

**EXPLANATION OF SIGNIFICANT DIFFERENCE
FOR THE 300-FF-5 RECORD OF DECISION¹**

June 2000

SITE NAME AND LOCATION

USDOE Hanford 300 Area
300-FF-5 Operable Unit
Hanford Site
Benton County, Washington

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INTRODUCTION TO THE SITE AND STATEMENT OF PURPOSE

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), hereafter referred to as the Tri-Parties, are issuing this Explanation of Significant Difference (ESD) to provide notice of the decision to expand the scope of the *Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington*, hereafter referred to as the “300-FF-5 Record of Decision” (ROD). The original scope of the 300-FF-5 ROD consisted of groundwater beneath and in the immediate vicinity of the 300 Area industrial complex, including all of the 300-FF-1 waste sites and most of the 300-FF-2 waste sites. The new scope of the 300-FF-5 ROD is expanded to include all groundwater that underlies the 300 Area waste sites and burial grounds. This includes the groundwater beneath the outlying 300-FF-2 source sites and burial grounds, including the following:

- 618-10 Burial Ground,
- 618-11 Burial Ground,
- 316-4 source waste site,
- 600-63 source waste site, and
- 600-259 source waste site.

These five sites are currently in the 300-FF-2 operable unit (OU) but the underlying groundwater was not contained in the scope of 300-FF-5, as it was originally defined in the July 1996 ROD. In addition, the groundwater beneath any newly discovered waste sites that are plugged into the 300-FF-2 ROD in the future will be included in the scope of the 300-FF-5 ROD.

This ESD also requires an update to the “Operation and Maintenance (O&M) Plan for the 300-FF-5 Operable Unit” (DOE/RL-95-73) to ensure that an adequate monitoring and institutional control plan is in place for groundwater beneath 300-FF-1 and 300-FF-2 waste sites.

The Tri-Parties are issuing this ESD in accordance with Section 117(c) of the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) and Section 300.435(c)(2)(i) of the CERCLA National Contingency Plan. This ESD will become part of the Administrative Record. The Administrative Record is available for review at the following location:

¹ EPA, July 1996, *Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington*.

Administrative Record
2440 Stevens Center Place, Room 1101
Richland, Washington 99352
509/376-2530
Attention: Debbi Isom

SITE HISTORY AND CONTAMINATION

Site History

Hanford's 300 Area industrial complex, which encompasses approximately 1.35 sq km (0.52 sq mi), is located about 1.6 km (1 mi) north of the City of Richland adjacent to the Columbia River (Figure 1). The facilities in the 300 Area Complex were associated primarily with former nuclear fuel fabrication activities and research and development. In 1989, the 300 Area was listed on the CERCLA National Priorities List (NPL) for cleanup. The original listing encompasses the waste sites located within the 300 Area Complex as well as a number of sites located in the 400 and 600 Areas near the 300 Area Complex. To organize the cleanup effort, the 300 Area NPL site is divided into three operable units. An overview of the OU boundaries as a result of this ESD are illustrated in Figure 2. A cross-section relationship of the 300 Area OUs to each other is depicted in Figure 3 and summarized below:

300-FF-1. The 300-FF-1 OU consists of waste sites that include the major 300 Area liquid/process waste disposal sites, the 618-4 burial ground, and three small landfills. A ROD was issued for the 300-FF-1 OU in 1996, with a final selected remedy of remove, treat if necessary, and dispose of the waste at the Environmental Restoration Disposal Facility (ERDF) (EPA 1996). Remediation of the waste sites is ongoing.

300-FF-5. The 300-FF-5 OU consisted of groundwater beneath the 300 Area Complex and in the immediate vicinity, including all of the 300-FF-1 and most of the 300-FF-2 waste sites. A ROD was issued in 1996 for the 300-FF-5 OU, with an interim selected remedy of continued monitoring and institutional controls (EPA 1996).

The technical background studies that were performed in support of the 300-FF-5 ROD concluded that the only contaminants of concern (COCs) in 300 Area groundwater were uranium, TCE, and 1,2-DCE. Therefore, the current 300-FF-5 operations and maintenance (O&M) plan, which defines groundwater monitoring activities for the 300-FF-5 ROD, only requires monitoring for these three contaminants. The 300-FF-5 O&M Plan is periodically re-evaluated and updated as new information about overlying source sites becomes available to ensure that adequate monitoring of 300 Area groundwater is occurring. An update effort is planned for fall 2000.

300-FF-2. The 300-FF-2 OU consists of remaining waste sites in the 300 Area and selected portions of the 600 Area of the Hanford Site. Potential remedies for the 300-FF-2 waste sites have been evaluated in a focused feasibility study. A proposed plan presenting the preferred alternative for these waste sites will be available for public comment in summer 2000.

