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MANUAL REVISION INSTRUCTIONS (MRI)Date Prepared:
March 13, 1995TO:

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H6-08Document No.: WHC-CM-7-7 Level: 3

Title: Environmental Investigations and
Site Characterization

Release No.: 91 Page 1 of 1

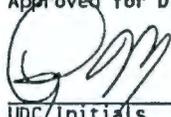
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INSTRUCTIONS

1. Remove and/or insert indicated sections into manual as shown below.
2. Update the Revision Record at the front of the manual.
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Section Numbers and Titles	Remove			Insert		
	Pages	REV	Date	Pages	REV	Date
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If you have any questions about this release contact:
Jean Feaster, 372-2340

Approved for Distribution:  UDC Initials	I have entered this release into the manual per the above instructions. 3-15-95 Date	_____ Signature	_____ Date
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IMPLEMENTATION NOTICE

WHC-CM-7-7, *Environmental Investigations and Site Characterization Manual*

Release No. 91, Effective March 17, 1995

Sections: **EII 6.6, Resource Protection Well Characterization and Evaluation, Rev 3**
 EII 6.10, Decommissioning Wells, Rev 3
 EII 8.3, Remediation of Groundwater Wells, Rev 2, Change 1

These sections were reformatted to current controlled manual (CM) standards. Minor changes were made including organizational name changes, addition of metric measurements, updating titles of reference documents.

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ICA = INSTRUCTION CHANGE AUTHORIZATION, (P) = PERMANENT (BLUE SHEET), (T) = ONE TIME (GOLDENROD SHEET)

Resource Protection Well Characterization and Evaluation**1.0 PURPOSE**

This Environmental Investigations Instruction (EII) specifies evaluation criteria and documentation requirements for the characterization and evaluation process of determining fitness-for-use recommendations to meet applicable data quality objectives (DQO) of existing resource protection wells.

2.0 SCOPE

This EII applies to well characterization and fitness-for-use evaluation for existing resource and nonresource protection wells on the Hanford Site at the direction of the cognizant manager.

3.0 DEFINITIONS

See the Glossary/Acronyms section of this manual.

4.0 RESPONSIBILITIES

The cognizant manager assigns a qualified cognizant engineer to implement this EII.

5.0 REQUIREMENTS

Fitness-for-use characterization and evaluation for existing resource protection wells identified for use is required by the Hanford Well Remediation and Decommissioning Plan (WHC-SD-EN-AP-122).

Wells are identified for use by Hanford Site user groups who provide DQOs for use in fitness-for-use characterization and evaluation.

6.0 PROCEDURE**6.1 Characterization**

- | | |
|--------------------|---|
| Cognizant Engineer | <ol style="list-style-type: none"> 1. Review existing well construction data and complete the Fitness-For-Use Checklist (A-6000-451, Siteform 0687, form completion instructions are also located on Siteforms). <ol style="list-style-type: none"> a. The checklist has been developed from the construction standards for new groundwater well construction contained in WAC 173-160, WAC 173-303, and OSWER Directive 9950. b. Use additional applicable guidance and specific case waivers contained in correspondence received from the Washington State Department of Ecology (Ecology). c. Identify sources used. Existing well construction data are filed by well number at the <i>Well Services</i> Record Center and with the Pacific Northwest |
|--------------------|---|

Laboratory (PNL) Geosciences Department. The amount and quality of well data varies greatly because of various construction dates and documentation methods. Well data typically may include the following types of information:

- 1) Driller's and geologic logs
- 2) Publications (e.g., PNL 6907, *Hanford Wells*, and drilling histories)
- 3) Geophysical logs
- 4) Chemical/radionuclide water sample analyses
- 5) Groundwater well sampling and measurement schedules and data
- 6) Well maintenance and remediation records
- 7) Computer database files.

Cognizant
Engineer

- d. Use the following means to collect information concerning the present physical condition of the well structure.
 - 1) **Field checks.** A field check of each well site addresses surface protection, capping and identification. Perform field checks in accordance with EII 6.4 and document using a checklist and a photograph of the wellhead.
 - 2) **Borehole logging (optional).** Television camera scans (EII 6.4) and existing geophysical logs (primarily neutron, natural gamma and caliper) provide borehole information (e.g., casing and screen condition).

6.2 Well Construction and Completion Summary

Cognizant
Engineer

1. Complete or direct completion of a Well Construction and Completion Summary, using all available data from sources documented on the Fitness-For-Use Checklist.
 - a. Complete summaries based on a common format revised to fit the specific construction details of the well under evaluation. An example is shown in Figure 1.
 - b. The drawings should contain the minimum information shown (when applicable) or a "not documented" (ND) notation.

- c. The scale may be diagrammatic. Give measurements in decimal feet or inches to the precision used in the source, i.e., do not show an entry of 8 inches as 8.00 inches.
- d. Show extrapolations made from undocumented assumptions as (Nom) for nominal, for example, 9-in. hole size (Nom) based on the use of 8-in. casing with a shoe.
- e. Date and attach the summary drawings to the Fitness-For-Use Checklist.

6.3 Evaluation of Resource Protection Wells

Cognizant
Engineer

1. Complete the Fitness-For-Use Checklist status recommendation using the decision tree process shown in Figure 2 by entering YES, NO or ND in the bracketed spaces.
 - a. Not applicable (NA) may be used where the checklist item does not apply (i.e., the well is not a monitoring well and does not have a screen).
 - b. Provide references used and supporting details for positive recommendations made for each specific category. Provide comments when applicable.

6.4 Review and Approval

Cognizant
Engineer

1. Generate a diagrammatic remediation or decommissioning plan (Figure 3) when remediation or decommissioning is recommended on a supporting document in accordance with WHC-CM-6-1, EP-1.12.
2. Provide the status recommendation and the remediation or decommissioning plan to all users and concerned organizations (reviewers) identified during the characterization process.
 - a. Reviewers may request reevaluation based on additional information or potential uses they provide.
 - b. Review and disposition is in accordance with WHC-CM-6-1, EP-1.6. The supporting document will consist of the Fitness-For-Use Checklist, Well Construction and Completion Summary and Diagrammatic Remediation or Decommissioning Plan (if required) for one well or groups of related wells.

