibility Study, Phases 1 and 2 (DOE/RL-92-11)

Hanford Federal Facility Agreement and Consent Order, as amended (Ecology, EPA, and DOE 1989)

Hanford Facility Resource Conservation and Recovery Act Permit for the Treatment, Storage, and Disposal of Dangerous Waste, as amended (Ecology 1994)

ADMINISTRATIVE RECORD

The Administrative Record can be reviewed at the following locations:

Lockheed Martin Services, Inc.
Administrative Record
2440 Stevens Center Place, Room 1101
Richland, Washington 99352
509/376-2530
ATTN: Debbi Isom

U.S. Environmental Protection Agency
1200 Sixth Avenue, HW-070
Seattle, Washington 98101
206/553-4494
206/553-4973
ATTN: Diane Richardson

Washington State Department of Ecology
Nuclear Waste Program Library
300 Desmond Drive
Lacey, Washington 98503
360/407-7100
ATTN: Marilyn Smith

POINTS OF CONTACT	INFORMATION REPOSITORIES
U.S. Department of Energy Representative xxx Project Manager 509/xxx U.S. Environmental Protection Agency Representative (Region 10) xxx Project Manager 509/xxx Washington State Department of Ecology Representative xxx Project Manager 509/xxx	This Proposed Plan is available for viewing at the following public information repositories: University of Washington, Suzzallo Library Government Publications Room Box 3529000 Seattle, Washington 98195 206/543-4664 ATTN: Eleanor Chase Gonzaga University, Foley Center Tri-Party Information Repository E. 502 Boone Spokane, Washington 99258 509/324-5932 ATTN: Tim Fuhrman Portland State University, Branford Price Millar Library Science and Engineering Floor Tri-Party Information Repository SW Harrison and Park Portland, Oregon 97207-1151 503/725-3690 ATTN: Michael Bowman U.S. DOE Richland Public Reading Room Washington State University, Tri-Cities Consolidated Information Center, Room 101L Richland, Washington 99352 509/376-8583 ATTN: Terri Traub

GLOSSARY

The first usage of technical terms and other specialized text in this Proposed Plan is shown in bold in the document and defined below.

100 Area Remaining Sites - 100 Area waste sites (other than the 100-N Area) within Operable Units listed on the National Priorities List that are not already addressed in the 1995 ROD or 1997 ROD Amendment or any other decision document at the time of publication of the Proposed Plan for these sites.

Action Memorandum – The primary decision document substantiating the need for a removal response under CERCLA, identifying the proposed action, and explaining the rationale for the removal.

Administrative Record - The files containing all the documents used to select a response action at a CERCLA remedial action site. See page 13 for locations where the Administrative Record for the Hanford Site is maintained.

Applicable or Relevant and Appropriate Requirements (ARARs) -Those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under federal or state law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, or that address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well-suited to the particular site.

Characterization - Identification of the characteristics of a site, often through sampling and analysis of environmental media and materials, to determine the nature and extent of contamination such that informed decisions can be made as to the level of risk presented by the site and therefore the appropriate remedial response.

Comprehensive Environmental Response, Compensation, and Liability Act of 1981 (CERCLA) - A federal law that establishes a program to provide for the identification of hazardous waste sites, to ensure that they are cleaned up, and to allow government entities to evaluate damages to natural resources. CERCLA is also known as the "Superfund law."

Confirmation Sampling - Sampling of environmental media and potentially contaminated materials at a waste site in order to determine if contaminants at a site are above or below remedial action goals. Confirmation sampling, within the context of the 100 Area Remaining Sites Proposed Plan, may also include the review of existing information about a site to determine whether a remedial response is required.

Containment - A general remedial alternative category for which the intent is to leave contaminants in place but minimize their future mobility and access using engineered barriers.

Cumulative Impacts - Impacts to human health and the environment that occur through the additive effect of a number of smaller incidents.

Environmental Restoration Disposal Facility (ERDF) - The Hanford Site's disposal facility for most waste and contaminated environmental media (contingent upon meeting the Environmental Restoration Disposal Facility waste acceptance criteria) generated under a CERCLA remedial action. ERDF currently receives wastes from ongoing remedial actions at Hanford.

Explanation of Significant Difference - Documentation of information obtained after the ROD is signed that would lead to significant changes in a component of the remedy chosen in the ROD as determined by the EPA.

Field Screening - Chemical and radiological analyses that can be performed in the field and that allow for rapid turnaround of data. Typically, this type of analysis is used to indicate contamination rather than to quantify it.

In Situ Treatment - A general category of remedial alternatives that treat contaminants at a waste site in place and without prior removal.

In Situ Vitrification - An in situ treatment technology that converts soil into stable glass or glass-like crystalline substances and stabilizes the contaminants in-place.

Institutional Controls - A general category of remedial alternatives that do not actively remediate contaminants at a waste site but rather limit or prohibit activities that may interfere with the integrity of a cleanup action or result in exposure to hazardous substances at a waste site.

Interim Remedial Actions - A remedial action that is taken at a site for a limited period of time to address one or more of the contamination problems, but not necessarily all of the contamination problems. For the purposes of this Proposed Plan, interim remedial actions are initiated at any time before the final remedial action to be taken in response to a final Record of Decision at the 100 Areas of the Hanford Site.

Land Disposal Restrictions - Regulations promulgated under RCRA that provide treatment standards and requirements on the generation, treatment, storage, and disposal of hazardous waste.

Model Toxics Control Act (MTCA) Regulations - An Act set forth by the State of Washington that provides risk-based cleanup levels for hazardous materials in the environment that are protective of human health and the environment.

National Environmental Policy Act of 1969 (NEPA) - A federal law that establishes a program to prevent and eliminate damage to the environment. Values for this act encompass a range of environmental concerns.

National Priorities List - A list of top-priority hazardous waste sites in the United States that are eligible for investigation and cleanup under the Superfund law.

Observational Approach - A method of planning, designing, and implementing a remedial action that uses a limited amount of initial field characterization data to create a general understanding of the site conditions. Information that is gathered during the remedial action phase is used to make real-time decisions to guide the remedial action. This method is considered more cost and time effective than traditional methods that require large amounts of initial data to make very detailed plans and designs for remedial actions.

Operable Unit - As applied to the Hanford Site, an Operable Unit is a group of land disposal sites placed together for the purposes of investigation and subsequent cleanup actions.

Plug-in Approach - An approach to the selection of a preferred remedial alternative at sites that contain multiple subsites that are similar physically and share common contaminants above remedial action goals.

Proposed Plan - The plan that presents the preferred alternative for remedial action of waste sites to the public by the responsible parties.

Record of Decision - The formal document in which the lead regulatory agency sets forth the selected remedial measure and the reasons for its selection.

Resource Conservation and Recovery Act of 1976 (RCRA) - A federal law that establishes requirements for the storage, treatment, and disposal of hazardous waste.

Remedial Action Goals - Contaminant concentrations, usually risk-based, to be met by remedial action.

Remedial Action Objectives - Site-specific quantitative goals that define the extent of cleanup required to achieve initial cleanup objectives that are established on the basis of the nature and extent of the contamination, the resources that are currently and potentially threatened, and the potential for human and environmental exposure.

Remedial Alternative - General or specific actions that are evaluated to determine the extent to which they can eliminate or minimize threats posed by contaminants to human health and the environment.

ROD Amendment - Documentation of information obtained after the ROD is signed that would lead to fundamental changes in the overall remedy chosen in the ROD as determined by the EPA.
Site Profile - A range of conditions for which a standard remedy will be able to successfully apply.

Standard Remedy - A successfully applied remedial alternative that has been established as the selected remedy for multiple waste sites that exhibit similar physical and chemical characteristics.

To Be Considered - Generally unpromulgated criteria, advisories, or guidance that are used with discretion to define cleanup parameters at a site. Not considered "applicable or relevant and appropriate" requirements.

Waste Sites - Sites that are contaminated or are potentially contaminated due to past operations. Contamination may be contained in environmental media, such as soil or groundwater, or in manmade structures or waste, such as debris.

