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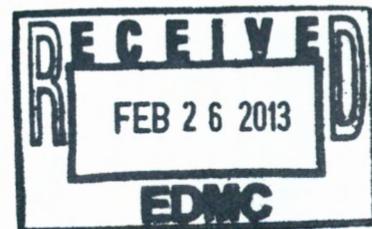
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100-F Area Orphan Sites Evaluation Report

Prepared for the U.S. Department of Energy
by Washington Closure Hanford



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ACRONYMS AND ABBREVIATIONS

AM	action memoranda
CERCLA	<i>Comprehensive Environmental Response, Compensation, and Liability Act of 1980</i>
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ESD	explanation of significant differences
GIS	Geographical Information System
GPS	global positioning system
IDMS	Integrated Document Management System
OSE	orphan sites evaluation
OU	operable unit
RCCC	River Corridor Closure Contract
RL	U.S. Department of Energy, Richland Operations Office
RMIS	Records Management Information System
ROD	record of decision
SIS	Stewardship Information System
Tri-Parties	U.S. Department of Energy, Richland Operations Office, U.S. Environmental Protection Agency, and Washington State Department of Ecology
Tri-Party Agreement	<i>Hanford Federal Facility Agreement and Consent Order</i>
WCH	Washington Closure Hanford
WIDS	Waste Information Data System

1.0 INTRODUCTION

The orphan sites evaluation (OSE) process is a systematic approach used to review land parcels and identify potential waste sites in the River Corridor that are not currently listed in existing *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) decision documents (records of decision [RODs] or, in some limited situations, action memoranda [AMs]). Evaluations are performed within the baseline scope of the River Corridor Closure Contract (RCCC) and consist of comprehensive reviews of historical documentation including, but not limited to, documents, drawings, maps, photographs, field investigations, and geophysical surveys. Orphan sites evaluations have or will be conducted within each reactor/operational area in the River Corridor and within the remaining nonoperational areas of the River Corridor geographical area (referred to as the "100-F/IU-2/IU-6 segments") as depicted in Figure 1-1. Evaluation results are reviewed with the U.S. Department of Energy (DOE), Richland Operations Office (RL) and the lead regulatory agency (U.S. Environmental Protection Agency [EPA] or Washington State Department of Ecology [Ecology]), and subsequently summarized in an OSE report.

New waste sites classified as "accepted" through the TPA-MP-14 process (RL-TPA-90-0001), and similar to those addressed in the existing 100 Area Remaining Sites Interim Action RODs (EPA 1999), qualify for the "plug-in" approach to the confirmatory sampling process and/or remove/treat/dispose cleanup action because remedial action is needed. The EPA 2009 Explanation of Significant Differences (ESD) (EPA 2009) established a process for use of annual fact sheets in lieu of ESDs to document future remediation of waste sites or candidate sites under the Remaining Sites ROD. If new waste sites are "accepted" but are not appropriate for a "plug-in" approach, a separate regulatory decision document will need to be developed and issued to authorize any remedial actions.

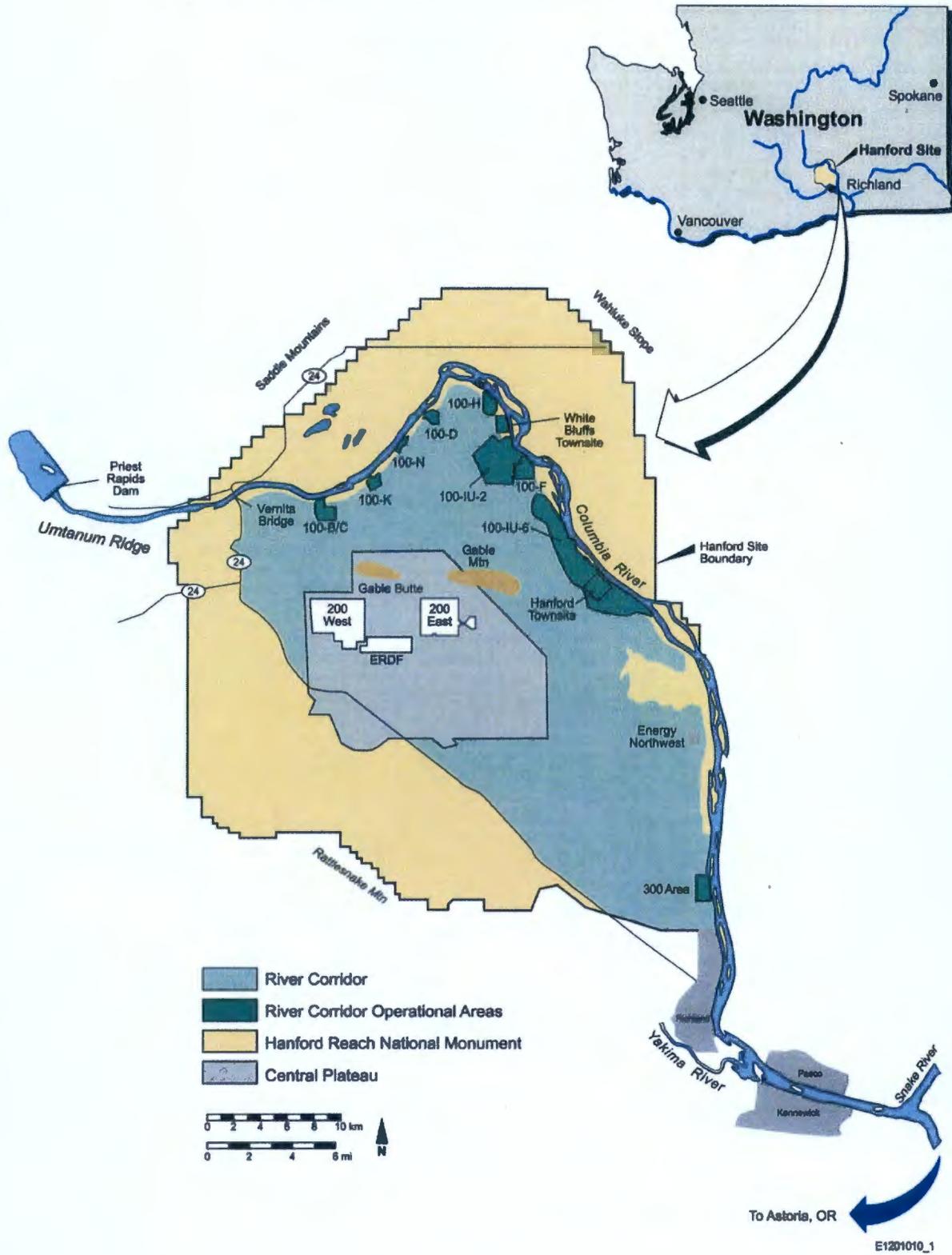
In addition, orphan sites and areas of concern are documented in the Hanford Site Waste Information Data System (WIDS), which is the official repository for documenting the life cycle of waste management units and other areas of concern on the Hanford Site.