6.5 Records

Record processing and disposition is as follows.

Name, Filing Unit Title or Description	Record Type*	Retention Period	Disposal Authority	Cut-off and Retirement Instructions
Fitness-for-Use checklist and supporting documentation	QA	TBD	TBD	When no further action is required to the well, transmit checklist and supporting documentation to file custodian (FC) for submittal to permanent storage per RIDS. FC places reference copy in project files maintained by well number and cross references to operable unit or operating facility in database. Copies are transmitted to users as necessary.

* QA = Quality Assurance; TBD = To be determined

7.0 FORM

Fitness-For-Use Checklist and Completion Instructions (A-6000-451, Siteforms).

8.0 DESIGNATED REVIEWING ORGANIZATION

The organization designated to review changes to this document is listed below.

Designated Reviewers

CMPOC

Hanford Technical Services, process owner

STS/HTS

Comments from other organizations are welcome; however, such comments are dispositioned at the option of the originating organization.

9.0 REFERENCES

OSWER 9950, "RCRA Ground Water Monitoring Technical Enforcement Guidance Document."

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells."

WAC 173-303-645, "Ground Water Protection."

PNL-6907, *Hanford Wells*.

WHC-CM-6-1, *Standard Engineering Practices*.

EP-1.6, "Engineering Data Transmittal Requirements."

EP-1.12, "Supporting Document Requirements."

WHC-SD-EN-AP-122, *Hanford Well Remediation and Decommissioning Plan*.

Figure 1. Example Well Construction and Completion Summary.
(sheet 1 of 2)

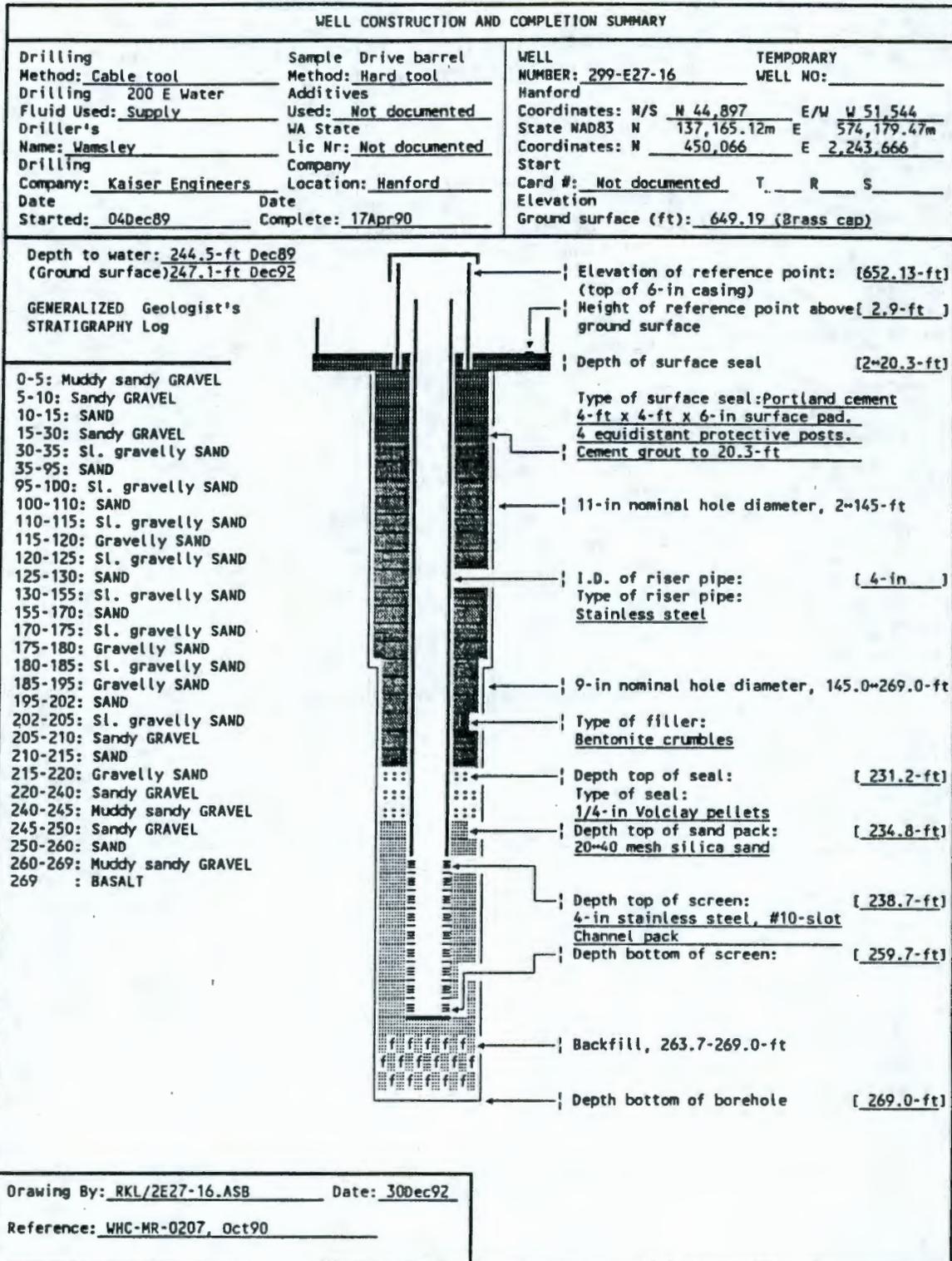


Figure 1. Example Well Construction and Completion Summary.
(sheet 2 of 2)