Status of Groundwater Monitoring and Contamination for the Expanded 300-FF-5 ROD Boundary

This ESD expands the scope of the 300-FF-5 ROD to include additional areas north of the original boundary as it was defined in the 300-FF-5 ROD. Groundwater in the expanded 300-FF-5 boundary was evaluated as part of the 300-FF-2 limited field investigation (LFI) (DOE 1997). The LFI evaluation and

subsequent groundwater evaluations have relied on data from existing wells and one new well installed near the 618-11 Burial Ground.

316-4 Crib Area

The groundwater data evaluation done in support of the 300-FF-2 LFI identified only one site outside the 300 Area Complex (the 316-4 Crib) that appeared to be impacting groundwater (DOE 1997) (Figure 4). Routine monitoring of wells near the crib continues to be performed as part of the Hanford sitewide Monitoring Program. Uranium contamination in groundwater downgradient from the crib (observed at well 699-S6-E4A) was first detected in 1951 and reached a peak of 5,900 pCi/L in 1952. Uranium concentrations decreased to 21 pCi/L by 1956. In 1995, well maintenance activities at well 699-S6-E4A may have introduced further contamination to the groundwater. Concentrations of total uranium reached a maximum of 768 µg/L immediately thereafter and have ranged between 22 and 165 µg/L from 1996 to 1999. In addition, tributyl phosphate was detected in well 699-S6-E4A and reached a maximum concentration of 1,500 µg/L in 1996. Concentrations of tributyl phosphate have ranged between 310 and 720 µg/L from 1997 to 1999. The groundwater plume appears to be localized. As an interim measure, additional monitoring data is required to delineate the nature and extent of contamination before a final cleanup decision can be made. Monitoring requirements will be specified in the O&M plan for the 300-FF-5 ROD.

618-11 Burial Ground Area

An additional new well (699-13-3A) was installed in 1995 as part of the 300-FF-2 LFI downgradient of the 618-11 Burial Ground (Figure 5). From 1995 through 2000, the well has been sampled annually for COCs associated with the burial ground. Concentrations of radioactive and inorganic constituents remained consistent from 1995 until 1998. In 1998, an increase in gross beta and total uranium was noted. Uranium concentrations have ranged between 8.5 and 12.2 µg/L. Gross alpha and gross beta results have ranged from 5 to 8 pCi/L and from 14 to near 30 pCi/L, respectively.

In January 1999, a groundwater sample collected from the well was analyzed for tritium for the first time. The results indicated a tritium concentration of 1,860,000 pCi/L, which is significantly higher than other regional wells where tritium concentrations range from 230 pCi/L to approximately 100,000 pCi/L. This also exceeds the drinking water standard for tritium (20,000 pCi/L). Reanalysis of the January 1999 sample confirmed the high value. Results from the annual sample collected in January 2000 indicated a tritium concentration of approximately 8,140,000 pCi/L. In February 2000, well 699-13-3A and 21 other wells in the area surrounding the 618-11 Burial Ground were sampled for tritium and other radionuclides. The monitoring results indicated that the tritium appears to be localized near the 618-11 Burial Ground. No other COCs were identified through the sampling. The results from well 699-13-3A indicate the 618-11 Burial Ground as the likely source of the elevated tritium levels. A larger scale groundwater investigation is currently underway, but additional monitoring data is required to delineate the nature and extent of contamination before a final cleanup decision can be made. Monitoring requirements will be specified in the revised O&M plan for the 300-FF-5 ROD.

618-10 Burial Ground Area

Groundwater monitoring activities for this burial ground are performed in conjunction with monitoring for the 316-4 Crib, which is located immediately downgradient from the burial ground (Figure 4). There is no evidence that this burial ground is contributing to groundwater contamination. Continued monitoring will be specified in the O&M plan for the 300-FF-5 ROD to verify this.

600-63 and 600-259 Area

Soil sampling has indicated that no contaminants have been released from the 600-63 or 600-259 facilities. Therefore, there is no ongoing groundwater monitoring for these sites.

Newly Discovered Sites

As sites are added to the 300-FF-2 OU via the plug-in approach, the DOE shall revise the O&M plan for the 300-FF-5 ROD, as necessary, to provide for an evaluation of potential groundwater impacts to determine whether groundwater response actions are warranted and to ensure that adequate groundwater monitoring is performed.