1.1 PURPOSE

The purpose of the OSE is to increase confidence that all known waste disposal or releases requiring characterization and cleanup within a given land parcel of the Hanford Site River Corridor have been identified. Information collected through conducting the evaluations also supports elements of the CERCLA 120(h)(4) requirements for review and identification of uncontaminated property at federal facilities.

In 2007, the River Corridor was divided into six geographic areas, commonly referred to as decision areas, to support six final RODs. Each of the areas encompasses reactor areas and their associated operable units (OUs). These include the 100-B/C Area, 100-K Area, 100-D and 100-H Areas, 100-N Area, the 100-F/IU-2/IU-6 Area, and 300 Area. The 100-F/IU-2/IU-6 Area was subdivided into five subareas, referred to as segments, to facilitate planning and implementation because of the large size of this area. This report summarizes the approach and results from an OSE of the Hanford Site 100-F Area that was conducted between March and September 2005.

Figure 1-1. Location of the 100-F Area in the River Corridor.



1.2 SCOPE

The scope of an OSE includes conducting a historical review and a field investigation, briefings with RL and EPA, and issuance of a summary report. Characterization, waste excavation, removal, disposal, and site closeout are excluded from the OSE scope of work. For orphan sites identified during the evaluation, the subsequent characterization and/or remedial action activities was performed by Washington Closure Hanford (WCH) following the addition of the work scope to the RCCC.

The scope of this report includes only the 100-F operational area (Figure 1-2). The coverage for the 100-F Area OSE includes an area of approximately 322 ha (796 ac) and encompasses the 100-FR-1 and 100-FR-2 source OUs.

1.3 KEY TERMS AND DEFINITIONS

100-F/U-2/U-6 Area Segments: The portion of the **River Corridor** that excludes the **reactor/operational areas**. The five segments consist of more than 47,774 ha (118,000 ac).

Field Investigation: A subtask of the **orphan sites evaluation** process that involves a systematic visual inspection of manmade surface features, items, or activity areas within a defined area of the river corridor to identify **potential orphan sites** and capture **miscellaneous restoration** items and **stewardship elements** that are observed. The field investigation also includes geophysical surveys of selected areas based on field observations or information from the **historical review** subtask.