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E27-16

WELL DESIGNATION : 2-E27-16
 RCRA FACILITY : 216-B-63 Trench
 CERCLA UNIT : 200 Aggregate Area Management Study
 HANFORD COORDINATES : N 44,897 W 51,544 [19Apr90-200E]
 LAMBERT COORDINATES : N 450,066 E 2,243,666 [HANCONV]
 N 137,165.12m E 574,179.47m [19Apr90-NAD83]
 DATE DRILLED : Apr90
 DEPTH DRILLED (GS) : 269.0-ft
 MEASURED DEPTH (GS) : Not documented
 DEPTH TO WATER (GS) : 244.5-ft, Dec89;
 247.4-ft, 09Mar93
 CASING DIAMETER : 4-in, stainless steel, +1.8↔238.7-ft;
 6-in, stainless steel, +2.9↔~0.5-ft
 ELEV TOP CASING : 652.13-ft [19Apr90-200E]
 ELEV GROUND SURFACE : 649.19-ft, Brass cap [19Apr90-200E]
 PERFORATED INTERVAL : Not applicable
 SCREENED INTERVAL : 4-in stainless steel with channel pack, 238.7↔259.7-ft
 COMMENTS : FIELD INSPECTION,
 OTHER;
 AVAILABLE LOGS : Geologist, Driller
 TV SCAN COMMENTS : Not applicable
 DATE EVALUATED : Not applicable
 EVAL RECOMMENDATION : Not applicable
 LISTED USE : B-63 Trench Quarterly water level measurement, 20Nov90↔09Mar93;
 Not on water sample schedule
 PUMP TYPE : Hydrostar
 MAINTENANCE :

Resource Protection Well Characterization and Evaluation

Figure 2. Decision Tree for Determining Fitness-For-Use.

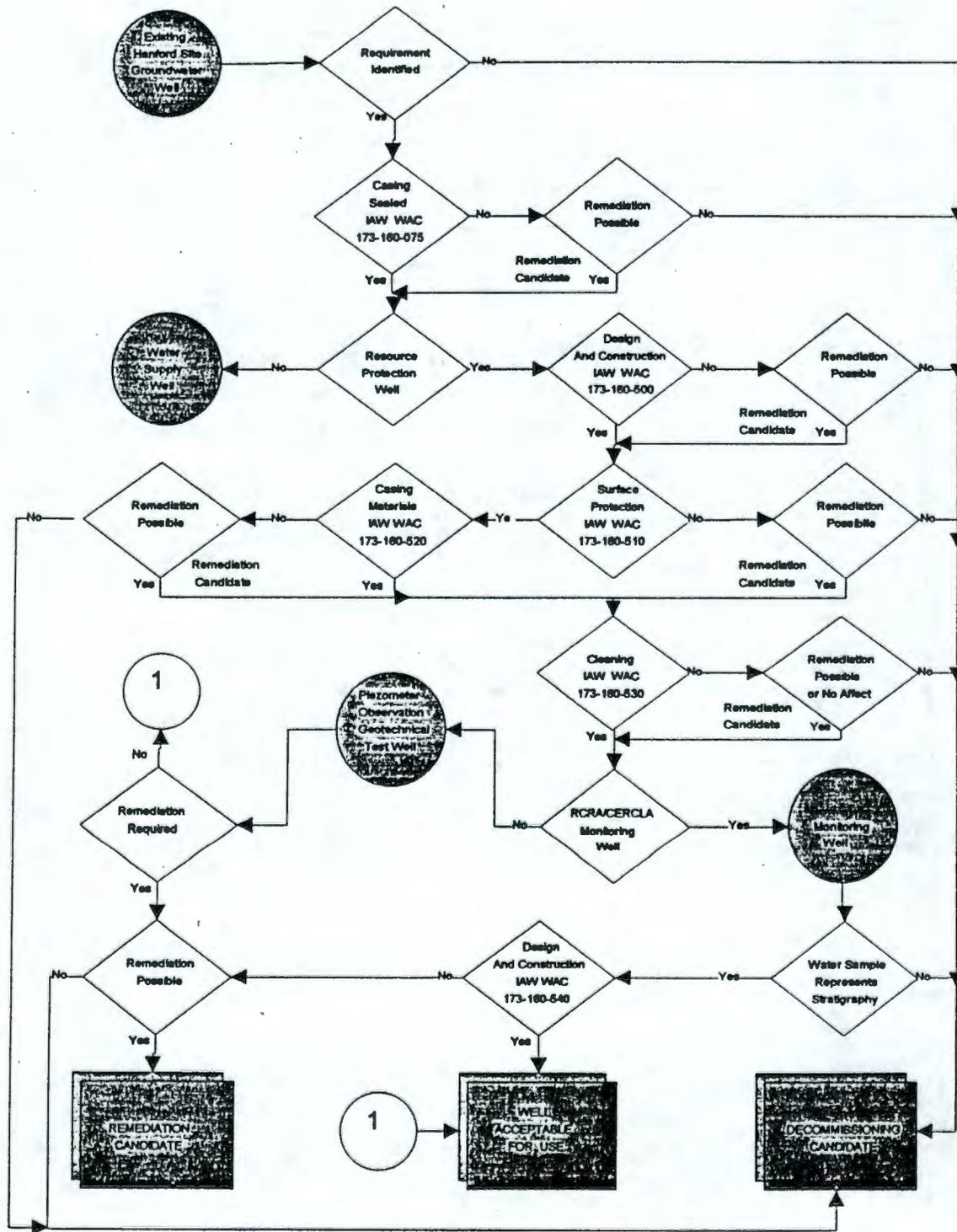
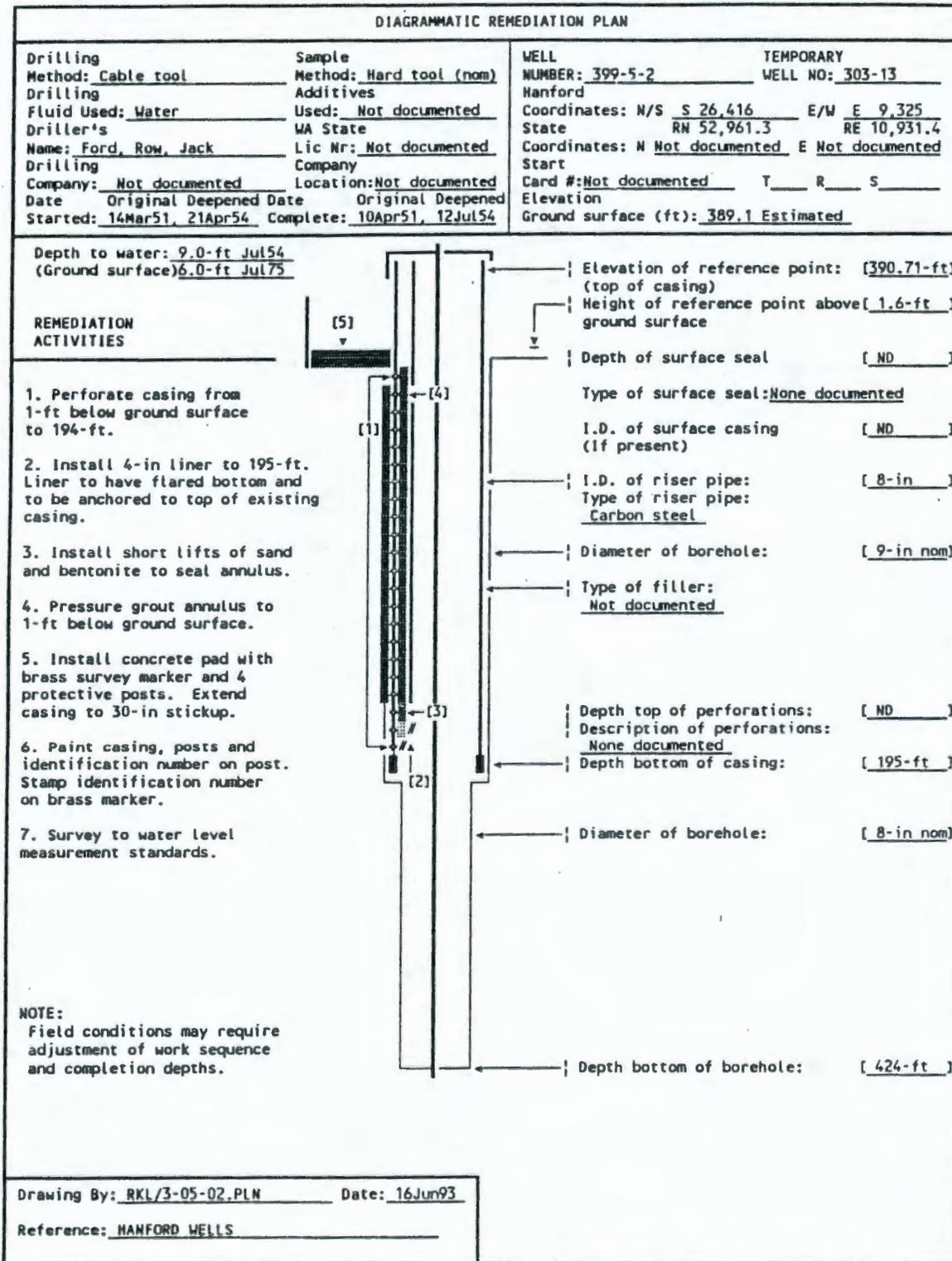


