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UC-2100

Pacific Northwest
National Laboratory

Operated by Battelle for the
U.S. Department of Energy

TWRS Privatization Phase I Monitoring Wells Engineering Study

B. A. Williams
D. R. Newcomer

April 1998

Prepared for the U.S. Department of Energy
under Contract DE-AC06-76RLO 1830

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Abstract

This engineering study will identify all well owners and users, the status or intended use of each well, regulatory programs, and any future well needs or special purpose use for wells within the TWRS Privatization Phase I demonstration area.

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1.0 Introduction

This engineering study provides an evaluation of existing wells and boreholes (wells) within the proposed location for the Tank Waste Remediation System (TWRS) Privatization Phase I demonstration site (Shord 1996). Phase I is part of the TWRS program that was established to manage, retrieve, treat, immobilize, and dispose of high-level waste stored in underground tanks at the Hanford Site (Singh and Fort 1997). This evaluation is to determine which wells will remain active within the demonstration site based on regulatory, programmatic, or other beneficial use requirements. An initial evaluation of wells within the demonstration site was conducted in 1996 (see WHC-SD-WM-ES-398, Rev. 0). However, changes in construction plans and expansion of the demonstration site necessitated a reevaluation and reclassification of the wells that are within the expanded site. Impacted wells include many of those previously evaluated as well as additional wells identified in or near the expansion areas. Thirty-three wells exist within and immediately adjacent to the identified boundary of the proposed demonstration site (Appendix A). The wells identified for decommissioning will be abandoned according to the well decommissioning plan (e.g., Skoglie 1996). Future well requirements within the site include replacement wells for those wells impacted by construction activities, replacements for *Resource Conservation and Recovery Act of 1976* (RCRA) wells going dry, and a new characterization well installed to support a TWRS Phase II site assessment.

2.0 Conclusions

The conclusions of this study of existing well needs within the TWRS Privatization Phase I Demonstration Site are:

- Two Groundwater Projects rely on wells within the area to meet federal, state, or U.S. Department of Energy (DOE), Richland Operations Office (RL) groundwater compliance requirements. These projects are Pacific Northwest National Laboratory (PNNL) Hanford Groundwater Monitoring Project (HGWMP) (conducts Site-Wide Surveillance and RCRA Monitoring); Bechtel Hanford Inc. (BHI) *Comprehensive Environmental, Response, Compensation, and Liability Act of 1980* (CERCLA).

- This revised study revealed a total of 33 wells (versus 21 in 1996) within the expanded demonstration site. Fifteen wells fulfill program compliance requirements, 3 of which are being retained to support the proposed Immobilized Low-Activity Waste (ILAW) Storage and Disposal facility (formerly ILLW). Thirteen wells have, previous to this study, been decommissioned, and five additional wells (orphan wells) have been identified for decommissioning.

- Fourteen of the 15 program monitoring wells meet required Washington Administrative Code (WAC), Chapter 173-160 well construction standards and do not currently pose a threat (via pathway to the aquifer) to the public or the environment. Well 299-E25-25, however, will require either a state well construction waiver or additional surface remediation to bring it into compliance with the WAC requirements.

- Decommissioning of the five orphan wells will commence after DOE-RL approval or privatization contractor turndown of the wells, and when funding is identified. Decommissioning activities will proceed according to the decommissioning plan (Skoglie 1996).

- New well requirements within the demonstration area such as those that might support the RCRA (i.e., proposed ILAW Storage Facility), site characterization (TWRS Phase II site assessment), and for replacement of wells impacted by planned privatization contractor construction activity will be addressed in separate plans, permits, as identified by the HGWMP.

3.0 Evaluation Criteria and DQOs

Well data quality objectives (DQOs) are defined by the individual user for the program they support and will not be re-evaluated in this study. All active wells must meet the minimum WAC 173-160 construction requirements (or receive a state waiver) in order to maintain protection (minimize potential for contamination) to the environment and provide representative data. Hanford Site programs that currently use wells in the TWRS Privatization Phase I area include PNNL's HGWMP and BHIs CERCLA Program. The HGWMP includes Hanford site-wide and RCRA monitoring of groundwater, which were combined into a single project in 1996.

Table 1 provides a list of all wells located within and adjacent to the defined boundary of the TWRS Phase I demonstration siting (former Grout Treatment Facility [GTF]). Several well databases were queried for the compilation of this table including Hanford Wells (Chamness and Merz 1993), Hanford Well Custodians (WHC-SD-EN-DP-071, Rev. 1), RCRA Borehole Data Packages for the GTF (WHC-SD-EN-DP-085, Rev. 0), Hanford Environmental Information System (HEIS), and GeoDAT/ Paradox (PNNL internal database). In addition to database queries, each program was contacted and provided input to the table.

Table 1 identifies the custodian and current users of each well and summarizes the well type, location in Hanford Plant and Lambert coordinates, borehole total drill depth, well completion date, depth of perforated or screened interval, and the approximate height of the water column in the well. Well as-built diagrams are attached as Appendix B.

Each groundwater monitoring project has specific criteria and requirements for well use and this study assumes that the wells are suitable to meet those intended program requirements. Therefore, this study will not reevaluate this aspect of well use. Instead, this study will evaluate ways to maximize well use by combining project/program needs to reduce the number of wells that may impact privatization activities.

Existing wells are also evaluated to determine if they pose an obstacle or impact planned facility construction for the site study. Wells that pose potential construction obstacles will be evaluated to determine if other existing wells could fulfill the users DQOs or if new wells are required.

3.1 Future Well Requirements

This study evaluates all future well use options prior to decommissioning to ensure the most efficient use of resources. Groundwater well requirements are categorized as: 1) Supply, and 2) Resource Protection.

1. Water supply wells will not be required. The unconfined groundwater contains many contaminants and will not meet water quality standards. The installation of water supply wells into deeper,

Table 1. Summary of Current Well Data in the TWRS Privatization Area

Well Number	Well ID	Custodian	Well Type	Users	East-West (Plant)	North-South (Plant)	East-West (Lambert)	North-South (Lambert)	Drill Depth, ft	Completion Date	Perforated or Screened Interval, ft	Length of Water Column, ft
299-E25-25	A4770	PNNL	U	S	43648.00	41002.00	576588.89	135984.41	288	April 1985	269 to 289	22
299-E25-26	A4771	PNNL	U	R	45884.00	40773.00	575907.50	135912.86	290	April 1985	270 to 290	
299-E25-27	A4772	PNNL	U	N	45135.71	39855.23	576136.44	135633.91	300	May 1985	274 to 294	22
299-E25-28	A4773	PNNL	U	R, S	45541.00	41424.00	576011.77	136111.69	348	April 1986	320 to 340	81
299-E25-29	A6034	PNNL	P, R	N/A	45734.77	40169.50	575953.81	135729.44	336	Oct. 1987	N/A	N/A
299-E25-29P	A4774	PNNL	P, U	S	45734.77	40169.50	575953.81	135729.44	336	Oct. 1987	256 to 276	10
299-E25-29Q	A4775	PNNL	P, L	S	45734.77	40169.50	575953.81	135729.44	336	Oct. 1987	325 to 330	57
299-E25-30	A6035	PNNL	P, R	N/A	44900.42	39710.36	576208.44	135590.23	330	Sept. 1987	N/A	N/A
299-E25-30P	A4776	PNNL	P, U	S	44900.42	39710.36	576208.44	135590.23	330	Sept. 1987	263 to 283	10
299-E25-30Q	A4777	PNNL	P, L	S	44900.42	39710.36	576208.44	135590.23	330	Sept. 1987	320 to 330	53
299-E25-31	A4778	PNNL	R, U	R	45752.90	40311.20	575948.19	135772.61	298	July 1987	259 to 279	10
299-E25-32	A6036	PNNL	P, R	N/A	44325.60	41200.00	576382.38	136044.56	354	May 1988	N/A	N/A
299-E25-32P	A4779	PNNL	P, U	R	44325.60	41200.00	576382.38	136044.56	354	May 1988	260 to 280	12
299-E25-32Q	A4780	PNNL	P, L	S	44325.60	41200.00	576382.38	136044.56	354	May 1988	320 to 330	59
299-E25-33	A4781	PNNL	R, U	N	45609.00	40116.40	575992.19	135713.38	400	Jan. 1988	262 to 282	14
299-E25-34	A4782	PNNL	U	R, S	45516.85	41385.90	576019.04	136100.01	276	Sept. 1988	252 to 272	9
299-E25-37	A4785	PNNL	R, U	O	45749.20	40461.50	575949.19	135818.41	280	Sept. 1989	260 to 280	12
299-E25-38	A4786	PNNL	R, U	R	45469.00	40056.40	576034.88	135695.20	283	Sept. 1989	259 to 280	12
299-E25-39	A4787	PNNL	R, U	S	43673.00	40518.00	576581.88	135837.27	282	Oct. 1990	258 to 278	7
299-E25-40	A4798	PNNL	R, U	R	47334.80	41759.00	575464.68	136212.32	274	Sept. 1989	252 to 273	
299-E25-41	A4790	PNNL	R, U	R, O	47330.90	41541.80	575466.06	135145.93	279	Sept. 1989	255 to 276	9
299-E25-44	A5448	PNNL	R, U	S	45223.00	39930.00	576110.13	135656.94	293	June 1992	266 to 286	14
299-E25-45	A5449	PNNL	R, U	N	44973.00	39940.00	576185.56	135659.16	298	Aug. 1992	269 to 290	16
299-E25-49	A6038	PNNL	R, U	N	44626.00	39967.00	576291.69	135668.33	293	Aug. 1993	269 to 289	17
299-E25-50	A6039	PNNL	R, U	N	44274.00	40009.00	576399.06	135681.61	294	Sept. 1993	270 to 290	17
299-E25-164	A6580	ERC 200-BP-3	V, D	ABAND	46846.00	40317.00	575615.13	135773.38	20	May 1981	N/A	N/A
299-E25-165	A9793	ERC 200-BP-3	V, D	ABAND	46803.00	40249.00	575628.25	135752.70	15	May 1981	N/A	N/A
299-E25-205	A6609	ERC 200-PO-5	V, D	ABAND	46680.00	41490.00	575664.63	136130.94	25	Feb. 1984	N/A	N/A
299-E25-211	A6615	ERC 200-PO-5	V, D	ABAND	45000.00	41075.00	576177.00	136005.92	25	Feb. 1984	N/A	N/A
299-E25-213	A6617	ERC 200-PO-5	V, D	ABAND	45370.00	41540.00	576063.88	136147.31	25	Feb. 1984	N/A	N/A
299-E25-215	A6619	ERC 200-BP-3	V, D	ABAND	45000.00	40750.00	576177.25	135906.91	25	Jan. 1984	N/A	N/A
299-E25-216	A6620	ERC 200-BP-3	V, D	ABAND	45700.00	40500.00	575964.19	135830.17	40	Jan. 1984	N/A	N/A
299-E25-217	A6621	ERC 200-BP-3	V, D	ABAND	46460.00	40340.00	575732.75	135780.81	25	Jan. 1984	N/A	N/A
299-E25-218	A6622	ERC 200-PO-4	V, D	ABAND	45350.00	39840.00	576071.31	135629.36	18	Jan. 1984	N/A	N/A
299-E25-219	A6623	ERC 200-BP-3	V, D	ABAND	45000.00	39780.00	576178.00	135611.36	25	Feb. 1984	N/A	N/A

Table 1. (contd)

Well Number	Well ID	Custodian	Well Type	Users	East-West (Plant)	North-South (Plant)	East-West (Lambert)	North-South (Lambert)	Drill Depth, ft	Completion Date	Perforated or Screened Interval, ft	Length of Water Column, ft
299-E25-220	A6624	ERC 200-BP-3	V, D	ABAND	44300.00	40650.00	576390.56	135877.00	40	Feb. 1984	N/A	N/A
299-E25-221	A6625	ERC 200-PO-4	V, D	ABAND	44500.00	39400.00	576330.69	135495.98	25	Jan. 1984	N/A	N/A
299-E25-235	A6639	PNNL	V, D	ABAND	45185.00	40054.00	576121.44	135694.70	55	Mar. 1987	N/A	N/A
299-E25-1000	A6536	PNNL	R, U	S	44013.00	40258.00	576478.44	135757.66	392	Oct. 1993	263 to 293	24

Custodians:
PNNL = Pacific Northwest National Laboratory
ERC = Bechtel Hanford Inc.

Well Type:
R = state compliant
D = *decommissioned*
V = monitors vadose zone
U = monitors upper part of unconfined aquifer
L = monitors lower part of unconfined aquifer
C = monitors confined aquifer
P = piezometer

Users:
R = RCRA
C = CERCLA
S = Site-Wide
W = water levels
N = No users
O = Other, special use

noncontaminated aquifers increases the risk of cross contamination from the shallow aquifer and is not recommended. Water is readily available from several existing sources within the 200 Area and can be accessed via pipeline.

2. Resource protection wells are used to detect contaminants in groundwater that may pose a threat to public health or the environment. In addition, these wells are used to assess groundwater conditions and cleanup activities ongoing throughout the 200 Area Hanford Plateau.

Future groundwater well requirements within the TWRS Privatization area fall into the resource protection well category and will be based on project needs.

3.2 New Project Needs

New facilities that treat, store, or dispose dangerous or hazardous waste must meet RCRA or Washington State groundwater monitoring requirements. Identified new projects are:

1. Privatization Contactor (PC) Facility(ies) - New facility groundwater monitoring needs will be defined in the RCRA operating permit requirements, which must be negotiated between the regulators and the PC. Based on planned activities, this facility is not initially expected to require groundwater monitoring for treatment, storage, or disposal under the RCRA. Prior to the abandonment of any existing wells in the construction area, the vendor will be given the option to procure these wells to fulfill anticipated needs or requirements. The PC will be responsible for all its individual well needs within the area or it may rely on the preexisting well database accessed through the Hanford Environmental Information System (HEIS).

2. ILAW Storage Facility - Groundwater monitoring may be required at the ILAW Storage Facility (formerly ILLW Interim Storage Facility), which is located on the west side of the Phase I Privatization area (Appendix A). This facility has been defined as the best alternative proposed for an interim storage facility. It is being evaluated to receive and store the vendors' ILAW product starting in 2002. TWRS ILAW Storage Facility (subproject OOL-EEW-465) is intended to provide storage and possibly permanent disposal under the direction of DOE, as proposed in Burbank (1996), a predecisional draft that outlines alternatives for ILAW storage architecture. Currently, four existing wells located west and south of the ILAW Storage Facility meet RCRA groundwater compliance requirements for a land disposal facility (DOE 1990). Facility groundwater monitoring is adequate for the current groundwater flow direction and provides>95% coverage for leak detection based on Monitoring Efficiency Model (MEMO) results (WHC-SD-WM-ES-398, Appendix C). The four RCRA wells surrounding the ILAW may be compromised because they fall within the proposed transfer feed line corridor, along the preexisting berm adjacent to the ILAW. A cost benefit analysis should be performed to determine if the wells should be decommissioned and replaced in new locations or if the transfer corridor should be modified to accommodate future use of the wells (this analysis is not within the scope of this engineering report revision).

3. TWRS Phase II Performance Assessment - Disposal of the vendors' ILAW product in the TWRS ILAW Storage Facility will require subsurface hydrogeologic characterization. This data will be used to support the Phase II performance assessment of the facility. To support this assessment, one new groundwater monitoring well will be installed to characterize the vadose zone and unconfined aquifer system. Details on this borehole, including its location, are included in the Phase II Engineering Work Plan as a characterization plan (Reidel 1995).

3.3 Existing Project Needs

Individual groundwater monitoring programs must maintain groundwater compliance for specific groundwater conditions. Known changes occurring within the hydrogeologic system (aquifer) include declining water levels, changing flow directions, and changing contaminant plume concentrations and migration pathways. The Hanford Site-Wide Groundwater Remediation Strategy/Groundwater Contaminant Predictions (BHI-00469) provides a Hanford Site groundwater and contaminant flow model, which has been used to evaluate these changes and determine, as practicable, the magnitude and extent of the change. Based on these model predictions an assessment of network well requirements has been completed for outer years. These changes could require additional new well installations to provide adequate monitoring coverage.

Of the 33 total wells within the Phase I area, 15 have been identified as active wells, which should be retained to support State or DOE groundwater monitoring requirements. The four RCRA wells surrounding the proposed ILAW Storage Facility (299-E25-29, -31, -37, and -38) are included as part of the existing 15 active wells to support future monitoring needs for the facility. With the exception of well 299-E25-25 all the wells meet state requirements for resource protection wells. Well remediation (or a request for a state well construction variance) will be required to continue operating this well.

