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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 600205

Station # 12

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Groundwater Well Services	4. Related EDT No.: N/A
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Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

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18. M. G. Gardner <i>M. G. Gardner</i> Signature of EDT Originator	19. N/A Authorized Representative Date for Receiving Organization	20. <i>D. J. Moak</i> Cogizant/Project Engineer's Manager	21. DOE APPROVAL (if required) Ltr. No. N/A <input type="checkbox"/> Approved <input type="checkbox"/> Approved w/comments <input type="checkbox"/> Disapproved w/comments
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**SUPPORTING DOCUMENT**

1. Total Pages <sup>4</sup> 25

<p>2. Title Summary Report of Hanford Site Well Remediation and Decommissioning Activities Through Fiscal Year 1993</p>	<p>3. Number WHC-SD-EN-PRS-001</p>	<p>4. Rev No. 0</p>
<p>5. Key Words Well remediation Well decommissioning</p>	<p>6. Author Name: M. G. Gardner Signature: <i>M.G. Gardner</i> 12/20/93 Organization/Charge Code 81730/RD11A</p>	
<p>7. Abstract</p> <p style="text-align: center;"><b>APPROVED FOR PUBLIC RELEASE</b> <i>V. Dinkland 12/29/93</i></p> <p>This document summarizes well remediation and decommissioning activities completed by Westinghouse Hanford Company on the Hanford Site for the period October 1, 1988 through September 30, 1993. The report also is intended to provide a background on past activities and status of current efforts.</p> <p>This report was prepared by M. G. Gardner, R. K. Ledgerwood and A. L. Schatz of the Ground Water Well Services Group, Westinghouse Hanford Company. Editorial support was provided by M. S. Kowalski of the Environmental Field Services Function, Westinghouse Hanford Company.</p>		
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## EXECUTIVE SUMMARY

Remediation and decommissioning of Hanford Site wells have become an integral part of Hanford Site environmental restoration and Resource Conservation and Recovery Act (RCRA) groundwater monitoring programs. A well remediation and decommissioning program was funded and implemented in fiscal year (FY) 1993. Funding for this work increased in FY 1994; the program is projected to increase further in funding and scope over the next several years as Hanford Site restoration and remediation efforts increase in scope and receive more attention from regulatory agencies.

This first summary report is intended to provide a background on past activities and status of current efforts. Future reports will provide a more comprehensive look at activities and accomplishments for the fiscal year being reported.

The current scope of well decommissioning activities planned during FY 1994 for the environmental restoration program will be concentrated on the North Slope and Arid Lands Ecology areas. In all, 48 wells have been identified as potentially requiring decommissioning. The RCRA groundwater monitoring well network is being evaluated, and wells requiring decommissioning are being identified. It is estimated that approximately 20 wells will be decommissioned under this program in FY 1994.

As Hanford Site restoration and remediation efforts increase in scope, the well decommissioning program will remain dynamic. The program will aggressively seek to fulfill the needs of the various environmental cleanup and groundwater and vadose monitoring programs. The Well Administration Team will continue to ensure that wells no longer meeting regulatory requirements for preservation are identified and decommissioned. Aided by the well custodianship database, this team will ensure that future program needs for existing wells are not compromised.

Initial efforts to establish a well decommissioning program have met with success. The following is a tabulation of current accomplishments:

- Hanford Well Remediation and Decommissioning Plan issued, FY 1993.
- Engineering specifications for remediation of groundwater wells in 200-BP-1 and 300-FF-5 CERCLA operable units issued, FY 1991. Generic specification for groundwater well remediation issued and revised, FY 1992 and 1993.
- Well ownership status database completed for 4,079 wells, FY 1993.
- Field characterization completed for 891 wells.
- Preliminary fitness-for-use evaluation completed for 661 wells. Evaluation recommendations approved for 36 wells.
- Remediation completed for 71 wells.
- Decommissioning completed for 7 wells.

### ACKNOWLEDGEMENTS

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The authors wish to thank the numerous technical and administrative staff from Pacific Northwest Laboratory, Westinghouse Hanford Company, and Kaiser Engineers Hanford who have contributed to this work.



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## 1.0 INTRODUCTION

Maintenance, rehabilitation, remediation, and decommissioning of Hanford Site wells will be required through final closure of the site, with well decommissioning being the last field activity performed. The Ground Water Well Services Group of Westinghouse Hanford Company (WHC) is chartered to carry out and complete those activities.

Approximately 4,387 wells have been drilled by many different entities for varying purposes on the Hanford Site during the last 100 years. Of those wells, 3,334 are known to exist at the end of this reporting period with 2,364 documented as in use for water quality sampling, water level monitoring or detection screening wells. Joint users were identified for 1,671 of the wells in use. Another 1,054 wells had been abandoned or decommissioned,

Other wells have been identified for possible future uses (DOE/RL 1989). Such uses may include operable unit characterization and monitoring, vapor extraction and soil treatment processes.