APPENDIX A

100 AREA REMAINING SITES

Figure A-1. 100 Area Remaining Sites in the 100-BC-1 and 100-BC-2 Operable Units

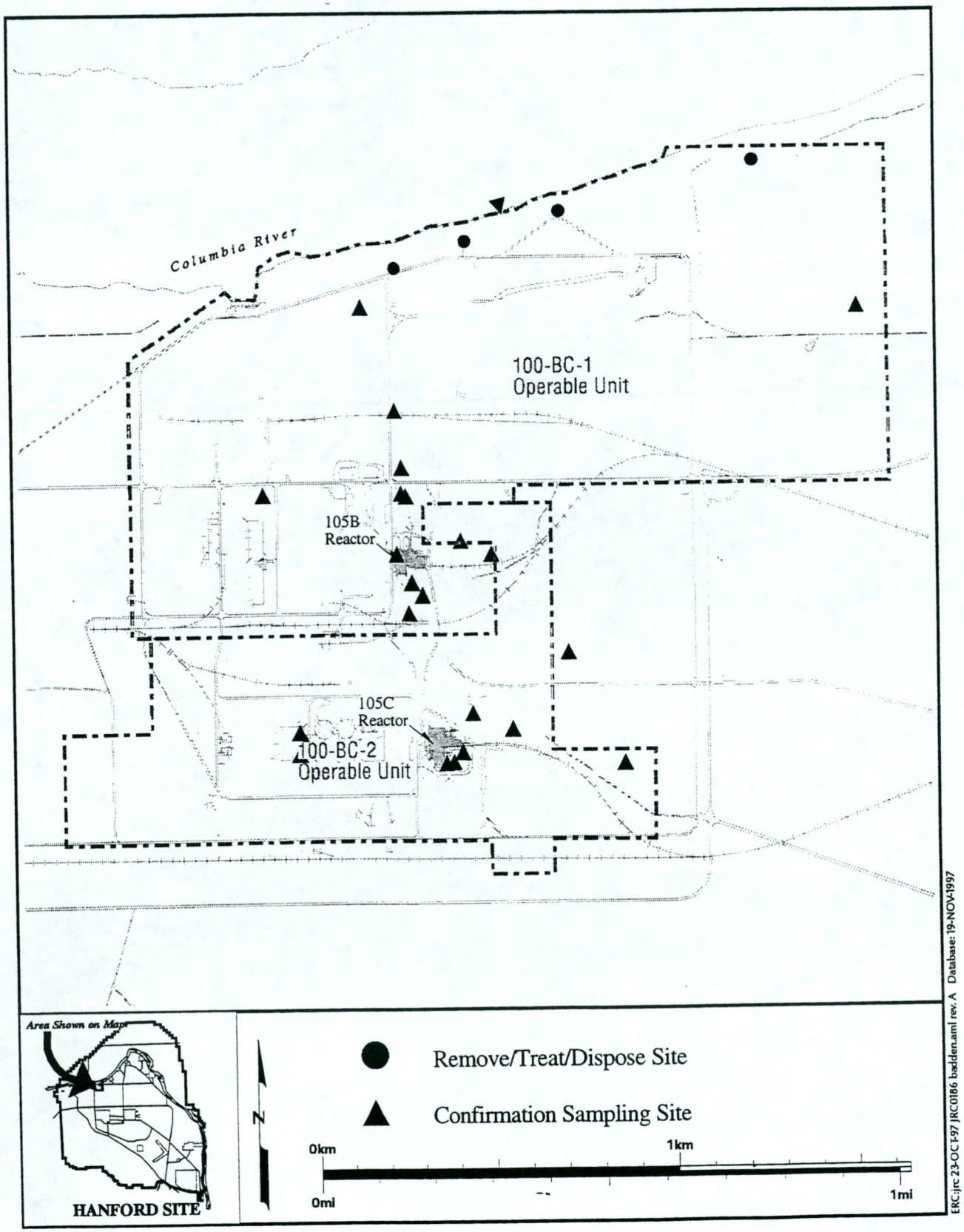


Figure A-2. 100 Area Remaining Sites in the 100-DR-1 and 100-DR-2 Operable Units

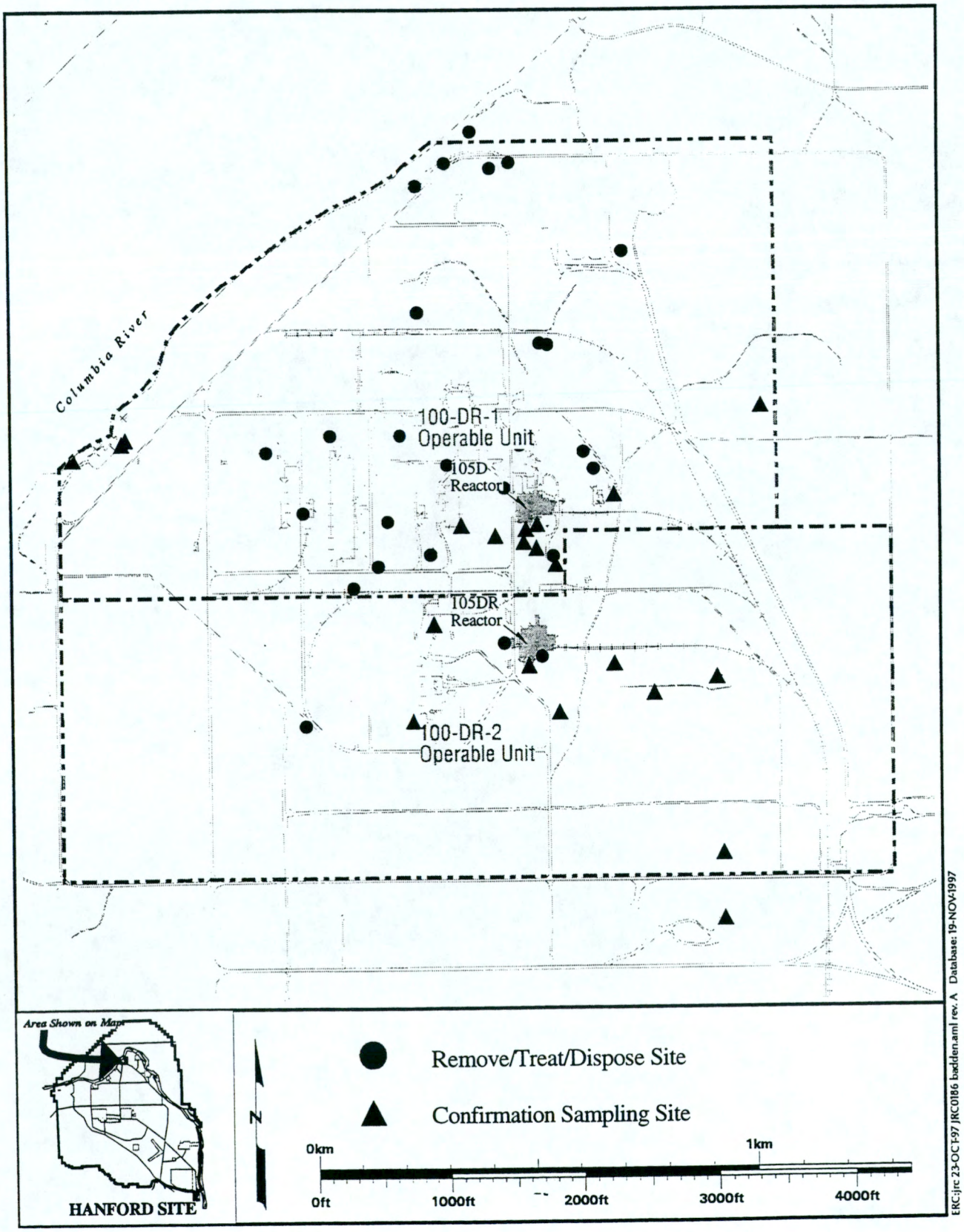


Figure A-3. 100 Area Remaining Sites in the 100-FR-1 and 100-FR-2 Operable Units

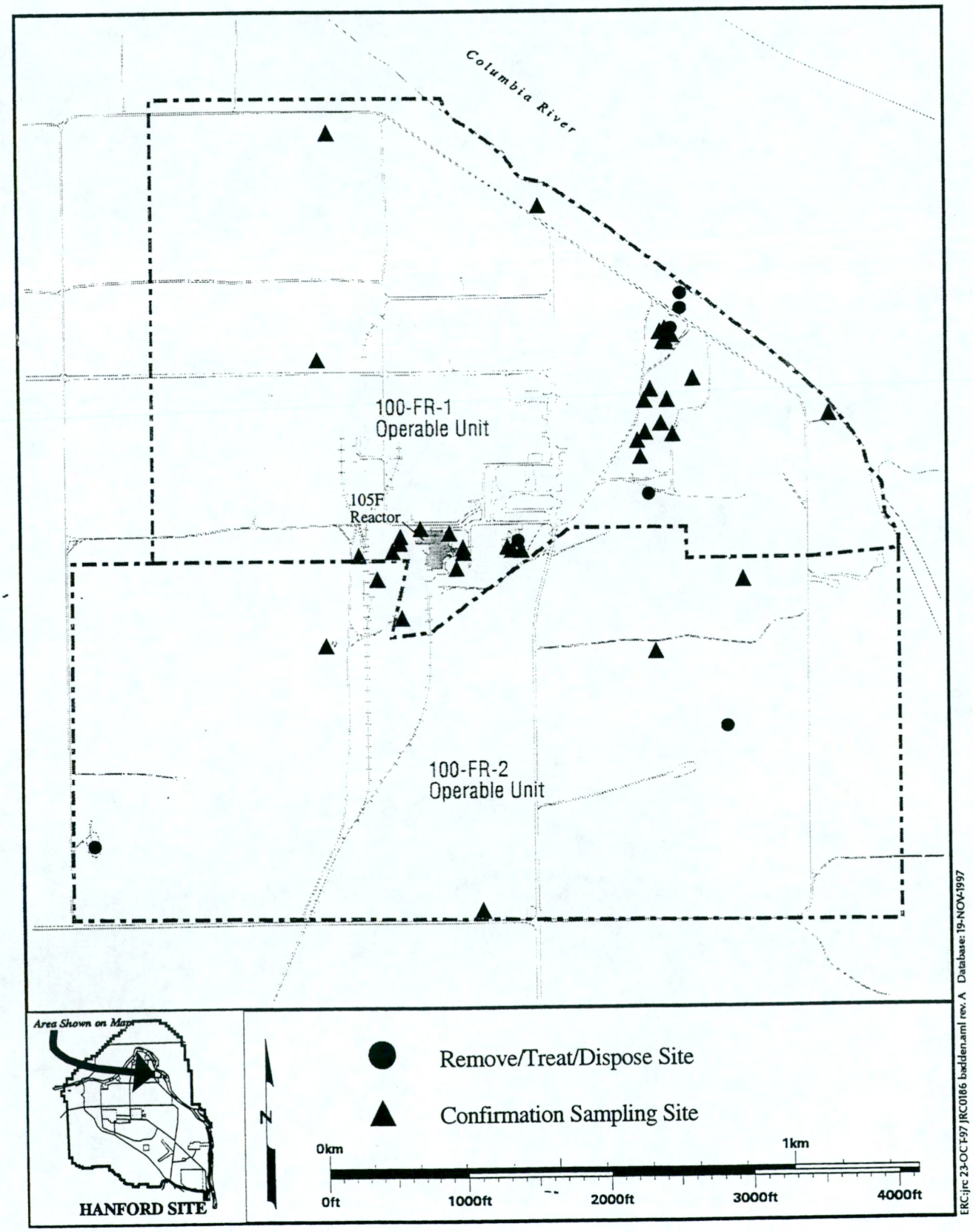


Figure A-4. 100 Area Remaining Sites in the 100-HR-1 and 100-HR-2 Operable Units

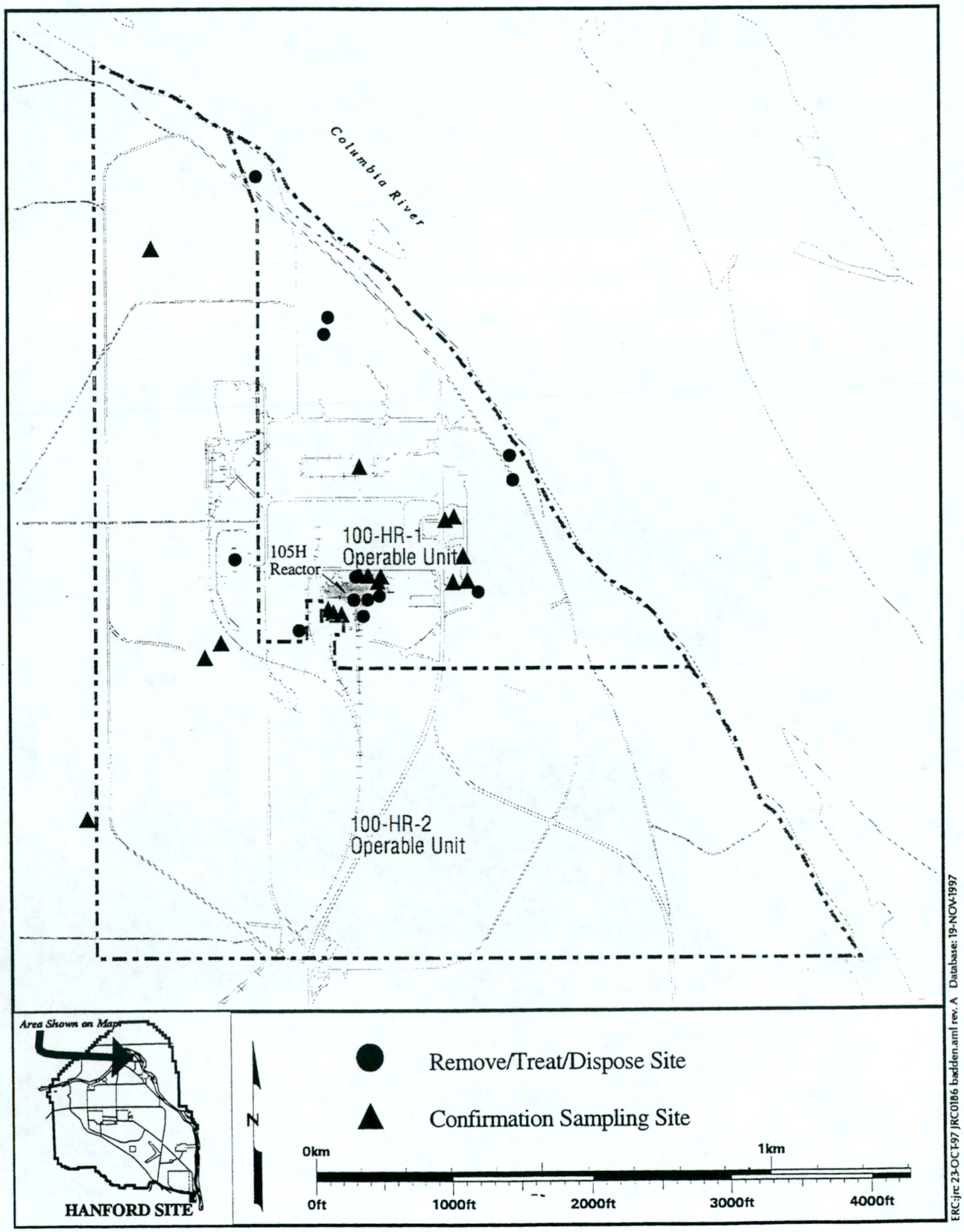


Figure A-5. 100 Area Remaining Sites in the 100-KR-2 Operable Unit

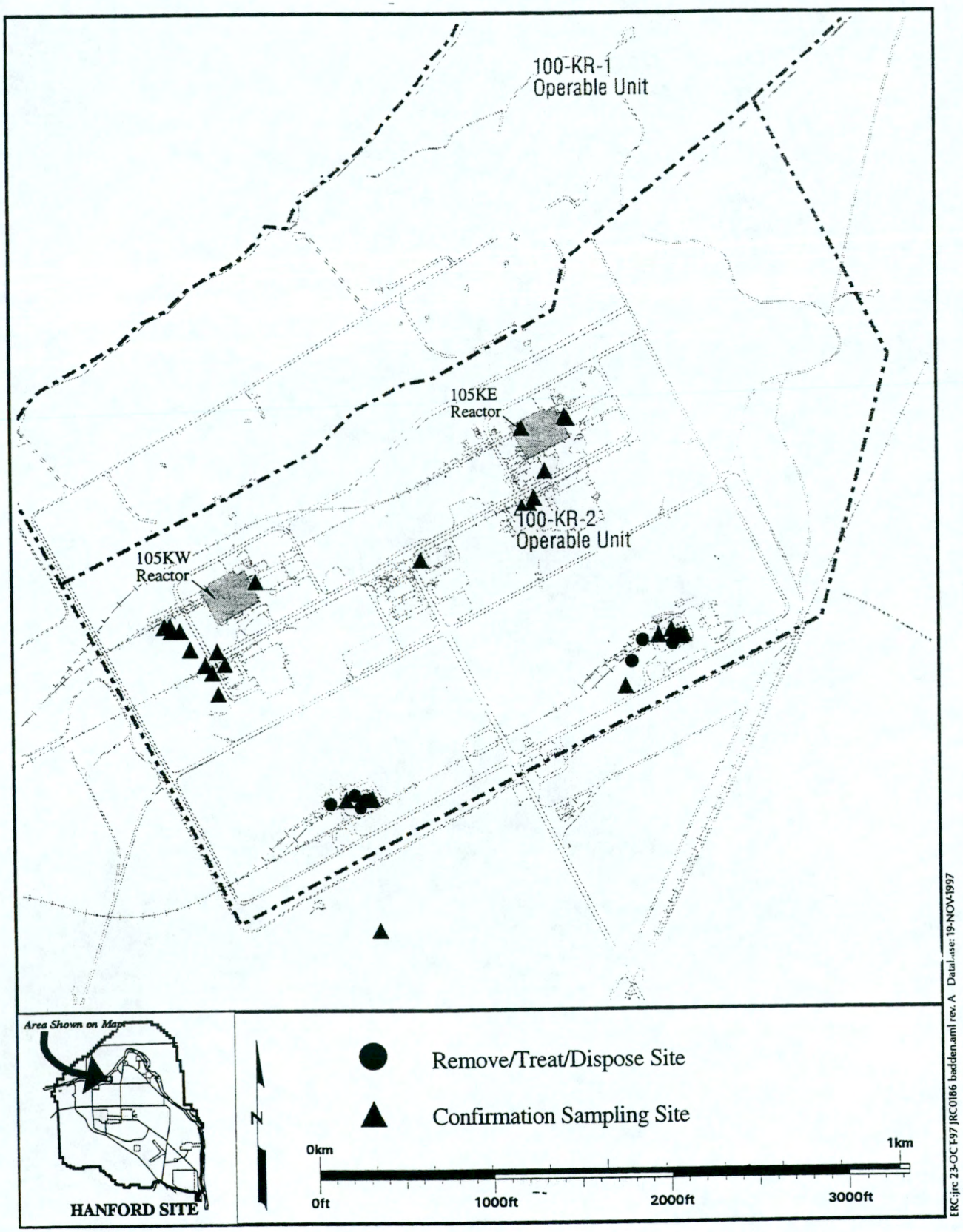


Figure A-6. 100 Area Remaining Sites in the 100-IU-6 Operable Unit

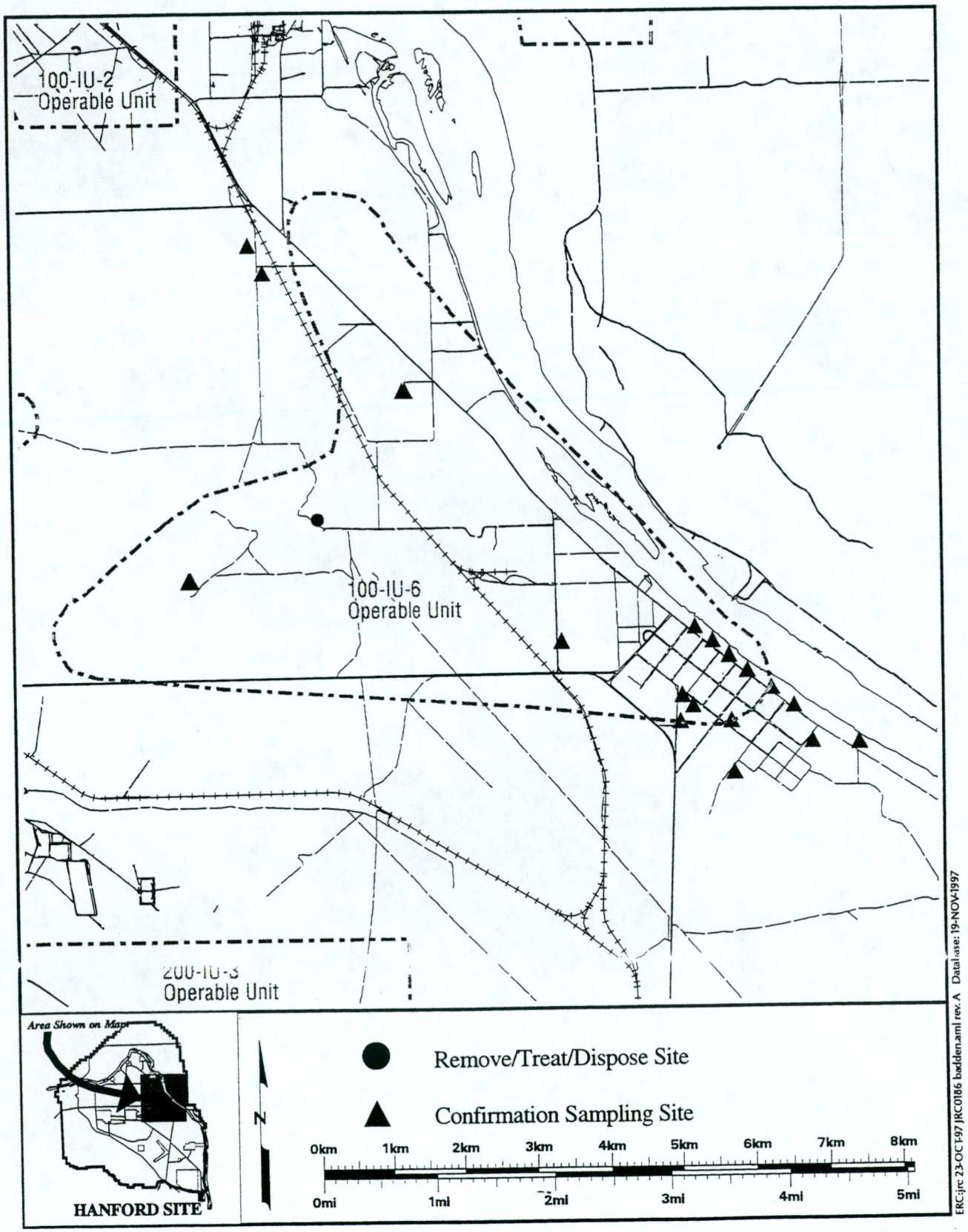


Figure A-7. 100 Area Remaining Sites in the 100-IU-2 Operable Unit

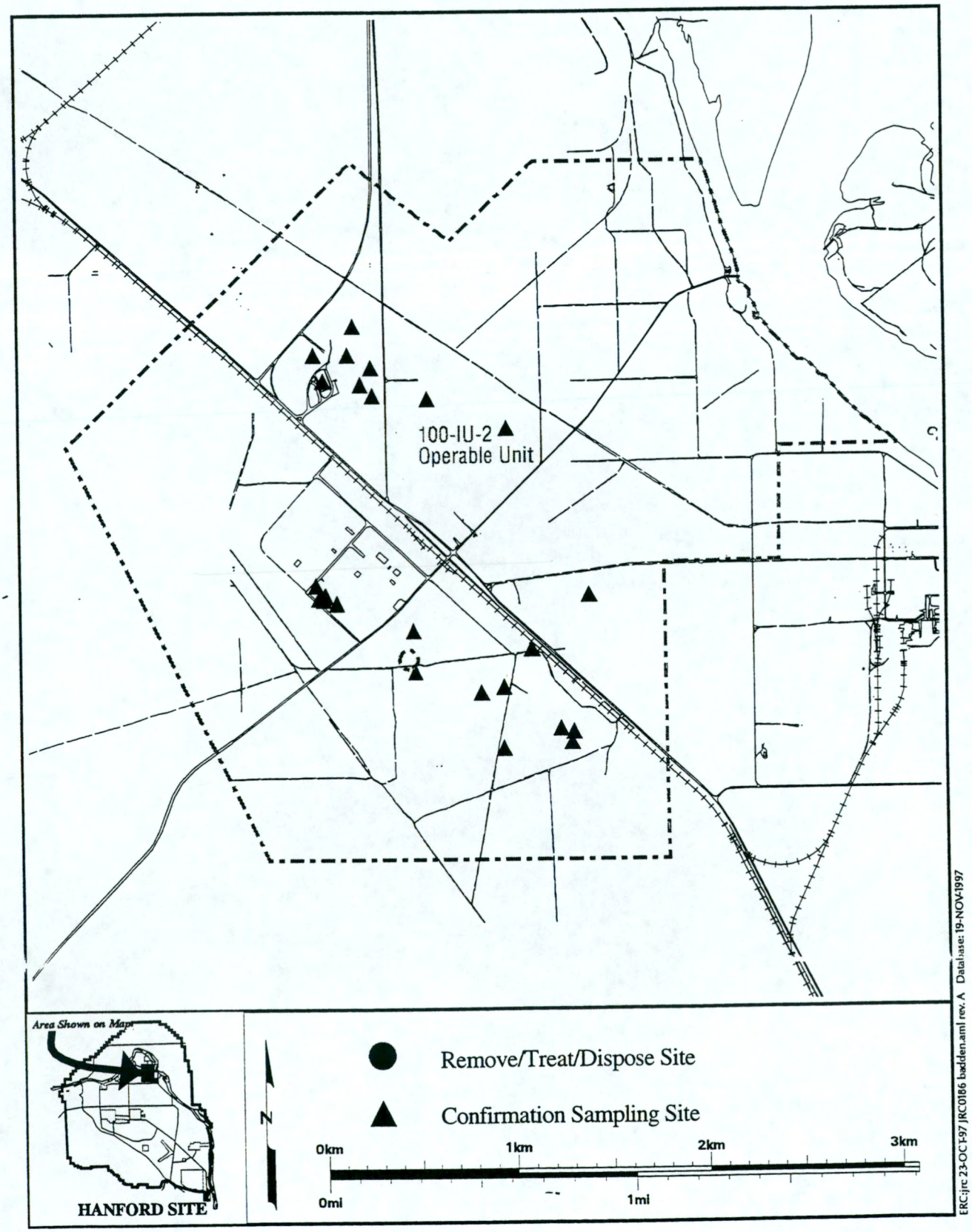


Table A-1. 100 Area Remaining Sites for Remove/Treat/Dispose. (2 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-BC-1	116-B-7 Outfall Structure (1904-B1)	Open concrete sump and concrete spillway for discharge of B Reactor process effluent to the Columbia River.	Concrete, soil	Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, H-3, Sr-90
	128-B-3 Coal Ash and Demolition Waste Site	Used for burning nonradioactive, combustible wastes and disposal of solid building demolition waste.	Soil, debris	Inorganics, organics
	132-B-6 Outfall Structure (1904-B2)	Open concrete sump and concrete spillway for discharge of B Reactor process effluent to the Columbia River.	Concrete, soil	Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, H-3, Sr-90