RCRA groundwater compliance, which is part of PNNL's HGWMP, currently utilizes seven wells within the area to ascertain groundwater flow, detect and assess groundwater contamination, and monitor water levels in the unconfined aquifer system. Under the RCRA program, there are currently five facilities with three separate groundwater networks, the 216-A-29 Ditch, Single Shell Tanks, Waste Management Area A-AX (SST WMA A-AX), and the combined 216-A36-B, 216-A-10, and 216-A37-1 Cribs (Plutonium-Uranium Extraction [PUREX] Cribs) network, which are located proximal to the area. The 216-A-29 Ditch facility currently relies on wells 299-E25-26, -28, -32, and -34, which are located within or immediately adjacent to the privatization area (see Plate 1 in Appendix A). SST WMA A-AX currently relies on wells 299-E25-40 and 299-E25-41, which are located on the east side (upgradient) of A-AX Tank Farm along Canton Avenue. The PUREX cribs currently rely on well 299-E25-31 as an upgradient well. This well is one of the four proposed ILAW monitoring wells located on the west side of the facility

The Atomic Energy Act groundwater compliance, also part of PNNL's HGWMP, provides regional groundwater plume maps for the entire Hanford Site (e.g., PNNL-11793) in support of DOE-RL Order 5400.1. This program relies on nine wells within the study area, four of which are RCRA monitoring wells, to fulfill its program requirements (see Plate 1 in Appendix A). The wells are 299-E25-25, -28, -29, -30, -32, -34, -39, -44, -1000. These requirements currently include monitoring of groundwater-levels

and the contaminants tritium, iodine-129, and nitrate. Other chemical and radiological constituents are monitored less frequently. No additional project requirements are anticipated for this area in the future.

The BHI CERCLA groundwater remediation program is responsible for groundwater remediation/ cleanup under the 200-PO-1 Operable Unit (OU), which encompasses the study area and currently utilizes data results from the RCRA and site-wide programs to supplement CERCLA program monitoring and provide groundwater quality determinations. BHI has indicated no additional future well requirements within the study area.

Review of modeled and expected changes to the unconfined aquifer system does not indicate any immediate or future needs for additional wells within the area to maintain RCRA compliance at existing RCRA facilities. Modeled results indicate that the maximum water table decline in the area will be approximately 3 m (9 ft) over the next 20 years (BHI-00469). Based on this information the wells selected for monitoring have an adequate water column for sampling through this time period. If any of the wells do go dry they will be evaluated for replacement by the appropriate well custodian and documented in the groundwater monitoring plan and/or permit. Groundwater flow over the next 20 years is predicted to change from the current southwest flow direction, to a more southeast flow (BHI-00469). Existing wells are adequately located to account for this change and no new well requirements are anticipated. The plume simulation model indicates that the groundwater contaminant plumes preferential flow path does not significantly change direction over the next 20 years. If contaminants do begin to migrate toward the southeast they will be monitored by existing wells located on the eastern side of the area.

Based on the preceding evaluation of the existing wells, only one new well has been identified. This well would be in support of the TWRS Phase II performance assessment. The location, drilling and construction of this well will be completed per the requirements of the characterization documentation (Reidel 1995).

No other new well needs within the TWRS Privatization Phase I Demonstration Site are envisioned.

4.0 Identification of Wells for Decommissioning

The 33 existing wells are divided into four categories to aid in consolidating well usage and to identify candidates for decommissioning. These wells are located within or immediately adjacent to the demonstration area, as shown on Plate 1 (Appendix A). Information on each of the wells is provided in Table 1. Table 2 provides a list of the 33 wells by category; category 4 is a subset of category 3 wells that maybe impacted by PC construction activities. The four categories are identified as:

- Category 1 - Decommissioned Wells
- Category 2 - Candidate Decommission Wells
- Category 3 - Active Monitoring Wells
- Category 4 - Compromised Wells

Category 1 - Decommissioned Wells: This category defines 13 existing boreholes, which have, previous to this study, already been decommissioned (see Table 2). These wells were used for monitoring the vadose zone in the past and are marked ABAND in the user column of Table 1. Seven decommissioned wells were added to this re-evaluation since the 1996 evaluation because of expansion of the privatization area. Although these wells have been abandoned, Chamness and Merz (1993) indicate that the casing materials for these wells, which range from 15 to 40 ft in depth, may still be in the ground.

Table 2. Wells Listed by Category

Category 1 Wells	Category 2 Wells	Category 3 Wells	Category 4 Wells
299-E25-164	299-E25-27	299-E25-25	299-E25-25
299-E25-165	299-E25-33	299-E25-26	299-E25-28
299-E25-205	299-E25-45	299-E25-28	299-E25-29 (P,Q)
299-E25-211	299-E25-49	299-E25-29 (P,Q)	299-E25-31
299-E25-213	299-E25-50	299-E25-30 (P,Q)	299-E25-32 (P,Q)
299-E25-215		299-E25-31	299-E25-37
299-E25-216		299-E25-32 (P,Q)	299-E25-38
299-E25-217		299-E25-34	299-E25-39
299-E25-218		299-E25-37	299-E25-1000
299-E25-219		299-E25-38	
299-E25-220		299-E25-39	
299-E25-221		299-E25-40	
299-E25-235		299-E25-41	
		299-E25-44	
		299-E25-1000	

The locations of the decommissioned wells are provided on Plate 1 (Appendix A) for reference to allow the construction contractor the ability to locate them during construction activities.

Category 2 - Candidate Decommission Wells: There are five existing groundwater wells identified with no use and are considered candidates for decommissioning (see Table 2). The wells are 299-E25-27, -33, -45, -49, and -50 (see Plate 1, Appendix A) and are identified in Table 1 by an "N" under the USER column. Only one well (299-E25-33) of the five was re-categorized since the 1996 evaluation. The Well Decommissioning Plan provides specific decommissioning requirements for the original four wells (Skoglie 1996). This plan will be revised to include decommissioning requirements for 299-E25-33 and modifications for wells 299-E25-49 and -50 (removal of the upper 50 ft of the well casing and annular seal materials to accommodate construction excavation activities in the area).

Category 3 - Active Wells: Fifteen wells will be retained as active monitoring wells (see Table 2). This group of wells includes four wells that were added since the 1996 evaluation (299-E25-26, -28, -40, and -41). Twelve wells have been identified that support the project requirements as summarized above. In addition, three wells (former GTF RCRA wells 299-E25-29, -37, and -38) will remain active to support future well needs at the proposed ILAW Storage Facility.

Category 4 - Compromised Wells: Nine of the 15 Category 3 wells identified may be compromised by impacts from future privatization construction activities (see Table 2). The wells are identified as 299-E25-25, -28, -29, -31, -32, -37, -38, -39, and -1000. Well 299-E25-28 and the four ILAW wells (299-E25-29, -31, -37, and -38) were identified as additional Category 4 wells since the 1996 study.

Wells located outside the demonstration area that are not anticipated to be impacted by Phase I activities are marked as shown on Plate 1. These wells primarily include active groundwater monitoring wells and abandoned vadose zone monitoring wells. The well numbers 299-E25-XX, where XX is equal to or less than 50, are active groundwater monitoring wells. The well numbers 299-E25-XX, where XX is greater than 50, are vadose zone monitoring wells that, for the most part, have been abandoned with the exception of well 299-E25-1000. All other wells shown on Plate 1 that are not impacted by Phase I activities are active monitoring wells.

4.1 Wells Compromised by Vendors' Construction Activities

Results of the evaluation of the Category 4 wells, completed by the HGWMP, are described in this section. Based on a review of the proposed construction activities for the Phase I privatization, nine wells may be compromised. Because the proposed construction area is still being studied and defined (TWRS Phase I Privatization Site Development Engineering Study), the exact number of Category 4 wells that will be impacted is not known. The nine Category 4 wells have been prioritized according to the existing program(s) importance, i.e., based on program DQOs, spatial location, and the height of the remaining water column within the wells. This prioritization will assist in subsequently determining the need for, and replacement of, the impacted wells.

Category 4 wells are prioritized as Priority 1, Priority 2, or Priority 3 and are discussed as follows:

Priority 1. Groundwater results from well 299-E25-32 support both projects (HGWMP and CERCLA). This well has added value because it is completed in two intervals by piezometers 'P' and 'Q' within the unconfined aquifer and thus provides information about the vertical gradients and contaminant distribution (i.e., tritium, iodine-129, and nitrate) across the interval. It is one of only a handful of wells at Hanford, which provide this type of access to the aquifer. The location of this well is key to understanding the impacts and effects of B-Pond recharge to the aquifer, the decline of the artificial groundwater mound, and changes to the groundwater-flow system. The RCRA program utilizes this well for several facilities, including the former 216-A-29 Ditch. This well also has a good historical groundwater database and declining groundwater levels will not impact the ability to sample this well.

The four wells surrounding the ILAW Storage Facility (299-E25-29, -31, -37, and -38) will form the downgradient monitoring network for the future RCRA storage site and will provide compliant groundwater monitoring.

Priority 2. Wells 299-E25-25, -28, and -1000 are utilized by the HGWMP. The location of well 299-E25-25 is key to tracking the decline in the B-Pond groundwater mound and the change in groundwater-flow conditions. Well 299-E25-28 is primarily used to monitor the bottom of the unconfined aquifer and is used to determine groundwater-flow gradients and contaminant distribution in the vertical direction. Well 299-E25-28 monitors the former 216-A-29 Ditch facility. Well 299-E25-1000 is the newest of all the wells within the area and is in a location that supports the evaluation and interpretation of regional groundwater-flow conditions. Declining groundwater levels will not impact the ability to sample these wells.

Priority 3. Well 299-E25-39 is utilized by the HGWMP. This well is also in a prime location for evaluating the B-pond mound decline and effects on regional groundwater-flow conditions. However, declining groundwater levels will impact the ability to sample this well. Less than 7 ft of water column is left in the screened interval and projected declines indicate that this well will go dry in a few years.

4.2 Requirements of Compromised Wells

The Priority 1 well, 299-E25-32 will require a replacement well to be installed if the PCs' construction activities require this well be decommissioned. Similarly, the ILAW wells, 299-E25-29, -31, -37, and -38, will require replacements if decommissioned unless the proposed transfer feed line right-of-way can be modified to avoid the wells.

Priority 2 wells will require one replacement if well 299-E25-1000 or both wells 299-E25-1000 and 299-E25-25 are decommissioned. Well 299-E25-1000 may be substituted for well 299-E25-25 if it must be decommissioned because of construction activities. Well 299-E25-28 must be replaced if it is decommissioned because there are no other nearby wells that monitor the bottom part of the unconfined aquifer.

The Priority 3 well 299-E25-39 can be decommissioned if necessary or it will be systematically decommissioned when it can no longer be sampled.

Preliminary indications from the construction contractor, Fluor Daniel Northwest (FDNW), identify only one well (299-E25-32) will be impacted. Based on the Priority 1 classification this well will require a replacement installed if it must be decommissioned. The other eight compromised wells are located far enough away from the proposed construction zones, right-of-ways, and corridors that they currently pose no problem.

5.0 Future Well Access

Per the recommendations of this study, all planned construction activities shall be engineered to allow continued access to the active wells for the purpose of program groundwater sampling, well maintenance, or other scheduled work. Easements will be placed around these wells to maintain access for sampling and provide protection from future land-use activities. Any contractor wishing to access wells will be required to acquire approval from the well custodian identified in Table 1.

6.0 Study Summary

There are a total of 33 wells within the demonstration area, 15 fulfill RCRA, CERCLA, or Atomic Energy Act groundwater compliance requirements and DQOs (well 299-E25-25 will require surface remediation [or a state variance] to bring it into compliance with the WAC regulations). Thirteen wells have, previous to this study, already been decommissioned, and five wells have been identified to be decommissioned per the decommissioning plan (Skoglie 1996). One additional well, 299-E25-39, will be decommissioned as it becomes too difficult to sample.

New well requirements within the demonstration area include; one new characterization well installed to support the TWRS Phase II performance assessment and, as will be determined, a possible replacement well for 299-E25-32. Any additional RCRA groundwater monitoring requirements at the ILAW facility will be addressed separately by the HGWMP in the appropriate RCRA groundwater-monitoring plan as required by the facility permit. The PC(s) will have the opportunity to procure any of the targeted Category 2 wells prior to decommissioning.

7.0 References

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Appendix A

TWRS Privatization Phase I Well Base Map

Appendix B

TWRS Privatization Phase I Well As-Built Diagrams

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-25

WELL DESIGNATION	:	299-E25-25
RCRA FACILITY	:	Not documented
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 41,001.6 W 43,648.4 [18Jul85]
LAMBERT COORDINATES	:	N 446,192 E 2,251,572 [HANCONV]
DATE DRILLED	:	Apr85
DEPTH DRILLED (GS)	:	288-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	263-ft, Apr85; 263.9-ft, 10Jun93
CASING DIAMETER	:	8-in, carbon steel, 0↔150-ft; 6-in, carbon steel, +2.74↔253-ft
ELEV TOP CASING	:	669.42-ft, [18Jul85]
ELEV GROUND SURFACE	:	Not documented
PERFORATED INTERVAL	:	8-in casing, 0↔150;
SCREENED INTERVAL	:	269↔289-ft, 6-in #10 slot stainless steel
COMMENTS	:	FIELD INSPECTION, 27Aug93, Carbon steel casings. Capped and locked No pad, posts or permanent identification. Not in radiation zone.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout semiannual water level measurement, 01Jun85↔10Jun93,
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: Water
Driller's Name: L. Bultena
Drilling Company: Onwego Drilling
Date Started: 11Mar85
Date Complete: 10Apr85

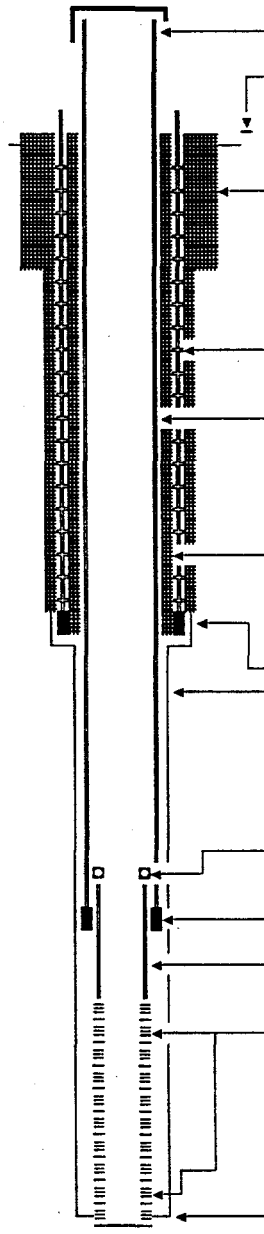
Sample Method: Drive barrel
Hard tool
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Kennewick, WA

WELL NUMBER: 299-E25-25
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 41,001.6 E/W W 43,648.4
State Coordinates: N 446,192 E 2,251,572
Start Card #: Not documented T R S
Elevation Ground surface: Not documented

Depth to water: 263-ft Apr85
(Ground surface) 263.9-ft 10Jun93

GENERALIZED STRATIGRAPHY Sl=slightly — Geologist's Log

0↔5: Sl. silty SAND
5↔10: Fine↔med SAND
10↔15: Cse↔very cse SAND w/SILT lenses
15↔25: Med↔very cse SAND w/PEBBLES
25↔35: Med↔cse SAND
35↔40: Sl. gravelly SAND
40↔50: SAND
50↔55: Gravelly SAND
55↔70: SAND
70↔80: Silty SAND
80↔100: SAND
100↔140: SAND & silty SAND lenses
140↔155: Gravelly SAND
155↔160: SAND
160↔170: Gravelly silty SAND
170↔175: Sandy GRAVEL
175↔180: Silty sandy GRAVEL
180↔185: Silty gravelly SAND
185↔195: Sandy GRAVEL
195↔270: Silty sandy GRAVEL
270↔288: Silty pebbley SAND



Elevation of reference point: [669.42-ft] (top of casing)
Height of reference point above ground surface [ND]
Depth of surface seal [0↔20-ft]
Type of surface seal: Cement grout between 8 and 12-in casing as 12-in was being pulled (removal not documented, but assumed)
8-in ID carbon steel casing, 0↔150-ft, perforated 2 cuts/rd/ft
6-in carbon steel casing, +ND↔253-ft
Annular seal, cement grout between 6-in and perforated 8-in casing, 0↔150-ft
Hole diameter, 20↔150-ft, 9-in nominal
150↔288-ft, 7-in nominal
Packer set @ 249-ft
6-in casing pulled back from total depth
20-ft blank, 249↔269-ft
6-in stainless steel telescoping screen, 269↔289-ft, #10-slot
Borehole drilled depth: [288-ft]

Drawing By: RKL/2E25-25.ASB
Date : 07Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-27