Using existing wells would save the cost of drilling new wells. However, to achieve desired data quality objectives, existing wells may require remediation before they are used. Remediation is also often necessary to meet regulatory requirements for surface and annular seals, surface protection, water quality, and reduction of monitored intervals.

Certain wells may require decommissioning to protect groundwater resources or public safety. Other wells may require removal from service if no longer needed for current or future programs.

The *Hanford Well Remediation and Decommissioning Plan* (WHC 1993) describes the process of identification of wells requiring action, and contains the requirements for conducting remediation/decommissioning activities. That plan directs preparation of an annual summary report of completed activities.

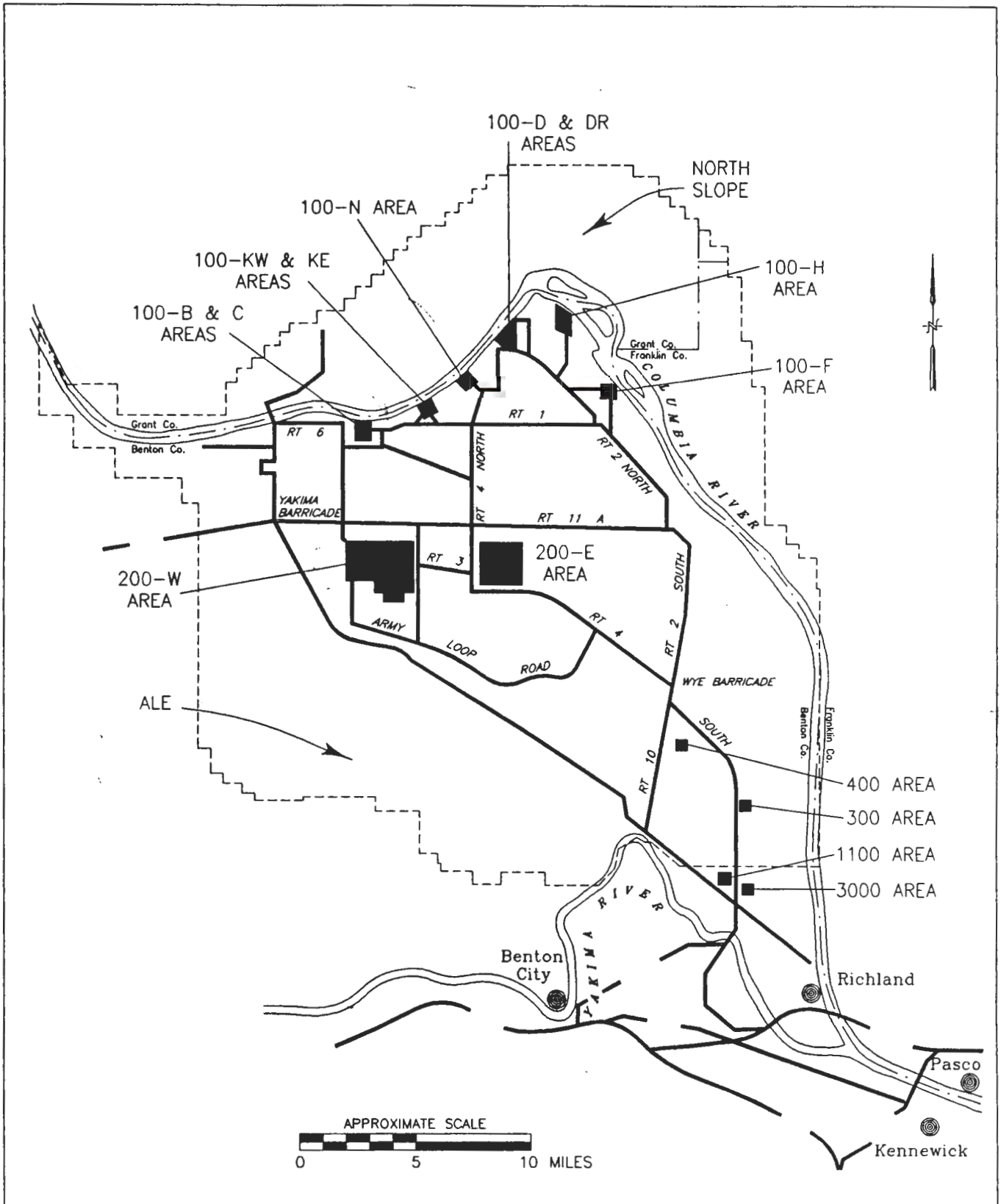


Figure 1. Hanford Site Map

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## 2.0 CONDUCT OF OPERATIONS

### 2.1 REGULATORY REQUIREMENTS

The Revised Code of Washington (as amended) (RCW 18.104) states that the drilling, making, or constructing of wells within the state is a business and activity of vital interest to the public. It further states that in order to protect the public health, welfare, and safety it is necessary that provision be made for the regulation and licensing of well contractors and operators and for the regulation of well design and construction.