BASIS FOR THE DOCUMENT

The Tri-Parties have determined that it would be appropriate to address all of the 300 Area NPL site groundwater with a single interim decision document. This will ensure that the groundwater monitoring program and remedy are implemented in a consistent and integrated fashion. To accomplish this, this ESD expands the scope of the 300-FF-5 interim ROD to include the groundwater beneath the 300-FF-2 OU waste sites, including sites located in the 600 Area.

The selected remedy specified the 300-FF-5 interim ROD is continued monitoring and institutional controls (EPA 1996). This ESD does not change the remedy selected in the 300-FF-5 interim ROD. It merely expands the boundary specified by the ROD to ensure adequate groundwater monitoring and institutional controls are occurring for the 300 Area NPL site.

The Tri-Parties have also determined that, at this time, the current 300-FF-5 interim remedy of institutional controls and monitoring is appropriate for the expanded groundwater boundary. Contamination within the expanded boundary is localized near two waste sites and poses no near-term threat to the Columbia River. In addition, as long as institutional controls preclude groundwater contact, there is no threat to human health. Groundwater contamination that has been identified in association with 300-FF-2 OU waste sites shall be integrated into an updated O&M Plan for the 300-FF-5 ROD. In addition, groundwater contamination deriving from the 300-FF-2 waste sites will continue to be evaluated to determine whether additional remedial actions for the groundwater (beyond monitoring and institutional controls) are necessary to protect human health and the environment. Any such groundwater remedial actions will be authorized in an amendment to the 300-FF-5 ROD.

DESCRIPTION OF SIGNIFICANT DIFFERENCES

The expansion of the 300-FF-5 ROD scope does not change the overall objectives of the 300-FF-5 remedy, which are to prevent contact with contaminated groundwater and to protect the Columbia River. Institutional controls preventing use of the 300 Area groundwater will remain in place and groundwater monitoring will be continued.

The 300-FF-5 monitoring program will be expanded as appropriate to include ongoing groundwater monitoring activities associated with the 300-FF-2 waste sites. This will include incorporating existing 300-FF-2 groundwater monitoring activities into the 300-FF-5 program through a revision to the O&M Plan for 300-FF-5 ROD. These activities will include the following:

- Sampling and analysis at well 699-S6-E4A, which provides downgradient monitoring for the 618-10 Burial Ground and the 316-4 Crib. The analyses shall consist of volatile organic analysis (VOA), semi-VOA (including tributyl phosphate), metals (both filtered and unfiltered), gross alpha, gross beta, total uranium, and a gamma energy analysis. The well shall be sampled semiannually. Both of the semiannual sampling events will be performed in conjunction with the sitewide monitoring program. In the January sampling event, the only analysis that is not included in the sitewide monitoring program and must be performed specifically in support of CERCLA program is the filtered metals analysis. In the July sampling event, the gamma energy analysis, filtered and unfiltered metals, and VOAs must all be analyzed exclusively in support of CERCLA.
- Sampling and analysis at well 699-13-3A, which provides downgradient monitoring for the 618-11 Burial Ground. The analyses shall consist of filtered and unfiltered metals, gross alpha, gross beta, and total uranium. Sampling prior to 2000 was performed on an annual basis. Due to the recent discovery of groundwater contamination downgradient from this burial ground, groundwater investigations have been initiated but additional groundwater monitoring data is required to define the nature and extent of contamination. These requirements will be documented in the revised O&M plan and will include, as appropriate, the following: the addition of other constituents to the analyte list (e.g., tritium), an increase in the frequency of sampling, sampling additional monitoring wells, and installing and sampling new monitoring wells. The O&M plan must include provisions for adequate monitoring of this waste site.
- A review of the 300-FF-5 data shall be performed after receipt of any groundwater analysis and a more complete evaluation of the data shall be provided annually to EPA.

In addition to the above requirements, the revised O&M plan must also address:

- Periodic monitoring of 300 area groundwater to ensure that 300-FF-2 waste sites are not impacting groundwater quality
- An evaluation of the groundwater monitoring plan for the 618-4 burial ground
- An evaluation of the groundwater monitoring plan for the 316-4 crib
- An evaluation of the groundwater monitoring plan for the 618-10 and 618-11 burial grounds
- An evaluation of the monitoring plan for groundwater contamination sources identified in the "Annual Hanford Site Groundwater Monitoring Report" that are associated with waste sites contained in the 300-FF-1 and 300-FF-2 operable units (i.e., the revised O&M plan must "track" with the most recent version of the annual sitewide groundwater monitoring report)
- Regulatory reporting requirements
- A periodic reevaluation of the adequacy of the groundwater monitoring program for the 300-FF-1 OU and 300-FF-2 OU waste sites (e.g., once every 5 years or more often if required by the EPA) and provisions for proposing changes to the O&M Plan for the 300-FF-5 ROD as appropriate. The reevaluation may result in expanding the list of analytes monitored at existing wells and/or adding additional monitoring wells. In addition, the review may identify the need for additional groundwater remedial actions (which would be implemented through an amendment to the 300-FF-5 ROD).