Figure 3. Example Diagrammatic Remediation Plan.



Decommissioning Wells**1.0 PURPOSE**

This Environmental Investigations Instructions (EII) specifies responsibilities and work control methods for initiation, direction and documentation of decommissioning activities for wells on the Hanford Site.

To prevent the well from being used for purposes other than intended and to preclude migration of contaminants into or between aquifers, individual wells are identified for decommissioning.

Decommissioning may also be necessary to withdraw the well from use in the following instances:

- The well is not suitable for rehabilitation or has failed structurally
- The well is not chemically compatible with its environment
- The well is no longer required for any documented use.

2.0 SCOPE

This instruction applies to the decommissioning or proper abandonment of wells on the Hanford Site.

An abandoned well is a well that has been filled or plugged so it is rendered unproductive. A properly abandoned well will not produce water or serve as a channel for movement of water (WAC 173-160-030).

The term "decommissioned well" used in this EII is a well that has been properly abandoned and its abandonment has been documented according to state requirements.

3.0 DEFINITIONS

See the Glossary/Acronyms section of this manual.

4.0 REQUIREMENTS

Requirements for protection of groundwater quality are contained in WHC-CM-7-5, Section 8. Specific requirements for well installation and use are as follows:

1. Groundwater monitoring wells shall be constructed in accordance with the relevant requirements of WAC 173-160 and 173-162.
2. Groundwater monitoring wells shall be operated in accordance with WAC 173-162 and the requirements of WAC 173-160 applicable to resource protection wells.

4.1 Well Decommissioning

The general requirements of WAC 173-160 for decommissioning or proper abandonment of wells are contained in WAC 173-160-415, "Abandonment of Wells". WAC 173-160, Sections 420 through 465 provide specific requirements applicable to the type of well being abandoned.

4.1.1 Identification of wells for decommissioning

Wells are identified for decommissioning by the process described in WHC-SD-EN-AP-122. EII 6.6 provides the mechanism to establish, review and approve technical requirements for individual well decommissioning.

4.1.2 Decommissioning of identified wells

Specific technical requirements for wells identified as requiring abandoning/decommissioning on the Hanford Site shall comply with the standards of WAC 173-160 (and applicable Ecology guidance and waivers) to provide for protection of public health, the environment and aquifer water quality.

Technical requirements will be detailed in the applicable approved EII 6.6 fitness-for-use evaluation package.

4.2 Ecology Variances

The following guidance and Hanford Site-specific variances have been issued by Ecology and apply to work scope as described in this EII.

4.2.1 Sand plug

Clean sand may be placed across individual aquifers in place of grout as plugging material. The sand shall be placed from the bottom of an aquifer to approximately 2 feet (0.6m) within an upper confining strata or above static water level. Where applicable, appropriate grout materials shall be placed between sand plugs to ensure isolation between individual aquifers.

Natural fill may be left in place as final plug in decommissioning unless it bridges multiple aquifers, in which case it must be removed to ensure isolation of aquifers. If not possible because of borehole conditions, a variance shall be requested in accordance with WAC 173-160.