	132-C-2 Outfall Structure (1904-C)	Former concrete sump and concrete spillway for discharge of C Reactor process effluent to the Columbia River.	Concrete, soil	Cs-137, Co-60, Eu-152, Eu-154, Eu-155, Ni-63, H-3, Sr-90
100-DR-1	100-D-1 Storm Drain	Received radioactive and hazardous liquid waste leakage from 116-D-7 (107-D) retention basin.	Concrete, steel, soil	Radionuclides
	100-D-2 Lead Sheeting	Concrete pad near the 190-D Anne, covered with lead sheeting.	Lead, concrete	Pb
	100-D-3 Silica Gel Burial Site	Received silica gel from the 115-D/DR drying towers. May also be the site of the 100-D Pluto Crib.	Soil, silica gel	C-12, radionuclides, inorganics, organics
	100-D-4 Sludge Trench near 116-D-7	Received reactor process effluent for disposal during fuel element cladding failures.	Soil	Co-60, Cs-137, Eu-152, Eu-155, U-138, Cr VI
	100-D-31 Process Sewer System	Carried water treatment waste and rainwater runoff to outfall 116-D-5 and to the 120-D-1 D Ponds.	Concrete, steel, soil	Cr, Hg, radionuclides, organics
	116-D-5 Outfall Structure (1904-D)	Received reactor process effluent and process wastewater from miscellaneous facilities.	Concrete, steel, soil	C-14, Cs-137, Sr-90, U-235, U-238, Pu-239
	116-DR-5 Outfall Structure (1904-DR)	Received reactor process effluent from the 116-DR-9 retention basin.	Concrete, steel, soil	C-14, Cs-137, Sr-90, U-235, U-238, Pu-239
	120-D-2 Waste Acid Reservoir (186-D)	Lead flashing was not removed when the facility was demolished in place. Facility was never used.	Brick, lead	Pb
100-DR-2	100-D-12 Sodium Dichromate and Acid Unloading Station	Received sodium dichromate and sulfuric acid solutions in water from flushing and draining of hoses and pipelines connected to railcars and trucks for unloading.	Concrete, steel, soil	Cs-137, Eu-152, Th-228, Sulfate, Cr VI