DOE shall submit a revised O&M plan by March 2001 that defines monitoring and institutional controls for the groundwater beneath 300-FF-1 and 300-FF-2 waste sites, as specified above. DOE shall implement the revised O&M plan as approved by EPA.

There will be an increased cost associated with expanding the 300-FF-5 monitoring program to include the existing groundwater monitoring associated with the 300-FF-2 waste sites. The cost of the original 300-FF-5 remedy was estimated at \$80,000 per year. The cost for the 300-FF-2 groundwater monitoring

is approximately \$10,000 per year, so the total cost of the 300-FF-5 remedial action will increase to approximately \$90,000 per year. The revised O&M plan may also have additional costs associated with its implementation.

SUPPORT AGENCY COMMENTS

By issuance of this ESD, the support agency concurs with the decision to expand the scope of the 300-FF-5 OU and ROD to include groundwater underlying the 300 Area NPL sites located under the 300-FF-2 waste sites, including sites located in the 600 Area.

STATUTORY DETERMINATIONS

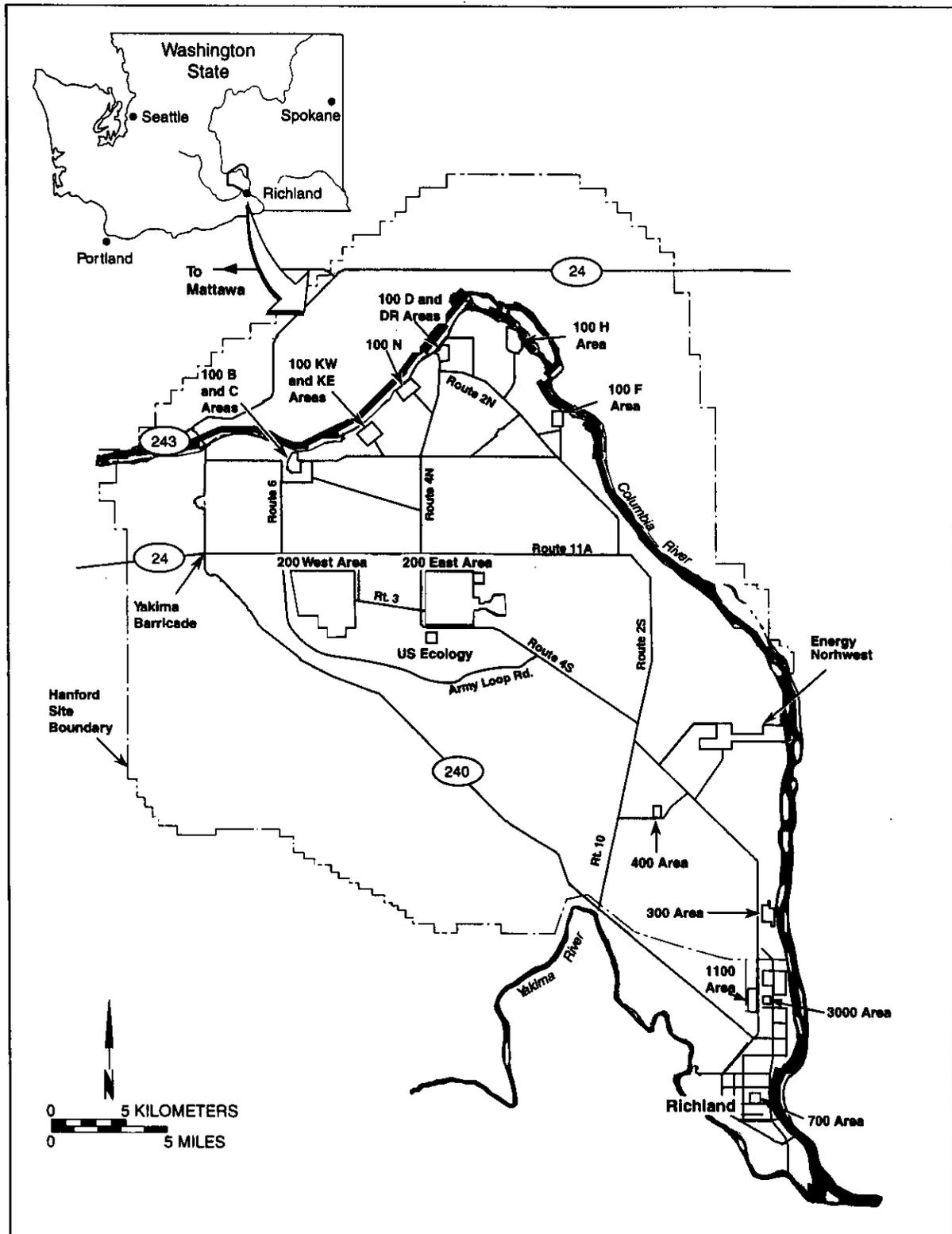
This modified remedy satisfies CERCLA Section 121. The interim remedy selected in the 300-FF-5 ROD, as modified by this ESD through the expansion of the 300-FF-5 ROD scope, remains protective of human health and the environment, complies with Federal and State requirements that are applicable or relevant and appropriate to remedial actions, is cost-effective, and utilizes permanent solutions and alternative treatment technologies to the maximum extent practicable.