RCW 18.104 empowers the Washington State Department of Ecology (Ecology) to adopt rules regulating those activities. Those rules and regulations are contained in Washington Administrative Code (WAC) 173-160 "Minimum Standards for Construction and Maintenance of Wells" and WAC 173-162 "Well Contractors and Operators -- Licensing" issued by Ecology.

WAC 173-160-050 requires that every well contractor submit a complete record on the construction, alteration or abandonment of the well to Ecology within thirty days after completion (or alteration) of that well, WAC 173-060-055 and RCW 18.104.048 require that a well construction notification (start card) be submitted to Ecology by the land owner for all wells before beginning modification or decommissioning. WHC ensures that those records for the Hanford Site are submitted to Ecology.

WAC 173-162-040 requires well remediation or decommissioning to be performed by or under the supervision of, a licensed well driller. WHC ensures that either field personnel supervising or operators performing remediation or decommissioning activities are Washington State licensed well drillers.

The WAC also provides a process of requesting variances to code requirements. During FY 1993, two letters clarifying interpretations of certain WAC 173-160 sections were received. In addition, one variance was granted allowing installation of sand plugs in lieu of backfill across the confined and unconfined aquifers during well abandonment/-decommissioning and remediation activities. Use of sand plugs instead of cement or bentonite fill reduces the potential affect on water quality samples taken from nearby wells.

### 2.2 TECHNICAL REQUIREMENTS

A generic engineering specification containing technical requirements for remediation of groundwater wells was prepared by WHC to allow more flexibility in field operations. The specification, in Construction Specifications Institute (CSI) format, was issued in FY 1992 and revised in FY 1993.

General technical requirements for borehole abandonment or decommissioning are contained in WAC 173-160-415 "Abandonment of wells." General:

*(1) Any well which is unusable, or whose use has been permanently discontinued, or which is in such disrepair that its continued use is impractical or is an environmental, safety or public health hazard shall be abandoned. The abandonment procedure (as prescribed by these regulations) must be recorded and reported as required by the department.*

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(2) Wells that were not constructed in accordance with these regulations, or wells which are abandoned to allow the placement of potential sources of contamination within one hundred feet of the well, shall be abandoned in one of two ways:

(a) The casing shall be perforated from the bottom to within five feet of the land surface and pressure grouted. Perforations shall be at least four equidistant cuts per row, and one row per foot. Each cut shall be at least one and one-half inches long.

(b) Withdraw the casing and fill the bore hole with grout, puddled clay, or bentonite as the casing is being withdrawn.

(3) Piping of sealing materials directly to the point of application or placement by means of a dump bailer or tremie tube is recommended. If cement grout, neat cement, or puddled clay is used as a sealing material below the static-water level in the well, it should be placed from the bottom up by methods that avoid segregation or dilution of the material. When used to place grout, the discharge end of the tremie tube shall be submerged in the grout to avoid breaking the seal while filling the annular space.

(4) If it can be verified that a water supply well was constructed in accordance with these regulations, and it is not being abandoned to allow siting of potential sources of contamination within one hundred feet of the well, it shall be abandoned in accordance with WAC 173-160-420 through 173-160-465, whichever applies.

Additional specific requirements for borehole abandonment are contained in WAC 173-160-420, 425, 435, 445, 455, 465 and 560.

### 2.3 GOVERNING PROCEDURES

WHC conducts well characterization, fitness-for-use assessments and remediation or decommissioning field operations and activity documentation according to Environmental Investigations Instructions (EII) contained in WHC-CM-7-7 *Environmental Investigations and Site Characterization Manual*.

Characterization of existing condition including well site visits and photographs, depth measurement, television surveys, and wellbore cleaning are performed in accordance with EII 6.4.

Fitness-for-intended use assessment of identified wells is performed in accordance with EII 6.6. This EII also provides the mechanism for obtaining review and approval of proposed remediation or decommissioning methods. The review and approval process involves all potential users and involved programs.

Remediation field activities are controlled by EII 8.3. Field activities include overdrilling casing and installing of surface seals, casing perforating and installing liners to provide annular seals, and other modifications of a well structure to achieve data quality objectives. Revision 1 of EII 8.3 was completed and issued during FY 1993.