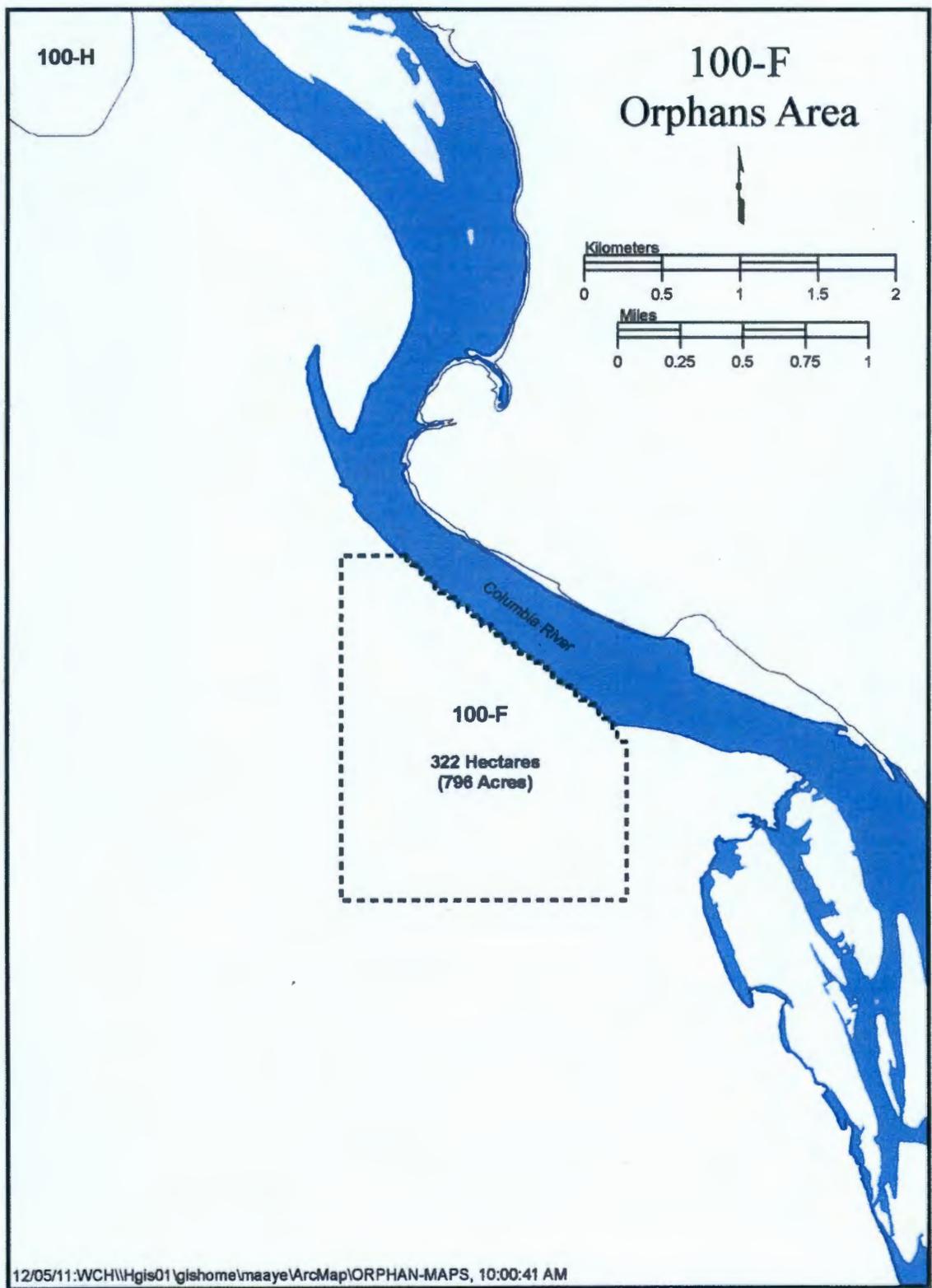
Geographical Information System (GIS) Database: A spatial database of points, lines, and polygons with descriptive attributes organized by themes (e.g., facilities, waste site boundaries, OUs, electrical lines, sewer lines, roadways, railways, groundwater wells).

Historical Review: A subtask of the **orphan sites evaluation** process that involves review of historical documents for building and land uses, potential releases, and current physical condition to identify **potential orphan sites** and focus areas for **field investigation** activities.

Miscellaneous Restoration: A RCCC scope element that includes removing abandoned railroad lines, abandoned above-grade utilities, surface debris such as concrete, and abandoned fences that are not otherwise addressed by the CERCLA decision documents and which are considered contaminated or potentially contaminated with CERCLA hazardous substances. All below-ground debris and structures are excluded from the miscellaneous restoration scope. Miscellaneous restoration also excludes de minimis volumes of non-CERCLA debris (small, scattered nonhazardous surface debris).

Orphan Site: Manmade features, items, or activity areas within the **River Corridor** that (1) meet the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al. 1989) **TPA-MP-14** criteria for waste site identification (RL-TPA-90-0001), (2) are not identified for characterization or cleanup within the existing CERCLA decision document (RODs or AMs), and (3) have been presented to and accepted by RL and EPA through the **orphan sites evaluation** process.

Figure 1-2. 100-F Coverage Area.



Orphan Sites Evaluation: A systematic approach involving **historical review** and **field investigation** activities to identify new source unit waste sites within the **River Corridor** that are not identified for characterization or cleanup within the existing CERCLA decision documents (RODs or AMs). Results of each OSE are presented in a summary report including a description of the process and a listing of identified **orphan sites**. Listings of **miscellaneous restoration** items and **stewardship** elements that are captured during the course of the evaluation are also included in the summary report. Orphan sites evaluations are performed for the **reactor/operational areas** and for the **100-F/IU-2/IU-6 Area segments** of the **River Corridor**.

Physical Hazard: A man-made feature that requires immediate attention (e.g., active subsidence, open wells/cisterns, open basement foundation) based on **field investigation** observations and best professional judgment. When identified, the location and description are communicated to the project safety personnel to address.

Potential Orphan Site: Man-made features, items, or activity areas identified within the **River Corridor** during the historical review or field investigation activities that are evaluated because they have the potential to meet the criteria for an **orphan site**.

Reactor/Operational Areas: The primary activity areas within the **River Corridor** that supported the Hanford Manhattan Project and subsequent Hanford Cold War Era. An **orphan sites evaluation** is conducted for each identified reactor/operational area including the 100-B/C, 100-D, 100-F, 100-H, 100-K, 100-N, 100-IU-2, 100-IU-6, 300, and 400 Areas. Collectively, the reactor/operational areas consist of approximately 6,880 ha (17,000 ac).

River Corridor: A portion of the Hanford Site that is defined by the RCCC. The River Corridor is more than 56,296 ha (139,000 ac) in size and is bounded on one side by the Columbia River. For the purpose of conducting **orphan sites evaluations**, the River Corridor is subdivided into **reactor/operational areas** and **100-F/IU-2/IU-6 Area segments**.

Stewardship Elements: Man-made features, items, or activity areas within the **River Corridor** that (1) do not meet the Tri-Party Agreement TPA-MP-14 criteria for waste site identification (RL-TPA-90-0001), (2) are not part of **miscellaneous restoration** scope, and (3) are anticipated to remain after completion of the RCCC. Examples may include, but are not limited to, groundwater wells, building foundations, and physical hazards. Stewardship elements also include unsubstantiated historical research artifacts that were investigated.

Stewardship Information System (SIS): A WCH-relational database consisting of three components: waste sites, facilities, and **orphan sites evaluations**. The SIS is a primary resource to capture information gathered through the **orphan sites evaluations**.