The response action selected by this ESD and the 300-FF-5 interim action ROD is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment. Such a release or threat of release may present an imminent and substantial endangerment to public health, welfare, or the environment.

PUBLIC PARTICIPATION COMPLIANCE

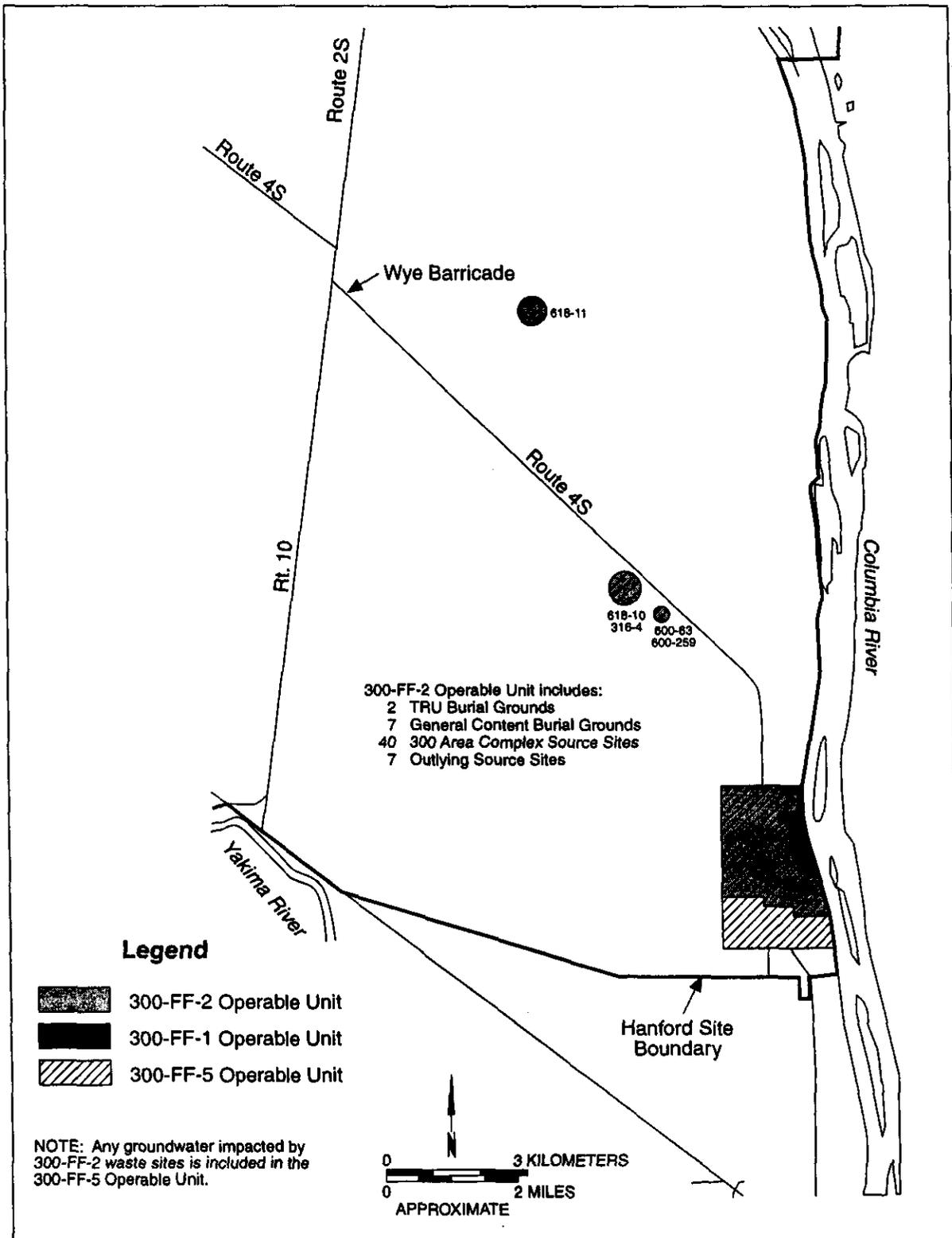
The public participation requirements set out in NCP Section 300.435(c)(2)(i) are met through issuance of this ESD.