Decommissioning procedures are contained in EII 6.10. The EII implements the technical and regulatory requirements of WAC 173-160 for borehole decommissioning. Revision 2 of EII 6.10 was completed and transmitted for issue during FY 1993.

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## 2.4 EFFLUENT MONITORING AND WASTE MANAGEMENT

Specifications and applicable EIs address the effluent monitoring and waste management requirements of WHC-CM-7-5 Environmental Compliance and provide for control and disposition of fluids and waste produced during maintenance, remediation, or decommissioning of wells.

## 2.5 HEALTH AND SAFETY

Specifications and instructions for all maintenance, remediation and decommissioning activities contain applicable health and safety requirements. These requirements may include special training, field safety, radiological safety and hazardous waste safety. Excavation and/or hazardous work permits are obtained as needed using existing procedures and forms.

## 2.6 PLANNING AND BUDGETING

Work within this activity is controlled under the WHC Management Control System as defined in WHC-CM-2-5 *Management Control System*.

## 2.7 ACTIVITY DOCUMENTATION

Well remediation and decommissioning field activities are documented as required by applicable EIs. Documentation consists of daily field activity reports in addition to WAC 173-160 required reports. Reports are transmitted to the Environmental Division Records Center with copies also maintained in the Environmental Field Services field file.

## 2.8 ANNUAL REPORT

An annual report summarizing remediation and decommissioning activities will be prepared and issued for clearance within 90 days after the end of each fiscal year. This report is the first of that series.

## 3.0 HANFORD SITE WELL STATUS AND CUSTODIANSHIP DATABASE

Summaries of reviewed remediation, decommissioning and maintenance field activity reports are entered into the Hanford Wells Database System (HWDS) maintained by WHC.

Well status characterization data including results of field inspection reports, digitized site photographs, and downhole camera inspections are included in the database system. Well site visits to 891 individual wells were recorded through FY 1993.

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In cooperation with the Well Administration Team (DOE/RL 1993), a well custodianship database was developed. The main purpose of this database was to identify responsible parties (custodians) for maintaining, remediating, and decommissioning of wells on the Hanford Site. A total of 4,079 wells were evaluated for custodianship determination. Wells in use by more than one program were assigned custodianship based on a specific priority. Wells not in use or claimed by any program were classed as "orphan" wells. The "orphan" wells become candidates for decommissioning activities. Table 1 lists a breakdown of the total wells assigned to each program and the total "orphan" wells.

The HWDS continues to grow and change as existing wells previously not documented are added, existing data is corrected, new wells are drilled, and wells are remediated or decommissioned.

Table 1. Hanford Site Well Custodians.

HANFORD SITE WELL CUSTODIAN	TOTAL WELLS
Sitewide Surveillance	286
Operational Monitoring (ROM) and RCRA	1,193
CERCLA	208
U.S. Army Corps. of Engineers --1100 Area & ALE/North Slope	60
Tank Waste Remediation System (TWRS) Vadose Charact. and Monitoring	741
Water Supply Wells	13
Washington Public Power Supply System	135
U.S. Ecology	5
Orphan Wells	693
<b>TOTAL</b>	<b>3,334</b>

#### 4.0 FITNESS-FOR-USE

The following activities were completed through FY 1993 as a part of fitness-for-use characterization and evaluation.

- Preliminary fitness-for-use evaluation were completed for 661 wells. Evaluations were based on available data and generic data quality objectives.
- Thirty-six fitness-for-use evaluations were approved.
- More than 1,000 individual well construction summary computer files have been made accessible to well users on the Hanford Local Area Network.

## 5.0 REMEDIATION AND DECOMMISSIONING ACTIVITIES

### 5.1 IDENTIFICATION OF WELL REQUIREMENTS

Representatives of well custodians or joint users may identify existing wells within or associated with areas of their responsibility for potential use or decommissioning. Additionally, federal or state regulators may identify areas to be evaluated or well structures of concern and request remediation or decommissioning of boreholes or groups of boreholes.

Each well proposed for use or decommissioning is evaluated and placed into action categories based upon applicable present and future use, degree of environmental impact, location and construction characteristics. Such criteria include:

**Potential or present use:**

- Groundwater quality analysis
- Water level measurements
- Geophysical logging or monitoring
- Water supply
- Groundwater or soil remediation
- Soil characteristics
- No known use.

**Environmental affect:**

- Potential affect on groundwater resources, particularly the Columbia River, confined aquifers and groundwater not presently contaminated
- Demonstrated contamination migration or aquifer interconnection
- Category list.

**Location and construction:**

- Spatial location with respect to permitted facilities or RCRA site requirements
- Well configuration
- Well construction materials
- Available construction and maintenance records.