WELL DESIGNATION	:	299-E25-27
RCRA FACILITY	:	(Grout?)
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 39,855.5 W 45,135.8 [18Jul85]
LAMBERT COORDINATES	:	N 445,041 E 2,250,087 [HANCONV]
DATE DRILLED	:	May85
DEPTH DRILLED (GS)	:	300-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	269-ft, May85; 272.0-ft, 10Jun93
CASING DIAMETER	:	12-in, carbon steel, ~0↔80-ft 8-in, carbon steel, 0↔160-ft; 6-in, carbon steel, +2.0↔257-ft
ELEV TOP CASING	:	676.08-ft [18Jul85]
ELEV GROUND SURFACE	:	674.06-ft, Brass cap [18Jul85]
PERFORATED INTERVAL	:	8-in casing, 0↔150;
SCREENED INTERVAL	:	274↔294-ft, 6-in #10 slot stainless steel
COMMENTS	:	FIELD INSPECTION, 23Aug89, 6-in carbon steel casing. 18-in concrete pad, no posts, capped and locked.
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout semiannual water level measurement, 01Jun85↔10Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring,
PUMP TYPE	:	None documented
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Drive barrel Method: Hard tool
Drilling Fluid Used: Water	Additives Used: Not documented
Driller's Name: L. Bultena	WA State Lic Nr:
Drilling Company: Onwego Drilling	Company Location: Kennewick, WA
Date Started: 10Apr85	Date Complete: 30May85

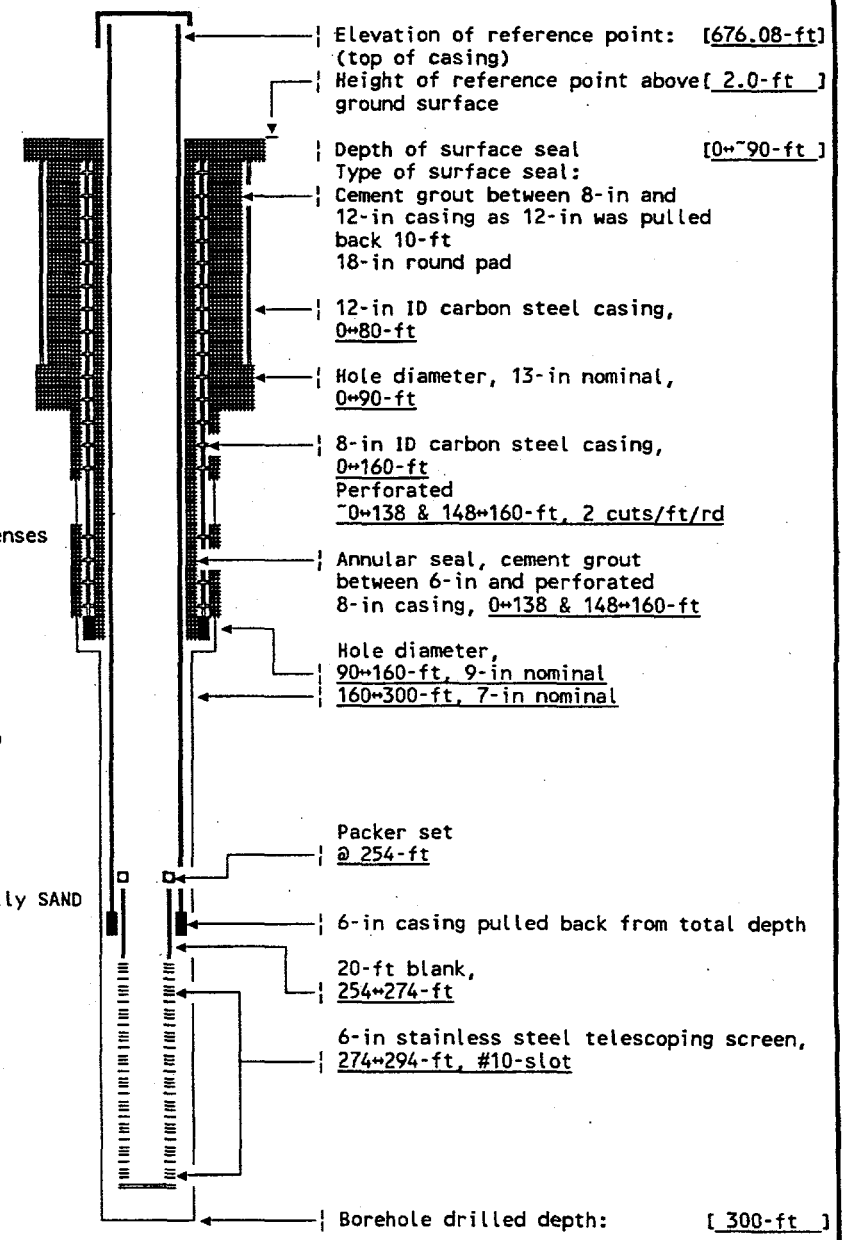
WELL NUMBER: 299-E25-27	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 39,855.5	E/W W 45,135.8
State Coordinates: N 445,041	E 2,250,087
Start Card #: Not documented	T R S
Elevation Ground surface: 674.06-ft Brass cap	

Depth to water: 269-ft May85
(Ground surface) 272.0-ft 10Jun93

GENERALIZED STRATIGRAPHY
Sl=slightly

Geologist's Log

0↔5: Sl silty pebbly SAND
5↔10: Sl silty sl gravelly SAND
10↔15: Gravelly SAND
15↔35: Sl gravelly SAND
35↔50: SAND
50↔55: Sl silty SAND
55↔60: Sl silty sl gravelly SAND
55↔65: Sl silty SAND
65↔75: Sl silty sl gravelly SAND
(GRAVEL lens @72-ft)
75↔80: Sl silty SAND
80↔90: Sl silty sl gravelly SAND
90↔95: Sl silty SAND
95↔116: SAND
116↔117: SILT lens
117↔125: Sl silty SAND
125↔130: SAND w/some silty SAND lenses
130↔155: SAND
155↔170: Sl silty SAND
170↔175: Sl silty sandy GRAVEL
175↔180: Sl silty sl sandy GRAVEL
180↔185: Sl sandy GRAVEL
185↔190: Sl silty sandy GRAVEL
190↔205: Sandy GRAVEL
205↔210: Sl silty sandy GRAVEL
210↔215: Sl silty sl gravelly SAND
215↔220: Sl gravelly silty SAND
200↔225: Silty sandy GRAVEL
225↔230: Sl silty sandy GRAVEL
230↔235: Silty sandy GRAVEL
235↔240: Sl gravelly silty SAND
240↔245: Silty sandy GRAVEL
245↔250: Silty sandy GRAVEL↔gravelly SAND
250↔265: Sl silty sandy GRAVEL
265↔270: Sl gravelly silt SAND
270↔275: Silty gravelly SAND
275↔285: Silty SAND
285↔290: Sl gravelly silty SAND
290↔295: Silty SAND
295↔300: Gravelly silty SAND



Drawing By: RKL/2E25-27.ASB
Date : 07Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-29

WELL DESIGNATION	:	299-E25-29
RCRA FACILITY	:	Grout
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 40,170 W 45,735
LAMBERT COORDINATES	:	N 445,355 E 2,249,487
DATE DRILLED	:	Oct87
DEPTH DRILLED (GS)	:	330-ft
MEASURED DEPTH (GS)	:	328.8-ft, Q-27Aug93
DEPTH TO WATER (GS)	:	Not documented, Oct87;
	:	(P)=270.1-ft, 10Jun93,
		(Q)=269.7-ft, 10Jun93
CASING DIAMETER	:	12-in carbon steel, +0.8↔3.5-ft;
		2-in, stainless steel, +0.7↔256.5-ft, (P);
		2-in, stainless steel, +0.7↔325.0-ft, (Q)
ELEV TOP CASING	:	673.06-ft, (12-in casing) [27Mar92-NGVD'29]
ELEV GROUND SURFACE	:	672.29-ft, Brass cap [27Mar92-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	P - 2-in, 256.5↔276.5-ft, stainless steel, slot not documented
		Q - 2-in, 325↔330-ft, stainless steel, slot not documented
COMMENTS	:	FIELD INSPECTION, 27Aug93;
		12-in carbon steel protective casing, 2 ea 2-in stainless steel piezometers.
		4-ft by 4-ft concrete pad, 4 posts, 1 removable.
		Capped and locked, brass cap in pad with well ID.
		Not in radiation zone.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout quarterly water level measurement, (P) 01Dec89↔10Jun93
		(Q) 01Dec89↔10Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling,
		PNL sitewide sampling 93
PUMP TYPE	:	Hydrostar (P)
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

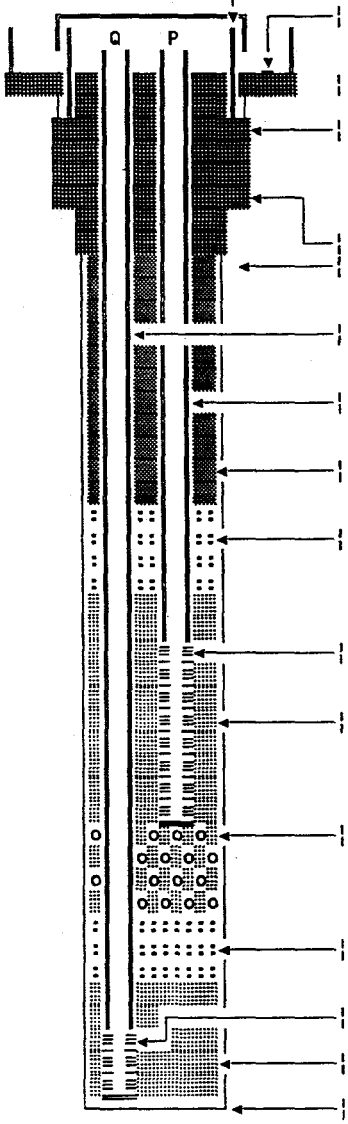
Drilling Method: Cable tool	Sample Drive barrel Method: Hard tool
Drilling Fluid Used: Water	Additives Used: Not documented
Driller's Name: R. Perry	Utah State Lic Nr: 354
Drilling Company: Basin and Range	Company Spanish Location: Fork, Utah
Date Started: 02Sep87	Date Complete: 07Oct87

WELL NUMBER: 299-E25-29	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,170	E/W W 45,735
State Coordinates: N 445,355	E 2,249,487
Start Card #: Not documented	T R S
Elevation Ground surface: 672.29-ft Brass cap	

Depth to water: Not documented
(Ground surface) 270.2-ft 10Jun93 (P)

GENERALIZED Geologist's STRATIGRAPHY Log

0↔45 SAND
45↔105: SAND and SILT
105↔140: SAND
140↔165: Pebbly SAND
165↔195: SAND
195↔205: Pebbly SAND
205↔330: SAND (and GRAVEL?)
(Log shows cuttings, assumed to be GRAVEL)



Elevation of reference point: [673.06-ft]
(top of 12-in casing)
Height of reference point above ground surface [0.77-ft]

Depth of surface seal [0↔25-ft]
Type of surface seal:
Cement grout to 25-ft
4x4-ft x 7-in surface pad
4 equidistant protective posts

Hole diameter,
0↔20-ft, 11-in nominal
20↔330-ft, 9-in nominal

2-in ID stainless steel tubing,
+ND↔325-ft (Q)

2-in ID stainless steel tubing,
+ND↔256.5-ft (P)

Bentonite crumbles-slurry,
25↔240-ft

Granular bentonite seal,
240↔252-ft

2-in stainless steel screen,
256.6↔276.5-ft, slot not documented

Silica sand pack,
252↔276.5-ft

Silica sand/gravel pack,
276↔297-ft

Volclay mixture seal,
297↔321-ft

2-in stainless steel screen,
325↔330-ft, slot not documented

Sandpack,
321↔330-ft

Depth bottom of borehole: [330-ft]

Drawing By: RKL/2E25-29.ASB
Date : 08Sep93
Reference :

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-30

WELL DESIGNATION	:	299-E25-30
RCRA FACILITY	:	Grout
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 39,710 W 44,900
LAMBERT COORDINATES	:	N 444,897 E 2,250,323
DATE DRILLED	:	Oct87
DEPTH DRILLED (GS)	:	330-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	271-ft, Oct87; 276.0-ft, 10Jun93 (Q)
CASING DIAMETER	:	12-in carbon steel, +0.3↔3.5-ft; 2-in, stainless steel, +0.3↔263.5-ft, (P); 2-in, stainless steel, +0.0↔325.0-ft, (Q)
ELEV TOP CASING	:	678.15-ft (12-in casing)
ELEV GROUND SURFACE	:	~677.9-ft, Estimated
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	P - 256.5↔276.5-ft, 2-in stainless steel, #20 slot, Q - 325↔330-ft, 2-in stainless steel, #20 slot,
COMMENTS	:	FIELD INSPECTION, 20Jan92; Stainless steel piezometer tubing, 12-in protective casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout quarterly water level measurement, (P) 01Jun91, then uncalibrated transducer Grout semiannual water level measurement, Q) 01Dec89↔10Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring, PNL sitewide sampling 93
PUMP TYPE	:	Hydrostar (P)
MAINTENANCE	:	

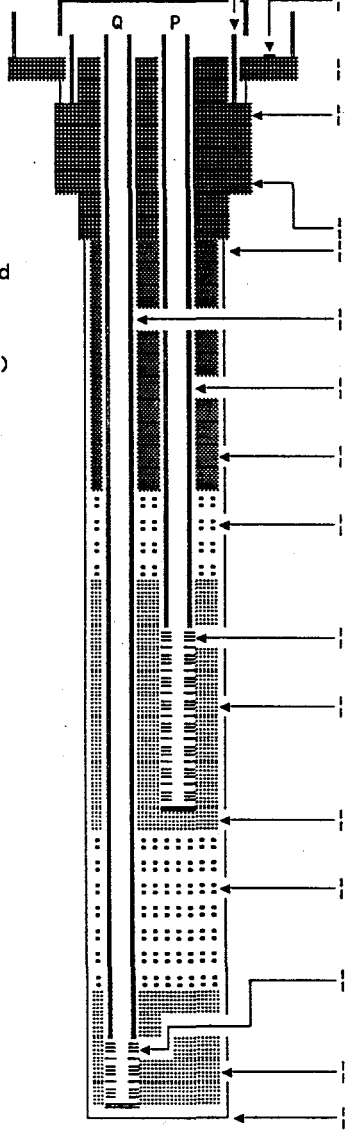
WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Drive barrel Method: Hard tool	WELL NUMBER: 299-E25-30	TEMPORARY WELL NO:
Drilling Fluid Used: Water	Additives Used: Not documented	Hanford Coordinates: N/S N 39,710	E/W W 44,900
Driller's Name: R. Perry	Utah State Lic Nr: 354	State Coordinates: N 444,897	E 2,250,323
Drilling Company: Basin and Range	Company Spanish Location: Fork, Utah	Start Card #: Not documented	T___ R___ S___
Date Started: 02Sep87	Date Complete: 07Oct87	Elevation Ground surface: 677.9-ft Estimated	

Depth to water: 271-ft Oct87
(Ground surface) 276.0-ft 10Jun93-G

GENERALIZED Geologist's STRATIGRAPHY Log

0-5: SAND, SILT & CLAY
5-10: SAND, trace GRAVEL
10-30: SAND, SILT & CLAY
30-55: SAND, some SILT
55-95: SAND, trace SILT
95-100: Pebbly SAND
100-115: SAND, some SILT
115-135: SAND, little-no SILT
(Perched water saturated zone 120-160-ft)
135-160: SAND
160-265: SAND, w/PEBBLES and cuttings (asumed GRAVEL)
265-310: SAND
310-323: Sandy GRAVEL
323-330: Gravelly SAND



Elevation of reference point: [678.15-ft]
(top of 12-in casing)
Height of reference point above ground surface [0.3-ft]

Depth of surface seal [0-25-ft]
Type of surface seal:
Cement grout to 25-ft
4x4-ft x 7-in surface pad
4 equidistant protective posts

Hole diameter,
0-20-ft, 11-in nominal
20-330-ft, 9-in nominal

2-in ID stainless steel tubing,
+ND-325-ft

2-in ID stainless steel tubing,
+ND-263.5-ft

Bentonite crumbles-slurry,
25-246-ft

Bentonite pellets,
246-260-ft

2-in stainless steel screen,
263.5-283.5-ft, #20-slot

Silica sand pack,
260-286-ft

Silica sand pack,
286-290-ft

Volclay mixture,
290-321-ft

2-in stainless steel screen,
325-330-ft, #20-slot

Sandpack,
321-330-ft

Borehole drilled depth: [330-ft]

Drawing By: RKL/2E25-30.ASB
Date : 08Sep93
Reference :

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-31

WELL DESIGNATION	:	299-E25-31
RCRA FACILITY	:	A-29 Ditch
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 40,311 W 45,752
LAMBERT COORDINATES	:	N 445,495 E 2,249,470
DATE DRILLED	:	Jul87
DEPTH DRILLED (GS)	:	298-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	264-ft, Jul87; 270.1-ft, 17Jun93
CASING DIAMETER	:	4-in, stainless steel, +2.1↔259-ft
ELEV TOP CASING	:	672.76-ft, [27Mar92-NGVD'29]
ELEV GROUND SURFACE	:	670.62-ft, Brass cap [27Mar92-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	259↔279-ft, 4-in stainless steel
COMMENTS	:	FIELD INSPECTION,
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	A29 Ditch quarterly water level measurement, 11Jul88↔17Jun93,
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling, PNL sitewide sampling 93
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