	116-D-8 Cask Storage Pad	Received potassium borate solutions contaminated with radionuclides from decontamination of shipping casks.	Concrete, steel, soil	Cs-137, Eu-152, Th-228, U-238
	116-DR-7 Inkwell Crib	Received liquid potassium borate solution contaminated with radionuclides.	Soil	Cs-137, Eu-152, Th-228, U-238
100-FR-1	116-F-8 Outfall Structure (1904-F)	Received reactor process effluent from the 116-F-14 retention basin.	Concrete, soil, steel	Co-60, Eu-152, Eu-154, Eu-155
	116-F-15 Radiation Crib	Concrete sump in the floor of the 108-F Laboratory Building that received drainage from lab floor and hood drains.	Concrete, steel	Pu-239, Sr-90, U-238, Pb
	116-F-16 PNL Outfall	Concrete spillway that received wastewater from the Experimental Animal Farm sewers.	Concrete, steel, soil	Sr-90, Cs-137, Pu-239
	1607-F2 Septic tank, drain field	Received sanitary wastes containing radionuclides and inorganic chemicals from personnel decontamination.	Concrete, tile, soil	Radionuclides, inorganic chemicals
	1607-F6 Septic tank, drain field (124-F-6)	Received sanitary wastes containing radionuclides and inorganic chemicals from personnel decontamination.	Concrete, tile, soil	Radionuclides, inorganic chemicals
100-FR-2	100-F-2 Strontium Gardens	PNL ecological study garden formerly used for growing plants in soils containing radionuclides.	Soil	Cs-137, Sr-90
	120-F-1 Glass Dump	An open trench containing fluorescent tubes, light bulbs, vacuum tubes, small batteries, and empty chemical bottles.	Debris, soil	Inorganics