Figure 1. Hanford Site Map.



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E9905079.4

Figure 2. Overview of the 300 Area Operable Unit Boundaries.



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E9905079.1

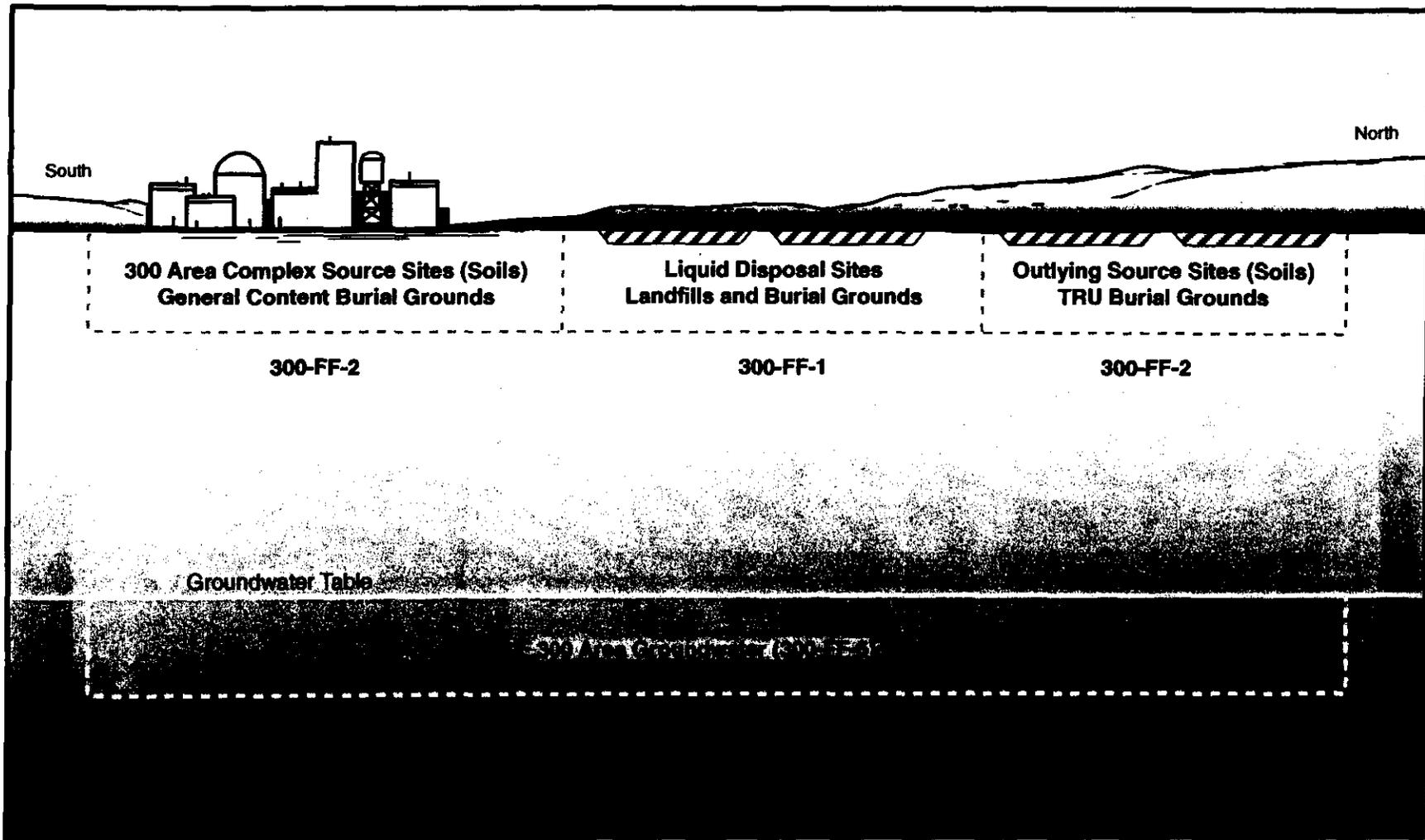


Figure 3. General Relationship of the 300 Area Operable Units.