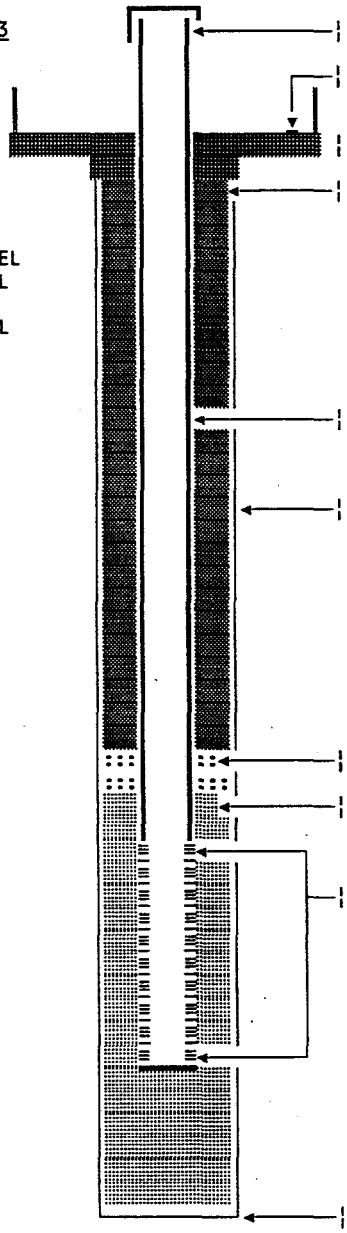
Drilling Method: Air Rotary	Sample Method: Air returns
Drilling Fluid Used: Air	Additives Used: Foam
Driller's Name: Nelson	WA State Lic Nr: Not documented
Drilling Company: Nelson Well Drill	Company Location: Pasco, WA
Date Started: 22Jun87	Date Complete: 16Jul87

WELL NUMBER: 299-E25-31	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,311	E/W W 45,752
State Coordinates: N 445,495	E 2,249,470
Start Card #: Not documented	T R S
Elevation Ground surface: 670.62-ft Brass cap	

Depth to water: 264-ft Jul87
(Ground surface)270.1-ft 17Jun93

GENERALIZED Geologist's STRATIGRAPHY Log

0↔27: No record
27↔33: Black SAND
33↔79: No record
79↔99: Black, silty SAND
99↔117: Black, sandy, silty GRAVEL
117↔137: Coarse SAND, fine GRAVEL
137↔177: No record
177↔197: Coarse SAND, fine GRAVEL
197↔217: Large GRAVEL, COBBLES
217↔220: COBBLES, GRAVEL
220↔225: No record
225↔230: Very open, moist
230↔237: No record
237↔258: COBBLES, GRAVEL, SAND
258↔271: No record
271↔276: Medium SAND and GRAVEL
276↔298: No record



Elevation of reference point: [672.76-ft]
(top of casing)
Height of reference point above ground surface [2.1-ft]
Depth of surface seal [3-249-ft]
Type of surface seal:
Volclay grout, 3↔249-ft
4x4-ftx4-in concrete pad
extending 3-ft into annulus
4-in ID T304 stainless steel casing, +2.1↔259.0-ft
Hole diameter, 9-in nominal 0↔298-ft
Bentonite pellets, 249↔254-ft
Silica sand pack, 254↔298-ft, mesh not documented
4-in ID stainless steel screen, 259↔279-ft, slot not documented
Borehole drilled depth: [298.0-ft]

Drawing By: RKL/2E25-31.ASB
Date : 08Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-33

WELL DESIGNATION	:	299-E25-33
RCRA FACILITY	:	Grout
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 40,116.20 W 45,609.55 [28Jun88]
LAMBERT COORDINATES	:	N 445,301 E 2,249,613 [HANCONV]
DATE DRILLED	:	Mar88
DEPTH DRILLED (GS)	:	400-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	266.5-ft, Mar88; 247-ft, 01Dec92
CASING DIAMETER	:	6-in, stainless steel, +2.62↔0.5-ft; 4-in, stainless steel, +ND↔261.9-ft
ELEV TOP CASING	:	650.23-ft, [27Mar92-NGVD'29]; 674.97-ft, [27Jun88]
ELEV GROUND SURFACE	:	Not documented
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	261.9↔282.2-ft, 4-in stainless steel, #20-slot
COMMENTS	:	FIELD INSPECTION, 12Aug89; Stainless steel casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID. OTHER; Casing was apparently cut off 25-ft after Jun88.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout semiannual water level measurement, 08Jul88↔01Dec91;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling, PNL sitewide sampling 93
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Drive barrel
Drilling Fluid Used: Water	Additives Used: Not documented
Driller's Name: Multiple	WA State Lic Nr: Not documented
Drilling Company: Kaiser Engineers	Company Location: Hanford
Date Started: 12Nov87	Date Complete: 24Mar88

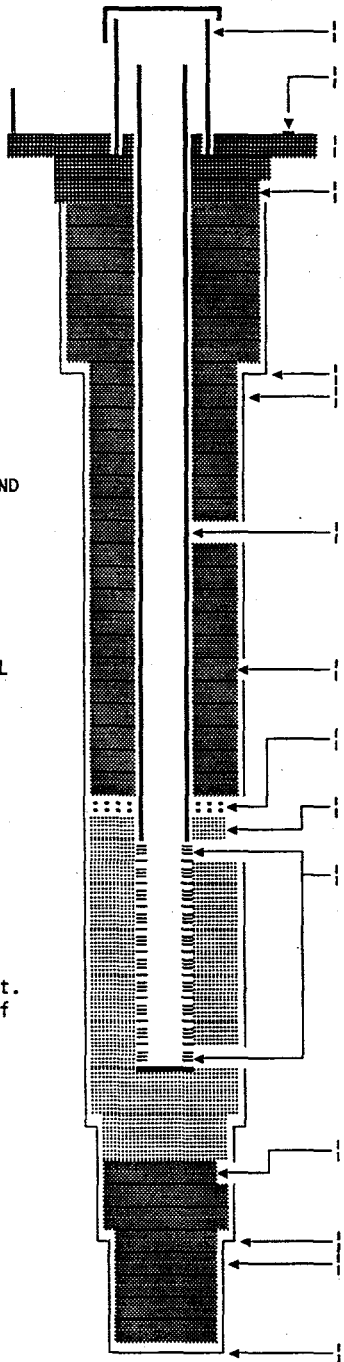
WELL NUMBER: 299-E25-33	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,116.20	E/W W 45,609.55
State Coordinates: N 445,301	E 2,249,613
Start Card #:	T R S
Elevation Ground surface: Not documented	

Depth to water: 266.5-ft Mar88
(Ground surface)247-ft Dec92

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0↔30: SAND
30↔35: Silty gravelly SAND
35↔45: SAND
45↔50: Silty SAND
50↔55: Silty gravelly SAND
55↔60: Sl gravelly SAND
60↔65: SAND
65↔75: Silty SAND
75↔80: Sl silty SAND
80↔85: Silty SAND
85↔105: SAND
105↔110: Gravelly silty SAND
110↔115: Silty gravelly SAND
115↔135: SAND
135↔140: Sl silty sl gravelly SAND
140↔165: Not documented
165↔185: SAND
185↔190: Gravelly SAND
190↔200: Gravelly silty SAND
200↔205: Gravelly SAND
205↔215: Silty sandy GRAVEL
215↔220: Sl silty sandy GRAVEL
220↔225: Sl silty sl sandy GRAVEL
225↔270: Silty sandy GRAVEL
270↔285: Silty SAND
285↔290: Sl silty gravelly SAND
290↔305: Silty sandy GRAVEL
305↔310: Silty gravelly SAND
310↔320: Sl silty sandy GRAVEL
320↔325: SAND
325↔350: Sandy GRAVEL
350↔385: Silty sandy GRAVEL
385↔400: BASALT

NOTE:
Construction diagram is as-built.
Well has apparently been cut off 25-ft to present elevation.
Former top-of-casing elevation was 674.97-ft.



Elevation of reference point: [650.03-ft] (top of casing)
Height of reference point above ground surface [ND]
Depth of surface seal [2.0↔20.0-ft]
Type of surface seal:
Cement grout 2↔20-ft
4x4-ft x 4-in concrete pad extending 2-ft into annulus
Hole diameter,
0↔120-ft, 13-in nominal
120↔315-ft, 11-in nominal
4-in ID T304 stainless steel casing, +ND↔261.9-ft
Granular/powdered bentonite, 20↔244.8-ft
Bentonite pellets, 244.8↔249.8-ft
Silica sand pack, 249.8↔ND-ft, 10↔20-mesh
4-in T304 stainless steel sceen, 261.9↔282.2-ft, #20-slot
Volclay grout, Depths not documented
Hole diameter,
315↔380-ft, 9-in nominal
380↔400-ft, 8-in nominal
Borehole drilled depth: [400-ft]

Drawing By: RKL/2E25-33.ASB
Date : 08Sep93
Reference :

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-37

WELL DESIGNATION	:	299-E25-37
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	Grout
HANFORD COORDINATES	:	N 40,461.5 W 45,749.2 [10Nov89-200E]
LAMBERT COORDINATES	:	N 445,646 E 2,249,472; [HANCONV]
		N 135,818.4m E 575,949.2m [10Nov89-NAD83]
DATE DRILLED	:	Jul89
DEPTH DRILLED (GS)	:	280.7-ft
MEASURED DEPTH (GS)	:	280.9-ft, 27Aug93
DEPTH TO WATER (GS)	:	264.6-ft, 11Aug89;
		268.3-ft, 10Jun93
CASING DIAMETER	:	4-in stainless steel, +1.1↔260.0-ft;
		6-in stainless steel, +3.0↔~0.5-ft
ELEV TOP CASING	:	673.51-ft, [27Mar92-NGVD'29]
ELEV GROUND SURFACE	:	670.51-ft, Brass cap [27Mar92-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	260.0↔280.7-ft, 4-in #10-slot stainless steel w/channel pack
COMMENTS	:	FIELD INSPECTION, 27Aug93;
		4 and 6-in stainless steel casing.
		4-ft by 4-ft concrete pad, 4 posts, 1 removable.
		Capped and locked, brass cap in pad with well ID.
		Not in radiation zone.
		OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout semiannual water level measurement, 01Dec89↔10Jun93
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling,
		PNL sitewide sampling 93
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: 200 W Water Supply
Driller's Name: C. Walmsley
Drilling Company: Kaiser Engineers
Date Started: 14Jun89 Date Complete: 13Jul89

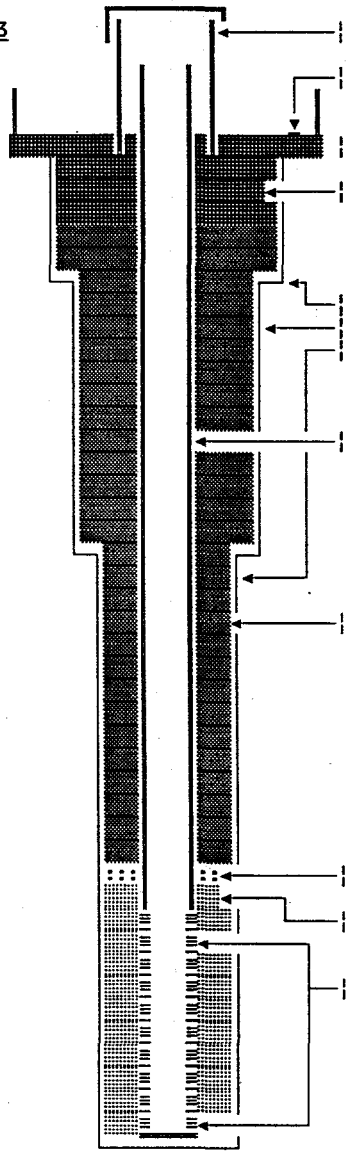
Sample Method: Hard tool Drive barrel
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Hanford

WELL NUMBER: 299-E25-37 TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,461.5 E/W W 45,749.2
State NAD83 N 135,818.4m E 575,949.2m
Coordinates: N 445,646 E 2,249,472
Start Card #: Not documented T___ R___ S___
Elevation Ground surface: 670.29-ft (Brass cap)

Depth to water: 264.6-ft Aug89
(Ground surface) 268.3-ft 10Jun93

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0↔10: SAND
10↔15: Sl muddy SAND
15↔20: Sl muddy gravelly SAND
20↔25: Sl gravelly muddy SAND
25↔35: Gravelly SAND
35↔50: SAND
50↔55: Muddy SAND
55↔65: SAND
65↔70: SAND/sl muddy SAND
70↔80: SAND
80↔85: Sl muddy SAND
85↔90: SAND
90↔95: Sl muddy SAND
95↔100: SAND
100↔105: Muddy SAND
105↔120: SAND
120↔125: Sl gravelly SAND
125↔130: Sl muddy SAND
130↔150: SAND
150↔155: Sl gravelly SAND
155↔165: SAND
165↔185: Gravelly SAND
185↔190: Sandy GRAVEL
190↔195: Gravelly SAND
195↔200: Muddy sandy GRAVEL
200↔250: Sandy GRAVEL
250↔270: Muddy sandy GRAVEL
270↔275: Sl gravelly muddy SAND
275↔280: Sandy GRAVEL



Elevation of reference point: [673.29-ft] (top of casing)
Height of reference point above ground surface [3.0-ft]

Depth of surface seal [3.0↔10.1-ft]
Type of surface seal:
Cement grout, 3.0↔10.1-ft,
4x4-ft x 6-in concrete pad
extends 3.0-ft into annulus

Hole diameter,
3↔20.3-ft, 13-in nominal
20.3↔153.7-ft, 11-in nominal
153.7↔280.7-ft, 9-in nominal

4-in ID T304 stainless steel casing,
+1.1↔260.0-ft

Granular bentonite,
10.1↔253.2-ft, 8↔20-mesh

¼-in Envirogel bentonite tablets,
253.2↔255.9-ft

Silica sand pack,
255.9↔280.7-ft, 10↔20-mesh

4-in stainless steel screen,
260.0↔280.7-ft, #10-slot
w/channel pack

Borehole drilled depth: [280.7-ft]

Drawing By: RKL/2E25-37.ASB
Date : 08Sep93
Reference : WHC-MR-0203

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-38

WELL DESIGNATION	:	299-E25-38
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	Grout
HANFORD COORDINATES	:	N 40,056.4 W 45,469.0 [10Nov89-200E]
LAMBERT COORDINATES	:	N 445,241 E 2,249,753; [HANCONV]
		N 135,695.2m E 576,034.9m [10Nov89-NAD83]
DATE DRILLED	:	Sep89
DEPTH DRILLED (GS)	:	283.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	265.1-ft, 05Jul89;
		268.2-ft, 10Jun93
CASING DIAMETER	:	4-in stainless steel, +1.4↔258.6-ft;
		6-in stainless steel, +3.0↔~0.5-ft
ELEV TOP CASING	:	673.75-ft, [27Mar92-NGVD'29]
ELEV GROUND SURFACE	:	670.77-ft, Brass cap [27Mar92-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	258.6↔279.6-ft, 4-in #10-slot stainless steel w/channel pack
COMMENTS	:	FIELD INSPECTION,
		OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout semiannual water level measurement, 01Dec89↔10Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling,
		PNL sitewide sampling 93
PUMP TYPE	:	Hydrostar, intake @ 279.1-ft
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

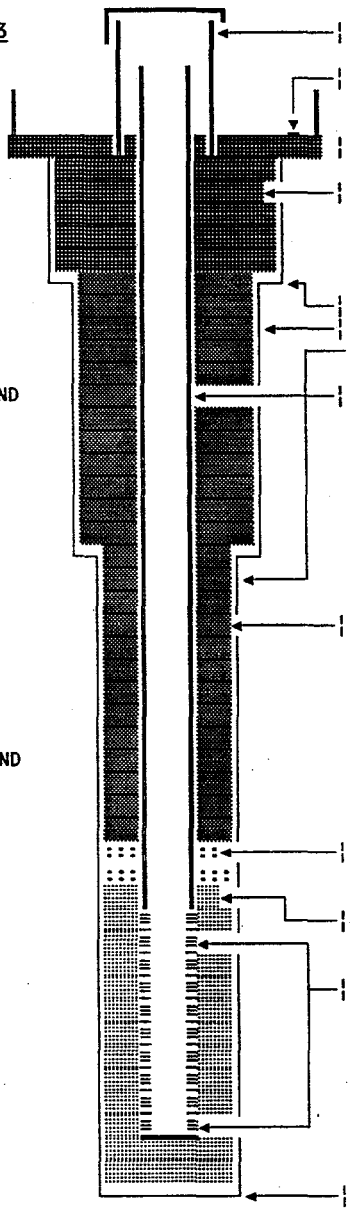
Drilling Method: Cable tool	Sample Method: Hard tool
Drilling Fluid Used: 200 W Water Supply	Additives Used: Not documented
Driller's Name: L. Watkins	WA State Lic Nr: Not documented
Drilling Company: Kaiser Engineers	Company Location: Hanford
Date Started: 07Jun89	Date Complete: 18Sep89

