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Borehole Completion Data Package for the 216-U-12 Crib

S. M. Goodwin
Pacific Northwest Laboratory

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BOREHOLE COMPLETION DATA PACKAGE FOR 216-U-12 CRIB

S. M. GOODWIN

June 1990

Prepared for
Westinghouse Hanford Company by the
Pacific Northwest Laboratory
Richland, Washington 99352

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1.0 INTRODUCTION

This data package summarizes the drilling, well completion, aquifer testing, and pump installation activities at the 216-U-12 Crib (U-12 Crib) for FY 1990. Drilling and well completion activities took place from February 1990 through May 1990. The four wells drilled included 299-W22-40, 299-W22-41, 299-W22-42, and 299-W22-43.

The U-12 Crib is located on the Hanford Site approximately 2000 ft south of the U Plant Building in the 200-West Area (Figure 1). A detailed description of the trench and its operational history can be found in Interim-Status Indicator-Evaluation Ground-Water Monitoring Plan for the 216-U-12 Crib (Jensen et al. 1990).

The purpose of the U-12 Crib ground-water monitoring program is to determine the impact of waste disposal on water quality in the uppermost aquifer underlying the facility. All four wells were drilled according to locations specified in the ground-water monitoring plan (Jensen et al. 1990); however, the crib coordinates were incorrectly identified in the ground-water monitoring plan. When the location of the crib has been resurveyed, a map showing the corrected position of the crib will be issued. Figure 2 depicts the location of the crib and wells as found in the ground-water monitoring plan.

These wells were installed according to specifications outlined in the ground-water monitoring plan (Jensen et al. 1990) and in Generic Specifications-Groundwater Monitoring Wells (Hodge 1990). Drilling, sampling, and documentation of the wells were performed according to procedures presented in Procedures for Ground-Water Investigations (PNL 1989) and Last and Liikala (1987). Specifically, the collection and documentation of borehole samples and the construction of wells followed Procedure DO-1, Rev. 0 (PNL 1989), and special chemical samples were collected according to DO-4, Rev.0 (PNL 1989). Health and safety considerations associated with the installation of ground-water monitoring wells were specified in Health and Safety Plan-Installation of Ground-Water Monitoring Wells, 216-U-12 Crib (KEH 1990).

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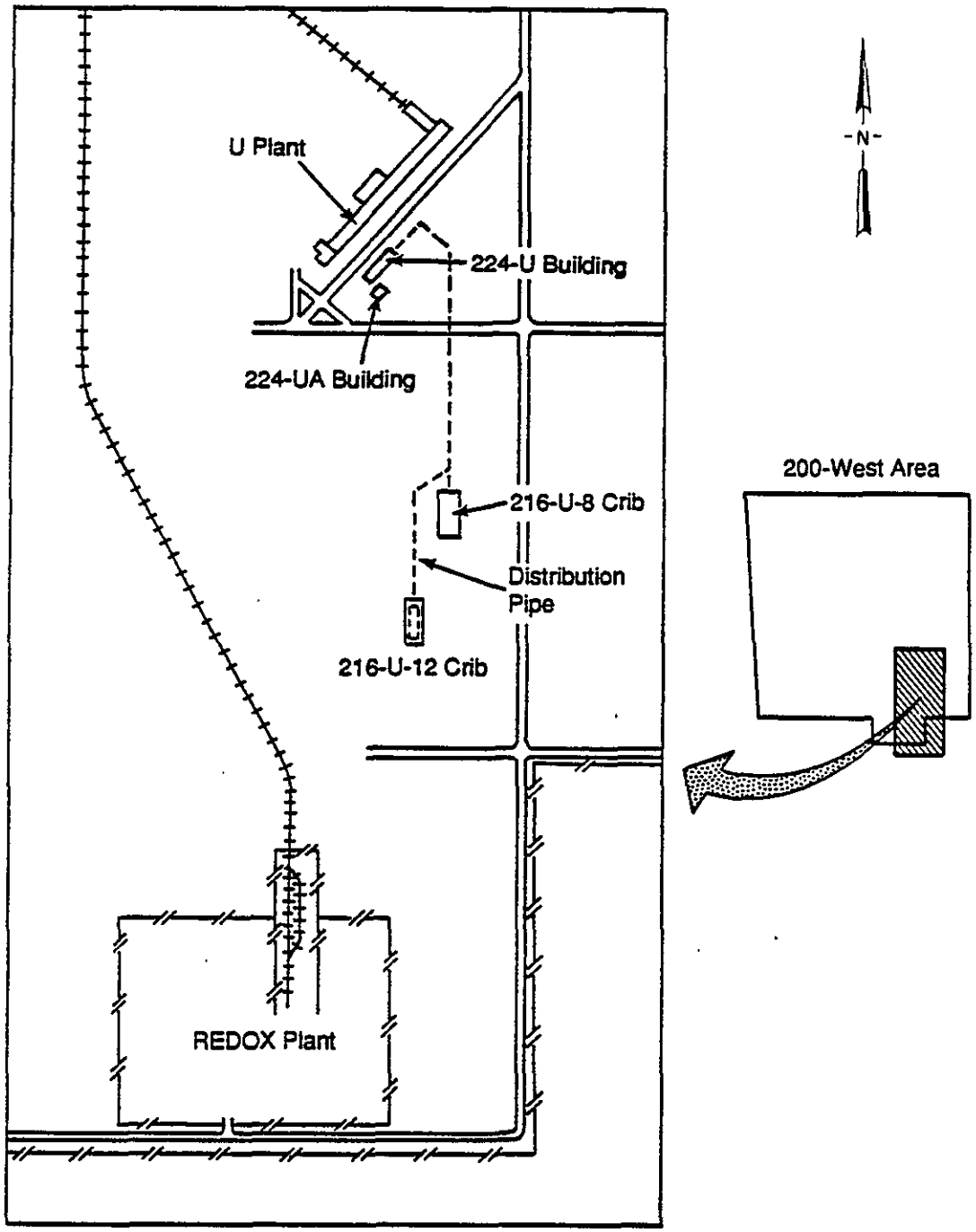

FIGURE 1. 200-West Area Map Showing the 216-U-12 Crib and Nearby Facilities

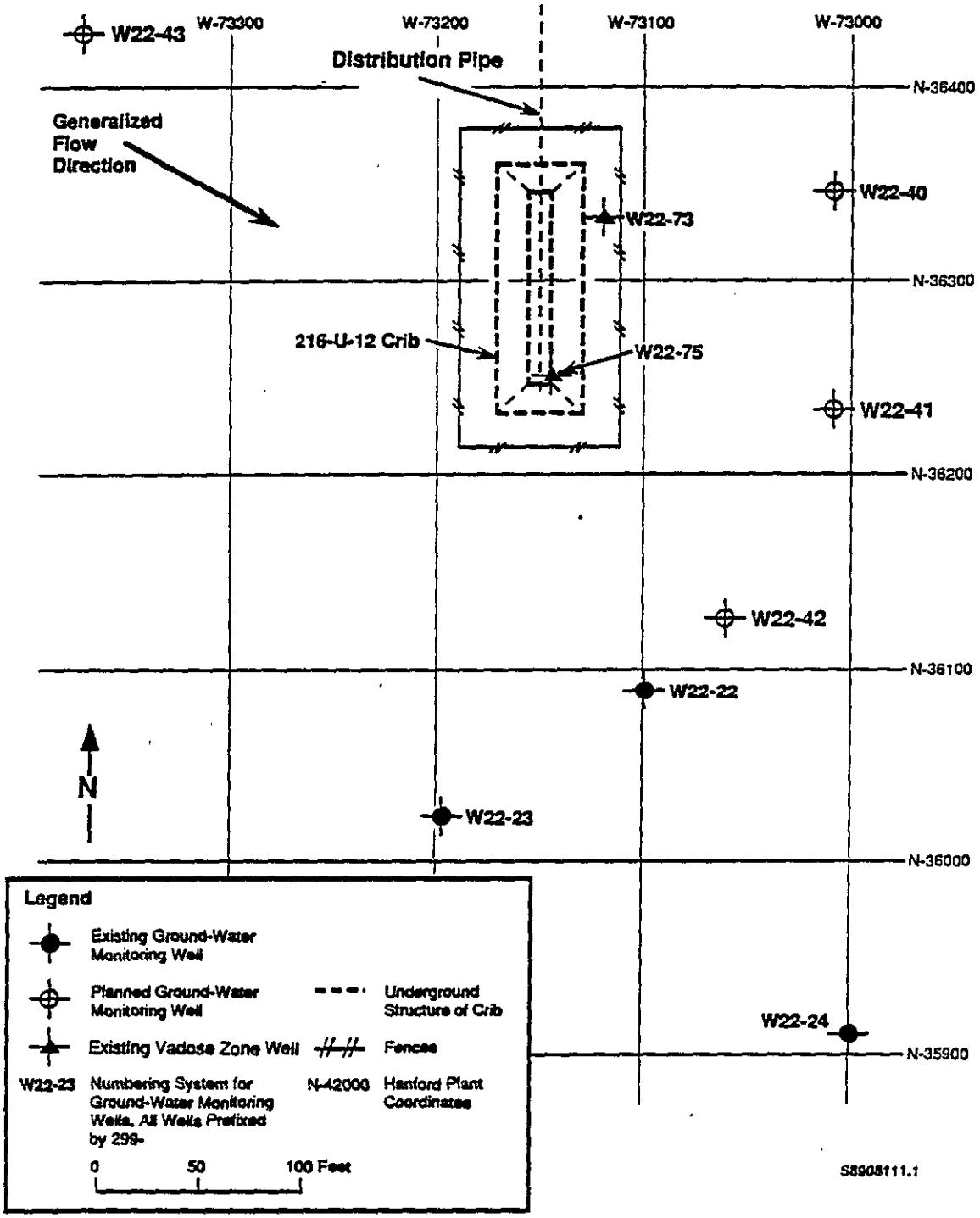

FIGURE 2. Location of Wells and Stratigraphic Cross Section A-A′ at the 216-U-12 Crib

Below is a list of the appendixes to this report and what each includes. Appendix A contains as-built diagrams, well completion/inspection reports, and geophysical logs. Appendix B lists sediment sample moisture contents, sieve analyses, sediment chemical analyses results, and chain-of-custody forms. Appendix C contains nonconformance/surveillance reports and deficiency reports. Appendix D contains the well-development logs, ground-water sample chemistry analyses, and pump installation reports. Appendix E presents aquifer tests results and interpretation of water level data, a summary of the water added and removed from the boreholes, and raw data. Appendix F contains the geologic logs.

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2.0 DRILLING

All four of the wells were drilled using cable tool drilling methods. Where possible, the sampled materials were recovered from the borehole using a drive barrel sampler; otherwise, wells were drilled with a hard tool, and samples were collected with a bailer. Wells were drilled to approximately 150 ft below land surface (bls) with 10-in.-diameter temporary carbon steel casing and a drive shoe, and to the final depth using 8-in.-diameter temporary carbon steel casing and a drive shoe. The boreholes were geophysically logged with a natural-gamma probe after reaching final depth; digitized geophysical logs are included in Appendix A. Geophysical logging was in accordance with Procedure GL-7A, Rev. 0 (PNL 1989).

Two 1-pint sediment samples were collected approximately every 5 ft or at changes in lithology for archival in the 2101-M storage facility. An additional sample was collected for moisture content analysis from intervals that were drilled with a drive barrel; data from moisture samples are contained in Appendix B. Samples for chemical and radiologic analyses were taken every 20 ft until approximately 40 ft above the water table where sample intervals were increased to every 10 ft. Additional samples were taken from zones of high moisture content or from the lithology changes. Chemical and radiological constituents were analyzed for volatile organics, anions, total organic carbon, nitrate/nitrite, and gross alpha and beta contamination; chemical sample data and chain-of-custody forms are included in Appendix B.

The following paragraphs contain brief descriptions of drilling activities at individual wells.

WELL 299-W22-40

Drilling began February 28, 1990, and continued until March 20, 1990, when a final depth of 245.0 ft below land surface (bls) was reached. A total of 143.5 ft of 10-in.-diameter and 247.94 ft of 8-in.-diameter temporary carbon steel casing was used to reach the final drilled depth. Drill methods used and sediments encountered are graphically represented in the as-built diagram in Appendix A. The well was logged with the natural-gamma geophysical

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probe on March 12 and March 30, 1990. The static water level measured on April 23, 1990, was 228.07 ft bls. During drilling, approximately 515 gal of drill supply water were added to the borehole, 255 gal of which were added below the water table.

WELL 299-W22-41

Drilling began February 7, 1990, and continued until February 28, 1990, when a final depth of 244.7 ft bls was reached. A total of 133.1 ft of 10-in.-diameter and 246.6 ft of 8-in.-diameter temporary carbon steel casing was used to reach the final drilled depth. Drill methods used and sediments encountered are graphically represented in the as-built diagram in Appendix A. The well was logged with the natural-gamma geophysical probe on March 5, 1990. The static water level measured on April 5, 1990, was 227.96 ft bls. During drilling, approximately 315 gal of drill supply water were added to the borehole, 255 gal of which were added below the water table.

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WELL 299-W22-42

Drilling began February 12, 1990, and continued until March 2, 1990, when a final depth of 244.0 ft bls was reached. A total of 136.9 ft of 10-in.-diameter and 245.4 ft of 8-in.-diameter temporary carbon steel casing was used to reach the final drilled depth. Drill methods used and sediments encountered are graphically represented in the as-built diagram in Appendix A. The well was logged with the natural-gamma geophysical probe on February 23 and March 5, 1990. The static water level measured on April 23, 1990, was 226.99 ft bls. During drilling, approximately 345 gal of drill supply water were added to the borehole, 105 gal of which were added below the water table.

WELL 299-W22-43

Drilling began February 22, 1990, and continued until March 15, 1990, when a final depth of 244.0 ft bls was reached. A total of 135.7 ft of 10-in.-diameter and 246.1 ft of 8-in.-diameter temporary carbon steel casing was used to reach the final drilled depth. Drill methods used and sediments encountered are graphically represented in the as-built diagram in Appendix A.

The well was logged with the natural-gamma geophysical probe on March 5 and March 30, 1990. The static water level measured on April 17, 1990, was 226.19 ft bls. During drilling, approximately 430 gal of drill supply water were added to the borehole, 240 gal of which were added below the water table.

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3.0 WELL COMPLETION

After total depth was reached, the wells were bailed to remove any remaining material from the borehole. A straightness test was then performed by passing a length of stainless steel casing to the bottom of the borehole. The generic specifications document (Hodge 1990) requires the straightness test casing to have a minimum length of 20 ft and to be not more than 1 in. smaller than the diameter of the final casing. All four of the wells passed the straightness test. After the straightness test was performed, the borehole was geophysically logged with the natural-gamma probe.

The permanent 4-in.-diameter, Johnson[a] type 304, schedule 5 stainless steel casing and type 304 screens were then installed with a hydraulic crane. Factory-welded stainless steel casing centralizers were placed every 40 ft along the permanent casing, beginning above the screen. The temporary carbon steel casing was then backpulled with hydraulic casing jacks as the annular fill and seal materials were added. The annular fill and seal materials consisted of a silica sand pack, a 3/8- to 1/2-in. bentonite pellet seal, an 8-20 mesh granular bentonite seal, and a cement grout seal. A concrete pad was then poured, and the 6-in. protective casing was installed; four yellow guard posts were set in concrete, and a brass marker was placed on the pad and stamped with the applicable well number. The completed well was geophysically logged with the natural-gamma probe and was camera surveyed prior to well development and sample-pump installation. After the sample-pump was installed and satisfactorily tested, the well was considered complete.

The following paragraphs describe the completion activities at individual wells; the datum for the measurements listed is below land surface (bls). As-Built diagrams in Appendix A graphically illustrate the placement of the permanent materials.

(a) Johnson Filtration Systems, Inc., St. Paul, Minnesota.

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WELL 299-W22-40

The stainless steel casing and screen were set on April 5, 1990. A total of 224.97 ft of type 304, schedule 5 casing and 20.35 ft of 10-slot, type 304 Channel Pack[a] screen was installed. The screen was placed from 244.49 to 224.14 ft bls, and the casing was placed from 224.14 ft bls to 0.83 ft above land surface. The Colorado silica sand filter pack consisted of 40-mesh sand 243.2 to 218.1 ft bls. The sand pack was settled by bailing with a dart bailer inside the screen; a total of 105 gal of water was removed and contained in 55-gal drums. The 3/8- and 1/2-in. bentonite pellets were placed from 218.1 to 211.1 ft bls, followed by 8-20 mesh bentonite crumbles from 211.1 ft to 20.5 ft bls. A cement grout seal was poured from 20.5 to 3.0 ft bls, followed by the cement pad from 3.0 ft bls to 0.5 ft above land surface.

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WELL 299-W22-41

The stainless steel casing and screen were set on March 29, 1990. A total of 225.12 ft of type 304, schedule 5 casing and 21.24 ft of 5-slot, type 304 continuous wrap screen was installed. The screen was placed from 245.33 to 224.09 ft bls, and the casing was placed from 224.09 ft bls to 1.03 ft above land surface. The Colorado silica sand filter pack consisted of 40-100 mesh sand from 243.4 to 220.7 ft bls. The sand pack was settled by bailing inside the screen; a total of 405 gal of water was removed and contained in 55-gal drums. The 3/8-in. bentonite pellets were placed from 220.7 to 215.4 ft bls, followed by 8-20 mesh bentonite crumbles from 215.4 to 18.4 ft bls. A cement grout seal was poured from 18.4 to 2.5 ft bls, followed by the cement pad from 2.5 ft bls to 0.5 ft above land surface.

(a) Channel Pack is a registered trademark of Johnson Filtration Systems, Inc., St. Paul, Minnesota.

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WELL 299-W22-42

The stainless steel casing and screen were set on April 18, 1990. A total of 225.0 ft of type 304, schedule 5 casing and 20.31 ft of 10-slot, type 304 Channel Pack screen was installed. The screen was then placed from 243.39 to 223.08 ft bls, and the casing was placed from 223.08 ft bls to 1.92 ft above land surface. The Colorado silica sand filter pack consisted of 40-mesh sand from 243.2 to 219.7 ft bls. The sand pack was settled by bailing with a dart bailer inside the screen; a total of 100 gal of water was removed and contained in 55-gal drums. The 1/2-in. bentonite pellets were placed from 219.7 to 215.25 ft bls, followed by 8-20 mesh bentonite crumbles from 215.25 ft to 18.8 ft bls. A cement grout seal was poured from 18.8 to 2.5 ft bls, followed by the cement pad from 2.5 ft bls to 0.5 ft above land surface.

WELL 299-W22-43

The stainless steel casing and screen were set on April 12, 1990. A total of 225.12 ft of type 304, schedule 5 casing and 20.34 ft of 10-slot, type 304 Channel Pack screen was installed. The screen was placed from 244.01 to 223.67 ft bls, and the casing was placed from 223.67 ft bls to 1.45 ft above land surface. The Colorado silica sand filter pack consisted of 40-mesh sand from 242.9 to 219.4 ft bls. The sand pack was settled by bailing inside the screen; a total of 50 gal of water was removed and contained in a 55-gal drum. The 1/2-in. bentonite pellets were placed from 219.4 to 215.95 ft bls, followed by 8-20 mesh bentonite crumbles from 215.95 ft to 18.0 ft bls. A cement grout seal was poured from 18.0 to 2.5 ft bls, followed by the cement pad from 2.5 ft bls to 0.5 ft above land surface.

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4.0 WELL DEVELOPMENT

All 216-U-12 crib wells were developed by pumping at a rate of approximately 10 gal/min until the turbidity of a collected water sample was below 5 Nephelometric Turbidity Units (NTU). Submersible 1/2-hp pumps were used for the development of all wells. The procedure used for well development is GC-7, Rev. 0, contained in PNL (1989). A summary table of well development activities, total volumes purged, and final turbidities is contained in Appendix D. The HydroStar[a] pumps were set in all four wells; testing of the HydroStar pumps occurred on May 15, 1990. Pump-installation logs are included in Appendix D; documentation of the HydroStar placement was in accordance with DO-3, Rev. 0 PNL (1989).

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(a) HydroStar is a registered trademark of Instrumentation Northwest, Inc., Redmond, Washington.

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5.0 SUMMARY

Table 1 summarizes the results for the individual wells.

TABLE 1. Summary Table for 216-U-12 Crib Wells (depths are measured from ground surface)

Activity	299-W22-40	299-W22-41	299-W22-42	299-W22-43
Drilling				
Start Date	02/28/90	02/07/90	02/12/90	02/22/90
Finish Date	03/20/90	02/28/90	03/02/90	03/15/90
Total Depth	245.0 ft	244.7 ft	244.0 ft	244.01 ft
Water Depth	228.8 ft	229.3 ft	228.82 ft	226.94 ft
Casing Used	10 in.=143.5 ft 8 in.=247.94 ft	10 in.=133.1 ft 8 in.=246.6 ft	10 in.=136.9 ft 8 in.=245.4 ft	10 in.=135.7 ft 8 in.=246.1 ft
Completion				
Start Date	04/05/90	03/29/90	04/18/90	04/12/90
Finish Date	04/11/90	04/04/90	04/23/90	04/17/90
Water Depth	228.07 ft	227.96 ft	226.99 ft	226.19 ft
Bottom Depth	243.63 ft	246.0 ft	243.2 ft	242.9 ft
Screen Depth	244.49 ft	245.33 ft	243.39 ft	244.01 ft
Development Activities				
Camera Run	04/23/90	04/23/90	04/27/90	04/23/90
Slug Tested	04/23/90	04/23/90	04/30/90	04/23/90
Developed	04/24/90	04/25/90	05/04/90	04/25/90
Pump Placed	05/07/90	05/07/90	05/08/90	05/08/90
Pump Tested	05/15/90	05/15/90	05/15/90	05/15/90
Pump Depth	236.63 ft	236.4 ft	235.27 ft	235.32 ft
Purge Volume	860 gal	600 gal	850 gal	920 gal

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6.0 REFERENCES

Hodge, C. E. 1990. Generic Specifications-Groundwater Monitoring Well. WHC-S-014, Rev. 4, Westinghouse Hanford Company, Richland, Washington.

Jensen, E. J., M. A. Chamness, S. M. Goodwin, S. H. Hall, and D. R. Newcomer. 1990. Interim-Status Indicator-Evaluation Ground-Water Monitoring Plan for the 216-U-12 Crib. WHC-SD-EN-019, Rev. 0, prepared for Westinghouse Hanford Company by Pacific Northwest Laboratory, Richland, Washington.

Kaiser Engineers Hanford (KEH). 1990. Health and Safety Plan - Installation of Ground-Water Monitoring Wells, 216-U-12 Crib, Rev. 0, Kaiser Engineers Hanford Industrial Safety and Health Department, Richland, Washington.

Last, G. V., and T. L. Liikala. 1987. A Field Guide for Well Site Geologists: Cable Tool Drilling. PNL-6392, Pacific Northwest Laboratory, Richland, Washington.

Pacific Northwest Laboratory (PNL). 1989. Procedures for Ground-Water Investigations. PNL-6894, Pacific Northwest Laboratory, Richland, Washington.

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APPENDIX A

AS-BUILT DIAGRAMS, WELL COMPLETION/INSPECTION REPORTS, SURVEY REPORT, AND GEOPHYSICAL LOGS

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AS-BUILT DIAGRAM

Well Number 299-W22-40 Geologist P.S. INNIS, C.D. CONDIT Page 1 of 2

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Construction Data		Depth in Feet	Geologic/Hydrologic Data	
Description	Diagram		Diagram Litho.	Lithologic Description
CONCRETE PAD		5		SAND
CEMENT GROUT		10		SL. GRAVELLY SL. MUDDY SAND
143.5 OF 10" CARBON STEEL		15		SL. MUDDY SAND
CASING (TEMPORARY)		20		MUDDY SAND
(1.4' STICK-UP)		25		SL. GRAVELLY SAND
		30		" " "
247.94 OF 8" CARBON STEEL		35		SAND
CASING (TEMPORARY)		40		SAND
		45		SAND (MUDDY [illegible])
		50		SAND
224.97' OF 4" TYPE 304		55		SAND
SCH. 5 STAINLESS STEEL		60		SL. GRAVELLY SAND
CASING		65		SL. MUDDY SAND [illegible] GRAVELLY SAND
		70		SAND
		75		SAND
		80		SAND
		85		SAND
		90		SL. MUDDY SAND 87-88 SAND
		95		SL. MUDDY SAND 92-93, 94-94.5 SAND
CASING CENTRALIZER		100		MUDDY SAND (CHANGE -117')
		105		SAND (CHANGE - 122')
8-20 MESH BENTONITE PELLETS		110		SL. MUDDY SAND (CHANGE - 105)
		115		" " "
		120		SAND
CASING JOINT		125		SAND
		130		SAND

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AS-BUILT DIAGRAM

Well Number 299-W22-40 Geologist P.S. INNIS, C.D. CONDIT Page 2 of 2

Reviewed by D.L. McFlan Date 4-24-90

Construction Data: Description	Construction Data: Diagram	Depth in Feet	Geologic/Hydrologic Data: Diagram Litho.	Geologic/Hydrologic Data: Lithologic Description
143.5' OF 10" CARBON		135		SAND
STEEL CASING (TEMPORARY)		140		SAND
		145		SAND
247.94' OF 8" CARBON		150		SAND
STEEL CASING (TEMPORARY)		155		SAND
3.1' STICK-UP		160		SL MUDDY SAND BEGINNING 157'
		165		SL MUDDY SAND
8-20 MESH BENTONITE PELLETS		170		" " "
		175		MUDDY SAND
CASING CENTRALIZER		180		SL MUDDY SAND
CASING JOINT		185		MUDDY SAND
		190		187' SL GRAVELLY SL MUDDY SAND
224.97' OF 4" TYPE 304		195		SL MUDDY GRAVELLY SAND
SCH. 5 STAINLESS STEEL		200		SL MUDDY SAND
CASING		205		SL GRAVELLY SL MUDDY SAND
		210		MUDDY SAND
1/2-3/8" BENTONITE PELLETS		215		" "
		220		" "
		225		SL MUDDY SAND
40 MESH CSSI SILICA SAND		230		D/W = 228.07' 4/23/90 MUDDY SAND
		235		MUDDY SANDY GRAVEL
20.35' OF 10 SLOT TYPE		240		" " "
304 STAINLESS STEEL CHANNEL		245		" " "
PACK SCREEN				

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WELL COMPLETION/INSPECTION REPORT(governing procedure DO-1, RO)

Specification No. WHC-S-014* Rev. No. 4
Project W-017 216-U-12 CRIB
Location 200 WEST
Drilling Co. KAISER ENGINEERING HANFORD
Driller LOUIS WATKINS
Other (companies) N/A
Geologist(s) P.S. INNIS (GOLDER ASSOCIATES)
C.D. CONDIT (GOLDER ASSOCIATES)
L.A. DOREMUS S.M. GOODWIN
M.A. SHANNESS

Well No. 299-W22-40 Temp. Well No. N/A
Coordinates
Casing Elev. Ground Elev.

DRILLING METHOD

Rotary Air N/A Mud N/A
Cable Tool D 0-160' H 160'-245'
Drilling Fluid WATER - 200 EAST POWER HOUSE SUPPLY
Other NONE

GEOPHYSICAL LOGGING

Sondes	Interval	Date
NATURAL GAMMA	0 - 143'	3/12/90
NAT. GAMMA	110 - 243	3/30/90
	-	
	-	
	-	

COMPLETION DATA

Drilled Depth 245.0
Completed Depth 244.49
Date Started 2/28/90
Date Completed 5/15/90
Static Water Level/Date 228.07' 4/23/90

AQUIFER TESTING

Type SLUG TEST
Length of Test
Volume Pumped
Drawdown
Date of Test 4/23/90

INSPECTION RESULTS

CLEANING

Inspection Method VISUAL
Acceptance Criteria SECTION 7.6, SECTION 4.2.2

	Accept	Reject	Date
Drilling Tools/Rig	PJD	N/A	3/20/90
Temporary Materials	PJD	N/A	3/20/90
Permanent Materials	SMW	N/A	4/5/90

SCREEN

Type	Length	Slot Size
JOHNSON DIV TYPE 304 STAINLESS	10.33	10
STEEL CHANNEL PACK	10.02	10

Depth(s) 244.49 - 234.16
234.16 - 224.14
Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.3.5
Accept SMW Reject N/A Date 4/5/90

CASING (permanent)

Type	Size	Placement
JOHNSON DIV. TYPE 304	4"	224.14 - ±0.03
SCH. 5 STAINLESS STEEL	-	- -

Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.1, 4.2.5
Accept SMW Reject N/A Date 4/5/90

MATERIAL STORAGE/PACKING

Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.2, 7.3

	Accept	Reject	Date
Mtl. Handling/Storage	SMW	N/A	4/5/90
Material Packing	SMW	N/A	4/5/90

LUBRICANTS/ADDITIVES

Inspection Method VISUAL
Acceptance Criteria SECTION 7.2

	Identify	Accept	Reject	Date
Additives	~~N/A~~ DRILL H_2O	SMW	N/A	4/11/90
Lubricants	FOOD GRADE VEG. OIL	PJD	N/A	2/28/90

STRAIGHTNESS TEST

Inspection Method VISUAL 21.56 ± 0.50 STRAIGHTNESS TESTER PIPE
Acceptance Criteria SECTION 8.2
Accept PJD Reject N/A Date 3/20/90

WELL PROTECTION

Inspection Method VISUAL - ~~21.56 ± 0.50 STRAIGHTNESS~~ ~~FENCE PIPE~~ 3/20/90
Acceptance Criteria SECTION 4.2.10

	Accept	Reject	Date
Protective Posts	MAC SMW	N/A	5/15/90
Locks	MAC	N/A	5/15/90

ANNULAR SEAL

Inspection Method MEASURED W/STEEL TAPE
Acceptance Criteria SECTION 4.2.6 - 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
[illegible]	[illegible] - 243.2	[illegible]	[illegible]	N/A	[illegible]
[illegible]	[illegible] - [illegible]	[illegible]	[illegible]	N/A	4/10/90
[illegible]	[illegible] - [illegible]	[illegible]	[illegible]	N/A	[illegible]
[illegible]	[illegible] - [illegible]	[illegible]	[illegible]	N/A	4/11/90

OTHER (initial if performed)

N/A Well Abandonment
JPM Well Development
JPM Downhole TV Inspection
SMW Complete As-Built Diagram, Driller's/Geologist's Logs

* ECN 146189 ECN 124393 146188 For all blanks mark N/A if not applicable.
ECN 124394 ECN 124427 124435

Well 299-W22-40 continued...