**The action categories include:**

- No action required, well is acceptable for defined data quality objective
- Rehabilitation to original condition required to attain data quality objective and fulfill criteria for intended use
- Remediation required to protect groundwater resources or to attain required data quality objective
- Decommissioning required, the well cannot be remediated or has no documented present or future use.

Wells within each action category are assigned priorities and scheduled for completion of remediation or abandonment. Hanford Site well custodians and applicable regulatory groups are required to concur before remedial or decommissioning actions are started.

Several programs have constructed and/or use existing wells to provide characterization and groundwater monitoring data (DOE/RL 1993 and WHC 1993). Appendices A and B tabulate wells remediated and decommissioned by WHC during this reporting period.

## 5.2 SITE-WIDE SURVEILLANCE

The independent site-wide surveillance program for the Hanford Site is conducted by Pacific Northwest Laboratory (PNL). This program monitors the effects, if any, of DOE activities at Hanford upon onsite and offsite environmental and natural resources.

Two Skagit/Hanford Nuclear Project or "Golder" drilled existing groundwater wells were remediated during FY 1993 to support 600 Area three-dimensional characterization and modeling.

## 5.3 OPERATIONAL MONITORING

WHC conducts an operational groundwater monitoring program in and next to reactor and chemical processing operations in the 100, 200, 300, 400, and 1100 Areas.

Between 1976 and 1985, WHC and previous contractors installed surface and annular seals in several hundred operational monitoring groundwater wells in the 200 East and 200 West. The seal installation was intended to stop or preclude migration of contaminants down the exterior of the well casing. Construction details of the remediation activities are given in Ledgerwood 1993b and 1993c which contain construction data summaries for 200 East and 200 West groundwater wells.

Characterization and evaluation of 17 wells during 1990 and 1991 supported 216-A-29 Ditch studies.

During FY 1993 one groundwater well in 200 East Area, (299-E27-1) was rehabilitated and remediated by installation of a surface seal and protective pad and posts.

## 5.4 RCRA PERMIT CHARACTERIZATION AND MONITORING

The Resource Conservation and Recovery Act (RCRA) groundwater monitoring program conducted by WHC currently involves site-specific monitoring and/or well installation at 20 facilities under the EPA interim status regulations.

RCRA facility 300 Area monitoring well 399-1-16D was decommissioned by WHC during 1989 because of suspected vertical interconnection. A single-use engineering specification was issued for this activity. The specification was modified to meet encountered field conditions. The well casing was perforated, and the well was pressure grouted to the surface.

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## **5.5 CERCLA MONITORING AND SITE CHARACTERIZATION**

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) "groundwater operable units" identified at Hanford generally include use of data from existing wells as a part of a specific groundwater operable unit work plan. Wells selected often must be remediated to allow use. Other existing wells within the operable unit may be identified for remediation or decommissioning.

WHC is responsible for the 100, 200, 300, and 400 areas and for 600 area wells associated with those monitoring programs.

The U.S. Army Corps of Engineers (COE) has responsibility for the 1100 Area, the Arid Land Ecology (ALE) study area and the Hanford Site North Slope.

### **5.5.1 200-BP-1 Operable Unit**

An engineering specification was issued establishing technical criteria for remediation of 24 groundwater wells within the 200-BP-1 Operable Unit in 200 East Area. Three wells were later added to the scope of the specification.

The 27 wells were successfully remediated during FY 1992. Results of remediation activities are documented in Ledgerwood (1993c) which contains 200 East Area well construction and completion summaries.

One well remediated (299-E33-24) was later decommissioned during FY 1993 along with nine vadose cone penetrometer probe holes. The wells were located in an area planned for the construction of a barrier cap for the stabilization of 216-B-57 crib. The well casings would have penetrated this barrier had they not been removed.

### **5.5.2 300-FF-5 Operable Unit**

Field characterization and construction summaries were completed for 62 existing resource protection wells within the scope of the 300-FF-5 Operable Unit in the 300 Area. Fitness-for-use evaluations and remediation recommendations were completed for 21 of the wells. The summaries packages and remediation recommendations were compiled and released in Ledgerwood (1991b).

An engineering specification providing criteria for remediating eight wells within the 300-FF-5 Operable Unit was issued in 1991. Eleven additional wells to be remediated were added to the scope of the specification. The 19 wells were successfully remediated during FY 1992.

The supporting documentation package was revised to include details of well remediations activities completed as of the issue date. Revision 1 was issued during FY 1993 (Ledgerwood 1993a).

Evaluation recommendations have been approved for decommissioning two and remediation of two additional 300-FF-5 resource protection wells. Work is in progress as of October 1, 1993.