Table A-1. 100 Area Remaining Sites for Remove/Treat/Dispose. (2 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-HR-1	100-H-11 Expansion Box French Drain E	French drain to allow drainage of leakage inside a reactor process effluent pipeline expansion box.	Concrete, soil, steel	Radionuclides
	100-H-12 Expansion Box French Drain F and Shielding Lead	French drain to allow drainage of leakage inside a reactor process effluent pipeline expansion box. Shielded with lead bricks.	Concrete, soil, steel, lead	Radionuclides, Pb
	100-H-13 French Drain G	Vitrified clay pipe french drain that formerly received drainage from a steel pipe exiting 105-H Reactor Building.	Vitrified clay, steel	Radionuclides
	100-H-14 Surface contamination Zone H	Surface contamination zone of unknown origin next to the south wall of the 105-H Reactor Building.	Soil	Radionuclides
	100-H-22 Effluent Pipeline Leak	Soil contaminated by leakage from the 105-H Reactor process effluent pipeline.	Soil	Co-60, Eu-152
	100-H-24 Electrical Substation (151-H)	Sampling of stained soil showed PCB levels below TSCA cleanup levels (7 samples).	Soil	PCBs
	100-H-31 PCB in soil at 105-H Reactor	Sampling of stained oil found 1200 ug/kg of Aroclor-1260 in one soil sample.	Soil	PCBs
	116-H-5 Outfall Structure (1904-H)	Former concrete structure that received H Reactor process effluent for discharge to pipelines to the Columbia River.	Concrete, steel, soil	Co-60, Sr-90, Cs-137, Eu-152, Eu-154, Pu-239/240
	116-H-9 Seal Pits Drainage Crib	Gravel-filled crib that received drainage from the 117-H Filter Building seal pits.	Soil, concrete, asbestos	Cs-137, Eu-152, Ra-226, Th-228, Th-232, U-238
	1607-H2 Septic Tank and Drain Field	Septic tank sludge samples showed elevated heavy metal concentrations.	Soil, concrete	Ag, As, Ba, Cd, Ar, Cu, Hg, Ni, Pb, Zn, Sulfate
	1607-H4 Septic Tank and Drain Field	Discharge pipe sludge samples showed elevated heavy metal concentrations.	Soil	Ba, Cu, Pb, Zn, Sulfate
100-KR-2	100-K-14 Acid Neutralization Pit	Received sulfuric acid overflow and drainage from the 183-KE day-use acid tank.	Soil	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Sulfate
	100-K-18 Caustic Neutralization Pit	Lined pit used to neutralize caustic solutions from 183-KW before disposal to the process sewer system.	Concrete, brick	As, Ba, Cd, Cr, Pb, Hg, Ag, Se
	100-K-34 Acid Neutralization Pit	Lined pit used to neutralize sulfuric acid solutions from 183-KW before disposal to the process sewer system.	Concrete, brick	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Sulfate
	100-K-53 Glycol Pipelines	Underground supply and return pipelines that transported ethylene glycol solutions between the 150-KE heat recovery station (116-KE-5) and the 165-KE Powerhouse.	Steel, soil	Ethylene glycol
	100-K-54 Glycol Pipelines	Underground supply and return pipelines that transported ethylene glycol solutions between the 150-KW heat recovery station (116-KW-4) and the 165-KW Powerhouse.	Steel, soil	Ethylene glycol
	120-KE-1 Filter Facility Dry Well	Lined pit used to neutralize sulfuric acid and sludge from 183-KE before disposal to the process sewer system.	Soil	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Sulfate
	120-KE-2 Filter Facility French Drain	French drain at 183-KE for disposal of sulfuric acid sludge removed from sulfuric acid tanks.	Soil, clay pipe	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Sulfate
	120-KW-1 Filter Facility Dry Well	Lined pit used to neutralize sulfuric acid and sludge from 183-KW before disposal to the process sewer system.	Soil	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Sulfate
	120-KW-2 Filter Facility French Drain	French drain at 183-KW for disposal of sulfuric acid sludge removed from sulfuric acid tanks.	Soil, clay pipe	As, Ba, Cd, Cr, Pb, Hg, Ag, Se, Sulfate
100-IU-6	600-149 Small Arms Range	Former practice range for small arms and incendiary devices.	Soil, debris	Pb

[1]COPC - Contaminants of Potential Concern

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-BC-1	100-B-3 (Former Hot Thimble Burial Ground)	Site where a highly contaminated vertical thimble was removed after being temporarily buried in a trench at this site. Radioactive and non-radioactive contaminants may remain in the unlined trench.	Soil	C-14, Co-60, Cs-137, Eu-152, Eu-154, Sr-90, tritium, cadmium, lead, mercury, misc. organic chemicals
	100-B-5 (Effluent Vent Disposal Trench)	Site is result of leakage that occurred at a junction box for reactor effluent pipeline.	Soil	Radionuclides, chromium VI
	100-B-10 (107-B Basin Leak and Warm Springs)	Springs attributed to leaks in the 116-B-11 retention basin. Samples of the water in 1949 showed 4 nCi/L beta activity.	Soil	Radionuclides, chromium VI
	116-B-15 (Cleanout Percolation Pit)	Received contaminated water processed through filters and an ion exchange system before discharge.	Soil	Co-60, Cs-137, Eu-155, Sr-90, U-238, chromium VI
	120-B-1(Battery Acid Sump)	Site is a concrete-lined sump, cleaned in 1986, and formerly used for disposal of waste battery acid, solvents and ethylene glycol.	Concrete, soil	Cadmium, chromium VI, lead, mercury, miscellaneous organic chemicals
	128-B-2 (100-B Burn Pit No. 2)	Unlined pit used for burning of nonradioactive, combustible wastes, including office wastes, paint, and chemical solvents.	Soil, concrete, misc. debris	Miscellaneous hydrocarbons; inorganic chemicals
	132-B-1 (108-B Tritium Separation Facility)	Demolished facility originally designed for mixing and adding chemicals for treatment of reactor cooling water and later converted to tritium recovery.	Soil, concrete	Tritium (H-3)
	132-B-3 (108-B Ventilation Exhaust Stack Site)	Stack and foundation were decontaminated and buried in a trench. ARCL report calculations predicted 2.2 mrem/yr exposure from a radionuclide inventory of 21 millicuries.	Concrete, steel liner, soil	Radionuclides
	132-B-4(117-B Filter Building)	Building was decontaminated and demolished in situ. ARCL report calculations predicted less than 1 mrem/yr exposure from a radionuclide inventory of 92 nanocuries.	Concrete, soil	H-3, C-14, Cs-137, Sr-90, Pu-239/240
	132-B-5 (115-B/C Gas Recirculation Facility)	Building which contained vacuum and pressure seal pits and tunnels was decontaminated and demolished in situ. ARCL report calculations predicted 17 mrem/yr exposure.	Concrete, soil	H-3, Co-60, C-14, Sr-90, Cs-137, Eu-152, Pu-239
	1607-B2 (124-B-2 Septic System)	Active sanitary septic system from office buildings, 105-B Reactor, and 190-B Pumphouse.	Concrete, tile, soil	Unknown
	1607-B7(124-C-1 Septic System)	Received sanitary sewage from 183-B Water Treatment Plant. Reinforced concrete septic tank and tile drain field.	Concrete, tile, soil	Unknown
100-BC-2	100-B-1[a] (Surface Chemical Dumping Area)	Undocumented solid and liquid waste site and laydown yard with several surface dump sites. Reportedly smells of oil and other petrochemicals.	Soil, concrete, miscellaneous debris	Petroleum hydrocarbons; undetermined origin inorganic chemicals
	100-C-3 (119-C Sample Building French Drain)	Site is a small french drain that received water coolant from the heat exchanger for the air sampler, building swamp cooler effluent and floor drain effluent.	Soil, unknown construction materials	Unknown; possible miscellaneous hydrocarbons and inorganic chemicals
	100-C-7 (183-C Filter Building Foundation and Demolition Waste)	Building demolished with sodium-dichromate-contaminated concrete left in place, along with an asbestos-covered steam pipe.	Concrete, soil, steel, asbestos	Sodium dichromate,
	116-C-3 (Chemical Waste Tanks)	Two below ground storage tanks which may have never been used but were installed to receive caustic waste from the metal examination facility. May be filled with water.	Steel, soil	Unknown; possible miscellaneous hydrocarbons and inorganic chemicals
	116-C-6 (Percolation Pit)	Received treated water from the 105-C Fuel Storage Basin cleanup project. Contaminated water was processed through filters and an ion exchange system before discharge. Site is an unlined	Soil	Co-60, Cs-137, Eu-155, Sr-90, U-238, chromium VI
	128-C-1(100-C Burning Pit)	Used for burning non-radioactive combustible materials and disposal of non-contaminated equipment and other solid waste.	Soil, concrete, misc. debris	Solvents and inorganic chemicals
	132-C-1 (105-C Reactor Stack Burial Ground)	Stack and foundation were decontaminated and demolished. ARCL report calculations predicted 4.4 mrem/yr exposure from a radionuclide inventory of 2.8 millicuries.	Concrete	Co-60, Sr-90, Cs-137, Eu-154, Pu-238, Pu-239/240
	132-C-3 (117-C Filter Building Site)	Building was decontaminated and demolished in situ in 1988. ARCL report calculations exist.	Concrete, soil	H-3, C-14, Cs-137, Sr-90, Eu-154, Eu-152, Pu-239/240.
	1607-B8 (Septic Tank and Drain Field)	Received sanitary sewage from 190-C Pumphouse. 350 gallon steel septic tank and tile drain field.	Steel, tile, soil	Unknown
	1607-B9 (Septic Tank and Drain Field)	Received sanitary sewage from 105-C Reactor. 2,400-gal septic tank and tile drain field. Septic tank dimensions are 4.3 x 0.9 x 2.5 m deep (14 x 3 x 8.3 ft deep). Drain field is 408 m^2 (4390 ft^2)	Concrete (?), tile, soil	Unknown