ANNULAR SEAL

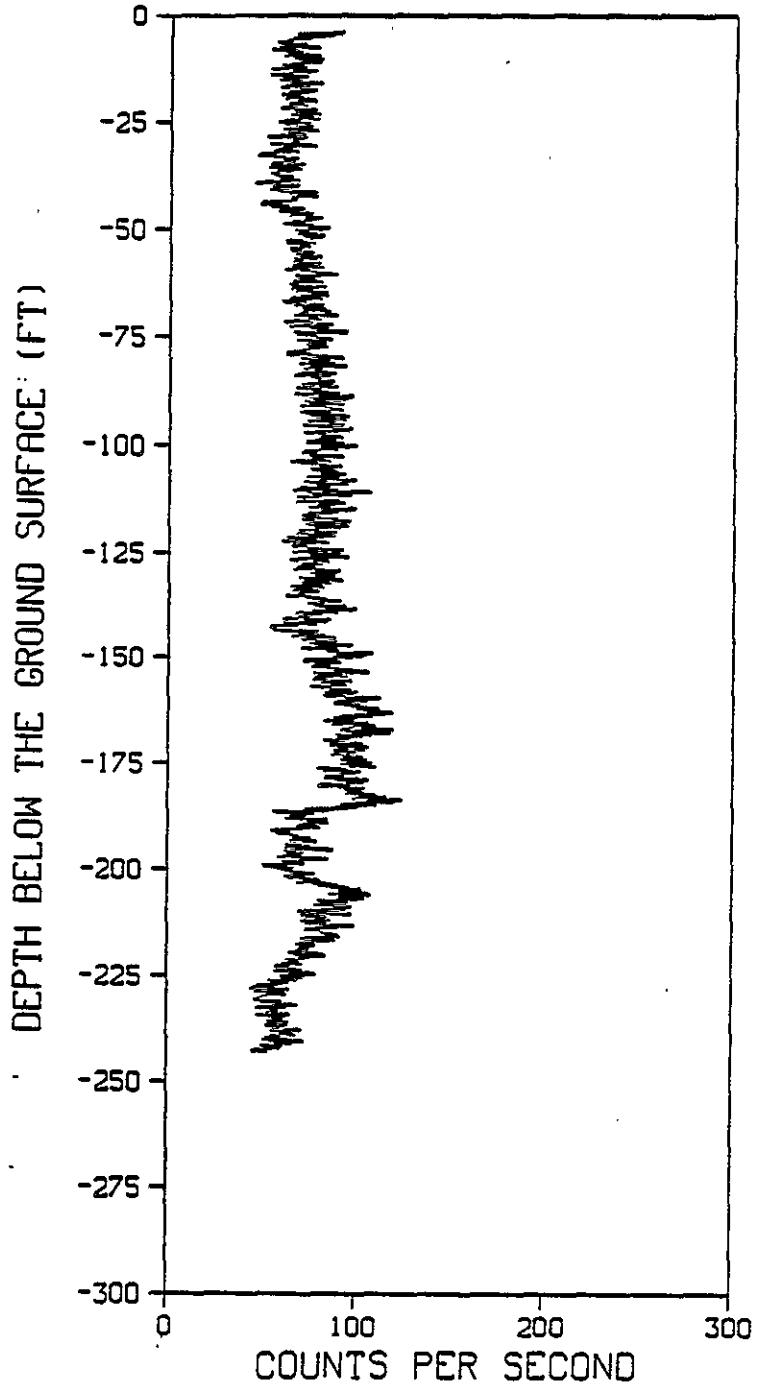
Inspection Method PHYSICAL MEASUREMENT Acceptance Criteria SECTION 4.2.6 - 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
CONCRETE PAD	3.0' - +0.5'	1 YARD³	MRU	N/A	5/1/92
	-				
	-				
	-				

for all blanks mark N/A if not applicable.

9413223.0438

NATURAL GAMMA LOG WELL 299-W22-40
216-U-12 CRIB GROUND-WATER MONITORING PROJECT



9413223.0439

Battelle
Pacific Northwest Laboratories

AS-BUILT DIAGRAM

Well Number 299-W22-41 Geologist R. Miller (GAI), AW Pearson Page 1 of 2

Reviewed by VE McGhan Date 4-24-90

Construction Data: Description	Construction Data: Diagram	Depth in Feet	Geologic/Hydrologic Data: Diagram Litho.	Geologic/Hydrologic Data: Lithologic Description
CONCRETE PAD		5		Slightly Muddy SAND DB
10"Ø carbon steel casing -		10		SAND - trace of gravels "
temporary w/drive shoe		15		" - f, micaceous "
from 4.0' to 133.1' bls		20		" - " "
CEMENT GROUT		25		" - " "
8"Ø carbon steel casing -		30		" - coarser "
temporary w/drive shoe		35		" - f micaceous to sand "
from + 2.1' to 244.4'		40		" - " " "
		45		" - coarser - increase [illegible]
8-20 MESH GRAVELS		50		Slightly Gravelly SAND "
		55		SAND - to gravels "
CASING CENTRALIZERS		60		" - " "
CASING JOINT		65		" - " "
		70		" - " "
		75		" "
225.12' of 4" DIA. TYPE		80		" - f sands to gravel "
304 SCH 5 STAINLESS STEEL		85		" - f micaceous "
SCREEN		90		" - to gravels "
		95		" - f micaceous "
		100		SAND
		105		" w/slightly cemented lenses @ 104'
		110		MUDDY SAND
		115		SAND
		120		"
		125		"
		130		"

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

AS-BUILT DIAGRAM

Well Number 299-W22-41 Geologist R Miller (GAI), AW Pearson Page 2 of 2

Reviewed by [illegible] Date 4-24-90

Construction Data		Depth in Feet	Geologic/Hydrologic Data	
Description	Diagram		Diagram Litho.	Lithologic Description
14" diameter steel casing		135		SAND CE
temporary with above size		140		" "
from +1.0' to 132.1' GS		145		" "
		150		" "
8" diameter steel casing		155		" - fine grade to mud sand
temporary with above size		160		Muddy SAND - gradational
from +22 to 164.4'		165		Sandy MUD LT
		170		" "
3-10 MESH BENTONITE		175		" "
CRUMBLES		180		" "
		185		" "
225.12' OF 4" DIA. TYPE 304		190		Muddy Sandy GRAVEL to cobble
SCH. 5 STAINLESS STEEL		195		" - "
CASING		200		" - "
		205		" "
CASING JOINT		210		Sandy MUD "
		215		" "
3/8" VOLCLAY TABLETS		220		" "
		225		" "
40 MESH CSS. SILICA SAND		230		" D/W = 227.96' 4/5/90 "
		235		Muddy Sandy GRAVEL "
21.24' OF TYPE 304		240		" " " "
CONTINUOUS WRAP STAINLESS		245		" " "
STEEL CASING				

A-1800-166 (3/87)

WHC-MR-0208

WELL COMPLETION/INSPECTION REPORT

Specification No. WHC-S-010 Rev. No. 2+4
Project W017
Location 200 WEST AREA 216-U-12 CRIB
Drilling Co. KEW
Driller [illegible]
Other (companies) NONE
Geologist(s) E.C. Miller (GAI) A.W. PEARSON
C.D. CONDIT (GAI), LA DOREMUS
SM GOODWIN, MA CHAMNESS

Well No. 299-W22-41 Temp. Well No. N/A
Coordinates
Casing Elev. Ground Elev.

DRILLING METHOD

Rotary Air N/A Mud N/A
Cable Tool D 20-160.0' H 160.0-240.7'
Drilling Fluid 200E Raw Water Supply
Other N/A

GEOPHYSICAL LOGGING

Sondes	Interval	Date
NAT. GAMMA	237' - 2.5'	3/5/90
	-	
	-	
	-	
	-	

COMPLETION DATA

Drilled Depth 240.7' bls
Completed Depth 245.33'
Date Started 2/7/90
Date Completed 5/15/90
Static Water Level/Date 227.96 4/5/90

AQUIFER TESTING

Type SLUG TEST
Length of Test
Volume Pumped
Drawdown
Date of Test 4/23/90

INSPECTION RESULTS

CLEANING

Inspection Method Visual
Acceptance Criteria Section 7.6

	Accept	Reject	Date
Drilling Tools/Rig	[illegible]	N/A	2/6/90
Temporary Materials	[illegible]	N/A	2/7/90
Permanent Materials	[illegible]	N/A	4/5/90

MATERIAL STORAGE/PACKING

Inspection Method Visual
Acceptance Criteria Section 4.2.2, 7.3

	Accept	Reject	Date
Mtl. Handling/Storage	[illegible]	N/A	4/5/90
Material Packing	[illegible]	N/A	4/5/90

SCREEN

Type	Length	Slot Size
JOHNSON DIV. TYPE 304 CONTINUOUS	21.24'	5
WRAP STAINLESS STEEL	—	—

Depth(s) 245.33' - 224.09'
Inspection Method Visual
Acceptance Criteria Section 4.2.5
Accept LAD Reject N/A Date 3/24/90

LUBRICANTS/ADDITIVES

Inspection Method Visual
Acceptance Criteria Section 7.2

	Identify	Accept	Reject	Date
Additives	DRILL WATER	[illegible]	N/A	4/5/90
Lubricants	Vegetable Oil	[illegible]	N/A	2/7/90

STRAIGHTNESS TEST

Inspection Method Run straightness tool to bottom
Acceptance Criteria Section 8.2
Accept [illegible] Reject N/A Date [illegible]

CASING (permanent)

Type	Size	Placement
JOHNSON DIV TYPE 304	4"	224.09' - +1.03'
SCH. 5 STAINLESS STEEL	-	— - —

Inspection Method Visual
Acceptance Criteria Section 4.2.1, 4.2.5
Accept LAD Reject N/A Date 3/24/90

WELL PROTECTION

Inspection Method Visual
Acceptance Criteria Section 4.2.10

	Accept	Reject	Date
Protective Posts	[illegible]	N/A	5/15/90
Locks	MAC	N/A	5/15/90

ANNULAR SEAL

Inspection Method Physical Measurement
Acceptance Criteria Section 4.2.6 - 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
40-100 MESH CSSI SILICA SAND	243.4 - 220.7	9.32 FT³ ~~[illegible]~~	[illegible]	N/A	4/3/90
3/8" VOLCLAY TABLETS	220.7 - 215.4	1.24 FT³	[illegible]	N/A	4/3/90
8-20 MESH BENTONITE CRUMBLES	215.4 - 18.4	99.4 FT³	[illegible]	N/A	4/4/90
CEMENT GROUT	18.4 - 2.5	5.44 FT³	[illegible]	N/A	4/4/90

OTHER (initial if performed)

N/A Well Abandonment
JYB Well Development
[illegible] Downhole TV Inspection
[illegible] Complete As-Built Diagram, Driller's/Geologist's Logs

For all blanks mark N/A if not applicable.

REV. 4 ECN #'s:
146169 124427 146155
124393 124394 124435

28

Well 299-W22-41 continued...

ANNULAR SEAL

spection Method PHYSICAL MEASUREMENT Acceptance Criteria SECT. 4.2.6 - 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
CONCRETE PAD	2.5' - +0.5'	1 YARD^3	MAX.	N/A	5/1/90
	-				
	-				
	-				

for all blanks mark N/A if not applicable.

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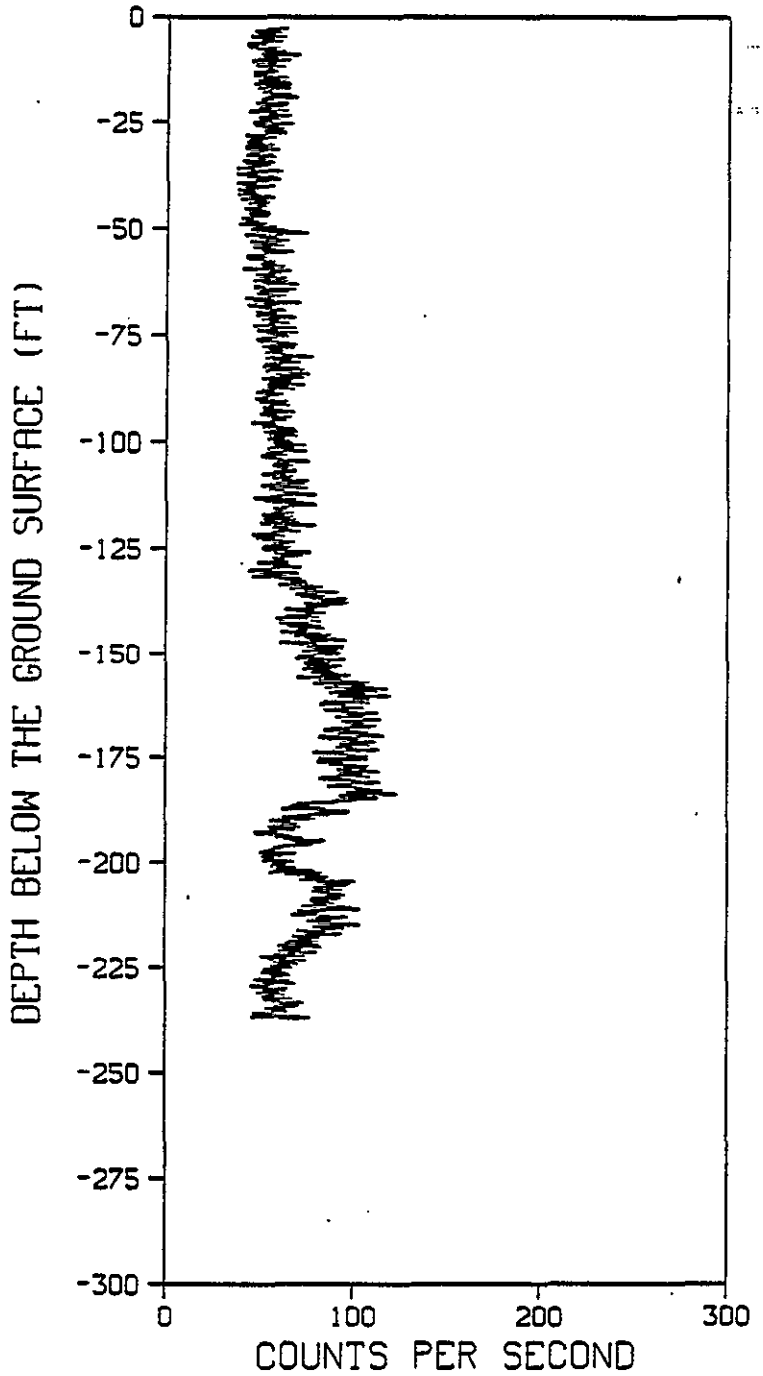
NATURAL GAMMA LOG WELL 299-W22-41
216-U-12 CRIB GROUND-WATER MONITORING PROJECT



9413223.0441

Battelle
Pacific Northwest Laboratories

AS-BUILT DIAGRAM

Well Number 299-W23-42 Geologist R.D. Millar (PNL) S.D. Conlit (WCC) Page 1 of 2

Reviewed by D.E. McElroy Date 4-24-90

Construction Data		Depth in Feet	Geologic/Hydrologic Data	
Description	Diagram		Diagram Litho.	Lithologic Description
CONCRETE PAD				
30.9 FT. OF TEMPORARY 10"		5'		SAND
CARBON STEEL CASING		10'		"
CEMENT GROUT		15'		"
265.4 FT. OF TEMPORARY 7"		20'		"
CARBON STEEL CASING		25'		"
FROM +1.4 to 2440'		30'		"
		35'		SLIGHTLY MOIST SAND
225.0' OF 4" DIA PIPE SCH		40'		SAND
304.5 STAINLESS STEEL		45'		"
SCREEN		50'		GRAVELLY SAND
		55'		SAND
CASING CENTRALIZER		60'		
CASING JOINT		65'		"
		70'		"
		75'		"
		80		"
8-20 BENTONITE CRUMBLES		85'		"
		90'		"
		95'		"
		100'		"
		105'		"
		110'		"
		115'		"
		120'		"
				"
		130		"

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

AS-BUILT DIAGRAM

Well Number #299-W22-42 Geologist S.D. Condit (GAI) AW Pearson R.D. Miller (GAI) Page 2 of 2

Reviewed by W.E. McGhan Date 4-24-90

Construction Data		Depth in Feet	Geologic/Hydrologic Data	
Description	Diagram		Diagram Litho.	Lithologic Description
Temporary 6" carbon		135'		SAND
steel casing		140'		"
		145'		"
Temporary 5" carbon		150'		"
steel casing		155'		SLIGHTLY MUDDY SAND
from 1.4' to 244.0' bls		160'		MUDDY SAND
		165'		SANDY MUD
8-20 mesh Bentonite Pellets		170'		" " "
		175'		Muddy SAND "
Casing Centralizer		180'		" " "
Casing Joint		185'		" " "
		190'		gravelly Muddy SAND "
		195'		" " " "
225.0' of 4" Dia. Type 304		200'		Muddy SAND "
Grade 5 Stainless Steel		205'		" " "
Casing		210'		slightly gravelly Sandy MUD "
		215'		" " " " "
1/2" Dia. Volcanic Pellets		220'		Sandy MUD "
		225'		D/W = 226.44' 4/23/90 "
40 mesh CSSI Silica Sand		230		Muddy SAND "
		235		Muddy Sandy GRAVEL "
20.31' of 10 Slot Type 304		240		" " " "
Stainless Steel Channel		245		" " " "
Pack Screen				total depth - 244.0' bls

A-1800-186 (3/87)

WHC-MR-0208 **WELL COMPLETION/INSPECTION REPORT**

Specification No. [illegible] Rev. No. 3 & 4
Project [illegible]
Location [illegible]
Drilling Co. [illegible]
Driller [illegible]
Other (companies) NONE
Geologist(s) [illegible] (REZ) AW PEARSON, [illegible] M.A. CHAMNESS, S. M. GOODWIN, L.A. DOREMUS

Well No. [illegible] Temp. Well No. N/A
Coordinates
Casing Elev. Ground Elev.

DRILLING METHOD
Rotary Air N/A Mud N/A
Cable Tool D 0'-150' H 150'-244.0'
Drilling Fluid [illegible] WATER SUPPLY
Other NONE

GEOPHYSICAL LOGGING

Sondes	Interval	Date
GAMMA	[illegible] - 137.7	2/23/90
" "	100.0' - 242.8'	3/5/90
	-	
	-	
	-	

COMPLETION DATA
Drilled Depth 244.0'
Completed Depth 243.39
Date Started 2/12/90
Date Completed 5/15/90
Static Water Level/Date 226.99' (4/23/90)

AQUIFER TESTING
Type SLUG TEST
Length of Test
Volume Pumped
Drawdown
Date of Test 4/30/90

INSPECTION RESULTS

CLEANING
Inspection Method [illegible]
Acceptance Criteria [illegible]

	Accept	Reject	Date
Drilling Tools/Rig	CLC	N/A	2/12/90
Temporary Materials	CLC	N/A	3/5/90
Permanent Materials	SMC	N/A	4/23/90

SCREEN

Type	Length	Slot Size
JOHNSON DIV. TYPE 304 STAINLESS	10.30	10
STEEL CHANNEL PACK	10.01	10

Depth(s) 243.39 - 233.09
233.09 - 223.08
Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.5 (REV. 4)
Accept SMC Reject N/A Date 4/18/90

CASING (permanent)

Type	Size	Placement
JOHNSON DIV. TYPE 304	4"	223.08 - +1.92
SCH. 5 STAINLESS STEEL	-	- -

Inspection Method VISUAL
Acceptance Criteria SECTIONS 4.2.1, 4.2.5 (REV. 4)
Accept SMC Reject N/A Date 4/18/90

MATERIAL STORAGE/PACKING
Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.2 7.3 (REV 4)

	Accept	Reject	Date
Mtl. Handling/Storage	SMC	N/A	4/23/90
Material Packing	SMC	N/A	4/23/90

LUBRICANTS/ADDITIVES
Inspection Method VISUAL
Acceptance Criteria SECTION 7.2

	Identify	Accept	Reject	Date
Additives	DRILL WATER	SMC	N/A	4/23/90
Lubricants	FOOD OIL	SMC	N/A	4/23/90

STRAIGHTNESS TEST
Inspection Method 21.6' LONG 7" O.D. PIPE
Acceptance Criteria SECTION 5.2 (REV 4)
Accept [illegible] Reject N/A Date [illegible]

WELL PROTECTION
Inspection Method VISUAL
Acceptance Criteria SECTIONS 4.2.1C

	Accept	Reject	Date
Protective Posts	SMC	N/A	5/15/90
Locks	MAC	N/A	5/1/90

ANNULAR SEAL
Inspection Method PHYSICAL MEASUREMENT
Acceptance Criteria SECTIONS 4.2.6 TO 4.2.10

Type	Interval	Volume	Accept	Reject	Date
40 MESH CSSI SILICA SAND	243.2 - 219.7	7.63 ft³	SMC	N/A	4/19/90
1/2" VOLCLAY TABLETS	219.7 - 215.25	1.24 ft³	SMC	N/A	4/19/90
8-20 MESH BENTONITE CHUNKS	215.25 - 18.8	99.4 ft³	LAD	N/A	4/20/90
CEMENT GROUT	18.8 - 2.5	7.92 ft³	SMC	N/A	4/23/90

OTHER (initial if performed)
___ Well Abandonment
[illegible] Well Development
[illegible] Downhole TV Inspection
SMC Complete As-Built Diagram, Driller's/Geologist's Logs

REV 4 ECN'S: 146189 124394
124393 146188
124427 124435

For all blanks mark N/A if not applicable.

WELL COMPLETION/INSPECTION REPORT(governing procedure DO-1, RO)

Well 299-W22-42 continued... WHC-MR-0208

ANNULAR SEAL

Inspection Method PHYSICAL MEASUREMENT Acceptance Criteria SECT. 4.2.6 - 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
CONCRETE PAD	2.5' - +0.5'	1 YMD³	MAV	N/A	5/1/90
	-				
	-				
	-				

for all blanks mark N/A if not applicable.

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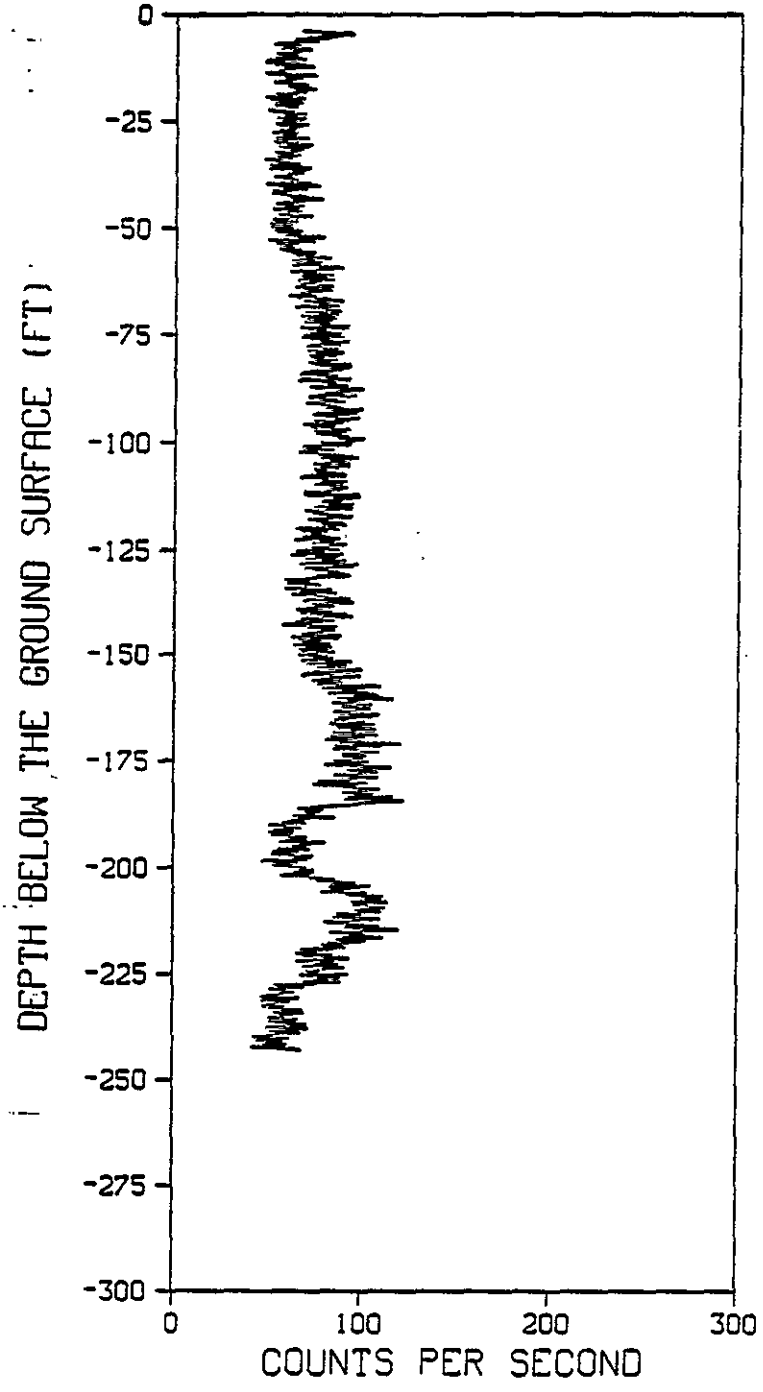
NATURAL GAMMA LOG WELL 299-W22-42
216-U-12 CRIB GROUND-WATER MONITORING PROJECT



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Battelle
Pacific Northwest Laboratories

AS-BUILT DIAGRAM

Well Number 299-W22-45 Geologist C.D. Conduit, AW Pearson Page 1 of 2

Reviewed by V.C. McGhan Date 4-25-90

Construction Data		Depth in Feet	Geologic/Hydrologic Data	
Description	Diagram		Diagram Litho.	Lithologic Description
CONCRETE PAD				
155.7 FT. OF TEMPORARY 10"		5'		SLIGHTLY MUDDY SAND
SARPEN STEEL CASING		10'		SLIGHTLY GRAVELLY SAND
CEMENT GROUT		15'		SAND
264.1 FT OF TEMPORARY 8"		20'		"
CARBON STEEL CASING		25'		"
		30'		"
225.12' OF 4" DIA. TYPE		35'		"
304 SCH. 5 STAINLESS STEEL		40'		SLIGHTLY GRAVELLY SAND
CASING		45'		GRAVELLY SAND
		50'		SLIGHTLY GRAVELLY SAND
		55'		SAND
CASING CENTRALIZER		60'		"
CASING JOINT		65'		"
		70'		"
		75'		"
		80'		"
		85'		"
		90'		"
		95'		"
		100'		SLIGHTLY MUDDY SAND
		105'		" " "
		110'		" " "
		115'		MUD LENSES 111'-114' SAND
8-20 MESH BENTONITE		120'		"
CRUMBLES		125'		"
		130'		"

A-1800-186 (3/87)

Battelle
Pacific Northwest Laboratories

AS-BUILT DIAGRAM

Well Number 299-W22-43 Geologist AW Pearson / E.C. Miller (GEI) Page 2 of 2

Reviewed by [illegible] Date 4-25-90

Construction Data		Depth in Feet	Geologic/Hydrologic Data	
Description	Diagram		Diagram Litho.	Lithologic Description
10" temporary carbon steel		135'		SAND DC
casing w/drive shoe from		140'		slightly Muddy SAND "
0.2' to 134.9' b/s		145'		" " " - silt-sized "
8" temporary carbon steel		150'		Muddy SAND - from 147' indicated
casing w/drive shoe from		155'		" " rock in-cuttings "
-1.35' to 244.75' b/s		160'		Sandy MUD - overburden "
		165'		" "
225.12' of 4" DIA. TYPE		170'		" "
304 SCH. 5 STAINLESS		175'		" "
STEEL CASING		180'		" "
		185'		" -basalt - caliche "
CASING CENTRALIZER		190'		Muddy Sandy GRAVEL - caliche
		195'		slightly Gravelly Muddy SAND
		200'		" " " " "
CASING JOINT		205'		Sandy MUD "
		210'		" " "
		215'		"
1/2" VOLCLAY TABLETS		220'		Muddy SAND "
		225		" " "
		230		D/w: 226.14' 4-17-90 "
40 MESH CSSI SILICA SAND		235		" " "
		240		SAND - to silt-size fine "
20.34' OF TYPE 304		245		MUDDY SANDY GRAVEL "
STAINLESS STEEL CHANNEL				
PACK SCREEN				

A-1800-186 (3/87)

WHC-MR-0208 WELL COMPLETION/INSPECTION REPORT(governing procedure DO-1, RO)

Specification No. NHC-S-014 Rev. No. 3 2
Project WO.7
Location [illegible]
Drilling Co. KEH
Driller D. LUETKE
Other (companies) NONE
Geologist(s) C.D. COLE - AW Pearson, R.C. Miller (GAI) S.M. GOODWIN, LA DORENUS MA CHAMNESS

Well No. 299-W22-43 Temp. Well No. N/A
Coordinates
Casing Elev. Ground Elev.