### **5.5.3 100 Aggregate Area Operable Unit**

Preliminary fitness-for-use characterization and evaluations were completed for 159 groundwater wells in or near the 100 Areas. Results were compiled as construction and completion summaries and released in Ledgerwood (1991a).

One well (199-H4-2) that provided a potential for aquifer interconnection was remediated during FY 1993. A piezometer and grout plugs were installed.

### **5.5.4 200 Aggregate Area Management Study (200 AAMS)**

Characterization and fitness-for-use evaluations were requested during 1992 and 1993 on 38 wells in or near 200 East Area and 41 wells in and near 200 West Area. The wells were to be incorporated into the 200 AAMS and 200-BP-1 groundwater sampling networks. Activities were to be limited to scrubbing and cleaning the wells, shortening monitored intervals, redevelopment, and installing of locking well caps and sampling pumps.

Site visits have been completed, and well bore cleaning is in progress.

### **5.5.5 1100 Area Well Remediation and Decommissioning**

The COE has also been assigned cleanup responsibility for the 1100 Area. Three 1100 Area wells used for groundwater monitoring did not comply with RCRA requirements and were identified for decommissioning.

Two of the wells were decommissioned in FY 1993 by perforating the casings and pressure grouting to the surface and one is scheduled for decommissioning.

### **5.5.6 Characterization Boreholes**

An engineering specification for drilling and decommissioning geotechnical test borings was developed and issued during 1992. Revision 1 to the specification was issued in FY 1993.

Many CERCLA site characterization test boreholes have been assigned Hanford series borehole numbers but are shown as "Decommissioned" in the database. Casing was pulled, and the boreholes were decommissioned as a part of the drilling process.

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**5.6 VADOSE ZONE CHARACTERIZATION AND MONITORING**

Several hundred Tank Waste Remediation System (TWRS) vadose zone wells are used by WHC to monitor subsurface waste storage and disposal sites to provide early warning of potential waste movement that could signal potential or future groundwater contamination problems. Many of these wells may require remediation or decommissioning to preclude groundwater resource contamination caused by well construction inadequacies .

Twenty-one existing 200 West Area TWRS groundwater and vadose zone wells have been remediated or reconfigured as a part of the 200 West Area Expedited Response Action involving vapor extraction of carbon tetrachloride. The remediation/reconfiguration included perforating well casing in zones targeted for vapor extraction, modifying well heads to accept vapor extraction equipment, installing well packers for zone isolation, and installing piezometers.

**5.7 WATER SUPPLY WELLS**

A few water supply wells are present on the Hanford Site. The wells are used for water supply at isolated facilities or as emergency facility backup water supplies. These wells may require rehabilitation or remediation as determined by the users.

**5.8 RESEARCH OR SPECIAL PURPOSE WELLS**

Many research or special purpose wells have been drilled on the Hanford Site. The wells include stratigraphic and hydrologic investigation boreholes, reactor siting study boreholes, and destroyed seismic test holes. Selected wells may require rehabilitation, reconfiguration, remediation, or decommissioning.

**5.8.1 Basalt Waste Isolation Project Boreholes**

The Basalt Waste Isolation Project (BWIP) drilled 98 boreholes at approximately 50 drill sites on or near the Hanford Site from 1977 through 1987. BWIP was terminated in late 1987 and was directed to decommission or transfer title to all boreholes and to remediate the drilling sites.

Borehole reconfiguration and decommissioning activities were completed during FY 1989 in accordance with WAC 173-160 and with Ecology's concurrence on the methods and materials used. The majority of the boreholes were constructed with compliant seals and were therefore sealed from the bottom to the surface with neat cement. The remaining boreholes either had casings pulled or perforated and pressure grouted using neat cement. Of the BWIP wells, 58 were decommissioned, 19 remediated and 21 transferred to PNL or WHC custodianship.

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## 5.9 ORPHAN WELLS

The following wells not in use or having no identified custodian, were decommissioned during FY 1993.

### 5.9.1 699-114-127 (DH-5 Core hole)

DH-5 core hole was drilled to 5,002 feet near Mattawa, Washington, in 1972 by Atlantic Richfield Hanford Company to provide deep basalt stratigraphic and hydrologic information. The well was no longer needed and presented a hazard to the public. Ecology concurred with decommissioning plans and the well was successfully decommissioned in FY 1993.

The well was plugged from the bottom to within approximately 100 feet of the surface with bentonite abandonment slurry. The top 100 feet of tubing was then plugged with neat cement.

### 5.9.2 Hanford Waste Vitrification Project

The proposed Hanford Waste Vitrification Project site in 200 East Area contained two existing boreholes (299-E29-1 and 299-E29-53). Neither was constructed to water or further needed. Both were decommissioned in FY 1993.