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-BC-2 (continued)	1607-B10 (Septic Tank and Drain Field)	Received sanitary sewage from headhouse of 183-C Water Treatment Plant. 350 gallon steel septic tank and tile drain field.	Steel, tile, soil	Unknown
	1607-B11 (Septic Tank and Drain Field)	Received sanitary sewage from 183-C Filter Building and Pump Room. 350 gallon steel septic tank and tile drain field.	Steel, tile, soil	Unknown
100-DR-1	100-D-8(105-DR Process Sewer Outfall)	Demolished structure that received wastewater from water treatment facilities, possible spills in the treatment facilities, and potentially storm drains from the 100-D Area Cask Pad storm drains.	Concrete, soil	Undetermined radionuclides and organics
	100-D-9[a] (Fuel oil tanks for 1840DA boiler house)	Former location of boiler fuel oil tanks removed during decontamination and decommissioning (D&D) of the 184-DA boiler house. No soil contamination was found.	Soil	Petroleum hydrocarbons; Undetermined organic and inorganic chemicals
	100-D-24(119-D Sample Building French Drain)	Site drawing H-1-19810 shows an "existing dry well" located south of the 119-D Sample Building (demolished) that received drainage from a floor drain.	Soil	Undetermined radionuclides, inorganic and organic chemicals
	100-D-30(Sodium Dichromate Soil Contamination)	Sodium dichromate soil contamination found after demolition of the 190-D Building.	Soil	Chromium
	116-D-10 (105-D Fuel Storage Basin Cleanout Percolation Pits)	Received water from the 105-D Fuel Storage Basin cleanup project that was processed through filters and an ion exchange system before discharge. Pits were excavated, contaminated soil was removed, and the site surveyed, released, and backfilled.	Soil	Undetermined radionuclides
	128-D-2Burning Pit	Received non-contaminated graphite blocks and other solid wastes during reactor construction.	Soil, concrete, metals	Undetermined inorganic and organic chemicals
	130-D-1[a] (1716-D Gasoline Storage Tank Site)	Former location of a steel underground gasoline storage tank (removed during 1989). Contaminated soil may remain.	Soil	Petroleum hydrocarbons; undetermined organic and inorganic chemicals
	132-D-1 (115-D/DR Gas Recirculating Facility)	Decontaminated and demolished building that contained vacuum and pressure seal pits and tunnels to the 105-D and 105-DR Reactor Building.	Concrete, metal	H-3, C-14, Co-60, Sr-90, Cs-137, Eu-152, Pu-239
	132-D-2 (117-D Filter Building)	Potentially contaminated building that was decontaminated and demolished in situ.	Concrete, soil	H-3, C-14, Co-60, Sr90, Cs-137, Eu-152, Pu-239
	132-D-3(1608-D Wastewater/Effluent Pumping Station)	Building was decontaminated, and demolished in situ. Received water from reactor building drains (primarily fuel storage basin overflows) containing low-level radionuclides and decontamination chemicals. Pumped water from collection pits to 105-D Reactor process effluent pipelines.	Concrete, soil	C-14, Sr-90, Tc-99, Ra-226, U-235, U-238, Pu-239, Am-241, VOCs, semi-VOCs
	628-3 Burn Pit	Used for burning of nonradioactive, combustible wastes, including construction debris and chemical solvents. Severe plant stress and soil discoloration.	Soil, misc debris, asbestos	Undetermined inorganic and organic chemicals
	1607-D4 (Septic Tank and Drain Field)	Received sanitary sewage from the 115-D/DR Gas Recirculation Building.	Concrete, tile, soil	Inorganics, Cs-137, Eu-152, semi-VOCs
	1607-D5 (Septic Tank and Drain Field)	Received sanitary sewage from the 181-D River Pumphouse.	Concrete, tile, soil	Unknown
	UPR-100-D-1 (Oil Soaked Soil)	Site is a small depression 0.6 m (2 ft) in diameter surrounded by oil-soaked soil. Natural vegetation partly obscures the site.	Soil	Oil
100-DR-2	100-D-13 (1607-DR3 Septic Tank and Drain Field)	Received sanitary sewage from temporary construction facilities and overflow from the water towers at 100-D and 100-DR Reactors. Site is described as an Imhoff tank with open pit drain field.	Concrete, soil, pipes	Undetermined radionuclides
	100-D-15 (Solid Waste Burial Site/Burrow Pit)	Received debris and miscellaneous waste described as non-radioactive and non-hazardous, including paint cans, solvent cans, and construction materials in two locations in a large borrow pit.	Concrete, metal, miscellaneous debris	Undetermined organic and inorganic chemicals
	100-D-23(119-DR Building French Drain)	Site drawings show an "existing dry well" that received floor drainage and effluent from evaporative cooler in the 119-D Sample Building (demolished).	Soil	Undetermined radionuclides, inorganic and organic chemicals
	100-D-27 (151-D Substation Transformer Leak)	Mineral oil containing less than 50 ppm PCBs leaked from a transformer. The transformer was repaired, and facility was powerwashed, all contaminated material was shoveled into seven 55 gallon drums, and the site backfilled with clean gravel.	Soil, gravel	PCBs
	100-D-28 (190-DR Septic System)	Received sanitary sewage from the 190-DR Building. Described as a 720 gallon steel septic tank and clay tile drain field.	Steel, tile, soil	Unknown

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-DR-2 (continued)	116-DR-8(117-DR Seal Pit Crib)	Received water contaminated with radioactive wastes from the 117-DR Building containment system and seal pits. Released from radiological controls. Facility is registered as an injection well.	Soil	C-14, H-3
	116-DR-10 (105-DR Fuel Storage Basin Cleanout Percolation Pond)	Received treated water from the 105-DR Fuel Storage Basin cleanup project. Contaminated water was processed through filters and an ion exchange system before discharge. In 1984 contaminated soil was removed and site was released using ARCL methodology.	Soil	Undetermined radionuclides
	128-D-1 (100-D/DR Burning Pit)	Used for burning of an estimated 40,000 m^3 of non-radioactive combustible materials such as paint waste, office waste, and chemical solvents. Disposal site was used from 1944-1967. Radioactively contaminated materials were found at the site in 1951 and removed.	Soil, misc. debris, asbestos	Undetermined radionuclides, inorganic and organic chemicals
	132-DR-1 (1608-DR Wastewater/ Effluent Pumping Station)	Building was decontaminated and demolished in situ. Received water from reactor building drains (primarily fuel storage basin overflows). Pumped water from collection pits to 105-DR Reactor process effluent pipelines.	Concrete, soil	Miscellaneous fission and activation products, acids, semi-VOCs.
100-FR-1	100-F-4 (108-F Building 12-in. French Drain)	Vertical 0.3 m (1 ft) diameter vitrified clay pipe adjacent to south wall of 108-F Building. A 1.3 cm (½ in.) steel pipe enters the drain from the 108-F Building. No record of dates of operation, waste type, or quantity.	Clay and steel pipes	Unknown
	100-F-7[a] (1705-F Building Fuel Storage Tank)	Possible location of a steel underground fuel oil storage tank.	Soil	Undetermined organic and inorganic chemicals
	100-F-9 (First French Drain at East End of 105-F Storage Room)	Vertical 0.9 m (3 ft) diameter concrete pipe buried to unknown depth with upper surface 5 cm (2 in.) above grade. No record of dates of operation, waste type and quantity. Drain has a 2.5 cm (1 in) steel pipe coming from the 105-F Building.	Concrete, soil	Unknown
	100-F-10(Second French Drain at East End of 105-F Storage Room)	Vertical concrete pipe buried to unknown depth with upper surface above grade. No record of dates of operation, waste type and quantity.	Concrete, soil	Unknown
	100-F-11 (108-F Building 18-in. French Drain)	Vertical 0.5 m (1.5 ft) diameter concrete pipe (length unknown) adjacent to electrical substation of 108-F Building. No record of dates of operation, waste type and quantity.	Concrete, soil	Unknown
	100-F-12 (36-in. French Drain at 105-F Building)	Vertical 0.9 m (3 ft) diameter concrete pipe of unknown length standing 5 cm (2 in.) above grade with a steel lid. No record of dates of operation, waste type, or quantity.	Concrete, steel, soil	Unknown
	100-F-16 (108-F Building 30-in. French Drain)	Vertical 0.8 m (2.5 ft) diameter steel pipe of unknown length adjacent to south wall of 108-F Building east porch. No record of dates of operation, waste type, or quantity.	Steel, soil	Unknown
	100-F-18 (Former Condensate Tank at 105-F)	Received condensate from the 105-F Fan House and discharged to a drain field. Tank and piping were removed but drain field may remain in place. No record of dates of operation, waste type, or quantity.	Steel	Unknown
	100-F-23 (141-F Drywell)	Received liquid wastes from the 141-C Building; may have been removed. Area posted as "Underground Radioactive Material."	Soil	Undetermined radionuclides
	100-F-24 (145-F Drywell/ French Drain)	Received liquid animal wastes, and may have been removed or covered with backfill during the demolition of the 145-F Facility, which was buried in place.	Soil	Unknown
	100-F-25 (146-FR Drywells/ French Drains	No evidence of drywells or french drains in the area. The units may have been removed or covered with backfill. No record of dates or operation, waste type, or quantity.	Unknown	Unknown
	100-F-29(100-F Experimental Animal Farm Process Sewer Pipelines)	This unit contains the many process sewer lines at the Experimental Animal Farm site. When the buildings were removed the underground lines were left in place. The unit excludes the Reactor and Water Treatment effluent lines.	Concrete, clay, metal	I-131, Sr-90, Cs-37, plutonium and uranium isotopes
	100-F-31 (144-F Sanitary Sewer System)	The site is the septic system receiving sanitary sewage from the 144-F Building. May have also received animal wastes with human wastes. May have been removed during the D&D of 144-F.	Soil	Undetermined radionuclides, inorganics
	100-F-33 (1705-F Fish Farm)	May have received unplanned releases of water containing process effluent from the fish ponds which were unlined, unreinforced concrete.	Soil	Undetermined radionuclides
	100-F-34 (Biology Facility French Drain)	May have received wastewater from the 1705-F Radiobiology Laboratory or Fish Ponds.	Clay pipe, soil	Unknown
	116-F-7 (117-F French Drain)	Received drainage from the confinement exhaust systems filter seal pits in the 117-F Building. Radionuclides had a short half-life and may no longer be of concern. Site was released from radiation zone status.	Concrete, soil, Clay, Asbestos	Unknown radionuclides