WELL NUMBER: 299-E25-38	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,056.4	E/W W 45,469.0
State NAD83 N 135,695.2m	E 576,034.9m
Coordinates: N 445,241	E 2,249,753
Start Card #: Not documented	T R S
Elevation Ground surface: 670.54-ft (Brass cap)	

Depth to water: 265.1-ft Jul89
(Ground surface) 268.2-ft 10Jun93

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0↔10: SAND
10↔15: Sandy GRAVEL
15↔20: SAND
20↔25: Sandy GRAVEL
25↔30: Sl gravelly SAND
30↔35: SAND
35↔40: Sl gravelly SAND
40↔65: SAND
65↔90: Sl gravelly SAND
90↔100: Sl muddy SAND
100↔110: Sl gravelly sl muddy SAND
110↔115: Sl muddy SAND
115↔120: SAND
120↔125: Sl mudy SAND
125↔135: Gravelly SAND
135↔140: Sl gravelly SAND
140↔145: SAND
145↔150: Muddy SAND
150↔165: SAND
165↔175: Gravelly SAND
175↔220: Sandy GRAVEL
220↔250: Muddy sandy GRAVEL
250↔257: Sandy GRAVEL
257↔258: Sl gravelly sandy MUD
258↔270: Sl gravelly muddy SAND
270↔275: Gravelly SAND
275↔280: Sl gravelly sl muddy SAND
280↔283: Sl gravelly SAND



Elevation of reference point: [673.52-ft] (top of casing)
Height of reference point above ground surface [3.0-ft]
Depth of surface seal [2.0↔19.3-ft]
Type of surface seal:
Cement grout, 2.0↔19.3-ft
4x4-ft x 6-in concrete pad
extends 2.0-ft into annulus
Hole diameter,
2.0↔20.0-ft, 13-in nominal
20.0↔154.7-ft, 11-in nominal
154.7↔283.0-ft, 9-in nominal
4-in ID T304 stainless steel casing, +1.4↔258.6-ft
Bentonite crumbles, 19.3↔251.5-ft
¼-in Volclay bentonite tablets, 251.5↔255.1-ft
Silica sand pack, 255.1↔283.0-ft, 8↔12-mesh
4-in stainless steel screen, 258.6↔279.6-ft, #10-slot w/channel pack
Borehole drilled depth: [283.0-ft]

Drawing By: RKL/2E25-38.ASB
Date : 08Sep93
Reference : WHC-MR-0203

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-39

WELL DESIGNATION	:	299-E25-39
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	Grout
HANFORD COORDINATES	:	N 40,518 W 43,673.0 [22Jan91-200E]
LAMBERT COORDINATES	:	N 445,708 E 2,251,548; [HANCONV]
		N 135,737.27m E 576,581.88m [22Jan91-NAD83]
DATE DRILLED	:	Oct90
DEPTH DRILLED (GS)	:	282.4-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	264.6-ft, 20Sep90;
		265.5-ft, 14Jun93
CASING DIAMETER	:	4-in stainless steel, +0.4↔257.5-ft;
		6-in stainless steel, +2.8↔~0.5-ft
ELEV TOP CASING	:	671.23-ft, [22Jan91-NGVD'29]
ELEV GROUND SURFACE	:	668.45-ft, Brass cap [22Jan91-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	257.5↔277.8-ft, 4-in #10-slot stainless steel
COMMENTS	:	FIELD INSPECTION,
		OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	Grout quarterly water level measurement, 01Jun91↔14Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling
PUMP TYPE	:	Hydrostar, intake @ 270.0-ft, (GS)
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: 200 W Water Supply
Driller's Name: D. Ludtke
Drilling Company: Kaiser Engineers
Date Started: 13Aug90 Date Complete: 18Oct90

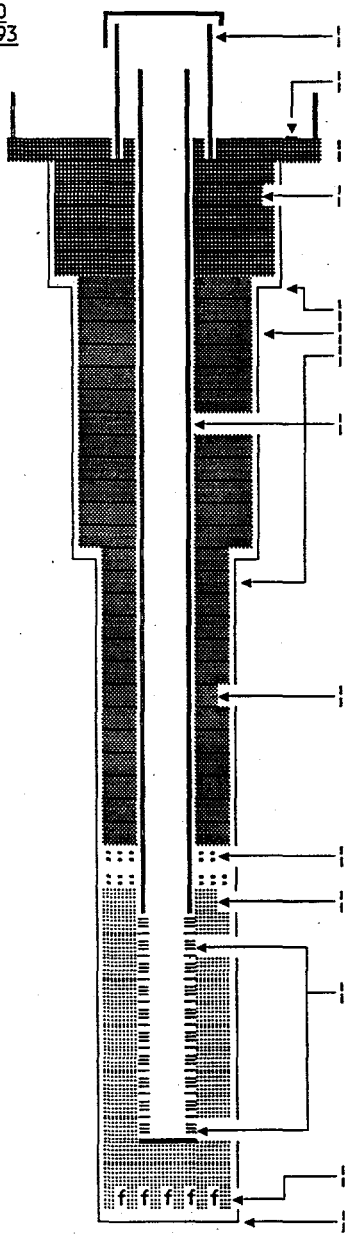
Sample Method: Hard tool Drive barrel
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Hanford

WELL NUMBER: 299-E25-39 TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,518 E/W W 43,673
State NAD83 N 135,837.27m E 576,581.88m
Coordinates: N 445,708 E 2,251,548
Start Card #: Not documented T___ R___ S___
Elevation Ground surface: 668.45-ft (Brass cap)

Depth to water: 264.6-ft 20Sep90
(Ground surface)265.5-ft, 14Jun93

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0↔7: Silty SAND
7↔14: Sl gravelly SAND
14↔20: SAND w/lenses of GRAVEL
20↔21: Sl gravelly SAND
21↔85: SAND
85↔155: Sl silty SAND
155↔160: Sl silty gravelly SAND
160↔170: Sl silty SAND
170↔190: Silty SAND
190↔200: Sandy GRAVEL
200↔210: Silty sandy GRAVEL
210↔225: Sandy GRAVEL
225↔230: Silty sandy GRAVEL
230↔235: Sl silty SAND
235↔240: SAND
240↔283: Sandy GRAVEL



Elevation of reference point: [671.23-ft] (top of casing)
Height of reference point above ground surface [2.78-ft]
Depth of surface seal [3.0↔18.0-ft]
Type of surface seal: Cement grout, 3.0↔18.0-ft 4x4-ft x 6-in concrete pad extends 3.0-ft into annulus
Hole diameter, 3.0↔18.4-ft, 13-in nominal
18.4↔206.3-ft, 11-in nominal
206.3↔282.4-ft, 9-in nominal
4-in ID stainless steel casing, +0.4↔257.5-ft
Granular bentonite, 18.0↔250.2-ft, 8↔20-mesh
¾-in bentonite pellets, 250.2↔253.5-ft
Silica sand pack, 253.5↔281.4-ft, 20↔40-mesh
4-in stainless steel screen, 257.5↔277.8-ft, #10-slot w/welded bottom cap
Fill, 281.4↔282.4-ft
Borehole drilled depth: [282.4-ft]

Drawing By: RKL/2E25-39.ASB
Date : 08Sep93
Reference : WHC-SD-EN-DP-048

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-44

WELL DESIGNATION	:	299-E25-44
RCRA FACILITY	:	Grout
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 39,930.35 W 45,222.74 [21Sep92-200E]
LAMBERT COORDINATES	:	N 445,116 E 2,250,000 [HANCONV];
		N 135.656.934m E 576,110.133m [NAD83-21Sep92]
DATE DRILLED	:	Jun92
DEPTH DRILLED (GS)	:	293.3-ft
MEASURED DEPTH (GS)	:	285.8-ft, 18Dec92
DEPTH TO WATER (GS)	:	269.2-ft, 02Jun92
		270.3-ft, 18Dec92
CASING DIAMETER	:	6-in, stainless steel, +2.4↔0.5-ft;
		4-in, stainless steel, +ND↔265.8-ft
ELEV TOP CASING	:	675.29-ft, [21Sep92-NGVD'29]
ELEV GROUND SURFACE	:	672.90-ft, Brass cap [21Sep92-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	265.8↔285.9-ft, 4-in stainless steel, #10-slot
COMMENTS	:	FIELD INSPECTION, 18Dec92;
		Stainless steel casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID.
		Not in radiation zone.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	No water level data;
CURRENT USER	:	WHC ES&M RCRA sampling
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

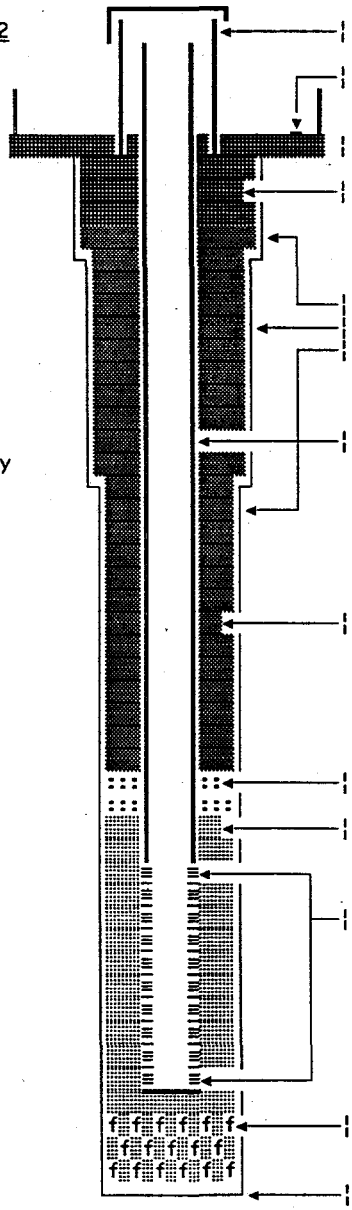
Drilling Method: Backhoe 0↔15-ft Air rotary
Drilling Fluid Used: Not applicable
Driller's Name: D. Mingo
Drilling Company: Jensen/KEH
Date Started: 06May92
Sample Method: Air returns
Additives Used: Rock oil
WA State Lic Nr: Not documented
Company Location: Hanford
Date Complete: 04Jun92

WELL NUMBER: 299-E25-44
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 39,930.35 E/W W 45,222.74
State NAD83 Coordinates: N 135,656.934m E 576,110.133m
N 445,116 E 2,250,000
Start Card #: Not documented T___ R___ S___
Elevation Ground surface: 672.90-ft (Brass cap)

Depth to water: 269.2-ft Jun92
(Ground surface)270.3-ft 18Dec92

GENERALIZED Geologist's STRATIGRAPHY Log

0↔10: SAND
10↔15 Sandy GRAVEL
15↔65: SAND, w/scattered PEBBLES
65↔75: SAND, finer PEBBLES
75↔110: SAND,
silty @ 82 and 90↔91-ft
110↔165: SAND, trace PEBBLES
165↔173: Granular to pebble SAND
173↔180: GRAVEL, pebble/cobble
180↔218: GRAVEL
218↔261: Pebble/cobble GRAVEL
261↔263.3: SAND
263.3↔263.5: SILT
263.5↔264: SILT w/SAND and pebbly SAND interbed
264↔265.3: SAND, minor PEBBLES
265.3↔269: Not documented
269↔270: Silty SAND
270↔293.3: SAND



Elevation of reference point: [675.29-ft] (top of casing)
Height of reference point above ground surface [2.39-ft]
Depth of surface seal [3.6↔9.9-ft]
Type of surface seal:
Cement grout, 3.6↔9.9-ft,
4x4-ft x 4-in concrete pad
extends 3.6-ft into annulus
Hole diameter,
3.6↔13.8-ft, 13-in nominal
13.8↔140.4-ft, 11-in nominal
140.4↔293.3-ft, 9-in nominal
4-in ID T304 Schedule 5 stainless steel casing, +ND↔265.8-ft
Bentonite crumbles, 9.9↔260.5-ft
Bentonite pellets, 260.5↔263.0-ft
Silica sand pack, 263.0↔287.0-ft, 20↔40 mesh
4-in stainless steel screen, 265.8↔285.9-ft, #10-slot w/end cap
Fill, 287↔293.3-ft
Borehole drilled depth: [293.3-ft]

Drawing By: RKL/2E25-44.ASB
Date : 08Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-45

WELL DESIGNATION	:	299-E25-45
RCRA FACILITY	:	Grout
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 39,937.7 W 44,973.2 [30Dec92-200E]
LAMBERT COORDINATES	:	N 445,126 E 2,250,249 [HANCONV];
		N 135,659.15m E 576,185.55m [NAD83-30Dec92]
DATE DRILLED	:	Jul92
DEPTH DRILLED (GS)	:	297.6-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	271.9-ft, 30Jun92
		280.4-ft, 18Dec92
CASING DIAMETER	:	6-in, stainless steel, +2.7↔-0.5-ft;
		4-in, stainless steel, +ND↔269.4-ft
ELEV TOP CASING	:	678.45-ft, [30Dec92-NGVD'29]
ELEV GROUND SURFACE	:	675.74-ft, Brass cap [30Dec92-NGVD'29]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	269.4↔289.6-ft, 4-in stainless steel, #10-slot
COMMENTS	:	FIELD INSPECTION, 18Dec92;
		4 and 6-in stainless steel casing.
		4-ft by 4-ft concrete pad, 4 posts, 1 removable.
		Capped and locked, brass cap in pad with well ID.
		Not in radiation zone.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	No water level data;
CURRENT USER	:	WHC ES&M RCRA sampling,
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Air rotary
Drilling Fluid Used: Not applicable
Driller's Name: D. Mingo
Drilling Company: Jensen/KEH
Date Started: 04May92
Date Complete: 27Jul92

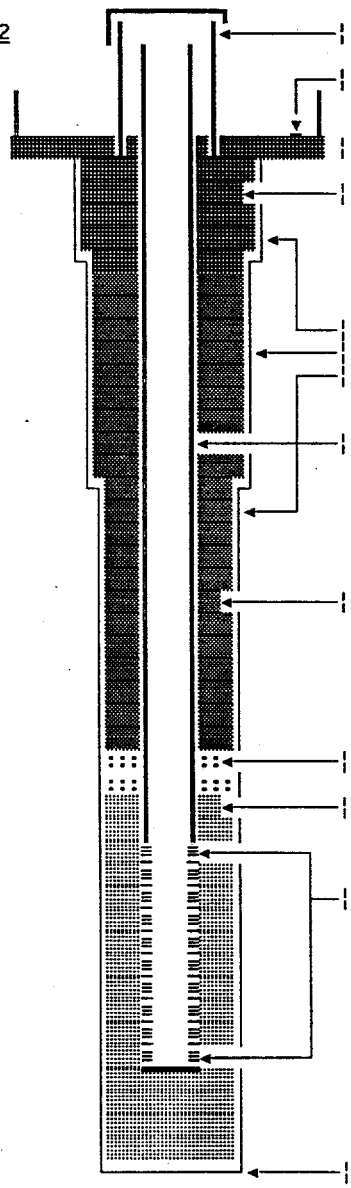
Sample Method: Air returns
Additives Used: Rock oil
WA State Lic Nr: Not documented
Company Location: Hanford

WELL NUMBER: 299-E25-45
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 39,939.7 E/W W 44,973.2
State NAD83 N 135,659.15m E 576,185.55m
Coordinates: N 445,126 E 2,250,249
Start Card #: Not documented T R S
Elevation Ground surface: 675.74-ft (Brass cap)

Depth to water: 271.9-ft Jun92
(Ground surface)280.5-ft 18Dec92

GENERALIZED Geologist's STRATIGRAPHY Log

0↔10: Sandy SILT
10↔20: Gravelly sandy SILT
20↔45: Silty SAND
45↔60: Gravelly silty SAND
60↔65: Gravelly sandy SILT
65↔75: Gravelly silty SAND
75↔85: Silty SAND
85↔110: Gravelly silty SAND
110↔172.5: Silty SAND
172.5↔185: Pebble SAND
185↔195: Cobble sandy PEBBLE
195↔230: Sandy cobble PEBBLE
230↔267: Silty sandy PEBBLE
267↔269: SILT
269↔295: Silty SAND
295↔297.6: Sandy PEBBLE



Elevation of reference point: [678.45-ft] (top of casing)
Height of reference point above ground surface [2.71-ft]

Depth of surface seal [2.0↔11.8-ft]
Type of surface seal: Cement grout, 2.0↔11.8-ft, 4x4-ft x 4-in concrete pad extends 2.0-ft into annulus

Hole diameter,
2.0↔11.6-ft, 13-in nominal
11.6↔172.7-ft, 11-in nominal
172.7↔297.6-ft, 9-in nominal

4-in ID T304 Schedule 5 stainless steel casing, +ND↔269.4-ft

Bentonite crumbles, 11.8↔261.5-ft

Bentonite pellets, 261.5↔265.8-ft

Silica sand pack, 265.8↔297.6-ft, 10↔20-mesh

4-in stainless steel screen, 269.4↔289.6-ft, #10-slot w/end cap

Borehole drilled depth: [297.6-ft]

Drawing By: RKL/2E25-45.ASB
Date : 08Sep93
Reference : HANFORD WELLS

VALIDATED
KDR 2/15/94
SIGNATURE/DATE

P 1 of 3

WELL CONSTRUCTION SUMMARY REPORT

Page 1 of 1

Specification No. WHC-5-014 WHC-SD-EN-AP-006 Rev. No. 7 ECL 09/19/93

ECNs 166764 169864 166764 ECL 09/9/93 ECL 09/19/93

Project W-0152

Drilling Company PC EXPLORATION

Driller T. MACHESKI / C. Shields

Other (Companies) B.F. Strodo (MCE/WHC)

Geologist(s) J. BARRON / A. Templeton / F.S. Mocker
R.A. Edrington
L.D. Lockard WHC Review

Well No. 299-E25-49 Temp. Well No. ECL 08/19/93 299-E25-49

Approximate Location GROUT TREATMENT FACILITY (GTF)

Drill Method

Type BACKHOE FOR STARTER CASING, THEN AIR ROTARY

Drilling Fluid N/A

Total Amount of Water Added During Drilling ~1020 gallons (Approximate total 1600 9A

Comments ① Columbia River Water was used during drilling activities from ~282' to 293' due to heaving sand in that interval.