DRILLING METHOD
Rotary Air N/A Mud N/A
Cable Tool D 0.0' - 146.0' H 146.0' - 244.0'
Drilling Fluid raw water supply - 200E
Other NONE

GEOPHYSICAL LOGGING

Sondes	Interval	Date
Induction 11"	2.0' - 135.0'	3/5/90
NAT GAMMA 6"	25' - 242'	3-30-90

COMPLETION DATA
Drilled Depth 244.0'
Completed Depth 244.01'
Date Started 2/22/90
Date Completed 5/15/90
Static Water Level/Date 226.19' 4-17-90

AQUIFER TESTING
Type SLUG TEST
Length of Test
Volume Pumped
Drawdown
Date of Test 4/23/90

INSPECTION RESULTS

CLEANING
Inspection Method VISUAL
Acceptance Criteria SECT SIN 7.6

	Accept	Reject	Date
Drilling Tools/Rig	CDC	n/a	2/23/90
Temporary Materials	[illegible]	n/a	3/7/90
Permanent Materials	SWL	N/A	4/17/90

MATERIAL STORAGE/PACKING
Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.2 7.3

	Accept	Reject	Date
Mtl. Handling/Storage	SWL	N/A	4/17/90
Material Packing	SWL	N/A	4/17/90

SCREEN

Type	Length	Slot Size
JOHNSON DIV. TYPE 304 STAINLESS	10.33'	10
STEL CHANNEL PACK	10.01'	10

Depth(s) 244.01' - 233.68'
233.68' - 223.67'
Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.5
Accept SWL Reject N/A Date 4/12/90

LUBRICANTS/ADDITIVES
Inspection Method VISUAL
Acceptance Criteria SECTION 7.2

	Identify	Accept	Reject	Date
Additives	DRILL WATER	SWL	n/a	4/17/90
Lubricants	[illegible]	[illegible]	n/a	3/8/90

STRAIGHTNESS TEST
Inspection Method 20' of 6" SS CASING TO BOTTOM OF HOLE
Acceptance Criteria SECTION 9.2
Accept [illegible] Reject n/a Date 5/16/90

CASING (permanent)

Type	Size	Placement
JOHNSON DIV. TYPE 304	4"	223.67' - +1.45'
[illegible] STAINLESS STEEL	-	- -

Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.1 4.2.5
Accept SWL Reject N/A Date 4/12/90

WELL PROTECTION
Inspection Method VISUAL
Acceptance Criteria SECTION 4.2.10

	Accept	Reject	Date
Protective Posts	SWL	N/A	5/15/90
Locks	MAC	N/A	5/1/90

ANNULAR SEAL
Inspection Method PHYSICAL MEASUREMENT Acceptance Criteria SECTION 4.2.6 TO 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
40 MESH CSSI SILICA SAND	242.9' - 219.4'	8.19 ft³	SWL	N/A	4/13/90
1/2" VOLCLAY TABLETS	219.4' - 215.95'	1.24 ft³	SWL	N/A	4/13/90
6-20 MESH BENTONITE CRUMBLES	215.95' - 15.0'	107.21 ft³	SWL	N/A	4/17/90
CEMENT GROUT	15.0' - 2.5'	7.42 ft³	SWL	N/A	4/17/90

OTHER (initial if performed)
N/A Well Abandonment
IAM Well Development
WSM Downhole TV Inspection
SWL Complete As-Built Diagram, Driller's/Geologist's Logs

ECN #'s: 146189 124427 146185 124393 124394 124435

For all blanks mark N/A if not applicable.

Well 299-W22-43 continued...

ANNULAR SEAL

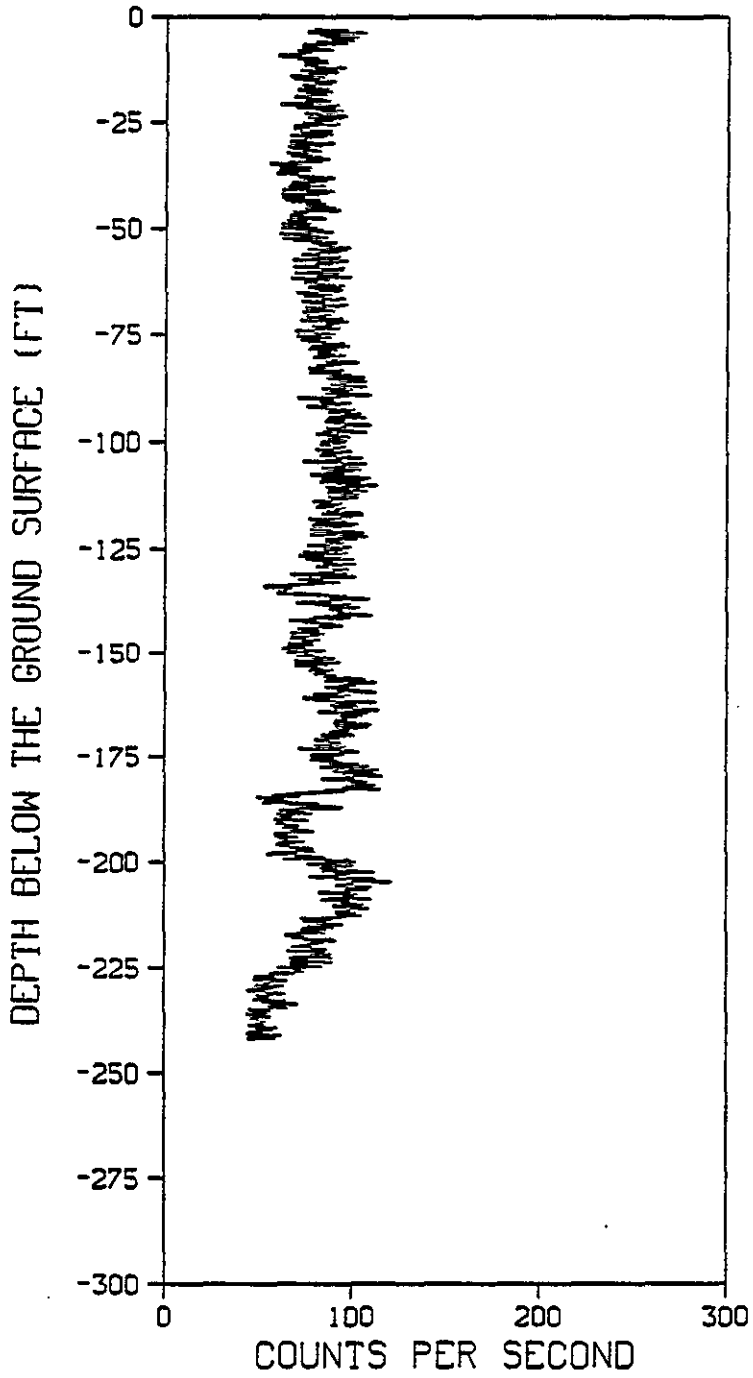
·pection Method PHYSICAL MEASUREMENT Acceptance Criteria SECT 4.2.6 - 4.2.9.1

Type	Interval	Volume	Accept	Reject	Date
CONCRETE PAD	2.5' - +0.5'	1 YARD³	MAC	N/A	5/1/90
	-				
	-				
	-				

for all blanks mark N/A if not applicable.

9413223.0453

NATURAL GAMMA LOG WELL 299-W22-43
216-U-12 CRIB GROUND-WATER MONITORING PROJECT



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APPENDIX B

MOISTURE CONTENT DATA, SIEVE DATA, CHEMICAL-SAMPLE DATA, AND CHAIN-OF-CUSTODY FORMS

9413223.0456

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MOISTURE CONTENTS FOR 216-U-12 CRIB

WELL NUMBER	SAMPLE DEPTHS (ft)	% H_2O
299-W22-40	5	13.36
(03/15/90)	10	6.06
	15	4.35
	20	21.73
	25	3.09
	30	3.03
	35	4.18
	40	6.03
	43	23.72
	45	2.94
	50	3.45
	55	3.51
	60	2.63
	64	13.84
	65	2.28
	70	2.50
	75	2.71
	80	3.73
	85	2.89
	87	8.93
	90	3.03
	95	3.42
	100	10.15
	105	2.08
	110	6.47
	115	8.86
	120	5.97
	125	3.15
	130	3.75
	135	3.36
	140	3.82
	145	4.40
	150	4.40
	155	5.59
	160	11.32
299-W22-41	5	5.34
(02/08/90)	10	NO SAMPLE
	15	NO SAMPLE
(02/20/90)	20	6.92
	30	3.69

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MOISTURE CONTENTS FOR 216-U-12 CRIB (cont.)

WELL NUMBER	SAMPLE DEPTHS (ft)	% H_2O
299-W22-41	35	7.02
(02/20/90) cont.	40	4.06
	45	5.11
	50	2.78
	55	2.86
	60	2.77
	65	2.86
	70	3.15
	75	1.87
	80	3.73
	85	7.46
	90	2.98
	95	4.16
	100	3.71
	105	2.75
	110	6.27
	115	5.07
	120	5.44
	125	4.46
	130	4.52
(02/23/90)	135	5.09
	140-a	4.62
	140-b	4.51
	150	3.78
	155	5.08
	160	8.27
299-W22-42	5	3.01
(02/20/90)	10	NO SAMPLE
	15	2.60
	20	2.53
	25	4.07
	30	3.66
	35	7.13
	40	6.11
	45	2.04
	50	1.85
	55	1.64
	60	1.57
	65	1.88
	70	0.31

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MOISTURE CONTENTS FOR 216-U-12 CRIB (cont.)

WELL NUMBER	SAMPLE DEPTHS (ft)	% H_2O
299-W22-42	75	2.16
(02/23/90) cont.	80	5.51
	85	2.61
	90	2.58
	95	3.21
	100	3.20
	105	3.10
	110	4.07
	115	3.77
	120	9.34
	125	4.79
	130	4.12
	135	3.32
	140	4.35
(02/27/90)	145	1.21
	150	1.56
299-W22-43	5	4.00
(02/23/90)	10	2.09
(02/27/90)	15	1.07
	20	1.77
	25	1.47
	30	0.48
	35	0.32
	40	0.59
	45	0.32
	50	0.33
	55	0.63
	60	0.31

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WESTINGHOUSE HANFORD OPERATIONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-040 ****

06/22/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
5	N/A	C	14.1	85.9	0.0	(m)S	WT	0.0	0.0	1.0	17.7	57.7	158.4	90.0	19.8	33.5
SORT= 1.10	MEDIAN=		3.00	MODE=	3.00	MEAN= 2.78	WT %	0.0	0.0	0.3	4.7	15.3	41.9	23.8	5.2	8.9
SPLIT WT= 379.1							CUM WT %	0.0	0.0	0.3	5.0	20.2	62.1	85.9	91.1	100.0
10	N/A	C	7.9	67.1	25.0	(m)gS	WT	113.4	24.1	33.4	127.7	113.2	51.5	42.6	16.3	27.2
SORT= N/A	MEDIAN=		1.00	MODE=	1.00	MEAN= N/A	WT %	20.6	4.4	6.1	23.3	20.6	9.4	7.8	3.0	5.0
SPLIT WT= 550.4							CUM WT %	20.6	25.0	31.1	54.4	75.0	84.3	92.1	95.1	100.0
15	N/A	C	5.1	94.9	0.1	S	WT	0.0	0.3	1.6	37.5	251.9	111.0	30.7	9.3	13.8
SORT= 0.85	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.90	WT %	0.0	0.1	0.4	8.2	55.2	24.4	6.7	2.1	3.0
SPLIT WT= 456.6							CUM WT %	0.0	0.1	0.4	8.6	63.9	88.2	94.9	97.0	100.0
20	N/A	C	42.5	57.2	0.2	mS	WT	0.0	0.9	1.9	2.1	11.2	68.5	129.0	100.1	57.8
SORT= 1.05	MEDIAN=		4.00	MODE=	4.00	MEAN= 3.72	WT %	0.0	0.3	0.5	0.6	3.0	18.4	34.7	27.0	15.6
SPLIT WT= 372.4							CUM WT %	0.0	0.3	0.8	1.3	4.3	22.8	57.5	84.4	100.0
25	N/A	C	5.1	82.8	12.1	gS	WT	51.4	10.6	77.1	209.4	84.8	32.9	20.2	7.8	18.4
SORT= 1.35	MEDIAN=		1.00	MODE=	1.00	MEAN= 0.60	WT %	10.0	2.1	15.0	40.9	16.6	6.4	4.0	1.5	3.6
SPLIT WT= 512.4							CUM WT %	10.0	12.1	27.1	68.0	84.5	90.9	94.9	96.4	100.0
30	N/A	C	4.8	92.1	3.1	S	WT	5.7	7.1	55.8	150.5	123.6	34.6	15.4	5.6	14.4
SORT= 1.07	MEDIAN=		1.00	MODE=	1.00	MEAN= 1.00	WT %	1.4	1.7	13.5	36.5	30.0	8.4	3.7	1.4	3.5
SPLIT WT= 413.2							CUM WT %	1.4	3.1	16.6	53.1	83.0	91.4	95.2	96.5	100.0
35	N/A	C	4.8	91.9	3.3	S	WT	10.5	3.9	10.7	154.1	168.2	46.6	21.9	6.7	14.3
SORT= 1.06	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.31	WT %	2.4	0.9	2.5	35.3	38.5	10.7	5.0	1.5	3.3
SPLIT WT= 437.1							CUM WT %	2.4	3.3	5.7	41.0	79.5	90.2	95.2	96.7	100.0
40	N/A	C	5.9	93.3	0.8	S	WT	0.0	3.4	12.8	42.6	122.7	152.3	49.5	9.6	14.2
SORT= 1.06	MEDIAN=		3.00	MODE=	3.00	MEAN= 2.12	WT %	0.0	0.8	3.1	10.5	30.1	37.4	12.2	2.4	3.5
SPLIT WT= 407.5							CUM WT %	0.0	0.8	4.0	14.4	44.6	82.0	94.1	96.5	100.0
43	N/A	C	39.7	59.0	1.2	mS	WT	1.0	3.0	3.2	2.4	4.9	21.4	158.4	111.5	16.5
SORT= 0.70	MEDIAN=		4.00	MODE=	4.00	MEAN= 3.80	WT %	0.3	0.9	1.0	0.8	1.5	6.6	49.1	34.6	5.1
SPLIT WT= 322.1							CUM WT %	0.3	1.2	2.2	3.0	4.5	11.1	60.3	94.9	100.0
45	N/A	C	8.0	87.4	4.6	S	WT	13.6	7.8	58.4	147.5	103.5	56.8	36.6	10.6	26.1
SORT= 1.54	MEDIAN=		2.00	MODE=	1.00	MEAN= 1.31	WT %	3.0	1.7	12.7	32.0	22.5	12.3	7.9	2.3	5.7
SPLIT WT= 461.8							CUM WT %	3.0	4.7	17.3	49.3	71.8	84.1	92.1	94.3	100.0
50	N/A	C	2.9	96.5	0.6	S	WT	0.0	2.5	44.6	154.0	135.3	48.4	16.8	4.2	7.8
SORT= 1.05	MEDIAN=		2.00	MODE=	1.00	MEAN= 1.13	WT %	0.0	0.6	10.8	37.2	32.7	11.7	4.1	1.0	1.9
SPLIT WT= 414.1							CUM WT %	0.0	0.6	11.4	48.6	81.3	93.0	97.1	98.1	100.0

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WHC-MR-0208

WESTINGHOUSE HANFORD OPE. ..ONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-040 ****

06/22/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
55	N/A	C	2.5	94.9	2.6	S	WT	2.9	7.9	54.7	154.8	125.8	42.0	11.2	2.8	7.6
SORT= 0.99	MEDIAN=		1.00	MODE=	1.00	MEAN= 0.96	WT %	0.7	1.9	13.4	37.8	30.7	10.3	2.7	0.7	1.9
SPLIT WT= 409.5							CUM WT %	0.7	2.6	16.0	53.8	84.5	94.7	97.5	98.2	100.0
60	N/A	C	3.2	90.4	6.4	(g)S	WT	16.9	15.2	81.4	227.8	96.6	31.6	15.1	4.4	11.8
SORT= 1.11	MEDIAN=		1.00	MODE=	1.00	MEAN= 0.67	WT %	3.4	3.0	16.3	45.5	19.3	6.3	3.0	0.9	2.4
SPLIT WT= 502.1							CUM WT %	3.4	6.4	22.7	68.1	87.4	93.8	96.8	97.7	100.0
64	N/A	C	10.5	89.3	0.2	(m)S	WT	0.0	0.6	5.8	27.9	53.6	68.8	141.9	17.2	17.7
SORT= 1.25	MEDIAN=		4.00	MODE=	4.00	MEAN= 2.77	WT %	0.0	0.2	1.7	8.4	16.1	20.6	42.6	5.2	5.3
SPLIT WT= 334.0							CUM WT %	0.0	0.2	1.9	10.3	26.3	47.0	89.5	94.7	100.0
65	N/A	C	4.0	89.8	6.2	(g)S	WT	1.5	25.1	103.7	153.0	84.1	28.2	14.3	5.1	11.9
SORT= 1.24	MEDIAN=		1.00	MODE=	1.00	MEAN= 0.61	WT %	0.4	5.9	24.3	35.9	19.7	6.6	3.3	1.2	2.8
SPLIT WT= 427.7							CUM WT %	0.4	6.2	30.5	66.4	86.1	92.7	96.0	97.2	100.0
70	N/A	C	4.0	95.7	0.3	S	WT	0.0	1.2	24.0	159.0	147.9	35.1	14.2	4.6	11.2
SORT= 0.90	MEDIAN=		2.00	MODE=	1.00	MEAN= 1.13	WT %	0.0	0.3	6.0	40.1	37.2	8.8	3.6	1.2	2.8
SPLIT WT= 397.5							CUM WT %	0.0	0.3	6.3	46.4	83.6	92.5	96.0	97.2	100.0
75	N/A	C	3.8	95.4	0.8	S	WT	0.0	3.4	24.3	131.5	197.2	50.8	17.7	4.6	12.1
SORT= 0.98	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.31	WT %	0.0	0.8	5.5	29.8	44.7	11.5	4.0	1.0	2.7
SPLIT WT= 443.0							CUM WT %	0.0	0.8	6.3	36.1	80.7	92.2	96.2	97.2	100.0
80	N/A	C	5.1	93.5	1.4	S	WT	0.5	4.3	23.3	93.7	117.7	61.3	25.9	6.4	11.3
SORT= 1.26	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.51	WT %	0.1	1.2	6.8	27.2	34.2	17.8	7.5	1.9	3.3
SPLIT WT= 344.4							CUM WT %	0.1	1.4	8.2	35.4	69.5	87.4	94.9	96.7	100.0
85	N/A	C	4.1	95.0	0.9	S	WT	0.5	4.0	37.1	163.6	182.3	56.1	19.1	5.6	14.0
SORT= 1.05	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.25	WT %	0.1	0.8	7.7	33.9	37.8	11.6	4.0	1.2	2.9
SPLIT WT= 482.9							CUM WT %	0.1	0.9	8.6	42.5	80.3	92.0	95.9	97.1	100.0
87	N/A	C	10.7	89.2	0.1	(m)S	WT	0.0	0.3	0.5	1.5	10.0	159.0	115.6	15.0	19.5
SORT= 0.80	MEDIAN=		3.00	MODE=	3.00	MEAN= 3.01	WT %	0.0	0.1	0.2	0.5	3.1	49.5	36.0	4.7	6.1
SPLIT WT= 321.3							CUM WT %	0.0	0.1	0.3	0.7	3.8	53.3	89.3	93.9	100.0
90	N/A	C	3.8	94.7	1.4	S	WT	0.2	6.5	41.2	131.2	185.8	67.4	19.5	5.8	12.3
SORT= 1.11	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.32	WT %	0.0	1.4	8.8	27.9	39.5	14.4	4.2	1.2	2.6
SPLIT WT= 470.4							CUM WT %	0.0	1.4	10.2	38.1	77.7	92.0	96.2	97.4	100.0
95	N/A	C	4.2	95.1	0.7	S	WT	0.1	3.2	23.7	107.7	194.1	73.4	26.1	6.8	11.9
SORT= 1.11	MEDIAN=		2.00	MODE=	2.00	MEAN= 1.50	WT %	0.0	0.7	5.3	24.1	43.4	16.4	5.9	1.5	2.7
SPLIT WT= 447.3							CUM WT %	0.0	0.7	6.0	30.1	73.5	89.9	95.8	97.3	100.0

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WESTINGHOUSE HANFORD OPERATIONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-040 ****

06/22/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<--2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
100	N/A	C	9.1	90.7	0.2	S	WT	0.0	0.9	6.2	4.2	12.9	163.6	133.2	12.3	19.7
SORT= 0.81 MEDIAN= 3.00 MODE= 3.00 MEAN= 2.98							WT %	0.0	0.3	1.8	1.2	3.7	46.4	37.7	3.5	5.6
SPLIT WT= 353.9							CUM WT %	0.0	0.3	2.0	3.2	6.9	53.2	91.0	94.4	100.0
105	N/A	C	3.8	94.4	1.7	S	WT	1.1	7.1	36.9	146.0	194.5	51.6	18.4	6.0	12.2
SORT= 1.01 MEDIAN= 2.00 MODE= 2.00 MEAN= 1.23							WT %	0.2	1.5	7.8	30.8	41.1	10.9	3.9	1.3	2.6
SPLIT WT= 473.7							CUM WT %	0.2	1.7	9.5	40.3	81.4	92.3	96.2	97.4	100.0
110	N/A	C	14.6	85.4	0.0	(m)S	WT	0.0	0.0	1.7	4.0	16.5	141.6	161.2	24.4	31.2
SORT= 0.85 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.13							WT %	0.0	0.0	0.5	1.1	4.3	37.2	42.4	6.4	8.2
SPLIT WT= 381.4							CUM WT %	0.0	0.0	0.5	1.5	5.8	43.1	85.4	91.8	100.0
115	N/A	C	13.3	85.9	0.8	(m)S	WT	0.1	3.1	3.6	4.7	18.5	141.1	177.5	21.6	31.8
SORT= 0.85 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.12							WT %	0.0	0.8	0.9	1.2	4.6	35.1	44.2	5.4	7.9
SPLIT WT= 402.5							CUM WT %	0.0	0.8	1.7	2.9	7.5	42.6	86.7	92.1	100.0
120	N/A	C	9.3	90.3	0.4	S	WT	0.0	1.9	5.8	36.4	187.1	115.0	69.0	18.1	24.4
SORT= 1.20 MEDIAN= 2.00 MODE= 2.00 MEAN= 2.24							WT %	0.0	0.4	1.3	7.9	40.9	25.1	15.1	4.0	5.3
SPLIT WT= 457.9							CUM WT %	0.0	0.4	1.7	9.6	50.5	75.6	90.7	94.7	100.0
125	N/A	C	4.6	95.3	0.0	S	WT	0.0	0.1	0.7	128.3	207.5	41.4	19.4	6.2	13.1
SORT= 0.90 MEDIAN= 2.00 MODE= 2.00 MEAN= 1.40							WT %	0.0	0.0	0.2	30.8	49.8	9.9	4.6	1.5	3.2
SPLIT WT= 416.8							CUM WT %	0.0	0.0	0.2	31.0	80.8	90.7	95.4	96.8	100.0
130	N/A	C	5.4	94.4	0.2	S	WT	0.7	0.2	1.0	73.6	220.1	74.3	35.2	8.1	15.1
SORT= 0.97 MEDIAN= 2.00 MODE= 2.00 MEAN= 1.80							WT %	0.2	0.0	0.2	17.2	51.4	17.4	8.2	1.9	3.5
SPLIT WT= 428.7							CUM WT %	0.2	0.2	0.4	17.6	69.0	86.4	94.6	96.5	100.0
135	N/A	C	6.0	93.7	0.2	S	WT	0.4	0.7	6.9	146.4	184.8	44.4	28.4	9.2	17.1
SORT= 1.11 MEDIAN= 2.00 MODE= 2.00 MEAN= 1.47							WT %	0.1	0.2	1.6	33.4	42.2	10.1	6.5	2.1	3.9
SPLIT WT= 438.7							CUM WT %	0.1	0.2	1.8	35.2	77.4	87.5	94.0	96.1	100.0
140	N/A	C	6.1	92.2	1.6	S	WT	0.6	6.5	11.1	65.9	181.1	116.8	35.1	8.9	18.4
SORT= 1.06 MEDIAN= 2.00 MODE= 2.00 MEAN= 1.83							WT %	0.1	1.5	2.5	14.8	40.8	26.3	7.9	2.0	4.1
SPLIT WT= 445.2							CUM WT %	0.1	1.6	4.1	18.9	59.7	86.0	93.9	95.9	100.0
145	N/A	C	8.9	91.1	0.0	S	WT	0.0	0.2	0.4	12.7	160.9	129.3	57.7	13.7	21.4
SORT= 1.10 MEDIAN= 3.00 MODE= 2.00 MEAN= 2.33							WT %	0.0	0.1	0.1	3.2	40.6	32.6	14.6	3.5	5.4
SPLIT WT= 396.1							CUM WT %	0.0	0.1	0.2	3.4	44.0	76.6	91.2	94.6	100.0
150	N/A	C	6.0	94.0	0.1	S	WT	0.0	0.3	1.3	30.8	248.5	139.7	47.4	12.3	17.3
SORT= 0.89 MEDIAN= 2.00 MODE= 2.00 MEAN= 2.01							WT %	0.0	0.1	0.3	6.2	50.0	28.1	9.5	2.5	3.5
SPLIT WT= 497.3							CUM WT %	0.0	0.1	0.3	6.5	56.5	84.5	94.1	96.5	100.0

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WESTINGHOUSE HANFORD OPERATIONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-040 ****

06/22/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
155	N/A	C	11.8	87.3	0.9	(m)S	WT	0.0	3.1	6.6	17.8	96.8	100.3	69.8	15.7	23.7
SORT= 1.26 MEDIAN= 3.00 MODE= 3.00 MEAN= 2.50							WT %	0.0	0.9	2.0	5.3	29.0	30.1	20.9	4.7	7.1
SPLIT WT= 334.1							CUM WT %	0.0	0.9	2.9	8.2	37.2	67.3	88.2	92.9	100.0
160	N/A	C	25.1	74.8	0.0	mS	WT	0.0	0.2	4.6	14.4	23.0	85.5	158.7	39.9	56.3
SORT= 1.22 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.43							WT %	0.0	0.0	1.2	3.8	6.0	22.4	41.5	10.4	14.7
SPLIT WT= 382.9							CUM WT %	0.0	0.0	1.2	5.0	11.0	33.4	74.9	85.3	100.0
165	N/A	H	35.7	64.2	0.0	mS	WT	0.0	0.2	0.6	9.1	17.8	55.9	242.8	68.6	112.9
SORT= 0.93 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.83							WT %	0.0	0.0	0.1	1.8	3.5	11.0	47.8	13.5	22.2
SPLIT WT= 517.7							CUM WT %	0.0	0.0	0.1	1.9	5.4	16.5	64.3	77.8	100.0
170	N/A	H	43.5	55.8	0.7	mS	WT	0.0	2.9	2.2	4.5	8.8	33.3	197.2	60.5	131.2
SORT= 0.88 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.94							WT %	0.0	0.7	0.5	1.0	2.0	7.6	44.8	13.7	29.8
SPLIT WT= 441.7							CUM WT %	0.0	0.7	1.2	2.2	4.2	11.7	56.5	70.2	100.0
175	N/A	H	39.6	60.2	0.2	mS	WT	0.0	0.6	5.3	7.6	6.8	23.6	159.0	37.2	96.2
SORT= 0.90 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.90							WT %	0.0	0.2	1.6	2.3	2.0	7.0	47.3	11.1	28.6
SPLIT WT= 342.1							CUM WT %	0.0	0.2	1.8	4.0	6.1	13.1	60.4	71.4	100.0
180	N/A	H	64.6	35.2	0.2	sM	WT	0.0	0.7	1.1	0.9	2.8	10.3	97.3	79.3	127.0
SORT= 0.77 MEDIAN= 4.75 MODE= 5.00 MEAN= 4.23							WT %	0.0	0.2	0.4	0.3	0.9	3.2	30.5	24.8	39.8
SPLIT WT= 325.8							CUM WT %	0.0	0.2	0.6	0.9	1.8	5.0	35.5	60.3	100.0
185	N/A	H	67.1	30.9	2.1	sM	WT	0.0	6.8	15.1	10.4	7.0	7.4	60.9	74.0	145.2
SORT= 0.91 MEDIAN= 4.75 MODE= 5.00 MEAN= 4.19							WT %	0.0	2.1	4.6	3.2	2.1	2.3	18.6	22.6	44.4
SPLIT WT= 326.4							CUM WT %	0.0	2.1	6.7	9.9	12.0	14.3	32.9	55.6	100.0
190	N/A	H	31.4	62.5	6.0	(g)mS	WT	6.2	17.9	19.1	22.9	33.3	44.2	131.4	36.7	89.4
SORT= 1.95 MEDIAN= 4.00 MODE= 4.00 MEAN= 3.05							WT %	1.6	4.5	4.8	5.7	8.3	11.0	32.8	9.2	22.3
SPLIT WT= 403.9							CUM WT %	1.6	6.0	10.8	16.5	24.8	35.8	68.6	77.7	100.0
195	N/A	H	21.0	69.9	9.1	(g)mS	WT	7.1	26.7	26.0	37.1	49.7	76.8	70.2	24.8	53.2
SORT= 2.28 MEDIAN= 3.00 MODE= 3.00 MEAN= 2.35							WT %	1.9	7.2	7.0	10.0	13.4	20.7	18.9	6.7	14.3
SPLIT WT= 370.8							CUM WT %	1.9	9.1	16.1	26.1	39.4	60.1	79.0	85.7	100.0
200	N/A	H	20.5	77.3	2.2	mS	WT	1.7	10.9	19.4	51.9	95.6	173.6	99.0	57.6	58.9
SORT= 1.63 MEDIAN= 3.00 MODE= 3.00 MEAN= 2.67							WT %	0.3	1.9	3.4	9.1	16.8	30.5	17.4	10.1	10.4
SPLIT WT= 568.6							CUM WT %	0.3	2.2	5.6	14.8	31.6	62.1	79.5	89.7	100.0
205	N/A	H	21.0	73.6	5.5	(g)mS	WT	3.9	12.7	22.7	30.1	43.6	67.9	57.9	19.3	44.0
SORT= 2.14 MEDIAN= 3.00 MODE= 3.00 MEAN= 2.48							WT %	1.3	4.2	7.5	10.0	14.4	22.5	19.2	6.4	14.6
SPLIT WT= 302.3							CUM WT %	1.3	5.5	13.0	23.0	37.4	59.9	79.1	85.4	100.0