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-FR-1 (continued)	116-F-12 (148-F French Drain)	Received an estimated 10,000 L of effluent pump prime water from the lift station between 1944 and 1964. Liquids discharged to the drain percolated into the soil. Contaminants, if any, are unknown.	Concrete, clay, soil	Unknown
	128-F-2 (100-F Burning Pit)	Irregularly shaped depression used for burning nonhazardous office waste, vegetation, paint, solvents, and other combustibles. Received some hardware and machinery. The site has been buried.	Soil	Organics
	132-F-1 (Chronic Feeding Barn Site)	A demolished concrete block building with concrete animal pens for animals used in radiological dose studies. Cleaned out and washed down regularly; drains were connected to sewer 100-F-29.	Soil, concrete	Sr-90, Cs-137, Pu-239
	132-F-3 (115-F Gas Recirculating Facility Site)	Building was decontaminated and demolished in situ. Area was covered with clean backfill .	Concrete, metal pipes, soil	H-3, C-14, Co-60, Sr-90, Cs-137
	132-F-4 (116-F Reactor Stack Demolition Site)	Stack and foundation were decontaminated and demolished. Rubble was covered with 1 m (3 ft) of soil.	Concrete	H-3, C-14, other beta/gamma
	132-F-5 (117-F Filter Building Site)	Decontaminated and demolished building that received and filtered ventilation air from the work areas of the 105-F Reactor Building and discharged it to the 116-F Stack.	Concrete	C-14, Co-60, Cs-137, Sr-90, Eu-154, Eu-152
	132-F-6 (1608-F Wastewater Pumping Station Site)	Received wastewater containing trace amounts of low-level radionuclides and decontamination chemicals from drains and sumps in the 105-F Reactor Building and pumped these wastes into the process effluent pipeline.	Concrete	H-3, C-14, Co-60, Sr-90, Cs-137, Eu-152, Eu-154, acids
	141-C (Large Animal Barn and Biology Laboratory)	Steel building, concrete foundation, footings, and adjacent contaminated soil were removed and disposed of to the 200 Area Burial Ground. Underground pipes were left in place. Radiologically released under AEC Regulatory Guide 1.86	Metal pipes	I-131, Sr-90, Cs-137, Pu-239
	1607-F3 (124-F-3 Septic System)	Received sanitary sewage from the 182-F Pump Station, 183-F Water Treatment Plant, and 151-F Substation.	Concrete, clay tile, soil	Unknown
	1607-F4 (124-F-4 Septic System)	Received sanitary sewage from the 115-F Gas Recirculation Building. Reinforced concrete septic tank.	Concrete, clay tile, soil	Unknown
	1607-F5 (124-F-5 Septic System)	Received sanitary sewage from the 181-F Pumphouse.	Concrete, clay tile, soil	Unknown
	1607-F7 (124-F-7 Septic System)	Received sanitary sewage from the 141-M Building.	Unknown	Unknown
	UPR-100-F-1 (141-C to 141-M Sewer Line Leak)	Spill of 17,000 gallons of animal pens wash water occurred when a process sewer line from the 141-C Hog Barn plugged and overflowed adjacent to the building in 1971.	Soil	Sr-90, Pu-239
	UPR-100-F-3 (Mercury Spill at 146-F Fish Lab)	Mercury spill on the floor of the 146-FR Fish Lab (since demolished). All material was "squeegeed" out the door of the building and was reported to have been cleaned up and removed.	Soil	Mercury
100-FR-2	100-F-14 (Vent Pipe)	Pipe extends 1 m (3.3 ft) above grade. Vent is attached to a tank (probably concrete) that received wastes from a carpenter shop.	Metal pipe, concrete	Unknown
	100-F-28 (Septic System)	The site is a septic tank and drain field for a small building not near any contaminated facilities.	Unknown	Unknown
	118-F-4 (Silica Gel Burial Ground; 115-F Pit)	Received 270 Kg (0.3 tons) of silica gel from the 115-F dryer rooms. Silica gel was disposed to a small unlined disposal pit. The site appears as an open unvegetated cobble field.	Soil, silica gel	Mixed wastes
	128-F-3 (PNL Burning Pit)	Used for burning materials from the Experimental Animal Farm. Shallow pit backfilled with coal ash. No records available on materials burned.	Ash, Soil	Unknown
	128-F-1 (Burning Pit)	Used for burning nonradioactive, combustible materials such as an paint waste, office waste, and chemical solvents.	Soil, misc. debris	Inorganics, organics
	1607-F1 (124-F-1 Septic System)	Received sanitary sewage from the 1701-F Badge House, 1709-F Fire Station, and 1720-F Administrative Office.	Concrete, vitrified pipe, soil	Unknown (served administrative offices)
100-HR-1	100-H-3[a] (1716-H Gasoline Storage Tank Site)	Possible location of a steel underground gasoline storage tank that operated from 1949-1965, and possibly an oil pit.	Soil	Petroleum hydrocarbons, undetermined organic and inorganic chemicals
	100-H-4 (1717-H Hot Shop, French Drain and Contaminated Storage Unit)	Site of a former maintenance building which was decontaminated and decommissioned in the 1970's. Contaminated storage unit and associated french drain were apparently used for work on low-level radioactive materials.	Soil	Radionuclides, organics

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-HR-1 (continued)	100-H-7 (French Drain A)	Vertical 0.76 m (2.5 ft) diameter vitrified clay pipe located east of the 105-H Reactor Building. No record of dates of operation, waste type and quantity. May have been connected to reactor.	Soil, vitrified clay	Radionuclides
	100-H-8 (French Drain B)	Vertical, at grade concrete pipe located east of the 105-H Reactor Building. No record of dates of operation, waste type and quantity. The drain surface is at grade, has a steel cover and is filled with gravel.	Concrete, soil	Unknown
	100-H-9 (French Drain C)	Vertical diameter concrete pipe located west of the 105-H Reactor Building. No record of dates of operation, waste type and quantity.	Concrete, soil	Unknown
	100-H-10 (French Drain D)	Vertical diameter vitrified clay pipe with steel lid located north of the 105-H Reactor Building. No record of dates of operation, waste type and quantity.	Concrete, soil	Unknown
	126-H-2 (183-H Clearwells; Disposal Pit)	Two reinforced concrete basins used to store clean reactor coolant water from the 1830H Solar Evaporation Basins.	Concrete, steel, miscellaneous debris	Undetermined radionuclides and inorganic chemicals
	132-H-1 (116-H Reactor Exhaust Stack Burial Site)	Stack and foundation were decontaminated and demolished in situ. Low-level smearable contamination was present on concrete at the time of demolition.	Concrete	C-14, H-3, Cs-137, Co-60, Eu-152, Eu-154, Eu-155
	132-H-3 (1608-H Wastewater Pumping Station Site)	Received wastewater containing trace amounts of low-level radionuclides and decontamination chemicals from drains and sumps in the 105-H Reactor Building and pumped these wastes into the process effluent pipeline.	Concrete, soil	Radionuclides, lead
100-HR-2	128-H-1 (Burning Pit)	Used for burning nonradioactive, combustible materials such as an paint waste, office waste, and chemical solvents. Partially backfilled with soil and ash. Some debris remains at the site.	Soil, misc. debris	Organics
	128-H-2 (Burning Pit)	Used for burning nonradioactive, combustible materials such as an paint waste, office waste, and chemical solvents.	Soil	Organics
	132-H-2 (117-H Filter Building Site)	Decontaminated, demolished building that received and filtered ventilation air from the work areas of the 105-H Reactor Building and discharged it to the 116-H Stack. The site also includes the original location of the 116-H-4 Pluto Crib, which was excavated in 1960 and moved to a different location.	Concrete	H-3, C-14, Co-60, Cs-137, Sr-90, Eu-52, Eu-154, Pu-239/240
	1607-H1 (Septic Tank and Drain Field)	Received sanitary sewage from the 151-H and 105-H buildings.	Concrete, soil, tile	Unknown
100-KR-2	100-K-13 (Undocumented Liquid Waste Site [French Drain])	Used for disposal of "gray water" waste during construction activities. Now covered by a metal caisson to protect it during construction of a nearby facility.	Soil, concrete	Unknown
	100-K-29(183-KE Sandblasting Site)	Area delineated by red garnet used for sandblasting of steel components from the 183-KE settling basins.	Red garnet sandblast grit	Undetermined Inorganics
	100-K-30(183-KE Sulfuric Acid Tank Site [West])	Site of a horizontal tank which was used for storage of sulfuric acid for water treatment. Concrete bases and above-ground piping for the tank remain in place. Depth and type of contamination (if any) is unknown. No information is available regarding disposal of sludge that the tank may have contained.	Soil, concrete	As, Ba, Cd, Cr, Pb, Hg, Ag, Se
	100-K-31(183-KE Sulfuric Acid Tank Site [East])	Site of a horizontal tank which was used for storage of sulfuric acid for water treatment. Concrete bases and above-ground piping for the tank remain in place. No information is available regarding disposal of sludge that the tank may have contained.	Soil, concrete	As, Ba, Cd, Cr, Pb, Hg, Ag, Se
	100-K-32(183-KW Sulfuric Acid Tank Site [East])	Site of a horizontal tank which was used for storage of sulfuric acid for water treatment. Concrete bases and above-ground piping for the tank remain in place. No information is available regarding disposal of sludge that the tank may have contained.	Soil, concrete	As, Ba, Cd, Cr, Pb, Hg, Ag, Se
	100-K-33(183-KW Sulfuric Acid Tank Site [West])	Site of a horizontal tank which was used for storage of sulfuric acid for water treatment. Concrete bases and above-ground piping for the tank remain in place. No information is available regarding disposal of sludge that the tank may have contained.	Soil, concrete	As, Ba, Cd, Cr, Pb, Hg, Ag, Se
	100-K-36 (1706-KE Chemical Storage Facility Dry Well)	French drain/dry well received spillage and drainage during transfer of sodium hydroxide and sulfuric acid at the Chemical Storage Facility. A white crystalline material, believed to be sodium carbonate, can be seen on the drain.	Soil	Acids, bases
	100-K-46 (119-KE French Drain)	Received sample waste, janitorial waste, and drainage from the evaporative cooler of the 119-KE Sample Building.	Soil	Undetermined radionuclides, inorganics, and organics