4.2.2 Grout seal

Based on field conditions and in compliance with WAC 173-160 or variance approved by Ecology, a grout seal consisting of bentonite (granules, pellets or grout), bentonite/cement slurry, or neat cement shall be placed, at the Field Team Leader/Drilling Engineer's (FTL/DE) discretion, above the sand plug to restrict migration of cement through the sand or formation to the groundwater.

Decommissioning Wells

4.2.3 Pressure grouting

Seal material (bentonite, bentonite/cement, neat cement slurries) shall be placed by pressure grouting to within approximately 3 feet of ground surface.

Pressure grouting means to apply pressure to force the grout into the formation through the perforations in the casing. The FTL/DE will determine packer placement and acceptable grouting pressure based on field conditions. For example, the formation may take grout and not attain pressure buildup beyond hydrostatic pressure.

4.2.4 Surface protection

Remove surface pads and posts (if present). Cut off any remaining casing at least 3 feet (0.91m) below ground surface. Top off well with grout, allowing grout to spread out in excavation to create a grout cap. Scribe well identification number into the grout cap or use brass survey marker if available. Backfill the excavation with native soil and compact.

4.3 Location of Decommissioned Wells

Document location of all decommissioned groundwater wells to enable return if required. Use existing surveys if available. Horizontal coordinates are to be reported in Hanford plant coordinates and Washington State (south zone-NAD83) Lambert coordinates for each decommissioned well.

4.4 Waste Management and Minimization

1. Minimize production of solid waste.
2. Dispose of nonradioactive nonhazardous solid waste in accordance with WHC-CM-7-5, Section 7.3.
3. Manage waste generated from well decommissioning in accordance with EII 4.2 or EII 4.3 of this manual as applicable.
4. Well casing is to be perforated as required and grouted in place unless casing removal has been identified as a requirement for remediation in the evaluation process of EII 6.6.

4.5 Control of Work

Control of work refers to the administrative authority for beginning, planning, scheduling, performing, documenting and evaluating work activities. Requirements for control of work applicable to activities covered by this EII are specified in Section 6.0.

4.6 Equipment

1. Equipment required for decommissioning of wells are those downhole tools normally found associated with drilling industry rigs.

Decommissioning Wells

2. Equipment used for this activity does not require calibration.

4.7 Material

Material used in abandonment activities shall meet the minimum requirements of WAC 173-160-415.

4.8 Training and Qualification

1. Training and qualification shall be documented and records shall be maintained as required by EII 1.7.
2. All decommissioning work is to be done by, or under the direct supervision of, an individual possessing a valid Washington State Water Well Construction Operator License.

4.9 Safety Requirements

Appropriate safety documentation shall be prepared and approved before activities may begin. All personnel shall be trained in the applicable safety requirements.

All activities associated with hazardous waste sites and Radiologically Controlled Areas (RCA) must comply with the applicable site-specific safety requirements for access control; monitoring of radiation and environmental hazards; and personal protective equipment.

Those requirements may include a Hazardous Work Permit, site-specific safety plan and Radiation Work Permits (RWP).

4.10 Evaluation Checklist

An evaluation checklist package for wells requiring abandonment must be prepared according to EII 6.6 and approved before starting decommissioning activities.

4.11 Equipment Decontamination

Decontamination/cleaning of drill rig and down-hole equipment is not required when decommissioning groundwater supply wells or oil and gas wells that are not located in hazardous or potentially hazardous areas. Decontamination/cleaning shall meet the minimum requirements of EII 5.4.

4.12 Start Card

1. The Notice of Intent to begin well construction, "start card" must be filed with the Washington State Department of Ecology (Ecology) in accordance with WAC-173-160-055, "Well Construction Notification (start card). Start cards are to be filed with the Kennewick Office of Ecology at least 72 hours before commencement of work.

Decommissioning Wells

2. WAC-173-160-055 requires that start cards be submitted for abandonment of a well. Abandonment is equivalent to the decommissioning activities defined in this EII.
3. DOE/RL has delegated the necessary authority to WHC to ensure timely and proper submittal of start cards before groundwater well decommissioning at the Hanford Site.
4. Start card information shall be provided to WHC at least five working days before the initiation of any decommissioning. Information must include well location (township, range, section and 1/4 section), proposed use, approximate start and completion dates, contractor's registration number (if applicable), driller's name and license number (if known) and drilling company's name.
5. The *Well Services* support function of WHC will coordinate start card submittals for all RCRA and CERCLA wells decommissioned at Hanford.

5.0 PROCEDURECognizant
Manager

1. Assign Field Team Leader/Drilling Engineer (FTL/DE).

FTL/DE

2. Obtain all approvals; complete or verify completion of required activities. Enter completion date and attach objective evidence of completion for each activity on the Groundwater Well Remediation/Decommissioning Checklist, A-6000-472.

NOTE: Photocopies of applicable activity documentation are acceptable objective evidence.

FTL/DE

3. Plan well decommissioning activities, including details such as grout pressures, perforation intervals, materials, and order of work.

Cognizant
Manager (or
designee)

4. Review Work Planning/Initiation part of the Groundwater Well Remediation/Decommissioning Checklist. Approve if appropriate.

5. Authorize startup of decommissioning activities.

FTL/DE

6. Notify the decommissioning contractor to mobilize; provide technical direction to decommissioning field personnel; ensure that activities are performed in accordance with WAC 173-303 and applicable Ecology guidance and waivers.

7. Closely monitor and direct decommissioning contractor for conformance to requirements.

NOTE: The FTL/DE has work stoppage authority.

8. Prepare and submit nonconformance reports when work is not in conformance with requirements.

9. Document decommissioning activities daily on the Field Activity Report (FAR) Well Remediation and Abandonment, BC-6000-287 and appropriate continuation page if necessary.

Cognizant
Manager (or
designee)

10. Review documentation within five working days.
11. Prepare and distribute (via internal memo or external letter as applicable) the cross-section drawing (informal sketch) showing final condition of the decommissioned well; include related documentation. Distribute to the Hanford Well Administrator, identified users, and concerned organizations.
12. Complete the Water Well Report in accordance with WAC 173-160-050 and transmit to Ecology within thirty days of completing remediation.
13. Prepare the Work Performance/Evaluation part of the Groundwater Well Remediation/Decommissioning Checklist.
14. Approve checklist.