TPA-MP-14 ("Maintenance of the Waste Information Data System"): A procedure for documenting the life-cycle of waste management units and other areas of concern on the Hanford Site. The procedure establishes responsibilities and the process required to maintain and update waste site information contained in WIDS.

Waste Information Data System (WIDS): An electronic database of waste site information for the Hanford Site. The database identifies waste management units on the Hanford Site, describes the current status of each unit, and includes other descriptive information.

2.0 ORPHAN SITES EVALUATION PROCESS OVERVIEW

2.1 ORPHAN SITES EVALUATION METHODOLOGY

This section presents a summary of the standard OSE work breakdown structure and deliverables. For the purpose of executing the work scope, each OSE has been organized into the following subtasks:

- Historical review
- Field investigation
- Gap analysis
- Integration
- Summary report.

The general scope of each subtask as it applies to the reactor/operational area OSE is summarized in Table 2-1.

Table 2-1. Orphan Site Evaluation Subtask Summary.

Subtask	Scope
Historical review (Section 4.0)	Review historical information (e.g., documents, photographs, drawings, geophysical surveys) associated with facilities, piping systems, operational processes, and waste sites to identify potential orphan sites and target areas for field investigation.
Field investigation (Section 5.0)	Conduct systematic foot-based land survey of operational and nonoperational areas to document potential orphan sites (field-based observation), follow up on potential orphan sites identified from historical review, identify miscellaneous restoration items observed, and identify stewardship elements observed. Nonintrusive geophysical surveys also may be conducted in target areas as part of the field investigation.
Gap analysis	Identify and prioritize any information gaps after completion of historical review and field investigation subtasks. Conduct follow up in identified areas to address information gaps to the extent possible. This subtask may include supplemental historical review and/or field investigation activities as needed.
Integration (Section 6.0)	Prepare draft lists of and initial grouping of potential orphan sites, miscellaneous restoration items, and stewardship elements. Conduct briefings of evaluation results progressively with WCH field remediation project, RL, and the lead regulator. Establish final list of new orphan sites and complete write-up/database entry for orphan sites, miscellaneous restoration items, and stewardship elements. Complete the Discovery Site Checklists for identified sites.
Summary report (this report)	Develop report to summarize results from each orphan sites evaluation conducted and issue to RL (RCCC contract deliverable C.2.10).

RCCC = River Corridor Closure Contract
 RL = U.S. Department of Energy, Richland Operations Office
 WCH = Washington Closure Hanford

2.2 EXCLUSIONS

The following exclusions apply to orphan sites evaluations conducted to support the RCCC.

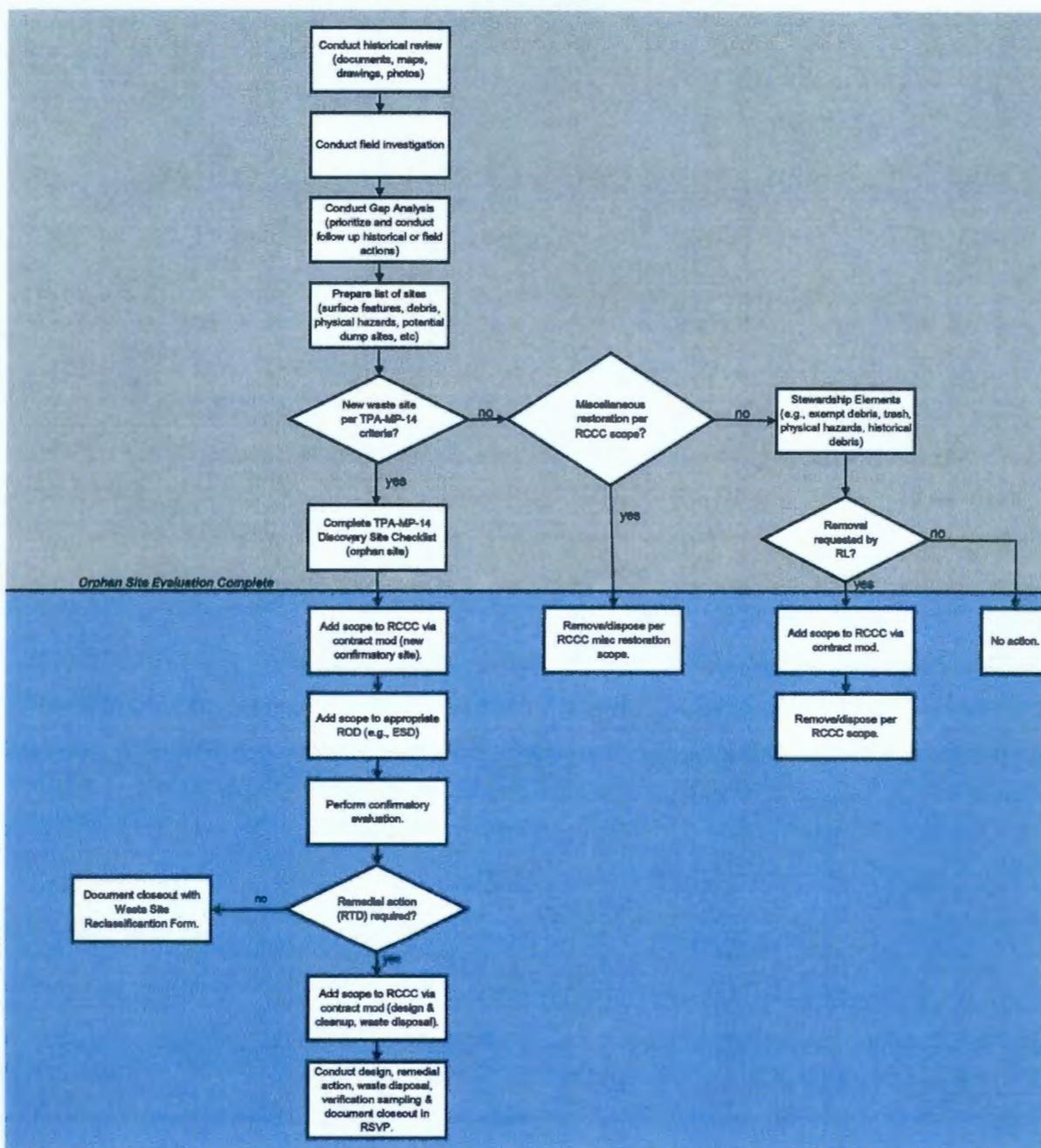
- Characterization (other than geophysical surveys), waste excavation, removal, disposal, and site closeout are excluded in the OSE scope of work. For orphan sites identified during the evaluation, these activities will be performed following modifications to the RCCC to add the appropriate work scope.
- Known or existing waste sites are excluded from the evaluations. This includes waste sites that are scheduled for characterization or cleanup, waste sites that are undergoing cleanup during the evaluation, waste sites where cleanup (i.e., excavation, backfill, and/or revegetation) has been completed prior to the evaluation, and waste sites that have been reclassified as no action or rejected. Surface debris located on these known or existing waste sites may be documented as part of this evaluation.
- Islands and the Columbia River (below the ordinary high-water mark) are normally excluded from the evaluations.
- General trash/garbage and small isolated pieces of debris are scattered throughout the Hanford Site and will not be recorded as part of the evaluations.
- Railroad lines and utility poles are excluded from consideration as an orphan site. These items will be addressed by the miscellaneous restoration requirement of the RCCC.
- Active temporary construction (e.g., remedial action construction trailers) is excluded from the evaluations.