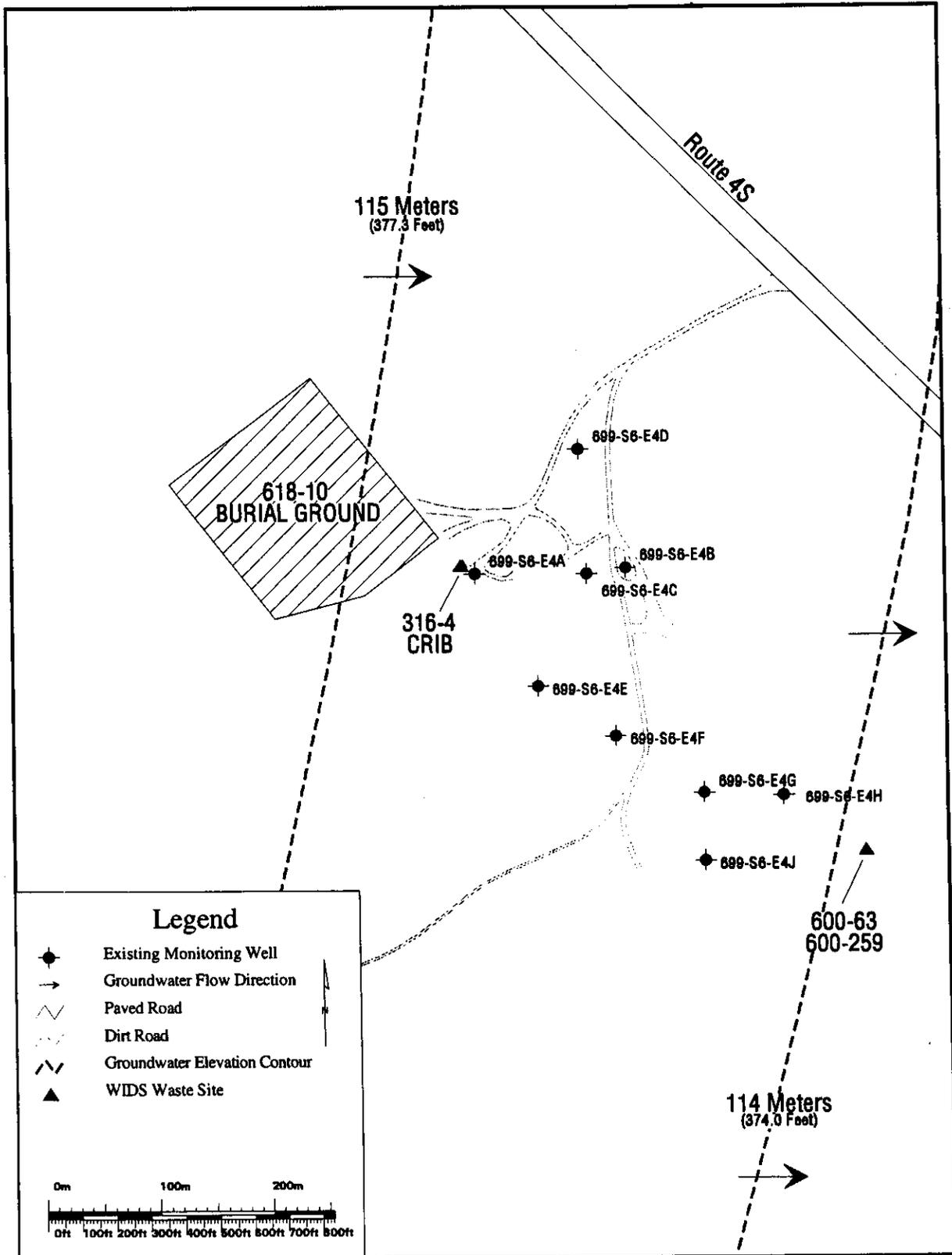
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Decontamination and Decommissioning of Buildings in the 300 Area Complex will be addressed through CERCLA removal authority.