WHC-MR-0208

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WESTINGHOUSE HANFORD OPERATIONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-040 ****

06/22/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
210	N/A	H	72.8	25.4	1.8	sM	WT	5.6	3.3	2.3	27.0	36.9	21.9	35.6	247.0	107.8
SORT= 1.34	MEDIAN=		4.75	MODE=	4.75	MEAN= 3.76	WT %	1.1	0.7	0.5	5.5	7.6	4.5	7.3	50.7	22.1
SPLIT WT= 484.8							CUM WT %	1.1	1.8	2.3	7.8	15.4	19.9	27.2	77.9	100.0
215	N/A	H	77.8	21.9	0.3	sM	WT	0.2	0.7	1.9	2.6	6.0	14.4	41.7	37.6	198.4
SORT= 0.69	MEDIAN=		5.00	MODE=	5.00	MEAN= 4.43	WT %	0.1	0.2	0.6	0.9	2.0	4.8	13.7	12.4	65.4
SPLIT WT= 305.5							CUM WT %	0.1	0.3	0.9	1.8	3.8	8.5	22.2	34.6	100.0
220	N/A	H	58.7	40.8	0.5	sM	WT	0.1	1.8	6.8	5.9	10.4	16.9	104.0	70.2	137.0
SORT= 0.88	MEDIAN=		4.75	MODE=	5.00	MEAN= 4.12	WT %	0.0	0.5	1.9	1.7	2.9	4.8	29.5	19.9	38.8
SPLIT WT= 355.9							CUM WT %	0.0	0.5	2.5	4.1	7.1	11.9	41.3	61.2	100.0
225	N/A	H	47.1	52.7	0.2	mS	WT	0.0	0.7	3.8	6.8	16.7	43.5	98.8	59.8	92.0
SORT= 1.16	MEDIAN=		4.00	MODE=	4.00	MEAN= 3.77	WT %	0.0	0.2	1.2	2.1	5.2	13.5	30.7	18.6	28.6
SPLIT WT= 325.7							CUM WT %	0.0	0.2	1.4	3.5	8.7	22.2	52.9	71.4	100.0
230	N/A	H	18.6	81.4	0.0	(m)S	WT	0.0	0.0	0.0	2.6	38.4	196.1	144.4	34.7	52.4
SORT= 1.04	MEDIAN=		3.00	MODE=	3.00	MEAN= 3.14	WT %	0.0	0.0	0.0	0.6	8.2	41.8	30.8	7.4	11.2
SPLIT WT= 469.3							CUM WT %	0.0	0.0	0.0	0.6	8.8	50.6	81.4	88.8	100.0
235	N/A	H	5.7	34.1	60.2	msG	WT	352.5	51.8	16.7	11.3	38.6	94.6	67.8	14.0	24.1
SORT= N/A	MEDIAN=		-2.00	MODE=	-2.00	MEAN= N/A	WT %	52.5	7.7	2.5	1.7	5.8	14.1	10.1	2.1	3.6
SPLIT WT= 672.4							CUM WT %	52.5	60.2	62.7	64.4	70.1	84.2	94.3	96.4	100.0
240	N/A	H	5.0	79.0	16.0	gS	WT	46.7	49.7	49.4	36.1	288.6	70.7	31.0	9.3	21.1
SORT= 1.75	MEDIAN=		2.00	MODE=	2.00	MEAN= 0.97	WT %	7.7	8.3	8.2	6.0	47.9	11.7	5.1	1.5	3.5
SPLIT WT= 602.3							CUM WT %	7.7	16.0	24.2	30.2	78.1	89.8	95.0	96.5	100.0
245	N/A	H	4.3	34.9	60.8	msG	WT	325.8	119.6	43.2	20.8	95.5	69.4	26.7	8.5	23.1
SORT= N/A	MEDIAN=		-1.00	MODE=	-2.00	MEAN= N/A	WT %	44.5	16.3	5.9	2.8	13.0	9.5	3.6	1.2	3.2
SPLIT WT= 733.3							CUM WT %	44.5	60.8	66.7	69.5	82.6	92.1	95.7	96.9	100.0

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WESTINGHOUSE HANFORD OPE ONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-041 ****

06/21/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
235	N/A	H	5.7	34.1	60.2	msG	WT	352.5	51.8	16.7	11.3	38.6	94.6	67.8	14.0	24.1
SORT=	N/A	MEDIAN=	-2.00	MODE=	-2.00	MEAN= N/A	WT %	52.5	7.7	2.5	1.7	5.8	14.1	10.1	2.1	3.6
SPLIT WT= 672.4							CUM WT %	52.5	60.2	62.7	64.4	70.1	84.2	94.3	96.4	100.0
240	N/A	H	5.0	79.0	16.0	gS	WT	46.7	49.7	49.4	36.1	288.6	70.7	31.0	9.3	21.1
SORT=	1.75	MEDIAN=	2.00	MODE=	2.00	MEAN= 0.97	WT %	7.7	8.3	8.2	6.0	47.9	11.7	5.1	1.5	3.5
SPLIT WT= 602.3							CUM WT %	7.7	16.0	24.2	30.2	78.1	89.8	95.0	96.5	100.0
245	N/A	H	4.3	34.9	60.8	msG	WT	325.8	119.6	43.2	20.8	95.5	69.4	26.7	8.5	23.1
SORT=	N/A	MEDIAN=	-1.00	MODE=	-2.00	MEAN= N/A	WT %	44.5	16.3	5.9	2.8	13.0	9.5	3.6	1.2	3.2
SPLIT WT= 733.3							CUM WT %	44.5	60.8	66.7	69.5	82.6	92.1	95.7	96.9	100.0

WESTINGHOUSE HANFORD OPERATIONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-042 ****

06/21/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
235	N/A	H	7.1	62.3	30.6	msG	WT	135.5	23.3	13.9	13.4	85.3	137.8	73.3	13.3	23.7
SORT=	N/A	MEDIAN=	2.00	MODE=	3.00	MEAN= N/A	WT %	26.1	4.5	2.7	2.6	16.4	26.5	14.1	2.6	4.6
SPLIT WT= 521.0							CUM WT %	26.1	30.6	33.2	35.8	52.2	78.8	92.9	95.4	100.0
240	N/A	H	8.1	62.4	29.5	(m)gS	WT	137.6	73.9	31.7	71.7	206.6	91.8	45.1	16.1	42.0
SORT=	N/A	MEDIAN=	2.00	MODE=	2.00	MEAN= N/A	WT %	19.2	10.3	4.4	10.0	28.8	12.8	6.3	2.2	5.9
SPLIT WT= 725.0							CUM WT %	19.2	29.5	33.9	44.0	72.8	85.6	91.9	94.1	100.0
244	N/A	H	10.1	47.0	42.9	msG	WT	142.9	128.6	73.6	42.3	67.9	70.1	43.7	15.4	48.4
SORT=	N/A	MEDIAN=	0.00	MODE=	-2.00	MEAN= N/A	WT %	22.6	20.3	11.6	6.7	10.7	11.1	6.9	2.4	7.7
SPLIT WT= 632.9							CUM WT %	22.6	42.9	54.5	61.2	71.9	83.0	89.9	92.4	100.0

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WESTINGHOUSE HANFORD OPL .IONS SIEVE ANALYSIS
ROCKSAN REPORT

**** REPORT ON WELL 0299-W22-043 ****

06/21/90

DEPTH	%CACO3	DM	%MUD	%SAND	%GRAVEL	CLASS		FINE PEB (<=-2)	VFINE PEB (-1)	VERY COARS (0)	COARS (1)	MED (2)	FINE (3)	VERY FINE (4)	SILT (4.75)	PAN (>4.75)
235	N/A	H	6.9	92.0	1.1	S	WT	5.4	0.3	0.0	1.6	48.4	337.4	77.7	12.7	22.1
SORT=	0.67	MEDIAN=	3.00	MODE=	3.00	MEAN= 2.69	WT %	1.1	0.1	0.0	0.3	9.6	66.7	15.4	2.5	4.4
SPLIT WT= 506.3							CUM WT %	1.1	1.1	1.1	1.5	11.0	77.8	93.1	95.6	100.0
240	N/A	H	2.3	97.5	0.2	S	WT	0.0	1.1	3.7	54.8	212.5	187.1	48.9	4.6	7.2
SORT=	0.88	MEDIAN=	2.00	MODE=	2.00	MEAN= 1.98	WT %	0.0	0.2	0.7	10.5	40.9	36.0	9.4	0.9	1.4
SPLIT WT= 519.5							CUM WT %	0.0	0.2	0.9	11.5	52.3	88.3	97.7	98.6	100.0
244	N/A	H	2.5	43.8	53.7	sG	WT	238.2	173.3	65.1	42.3	118.6	83.9	26.0	5.5	14.0
SORT=	N/A	MEDIAN=	-1.00	MODE=	-2.00	MEAN= N/A	WT %	31.1	22.6	8.5	5.5	15.5	10.9	3.4	0.7	1.8
SPLIT WT= 765.4							CUM WT %	31.1	53.7	62.1	67.7	83.1	94.1	97.5	98.2	100.0

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RCRA SEDIMENTS CHARACTERIZATION
216-U-12 CRIB
LAST REVISION 10-May-90
J. A. SCHRAMKE

WELL NUMBER	DEPTH (ft)	IC NITRATE (micrograms/g)	IC SULFATE (micrograms/g)	IC FLUORIDE (micrograms/g)	IC CHLORIDE (micrograms/g)	IC PHOSPHATE (micrograms/g)	IC BROMIDE (micrograms/g)
299-W22-40	43						
299-W22-40	64						
299-W22-40	87						
299-W22-40	220						
299-W22-40	240						
299-W22-41	40	1.5	4.8	< 1.0	5.4	< 2.0	< 1.0
299-W22-41	100	1.6	10.1	< 1.0	< 1.0	< 2.0	< 1.0
299-W22-41	160	(d) 33.1	14.1	< 1.0	3.2	< 2.0	< 1.0
299-W22-41	220	27.2	25.7	< 1.0	4.7	< 2.0	< 1.0
299-W22-41	240	(d) 46.3	26.9	< 1.0	(d) 9.9	< 2.0	< 1.0
299-W22-42	40	3.0	14.6	< 1.0	(d) 11.7	< 2.0	< 1.0
299-W22-42	100	3.7	10.5	< 1.0	1.6	< 2.0	< 1.0
299-W22-42	160	(d) 54.1	(d) 33.8	< 1.0	5.8	< 2.0	< 1.0
299-W22-42	220	(d) 43.9	(d) 32.8	< 1.0	6.3	< 2.0	< 1.0
299-W22-42	240	< 1.0	17.6	< 1.0	(d) 10.0	< 2.0	< 1.0
299-W22-43	20						
299-W22-43	140						
299-W22-43	160						
299-W22-43	220						
299-W22-43	240						

LAST REVISION 10-May-90
J. A. SCHRAMKE

WELL NUMBER	DEPTH (ft)	IC NITRITE (micrograms/g)	TOC (micrograms/g)	BETA (PCI/G)	SIGMA BETA (PCI/G)	LO-ALPHA (PCI/G)	SIGMA LO-ALPHA (PCI/G)
299-W22-40	43		17	23.7	4.26	9.00	3.20
299-W22-40	64		< 10	24.4	4.20	5.40	2.72
299-W22-40	87		< 10	24.4	4.30	3.99	2.14
299-W22-40	220		< 10	30.1	4.77	7.18	3.01
299-W22-40	240		11	16.9	3.35	2.67	2.44
299-W22-41	40	< 1.0	< 10	17.1	3.47	± 1.60	2.11
299-W22-41	100	< 1.0	39	20.5	3.81	3.47	2.21
299-W22-41	160	< 1.0	< 10	26.7	4.66	6.75	2.77
299-W22-41	220	1.0	577	25.4	4.46	8.06	3.00
299-W22-41	240	2.7	< 10	19.3	3.72	5.74	2.77
299-W22-42	40	< 1.0	< 10	15.6	3.36	2.12	2.03
299-W22-42	100	< 1.0	< 10	26.1	4.44	3.92	2.48
299-W22-42	160	< 1.0	< 10	28.1	4.72	4.62	2.51
299-W22-42	220	< 1.0	< 10	32.9	5.20	6.26	2.70
299-W22-42	240	< 1.0	< 10	21.2	3.94	1.89	1.80
299-W22-43	20		< 10	21.6	3.86	6.17	2.84
299-W22-43	140		< 10	23.5	4.16	7.06	2.68
299-W22-43	160		< 10	23.5	4.16	2.99	2.41
299-W22-43	220		< 10	26.0	4.49	3.86	2.32
299-W22-43	240		< 10	18.7	3.57	± 0.487	1.61

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LAST REVISION 10-May-90
J. A. SCHRAMKE

WELL NUMBER	DEPTH (ft)	K-40 (PCI/G)	SIGMA K-40 (PCI/G)	CS-137DA (PCI/G)	SIGMA CS-137DA (PCI/G)	PB-212 (PCI/G)	SIGMA PB-212 (PCI/G)
299-W22-40	43	18.7	2.31	± -0.0210	0.0340	1.54	0.184
299-W22-40	64	22.1	2.65	± 0.00105	0.0388	1.02	0.140
299-W22-40	87	15.5	1.93	± 0.0203	0.0297	1.01	0.127
299-W22-40	220	22.7	2.71	± 0.0176	0.0397	1.63	0.194
299-W22-40	240	16.4	1.90	± -0.0300	0.0254	0.666	0.0892
299-W22-41	40	10.1	1.14	± -0.0088	0.0138	0.473	0.0553
299-W22-41	100	17.3	1.85	± -0.0122	0.0156	0.693	0.0782
299-W22-41	160	18.8	2.07	± -0.00466	0.0219	1.17	0.129
299-W22-41	220	23.4	2.54	± 0.0240	0.0251	1.67	0.183
299-W22-41	240	14.2	1.60	± -0.0244	0.0184	0.777	0.089
299-W22-42	40	12.8	1.43	0.0165	0.0143	0.519	0.0627
299-W22-42	100	22.6	2.47	± .00624	0.0244	1.36	0.150
299-W22-42	160	22.7	2.47	± 0.06	0.0251	1.24	0.140
299-W22-42	220	24.2	2.58	± 0.00349	0.0279	1.57	0.172
299-W22-42	240	16.5	1.82	± 0.0127	0.0184	0.787	0.0927
299-W22-43	20	18.9	2.27	± -0.00183	0.0311	1.21	0.149
299-W22-43	140	24.5	2.83	± -0.0394	0.0393	1.35	0.151
299-W22-43	160	18.8	2.24	± 0.00879	0.0320	1.14	0.140
299-W22-43	220	16.3	2.15	± 0.00369	0.0256	1.16	0.131
299-W22-43	240	22.4	2.57	± 0.0130	0.0299	0.323	0.114

LAST REVISION 10-May-90
J. A. SCHRAMKE

WELL NUMBER	DEPTH (ft)	PB-214 (PCI/G)	SIGMA PB-214 (PCI/G)	PERCENT MOISTURE	PERCENT PASSED 2 MM SCREEN	VOA SEDIMENT WT (G)	VOA CHCL3 (ug/G)
299-W22-40	43	1.15	0.170			0.99	< 30
299-W22-40	64	0.999	0.149			1.14	< 26
299-W22-40	87	0.736	0.117			0.98	< 34
299-W22-40	220	1.01	0.157			(b)	4.2 ug/ml
299-W22-40	240	0.484	0.0855			(b)	1.2 ug/ml
299-W22-41	40	0.419	0.0560	3.3	95.9	(a)	
299-W22-41	100	0.509	0.0671	3.4	87.9	7.22	< 4
299-W22-41	160	0.882	0.113	6.8	58.9	6.30	< 4
299-W22-41	220	0.949	0.126	22.2	70.5	(b)	1.0 ug/ml
299-W22-41	240	0.474	0.0713	20.6	46.3	(b)	1.0 ug/ml
299-W22-42	40	0.414	0.059	4.8	91.2	1.37	< 22
299-W22-42	100	1.07	0.136	2.1	97.6	1.89	< 16
299-W22-42	160	0.933	0.122	22.6	58.1	5.83	< 5
299-W22-42	220	0.917	0.123	34.7	73.4	(b)	1.0 ug/ml
299-W22-42	240	0.559	0.081	12.2	53.7	(b)	(c)
299-W22-43	20	1.01	0.147			1.77	< 17
299-W22-43	140	1.15	0.161			7.39	< 4
299-W22-43	160	0.853	0.129			(b)	(c)
299-W22-43	220	0.757	0.113			(b)	1.2 ug/ml
299-W22-43	240	0.593	0.110			(b)	1.4 ug/ml

LAST REVISION 10-May-90
J. A. SCHRAMKE

WELL NUMBER	DEPTH (ft)	VOA CCl4 (ng/g)	VOA TCE (ng/g)	VOA PCE (ng/g)	VOA 1,1,1-TCA (ng/g)	VOA TOLUENE (ng/g)	VOA m- and p-XYLENE (ng/g)
299-W22-40	43	< 1.0	< 10	< 2.5	< 11	< 51	< 30
299-W22-40	64	< 0.8	< 9	< 2.2	< 10	< 44	< 26
299-W22-40	87	< 1.0	< 11	< 2.8	< 12	< 57	< 33
299-W22-40	220	0.01 ng/ml			(c)	0.5 ng/ml	0.7 ng/ml
299-W22-40	240	0.04 ng/ml	(c)	(c)	(c)	0.9 ng/ml	0.4 ng/ml
299-W22-41	40						
299-W22-41	100	< 0.2	< 2.1	< 0.4	< 2	< 7	< 4
299-W22-41	160	< 0.2	< 2	< 0.4	< 2	< 7	< 4
299-W22-41	220	(c)	(c)	(c)	(c)	(c)	(c)
299-W22-41	240	(c)	(c)	(c)	(c)	0.4 ng/ml	0.2 ng/ml
299-W22-42	40	< 0.7	< 7	< 1.8	< 8	< 37	< 29
299-W22-42	100	< 0.5	< 6	< 1.3	< 6	< 27	< 16
299-W22-42	160	< 0.2	< 2	< 0.5	< 2	< 9	<5
299-W22-42	220	(c)	(c)	(c)	(c)	2.0 ng/ml	< 0.1 ng/ml
299-W22-42	240	(c)	(c)	(c)	(c)	1.0 ng/ml	(c)
299-W22-43	20	< 0.5	< 6	< 1.4	< 6	< 29	< 17
299-W22-43	140	< 0.2	< 2	< 0.4	< 2	< 7	< 4
299-W22-43	160	(c)	(c)	(c)	(c)	< 0.1 ng/ml	(c)
299-W22-43	220	0.13 ng/ml	0.1 ng/ml	(c)	(c)	0.6 ng/ml	(c)
299-W22-43	240	0.28 ng/ml	0.04 ng/ml	< 0.1 ng/ml	(c)	< 0.1 ng/ml	(c)

LAST REVISION 10-May-90
J. A. SCHRAMKE

WELL NUMBER	DEPTH (ft)	VOA o-XYLENE (ng/g)	VOA BENZENE (ng/g)	VOA methylisobutyl-ketone (ng/g)	VOA ETHYL BENZENE (ng/g)	VOA bromodichloro-methane (ng/g)
299-W22-40	43	< 58				
299-W22-40	64	< 50				
299-W22-40	87	< 65				
299-W22-40	220	0.7 ng/ml		1.1 ng/ml	0.3 ng/ml	0.2 ng/ml
299-W22-40	240	0.3 ng/ml				
299-W22-41	40					
299-W22-41	100	< 8				
299-W22-41	160	< 8				
299-W22-41	220	(c)				
299-W22-41	240	0.2 ng/ml	0.4 ng/ml			
299-W22-42	40	< 42				
299-W22-42	100	< 30				
299-W22-42	160	< 10				
299-W22-42	220	0.2 ng/ml				
299-W22-42	240	(c)				
299-W22-43	20	< 32				
299-W22-43	140	< 8				
299-W22-43	160	(c)		0.4 ng/ml		
299-W22-43	220	(c)		0.3 ng/ml		
299-W22-43	240	(c)				

9413223.0470

‡ Denotes a result less than the overall error

(a) Analyst's note: Samples contained pentane instead of purge and trap grade methanol so volatile organic analysis could not be accomplished in these samples.

(b) Analyst's note: In most cases this sample contained 2 to 5 ml of H2O with the remaining, sediment in 40 ml VOA vials. Values are in ng/ml, background subtraction is not necessary and detection limits are improved.

(c) not detectable

(d) Analyst's note: Analysis date different

9413223.0471

Battelle
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington 99352

CHAIN OF CUSTODY

031290A
216U12

Company Contact: JANET SCHRAMKE Telephone: 376-2136

Samples Collected by: PNL Date: Time:
see COC #'s 020990 U-12 W22-41, 021490 216-U-12 W22-41, 022290 U12 W22-41, 030790 216U12 W22-41, 021590-W22-42, 050290 216U12 W22-42, 030190 216U12 W22,42

Sample Location: 216-U-12 CRIB WELLS 299-W22-41 & 299-W22-42

Ice Chest No.: Field Logbook Page No.: N/A

Remarks: VOA analyses

Method of Shipment: GOV'T VEHICLE

Sample Identification

WELL 299-W22-41:	WELL 299-W22-42:
40' - (2) 40 ML GLASS AMBER	40' - (2) 40 ML GLASS AMBER
100' - (2) 40 ML GLASS AMBER	100' - (2) 40 ML GLASS AMBER
160' - (2) 40 ML GLASS AMBER	160' - (2) 40 ML GLASS AMBER
220' - (2) 40 ML GLASS AMBER	220' - (2) 40 ML GLASS AMBER
240' - (2) 40 ML GLASS AMBER	240' - (2) 40 ML GLASS AMBER

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
Janet A Schramke	C. Vunder	3/12/90 1135
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time

BC-1200-345 (7-85)

Battelle
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington 99352

CHAIN OF CUSTODY

032290A

Company Contact: JANET SCHRAMKE Telephone: 376-2136

REF COFC #S 021590-W2242; 022190-W2242; 022790 216 U12 W22 030190 216 U12 W2242; 030310 216 U12 W2242

Samples Collected by: SHANNON GOODWIN Date: Time:

Sample Location: 216 U12 CRIB, WELL 299-W22-42

Ice Chest No.: PNL Field Logbook Page No.:

Remarks: CHARGE ANALYTICAL FEES TO WP M46720; SUBMIT REPORT TO JA SCHRAMKE K6-81; PNL. DO NOT ENTER ON MAGNETIC TAPE. CALL J.A. SCHRAMKE TO COLLECT SAMPLE RESIDUALS. NEED MINIMUM OF 5 GRAMS

Method of Shipment: GOV'T VEHICLE

Sample Identification

299-W22-42-40' (2) 300 mL glass	111, 112, 998, 742, C69
299-W22-42-100' (2) 300 mL glass	111, 112, 998, 742, C69
299-W22-42-160' (2) 250 mL glass	111, 112, 998, 742, C69
299-W22-42-220' (2) 250 mL glass	111, 112, 998, 742, C69
299-W22-42-240' (2) 250 mL glass	111, 112, 998, 742, C69

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
[signature]	Janet A Schramke	3/22/90 1631
Janet A Schramke	[signature]	3-23-90 14:10

BC-1200-345 (7-85)

Battelle
Pacific Northwest Laboratories
P.O. Box 999
Richland, Washington 99352

CHAIN OF CUSTODY

0322903

Company Contact: JANET SCHRAMKE Telephone: 376-2136

REF CCFC #S 0209C0412 W2241, 0214C0216412 W2241, 0222C0412 W2241, 0227C0216412 W2241, 0228C0216412 W2241

Samples Collected by: SHANNON GOODWIN Date: Time:

Sample Location: 216-U12 CRIB, WELL 299-W22-41

Ice Chest No.: PNL Field Logbook Page No.:

Remarks: CHARGE ANALYTICAL FEES TO WP M46720; SUBMIT REPORT TO J.A. SCHRAMKE, K6-81, PNL; DO NOT ENTER ON MAGNETIC TAPE, CALL J.A. SCHRAMKE TO COLLECT SAMPLE RESIDUALS. NEED MINIMUM OF 5 GRAMS.

Method of Shipment: GOVT VEHICLE

gs 3/23/90

Sample Identification	
299-W22-41-40' (2) 250mL GLASS	111, 112, 998, 742, C69
299-W22-41-100' (2) 250mL GLASS	111, 112, 998, 742, C69
299-W22-41-160' (2) 250mL GLASS	111, 112, 998, 742, C69
299-W22-41-220' (2) 250 mL GLASS	111, 112, 998, 742, C69
299-W22-41-240' (2) 250 mL GLASS	111, 112, 998, 742, C69

CHAIN OF POSSESSION

Relinquished by:	Received by:	Date/Time:
[illegible]	Janet A Schramke	3/22/90 1630
Janet A Schramke	[illegible]	3-23-90 14:10

BC-1200-345 (7-85)

Battelle
Pacific Northwest Laboratories
Richland, Washington

CHAIN OF CUSTODY

032990A

Company Contact: JANET SCHRAMKE Telephone: 376-2136

Samples Collected by: SHANNON GOODWIN REF COFC #'S 030590-W22-40; 030690-W22-40; 030790-W22-40; 031640-W22-40; 031990-W22-40 Date: _____ Time: _____

Sample Location: 216-U-12 CRIB, WELL 299-W22-40

Ice Chest No.: PNL Field Logbook Page No.: _____

Remarks: CHARGE ANALYTICAL FEES TO WP M46720; SUBMIT REPORT TO JA SCHRAMKE KE-81 PNL. DO NOT ENTER ON MAGNETIC TAPE. CALL JA SCHRAMKE TO COLLECT SAMPLE RESIDUALS. NEED MINIMUM OF 5 GRAMS.

Method of Shipment: GOV'T VEHICLE

Sample Identification

299-W22-40-43' (2) 250 ML GLASS	111 112 998 742 C69
299-W22-40-64' (2) 250 ML GLASS	111 112 998 742 C69
299-W22-40-87' (2) 250 ML GLASS	111 112 998 742 C69
299-W22-40-220' (2) 250 ML GLASS	111 112 998 742 C69
299-W22-40-240' (2) 250 ML GLASS	111 112 998 742 C69

Chain of Possession

Relinquished by:	Received by:	Date/Time:
[signature]	[signature]	3/29/90 9:45
[signature]	[signature] UST	3-29-90 1000

PNL-MA-567, GC-1

BC-1200-345 (11/89)

Battelle
Pacific Northwest Laboratories
Richland, Washington

CHAIN OF CUSTODY

032990 B

Company Contact: JANET SCHRAMKE Telephone: 376-2136

Samples Collected by: SHANNON GOODWIN REF CLOC #'S: 022690-W22-43, 030790-W22-43; 030890-W22-43; 031240-W22-43; 031950-W22-43 Date: _____ Time: _____

Sample Location: 216-U-12 CRIB; WELL 299-W22-43

Ice Chest No.: PNL Field Logbook Page No.: _____

Remarks: CHARGE ANALYTIC FEES TO WP M46720; SUBMIT REPORT TO JA SCHRAMKE 1K6-51 PNL. DO NOT ENTER ON MAGNETIC TAPE. CALL JA SCHRAMKE TO COLLECT SAMPLE RESIDUALS NEED MINIMUM OF 5 GRAMS.

Method of Shipment: GOV'T VEHICLE

Sample Identification

299-W22-43-20' (2) 300 ML GLASS	111, 112 996, 742, C69
299-W22-43-140' (2) 250 ML GLASS	111, 112, 996, 742, C69
299-W22-43-160' (2) 250 ML GLASS	111, 112, 996, 742, C69
299-W22-43-220' (2) 250 ML GLASS	111, 112, 996, 742, C69
299-W22-43-240' (2) 250 ML GLASS	111, 112, 996, 742, C69

Chain of Possession

Relinquished by:	Received by:	Date/Time:
[signature]	Janet A Schramke	3/29/90 9:45
Janet A Schramke	Sherrie West	3-29-90 1000

PNL-MA-567, GC-1

BC-1200-345 (11/89)

Battelle
Pacific Northwest Laboratories
Richland, Washington

CHAIN OF CUSTODY

032990 C

Company Contact: JANET SCHRAMKE Telephone: 376-2136

Samples Collected by: S. M. GOODWIN REF. CW C #'S 030590-W22-40; 030690-W22-40; 030790-W22-40; 031690-W22-40; 031990-W22-40 Date: Time:

Sample Location: 200 WEST, 216-V-12 CRIB, WELL 299-W22-40

Ice Chest No.: Field Logbook Page No.:

Remarks: VOA ANALYSES

Method of Shipment: GOV'T VEHICLE

Sample Identification

299-W22-40-43' (2) 40 ML AMBER GLASS
299-W22-40-64' (2) 40 ML AMBER GLASS
299-W22-40-87' (2) 40 ML AMBER GLASS
299-W22-40-220' (2) 40 ML AMBER GLASS
299-W22-40-240' (2) 40 ML AMBER GLASS

Chain of Possession

Relinquished by:	Received by:	Date/Time:
[signature]	[signature]	3/29/90 0945
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

PNL-MA-567, GC-1

BC-1200-345 (11/89)

9413223.0477

Battelle
Pacific Northwest Laboratories
Richland, Washington

CHAIN OF CUSTODY

032490D

Company Contact: JANET SCHRAMKE Telephone: 376-2136

Samples Collected by: SHANNON GOODWIN REF. COC #'S. 022690-W22-43; 030790-W22-43; 030590-W22-43; 031290-W22-43; 031495-W22-43 Date: Time:

Sample Location: 216-U-12 CRIB, WELL 299-W22-43

Ice Chest No.: PNL Field Logbook Page No.:

Remarks: VOA ANALYSES

Method of Shipment: GOV'T VEHICLE

Sample Identification

299-W22-43: 20' (2) 40 ML AMBER GLASS
299-W22-43 - 140' (2) 40 ML AMBER GLASS
299-W22-43 - 160' (2) 40 ML AMBER GLASS
299-W22-43 - 220' (2) 40 ML AMBER GLASS
299-W22-43 - 240' (2) 40 ML AMBER GLASS

Chain of Possession

Relinquished by:	Received by:	Date/Time:
[signature]	[signature]	3/29/90 0945
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:
Relinquished by:	Received by:	Date/Time:

PNL-MA-567, GC-1

BC-1200-345 (11/89)

9113223.0478

9413223.0479

APPENDIX C

NONCONFORMANCE/SURVEILLANCE REPORTS, DEFICIENCY REPORTS, AND DESIGN FIELD CHANGES

9413223.0480

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APPENDIX C

NONCONFORMANCE/SURVEILLANCE REPORTS, DEFICIENCY REPORTS, AND DESIGN FIELD CHANGES

No nonconformance/surveillance reports, deficiency reports, or field design changes are currently on file. A deficiency report is currently being generated for well 299-W22-41 addressing the lack of gamma ray logging inside the 10-in.-diameter carbon steel casing prior to installation of the 8-in.-diameter carbon steel casing. This report will be distributed to the appropriate personnel upon completion.