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-KR-2 (continued)	100-K-48[a] (100-KE Oil Contamination Area)	Site of fuel oil spillage from rail car off-loading. The oil has been absorbed by soil and sand forming a hard asphalt-like covering on the surface.	Soil	Petroleum hydrocarbons; undetermined organic chemicals
	100-K-49[a] (100-KW Oil Contamination Areas)	Site of fuel oil spillage from rail car off-loading. The oil has been absorbed by soil and sand forming a hard asphalt-like covering on the surface.	Soil	Petroleum hydrocarbons; undetermined organic chemicals
	120-KE-3(183-KE Filter Water Facility Trench, 100-KE-3)	Received sulfuric acid sludge from sulfuric acid storage tanks; sludge contained mercury. The sludge has been removed. Lined with sand to allow the sludge water slurry to drain.	Soil	As, Ba, Cd, Cr, Pb, Hg, Ag, Se
	120-KE-6 (183-KE Sodium Dichromate Tank)	Site of a vertical steel tank used for storage of sodium dichromate solution. Concrete base and piping for the tank remain in place. No known releases, but residual dichromate possible in soil.	Soil, concrete	Cr
	120-KW-5 (183-KW Sodium Dichromate Tank)	Site of a vertical steel tank used for storage of sodium dichromate solution. Concrete base and piping for the tank remain in place. No known releases, but residual dichromate is possible in the soil.	Soil, concrete	Cr
	130-K-2 (1717-K Waste oil storage tank)	Site of a removed underground tank which stored used motor oil. No evidence was found to indicate leakage from the tank	Soil	Unidentified Hydrocarbons
	130-KE-1 (105-KE Emergency Diesel Oil Storage Tank)	Site of two removed 2,000 gallon emergency diesel oil storage tanks. No evidence of leakage was found. However, insulating material covering the tank exteriors showed detectable radioactive contamination when removed.	Soil	Diesel fuel, radionuclides
	130-KW-1 (105-KW Emergency Diesel Oil Storage Tank)	Site of two removed 2,000 gallon emergency diesel oil storage tanks. No evidence of leakage was found. However, radioactive contamination was discovered on the exterior of the tanks. The site was cleaned and closed under the UST Program.	Soil	Diesel fuel, radionuclides
	600-29 (100-K Construction Laydown Area)	Laydown area for the construction of 105-KE Reactor during 1952-1954. Site contains surface chemical dumping areas with oil-stained soil and distressed vegetation.	Soil	Undetermined organic chemicals.
	UPR-100-K-1 (105-KE Fuel Storage Basin Leak)	Received water contaminated with radionuclides leaking from cracks in the 105-KE Reactor Fuel Storage Basin.	Soil	H-3, C-14, C0-60, Sr-90, CS-137, Eu-152, Eu-154, U-235, U-238, Pu-238, Pu-239/240
100-IU-2	600-5(Waste Oil Dump, Asphalt Heliport)	The site is a circular area of heavy oil or asphalt and a ditch covered with similar material. A pipe is in the center of the pad and flush with the surface. Homestead-type trash is scattered in the area.	Soil	Organics
	600-52(White Bluffs Surface Basin)	This site is a depression, adjacent to the pickling acid crib where material from the crib may have washed. Previous sampling showed no contamination. Some demolition debris is in the area.	Soil	Chromium, zinc
	600-99(J.A. Jones #2)	Contained construction debris including wood, concrete, and metals. The site was exhumed and contents taken to a 200 Area burial ground.	Soil	Unknown
	600-120(Spare Parts Burn Pit)	The site is a burn pit that was used for industrial and commercial wastes, and has been backfilled with coal ash.	Ash, soil	Organics and inorganics
	600-124(Burn Site and Paint Disposal Area)	The area is littered with debris, such as burned wood, roofing materials, glass, nails, chips of dried paint and paint cans.	Misc debris, soil	Organics and inorganics
	600-127[a](Fuel Storage Area)	A low soil berm surrounds two loading docks and is covered by coal ash with soil underneath being discolored, probably from petroleum contamination. Fuel storage tanks may have been held in this area.	Soil, ash	Organics
	600-128[a] (Oil and Oil Filter Dump Site)	The site contains oil and oil filters.	Soil	Organics
	600-131 (Special Fabrication Shop and Warehouse)	The site is the remnants of a fabrication shop, boilerhouse, warehouse, loading dock/well, and water station. The area is graveled and littered with debris. Solvents and oils were typically used in similar facilities.	Concrete, soil, misc debris, transite	Organics
	600-132 (Construction Contractor Shop Landfill)	This site is a large open-pit landfill which was contaminated and cleaned out. Potential for radioactive wastes (source unknown). May have been used for disposal of oils and solvents.	Soil	Organics, radionuclides
	600-135 (Spare Parts Machine Shop Landfill and Pit)	Two pits make up this site; one is a borrow pit later used for waste disposal (unknown wastes) and partly backfilled. The purpose of the second pit is unknown.	Soil, misc debris	Unknown
	600-139[a] (Automotive Repair Shop)	The site has scattered debris, such as battery caps, gaskets, oil stains, and lenses from tail lights.	Soil, misc. debris	Organics
	600-176 (White Bluffs Paint Disposal Area)	Excess paint materials were disposed of by dumping them on the ground. Dried paint chips remain at the site.	Soil, paint chips	Organics

Table A-2. 100 Area Remaining Sites for Confirmatory Sampling. (7 Pages)

Operable Unit	Site Name	Current Site Knowledge	Media	COPC[1]
100-IU-2 (continued)	600-181[a] (White Bluffs Oil Dump)	A large quantity of oils have been dumped on the surface at this site.	Soil	Organics
100-IU-6	600-188 (White Bluffs Waste Disposal Trench 2)	The site is an open trench with industrial wastes filling about one-third of the trench. Empty 55 gallon drums and discolored soil remain in the site	Soil, misc. debris	Organics, inorganics
	600-189 (White Bluffs Warehouse Facility French Drains)	Two french drains remain in a former warehouse area. The area contains debris and evidence of oil or chemical dumping. The french drains may have received storm water runoff from the warehouses.	Soil	Organics (at discolored soil)
	600-190 (White Bluffs Warehouse Tar/ Paint Disposal Area)	Tar and paints appear to have been dumped at the site. The site also contains warehouse sites and associated french drains, concrete foundations, valve boxes, and miscellaneous debris.	Soil, concrete, debris	Organics
	600-199 (White Bluffs Ash Covered Concrete Pad)	A concrete foundation pad has been covered with coal ash.	Concrete, ash	Unknown
	600-201 (White Bluffs Paint and Solid Waste Disposal Site)	The site contains miscellaneous debris such as glass, metal shavings, canvas, and dried paint.	Soil, misc. debris	Organics
	628-1 (White Bluffs Burn Pit)	Approximately 1/4 acre has stressed vegetation. The burn pit is covered with sand and gravel.	Soil	Organics
	600-3 (Hanford Townsite Dumping Area and Paint Pit)	The site is an old borrow pit, and a large area of scattered trash. Bulldozer tracks indicate an attempt to bury trash. Parts of the area show signs of burning and stressed vegetation. The site may have been used as railroad maintenance shop disposal yard.	Misc. debris, soil, asbestos	Organics, inorganics
	600-107 (Cribs at 213-J&K Gable Mtn Plutonium Storage Vaults)	Two small gravel-filled concrete culverts on either side of the 213-J and K storage vaults were dug up in 1974 to allow a radiological survey. No contamination was found above background limits, and the excavated material was backfilled.	Concrete, soil	Radionuclides
	600-108(213-J and K Gable Mtn Plutonium Storage Vaults)	The reinforced concrete facility was constructed into the side of Gable Mountain used for soil sample storage and seismic testing which may have briefly stored plutonium. Explosives and hardware contaminated with radioactive sodium were stored there. No smearable radioactivity was detected and the site has been released from radiation zone status	Concrete	Radionuclides
	600-111 (P-11 Critical Mass Laboratory)	Received plutonium waste from the 120 building. It was retired after a fire in the adjacent 120 building caused structural damage and exhumed in 1974. A steel pipe rising from a concrete slab remains at the site.	Concrete, soil	Radionuclides
	600-202 (Four Burn and Burial Pits)	Four burn and burial pits are arranged in a rectangle and received miscellaneous debris, including glass, metal, porcelain which are evident at the site.	Misc debris, soil	Organics
	600-204 (Hanford Townsite Burn and Burial Trench)	The site was used as a burn pit and possibly burial ground. Miscellaneous debris (metal and glass fragments, fire-scarred rock, and cans) is scattered in the bottom.	Misc debris, soil	Organics
	600-208 (Hanford Construction Camp Boiler House Ponds)	Liquid waste disposal ponds serving the steam plants for the Hanford Construction Camp. The wastes in the water were probably mostly water softener brine.	Soil	Unknown
	UPR-600-16 (Fire and Contamination Spread)	A fire-spread plutonium contamination; in 1974 the site was exhumed and released from radiation zone status.	Soil	Plutonium

[1]COPC – Contaminants of Potential Concern
[2]ARCL –Allowable Residual Contamination Level

[a] This site is a petroleum site that is being remediated to cleanup standards established in the Model Toxics Control Act Cleanup Regulations (WAC 173-340) and is outside the CERCLA remedy selection process. It is anticipated that this site can be remediated by the Remove, Treat, and Dispose Alternative. However, should petroleum be found at depth in the soil or in groundwater, other remedial alternatives may be selected by the EPA, Ecology, and the DOE.