E0005076

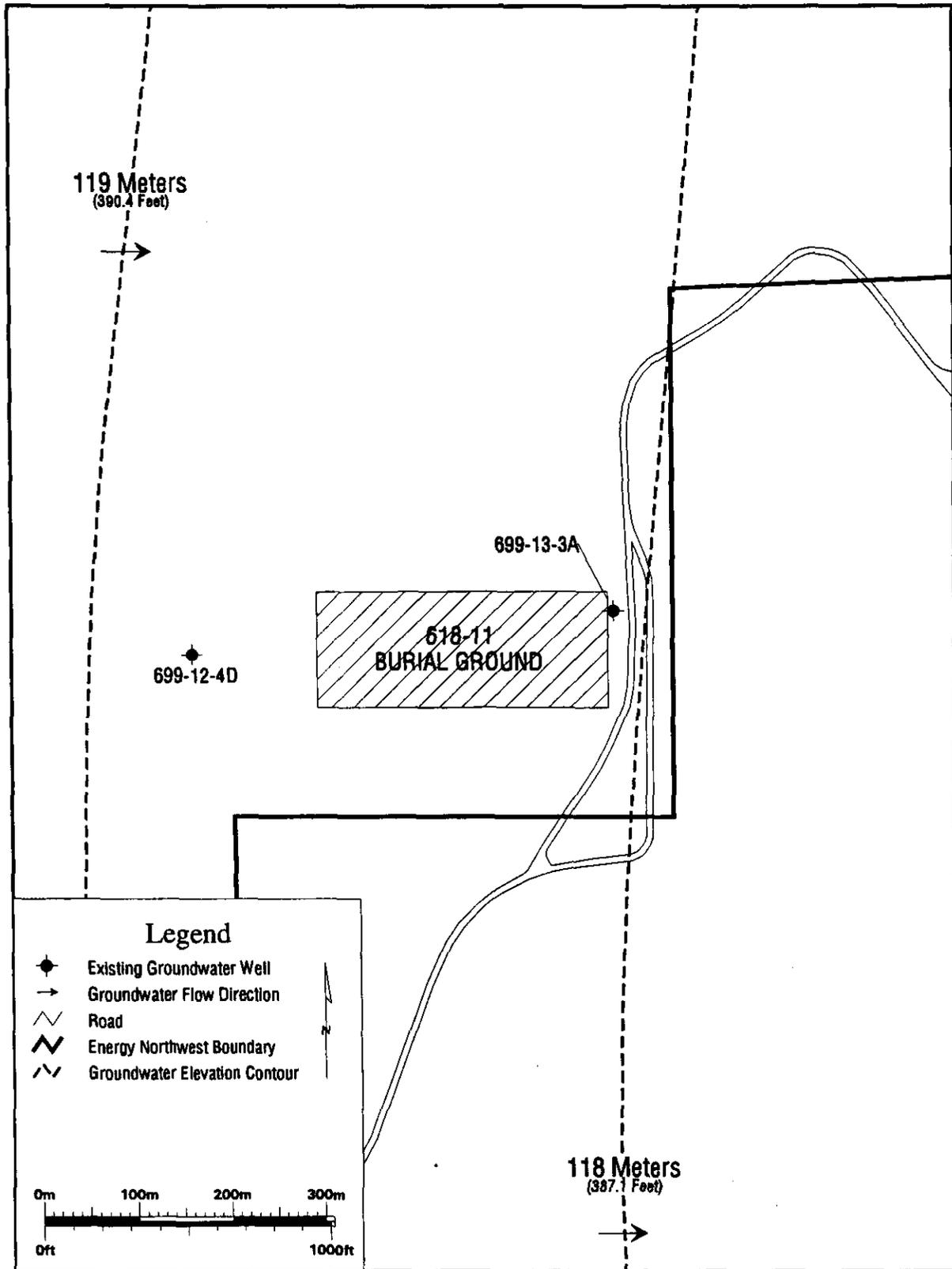
Note: Generalized Cross-Section Not Drawn to Scale.

Figure 4. 316-4 Crib and 618-10 Burial Ground Area.



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Figure 5. Location Map of the 618-11 Burial Ground.



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Signature sheet for the Explanation of Significant Difference to the Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington, between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.



Mike Gearheard
Director, Office of Environmental Cleanup
United States Environmental Protection Agency, Region 10

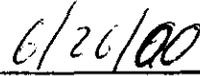
6-15-00

Date

Signature sheet for the Explanation of Significant Difference to the Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington, between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.

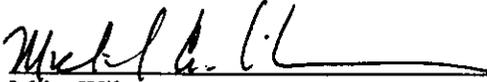


Harry L. Boston
Deputy Manager, Site Transition
Richland Operations Office
United States Department of Energy



Date

Signature sheet for the Explanation of Significant Difference to the Record of Decision for the 300-FF-1 and 300-FF-5 Operable Units, Hanford Site, Benton County, Washington, between the United States Department of Energy and the United States Environmental Protection Agency, with concurrence by the Washington State Department of Ecology.



Mike Wilson
Program Manager, Nuclear Waste Program
Washington State Department of Ecology

6/27/00

Date