Temporary Casings and Drilled Depth

Casing Type and Size	Interval	Shoe OD
CS - 12" DIAM.	0 - 12.1'	N/A
CS - 10" DIAM.	0 - 158'	N/A
CS - 8" DIAM.	0 - ~~155~~ FM 8-21-93 292'	N/A

Drilled Depth 293' Hole Diameter at TD 8"

Date Drilling Started 8/5/93

Geophysical Logging

Sondes (type)	Interval	Date
Gross Gamma	3.1 - 157.2	8-18-93
KUT	-2 - 153	8-18-93
KUT	0 - 292.45	8-31-93
Gross Gamma	135.0 - 292.0	9-01-93

Static Water Level/Date 272.19' @ 0718 8-25-93

Comments 272.3' @ 14:59 9/10/93 (JNB) FOLLOWING COMPLETION

Completion Activity Date Started 9/1/93 ①

Casing and Screen (Permanent)

Type	Depths	Length	Slot Size
4" SS-304	289.50 - 289.18	0.32'	END CAP
4" SS SCREEN-304	289.18 - 269.17	20.01'	10-SLOT
4" SS-BLANK-304	269.17 - -3.92	273.09'	N/A

Annular Seal/Filter Pack

Type	Interval	Volume	Mesh Size
SILICA SAND	292.3 ECL 8-21-93 ~~293.2~~ - 264.0	10.08 cu.ft.	20-40
BENTONITE PELLETS	264.0 - 256.4	1.24 cu.ft	1/2"
GRANULAR BENTONITE	256.4 - 12.0	198.09 cu.ft.	8-20
PORTLAND CEMENT I&II	12.0 - 2.0	20.56	TYPE I & II

Other Activity

Aquifer Test Performed? Yes

Type INSTANTANEOUS SLUG Date 9/24/93

Well Abandoned?

Date

Well Survey Data

Date 11/16/93

Washington State Prime Coordinates N135668.325, E576291.697

Protective Casing Elevation 678.66

Brass Cap Elevation 675.44

Comments/Remarks ① BAILED SAND OVERLAP OUT OF HOLE 8/27 to 9/1 @ 14:43; ALSO OPERATIONS WERE SHUT DOWN @ NOON ON 9/7 AND DIDN'T RESUME UNTIL 9/10; ALSO OPERATIONS WERE ESSENTIALLY DOWN FROM 9/3 - 9/8 FOR HOLIDAY.
② ADDED APPROXIMATELY 1600 GALLONS RAW COLUMBIA RIVER WATER DURING COMPLETION PROCESS.

WELL SUMMARY SHEET

Boring or Well No. 299-E25-49

Sheet 1 of 2

Location ~1500' EAST OF GTF Project W-152

Prepared By [signature] ANDREW M. TEMPLETON (Sign/Print Name) Date 8-27-93

Reviewed By [signature] EDWARD C. LEBER (Sign/Print Name) Date 09/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
TEMP. 12" CS CASING SET @ 12.1'. THIN LAYER OF GRANULAR BENTONITE 2 EA 50# BAGS AROUND CASING BASE		0		
PORTLAND CEMENT-I & II 2.0-12.0'		5		0.0-5.0 FT Silty SAND
		10		5.0-10.0 FT SAND
		15		10.0-15.0 FT Gravelly SAND
		20		15.0-25.0 FT Medium to Coarse SAND
		25		
		30		25.0-30.0 FT Fine to Medium SAND
		35		30.0-35.0 FT Medium to Coarse SAND
		40		35.0-37.0 FT Slightly Silty SAND
		45		37.0-45.0 FT Medium SAND
		50		45.0-50.0 FT Medium SAND
		55		50.0-53.0 FT Coarse SAND
Temp. 10" CS CASING set at 158'		60		53.0-65.0 FT Medium to Coarse SAND
		65		65.0-67.0 FT Silty SAND
		70		67.0-71.0 FT Fine to Medium SAND
		75		71.0-73.0 FT Silty SAND
		80		73.0-85.0 FT Fine to Medium SAND
GRANULAR BENTONITE 12.0-256.4'		85		85.0-86.0 FT Slightly Silty SAND
		90		86.0-88.0 FT SAND
		95		88.0-89.0 FT Silty SAND
		100		89.0-105.0 FT Gravelly SAND
		105		
Temp. 8" CS Casing		110		105.0-127.0 FT Fine SAND
		115		
		120		
		125		
		130		127.0-132.5 FT Slightly Silty Gravelly SAND
		135		
		140		132.5-143.0 FT Slightly Silty SAND
		145		143.0-144.0 FT Sandy SILT
		150		144.0-149.0 FT Slightly Silty SAND

WELL SUMMARY SHEET

Boring or Well No. 299-E25-49

Sheet 2 of 2

Location ~1500' East of GTF

Project W-152

Prepared By J.N. BARRON / F.S. Mocker (Sign/Print Name) Date 8-27-93

Reviewed By Edward C. LaFleur / EDWARD C. LAFLEUR (Sign/Print Name) Date 09/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
Temp. 10" CS Casing Set at 158'		150		
		155		149.0-156.0 FT SAND
				156.0-163.0 FT fine SAND
		160		
		165		163.0-180.0 FT Sandy GRAVEL
		170		
Temp 8" CS casing		175		
		FM 8-21-93		
		180		180.0-185.0 FT Slightly Silty Gravelly SAND
		FM 8-24-93		
		185		
		190		185.0-200.0 FT Sandy GRAVEL
		195		
		200		200.0-205.0 FT Silty Sandy GRAVEL
		205		205.0-220.0 FT Sandy GRAVEL
BLANK SS 4" w/ CENTRALIZER		210		
		215		
		220		220.0-223.0 FT Silty Sandy GRAVEL
				@223.0 FT 0.3ft SAND lense
		225		223.0-228.0 FT Silty Sandy GRAVEL
		230		228.0-233.0 FT Sandy GRAVEL
		235		233.0-245.0 FT Silty Sandy GRAVEL
GRANULAR BENTONITE 12.0-256.4'		240		
		245		245.0-247.0 FT GRAVEL
		250		247.0-253.0 FT SAND
		255		253.0-265.0 FT Silty Sandy GRAVEL
1/2" BENTONITE PELLETS 256.4'-264.0'		260		
TOP OF SAND 264.0		265		265.0-271.0 FT Silty Gravelly SAND
TOP OF SS SCREEN = 269.17'		270		
STATIC WATER LEVEL = 272.3'		275		271.0-274.0 FT Gravelly Silty SAND
		280		274.0-293.0 FT SAND
		285		
BOTTOM OF SCREEN = 289.5' (10-SLOT)		290		Driller's T.D. @ 293.0'
BOTTOM OF SAND = 293.3' (20-40)		295	TD 293'	
SLOUGH (292.3 - 293.0)				

VALIDATED KDR 2/15/94 SIGNATURE/DATE

WELL CONSTRUCTION SUMMARY REPORT

Specification No. WHC-S-014 WHC-SD-EN-AP-006 Rev. No. 7 ECN 09/14/93

ECNs 166764

Project W-0152

Drilling Company PC EXPLORATION

Driller Tim Macheski

Other (Companies)

Geologist(s) J. BARRON, F.S. Mocker
R. Edrington (WHC)
L.D. Lockard WHC Review

Date Drilling Started 8/6/93

Well No. 299-E25-50 Temp. Well No. 299-E25-50 ECN 08/10/93

Approximate Location GROUT TREATMENT FACILITY

Drill Method

Type BACKHOE for STARTER CASING, then AIR ROTARY TO FOLLOW.

Drilling Fluid N/A

(1) Total Amount of Water Added During Drilling ~~N/A~~ E.C. 09/16/93 ~ 100 gals H_2O

Comments

Temporary Casings and Drilled Depth

Casing Type and Size	Interval	Shoe OD
CS - 12" DIAM.	0 - 15.1'	N/A
CS - 10" DIAM	0 - 82'	N/A
CS - 8" DIAM	0 - 293'	N/A
	-	

Drilled Depth 294.2' Hole Diameter at TD 8 inch

Geophysical Logging

Sondes (type)	Interval	Date
ICUT	0 - 81.45	8-31-93
KUT	0 - 294.2	9-13-93
GEOLOGS GAMMA	3.1 - 293.1	9-13-93
	-	
	-	

(2) Static Water Level/Date 272.12' @ 1540 on 9-10-93

Comments Soil subsidence occured around outside of temporary casing after downsizing to 8" casing @ 82'

Completion Activity

Date Started 9/14/93

Casing and Screen (Permanent)

Type	Depths	Length	Slot Size
304/SS	289.70 - 289.38	0.32'	END CAP
304/SS	289.38 - 269.38	20.00'	20-SLOT
304/SS	269.38 - 3 293.369	273.07'	BLANK
	-		
	-		

Annular Seal/Filter Pack

Type	Interval	Volume	Mesh Size
SILICA SAND	294.1 - 264.8	9.10 CU.FT.	10-20
BENTONITE PELLETS	264.8 - 261.0	0.93 CU.FT.	1/2"
GRANULAR BENTONITE	261.0 - 10.7	90.17 CU.FT.	8-20
PORTLAND CEMENT	10.7 - 1.0	21.84 CU.FT.	TYPE I & II
	-		

Other Activity

Aquifer Test Performed? No Slug test performed

Type N/A Date 9/27/93

Well Abandoned?

Date

Well Survey Data

Date 11/16/93

Washington State Prime Coordinates N: 135681.613 E: 576399.049

Protective Casing Elevation 677.60'

Brass Cap Elevation 675.32

Comments/Remarks (1) ADDED ABOUT 100 GALLONS OF RAW COLUMBIA RIVER WATER TO STABALIZE HOLE DURING BACKFILLING

(2) STATIC WATER LEVEL 09-17-93 272.2'

WELL SUMMARY SHEET

Boring or Well No. 299-E25-50

Sheet 1 of 2

Location GROUT TREATMENT FACILITY

Project W-0152

Prepared By J.N.Barron / J. BARRON (Sign/Print Name) Date 8/6/93

Reviewed By Edward LaFave / EDWARD C. LAFAVE (Sign/Print Name) Date 09/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
PORTLAND CEMENT (GEL) 10.7'-1.0'		0		
		5		0-5 SANDY SILT
		10		5-13.1' Slightly Silty SAND w/ sandy SILT
		15		Lenses
		20		13.1'-38' SAND
12" TEMP CS SET @ 15.1'		25		"
		30		"
		35		38'-39' Silty SAND
		40		39'-40' Slightly Silty SAND
		45		40'-42' Slightly Silty SAND
		50		42-43' Silty SAND
		55		43'-68' Slightly Silty SAND
GRANULAR BENTONITE (8-20) 26.0'-10.7'		60		" " "
		65		" " "
		70		68'-69' Silty SAND
		75		69'-75' Slightly Silty SAND
10" TEMP CS SET @ 82'		80		75'-83' Silty SAND
		85		83'-95' Slightly Silty SAND
		90		" " "
		95		95'-104' Silty SAND
		100		" "
		105		" "
8" TEMP CS		110		104'-116' SAND
		115		"
		120		116'-135' Silty SAND
		125		" "
		130		" "
		135		" "
		140		135'-144' SAND
		145		144'-158' Silty SAND
		150		" "
		155		" "

A-6000-384 (01/93)

WELL SUMMARY SHEET

Boring or Well No. 299-E25-50

Sheet 2 of 2

Location GROUT TREATMENT FACILITY Project W-0152

Prepared By J. BARRON (Sign/Print Name) Date 09/16/93

Reviewed By Edward Rhoe / EDWARD C. RHOE (Sign/Print Name) Date 09/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
		160		144'-158' Silty SAND
		165		158'-164' SAND
8" TEMP CS SET @ 293'		170		164'-200' Gravelly Silty SAND
		175		
		180		
		185		
		190		
		195		
		200		
		205		200'-227' Silty Sandy GRAVEL
		210		
		215		
		220		
8-20 GRANULAR BENTONITE 261.0-10.7'		225		227'-228' SAND
		230		228'-229' GRAVEL
		235		229'-230' SAND
		240		230'-245' Silty Sandy GRAVEL
SS BLANK CASING		245		245'-250' Slightly Silty Gravelly SAND
		250		
		255		250'-255' SAND
		260		255'-260 Slightly Silty Gravelly SAND
1/2" BENTONITE PELLETS 264.8'-261.0'		265		260-268.8 Gravelly SAND
		270		268.8-269.85 Gravel
STATIC WATER LEVEL 272.3'		275		270-274 Slightly Silty Gravelly SAND
		280		@ 274' Top of Ringold FM
10-20 SILICA SAND 294.1'-264.8'		285 FM 9/11/93		274'-294' Gravelly Silty SAND
20 SLOT SCREEN (SS) 289.70'-269.38'		290		
Total Depth 294.2' BGS		295		
SLUFF = 0.1'				

VALIDATED KDR 2/15/94 SIGNATURE/DATE

WELL CONSTRUCTION SUMMARY REPORT

Specification No. WHC-S-014 Rev. No. 7

ECNs 166764

Project W0152

Drilling Company PC Exploration

Driller T. Macheski C. Shields

Other (Companies) Golder Associates

Geologist(s) J. Barron
A. Templeton
F. Mocker
D.J. Anderson R.S. Edrington
L.D. Lockard WHC Review

Date Drilling Started 8/9/93

Well No. 299-E25-1000 Temp. Well No.

Approximate Location Grout Treatment Facility

Drill Method

Type Backhoe Excav. for starter casing / air rotary

Drilling Fluid N/A

Total Amount of Water Added During Drilling

Comments 450 gallons added during completion process.

Temporary Casings and Drilled Depth

Casing Type and Size	Interval	Shoe OD
CS - 12"	0 - 15.1'	N/A
CS - 10"	0 - 178.6'	N/A
CS - 8"	0 - 378.9	N/A
	-	

Drilled Depth 391.89' Hole Diameter at TD

Static Water Level/Date 267.44 10/22/93

Comments

Geophysical Logging

Sondes (type)	Interval	Date
KUT	0 - 175	9-16-93
KUT	140' - 390'	10-12-93
Neutron Capture	255' - 380	10-14-93
	-	
	-	

Completion Activity Date Started 10/23/93

Casing and Screen (Permanent)

Type	Depths	Length	Slot Size
Casing Type 304	1.07 SU 0 - 263.3'	264.37' ~~263.3 LOK~~ 3/11/94	N/A
Type 304 Cent wrap	263.3' - 293.6'	303" / cap	10
	-		
	-		
	-		

Annular Seal/Filter Pack

Type	Interval	Volume	Mesh Size
Bentonite Hole plug	297.5' - 391.6'	62.1 cuft.	> 1/2"
10-20 Sand	293.4 - 297.5'	2.14 cuft	10-20
20-40 Sand	258.5 - 293.4'	12.3 cuft.	20-40
3/8" pellets	254.3' - 258.5'	1.55 cuft.	3/8"
Hole plug	243.1' - 254.3	2.76 cuft.	> 1/2"

See below in comments

Other Activity

Aquifer Test Performed? N/A

Type N/A Date N/A

Well Abandoned? N/A

Date N/A

Well Survey Data

Date 12/16/93

Washington State Prime Coordinates N: 135737.654 E: 576478.436

Protective Casing Elevation 674.40'

Brass Cap Elevation 670.96

Comments/Remarks See NCR# 050058, EQA-93-100; NCR# 050961, EQA-93-105

10-20 Sand	232.9' - 237.8'	1.07 cuft	10-20
10-20 SAND	230.0' - 232.4'	1.07 cuft	10-20
Bent crumbles	14.1' - 230.0'	156.9 cuft.	8-20
Type I-II	0 - 14.1'	24.1 cuft.	