NOTE: The completed checklist and objective evidence package ensures that the documents needed to support the activities have been completed.

5.5 Records

Record processing and disposition is as follows:

Name, Filing Unit Title or Description	Record Type*	Retention Period	Disposal Authority	Cut-off and Retirement Instructions
FAR: Well Remediation and Abandonment (BC-6000-287)	QA	TBD	TBD	Transmit to FC upon completion for submittal to IRM permanent storage per approved RIDS. FC places copy in project file.
Groundwater Well Remediation/Decommissioning Checklist (A-6000-472)	QA	TBD	TBD	Transmit to FC upon completion for submittal to IRM permanent storage per approved RIDS. FC places copy in project file.

* QA = Quality Assurance

Decommissioning Wells

6.0 FORMS

Field Activity Report - Well Remediation and Abandonment (BC-6000-287, Siteforms)
Groundwater Well Remediation/Decommissioning Checklist (A-6000-472, Siteforms)

7.0 DESIGNATED REVIEWING ORGANIZATION

The organization designated to review changes to this document is listed below.

Designated ReviewersCMPOC

Hanford Technical Services, process owner

STS/HTS

Comments from other organizations are welcome; however, such courtesy comments are dispositioned at the option of the originating organization.

8.0 REFERENCES

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells."

WAC 173-162, "Regulations and Licensing of Well Contractors and Operators."

WHC-CM-7-5, *Environmental Compliance*.

Section 7.3, "Standards for Nonradioactive Nonhazardous Solid Waste Disposal."

Section 8.0, "Water Quality."

WHC-SD-EN-AP-122, "Hanford Well Remediation and Decommissioning Plan."

9.0 BIBLIOGRAPHY

ECOLOGY, 1993, C. Cline, Ecology to J. Hennig, RL, "Request of Variance from WAC 173-160-415 to Install Sand Plugs in Aquifers During Well Abandonment/Decommissioning and Remediation Activities." May 5, 1993.

WHC-CM-4-3, *Industrial Safety Standards*, Volume 1, "Safety Standards."

Standard A-3, "Prejob Safety Planning/Job Hazard Analysis."

Standard CM-9, "Surface Drilling."

Standard G-10, "Controlling Access to Unoccupied Facilities."

WHC-CM-6-1, *Standard Engineering Practices*, EP-1.2, "Engineering Specification Requirements."

WHC-CM-7-5, *Environmental Compliance*.

Section 12.2, "Historical and Archaeological Site Preservation."

Section 12.4, "Plant and Wildlife Species on the Hanford Site."

WHC-CM-8-7, *Operations Support Services*, Section 503.1, "Excavation Permits."

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Remediation of Groundwater Wells**1.0 PURPOSE**

This Environmental Investigations Instruction (EII) specifies responsibilities and work control methods for remediation activities at existing groundwater wells on the Hanford Site.

Remediation of individual groundwater wells may be necessary to allow the well to be used for alternate purposes, preclude migration of contaminants into or between aquifers, or allow continued use of the well for its intended purpose.

2.0 SCOPE

This EII applies to the remediation (repairing or altering the structure) of existing groundwater wells on the Hanford Site.

3.0 RESPONSIBILITIES**3.1 Cognizant Manager**

1. Assign the Field Team Leader (FTL)/Drilling Engineer (DE).
2. Review required documentation and authorize start of remediation activities.

3.2 Field Team/Drilling Engineer

1. Plan groundwater well remediation activities.
2. Interface with the remediation service contractor.
3. Provide onsite technical direction of contractors.
4. Ensure completion of field activities as required by WAC 173-160 and applicable specifications.
5. Document field activities.
6. Ensure that required documentation and records are properly completed, approved, and controlled.

4.0 REQUIREMENTS**4.1 Groundwater Protection**

Requirements for groundwater well installation and use are contained in WHC-CM-7-5, Section 8.3.7. Those requirements are:

1. Groundwater monitoring wells shall be constructed in accordance with the relevant requirements of WAC 173-160 and WAC 173-162.

Remediation of Groundwater Wells

2. Groundwater monitoring wells shall be operated in accordance with WAC 173-162 and the relevant requirements of WAC 173-160 for resource protection wells.

4.2 Functional Design Requirements

Functional design requirements for use of existing wells are developed based on approved decisions reached under the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement).

4.3 Technical Requirements

Technical requirements are contained in engineering specifications for well remediation prepared according to WHC-CM-6-1, EP-1.2, as required by remediation activities. Activities may consist of changes to existing structures or complete remediation equivalent to new monitoring well construction.

4.4 Waste Management And Minimization

1. Production of solid waste shall be minimized.
2. Nonradioactive, nonhazardous solid waste shall be disposed of in accordance with WHC-CM-7-5, Section 7.
3. Waste generated from well remediation will be managed in accordance with EII 4.2 or EII 4.3 of this manual, as applicable.
4. Well casing shall be perforated as required and grouted in place unless casing removal has been identified as a requirement for remediation in the evaluation process of EII 6.6 of this manual.

4.5 Control of Work

Control of work refers to the administrative authority for beginning, planning, scheduling, performing, documenting, and evaluating work activities. Control of work requirements applicable to activities covered by this EII are specified in Section 6.0.

4.6 Equipment

1. Equipment required for remediation of groundwater wells are those tools normally associated with water well industry drilling rigs.
2. No equipment used for this activity requires calibration.

4.7 Measurements

1. Well depth and remediation modifications shall be measured to ± 0.1 ft (0.03m) using standard steel engineering scale measuring tapes.

Remediation of Groundwater Wells

2. All measurements shall be related to the common datum of ground surface, which shall be established at existing ground surface level prior to remediation activities.

4.8 Well Location

Location of all remediated groundwater wells shall be determined by onsite survey. Existing surveys may be used where available and applicable. The survey requirements are found in WHC-S-0115.

4.9 Training And Qualifications

1. Training and qualifications shall be documented and records shall be maintained as required by EII 1.1 and 1.7 of this manual.
2. All remediation work is to be performed by, or under the direct supervision of, an individual possessing a valid Washington State Water Well Construction Operator License obtained in accordance with WAC 173-162.