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9413223.0482

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APPENDIX D

WELL-DEVELOPMENT LOGS, PUMP-INSTALLATION LOGS, AND SUMMARY OF WATER ADDED AND REMOVED FROM BOREHOLES

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WELL DEVELOPMENT DATA FOR 216-U-12 CRIB

WELL NUMBER	DRILLED DEPTH (FT)	DEPTH TO WATER (FT)	TOTAL DRILL WATER ADDED (GAL)	WATER ADDED BELOW WATER TABLE (GAL)	END DEVELOPMENT (DATE)	VOLUME BAILED (GAL)(a)	VOLUME PURGED (GAL)	FINAL TURBIDITY (NTU)
299-W22-40	245.0	228.07	515	255	4/24/90	105	860	0.29
299-W22-41	263.8	239.70	315	150	4/25/90	400	600	1.8
299-W22-42	267.5	245.85	345	100	5/04/90	100	850	4.7
299-W22-43	260.02	232.9	430	240	4/25/90	50	920	0.32

(a) Volume bailed is amount removed to settle the sand pack during completion

9413223.0085

9413223.0486

1.62

DRILL LOG	By Borghese	Rig Pump Rig	Well Number 299-W22-40 (U12)	Computer Number N/A	Project or Work Order No. W-017
	Date 4/24/90		Depth N/A To		Subcontract No.

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				on site, cap welded on,	1100	
				Mel broke weld		
				D/W 228.0 + 1.35' = 229.35 top of 4"		steel tape L500-16
				D/B 242.65 + 2.65 = 245.30 top of 4"		
				stand pipe = .8' above land surface		
				steam cleaning of pump + riser pipe		
				witnessed by SP. Airhart 4/24/90		
				came to site wrapped in plastic		
				pump S/N 188-20-24175		
				pump + pipe length 5.2'		
				intake 1.3' from bottom of pump		
				driller, Mel Thoresen installing pump and	1117	
				riser pipe, wearing clean cotton gloves		
				pump wire attached to column w/ plastic ties		
				tagged bottom		
				pump bottom is 1.25 - .5 = .75 off bottom of well	1150	
				well covered w/ plastic		

REMARKS:

Jane V. Borghese

92-MM-567 GC-7 Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

WHC-MR-0208

72

9413223.0487

2 of 6

DRILL LOG	By: Borghese	Rig: Pump Rig	Well Number: 299-W22-40 (1412)	Computer Number: N/A	Project or Work Order No.: W-017
	Date: 4/24/90		Depth: N/A To		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				broke for lunch	1200	
				Mel thinks the pump is ~10'	1230	
				from bottom - must have tagged		
				the point where the screens are		
				connected - will try to see		
				if pump can be lowered		
				pump hanging up at about 10 and		
				5' from bottom		
				Mel is pulling pump -		
				pump guard is just slightly skewed -	1350	
				remove guard		
				replaced pump in well - no catch		
				Bottom of pump at 9' from bot of well	1420	
				water truck moved to site contains		
				about 1600 gals.		
				well covered with plastic	1425	
				Left site	1430	

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

WHC-MR-0208

23

9413223.0488

DAILY BOREHOLE /WELL COMPLETIONLOG

Boring or Well Number _____ Sheet ____ of ____

Location 200 E Decontamination Pad Project W-017

Logged by STEVE AIRHART (Print) S.P.A. (Sign) Date 4-24-90

Reviewed by _____ (Print) _____ (Sign) Date _____

Lithograph Classification Scheme N/A Procedure WHC-S-014 Rev No. 4

Measuring Equipment N/A

Drilling Contractor KEH

Cleaner Driller Mel Thoresen

Rig/Equipment steam Cleaner

Time	Casing/Screen					Annular Fill			Over-lap	Comments
	Type	Diameter	Length	Stickup	Depth	Type	Quantity	Depth		
										The following items were steam-
										cleaned in accordance w/
										WHC-S-014 Rev. 4 Section 7.5
									—	1" diameter riser pipe
									—	2 4½ Hp submersible pumps
										& LB7-11-1965 + FBB-20-2495
									—	3 slugs
									—	1 3" dia. dart bailer
										S.P.A. 4/24/90 0830

74

WHC-MR-0208

A-1 (10/89)

WELL DEVELOPMENT LOG

Well Number 299-W22-40
Location W12 Crib 200W
Procedure PNL-MA-567, GC-7, Rev. 0

Start Date/Time 4/25/90 0910
End Date/Time 4/25/90 1103
Page 1 of 1

Well Depth 245.30' Pump Depth (Intake) 243.25' Initial Water Level 229.35

Date	Time	Flow Rate	Turbidity	Person Meas.	Person Rec.	Comments
4/25	0918	3.2		IAM	IPM	
	0920		3.3			Standardized turbidimeter on 10 range using 8.0 standard
	0933		1.0			Restandardized 10 range
	0938					Increased flowrate - wide open
	0939	7.9				
	0942		0.59			Standardized 1 range using 0.56 NTU standard
	1002	7.9				
	1012		0.27			
	1040	9.4				10 PSI drop on pressure gauge when switching from tanker to drum
	1058	9.4				
	1100		0.29			Restandardized 1 range using .56 NTU standard

Note: Unless otherwise noted, the following units are assumed:
Flow rate - gpm
Turbidity - NTU
Water Level - ft

Equipment:
Make: Hach Turbidimeter
Model: 16800
Serial #: 880703336

4/25/90

PNL-MA-567, GC-7, Rev. 0

9413223.0490

DRILL LOG	By: JP McDonald	Rig: None	Well Number: 299-W22-40	Computer Number: N/A	Project or Work Order No.: W-417, U-12
	Date: 4/25/90		Depth: Development To		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived at well. Tanker truck is here,	0835	
				pump installed yesterday.		
				Driller arrived.	0845	
				Pump on, began development	0910	
				Pump off, development complete. Approximately	1103	
				820 gallons pumped, final NTU was 0.29.		
				Moving to W22-43.	1115	

REMARKS: 4/25/90 . PNL-MA-567, GC-7, Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standard Water

WHC-MR-0208

76

9413223.0491

1 of 3

DRILL LOG	By Borghese	Rig Pump Rig	Well Number 299-W22-41	Computer Number N/A	Project or Work Order No. W-017
	Date 4/24/90		Depth N/A To		Subcontract No.

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived on site, well capped - capped not broke weld	930	driller Nel Thorsen
				standpipe height: 1.05' from Land surface		
				D/W 228 + 1.26 = 229.26 Top of 4"	940	steel tape L500-16
				D/B 243.34 + 2.65 = ~~4.9~~ 245.99 Top of 4"		
				187-11-1965 - pump and riser pipe steam cleaning witnessed		
				by S.P. Aichart 4-24-90, arrived on site		
				wrapped in plastic,		
				driller installing pump and riser pump wiping cotton gloves		
				pump 4.1 ft opening 1.45' from bottom		
				of pump		
				pump wire attached to column w/ plastic ties		
				tag bottom of well		
				bottom of pump 1.15' from bottom of well	1040	
				water truck arrived (contains ~1000 gals)	1120	
				waiting for generator		

REMARKS:

Jon V. Borghese 4/24/90

PNL-MA-567 GC-7 Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse

WHC-MR-0208

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9413223.0492 ~~2of2~~ 2of3

DRILL LOG

By	Rig	Well Number	Computer Number	Project or Work Order No.
Borghese	Pump Rig	299-W22-41	N/A	W-017
Date 4/24/90		Depth N/A To		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				generator arrived	1250	
				pump on	1255	
				press 7100 flowrate measured by bucket	1300	5gal/1:15 (min:sec) 4gpm
				and stopwatch,		
				flowrate	1310	5gal/1:11 4.23
				flowrate	1330	5gal/1:11 4.~~30~~ 23
				starting to increase rate	1333	
				press ~72, reduced to ~63 when measuring	1335	5gal/32sec 9.4 ~~3~~ gpm
					1345	5gal/34sec 8.8
				press ~60	1355	5gal/25sec 12
				" drops to ~50 when measuring	1408	5gal/25sec 12
				since lower Press reading is higher flow		
				and pressure drops when measuring at well head		
				w/ a recording is higher than actual rate		
				pumped just a bit longer so that necessary		
				volume is removed.		
				pump off	1415	
				volume pumped ~600 gals (reported to KEH)		

REMARKS:

Jane V. Borghese 4/24/90

PDL-MR-567 GC-7 Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

WHC-MR-0208

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9413223.0493

3-6

DRILL LOG	By Borshear	Rig Pump Rig	Well Number 299-22-41	Computer Number N/A	Project or Work Order No. W-017
	Date 4/24/90		Depth N/A To		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				starting to remove pump and	1430	
				main pipe		
				pump and pipe removed	1500	
				cap welded on	1515	
				left site for day	1520	

REMARKS:

Tom V. Borshear 4/24/90

PNL-MA-567 GC-7 Rev 0

D - Drive Barrel H - Hard Tool L - Large M - Medium

WHC-MR-0208

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WELL DEVELOPMENT LOG

Well Number 299-W22-41
Location U-12
Procedure PNL-MA-567, GC-7, Rev. 0

Start Date/Time 4/24/90 1255
End Date/Time 4/24/90 1415
Page 1 of 1

Well Depth 255.44 Pump Depth (Intake) 244.84 Initial Water Level 229.26
(water level depths from top of 4" casing)

Date	Time	Flow Rate	Turbidity	Person Meas.	Person Rec.	Comments
4/24				JVB	STR	standardized turbidimeter 0-50 NTU range
	1307 ~~15~~	4	6			
	1310	4.23				Standardized 0-8 NTU range
	1315		8.5			There's a few black droplets in sample line (some float, some cling to side of tube)
	1325	4.23	3.1			very few droplets
	1333					starting to increase flowrate
	1336	9.4 ~~13~~	1.6			
	1345	8.8				
	1355	12				increasing flowrate
	1400	12	1.8			

Note: Unless otherwise noted, the following units are assumed:
Flow rate - gpm
Turbidity - NTU
Water Level - ft

Equipment:
Make: Hach
Model: 16800
Serial #: 880703336

Jane V. Bayless 4/27/90

9413225.0494

9413223.0495

DAILY BOREHOLE /WELL COMPLETIONLOG

Boring or Well Number _____ Sheet ____ of ____

Location 200 E Decontamination Pad Project W-017

Logged by STEVE AIRHART (Print) S.P.A. (Sign) Date 4-24-90

Reviewed by _____ (Print) _____ (Sign) Date _____

Lithograph Classification Scheme N/A Procedure WHC-S-014 Rev No. 4

Measuring Equipment N/A

Drilling Contractor KEH

Cleaner Driller Mel Thoressen

Rig/Equipment steam cleaner

Time	Casing/Screen Type	Diameter	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over-lap	Comments
										The following items were steam-
										cleaned in accordance w/
										WHC-S-014 Rev. 4 Section 7.5
									—	1" diameter riser pipe
									—	2 4½ Hp submersible pumps
										#'s LB7-11-1965 & FBA-20-2495
									—	3 slugs
									—	1 3" dia. dart bailer
										S.P.A. 4/24/90 0830

A-1600-004 (10/89)

WHC-MR-0208

9413223.0496

1 of 1

DRILL LOG	By: Borghese	Rig: Steam cleaning	Well Number:	Computer Number:	Project or Work Order No.: W-017
	Date: 4/30/1990		Depth: N/A To	N/A	Subcontract No.:

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Drilled at decon area	1230	
				steam cleaned shut suction	1330	
				of pump rain pipe, oil filter		
				Temp 180° having pressure		
				problems - mechanic working		
				of air cleaner		
				- Pump still needs to be cleaned		
				Left decon area	1415	
				Jane V Borghese		
				4/30/90		

REMARKS:

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 86)

WHC-MR-0208

28

9413223.0497

1-6

DRILL LOG	By Borghese	Rig Pump Rig Mel Thorsen	Well Number 299-W22-42	Computer Number	Project or Work Order No. W-017-
	Date 5-3-90		Depth N/A To	N/A	Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Well Development		
				well was capped and locked	11:40	
				upon arrival		
				Pump S/N F88-20-2495, steam		
				cleaning witnessed by L.D. Walker		
				of WHC, above 180°F on 5/3/90		
				Pump brought to site wrapped		
				in plastic — w/ L.D. Walker		
				signature on bag.		
				STANDPIPE 28'		
				pad .5'		
				D/W 227.98 on 4/30/90 from land surface		
				D/B 243.55 " " " " "		
				D/W 231.46 " " " from Top of 6" casing		
				D/B 247.03 " " " " " "		

REMARKS:

5/3/90 Jane V Borghese

4/30/90 JVB PDL-MA-567, GL 7 Rev 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

WHC-MR-0208

83

9413223.0498

2 of 2

DRILL LOG	By Borghese	Rig Pump Rig	Well Number 299-W22-42	Computer Number N/A	Project or Work Order No. W-017
	Date 5-3/90		Depth N/A To		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				driller wore clean cotton gloves during well pipe - pump installation		
				pump wire attached to column of well pipe w/ teflon ties.		
				Pump intake 1.3' from pump bottom pump bottom .7' from well bottom		
				Pump in place	1330	
				will not continuously pump, control borehole Mel, lifting it up + down a bit to release sand (if it's there)		
				will attempt to restart		
				see well devel. log		

REMARKS:

~~PVL MA 567 GC~~

Jan Borghese 5/3/90

PVL MA 567 G Rev 0

D - Drive Bailer H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

WHC-MR-0208

WELL DEVELOPMENT LOG

Well Number 299-W22-42
Location H-12, 200 W
Procedure PNL-MA-567, GC-7, Rev. 0

Start Date/Time 5/3/90 1405
End Date/Time 5/3/90 1455
Page 1 of 1

Well Depth 247' from top of 6" casing Pump Depth (Intake) ~245' from top of 6" casing Initial Water Level 231.46" from top of 6" casing

Date	Time	Flow Rate	Turbidity	Person Meas.	Person Rec.	Comments
5/3	1410	5		JVB	JVB	standardized meter to 5-90
	1413		85			
	1420		16			
	1428		5			
	1430					Standardizing meter to C.V-8.6
			5.2			reading of 1428 sample
	1436		2.3			
	1443	12.5				Increased flowrate
	1448		4.0			
	1450	18.7				Increased flowrate
	1455					pump off
	1500					well sealed w/plastic
						will continue on 5/4/90
	1505					left site

Note: Unless otherwise noted, the following units are assumed:
Flow rate - gpm
Turbidity - NTU
Water Level - ft

Equipment:
Make: HACH
Model: 16800
Serial #: 880903409

Jane V Borghese
5/3/90

Aquifer Test Data

page 1 of 1

Data for Well 299-W22-42
Pumping Well
Observation Wells N/A

Location U-12, 200W
Type of Aquifer Test Well development
How Q Measured 5gal bucket, stopwatch
How W.L.'s Measured N/A
Rad./Dist. of From Pumping Well 2"
Meas. Point for W.L.'s N/A
Elevation of Meas. Point N/A
standpipe 2.98'

Depth of Pump/Airpipe N245'
Pump On: date 5/3/90 time 1405
Pump Off: date 5/3/90 time 1455
Duration of Aquifer Test

Time t = ____ at t' = 0					Water Level Data Static Water Level ____					Discharge		Recorded By	Comments
Day	Clock Time	t	t'	t/t'	Reading	Conversions or Corrections	Water Level	s or s'		Read-ing	Q		
5/3	1410										5	JVB	5gal / 1.02
	1443										12.5		5gal / 2.4 sec
	1450										18.7		2.5gal / 12.8 sec
	1455												pump off

J.V. Bergstrom 5/3/90

DNL MA-567 GC-7 Rev 0

0050.3223.146

Aquifer Test Data

page 1 of 1

Data for Well 299-W22-42

Pumping Well

Observation Wells N/A

Location C112 200W

Type of Aquifer Test Well development

How Q Measured bucket, stopwatch

How W.L.'s Measured N/A

Rad./Dist. of/From Pumping Well N/A

Meas. Point for W.L.'s

Elevation of Meas. Point

Depth of Pump/Airpipe 2245'

Pump On: date see DAY1 time

Pump Off: date time N/A

Duration of Aquifer Test N/A

Time t = ____ at t' = 0					Water Level Data Static Water Level 231.46'					Discharge		Recorded By	Comments
Day	Clock Time	t	t'	t/t'	Reading	Conversions or Corrections	Water Level	s or s'		Read-ing	Q		
	1128					DAY 2		of	well			development	
5/4	~~1130~~	1128	JVB										Pump on
	1130										16.7		5gal / 18sec
	1140										16.7		5gal / 18sec
	~~1150~~	JVB											
	1150												pump off

Sam L Dorian 5/4/91

Rad-1214 5027 C-C-7 K-C

9113223.0501

Day 2

WELL DEVELOPMENT LOG

Well Number 299-W22-92
Location A-12 200W
Procedure PNL-MA-567, GC-7, Rev. 0

Start Date/Time 5/4/90 1128
End Date/Time 5/4/90 1150
Page 1 of 1

Well Depth 247' Pump Depth (Intake) ~245' Initial Water Level 231.46'
depths from top of 6" casing

Date	Time	Flow Rate	Turbidity	Person Meas.	Person Rec.	Comments
				JVB	JOB	Continuation of development
						started on 5/3/90
1130		16.7				standardized meter to 0-8.6 NTU
1135			>8.6			
1140						standardized 0-90 NTU
1141			12			
1147			4			
1148			~~4~~ 508			standardizing 0-8.6
			4.7			1147 sample
1150						Pump off

Note: Unless otherwise noted, the following units are assumed:
Flow rate - gpm
Turbidity - NTU
Water Level - ft

Equipment:
Make: HACH
Model: 16800
Serial #: 880903409

Jane V. Boyhee 5/4/90

9413223.0502

9413223.0503

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DRILL LOG	By Bosshore	Rig Pump Rig	Well Number 299-W22-42	Computer Number	Project or Work Order No. W-017
	Date 5/4/90		Depth N/A To	N/A	Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				DAY 2 of well development		
				Arrived on site	0730	
				Mil setting up manifold		
				and pump connections		
				Tried to start pump - No go	0740	
				will pull it up/down a few times		
				Pump will not start	0800	
				Pulling pump will replace with	840	
				another - Rise Pipe ~~will be~~ is being		
				placed - off ground on pallets on plastic		
				Zone sand on top of pump	0900	
				Rise pipe wrapped in plastic		
				Leaving site to retrieve other pump	0915	
				Steam cleaning pump wire and pump	0945	
				S/N 187 11-1965		
				Temp > 180°F, Pressure ~ 1400 psi		

REMARKS:

Jane V Bosshore 5/4/90

FRL MA 567 GC-7 Rev0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

WHC-MR-0208

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9413223.0504

2-63

DRILL LOG	By Bogheer	Rig Pump Rig	Well Number 299-W22-42	Computer Number N/A	Project or Work Order No. W-017
	Date 5/4/9		Depth N/A To		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Well development		
				Arrived back on site	1034	
				after steam cleaning		
				Pump length S/N 07-11-1965 4.1'		
				Bot of pump to intake 1.45'		
				Installing pump in hole	1045	
				Bottom of pump - ~ ~~20 to~~ .7' from well bottom		
				Intake is then 1.45 + .7 = 2.15'		
				from bottom ~ 245	1125	
				Willie wear cotton gloves and used ~~plastic~~ teflon tape to secure pump wire		
				Pump on	1130	
				water looks dirty, has		
				fine sand in it		
				pump off	1150	

REMARKS:

Jane V Bogheer 5/4/90

PNC-MA567 GC 2nD

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 95)

WHC-MR-0208

90

9413223.0505

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DRILL LOG

By	Rig	Well Number	Computer Number	Project or Work Order No.
Boyhse	Pump Rig	299-W22-42	N/A	W-017
Date 5/4/90		Depth N/A To		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				starting to remove pump from hole	1230	
				pump removed, well locked	1315	
				leaving site	1325	

REMARKS:

Jan V. Byhse 5/4/90

PNL-MA-567 GC-7 Rev-0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small

WHC-MR-0208

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9413223.0506

1-61

DRILL LOG	By: JP McDonald	Rig: Pump Setting Rig	Well Number: 299-W22-43	Computer Number: N/A	Project or Work Order No.: W-817, W12
	Date: 4/25/90		Depth: Steam Cleaning To		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived at pad.	0730	
				Witnessed driller (McI) steam clean development		
				pump (SN: 287-11-1965) and spool of wire.	0800	
				Driller filled 55-gallon drum with steam		
				cleaning water. Set pump in drum and ran	0805	
				water through the pump. Wrapped pump +		
				spool in plastic and placed on pump rig.	0820	
				Leaving pad.	0825	
				Arrived at well. Pump was set while I	1117	
				was developing W23-40.		
				Teamster brought tanker truck and generator	1140	
				over.		
				Pump on, began development	1152	
				Pump off, development complete. Approximately	1327	
				920 gallons pumped total, final turbidity		
				was 0.32 NTU.		
				Leaving well.	1350	

REMARKS: 4/25/90 PNL-MA-567, EC-7, Rev. 0

D - Drive Bar. H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

WHC-MR-0208

92

WELL DEVELOPMENT LOG

Well Number 299-W22-43
Location D-12 Crib, 200W
Procedure PNL-MA-567, GC-7, Rev. 0

Start Date/Time 4/25/90 1152
End Date/Time 4/25/90 1327
Page 1 of 1

Well Depth 245.41' 4/23/90 Pump Depth (Intake) 243.8' Initial Water Level 227.59' 4/23/90

Date	Time	Flow Rate	Turbidity	Person Meas.	Person Rec.	Comments
4/25	1153	4.5		JPM	JPM	
	1157		16			Standardized turbidimeter on 100 range using 90 NTU standard
	1217		1.0			Standardized 10 range using 8.0 NTU standard.
	1221					Increased flowrate - wide open
	1222	12.0	~~12.0~~ 4/25/90			
	1224		2.0			Restandardized on 10 range
	1245	12.0				
	1248		0.56			Standardized turbidimeter on 1 range using 0.56 NTU standard.
	1315	12.0				
	1325		0.32			Restandardized on 1 range

Note: Unless otherwise noted, the following units are assumed:
Flow rate - gpm
Turbidity - NTU
Water Level - ft

Equipment:
Make: Hach Turbidimeter
Model: 16800
Serial #: 880703336

4/25/90

PNL-MA-567, GC-7, Rev. 0

9113223.0507

DEPTH SETTINGS FOR HYDROSTAR PUMPS AT
216-U-12 CRIB[a]

WELL NUMBER	CASING ELEV (FT)	BRASS CAP ELEV (FT)	SCREENED INTERVAL (FT)	DEPTH TO WATER (FT)	LOCATION OF PUMP INTAKE (FT)
299-W22-40	(b)	(b)	248.0 - 228.0	232.07	239.86
299-W22-41	(b)	(b)	248.0 - 228.0	231.86	239.88
299-W22-42	(b)	(b)	247.0 - 227.0	231.08	238.75
299-W22-43	(b)	(b)	247.0 - 227.0	230.23	238.77

(a) All measurements are from top of 6-in. stainless steel casing; information is from pump-installation forms.

(b) Results of the well survey have not yet been reported.

9413223.0508

SAMPLING PUMP INSTALLATION FORM

Project: W-417, V-12 Well Number: 299-W22-40

Pump Type: Positive displacement piston Pump Model: Hydrostar HS-8001

Date Installed: 5/7/90 Installed by: M.E. Thoresen, KEH
Tape: L500-16 Tape: L500-16

Depth-to-Water: 232.07' from toc Depth-to-Bottom: 248.03' from toc

Reported Depth-to-Bottom: 244.3 from LS Date: 4/23/90

Screened Interval: 242 - 228 Saturated Screened Interval: 242 - 237

Pump Riser Pipe Description:

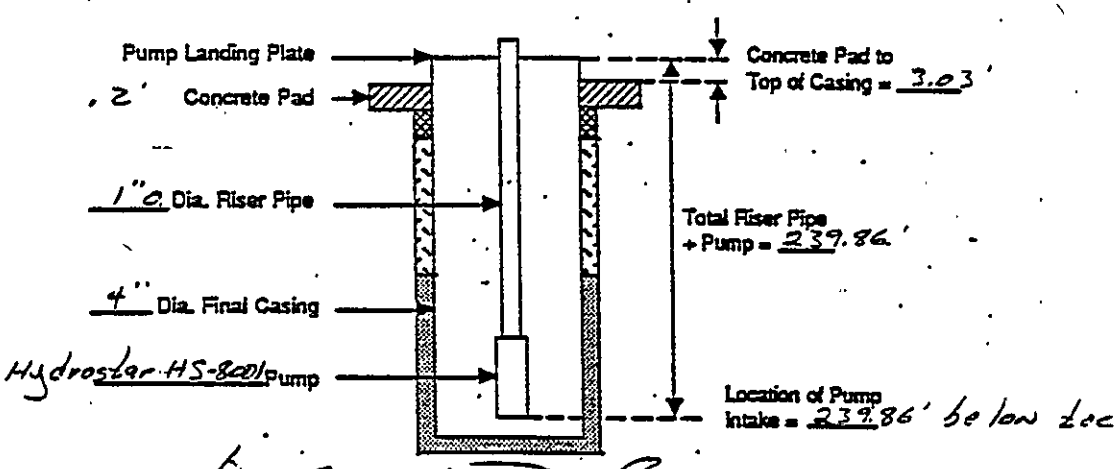
All pipe is 1" o.d.
All joints wrapped with Teflon tape except last joint 10' below landing plate.

1	10' length + pump:	12.24'
21	10' lengths (9.983' avg.)	209.64'
2	3' lengths (2 @ 2.99')	5.98'
1	2' length	1.98'
1	10' length	10.02'
		239.86'

Additional Comments:

All sampling pump materials were properly protected during this installation. See drill log form for details.

Sketch of Pump Installation:



Completed By: [signature] Date: 5/2/90

PNL-MA-567, DO-3, Rev. 0

A-1850-008 (4/89)
S8902066.1

9413223.0509

9413223.0510

Page 1 of 2

DRILL LOG	By: J P McDonald	Rig: Pump Setting Rig	Well Number: 299-W22-40	Computer Number: N/A	Project or Work Order No.: W-017, U-12
	Date: 5/7/90		Depth: Hydrostar Installation		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				D/W = 232.07' Tape L500-16	0828	
				D/W = 232.07' " " "	0831	
				DTB: 245.38' + 2.65' = ~~248.03~~ 248.03' (L500-16) SPM 5/7/90	0835	
				(Ø mark to end of weight = 2.65') All measurements		
				are from top of 6" casing.		
				248.03' (DTB) - 232.07' (D/W) = 15.96' (saturated zone).		
				15.96' ÷ 2 = 7.98' (1/2 saturated zone)		
				232.07' + 7.98' = 240.05' (Depth for pump intake)		
				Use 23-10' lengths, 2-3' lengths and 1-2' length.	0848	
				Setting up rig.	1235	
				Driller began installing couplings on riser pipe.	1245	
				Couplings installed. Visually verified that all	1315	
				joints were wrapped with Teflon tape. Began		
				pump inspection. Laid down plastic on rig for		
				inspection. Both pump and screen were kept		
				in plastic inside their original cartons. Driller		
				removed internal pump mechanism. Teflon cups OK.		
				O-ring OK. Driller installed screen. Nuts inside		

REMARKS:

J P McDonald 5/7/90 PNL-MA-567, DD-3, Rev 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 85)

WHC-MR-0208

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9413223.0511

Page 2 of 2

DRILL LOG	By: JP McDonald	Rig: Pump Selling Rig	Well Number: 299-W22-40	Computer Number: N/A	Project or Work Order No.: W-017, U-12
	Date: 5/7/90		Depth: Hydrostar Installation		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				pump were tightened slightly. Pump reassembled.		1 10' length + pump 12.24'
				Driller actuated pump - moves freely. Pump		2 " "
				inspection complete. All riser pipe, operating		3 " "
				rods and couplings were wrapped in plastic and	1324	4 " "
				inside their original cartons. These materials		5 " "
				are being kept above ground on the pump rig.		6 " "
				Began pump installation.		7 " "
				Top of 6" casing is 3.03' above pad. Pad is 2'		8 " "
				above land surface.		9 " "
				Riser pipe installation complete. Verified	1339	10 " "
				that all joints are wrapped with Teflon tape		11 " "
				except last joint 10' below loading plate.		12 " "
				Packing gland installed. Out of time - will		13 " "
				complete installation tomorrow. Driller	1455	14 " "
				wore cotton gloves throughout this installation.		15 " "
				Driller cut operating rod 2 1/8" above packing		16 " "
				gland. Well cap is locked.		17 " "
				Leaving site.		18 " "
						19 " "
						20 " "
						21 " "
						22 " "
						1 3' " 2.99'
						2 " " 2.99'
						1 2' " 1.98'
					1458	23 10' " 10.02'
					1500	
					1510	

REMARKS:

5/7/90 PNL-MA-567, DO-3, Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

WHC-MR-0208

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SAMPLING PUMP INSTALLATION FORM

Project: W-017, V-12 Well Number: 299-W22-41

Pump Type: Positive displacement piston Pump Model: Hydrostar HS-8001

Date Installed: 5/7/90 Installed by: M.E. Thoresen, KEH
L300-22 5/3/90 L300-22 5/3/90

Depth-to-Water: 231.86' below toc Depth-to-Bottom: 248.48' below toc

Reported Depth-to-Bottom: ~244 from landsafe Date: 4/23/87

Screened Interval: 227 - 237 Saturated Screened Interval: 248 - 231

Pump Riser Pipe Description:

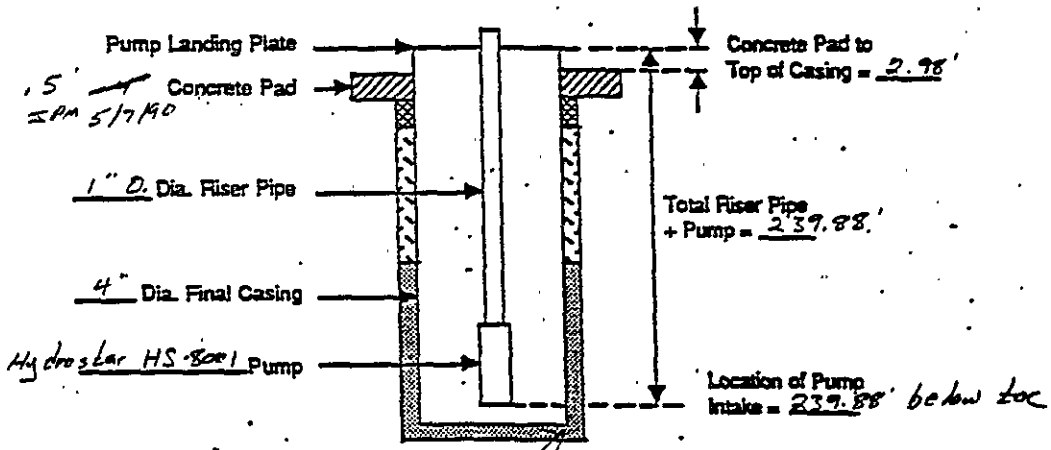
All pipe is 1" outside dia.
All joints wrapped with Teflon tape except last joint 10' below landing plate.