A-6000-436 (01/93)

WELL SUMMARY SHEET

Boring or Well No. 299-E25-1000

Sheet 1 of 3

Location GTF: East of 200 EAST AREA Project W-0152

Prepared By Donna J. Anderson (Sign/Print Name) Date 11/15/93

Reviewed By Edward C. LaFleur / EDWARD C. LAFLEUR (Sign/Print Name) Date 11/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
Temporary 12" carbon steel casing set at 15.1' BGS		5		0-5' sandy SILT
Type I-II cement 0-14.1' BGS		10		5-25' slightly gravelly slightly silty SAND
8-20 mesh bentonite seal at 15.1'		15		
		20		
		25		
		30		25-57' SAND 5 <10% gravel
		35		
Temporary 10" carbon steel casing set at 178.6' BGS w/ no shoe		40		
		45		
		50		
		55		
		60		57-59' 4-5 thick silt layers
Temporary 8" carbon steel casing set at 378.9' BGS w/o shoe		65		59-68' SAND
		70		68'-69' silter layer
		75		69'-78' gravelly SAND
		80		78-79' silter zone
		85		79'-86' gravelly silty SAND
Type 304 stainless steel casing and 10 slot screen set @ 293.6' BGS		90		86-89.62 SAND
		95		89.62' - .3' thick pebble gravel lense
		100		89.62'-92' silty fine sand
		105		92-95' Fine to medium SAND
		110		95'-97' silty SAND
		115		97'-100' fine to coarse SAND
		120		100'-105' silty SAND
		125		105-110 SAND
		130		110-136 slightly silty SAND
		135		136-149 gravelly SAND
		140		
		145		
		150		149-150 silty SAND
		155		150- SAND

WELL SUMMARY SHEET

Boring or Well No. 299-E25-1000

Sheet 2 of 3

Location GTF: East of 200 E Area. Project W-0152

Prepared By Dennis J. Anderson (Sign/Print Name) Date 11/15/93

Reviewed By Edward C. Rogers / Edward C. Rogers (Sign/Print Name) Date 11/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
Temporary 10" carbon steel casing set at 178.6' BGS with no shoe		165		150-167' SAND S
		170		167-169' slightly silty SAND (m) S
				169-171' SAND S
		175		171'-174' gravelly silty SAND gmS
				174'-177.5' SAND S
		180		177.5'-190 sandy Gravel sG
		185		
Temporary 8" carbon steel casing set at 378.9' BGS with no shoe		190		190'-191' gravelly SAND gS
		195		
		200		191'-212.5' sandy GRAVEL sG ~65% gravel
		205		
8-20 msh bentonite 14.1'-230.0'		210		
10-20 sand 230.0'-232.4'		215		212.5'-231' sandy GRAVEL sG ~55% gravel
Formation 232.4'-232.9'		220		
10-20 SAND 232.9'-237.8'		225		
Formation 237.8'-245.1'		230		
Note: see NCR 050961 attached		235		231'-238' SAND S
		240		238'-240' gravelly SAND gS
Hole plug >1/2" 243.1'-254.3'		245		240'-251' sandy GRAVEL sG
Non-hydrated 3/8" bentonite pellets 254.3'-258.5' BGS		250		251'-253' silty gravelly SAND mgS
		255		253'-263' sandy Gravel sG
20-40 SAND 258.5'-293.4'		260		263'-265' gravelly SAND gS
		265		
Type 304 continuous stainless steel screen - 10 slot 263.3'-293.3' BGS		270		265'-303.5' sandy Gravel sG
		275		
		280		
Stainless steel end cap 293.3'-293.6' BGS		285		
		290		
10-20 Sand 293.4'-297.5' BGS		295		
		300		
Hole plug - >1/2" in size 297.5'-391.6' BGS		305		303.5'-304' gravelly sandy SILT gsM
		310		304'-305' SILT M
Note: sand interval 351.6'-354.8'		315		305'-325' Gravel G

WELL SUMMARY SHEET

Boring or Well No. 299-EZ5-1000

Sheet 3 of 3

Location GTF: East of 200 E Area

Project W-0152

Prepared By Dennis J. Cadeau (Sign/Print Name) Date 11/15/93

Reviewed By Edward C. Golliard / Edward C. Golliard (Sign/Print Name) Date 11/19/93

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
		325		
		330		305'-325' Gravel G
Hole plug interval from		335		325'-348' sandy Gravel sG
297.5'-391.6' BGS		340		
Hole plug > 1/2" in size		345		
Note: Sand interval		350		348'-352' gravelly SAND gS
10-20 SAND 351.6'-354.8'		355		352'-355' sandy Gravel sG
		360		355'-365' gravelly SAND gS
		365		365'-378.5' sandy Gravel sG
Temporary 8" carbon steel		370		
casing set at 378.9' BGS		375		
with ~~2~~ No shoe		380		Top of basalt at 378.5' BGS
		385		378.5'-391.9' basalt (TD)
		390		
Slough = 391.9-391.6' BGS		395		Total depth of borehole = 391.9' BGS
Note: NCR 050058 issued 10/8/93 for failure to characterize the interval 260'-323' BGS NCR closed on 10/20/93 see attached copy				
Note: NCR 050961 issued for sloughing / formation against 4" stainless steel casing at intervals 232.4'-232.9' and 237.8'-243.1' BGS				Note: This well summary is taken from GAI's well summary; originals are in log book

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool	Sample Method: Hard tool (nom)
Drilling Fluid Used: Water	Additives Used: Not documented
Driller's Name: J. Bultena	WA State Lic Nr: 0066
Drilling Company: Onwego Drilling	Company Location: Kennewick, WA
Date Started: 01Mar85	Date Complete: 11Apr85

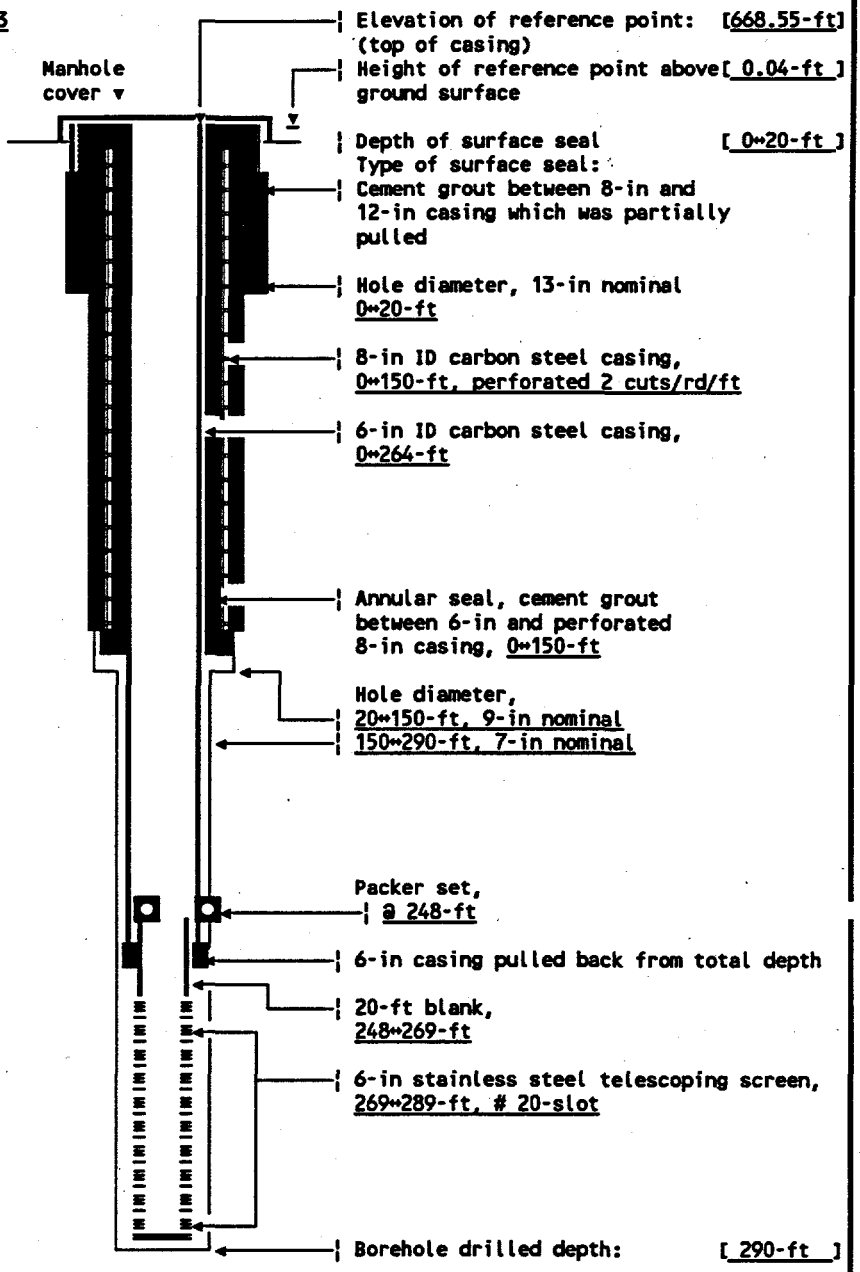
WELL NUMBER: 299-E25-26	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 40,773	E/W W 45,884
State Coordinates: N 445,957	E 2,249,336
Start Card #: Not documented	T R S
Elevation Ground surface: 668.51-ft Brass cap	

Depth to water: 264-ft Apr85
(Ground surface) 266.1-ft 22Jun93

GENERALIZED STRATIGRAPHY

Geologist's Log

0-5: Silty SAND
5-10: Gravelly SAND
10-15: Silty SAND
15-20: Gravelly silty SAND
23-40: Gravelly SAND
40-65: SAND
65-75: SAND, SILT lenses
75-100: Gravelly SAND
100-103: SAND
103-105: Silty CLAY, silty SAND
105-110: SAND
110-130: SAND SILT CLAY lenses
130-150: SAND
150-160: Gravelly SAND
160-175: Sandy GRAVEL
175-195: Gravelly SAND
195-205: Sandy GRAVEL
205-240: Sandy GRAVEL, COBBLES
240-245: Sandy GRAVEL
245-255: Silty sandy GRAVEL
255-260: Gravelly silty SAND
260-285: Silty gravelly SAND
285-290: Silty SAND



Drawing By: RKL/2E25-26.ASB
Date : 07Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-26

WELL DESIGNATION	:	299-E25-26
RCRA FACILITY	:	A-29 Ditch
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 40,772.8 W 45,884.5 [18JUL85]
LAMBERT COORDINATES	:	N 445,957 E 2,249,336 [HANCONV]
DATE DRILLED	:	Apr85
DEPTH DRILLED (GS)	:	290-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	264-ft, Apr85; 266.1-ft, 22Jun93
CASING DIAMETER	:	8-in, carbon steel, 0↔150-ft; 6-in, carbon steel, +.04↔264-ft
ELEV TOP CASING	:	668.55-ft, [18Jul85]
ELEV GROUND SURFACE	:	668.51-ft, Brass cap [18Jul85]
PERFORATED INTERVAL	:	8-in casing, 0↔150;
SCREENED INTERVAL	:	269↔289-ft, 6-in #10 slot stainless steel
COMMENTS	:	FIELD INSPECTION, 09Apr93, 6 & 12-in carbon steel casing. Capped, not locked. In middle of road under manhole cover. No pad, posts or permanent identification. Not in radiation zone.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	A29 Ditch monthly water level measurement, 01Jun85↔22Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling, PNL sitewide sampling 93
PUMP TYPE	:	Electric submersible
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: Water
Driller's Name: L. Bultena
Drilling Company: Onwego Drilling
Date Started: 01Mar85

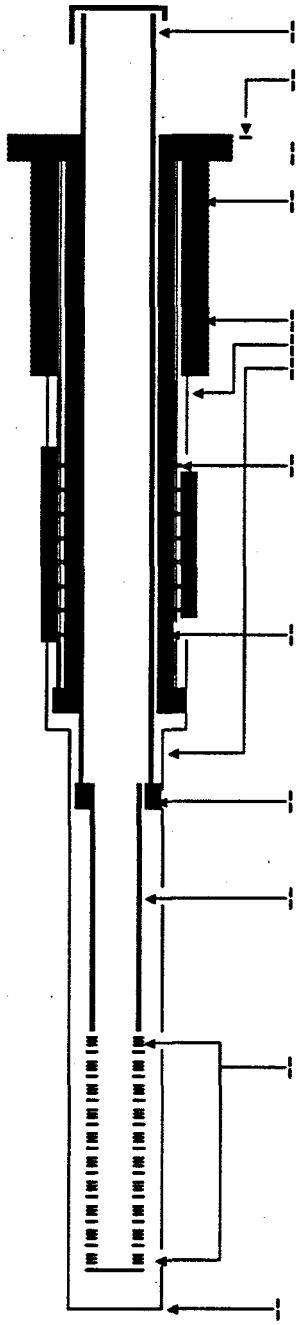
Sample Method: Hard tool (nom)
Drilling Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Kennewick, WA
Date Complete: 11Apr85

WELL NUMBER: 299-E25-28
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 41,424 E/W W 45,541
State Coordinates: N 445,609 E 2,249,678
Start Card #: Not documented T R S
Elevation Ground surface: 660.34-ft Brass cap

Depth to water: 265-ft Apr85
(Ground surface) 258.1-ft 22Jun93

GENERALIZED STRATIGRAPHY / Geologist's Log

0-10: SAND
10-15: Fine SAND with SILT lenses
15-30: Coarse SAND
30-60: Coarse-fine SAND with SILT lenses
60-75: Silty SAND
75-90: Gravelly SAND
90-95: SAND
95-100: Silty gravelly SAND
100-115: Silty SAND
115-125: Layered SAND, BASALTIC GRAVEL
125-130: SAND
130-145: Silty SAND
145-155: Silty sandy GRAVEL
155-165: Silty GRAVEL/COBBLE
165-195: Silty GRAVEL
195-200: Silty sandy GRAVEL
200-210: Silty GRAVEL
210-220: Silty BASALTIC GRAVEL
220-225: Silty sandy BASALTIC GRAVEL
225-240: Sandy BASALTIC GRAVEL
240-245: Gravelly SAND
245-250: Silty clayey GRAVEL
250-255: Sandy GRAVEL
255-260: Silty sandy GRAVEL
260-265: SAND, clayey GRAVEL
265-275: Silty SAND
275-295: SAND
295-310: Sandy GRAVEL
310-315: Gravelly SAND
315-325: Sandy GRAVEL
325-330: Gravelly SAND
330-335: Clayey SAND
335-341: Silty gravelly SAND
341-348: BASALT



Elevation of reference point: [662.44-ft] (top of casing)
Height of reference point above round surface [2.1-ft]
Depth of surface seal [0-80-ft]
Type of surface seal:
Cement grout between 8-in and 10-in casing as 10-casing was pulled back
Hole diameter,
0-80-ft, 11-in nominal
80-220-ft, 9-in nominal
220-348-ft, 7-in nominal
8-in ID carbon steel casing,
0-220-ft
Perforated,
148-198-ft, 2 cuts/rd/ft
198-202-ft, 2 cuts/rd, 2 rds/ft
Annular seal,
Cement/5% bentonite grout between 6-in and 8-in perforated casing
148-202-ft
6-in ID carbon steel casing,
+2.1-244-ft
(Pulled back from total depth)
80-ft blank,
240-320-ft
(Packer not documented)
6-in stainless steel telescoping screen,
320-340-ft, #10-slot
Borehole drilled depth: [348-ft]

Drawing By: RKL/2E25-28.ASB
Date : 07Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-28

WELL DESIGNATION	:	299-E25-28
RCRA FACILITY	:	A-29 Ditch
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 41,424 W 45,541
LAMBERT COORDINATES	:	N 445,424 E 2,249,678
DATE DRILLED	:	Apr85
DEPTH DRILLED (GS)	:	348-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	265-ft, Apr85; 258.1-ft, 22Jun93
CASING DIAMETER	:	8-in, carbon steel, 0-220-ft; 6-in, carbon steel, +2.1-244-ft
ELEV TOP CASING	:	662.44-ft, [15May86]
ELEV GROUND SURFACE	:	660.34-ft, Brass cap [15May86]
PERFORATED INTERVAL	:	8-in casing, 148-202-ft
SCREENED INTERVAL	:	320-340-ft, telescoping, 6-in #10 slot stainless steel
COMMENTS	:	FIELD INSPECTION, 23Aug89, 6-in carbon steel casing. 18-in concrete pad, no posts, capped and locked. No permanent identification.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	A29 Ditch monthly water level measurement, 01Jan87-22Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling, PNL sitewide sampling 93
PUMP TYPE	:	Electric submersible
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