## 5.10 NON-DOE CONTRACTOR WELLS

Non-DOE contractors such as the Washington Public Power Supply System, Skagit Power, Siemens Nuclear, and U.S. Ecology have constructed characterization and facility monitoring wells. Some of these wells may be selected for characterization, remediation, or decommissioning.

### 5.10.1 Skagit/Hanford Nuclear Project

Approximately 100 boreholes were drilled during 1979-1980 by Golder Associates Inc. for the Puget Sound Power & Light Company Skagit/Hanford Nuclear Project siting studies. Most of those boreholes were decommissioned after site studies were canceled. Some have been retained by PNL for reconfiguration or use as 600 Area screening wells.

### 5.10.2 Washington Public Power Supply System

The Washington Public Power Supply System drilled two series of site characterization boreholes. One series near the 100-N Area supported construction of power generation facilities.

One core hole in that series (BH-17) was reconfigured by BWIP. Another, BH-18, is in the North Slope area and may be a candidate for decommissioning.



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APPENDIX A - Wells Remediated, October 1988 through September 1993

Well Number	Drill Date	Remediation Activities	Date Rem	Responsible Program
199-H4-2	May52	Annular seal, pad, 1 piezo	Mar92	CERCLA, 100AA
299-E27-1	Apr48	Surface seal, pad, posts, repair csg	Oct92	Operational mon
299-E33-1	Aug54	Pad, posts	Jun92	CERCLA, 200-BP-1
299-E33-3	Nov54	Pad, posts	Jun92	CERCLA, 200-BP-1
299-E33-4	Dec54	Pad, posts	Jun92	CERCLA, 200-BP-1
299-E33-5	Jun55	Pad, posts	Jun92	CERCLA, 200-BP-1
299-E33-7	Apr55	Pad, posts	Jun92	CERCLA, 200-BP-1
299-E33-12	Sep53	Surface seal, pad, posts	Oct92	CERCLA, 200-BP-1
299-E33-13	Oct53	Annular/surface seal, pad, posts	Oct92	CERCLA, 200-BP-1
299-E33-14	Dec53	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
299-E33-15	Feb53	Surface seal, pad, posts	Oct92	CERCLA, 200-BP-1
299-E33-18	Feb50	Surface seal, pad, posts	Oct92	CERCLA, 200-BP-1
299-E33-24	May67	Surface/annular seal, pad, posts	Oct92	CERCLA, 200-BP-1
299-E33-26	Mar69	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
299-E34-1	Jun61	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
299-W15-82	Oct54	Perforated	Apr93	CCL <sub>4</sub> ERA
299-W15-84	Oct54	Perforated	Apr93	CCL <sub>4</sub> ERA
299-W15-85	Oct54	Perforated	Apr93	CCL <sub>4</sub> ERA
299-W15-95	Jan59	Perforated	Apr93	CCL <sub>4</sub> ERA
299-W18-17	Jan64	Perforated, cement grouted	May93	CCL <sub>4</sub> ERA
299-W18-18	Sep81	Perforated, cement grouted	May93	CCL <sub>4</sub> ERA
299-W18-19	Jun92	Shaped charge perfed, grouted	Jul93	CCL <sub>4</sub> ERA
299-W18-20	Aug82	Perforated, grouted	Apr93	CCL <sub>4</sub> ERA
299-W18-93	Feb72	Perforated, cement plug	Jun92	CCL <sub>4</sub> ERA
299-W18-94	Feb72	Perforated, cement plug	Jun92	CCL <sub>4</sub> ERA

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APPENDIX A - Wells Remediated, October 1988 through September 1993