4.10 Safety Requirements

All remediation activities shall comply with the requirements of the applicable site-specific safety documents, (e.g., HWOP, JSA, site-specific safety plan), and Radiation Work Permit (RWP) for access control, monitoring of radiation, health and safety hazards, and personal protective equipment.

4.11 Evaluation Checklist

An evaluation checklist for Wells requiring remediation shall be prepared in accordance with EII 6.6 and properly approved before starting remediation activities.

4.12 Start Card

1. The Notice of Intent to begin well construction, "start card," must be filed with the Washington State Department of Ecology (Ecology) in accordance with WAC-173-160-055, "Well Construction Notification (start card)." Start cards are to be filed with the Kennewick Office of Ecology at least 72 hours before commencement of work.
2. WAC 173-160-055 requires that start cards be submitted for reconstruction of a well. Reconstruction is equivalent to the remediation activities defined at the Hanford Site.
3. DOE/RL has delegated the necessary authority to WHC to ensure timely and proper submittal of start cards before groundwater well remediation at the Hanford Site.
4. Start card information shall be provided to WHC at least five working days before the initiation of any well remediation. Information must include well location (township, range, section and 1/4 section), proposed use, approximate start and completion dates,

Remediation of Groundwater Wells

contractor's registration number (if applicable), driller's name and license number (if known) and drilling company's name.

5. The *Well Services* support function of WHC will coordinate start card submittals for all RCRA and CERCLA wells remediated at Hanford.

5.0 PROCEDURE**5.1 Work Planning/Initiation****5.1.1 Environmental Readiness Review**

The FTL/DE shall prepare a Well Remediation Readiness Checklist, A-6001-365 (Figure 1) and conduct of operation matrix as required in EII 1.13 of this manual. The conduct of operation matrix may include more than one well when applicable.

The FTL/DE obtains all approvals and completes or verifies completion of required activities for individual wells by initiating and entering the completion date for each activity on the checklist.

5.1.2 Work Authorization

The cognizant manager (or designee) reviews the checklist and conduct of operation matrix for completeness. Approval indicates authorization to proceed.

5.2 Mobilization

The FTL/DE notifies the remediation services contractor to mobilize after Section 5.1 has been completed and approved.

5.3 Work Performance and Review

1. The FTL/DE closely monitors and directs the remediation services contractor doing remediation work for conformance to specifications.
2. The FTL/DE has work stoppage authority.
3. Engineering Change Notices (WHC-CM-6-1, EP-2.2) are initiated when revisions to the specifications are required.
4. Nonconformance Reports (WHC-CM-4-2, QI 15.1) are prepared when work is not in conformance with requirements.
5. Remediation activities shall be documented daily on the Field Activity Report (FAR) - Well Remediation and Abandonment. The Text Continuation Page and Drawing Continuation Page are used when required.

Remediation of Groundwater Wells

5.4 Work Evaluation

The FTL/DE assembles completed FARs and other records generated during remediation. The cognizant manager (or designee) reviews the records for completeness.

5.4.1 Well Condition Drawing

The FTL/DE prepares and distributes (via internal memo or external letter as applicable) the cross-section drawing (informal sketch) showing final condition of the remediated well and other related documentation deemed necessary to the geosciences, hydrology, and engineering groups who direct work, or who need information.

5.4.2 Well Completion Report

The FTL/DE ensures that the Water Well Report/Resource Protection Well Report (WAC 173-160-050, "Records") has been properly completed and transmitted to Ecology within 30 days of completing remediation.

5.4.3 Well Remediation Verification Report

The FTL/DE completes the Well Remediation Verification Report, A-6001-364 (verification report, Figure 2). The cognizant manager then approves the completed verification report.

Remediation of Groundwater Wells

5.5 Records

Processing and disposition of records generated during implementation of this EII are as described

Name, Filing unit title or description	Record Type*	Retention Period	Disposal Authority	Cut-off and Retirement Instructions
FARS: Well Remediation and Abandonment, Text Cont. Page, Drawing Cont. Page, Tubular Goods Tally Cont. Page, Cement Calculations - Cont. Page	QA	TBD	TBD	Transmit to FC upon completion for submittal to IRM permanent storage per RIDS. FC places copy in project file. Continuation pages are transmitted when used.
Well Remediation Readiness Checklist, Well Remediation Verification Report, Conduct of Operation Matrix	QA	TBD	TBD	Transmit to FC upon completion for submittal to IRM permanent storage per RIDS. FC places copy in project file.
Nonconformance Reports (NCRs)	QA	TBD	TBD	When applicable, transmit to FC upon completion for submittal to IRM permanent storage per RIDS. FC places copy in project file.

* QA = Quality Assurance; TBD = To be determined

6.0 FORMS

The following forms and instructions are available on Siteforms.

- FAR - Well Remediation and Abandonment (BC-6000-287)
- FAR - Cement Calculations - Continuation Page (BC-6000-279)
- FAR - Drawing Continuation Page (BC-6000-281)
- FAR - Tubular Goods Tally - Continuation Page (BC-6000-281)
- Groundwater Well Remediation/Decommissioning Checklist (A-6000-472)
- Well Remediation Readiness Checklist (A-6000-365)
- Well Remediation Verification Report (A-6000-364).

Remediation of Groundwater Wells

7.0 DESIGNATED REVIEWING ORGANIZATIONS

Organizations designated to review changes to this document are listed below.

Designated ReviewersCMPOC

Documentation and Records Services
Hanford Technical Services, process owner

IRM/DRM
STS/HTS

Comments from other organizations are welcome; however, such courtesy comments are dispositioned at the option of the originating organization.

8.0 REFERENCES

Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement).

WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells."

WAC 173-162, "Regulation and Licensing of Well Contractors and Operators."

WAC 173-303, "Dangerous Waste Regulations."

WHC-S-0115, *Specification for Remediation of Existing Resource Protection Wells,*

WHC-CM-3-5, *Records Management and Document Control*, Section 5, "Records Storage, Retrieval, and Destruction."