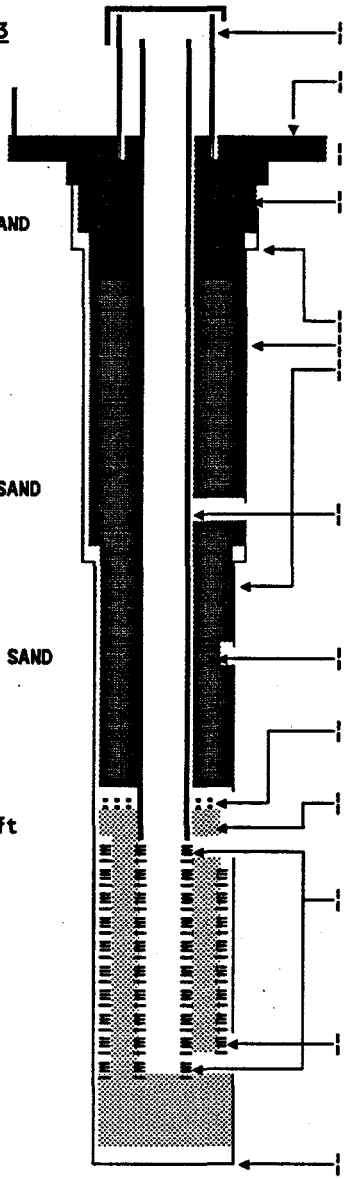
Drilling Method: Cable tool	Sample Method: Drive barrel
Drilling Fluid Used: Water 200E Area	Additives Used: Not documented
Driller's Name: Cordon/Garcia/Murphy	WA State Lic Nr: 1143 (Garcia)
Drilling Company: Kaiser Engineers	Company Location: Hanford
Date Started: 03Jun88	Date Complete: 19Sep88

WELL NUMBER: 299-E25-34 Hanford	TEMPORARY WELL NO:
Coordinates: N/S N 41,386 State	E/W W 45,517
Coordinates: N 446,571 Start	E 2,249,702
Card #: 007916	T 26E R 12N S 1
Elevation Ground surface: 660.62-ft (Brass cap)	

Depth to water: 254.5-ft Sep88
(Ground surface)258.2-ft 22Jun93

GENERALIZED Geologist's STRATIGRAPHY Log

0-10: Silty SAND
10-15: Silty sandy GRAVEL
15-20: Slightly silty gravelly SAND
20-30: Slightly gravelly slightly silty SAND
30-35: Slightly gravelly SAND
35-40: Silty SAND
40-55: SAND
55-65: Silty SAND
65-75: SAND
75-80: Gravelly SAND
80-85: Silty sandy GRAVEL
85-90: Gravelly silty SAND
90-100: Slightly silty gravelly SAND
100-105: Slightly gravelly slightly silty SAND
105-110: Gravelly SAND
110-115: SAND
115-120: Slightly gravelly SAND
120-125: Gravelly silty SAND
125-140: Slightly silty gravelly SAND
140-145: SAND
145-150: Slightly gravelly SAND
150-155: Gravelly SAND
155-180: Sandy GRAVEL
180-185: Silty sandy GRAVEL
185-195: Sandy GRAVEL
195-200: Apparent BOULDER @ 195 ft
200-210: Sandy GRAVEL
210-215: Silty sandy GRAVEL
215-225: Sandy GRAVEL
225-230: Gravelly SAND
230-245: Sandy GRAVEL
245-250: Gravelly SAND
250-255: Sandy GRAVEL
255-260: SAND
260-265: Silty sandy GRAVEL
265-270: SAND
270-275: Sandy GRAVEL
275-TD : Gravelly SAND



Elevation of reference point: [662.87-ft] (top of casing)
Height of reference point above ground surface [2.25-ft]
Depth of surface seal [2.2-20.1-ft]
Type of surface seal:
Cement grout, 2.2-20.1-ft
4x4-ft x 4-in concrete pad extending 2.2-ft into annulus
Hole diameter,
0-10-ft, 13-in nominal
10-162.5-ft, 11-in nominal
162.5-276.0-ft, 9-in nominal
4-in ID T304 stainless steel casing, +ND-251.6-ft
Granular/powdered bentonite, 20.1-250.3-ft
¼-in Enviroplug bentonite pellets, 250.3-251-ft
Silica sand pack, 251-276-ft, 6-30-mesh
4-in T304 stainless steel screen, 251.6-271.6-ft, #20-slot
8-in T304 stainless steel telescoping screen, 251.6-271.6-ft
Borehole drilled depth: [276.0-ft]

Drawing By: RKL/2E25-34.ASB
Date : 08Sep93
Reference : HANFORD WELLS

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-34

WELL DESIGNATION	:	299-E25-34
RCRA FACILITY	:	A-29 Ditch
CERCLA UNIT	:	200 Aggregate Area Management Study
HANFORD COORDINATES	:	N 41,385.9 W 45,516.8 [28Oct88-200E]
LAMBERT COORDINATES	:	N 446,571 E 2,249,702 [HANCONV]
DATE DRILLED	:	Sep88
DEPTH DRILLED (GS)	:	276-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	254-ft, Sep88; 258.2-ft, 22Jun93
CASING DIAMETER	:	6-in, stainless steel, +2.25↔-0.5-ft; 4-in, stainless steel, +ND↔252-ft
ELEV TOP CASING	:	662.87-ft, [28Oct88-200E]
ELEV GROUND SURFACE	:	660.62-ft, Brass cap [28Oct88-200E]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	251.6↔271.6-ft, 4-in stainless steel, #20-slot
COMMENTS	:	FIELD INSPECTION, 23Aug89; Stainless steel casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID.
AVAILABLE LOGS	:	Geologist
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	A29 Ditch water level measurement, 18Oct88↔22Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling, PNL sitewide w/l monitoring
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

Drilling Method: Cable tool
Drilling Fluid Used: 200 W Water Supply
Driller's Name: L. Watkins
Drilling Company: Kaiser Engineers
Date Started: 07Aug89

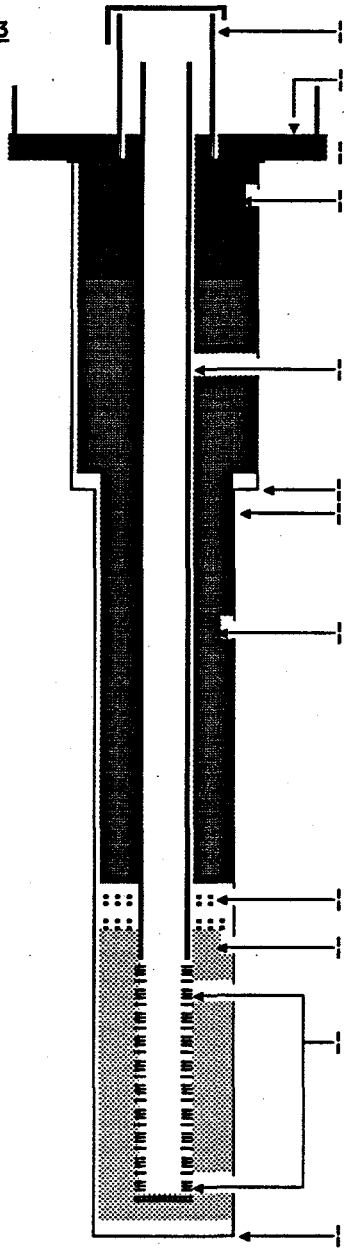
Sample Method: Drive barrel
Additives Used: Not documented
WA State Lic Nr: Not documented
Company Location: Hanford
Date Complete: 18Sep89

WELL NUMBER: 299-E25-40
TEMPORARY WELL NO:
Hanford Coordinates: N/S N 47,759.6 E/W W 47,334.8
State NAD83 N 136,212.6m E 575,464.9m
Coordinates: N 452,940 E 2,247,868
Start Card #: Not documented T___ R___ S___
Elevation Ground surface: 662.80-ft (Brass cap)

Depth to water: 257.4-ft Aug89
(Ground surface)260.7-ft 24Jun93

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0-40: SAND, trace COBBLES @ 5 and 20-ft
40-45: Sandy GRAVEL
45-65: SAND
65-75: Sl gravelly SAND
75-80: Sandy GRAVEL
80-100: Gravelly SAND
100-165: SAND
165-175: Sl gravelly SAND
175-195: SAND
195-210: Sandy GRAVEL
210-220: Sl gravelly SAND
220-250: SAND
250-255: Sl muddy SAND
255-260: MUD
260-265: Sl gravelly SAND
265-274: Sandy GRAVEL



Elevation of reference point: [665.71-ft] (top of casing)
Height of reference point above ground surface [2.9-ft]
Depth of surface seal [2.0-20.3-ft]
Type of surface seal:
Cement grout, 2.0-20.3-ft
4x4-ft x 6-in concrete pad extends 2.0-ft into annulus
4-in ID stainless steel casing, +1.25-252.0-ft
Hole diameter,
0-143.6-ft, 11-in nominal
143.6-274.0-ft, 9-in nominal
Bentonite crumbles, 20.3-244.8-ft, 8-20-mesh
in Volclay bentonite tablets, 244.8-248.4-ft
Silica sand pack, 248.4-274.0-ft, 16-30-mesh
4-in stainless steel screen, 252.0-273.0-ft, #10-slot w/channel pack
Borehole drilled depth: [274.0-ft]

Drawing By: RKL/2E25-40.ASB
Date : 08Sep93
Reference : WHC-MR-0209

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-40

WELL DESIGNATION	:	299-E25-40
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	SST WMA A-AX, 241-AX Tank Farm
HANFORD COORDINATES	:	N 47,759.6 W 47,334.8 [04Jan90-200E]
LAMBERT COORDINATES	:	N 452,940 E 2,247,868; [HANCONV]
		N 136,212.6m E 575,464.9m [04Jan909-NAD83]
DATE DRILLED	:	Sep89
DEPTH DRILLED (GS)	:	274.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	257.4-ft, 31Aug89;
		260.7-ft, 24Jun93
CASING DIAMETER	:	4-in stainless steel, +1.25~252.0-ft;
		6-in stainless steel, +2.9~0.5-ft
ELEV TOP CASING	:	665.71-ft, [04Jan90-200E]
ELEV GROUND SURFACE	:	662.80-ft, Brass cap [04Jan90-200E]
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	252.0~273.0-ft, 4-in #10-slot stainless steel w/channel pack
COMMENTS	:	FIELD INSPECTION, 02Feb90;
		Stainless steel casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID.
		Not in radiation zone.
		OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	SST monthly water level measurement, 01Dec89~24Jun93;
CURRENT USER	:	WHC ES&M w/l monitoring and RCRA sampling
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

WELL CONSTRUCTION AND COMPLETION SUMMARY

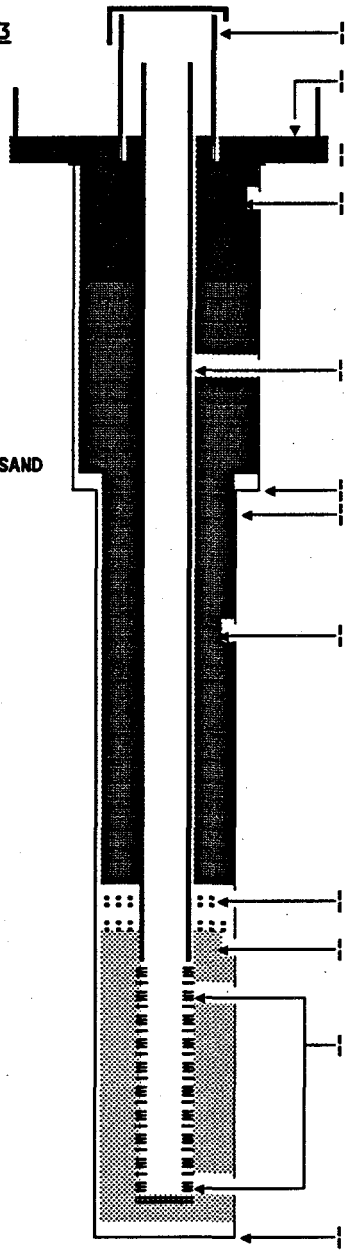
Drilling Method: Cable tool	Sample Method: Hard tool
Drilling Fluid Used: 200 W Water Supply	Additives Used: None
Driller's Name: C. Whamsley	WA State Lic Nr: Not documented
Drilling Company: Kaiser Engineers	Company Location: Hanford
Date Started: 08Aug89	Date Complete: 22Sep89

WELL NUMBER: 299-E25-41	TEMPORARY WELL NO:
Hanford Coordinates: N/S N 41,541.8	E/W W 47,330.9
State NAD83 N 136,146.2m	E 575,466.3m
Coordinates: N 446,722	E 2,247,888
Start Card #: Not documented	T R S
Elevation Ground surface: 668.10-ft (Brass cap)	

Depth to water: 262.2-ft Sep89
(Ground surface)266.0-ft 19Aug93

GENERALIZED Geologist's STRATIGRAPHY Log
Sl=slightly

0-15: SAND
15-20: Sl muddy SAND
20-30: Sandy GRAVEL
30-40: SAND
40-45: Muddy sandy GRAVEL
45-50: Sl gravelly SAND
50-60: SAND
60-70: Sl gravelly SAND
70-80: Gravelly SAND
80-85: Sl gravelly SAND
85-100: Gravelly SAND
100-120: SAND
120-130: Interbedded SAND-muddy SAND
130-180: SAND
180-190: Sl gravelly SAND
190-200: SAND
200-210: Sandy GRAVEL
210-220: Gravelly SAND
220-230: Muddy sandy GRAVEL
230-255: Gravelly SAND
255-265: Sandy MUD
265-270: Muddy sandy GRAVEL
270-279: Sandy GRAVEL



Elevation of reference point: [671.26-ft]
(top of casing)
Height of reference point above ground surface [3.2-ft]
Depth of surface seal [2.0-17.5-ft]
Type of surface seal:
Cement grout, 2.0-17.5-ft
4x4-ft x 6-in concrete pad
extends 2.0-ft into annulus
4-in ID stainless steel casing,
+2.1-255.3-ft
Hole diameter,
2.0-138.6-ft, 11-in nominal
138.6-279.0-ft, 9-in nominal
Bentonite crumbles,
17.5-248.7-ft, 8-20-mesh
-in Volclay bentonite tablets
248.7-252.4-ft
Silica sand pack,
252.4-279.0-ft, 16-30-mesh
4-in stainless steel screen,
255.3-276.3-ft, #10-slot
w/channel pack
Borehole drilled depth: [279.0-ft]

Drawing By: RKL/2E25-41.ASB
Date : 08Sep93
Reference : WHC-MR-0209

SUMMARY OF CONSTRUCTION DATA AND FIELD OBSERVATIONS
RESOURCE PROTECTION WELL - 299-E25-41

WELL DESIGNATION	:	299-E25-41
CERCLA UNIT	:	200 Aggregate Area Management Study
RCRA FACILITY	:	SST WMA A-AX, 241-AX Tank Farm
HANFORD COORDINATES	:	N 41,541.8 W 47,330.9 [04Jan90-200E]
LAMBERT COORDINATES	:	N 446,722 E 2,247,888 [HANCONV]
		N 136,146.2m E 575,466.3m [04Jan90-NAD83]
DATE DRILLED	:	Sep89
DEPTH DRILLED (GS)	:	279.0-ft
MEASURED DEPTH (GS)	:	Not documented
DEPTH TO WATER (GS)	:	262.2-ft, 22Sep89; 266.0-ft, 19Aug93
CASING DIAMETER	:	4-in stainless steel, +2.1~255.3-ft; 6-in stainless steel, +3.2~-0.5-ft
ELEV TOP CASING	:	671.26-ft
ELEV GROUND SURFACE	:	668.10-ft (Brass cap)
PERFORATED INTERVAL	:	Not applicable
SCREENED INTERVAL	:	255.3~276.3-ft, 4-in #10-slot stainless steel w/channel pack
COMMENTS	:	FIELD INSPECTION, 02Feb90; Stainless steel casing. 4-ft by 4-ft concrete pad, 4 posts, 1 removable capped and locked, brass cap in pad with well ID. Not in radiation zone. OTHER:
AVAILABLE LOGS	:	Geologist, driller
TV SCAN COMMENTS	:	Not applicable
DATE EVALUATED	:	Not applicable
EVAL RECOMMENDATION	:	Not applicable
LISTED USE	:	SST monthly water level measurement, 01Dec89~19Aug93;
CURRENT USER	:	WHC ES&H w/l monitoring and RCRA sampling
PUMP TYPE	:	Hydrostar
MAINTENANCE	:	

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