Additional exclusions may be identified during the course of performing work and interacting with RL and the regulators.

2.3 INTEGRATION WITH CERCLA CLEANUP ACTIONS

Source OU cleanup actions in the River Corridor are currently being performed in accordance with several RODs that provide a regulatory framework, establish cleanup objectives, and identify selected remedies. The process flow and approach for integrating the orphan sites evaluations results with CERCLA remedial actions in the river corridor is presented in Figure 2-1. Following completion of the orphan sites evaluation for a given area, it is anticipated that any new waste sites identified by the process will be added to WIDS and to an appropriate interim action ROD for subsequent characterization and determination for additional remedial action. If one or more of the new waste sites does not meet the criteria to be added to an existing ROD, the Tri-Parties (DOE, EPA, and Ecology) will determine an approach to establish the regulatory framework for selection of cleanup actions under an appropriate decision document.

Figure 2-1. Process for Integration of Orphan Sites Evaluation Results with CERCLA Cleanup Actions.



- CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
- ESD = explanation of significant differences
- RCCC = River Corridor Closure Contract
- RL = U.S. Department of Energy, Richland Operations Office
- ROD = record of decision
- RSVP = remaining sites verification package
- RTD = remove, treat, and dispose

2.4 INTEGRATION WITH PROPERTY TRANSFER REQUIREMENTS

Section C.2.11, Activity 11 of the RCCC requires development of a long-term stewardship plan containing a proposed finding of suitability to transfer in accordance with CERCLA 120(h) (WCH-2, *Project Management Plan*). CERCLA Section 120(h)(4) establishes requirements for identifying federal facility property where no hazardous substances and petroleum products or their derivatives were known to have been released or disposed.

Review of the following types of information associated with current and previous uses of the property are identified in Section 120(h)(4):

- A detailed search of federal government records pertaining to the property
- Recorded chain-of-title documents regarding the real property
- Aerial photographs that may reflect prior uses of the real property and that are reasonably obtainable through state or local government agencies
- A visual inspection of the real property and any buildings, structures, equipment, pipe, pipeline, or other improvements on the real property, and a visual inspection of properties immediately adjacent to the real property
- A physical inspection of property adjacent to the real property, to the extent permitted by owners or operators of such property
- Reasonably obtainable federal, state, and local government records of each adjacent facility where there has been a release of any hazardous substance or any petroleum product or its derivatives (e.g., aviation fuel and motor oil), and which is likely to cause or contribute to a release or threatened release of any hazardous substance or any petroleum product or its derivatives (e.g., aviation fuel and motor oil), on the real property
- Interviews with current or former employees involved in operations on the real property.

Identification also can be based on sampling, if appropriate under the circumstances. For property that is part of a federal facility on the National Priorities List (e.g., the Hanford Site), the identification of uncontaminated properties is not complete until the EPA administrator (or his designee) concurs with the results.

These requirements are consistent with the investigations conducted through the orphan sites evaluation process. Where indicators exist to suggest a potential for release or disposal of hazardous substances, a conservative decision is made to identify a new orphan site. Orphan sites are subsequently investigated and characterized through sampling conducted in accordance with a regulator-approved sample design to determine if remedial actions are warranted.

2.5 INFORMATION MANAGEMENT

The Stewardship Information System (SIS) is an Oracle® database created by WCH for the specific purpose of supporting transition from cleanup to long-term stewardship in the River Corridor. Information generated during the process of conducting orphan sites evaluations is captured within facilities, waste sites, and orphan sites evaluation components of the SIS database. The WCH Geographical Information System (GIS) database contains spatial information (e.g., shape and point data) generated from the evaluations and integrates with the SIS database.

For sites identified as orphans (new discovery waste sites), information is also provided to the current WIDS administrator for inclusion into the official Hanford Site WIDS database.