1	10' length + pump	12.26'
21	10' lengths (avg. 9.983')	209.64'
2	3' lengths (2.99' ea.)	5.98'
1	2' length	1.98'
1	10' length	10.02
		239.88

Additional Comments:

All sampling pump materials were properly protected during this installation. See drill log form for details.

Sketch of Pump Installation:



Completed By: [signature] Date: 5/7/90

ANL-MA-567, DO-3, Rev. 0

A-1850-008 (4/89)
S8902066.1

9413223.0512

9413223.0513

1.51

DRILL LOG	By Borghese	Rig N/A	Well Number 299-W22-41	Computer Number N/A	Project or Work Order No. W-017
	Date 5-3-90		Depth N/A		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				steel tape L300 - 22		2.65' from 0' mark to end of weight
				D/W 231.800 JJB + 0.86 = 231.86	1305	
				231.00 + 0.86 = 231.86	1310	
				D/B 245.83 + 2.65 = 248.48	1321	
				depths are from top of 6" casing		
				Jan V. Borghese 5/3/90		

REMARKS:

WL MA 567 DO-3 Rev 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse

99

WAC-MA-0208

DRILL LOG	By: JP McDonald	Rig: Pump Setting Rig	Well Number: 299-W22-41	Computer Number: N/A	Project or Work Order No.: W-017, U-12
	Date: 5/7/90		Depth: Hydrostar Installation		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived at site. Setting up rig.	0800	
				D/W + OTB taken by J.V. Berghese on 5/3/90.		
				248.48' (OTB) - 231.86' (D/W) = 16.62' (saturated zone)		
				16.62' ÷ 2 = 8.31' (1/2 saturated zone).		
				231.86' + 8.31' = 240.17' (Depth for pump intake)		
				Use 23-10' lengths, 2-3' lengths, and 1-2' length.		
				Driller began installing couplings on riser pipe.	0815	
				Couplings installed - visually verified that all	0900	
				joints were wrapped with Teflon tape. All riser		
				pipe, operating rods and couplings are wrapped		
				in plastic inside their original cartons and kept		
				above ground on the rig.		
				Began pump inspection. Laid plastic down on pump	0915	
				rig for inspection. Driller removed internal pump		
				mechanism. O-ring ok. Screen attached. Both		
				pump and screen were wrapped in plastic and inside		
				their original containers. Nuts on mechanism		
				were tight. Teflon cups ok. Pump reassembled.		

REMARKS:

[signature] 5/7/90 PNL-MA-567, DD-3, Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

WHC-MR-0208

001

9413223.0515

Page 2 of 2

DRILL LOG	By: JP McDonald	Rig: Pump Setting Rig	Well Number: 299-W22-11	Computer Number: N/A	Project or Work Order No.: W-012, W-12
	Date: 5/7/90		Depth: Hydrostar Installation		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Driller actuated piston - moves freely. Pump		1 10' length + pump 12.26
						2 " "
				inspection complete. Screen length is 1.98'.	0927	3 " "
						4 " "
				Began pump installation.	0930	5 " "
						6 " "
				Riser pipe installation complete. Verified that	1117	7 " "
						8 " "
				all joints are wrapped with Teflon tape except		9 " "
						10 " "
				last joint 10' below landing plate.		11 " "
						12 " "
				Packing gland installed.	1119	13 " "
						14 " "
				operating rod cut and threaded 2'6" above packing	1127	15 " "
						16 " "
				gland. Driller actuated pump - feels like its in		17 " "
						18 " "
				water. Brass connector installed. Lid fits		19 " "
						20 " "
				good. Well is locked. Driller wore cotton		21 " "
						22 " "
				gloves throughout this installation.		1 3" " 2.99'
						2 " " 2.99'
						1 2' " 1.98'
				Driller stamped well name on brass cap and casing.	1137	23 10' " 10.02'
				Pump installation complete.		
				Leaving well.	1150	
				TOC is 2.98' above pad. Pad is .5' thick.	1345	

REMARKS:

5/7/90 PNL-MA-567, DO-3, Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

WHC-MR-0208

101

SAMPLING PUMP INSTALLATION FORM

Project: W-017, C1+2 Well Number: 299-W22-42

Pump Type: Positive displacement Piston Pump Model: Hydrostar ~~8000~~ 8001

Date Installed: 5/8/90 Installed by: Mel Thoresen (KEH), Barghear (PNL)

Depth-to-Water: 231.08' Top of 6" Depth-to-Bottom: 247.09' Top of 6"

Reported Depth-to-Bottom: 243.55 from LS Date: 4/30/90

Screened Interval: 247 - 227 Saturated Screened Interval: 247 - 231.0

Pump Riser Pipe Description:

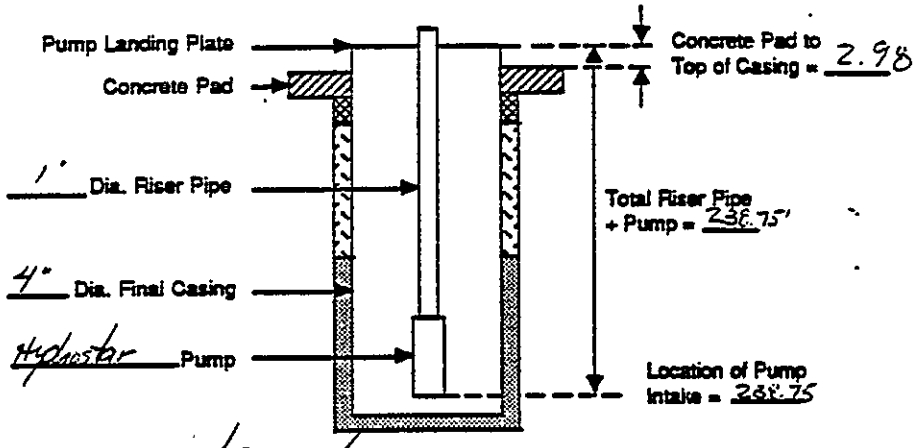
Pump Intake to top of coupling 12.25

pipe lengths

21 x 9.98	209.58
1 x 2.98	2.98
2 x 1.98	3.96
1 x 9.98	9.98
	238.75

Additional Comments:
- All material came to site in manufacturer's packaging
- Drillers wore cotton gloves during installation
- pump checked out fine, screen installed
- All joints wrapped w/ teflon tape, except last 10' joint

Sketch of Pump Installation:



Completed By: Jane V. Barghear Date: 5/8/90

PNL-MA567 DO.3 Rev 0

A-1850-008 (4/89)
S8902066.1

9413223.0516

9413223.0517

1 of

DRILL LOG	By: JP McDonald	Rig: None	Well Number: 299-W22-42	Computer Number: N/A	Project or Work Order No.: W-017, W-12
	Date: 5/7/90		Depth: Hydrostar Installation		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				D/W: 231.08' Tape 4500-16	1304	
				D/W: 231.08' " " "	1307	
				DTB: 244.44' + 2.65' = 247.09' Tape 4500-16	1311	
				(Ø mark to end of weight = 2.65') All measurements		
				are from top of 6" casing.		
NOTE: Incorrect				244.44' (DTB) - 231.08' (D/W) = 13.36' (saturated zone)		
D/B used on				13.36' ÷ 2 = 6.68' (1/2 saturated zone)		
calculations on 5/14/90				231.08' + 6.68' = 237.76' (Depth for pump intake)		
	SUB			Use 23-10' lengths and 2-3' lengths.		
				TOC is 2.98' above pad. Pad is .4' thick.	1342	

REMARKS: 5/7/90 PNL-MA-567, DO-3, Rev. 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF Very Fine Standing Water

WHC-MR-0208

103

9413223.0518

1 of 2

DRILL LOG	By: Borghese	Rig: Pump Rig	Well Number: 299-W22-42	Computer Number: N/A	Project or Work Order No.: CV-017
	Date: 5/8/90		Depth: N/A To		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Hydrostatic Installation		
				corrected D/B from 5/7: 247.09		
				D/W from 5/7: -231.08		
				16.01		
				÷ 2		
				8.01		
				+231.08		
				target pump placement 239.09		
				Use 13, 10' = 230'		
				pump 2.2		
				2, ~~3~~ 5.3 2' ~~4~~ 4		
				1, 3' 3		
				239.2.		

REMARKS:

Jan V Borghese 5/8/90

PNL MA 567 DO-3 R

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

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WHC-MR-0208

9413223.0519

2 of

DRILL LOG	By Borghese	Rig Pump Rig	Well Number 299-W22-42	Computer Number	Project or Work Order No. W-017
	Date 5/8/90		Depth N/A To	N/A	Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Hydrostar Installation		
				Drillers wore clean cotton gloves during installation. All materials came to site in manufacturers packaging. teflon tape installed on all couplings		
				Thread bad on pump check valve - lifting rod broke off while sucking out - checking out different pump and screen pump HS-8001 looks good, driller checked pump strokes - works fine screen installed on pump		
				Pump intake to top of coupling 12.25		
				pipelengths 21 SUB x 9.98 : 209.58 ~~219.56~~		
				1 x 2.98 2.98		
				2 x 1.98 3.96		
				1 x 9.98 9.98		
				PUMP INTAKE 238.75		

REMARKS: int threaded, cross marked and original casing stamped w/ total ID
Locked well; Left site

Jane V. Borghese
5/8/90
DNC 114567 DO-3 Rev 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

WHC-MR-0208

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SAMPLING PUMP INSTALLATION FORM

Project: W017, U12 Well Number: 299-W22-43

Pump Type: Positive Displacement Piston Pump Model: HS - 8001

Date Installed: 5/8/90 Installed by: Mel Thorson, KEH, J.V. Boyle

Depth-to-Water: 230.23 from top of 6" Depth-to-Bottom: 247.54 from top of 6"

Reported Depth-to-Bottom: ≈43.7 Date: 4/23/90

Screened Interval: 247 - 227 Saturated Screened Interval: 247.54 - 230.23

Pump Riser Pipe Description:

pump intake to top of coupling: 12.25

pipe lengths 21 × 9.98 209.58

1 × 2.98 2.98

2 × 1.99 3.98

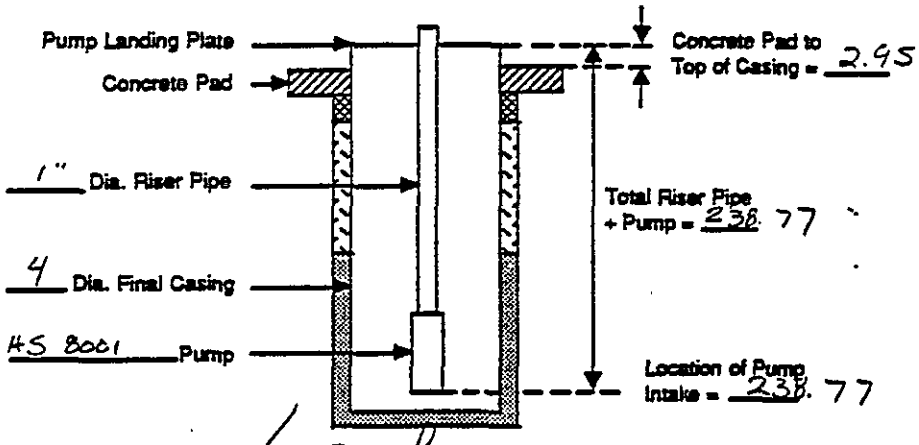
1 × 9.98 9.98

238.77

Additional Comments:

- all material came to site in manufacturers packaging
- duties wore cotton gloves during installation
- pump checked out fine screen installed
- joints wrapped with teflon tape, except last 10' joint

Sketch of Pump Installation:



Completed By: Jan V. Boyle Date: 5/8/90

PNL MA 567 D03 Rev 0

A-1650-008 (4/89)
S8902066.1

9413223.0520

9413223.0521

DRILL LOG	By: Borghese	Rig: Pump Rig	Well Number: 299-W22-43	Computer Number: N/A	Project or Work Order No.: W-017
	Date: 5/8/90		Depth: N/A To		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
Hydrostatic Instalation				D/W 230 + .23 = 230.23	850	
				D/W 230 + 23 = 230.23	855	
				D/B 244.91 + 2.63 = 247.54	900	
				steel tape L300-22		
				STANDPIPE : 2.95'		
				D/B - D/W : 247.54 - 230.23 = 17.31		
				÷ 2		
				8.66		
				+ 230.23		
				target for pump intake 238.89		
				239		
				pipe needed: 23 x 10, 2 x 2, 1 x 3, pump		
				setting up rig	1246	
				checking and installing screen on pump	1306	

REMARKS:

James V. Borghese 5/8/90

PNL MA567 00-3, Rev 0

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Co...

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WHC-MR-0208

DRILL LOG	By Borghese	Rig Pump Rig	Well Number 299-W22-43	Computer Number N/A	Project or Work Order No. W-017
	Date 5/8/90		Depth N/A To		Subcontract No. N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				distance from pump intake to top of coupling 12.25	1315	
				riser pipe 21 x 9.98 209.58		
				1 x 2.98 2.98		
				2 x 1.99 3.98		
				1 x 9.98 9.98		
				pump intake placement 238.77	1440	
				cut, threaded, lines marker and surface		
				casing stamped w/ well ID		
				well locked, left site	1455	

REMARKS:

Jason V Borghese 5/8/90

PNL MA567 003 E

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

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WHC-MR-0208

9413223.0523

APPENDIX E

AQUIFER-TEST DATA

9413223.0524

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Aquifer Test Data

page 1 of 1

Data for Well 299-W22-40
Pumping Well N/A
Observation Wells N/A

Location U-12 Crib, 200W
Type of Aquifer Test Slug Withdrawl 4/23/90
How Q Measured N/A
How W.L.'s Measured Steel Tape L300-22
Rad./Dist. of/From Pumping Well N/A
Meas. Point for W.L.'s ~~N/A~~ Top of 4" steel pipe
Elevation of Meas. Point N/A

Depth of Pump/Airpipe N/A
Pump On: date N/A time N/A
Pump Off: date N/A time N/A
Duration of Aquifer Test N/A

Time t = _____ at t' = 0					Water Level Data Static Water Level _____					Discharge		Recorded By	Comments
Day	Clock Time	t	t'	t/t'	Reading	Conversions or Corrections	Water Level	s or s'		Read-ing	Q		
4/23	1312							From top of 4"					245.13' OTB
	1322						228.90						
	1324						228.90						
	1348				Begin test 1 - withdrawl								
	1405				Test complete.								
												4/23/90	
						PNL-MA-567, AT-6, Rev. 0							

Location 012 Crib 200W Date of Test 4/23/90

Well Number 299-W22-40 Procedure Number AT-6, Rev. 0

Type of Test(s) Withdrawl

Personnel Conducting Test JP McDonald, PNL; ME Thoresen, KEH

WELL CONFIGURATION

Well Depth 242.59' + 2.64' = 245.13' (L300-22 1312 POT. From top of 4") Borehole Diameter 8"

Well Casing Inside Diameter 4" Well Screen Inside Diameter 4"

Length of Screened Interval 20.35' Depth of Screen 224.14' - 244.49' b.l.s.

Comments D/W = 228.90' @ 1322 POT L300-22 From top of 4"
D/W = 228.90' @ 1324 POT " "

SLUG INFORMATION

Slug Construction Materials Galvanized steel

Length of Slug 6.0' Diameter of Slug 2 1/4"

Comments Bottom of slug at ~236' prior to withdrawl.

Volume of Attachments (if applicable)

MEASUREMENT EQUIPMENT INFORMATION

	Make	Model	Serial Number	
Electric Tape				
Steel Tape	Lufkin	300'	L300-22	
Data logger	In-Situ	SE1000B	1KB-741	Test 1
Transducer	Druck	PTX-161/D	262362	
Other				

XD reading 15.08, set ref value to zero.

4/23/90

PNL-MA-567, AT-6, Rev. 0

9413223.0526

9113223.0527

Equipment Record Form for the Installation and Removal of Data Loggers and Pressure Transducers

Initial Check: N/A		
Purpose of Installation: Slug withdrawl test		
Monitored Hydrologic Unit or Water Body: Unconfined Aquifer		
Date/Time of Installation: 4/23/90 1340	Procedure Followed: AT-6	
Data Logger Make/Model: In-Situ SE1000B		
Serial No.: 1KB-701	Number of Channels Used: 1	
Pressure Transducer Make/Model: Druck/PTX-1610	Full Scale Range: 10psi	Well No.: 299-W22-40
	Serial No.: 262362	Depth: ~244'
~~Pressure Transducer~~ Make/Model:	Full Scale Range:	Well No.:
	Serial No.:	Depth:
Description of Data Logger Installation and Well Head Configuration: Well head is a 4" standpipe, transducer secured in place with tape.		
Comments: Test 1		
Equipment Installed By JP McDonald		
Date/Time of Equipment Removal: 4/23/90 1420		
Decontamination Procedure (if required): Transducer steam cleaned prior to installation		
Equipment Removed By JP McDonald		

4/23/90

PNL-MA-567, AT-6, Rev. 0

9413223.0528

DRILL LOG	By: JP McDonald	Rig: Pump Setting Rig	Well Number: N/A	Computer Number: N/A	Project or Work Order No.: W-017
	Date: 4/23/90		Depth: Steam Cleaning		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived at steam cleaning pad.	0710	
				Witnessed driller (Mel) steam clean 3 6'	0913	
				slugs. Slugs wrapped in plastic.	0945	
				Driller steam cleaned transducers (SN: 262362,	1020	
				SN: 259096). Unable to get corrosion off		
				transducer 259198. Other two transducers are		
				wrapped in plastic.		
				Leaving pad.	1045	

REMARKS:

4/23/90

D - Drive Barrel H - Hand Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine Standing Water

1114

WHC-MR-0208

(5/18/89, Rev. 0)

ELECTRONIC DATA CONTROL FORM

DATE AND START TIME OF DATA ACQUISITION 4/23/90 13:48

DATE AND END TIME OF DATA ACQUISITION 4/23/90 14:05

WELL NUMBER 299-W22-40

TYPE OF TEST OR DATA Slug WITHDRAWAL

TYPE AND IDENTIFICATION NUMBER OF DATA LOGGER
In Situ SE1000B 1KB-701

TEST NUMBER 1

CHANNEL OR INPUT NUMBER 1

UNITS OF VALUES RECORDED ft. from referenced level

NUMBER OF PAGES ATTACHED

COMMENTS:

DATA VALIDATION STATEMENT:

The attached data represent the data as originally recorded on the data logger. Any exceptions and reasons for such are indicated in the comments section.

Technician 4/30/90
Name, title Date

9413223.0529

SE1000B
Environmental Logger
04/23 14:08

Unit# 00701 Test# 1

INPUT 1: Level (F)

Reference	0.00
Scale factor	9.99
Offset	0.01

Step# 0 04/23 13:48

Elapsed Time	Value
0.0000	- 0.01
0.0033	- 0.01
0.0066	- 0.01
0.0099	- 3.42
0.0133	- 2.71
0.0166	- 1.56
0.0200	- 1.81
0.0233	- 1.32
0.0266	- 0.94
0.0300	- 0.84
0.0333	- 0.98
0.0500	- 1.64
0.0666	- 1.48
0.0833	- 1.30
0.1000	- 1.15
0.1166	- 1.02
0.1333	- 0.91
0.1500	- 0.81
0.1666	- 0.73
0.1833	- 0.65
0.2000	- 0.59
0.2166	- 0.53
0.2333	- 0.48
0.2500	- 0.44
0.2666	- 0.40
0.2833	- 0.37
0.3000	- 0.34
0.3166	- 0.31
0.3333	- 0.28
0.4167	- 0.20
0.5000	- 0.14
0.5833	- 0.11
0.6667	- 0.08
0.7500	- 0.06
0.8333	- 0.05
0.9167	- 0.05
1.0000	- 0.04

9413223.0530

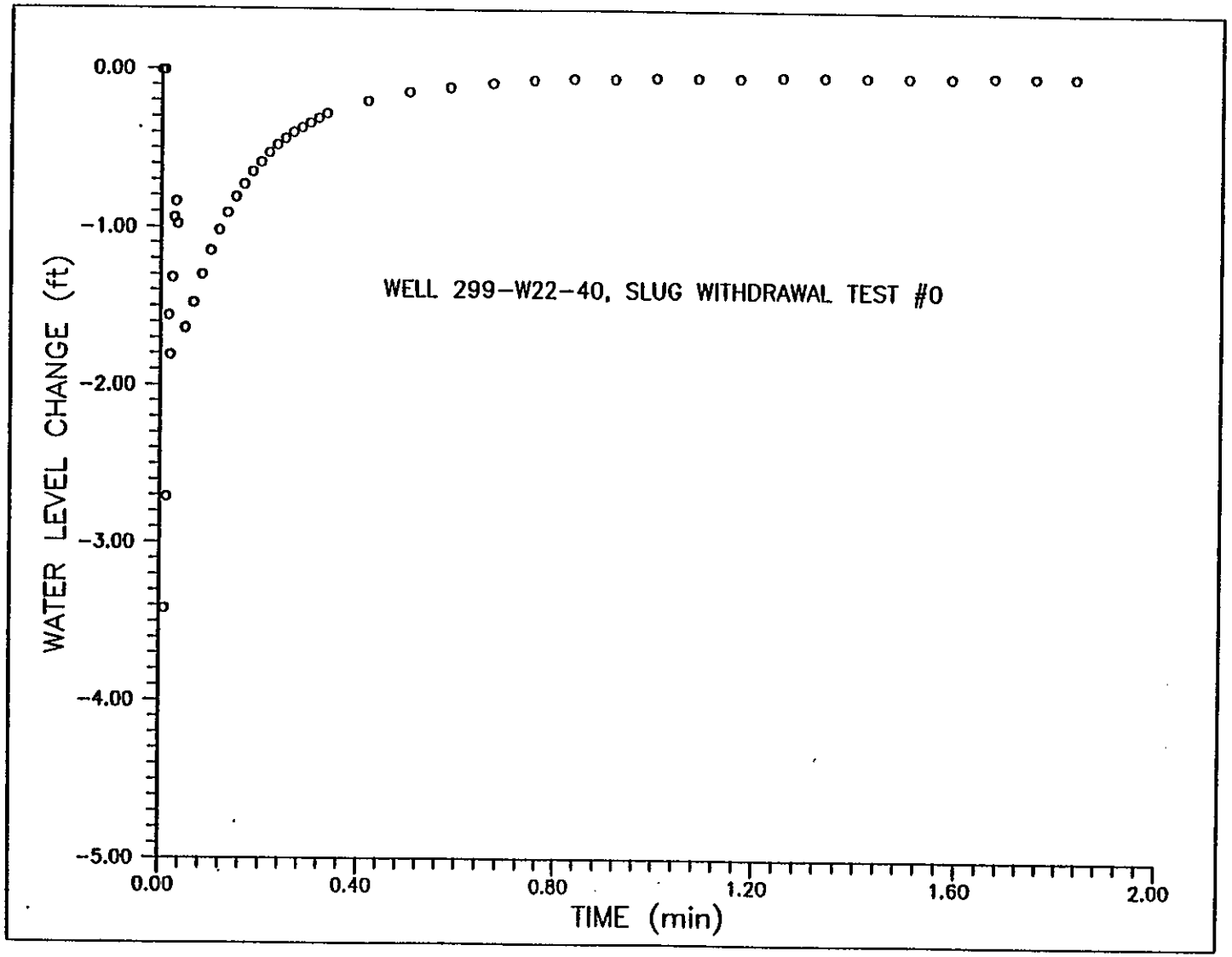
299-W22-40
test 1 1 of 2

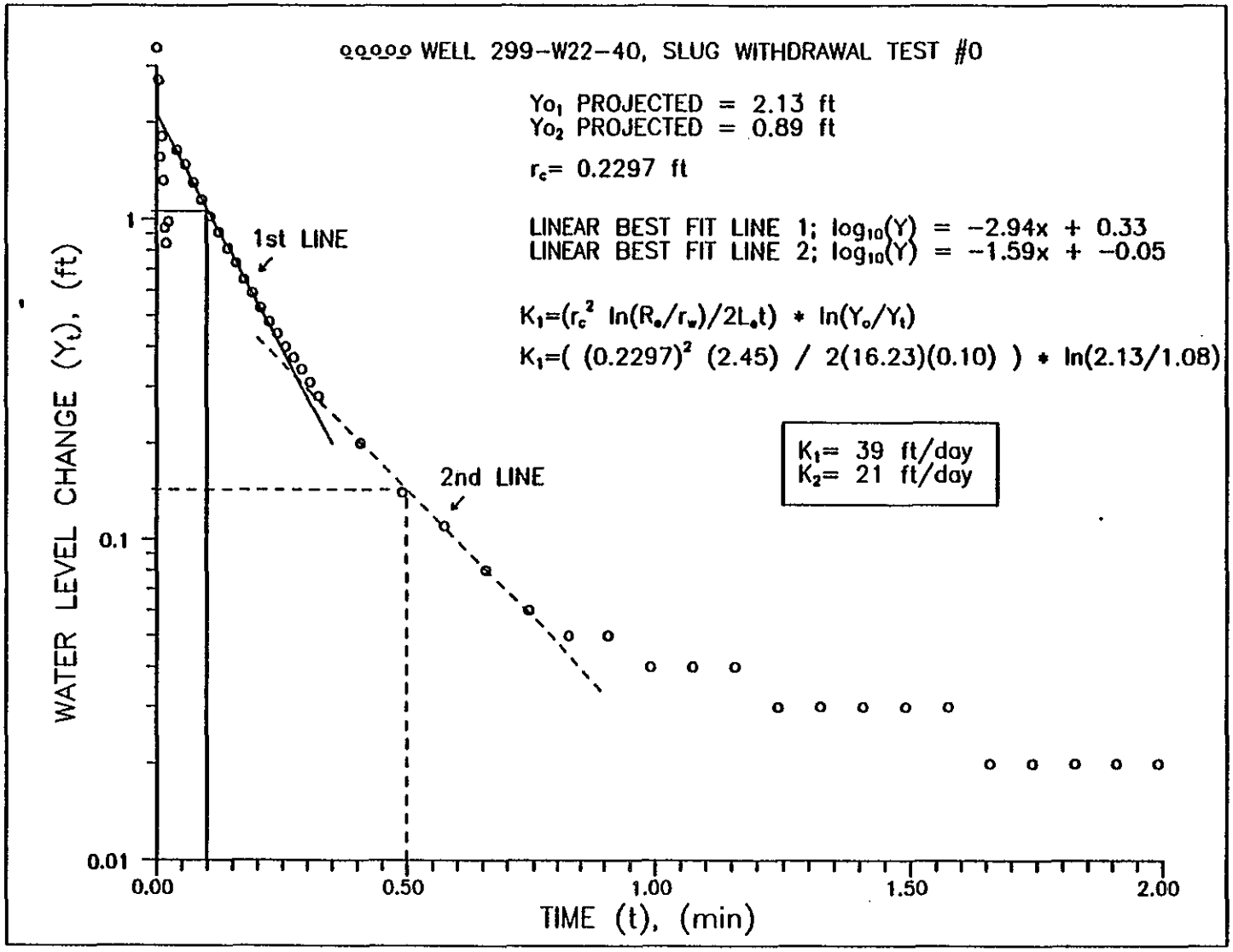
1.0833	-	0.04
1.1667	-	0.04
1.2500	-	0.03
1.3333	-	0.03
1.4166	-	0.03
1.5000	-	0.03
1.5833	-	0.03
1.6667	-	0.02
1.7500	-	0.02
1.8333	-	0.02
1.9167	-	0.02
2.0000	-	0.02
2.5000	-	0.02
3.0000	-	0.02
3.5000	-	0.02
4.0000	-	0.02
4.5000	-	0.02
5.0000	-	0.02
5.5000	-	0.02
6.0000	-	0.02
6.5000	-	0.02
7.0000	-	0.02
7.5000	-	0.02
8.0000	-	0.02
8.5000	-	0.02
9.0000	-	0.02
9.5000	-	0.03
10.0000	-	0.03
11.0000	-	0.03
12.0000	-	0.03
13.0000	-	0.03
14.0000	-	0.03
15.0000	-	0.03
16.0000	-	0.04
17.0000	-	0.04

END.