WHC-CM-4-2, *Quality Assurance Manual*, QI 15.1, "Nonconforming Item Reporting."

WHC-CM-6-1, *Standard Engineering Practices.*

EP-1.2, "Engineering Specification Requirements."

EP-2.2, "Engineering Document Change Control Requirements."

WHC-CM-7-5, *Environmental Compliance.*

Section 7, "Solid Waste Management."

Section 8, "Water Quality."

9.0 BIBLIOGRAPHY

WHC-CM-2-5, *Management Control System*, Section 2.5, "External Work Orders."

WHC-CM-4-3, *Industrial Safety Manual*, Volume 1, "Safety Standards."

Standard A-3, "Prejob Safety Planning/Job Hazard Analysis."

Standard CM-9, "Surface Drilling."

Standard G-10, "Controlling Access to Unoccupied Facilities."

WHC-CM-4-11, *ALARA Program Manual.*

Remediation of Groundwater Wells

WHC-CM-4-40, *Industrial Hygiene Manual*, Section 3.1, "Confined Spaces Entry."

WHC-CM-4-46, *Nonreactor Facility Safety Analysis Manual*, Section 4.0, "Hazard Classification."

WHC-CM-7-5, *Environmental Compliance*.

Section 4.0. "National Environmental Policy Act/State Environmental Policy Act."

Section 12.3, "Historical and Archaeological Preservation."

Section 12.4, "Plant and Wildlife Species on the Hanford Site."

WHC-CM-8-7, *Operations Support Services*, Section 503.1, "Excavation Permits."

Remediation of Groundwater Wells

Figure 1. Well Remediation Readiness Checklist, A-6001-365.

WELL REMEDIATION READINESS CHECKLIST		Page <u>1</u> of <u>1</u>
Criteria from applicable requirement documents		
Well No.	Well Specification/Revision WHC-S-0115, Rev. 0	
Work Initiation Activity	Requirement Document - Section	Completion Date or NR Initials/Date
Evaluation Checklist Approved	WHC-CM-7-7, EII 6.6	_____
Engineering Specification Issued	WHC-CM-6-1, EP 1.2	_____
Cultural Resources Review/Clearance	WHC-CM-7-5, 12.3	_____
Endangered Species Review/Clearance	WHC-CM-7-5, 12.4	_____
Env Assessment/NEPA Documentation	WHC-CM-7-5, 4.0	_____
HWOP/Site Safety Plan Complete	WHC-CM-4-3 Vol 4/WHC-CM-7-7, EII 2.1	_____
Radiation Work Permit Obtained	WHC-CM-1-6	_____
Hazard Classification Complete	WHC-CM-4-46, 4.0	_____
Retired Area Entry Permit Obtained	WHC-CM-4-3, G-10	_____
ALARA Checklist Complete	WHC-CM-4-11	_____
Evacuation Permit Obtained	WHC-CM-4-3, CM-8/WHC-CM-8-7, 503.1	_____
Confined Space Entry Permit Obtained	WHC-CM-4-40, 3.1	_____
Jet Perforation Planned/Controlled	WHC-CM-4-3, CM-11	_____
Personnel Training Complete	WHC-CM-7-7, EII 1.1	_____
Procedures Revised	WHC-CM-7-7, EII 1.2, EII 1.4	_____
Conduct of Operations Matrix Complete	WHC-CM-7-7, EII 1.13	_____
Work Schedule Complete	WHC-CM-7-7, EII 1.14	_____
Letter of Instruction Issued	WHC-CM-6-2, PM-10, WHC-CM-7-7, EII 1.15	_____
Authorization Work Order Issued	WHC-CM-2-5, 2.5	_____
Remediation Rig/Tools Inspected	WHC-S-0115, 0110-1.6	_____
Start Card Transmitted	WAC-173-160-055/WHC-CM-7-7, EII 8.3	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
NR = Not Required		
Comments _____		

Checklist Completed By:	Checklist Approved By:	
_____	_____	
<small>Print/Sign Name and Date</small>	<small>Print/Sign Name and Date</small>	

Remediation of Groundwater Wells

Figure 2. Well Remediation Verification Report, A-6001-364.

WELL REMEDIATION VERIFICATION REPORT			Page <u>1</u> of <u>1</u>
Criteria from WHC-S-0115, and applicable change documents			
Well No.	Well Specification/Revision	Remediation Plan Number	
	WHC-S-0115, Rev. 0		
Subject	Verification Method	Criteria	Completion Date or NR Initials/Date
		Specification Section	Chg. Doc.
Cleaning			
Remediation Rig/Tools	Visual	01100-1.7.1.8	
Temporary Materials	Visual	01100-1.7.1.8	
Lubricants/Additives			
Lubricants	Visual	01019-1.3.2.5.2	
Additives	Visual	01019-1.3.2.5.1	
Remediation Materials			
Liner Casing	Visual	02670-2.4	
Casing Centralizers	Visual	02670-2.4	
Screens	Visual	02670-2.5	
Cement Grout	Visual	02670-2.1	
Well Cap	Visual	02670-2.6	
Concrete for Pad	Visual	02670-2.1	
Storage/Packaging	Visual	01600-1.3.1	
Site Preparation	Visual	02110-3.1	
Casing Perforations	Visual	02670-3.1	
Liner/Grout Installation	Visual/Calculation	02670-3.1	
Overdrill/Grout Installation	Visual/Calculation	02670-3.1	
Surface Pad Installation	Visual	02670-3.4	
Protective Post Installation	Visual	02670-3.5	
Cap/Hasp/Lock Installation	Visual	02670-3.6	
Casing Extended/Cutoff	Visual	02670-3.7	
Casing Exterior/Posts Painted	Visual	02670-3.8	
Labeled/BC-Casing Stamped	Visual	02670-3.5	
Survey Complete	Visual	01050-2.1	
Site Restored	Visual	02670-2.9	
Waste Controlled	Visual	01100-1.9, 1.10	
Well Record to Ecology	Visual	01300-1.2.1.8	
			NR = Not Required
Comments _____			
Report Completed By: _____		Report Approved By: _____	
Print/Sign Name and Date		Print/Sign Name and Date	