3.0 100-F AREA OVERVIEW

The 100-F Area is the farthest downstream of the nine reactor areas. The 105-F Reactor was a weapons-grade plutonium production facility. Facilities associated with the 100-F Reactor were designed to transport, treat, and store reactor cooling water. Support facilities were also used to house utilities, maintenance equipment, and miscellaneous services.

Construction of the 105-F Reactor began in 1943 and was completed in February 1945. The 105-F Reactor was the third of the three original graphite-moderated plutonium production reactors built at the Hanford Site. Initially, the 100-F Area contained 29 permanent buildings and 24 service facilities, including electrical systems, overhead and underground pipelines, roads, fences, and parking areas.

The 100-F Area also contained an experimental animal farm that began operation in 1945 and continued until 1976. Early studies at the experimental animal farm were conducted to measure the effects of reactor effluents on fish. Later research included the studies of swine, sheep, dogs, and rats. The experimental animal farm facilities included numerous laboratories, barns, pens, pastures, kennels, and waste facilities. At one time nearly 40% of the 100-F Area buildings were devoted to biological research. The reactor and support facilities operated until 1965 when the reactor facility was deactivated and permanently retired from service. Many of the reactor support buildings were decommissioned with the reactor in 1965. Biological research to study the effects of ionizing radiation on plants and animals continued in several buildings until 1976. The facilities related to the experimental animal farm were decommissioned between 1978 and 1979.

CERLCA remedial actions at the 100-FR-1/2 OUs started in August 2000. The 105-F Reactor was placed in interim safe storage (i.e., cocooned) in 2003 under an action memorandum (EPA and DOE 1998).

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4.0 100-F AREA HISTORICAL REVIEW

A comprehensive review of historical information was conducted to identify potential orphan sites for the 100-F Area and/or areas of interest to be investigated further during the course of conducting the associated field investigation. Historical research generally focuses on identifying specific items or features that are typically associated with a waste site. The most common features associated with a waste site include drains, cribs, drywells/french drains, burial grounds, pipelines, above- and below-ground storage tanks, septic systems, drain fields, burn pits, trenches, ditches, pits, spills, sumps, vaults, ash pits, disposal areas, pumps, and building and facilities that contain chemicals and radiological contaminants.

4.1 HISTORICAL INFORMATION RESOURCES

Information obtained and used in the historical review includes, but is not limited to, the following types of resources:

- Maps
- Construction and operations drawings
- Technical and operations documents
- Construction and operations photographs
- Aerial photographs
- Geophysical survey results
- Cleanup verification packages
- Sampling logbooks
- Building demolition and deactivation records
- Personnel interviews.

4.1.1 Documents

Historical documents were located by keyword searches of available databases including the Records Management Information System (RMIS), Integrated Document Management System (IDMS), Declassified Document Retrieval System, DocsOpen, Document and Record Tracking Systems, DOE Reading Room Library, and the Records Holding database. Information from additional databases was accessed through Records and Document Control and Hanford Site Central Files.

4.1.2 Photographs

Photographs collected from RMIS/IDSM database were rectified and used for evaluation and disposition of historical features. The photographs included ground-based and aerial perspectives. These historical photographs primarily depicted construction and operation activities. Among other things, the project team reviewed the photographs for indications of liquid spills, ground disturbance, open trenches or ditches, stressed vegetation, debris, and septic tanks as candidate features for field investigations (see Section 5.0).

4.1.3 Construction Drawings

Construction drawings of interest were identified by reference in reviewed documents and database searches (e.g., Crystal®). Construction drawings were reviewed as part of the waste sites and buildings research. Information obtained was incorporated and referenced in the waste sites and buildings writeups, and subsequently used to update applicable components of the SIS database.

4.2 HISTORICAL REVIEW SUMMARY

The resources identified in Section 4.1 were used to review information related to facility and infrastructure construction, operations, process systems, releases, and demolition (where applicable) within the 100-F Area. Information suggesting the presence of a potential discovery site was reviewed against the existing baseline of waste sites for the area. Where not previously identified as a waste site, further investigation was conducted to support a final determination. In some cases, additional investigation included field verification and/or geophysical surveys as part of the field investigation summarized in Section 5.0. Integration of information from the historical review and field investigation activities is reflected in the results presented in Section 6.0.

5.0 100-F AREA FIELD INVESTIGATION

The field investigation builds on results from the historical review subtask to investigate potential areas of interest to identify and document observations on a systematic investigation of the 100-F Area. The field investigation consists of walking over an area of interest in a systematic manner and locating, documenting, and mapping observed items and features that could lead to the identification of orphan sites. During the course of conducting the field investigation, observed items and features that meet the definition of miscellaneous restoration items or stewardship elements also are documented and mapped.

5.1 FIELD INVESTIGATION DOCUMENTATION TOOLS AND APPROACH

The field investigation provides another level of assurance that all potential waste sites have been identified. Three primary tools provide the media to record the information observed in the field including hand-held Trimble GeoXT® global positioning system (GPS) units, digital cameras, and field logbooks. Nonintrusive geophysical survey instrumentation is used to supplement these tools for selected areas or features identified during the historical review or field investigation.

To ensure a systematic approach for area coverage, a standardized 30- by 30-m (98- by 98-ft) planning grid is established over the area to be investigated. The grid and existing known

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features in the area are loaded onto a hand-held GeoXT GPS unit that is used in the field to monitor progress and record information. Using the conceptual grid as a guideline, the investigation is conducted with approximately 15-m (49-ft) spacing between team members.