9413223.0531

299-W22-40
Sheet 1 Rev 2


WELL 299-W22-40, SLUG WITHDRAWAL TEST #0
WATER LEVEL CHANGE (ft)
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
0.00
0.40
0.80
1.20
1.60
2.00
TIME (min)


WELL 299-W22-40, SLUG WITHDRAWAL TEST #0
Yo1 PROJECTED = 2.13 ft
Yo2 PROJECTED = 0.89 ft
rc= 0.2297 ft
LINEAR BEST FIT LINE 1; log10(Y) = -2.94x + 0.33
LINEAR BEST FIT LINE 2; log10(Y) = -1.59x + -0.05
K1=(rc2 ln(Re/rw)/2Leto) * ln(Yo/Yt)
K1=((0.2297)2 (2.45) / 2(16.23)(0.10)) * ln(2.13/1.08)
K1= 39 ft/day
K2= 21 ft/day
1st LINE
2nd LINE
WATER LEVEL CHANGE (Yt), (ft)
1
0.1
0.01
0.00
0.50
1.00
1.50
2.00
TIME (t), (min)

WELL 299-W22-40, SLUG WITHDRAWAL TEST #0, 1st STRAIGHT LINE
****
THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.
****
****
RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.
****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2297	.3333	16.2300	16.2300	240.0000

****
Le/Rw = 48.6900000
A= 3.0669280
B= 5.036012E-001
C= 2.6454010
SANDPACK POROSITY= 3.000000E-001
t (min)= 1.000000E-001
1/t= 10.0000000
Yo= (ft) 2.1300000
Yt= (ft) 1.0800000
1/t ln(Yo/Yt)= 6.7916090
ln[(H-Lw)/Rw]= 6.0000000
ln(Re/Rw)= 2.4500630
****
K (ft/day) = 38.9596600
****
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 632.3152000
****

9413223.0534

WELL 299-W22-40, SLUG WITHDRAWAL TEST #0, 2nd STRAIGHT LINE
****
THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.
****
****
RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.
****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2297	.3333	16.2300	16.2300	240.0000

****
Le/Rw = 48.6900000
A= 3.0669280
B= 5.036012E-001
C= 2.6454010
SANDPACK POROSITY= 3.000000E-001
t (min)= 5.000000E-001
1/t= 2.0000000
Yo= (ft) 8.900000E-001
Yt= (ft) 1.400000E-001
1/t ln(Yo/Yt)= 3.6991580
ln[(H-Lw)/Rw]= 6.0000000
ln(Re/Rw)= 2.4500630
****
K (ft/day) = 21.2200000
****
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 344.4005000
****

9413223.0535

121

Aquifer Test Data

page 1 of 1

Data for Well 299-W22-41
Pumping Well N/A
Observation Wells N/A

Location U-12 Crib, 200W
Type of Aquifer Test Slug Withdrawl 4/23/90
How Q Measured N/A
How W.L.'s Measured Steel Tape L300-22
Rad./Dist. of/From Pumping Well N/A
Meas. Point for W.L.'s Top of 4" standpipe
Elevation of Meas. Point N/A

Depth of Pump/Airpipe N/A
Pump On: date N/A time N/A
Pump Off: date N/A time N/A
Duration of Aquifer Test N/A

Time t = _____ at t' = 0					Water Level Data Static Water Level _____					Discharge		Recorded By	Comments
Day	Clock Time	t	t'	t/t'	Reading	Conversions or Corrections	Water Level	s or s'		Read-ing	Q		
4/23	1423												DTB 245.94'
	1428						228.74						
	1429						228.74						
	1452		Began test 2 - withdrawl										
	1502		Test complete										
													4/23/90
						ANA-MA-567, AT-6, Rev. 0							

9413273.0546

Location U12 Crib 200W Date of Test 4/23/~~8~~ 90

Well Number 299-W22-41 Procedure Number AT-6 Rev. 0

Type of Test(s) Withdrawal

Personnel Conducting Test JP McDonald, PNL; ME Thoresen, KEH

WELL CONFIGURATION

Well Depth From top of 4" 243.30' + 2.64' = 245.94' Borehole Diameter 8"

Well Casing Inside Diameter 4" Well Screen Inside Diameter 4"

Length of Screened Interval 21.24' Depth of Screen 224.09' - 245.33' b.l.s.

Comments D/W = 228.74' @ 1428 PDT
" " " " 1429 PDT

SLUG INFORMATION

Slug Construction Materials Galvanized steel

Length of Slug 6.0' Diameter of Slug 2 1/4"

Comments

Volume of Attachments (if applicable)

MEASUREMENT EQUIPMENT INFORMATION

	Make	Model	Serial Number	
Electric Tape				
Steel Tape	Lufkin	300'	L300-22	
Data logger	In-Situ	SE1000B	1KB-701	Test 2
Transducer	Druck	PTX-161/D	259212	
Other				

4/23/90

PNL-MA-567, AT-6, Rev 0

9413223.0537

9413223.0538

DRILL LOG	By: J P McDonald	Rig: Pump Setting Rig	Well Number: N/A	Computer Number: N/A	Project or Work Order No.: W-017
	Date: 4/23/90		Depth: Steam Cleaning		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived at steam cleaning pad.	0710	
				Witnessed driller (Mel) steam clean 3 6'	0913	
				slugs. Slugs wrapped in plastic.	0945	
				Driller steam cleaned transducers (SN: 262362,	1020	
				SN: 259096). Unable to get corrosion off		
				transducer 259198. Other two transducers are		
				wrapped in plastic.		
				Leaving pad.	1045	

REMARKS:

J P McDonald 4/23/90

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine

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WHC-MR-0208

9413223.0539

Equipment Record Form for the Installation and Removal of Data Loggers and Pressure Transducers

Initial Check: N/A		
Purpose of Installation: Slug withdrawl test		
Monitored Hydrologic Unit or Water Body: Unconfined Aquifer		
Date/Time of Installation: 4/23/90 1435	Procedure Followed: AT-6	
Data Logger Make/Model: In-Situ SE 2000B		
Serial No.: 1KB-701	Number of Channels Used: 1	
Pressure Transducer Make/Model: Druck/PTX-161D	Full Scale Range: 10 psi	Well No.: 299-W22-40
	Serial No.: 259212	Depth: ~243'
~~Pressure Transducer~~ Make/Model:	Full Scale Range:	Well No.:
	Serial No.:	Depth:
Description of Data Logger Installation and Well Head Configuration: well head is a 4" standpipe, transducer is secured in place with tape.		
Comments: Test 2		
Equipment Installed By SP McDonald		
Date/Time of Equipment Removal: 4/23/90 1505		
Decontamination Procedure (if required): Transducer steam cleaned prior to installation		
Equipment Removed By SP McDonald		

4/23/90

PNL-MA-567, AT-6, Rev. 0

(5/18/89, Rev. 0)

ELECTRONIC DATA CONTROL FORM

DATE AND START TIME OF DATA ACQUISITION 4/23/90 14:52

DATE AND END TIME OF DATA ACQUISITION 4/23/90 15:02

WELL NUMBER 299-W22-41

TYPE OF TEST OR DATA slug withdrawal

TYPE AND IDENTIFICATION NUMBER OF DATA LOGGER

In situ 5E10008 IKB 701

TEST NUMBER 2

CHANNEL OR INPUT NUMBER 1

UNITS OF VALUES RECORDED ft. from referenced level

NUMBER OF PAGES ATTACHED

COMMENTS:

DATA VALIDATION STATEMENT:

The attached data represent the data as originally recorded on the data logger. Any exceptions and reasons for such are indicated in the comments section.

Technician 4/30/90

Name, title Date

9413223.0540

SE1000B
Environmental Logger
04/23 16:12

Unit# 00701 Test# 2

INPUT 1: Level (F)

Reference	0.00
Scale factor	9.98
Offset	0.00

Step# 0 04/23 14:52

Elapsed Time	Value
0.0000	- 0.01
0.0033	- 0.01
0.0066	- 0.01
0.0099	- 0.01
0.0133	- 4.88
0.0166	0.95
0.0200	0.54
0.0233	- 2.20
0.0266	0.84
0.0300	- 1.17
0.0333	- 1.39
0.0500	- 1.92
0.0666	- 1.89
0.0833	- 1.81
0.1000	- 1.77
0.1166	- 1.72
0.1333	- 1.68
0.1500	- 1.62
0.1666	- 1.59
0.1833	- 1.54
0.2000	- 1.51
0.2166	- 1.47
0.2333	- 1.43
0.2500	- 1.40
0.2666	- 1.36
0.2833	- 1.33
0.3000	- 1.30
0.3166	- 1.26
0.3333	- 1.23
0.4167	- 1.08
0.5000	- 0.98
0.5833	- 0.86
0.6667	- 0.76
0.7500	- 0.67
0.8333	- 0.59
0.9167	- 0.53
1.0000	- 0.48

9413223.0541

299-W22-41
test 2

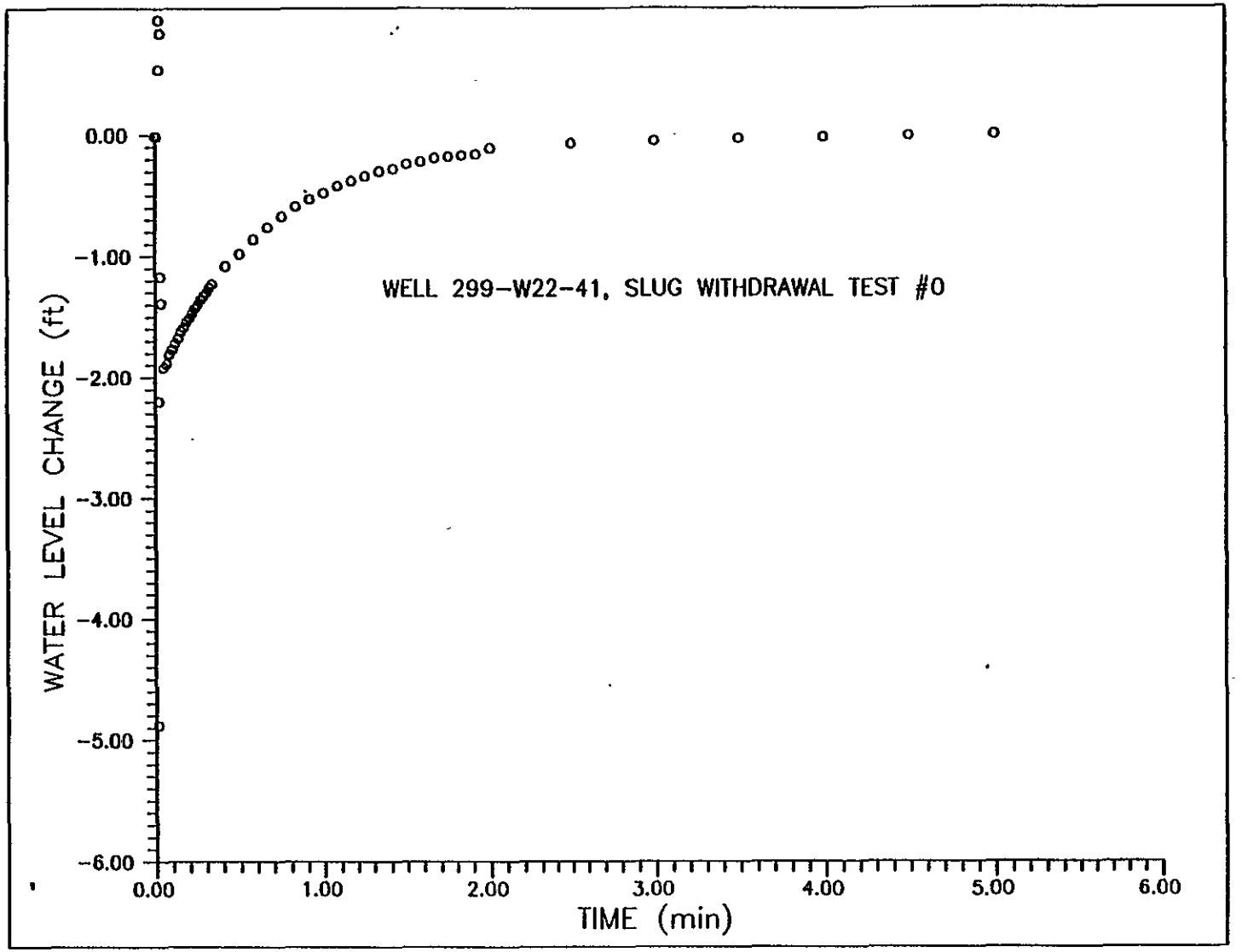
1 of 2

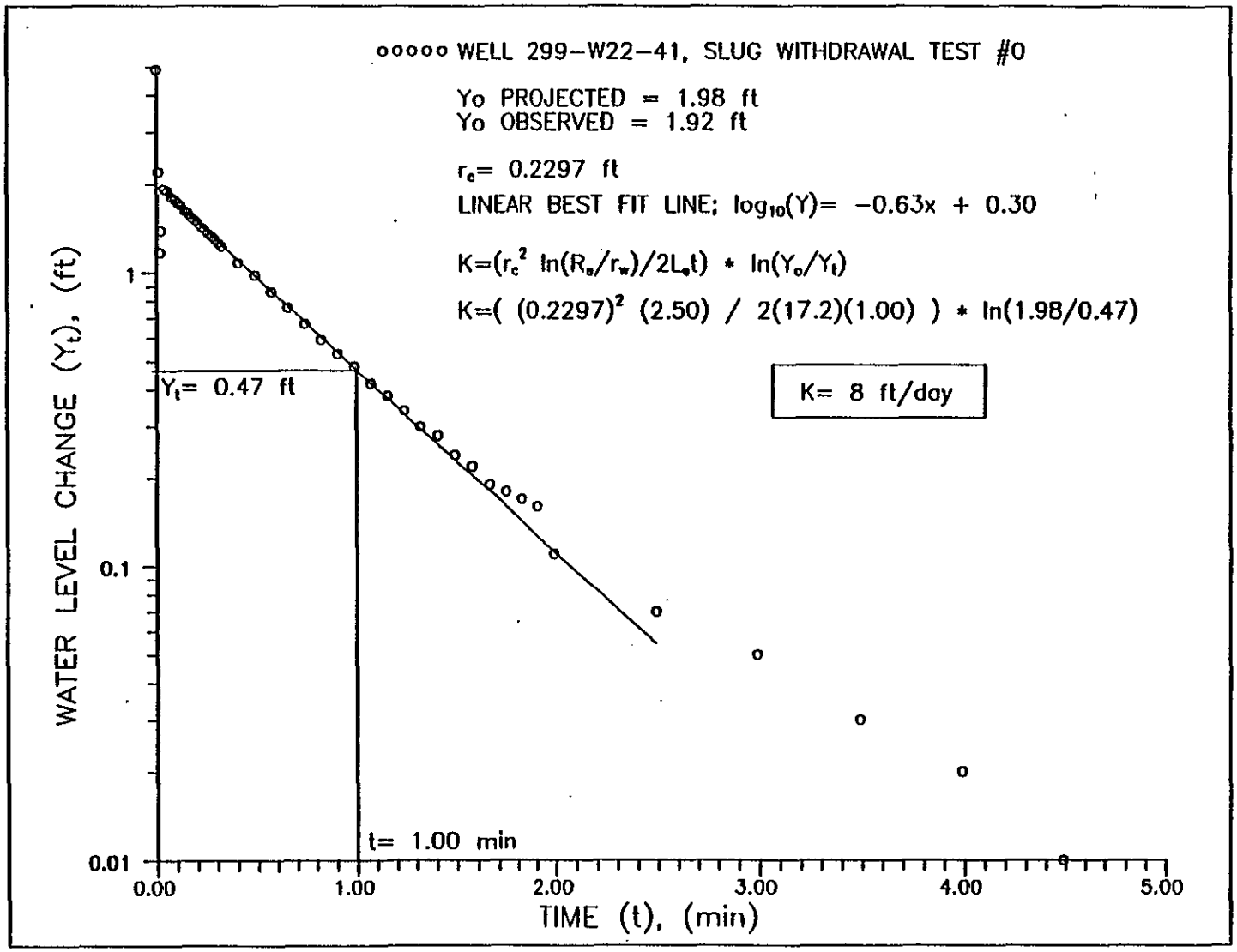
1.0833	-	0.42
1.1667	-	0.38
1.2500	-	0.34
1.3333	-	0.30
1.4166	-	0.28
1.5000	-	0.24
1.5833	-	0.22
1.6667	-	0.19
1.7500	-	0.18
1.8333	-	0.17
1.9167	-	0.16
2.0000	-	0.11
2.5000	-	0.07
3.0000	-	0.05
3.5000	-	0.03
4.0000	-	0.02
4.5000	-	0.01
5.0000	-	0.00
5.5000	-	0.02
6.0000	-	0.02
6.5000	-	0.02
7.0000	-	0.01
7.5000	-	0.02
8.0000	-	0.01
8.5000	-	0.02
9.0000	-	0.03
9.5000	-	0.01
10.0000	-	0.02

END

9413223.0542

299-W22-41
tot 2 2-62


WELL 299-W22-41, SLUG WITHDRAWAL TEST #0
WATER LEVEL CHANGE (ft)
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
-6.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
TIME (min)


ooooo WELL 299-W22-41, SLUG WITHDRAWAL TEST #0
Yo PROJECTED = 1.98 ft
Yo OBSERVED = 1.92 ft
r_c= 0.2297 ft
LINEAR BEST FIT LINE; $\log_{10}(Y)$= −0.63x + 0.30
$K=(r_c^2 \ln(R_e/r_w)/2L_e t) * \ln(Y_o/Y_t)$
$K=((0.2297)^2 (2.50) / 2(17.2)(1.00)) * \ln(1.98/0.47)$
K= 8 ft/day
Y_t= 0.47 ft
t= 1.00 min
WATER LEVEL CHANGE (Y_t), (ft)
1
0.1
0.01
0.00
1.00
2.00
3.00
4.00
5.00
TIME (t), (min)

130

WELL 299-W22-41, SLUG WITHDRAWAL TEST #0
****
THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.
****
****
RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.
****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2297	.3333	17.2000	17.2000	240.0000

****
Le/Rw = 51.6000000
A= 3.1500690
B= 5.145658E-001
C= 2.7612310
SANDPACK POROSITY= 3.000000E-001
t (min)= 1.0000000
1/t= 1.0000000
Yo= (ft) 1.9800000
Yt= (ft) 4.700000E-001
1/t ln(Yo/Yt)= 1.4381200
ln[(H-Lw)/Rw]= 6.0000000
ln(Re/Rw)= 2.5011280
****
K (ft/day) = 7.9466870
****
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 136.6830000
****

Aquifer Test Data

page 1 of 1

Data for Well 299-W22-43
Pumping Well N/A
Observation Wells N/A

Location C-12
Type of Aquifer Test Slug withdrawal
How Q Measured N/A
How W.L.'s Measured steel tape + trans.
Rad./Dist. of From Pumping Well 2"
Meas. Point for W.L.'s top of 4"
Elevation of Meas. Point N/A

Depth of Pump/Airpipe N/A
Pump On: date N/A time
Pump Off: date N/A time
Duration of Aquifer Test
stand pipe height above LS: 1.81'

Time t = ____ at t' = 0					Water Level Data Static Water Level ____					Discharge		Recorded By	Comments
Day	Clock Time	t	t	t/t'	Reading	Conversions or Corrections	Water Level	s or s		Reading	Q		
9/30	955				well capped upon arrival							JVB	steel tape 2500-16
	1000				229	+ .78	22470		W/L				Insitu SF10003
					242.7	+ 2.65	24535		D/B				SN 1KB-700
	1015				14.63	xD	placed	in	hole				Trans SN 259212
													PTX 161D
													meas. w/ DI
					Pulling slug to bottom of hole								slug stamped
	1025				slug on bottom								chamio witnessed
					pulled up		8"						by SP Richart
					14.25	xD							
					synchronized clock to watch								
	1025				14.25								
	1030				14.25								
					started test on linear scale								
					stopped - replaced slug								
	1040				14.26								
	1042				14.26								
	1048				14.25								
	1049				14.26								
	1052				Start test B								
	1053				Stopped test B								
	1104				14.26	xD		pulled	trans				
	1117				pulled slug, well cap tacked welded on								
	1130				left site								

Dave V. Bonham
FNL-MA 567 AT-6, Rev. 0.
4/30/93

Location 2-12, 200 W Date of Test 4/30/90

Well Number 299-W22-42 Procedure Number DUL-MH-567 AT-6, Rev 0

Type of Test(s) Slug withdrawal

Personnel Conducting Test Mel Thoresen (KEH) Jane V. Borghese (PNL)

WELL CONFIGURATION

Well Depth 245.35' from top of 4" Borehole Diameter ~~4"~~ JUS 8"

Well Casing Inside Diameter 4" Well Screen Inside Diameter 4"

Length of Screened Interval 20' Depth of Screen 245-225

Comments

SLUG INFORMATION

Slug Construction Materials galvanized steel

Length of Slug 6' Diameter of Slug 2 1/4"

Comments

Volume of Attachments (if applicable)

MEASUREMENT EQUIPMENT INFORMATION

	Make	Model	Serial Number
Electric Tape	N/A		
Steel Tape	see Aquifer test form		
Data logger			
Transducer			
Other			

Jane V Borghese 4/30/90

PNL MH-567 AT-6 Rev 0

9413223.0547

Equipment Record Form for the Installation and Removal of Data Loggers and Pressure Transducers

Initial Check: in lab		
Purpose of Installation: To record WL changes during slug test		
Monitored Hydrologic Unit or Water Body: sat screened interval		
Date/Time of Installation: 4/30/90 1015	Procedure Followed: PNL-MA Sec 7 WL-4, Rev 0	
Data Logger Make/Model: Insitu SE1000B		
Serial No.: 1KB-700	Number of Channels Used: 1	
Pressure Transducer Make/Model: Insitu PTX161D	Full Scale Range: 10psi	Well No.: 299-W22-42
	Serial No.: 259212	Depth: ~244
Pressure Transducer Make/Model:	Full Scale Range:	Well No.:
	Serial No.:	Depth:
Description of Data Logger Installation and Well Head Configuration: transducer set 1' from bottom of hole		
Comments:		
Equipment Installed By J.V Borghese		
Date/Time of Equipment Removal: 4/30/90 11 17		
Decontamination Procedure (if required): steam cleaned		
Equipment Removed By J. V Borghese, Mel Thoresen		

Jim V. Borghese
4/30/90

9413223.0549

DAILY BOREHOLE /WELL COMPLETIONLOG

Boring or Well Number _____ Sheet ____ of ____

Location 200 E Decontamination Pad Project W-017

Logged by Steve Airhart (Print) [signature] (Sign) Date 4-24-90

Reviewed by _____ (Print) _____ (Sign) Date _____

Lithograph Classification Scheme N/A Procedure WHC-S-014 Rev No. 4

Measuring Equipment N/A

Drilling Contractor KEH

Driller (Cleaner) Mel Thorsen

Rig/Equipment steam cleaner

Time	Casing/Screen Type	Diameter	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
										The following items were steam-
										cleaned in accordance w/
										WHC-S-014 Rev. 4 Section 7.5
									—	1" diameter riser pipe
									—	2 4½ Hp submersible pumps
										#'s L87-11-1965 & TA2-20-2415
									—	3 slugs
									—	1 3" dia dart bailer
										[signature] 4/24/90 0830

135

WHC-MR-0208

A-1800-004 (10/89)

(5/18/89, Rev. 0)

ELECTRONIC DATA CONTROL FORM

DATE AND START TIME OF DATA ACQUISITION 7/30/90 1052

DATE AND END TIME OF DATA ACQUISITION 7/30/90 1103

WELL NUMBER 299-W22-72

TYPE OF TEST OR DATA Slug withdrawal

TYPE AND IDENTIFICATION NUMBER OF DATA LOGGER

In situ SE1003 S/N 1170 - Foc.

TEST NUMBER 0

CHANNEL OR INPUT NUMBER 1

UNITS OF VALUES RECORDED ft from wtr level

NUMBER OF PAGES ATTACHED

COMMENTS:

DATA VALIDATION STATEMENT:

The attached data represent the data as originally recorded on the data logger. Any exceptions and reasons for such are indicated in the comments section.

Jim Bertram Scientist — 7/1/90

Name, title — Date

9413223.0550

SE1000B
Environmental Logger
04/30 15:30

Unit# 00700 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	9.98
Offset	0.00

Step# 0 04/30 10:52

Elapsed Time	Value
0.0000	0.00
0.0033	0.00
0.0066	0.00
0.0099	0.00
0.0133	- 10.30
0.0166	1.15
0.0200	3.38
0.0233	- 5.58
0.0266	0.92
0.0300	- 0.27
0.0333	- 1.13
0.0500	- 1.97
0.0666	- 1.80
0.0833	- 1.76
0.1000	- 1.68
0.1166	- 1.63
0.1333	- 1.57
0.1500	- 1.52
0.1666	- 1.46
0.1833	- 1.41
0.2000	- 1.36
0.2166	- 1.32
0.2333	- 1.27
0.2500	- 1.23
0.2666	- 1.19
0.2833	- 1.15
0.3000	- 1.12
0.3166	- 1.08
0.3333	- 1.04
0.4167	- 0.89
0.5000	- 0.75
0.5833	- 0.64
0.6667	- 0.55
0.7500	- 0.47

Well 299-W22-42
Slug withdrawal test #0 page 1 of 2

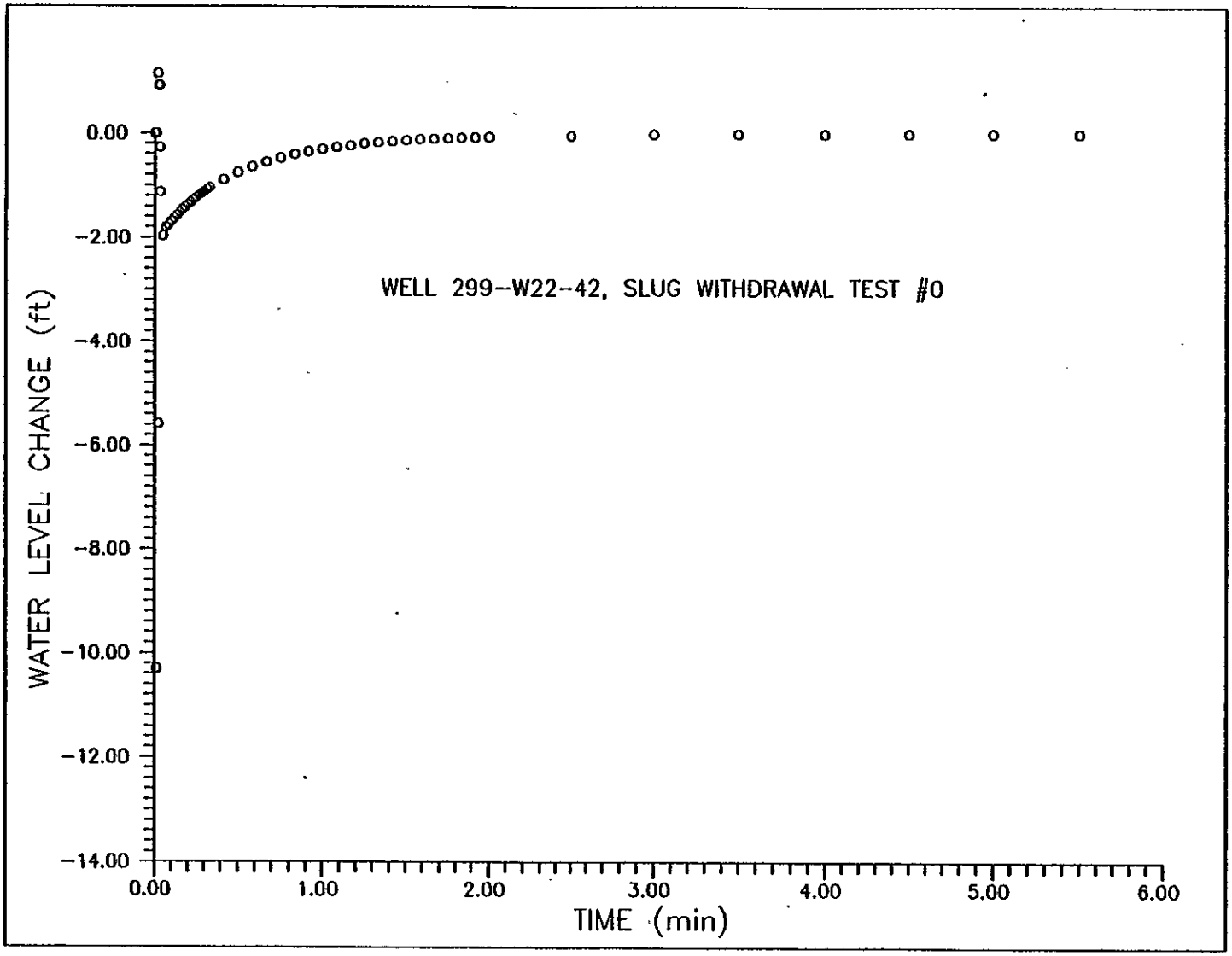
9413223.0551

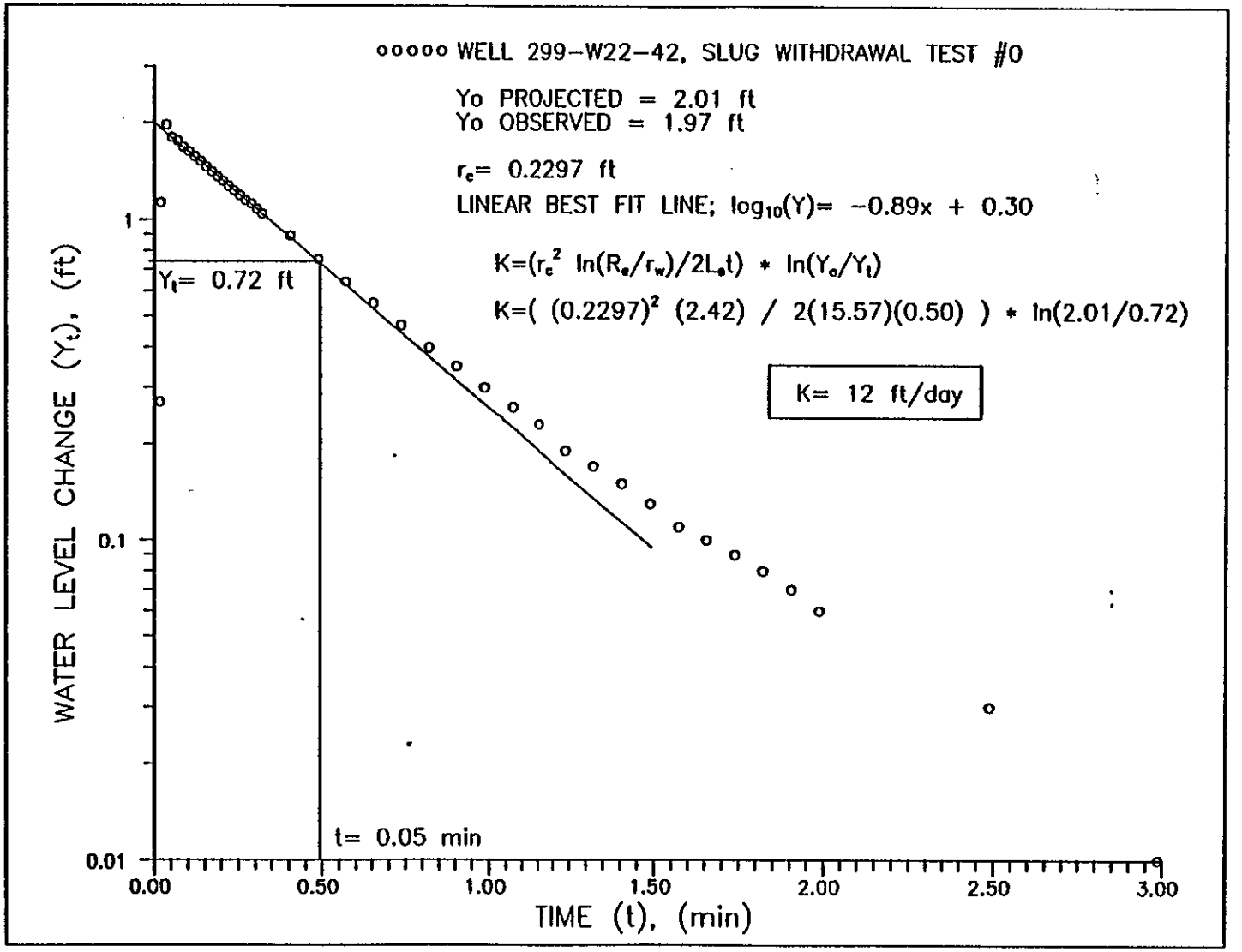
0.8333	-	0.40
0.9167	-	0.35
1.0000	-	0.30
1.0833	-	0.26
1.1667	-	0.23
1.2500	-	0.19
1.3333	-	0.17
1.4166	-	0.15
1.5000	-	0.13
1.5833	-	0.11
1.6667	-	0.10
1.7500	-	0.09
1.8333	-	0.08
1.9167	-	0.07
2.0000	-	0.06
2.5000	-	0.03
3.0000	-	0.01
3.5000	-	0.00
4.0000	-	0.00
4.5000	-	0.00
5.0000		0.00
5.5000		0.00
6.0000		0.00
6.5000		0.00
7.0000		0.00
7.5000		0.00
8.0000		0.00
8.5000		0.00
9.0000		0.00
9.5000		0.00
10.0000		0.00
11.0000		0.00