Well Number	Drill Date	Remediation Activities	Date Rem	Responsible Program
299-W18-96	Feb72	Perforated, cement plug	Jun92	CCL <sub>4</sub> ERA
299-W18-97	Feb72	Perforated	Mar92	CCL <sub>4</sub> ERA
299-W18-98	Feb72	Perforated, cement plug	Jun92	CCL <sub>4</sub> ERA
299-W18-99	Mar72	Perforated, cement plug	Jun92	CCL <sub>4</sub> ERA
299-W18-150	Jun73	Perforated, piezos installed	Mar92	CCL <sub>4</sub> ERA
299-W18-158	Aug76	Perforated, piezos installed	Mar92	CCL <sub>4</sub> ERA
299-W18-159	Jan78	Perforated	Feb92	CCL <sub>4</sub> ERA
299-W18-163	Feb77	Perforated, piezos installed	Mar92	CCL <sub>4</sub> ERA
299-W18-165	Mar77	Perforated	Dec91	CCL <sub>4</sub> ERA
299-W18-166	Apr77	Perforated	Dec91	CCL <sub>4</sub> ERA
299-W18-168	Jun77	Perforated	Dec91	CCL <sub>4</sub> ERA
399-1-1	Nov48	Surface seal, pad, posts	Jan92	CERCLA, 300-FF-5
399-1-2	Apr50	Surface seal, pad, posts	Apr92	CERCLA, 300-FF-5
399-1-6	Mar75	Surface seal, pad, posts	Aug92	CERCLA, 300-FF-5
399-2-1	Nov48	Surface seal, pad, posts	Jan92	CERCLA, 300-FF-5
399-2-2	Oct76	Pad, posts	Aug92	CERCLA, 300-FF-5
399-3-9	Aug76	Pad, posts	Jan92	CERCLA, 300-FF-5
399-3-11	Sep76	Annular extension, pad, posts	Aug92	CERCLA, 300-FF-5
399-3-12	Sep80	Surface seal, pad, posts	Feb92	CERCLA, 300-FF-5
399-4-1	Feb51	Surface seal, pad, posts	Feb92	CERCLA, 300-FF-5
399-4-7	Nov61	Surface seal, pad, posts	Feb92	CERCLA, 300-FF-5
399-4-9	Sep76	Annular extension, pad, posts	Feb92	CERCLA, 300-FF-5
399-4-10	Sep76	Pad, posts	Aug92	CERCLA, 300-FF-5
399-5-1	Feb51	Surface seal, pad, posts	Aug92	CERCLA, 300-FF-5
399-6-1	Jun50	Surface seal, pad, posts	Jan92	CERCLA, 300-FF-5

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APPENDIX A - Wells Remediated, October 1988 through September 1993

Well Number	Drill Date	Remediation Activities	Date Rem	Responsible Program
399-8-1	Jun50	Surface seal, pad, posts	Apr92	CERCLA, 300-FF-5
399-8-2	May50	Surface seal, pad, posts	Apr92	CERCLA, 300-FF-5
399-8-3	Mar51	Surface seal, pad, posts	Apr92	CERCLA, 300-FF-5
399-8-4	Sep79	Surface seal, pad, posts	Mar92	CERCLA, 300-FF-5
699-18-21	Feb81	Cement plug, screen, pad, posts	Apr93	PNL Sitewide mon
699-31-11	Jun80	Cement plug, screen, pad, posts	Apr93	PNL Sitewide mon
699-47-50	Jun80	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-47-60	Jul48	Surface seal, pad, posts	Oct91	CERCLA, 200-BP-1
699-49-55A	Jul61	Surface seal, pad, posts	Oct91	CERCLA, 200-BP-1
699-49-55B	May82	Surface seal, pad, posts	Oct91	CERCLA, 200-BP-1
699-49-57A	Jul56	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-50-53A	Feb55	Surface seal, pad, posts	Oct91	CERCLA, 200-BP-1
699-53-55A	Aug61	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-53-55B	May75	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-53-55C	May75	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-54-57	Apr82	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-55-57	May75	Surface seal, pad, posts	Dec91	CERCLA, 200-BP-1
699-59-58	Jul72	Surface seal, pad, posts	Jun92	CERCLA, 200-BP-1
699-60-57	Jul72	Surface seal, pad, posts	Jun92	CERCLA, 200-BP-1
699-60-60	Jun48	Surface seal, pad, posts	Jun92	CERCLA, 200-BP-1
699S30E15A	Oct71	Surface seal, pad, posts	Aug92	CERCLA, 300-FF-5

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APPENDIX B - Wells Decommissioned, October 1988 through September 1993

Well Number	Drill Date	Decommissioning Activities	Date Dec	Responsible Program
299-E29-1	Nov76	Pull casing, backfill w/bentonite crumbles	Jan92	HWVP
299-E29-53	Unk	Overdrill & remove PVC casing, backfill w/bentonite crumbles	Jan92	HWVP
299-E33-24	May67	Sand plug, cement grout inside liner, cut casing, fill to grade	Sep93	CERCLA, 200-BP-1
399-1-16D	Jan87	Perforate casing, place cement and bentonite plugs	Apr89	RCRA, 300 Area Process Trenches
399-4-8	Oct71	Perforate, sand plug, cement grout casing, cut casing, fill to grade	Sep93	CERCLA, 200-BP-1
699-114-127	Feb72	Backfill piezo tube w/bentonite, cut casing and fill to grade	Jul93	CERCLA, COE North Slope
699-S31-E13	May93	Perforate, sand plug, cement grout casing, cut casing, fill to grade	May93	CERCLA, COE, 1100-Area

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