5.2 FIELD INVESTIGATION SUMMARY

The 100-F Area field investigation covered an area of approximately than 322 ha (796 ac) (Figure 1-2). Field investigation activities were conducted between March and May 2005. Items or features of interest that were observed during the investigation were recorded in state plane coordinates as a point, line, or area (polygon) using the GeoXT GPS unit. Attributes of each item or feature were recorded with the GeoXT from an imbedded data dictionary picklist structure created specifically for orphan sites evaluations. Features of interest were also photographed with a digital camera.

During the course of conducting the field investigation, more than 600 features were recorded using the GeoXT GPS unit. Associated images of the recorded features were captured in digital photographs. Integration of information from the historical review and field investigation activities, including final categorization of items and features, is reflected in the results presented in Section 6.0.

5.2.1 Geophysical Surveys

Targeted geophysical surveys of nine areas were conducted to support the 100-F Area field investigation. The surveys were conducted to follow up on information discovered during the historical review and/or features observed during the field investigation. Examples included suspect underground tanks or piping systems identified on project drawings, conflicting information associated with location of subsurface features on project drawings, and disturbed surface areas with indication of potential buried debris. Combinations of electromagnetic induction (EM-61), vertical gradient magnetics, and ground-penetrating radar geophysical investigation methods were used in the surveys. Results from the surveys were summarized in a letter report (BHI 2005).

5.2.2 Physical Hazards

During the course of performing the field investigation, physical hazards (e.g., active subsidence, open wells/cisterns, open basement foundation) are recorded using the GeoXT GPS units and reported to safety representatives and field personnel to determine if any mitigating actions (e.g., marking, removal) were needed. No physical hazards were identified during field walkdown activities.

6.0 100-F AREA EVALUATION RESULTS

A final step of the orphan sites evaluation process involves integrating information from the historical review and field investigation, categorizing documented items and features, conducting briefings with RL and the lead regulatory agency staff, and making any necessary changes or modifications to establish the final results. The final results are then documented in

this summary report and reflected in updates to applicable components of the SIS, GIS, and WIDS databases.

6.1 INTEGRATION OF HISTORICAL REVIEW AND FIELD INVESTIGATION INFORMATION

The orphan sites evaluation project team members reviewed information generated from the historical review and field investigation activities to refine the initial categorization of items and features into orphan sites, miscellaneous restoration items, and stewardship elements. Decisions regarding whether or not an item or feature of interest met the qualifications to be identified as an orphan site were made consistent with criteria established by the TPA-MP-14 process (RL-TPA-90-0001). This includes consideration of the following type of questions:

- Is it a solid waste management unit?
- Is it a waste disposal unit (e.g., pits, trenches, dumping areas, french drains)?
- Is it an unplanned release that represents a potential threat to human health and the environment?
- Is it an inactive contaminated structure?
- Does it require a *Resource Conservation and Recovery Act of 1976* permit to treat or store dangerous or mixed waste?
- Is it another type of storage unit (e.g., radioactive waste storage unit) that requires action?

The items identified during the OSE process that meet the criteria are typically unplanned releases, inactive structures, or waste disposal units. Inclusion of items or features in the category of Miscellaneous Restoration was based on the requirements of Section C.2.10 of the RCCC (WCH-2).

6.2 INFORMATION BRIEFINGS

Briefings were conducted to share information and results from the 100-F Area OSE. Initial briefings were held with representatives from the Environmental Restoration Contract project organization responsible for implementing source OU remedial actions. Results of the 100-F Area orphan sites evaluation were subsequently presented to RL project staff (River Corridor Program) and EPA staff during a briefing in August and September 2005, respectively (WCH 2005).

The briefings included an overview of the orphan sites evaluation process and identification and review of proposed orphan sites. Table listings of the sites and features were distributed at the briefings, and selected photographs were projected and discussed with attendees.

6.3 RESULTS AND CATEGORIZATION

Results of the 100-F Area orphan sites evaluation were originally developed as letter reports under the Environmental Restoration Contract. Categorization of the items and features documented during the 100-F Area orphan sites evaluation in accordance with the RCCC scope is presented in the following subsections.

6.3.1 Orphan Sites

A total of 14 new discovery sites were identified through this OSE. Waste site identification numbers and a brief description of attributes are presented in Table 6-1.

A TPA-MP-14 discovery site evaluation checklist was completed for each discovery site identified through this evaluation and assigned a corresponding WIDS identification number. These new discovery sites were "accepted" in accordance with the TPA-MP-14 processes and added to the RCCC scope for subsequent characterization and determination of any remedial actions (Figure 2-1). Information associated with the new discovery site is stored in the waste site component of the SIS database including a site identification number, location, description, photographs, and status.

6.3.2 Miscellaneous Restoration

An evaluation of the remaining items (e.g., items that were not identified as orphan sites) recorded in 2005 during the 100-F Area evaluation was conducted in 2009 to identify an initial list of items that would likely be subject to the miscellaneous restoration scope of the RCCC (Section C.2.10). An initial screening was performed by WCH and subsequently reviewed with DOE-RL in July 2010 for the miscellaneous restoration work scope. Based on the evaluation, a total of six miscellaneous restoration items were identified (Table 6-2). It is anticipated that these items will be removed or otherwise addressed in accordance with RCCC requirements. The items identified in Table 6-2 do not necessarily include all of the items that will be addressed in the 100-F Area within the scope of the miscellaneous restoration contract requirement. Information associated with the miscellaneous restoration items is stored in the orphan sites evaluation component of the SIS database including tracking numbers, locations, and summary descriptions (including photographs).

6.3.3 Stewardship Elements

More than 500 items were recorded during the 100-F Area orphan sites evaluation that are not included in the list of orphan sites (Table 6-1) or miscellaneous restoration items (Table 6-2). While these stewardship elements do not meet the criteria for the orphan sites or miscellaneous restoration categories and are not within the RCCC cleanup scope, it is possible that some may be removed because they ultimately lie within the excavation footprint or other impacted areas (e.g., staging pile areas, container queues) associated with CERCLA remedial actions. Information associated with the stewardship items is stored in the orphan sites evaluation component of the SIS database.

Table 6-1. Summary of Orphan Sites for the 100-F Area. (2 Pages)

Waste Site Identification	Item	Source and Description
100-F-44	100-F Miscellaneous Pipelines	Discovered during historical evaluation. A compilation of additional sewage pipeline segments documented in the remedial action logbooks and identified during the reviews of historical records (e.g., drawings).
100-F-45	100-F Buried River Effluent Pipelines	Discovered during historical evaluation. Based on the results of historical investigation and a limited geophysical survey, it is believed that sections of 106-cm (42-in.)-diameter river effluent pipelines may have been buried here since 1946. About 1 m (3 ft) of the end of a section of large, thick-walled flattened pipeline is visible on the surface of the site.
100-F-46	119-F Stack Sampling Building French Drain	Discovered during historical evaluation. A 5-cm (2-in.) cast iron pipe drained contaminated condensate from the 119-F Stack Sampling Building into the dry well. The condensate from the stack off-gases drained via a 5-cm (2-in.) cast iron pipeline to the 119-F french drain in the soil near the 119-F Sampling Building.
100-F-47	151-F Substation	Discovered during historical evaluation. The substation consisted of a fenced, gravel-bed yard with the 151-F Switch House along the eastern fence line. A railroad spur entered the yard from the south and paralleled the east fence line. More than 100 concrete pads of various sizes were located throughout the yard, supporting a variety of electrical equipment. Underground concrete-encased "Korduct" ducts connected the switch house with the transformers and oil circuit breakers.
100-F-48	184-F Coal Pit Debris	Discovered during historical evaluation. A relatively large concentration of debris was noted in a historical photograph on the western half of the coal pit located immediately to the north of the 184-F Power House. There has been no information found with regard to disposition of the debris. The coal pit has been backfilled with soil.
100-F-49	1716-F Maintenance Garage Lubrication Pit	Discovered during historical evaluation. The 1716-F facility provided repair and maintenance for the 100-F Area vehicles. The garage was potentially contaminated and the above-ground structure was demolished and buried in the 182-F River Water Reservoir, leaving the foundation and below-grade structures. The lubrication pit was backfilled.
100-F-50	100-F Railroad French Drain	Discovered during field evaluation. The ground between two sets of railroad tracks slope down to this french drain. The purpose of this french drain may have been to prevent erosion of railroad beds by collecting and draining snow run-off.
100-F-51	146-F Fish Laboratory Soil	Discovered during historical evaluation. The 146-F Fish Laboratory was housed in a Quonset hut in the northwest corner of the 100-F Area, near the 1904-F Outfall. There is a potential of contaminated soil associated with the operation of this facility.

Table 6-1. Summary of Orphan Sites for the 100-F Area. (2 Pages)

Waste Site Identification	Item	Source and Description
100-F-52	146-FR Radioecology/ Aquatic Biology Laboratory Soil	Discovered during historical evaluation. The 146-FR Radioecology and Aquatic Biology Laboratory functionally replaced the 146-F Fish Laboratory and associated outdoor ponds. There is a potential of contaminated soil associated with the operation of this facility.
100-F-53	108-F Septic System	Discovered during historical evaluation. A 1944 construction drawing was found that showed what appeared to be a septic system or drain field in the ground east of the 108-F Building site and adjacent to the railroad tracks.
100-F-54	100-F Animal Farm Pastures	Discovered during historical evaluation. The 100-F Area complex contained three general pasture areas for radioactively contaminated animals.
100-F-55	1607-F7 Contaminated Ash Layer	Discovered during field evaluation. An ash layer was discovered in the soil beyond the 1607-F-7 waste site boundary. The ash was sampled and found to be above cleanup limits for sodium dichromate. The ash layer was approximately 30.1 cm (1 ft) below grade.
100-F-56	100-F Surface Debris/Stains	Discovered during field evaluation. Surface debris identified during the field walkdowns. Five generic groupings of wastes included asbestos-containing material, lead, oil filters, garnet (sand blasting material), and treated wood.
100-F-57 ^a	190-F Process Water Pump House Debris	Discovered during historical evaluation. The 190-F "complex" (185-F, 189-F, and 190-F) was demolished, contaminated portions sent to 200 Area burial grounds, salvageable materials sold, and the remaining rubble sent to 182-F Reservoir as fill.

^a The asbestos debris portion of the 100-F-57 waste site was removed and put in a new waste site identified as 100-F-59.

Table 6-2. Summary of Miscellaneous Restoration Items for the 100-F Area.

Orphan Sites Evaluation Identification	Keyword	Description	Photograph Identification
F-488	Fence	Rebar laydown area and chain link fencing.	20050512-1
F-498	Railroad	Railroad track segment, 9.2 m (30 ft) long (approximately).	NA
F-464	Railroad	End of railroad tracks northern extent. On former site of 151-F Substation.	20050504-29
F-523	Concrete	Large concrete support chunk 1.2 m by 1.2 m (4 ft by 4 ft).	20050513-22
F-525	Concrete	Concrete chunk 1.5 m (5 ft) round by 1 m (3 ft) tall.	20050513-24
F-542	Drum	Old rusted smashed 114-L (30-gal) drum.	20050513-48

NA = not available

7.0 REFERENCES

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