END

9413223.0552

Well 299-W22-42
Slug withdrawal test #0 page 2 of 2


WELL 299-W22-42, SLUG WITHDRAWAL TEST #0
WATER LEVEL CHANGE (ft)
0.00
-2.00
-4.00
-6.00
-8.00
-10.00
-12.00
-14.00
0.00
1.00
2.00
3.00
4.00
5.00
6.00
TIME (min)


ooooo WELL 299-W22-42, SLUG WITHDRAWAL TEST #0
Yo PROJECTED = 2.01 ft
Yo OBSERVED = 1.97 ft
r_c= 0.2297 ft
LINEAR BEST FIT LINE; $\log_{10}(Y)$= -0.89x + 0.30
$K=(r_c^2 \ln(R_e/r_w)/2L_e t) * \ln(Y_o/Y_t)$
$K=((0.2297)^2 (2.42) / 2(15.57)(0.50)) * \ln(2.01/0.72)$
K= 12 ft/day
Y_t= 0.72 ft
t= 0.05 min
WATER LEVEL CHANGE (Y_t), (ft)
1
0.1
0.01
0.00
0.50
1.00
1.50
2.00
2.50
3.00
TIME (t), (min)

WELL 299-W22-42, SLUG WITHDRAWAL TEST #0
****
THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.
****
****
RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.
****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2297	.3333	15.5700	15.5700	240.0000

****
Le/Rw = 46.7100000
A= 3.0229800
B= 4.898688E-001
C= 2.6137240
SANDPACK POROSITY= 3.000000E-001
t (min)= 5.000000E-001
1/t= 2.0000000
Yo= (ft) 2.0100000
Yt= (ft) 7.200000E-001
1/t ln(Yo/Yt)= 2.0532770
ln[(H-Lw)/Rw]= 6.0000000
ln(Re/Rw)= 2.4165910
****
K (ft/day) = 12.1100400
****
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 188.5534000
****

9413273.0555

Aquifer Test Data

page 1 of 1

Data for Well 299-W22-43

Pumping Well N/A

Observation Wells N/A

Location U-12 Crib, 200W

Type of Aquifer Test Slow withdrawal 4/23/90

How Q Measured N/A

How W.L.'s Measured Steel tape 1300-22

Rad./Dist. of/From Pumping Well N/A

Meas. Point for W.L.'s Top of 4" standpipe

Elevation of Meas. Point Not surveyed

Depth of Pump/Airpipe N/A

Pump On: date N/A time N/A

Pump Off: date N/A time N/A

Duration of Aquifer Test N/A

Time t = _____ at t' = 0					Water Level Data Static Water Level _____					Discharge		Recorded By	Comments
Day	Clock Time	t	t'	t/t'	Reading	Conversions or Corrections	Water Level	s or s'		Read-ing	Q		
4/23	1150						227.66						
	1152						227.59						
	1156												DTB: 245.41
	1211		Begin Test Ø - withdrawal										
	1237		Test complete.										
												4/23/90	
						ANL-MA-567, AT-6, Rev. 0							

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Location U12 crib, 200W Date of Test 4/23/90

Well Number 299-W22-43 Procedure Number AT-6, Rev. 0

Type of Test(s) withdrawal

Personnel Conducting Test JP McDonald, PNL; ME Thoresen, KEH

WELL CONFIGURATION

Well Depth 242.76' + 2.65' = 245.41' (from top of 4") Borehole Diameter 8"

Well Casing Inside Diameter 4" Well Screen Inside Diameter 4"

Length of Screened Interval 20.34' Depth of Screen 223.67' - 244.01' b.l.s.

Comments D/W = 227.60' from top of 4"
D/W = 227.59' " " " "

SLUG INFORMATION

Slug Construction Materials Galvanized steel

Length of Slug 6.0' Diameter of Slug 2 1/4"

Comments

Volume of Attachments (if applicable)

MEASUREMENT EQUIPMENT INFORMATION

	Make	Model	Serial Number	
Electric Tape				
Steel Tape	Lufkin	300'	L300-22	
Data logger	In-Situ	SE1000B	1KB-701	Test #
Transducer	Druck	PTX-161/A	259096	
Other				

4/23/90

PNL-MA-567, AT-6, Rev. 0

9113273.0557

9413223.0558

DRILL LOG	By: J P McDonald	Rig: Pump Setting Rig	Well Number: N/A	Computer Number: N/A	Project or Work Order No.: W-017
	Date: 4/23/90		Depth: Steam Cleaning		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Arrived at steam cleaning pad.	0710	
				Witnessed driller (Mel) steam clean 3 6'	0913	
				slugs. Slugs wrapped in plastic.	0945	
				Driller steam cleaned transducers (SN: 262362,	1020	
				SN: 259096). Unable to get corrosion off		
				transducer 257198. Other two transducers are		
				wrapped in plastic.		
				Leaving pad.	1045	

REMARKS:

[signature] 4/23/90

D - Drive Bar H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

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Equipment Record Form for the Installation and Removal of Data Loggers and Pressure Transducers

Initial Check: N/A		
Purpose of Installation: Slug withdrawl test		
Monitored Hydrologic Unit or Water Body: Unconfined Aquifer		
Date/Time of Installation: 4/23/90 1140	Procedure Followed: AT-6	
Data Logger Make/Model: In-Situ SE1000A		
Serial No.: 1KB-701	Number of Channels Used: 1	
Pressure Transducer Make/Model: Druck/PTX-161D	Full Scale Range: 20 psi	Well No.: 2-WZ2-43
	Serial No.: 259096	Depth: ~243'
Pressure Transducer Make/Model:	Full Scale Range:	Well No.:
	Serial No.:	Depth:
Description of Data Logger Installation and Well Head Configuration: well head is a 4" standpipe, transducer secured in place with tape.		
Comments: Test 0		
Equipment Installed By JP McDonald		
Date/Time of Equipment Removal: 4/23/90 1245		
Decontamination Procedure (if required): Transducer steam cleaned prior to installation		
Equipment Removed By JP McDonald		

4/23/90

PNL-MA-567, AT-6, Rev. 0

(5/18/89, Rev. 0)

ELECTRONIC DATA CONTROL FORM

DATE AND START TIME OF DATA ACQUISITION 4/25/90 12:11

DATE AND END TIME OF DATA ACQUISITION 4/25/90 12:36

WELL NUMBER 299 - W22 - 43

TYPE OF TEST OR DATA S/US WITHDRAWAL

TYPE AND IDENTIFICATION NUMBER OF DATA LOGGER

In - Situ SE1000B 1KB - 701

TEST NUMBER 0

CHANNEL OR INPUT NUMBER 1

UNITS OF VALUES RECORDED ft. from referenced level

NUMBER OF PAGES ATTACHED

COMMENTS:

DATA VALIDATION STATEMENT:

The attached data represent the data as originally recorded on the data logger. Any exceptions and reasons for such are indicated in the comments section.

Technician 4/30/90

Name, title Date

9113223.0560

SE1000B
Environmental Logger
04/23 12:41

Unit# 00701 Test# 0

INPUT 1: Level (F)

Reference	0.00
Scale factor	19.94
Offset	- 0.04

Step# 0 04/23 12:11

Elapsed Time	Value
0.0000	0.00
0.0033	0.00
0.0066	0.00
0.0099	- 0.00
0.0133	- 3.76
0.0166	1.08
0.0200	1.74
0.0233	- 3.54
0.0266	0.64
0.0300	- 0.50
0.0333	- 0.28
0.0500	- 1.14
0.0666	- 1.76
0.0833	- 1.40
0.1000	- 1.18
0.1166	- 1.01
0.1333	- 0.88
0.1500	- 0.76
0.1666	- 0.66
0.1833	- 0.59
0.2000	- 0.52
0.2166	- 0.46
0.2333	- 0.42
0.2500	- 0.37
0.2666	- 0.33
0.2833	- 0.30
0.3000	- 0.28
0.3166	- 0.25
0.3333	- 0.23
0.4167	- 0.15
0.5000	- 0.11
0.5833	- 0.08
0.6667	- 0.06
0.7500	- 0.05
0.8333	- 0.03
0.9167	- 0.03
1.0000	- 0.03

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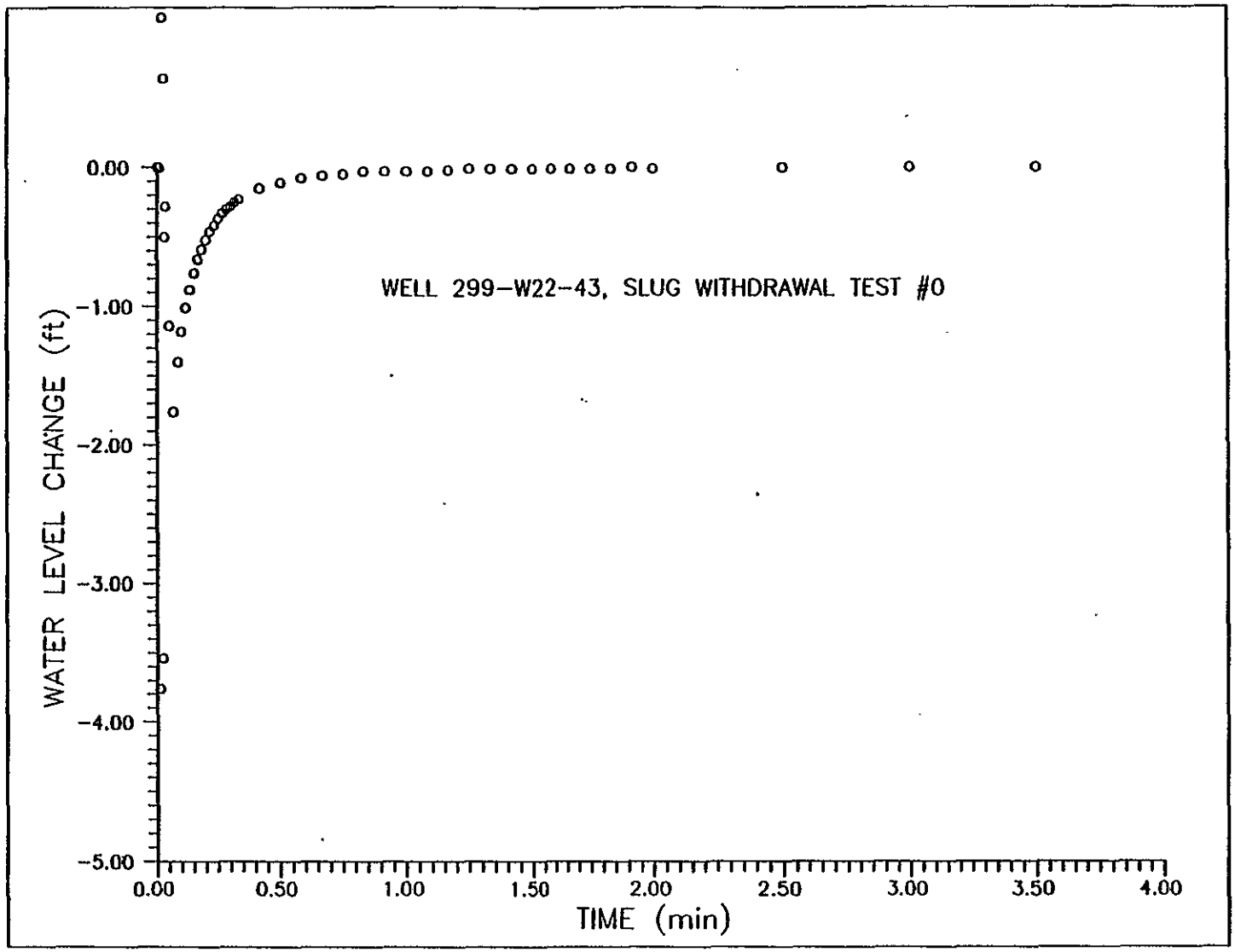
299-W22-43
Test 0 1 of 2

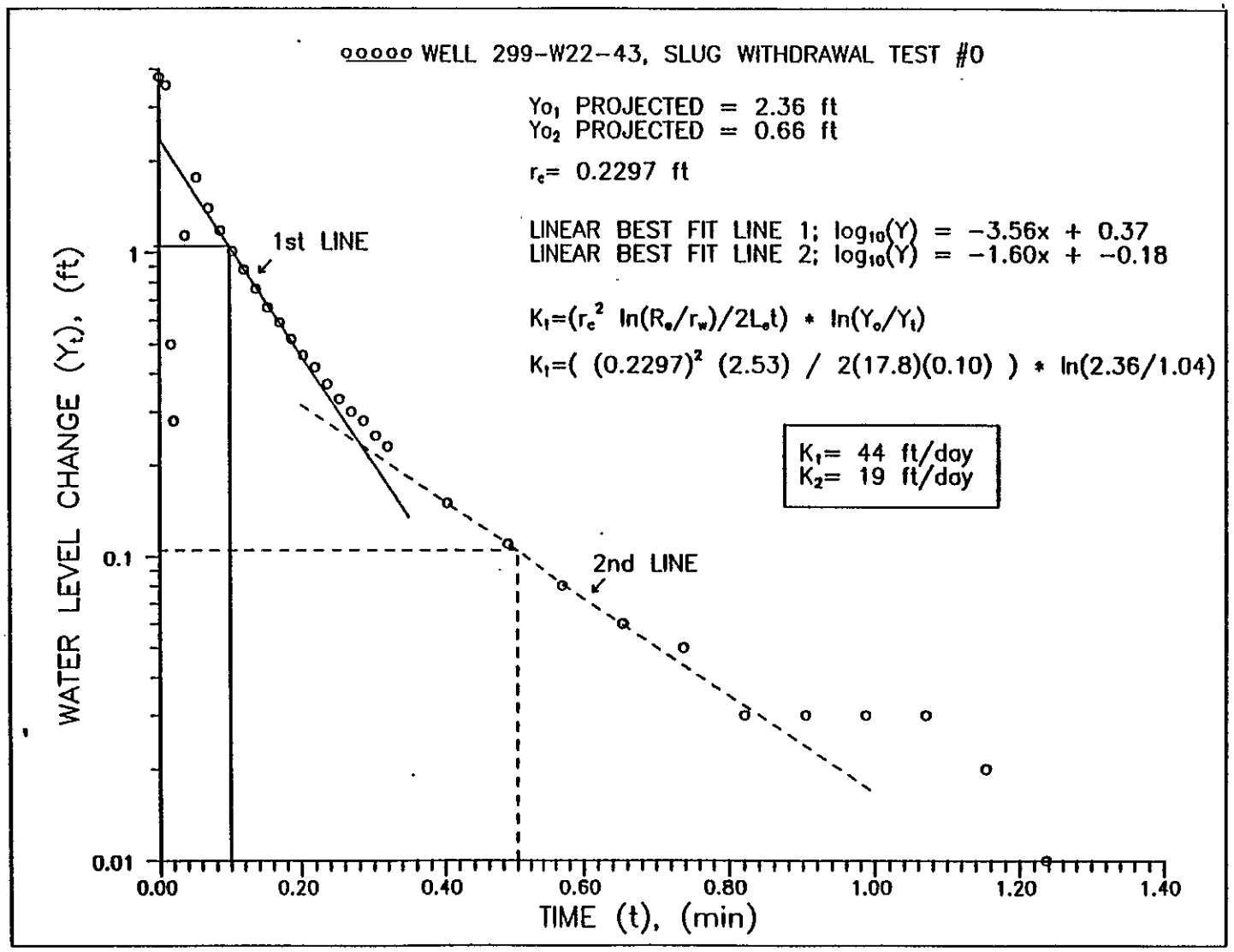
1.0833	- 0.03
1.1667	- 0.02
1.2500	- 0.01
1.3333	- 0.01
1.4166	- 0.01
1.5000	- 0.01
1.5833	- 0.01
1.6667	- 0.01
1.7500	- 0.01
1.8333	- 0.01
1.9167	0.00
2.0000	- 0.01
2.5000	0.00
3.0000	0.00
3.5000	0.00
4.0000	0.00
4.5000	0.00
5.0000	0.00
5.5000	0.00
6.0000	0.00
6.5000	0.01
7.0000	0.00
7.5000	0.00
8.0000	0.00
8.5000	0.00
9.0000	0.00
9.5000	0.00
10.0000	0.00
11.0000	0.00
12.0000	0.00
13.0000	0.00
14.0000	0.00
15.0000	0.00
16.0000	0.00
17.0000	0.00
18.0000	0.00
19.0000	0.00
20.0000	0.00
21.0000	0.00
22.0000	0.00
23.0000	0.00
24.0000	0.00
25.0000	0.00

END

9413223.0562

299-W22-43
Rev 0 2 of 2


WELL 299-W22-43, SLUG WITHDRAWAL TEST #0
WATER LEVEL CHANGE (ft)
0.00
-1.00
-2.00
-3.00
-4.00
-5.00
0.00
0.50
1.00
1.50
2.00
2.50
3.00
3.50
4.00
TIME (min)


ooooo WELL 299-W22-43, SLUG WITHDRAWAL TEST #0
Yo1 PROJECTED = 2.36 ft
Yo2 PROJECTED = 0.66 ft
rc= 0.2297 ft
LINEAR BEST FIT LINE 1; log10(Y) = -3.56x + 0.37
LINEAR BEST FIT LINE 2; log10(Y) = -1.60x + -0.18
K1=(rc2 ln(Re/rw)/2Let) * ln(Yo/Yt)
K1=((0.2297)2 (2.53) / 2(17.8)(0.10)) * ln(2.36/1.04)
K1= 44 ft/day
K2= 19 ft/day
1st LINE
2nd LINE
WATER LEVEL CHANGE (Yt), (ft)
1
0.1
0.01
0.00
0.20
0.40
0.60
0.80
1.00
1.20
1.40
TIME (t), (min)

WELL 299-W22-43, SLUG WITHDRAWAL TEST #0, 1st STRAIGHT LINE

****

THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.

****

****

RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.

****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2297	.3333	17.8200	17.8200	240.0000

****

Le/Rw = 53.4600000
A= 3.2102570
B= 5.220909E-001
C= 2.8209920
SANDPACK POROSITY= 3.000000E-001
t (min)= 1.000000E-001
1/t= 10.0000000
Yo= (ft) 2.3600000
Yt= (ft) 1.0400000
1/t ln(Yo/Yt)= 8.1944090
ln[(H-Lw)/Rw]= 6.0000000
ln(Re/Rw)= 2.5309940

****

K (ft/day) = 44.2267200

****

T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 788.1201000

****

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WELL 299-W22-43, SLUG WITHDRAWAL TEST #0, 2nd STRAIGHT LINE
****
THE BELOW HYDRAULIC CONDUCTIVITY VALUE WAS CALCULATED
USING THE BOUWER AND RICE SLUG TEST METHOD.
SOURCE= "THE BOUWER AND RICE SLUG TEST-AN UPDATE"
GROUND WATER, VOL 27, NO. 3, MAY-JUNE 1989.
****
****
RADIUS OF CASING USED IN CALCULATIONS HAS BEEN
CORRECTED FOR THE THICKNESS OF GRAVEL OR SAND
PACK DUE TO WATER LEVEL CHANGES IN THE SCREEN OR
OPEN INTERVAL OF WELL.
****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.2297	.3333	17.8200	17.8200	240.0000

****
Le/Rw = 53.4600000
A= 3.2102570
B= 5.220909E-001
C= 2.8209920
SANDPACK POROSITY= 3.000000E-001
t (min)= 5.000000E-001
1/t= 2.0000000
Yo= (ft) 6.600000E-001
Yt= (ft) 1.100000E-001
1/t ln(Yo/Yt)= 3.5835190
ln[(H-Lw)/Rw]= 6.0000000
ln(Re/Rw)= 2.5309940
****
K (ft/day) = 19.3409000
****
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 344.6548000
****

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APPENDIX F

GEOLOGIC LOGS

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 2/28/90 Sheet No. 1 of 1 Project W-017 216 U-12 CRIB

Logged by P.S. INNIS, Reviewed by [illegible] Date 2/28/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL B.E #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0700	ARRIVE AT LAYDOWN
											YARD.
										0715	OBSERVED STEAM
											CLEANING OF DRILL
											TOOLS.
								REF WHC-S-014 SECTION 7.6		0800	OBSERVED STEAM
											CLEANING OF RIG
											TOOLS & RIG AFTER
											FREE OF DIRT, OIL
											ETC.
										0915	MOVING RIG
										0935	ARRIVED AT
											WELL SITE. DRILLER
											SETTING UP RIG
										1200-1230	LUNCH
										1230	
										1300	DRILLERS MEETING
											CONTINUED RIG/SITE
								REF WHC-S-014 SECTIONS 7.2			SETUP.
								DRILLER USING FOOD GRADE OIL ON TOOLS			
										1530	OFF SITE

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/1/90 Sheet No. 1 of 2 Project W-017 216-U-12 CRIB

Logged by P.S. Innis (GAI) Date 3/1/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme Folk Procedure D.O.1 Rev 0

Drilling Contractor KEH
Driller Louis Watkins
Rig/Method Cable Tool BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								10" Casing appears clean - steam		0700	Geologist & Driller
								cleaning not witnessed			on site
										0715	Set up exclusion zone
										0840	Drilling began
5'	GM	KDET	M	Lith	2		S	SAND, Tr. Gravel, 90% Sand, 10% Mud		0850	Pulled Core Barrel
				Moist	1			60%MS, 20%FS, 10%VFS, 10%Mud			(C.C.B.) Sample
								Well Sorted; SAND: 35% Basalt (mafic),		0905	Driller placing
								60% Felsic, 5% Amphiboles, Mica & other; SR-A			9.4' of 10" Carbon
								Pale Yellow (2.5Y7/4) to Lt Yellowish Brown			Steel Casing
								(2.5Y6/4); Strong Rxn to 10% HCl,			Shoe O/D = 0.97'
								Unconsolidated		0920	Driller welding
											9.6' of 10" C.S.
											Casing totaling
											19.0' (18'-11¾")
										1020	Drilling began
10'	GM	KDET	M	Lith	2		(gm)S	Slightly Gravelly Slightly Muddy SAND		1055	Pulled CB Sample
				Moist	1			10% Gravel, 80% Sand, 10% Mud; 3% MP,			
								3% FP, 4% VFP, 10% VCS, 25% CS, 20% MS,			
								15% FS, 10% VFS, 10% Mud; Poorly Sorted			
								Gravels: 10% Basalt, 10% Qtz, Granitics,			
								10% Diorite, 10% Quartzite, Caliche & Other			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/1/90 Sheet No. 2 of 2 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS, Pamela S. Innis (GAI) Date 3/1/90 Reviewed by J.R. McKhan Date 4-24-90 Lith. Class. Scheme FOLK Procedure DD.1 REV 0	Drilling Contractor KEH Driller LOUIS WATKINS Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
10'								(CONT) R-SR; SANDS: 65% BASALT (MAFIC)			
								35% QTZ, FELSIC SR-A; LT. YELLOWISH		1115	RPT OFF SITE
	PID	LDET						BROWN (2.5Y6/4), MODERATE RXN TO HCl,		1135	S.S.O TOOK CONTAM READING
								UNCONSOLIDATED; GREATER BASALT IN SANDS		1200-1230	LUNCH
										1240	RPT ON SITE - DRILLING BEGAN
15'	GM	LDET	M	LITH	2		(m)S	SLIGHTLY MUDDY SAND, 89% SAND, 11% MUD		1300	PULLED CB SAMPLE
				MOIST	1			1% CS, 60% MS, 17% FS, 11% VFS, 11% MUD			
								WELL SORTED; SAND: 65% BASALT, 30% QTZ		1310	DRILLER WELDING
								FELSIC, 5% MICA & OTHER SR-SA; LT. YELLOWISH			10.5 OF 10" C.S.
								BROWN, MODERATE RXN TO HCl, UNCONSOLIDATED			CASING TOTALING
											29.5' (29'-6")
20'	GM	LDET	M	LITH	2		mS	MUDDY SAND) 78% SAND, 22% MUD		1330	TOOK START OF HOLE
				MOIST 40ml	1			35% FS, 43% VFS, 22% MUD, WELL SORTED			VOA OPENED BLANKS
				VOA 250ml	2			SAND: 30% BASALT (MAFIC), 55% QTZ, FELSIC,		1410	DRILLING BEGAN
				CHEM	2			15% MICA, SR-SA; LT OLIVE BROWN		1445	PULLED CB SAMPLE
								(2.5Y 5/4), MODERATE TO STRONG RXN TO HCl			
								SLIGHTLY CONSOLIDATED		1530	OFF SITE
								CHAIN OF CUSTODY 030190 216U12W22-40			
								TOTAL FOOTAGE 24'			
								CASING AT 23'			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/2/90	Sheet No. 1 of 2
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. INNIS — Date 3/2/90
Reviewed by T.L. McLellan — Date 4-24-90
Lith. Class. Scheme FOLK — Procedure DD1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
24'	AT START									0700	ARRIVE ON SITE
										0750	RPT ON SITE
											DRILLING BEGIN
25'	GM	FDET	D	LITH	2		(g)S	SLIGHTLY GRAVELLY SAND, 8% GRAVEL, 84% SAND		0805	PULLED CP TOOLS
				MOIST	1			8% MUD, TR. CP, 2% MP, 3% FP, 3% VFP, 8% VCS			
								32% CS, 25% MS, 10% FS, 2% VFS, 2% MUD;			
								POORLY SORTED; GRAVELS: 65% BASALT (MAFIC),		0910	DRILLER WELDING
								35% QTZ. GRANITICS SR; SANDS: 70% BASALT,			9.9' OF 10" C.S.
								25% QTZ. FELSIC, 5% OTHER SR-SA; LIGHT			CASING TOTALING
								OLIVE BROWN (2.5Y5/4), MOD RXN TO 10%			39.4' (39'-5¼")
								HCl, [illegible]		1010	DRILLING CONTINUED
30'	GM	FDET	P	LITH	2		(g)S	SLIGHTLY GRAVELLY SAND, 6% GRAVEL, 88% SAND		1120	PULLED CB SAMPLE
	PID	FDET		MOIST	1			6% MUD, TR. CP, TR. MP, 3% FP, 3% VFP,		1130	RPT OFF SITE
								5% VCS, 25% CS, 30% MS, 18% FS, 10% VFS,			
								6% MUD; MODERATELY SORTED; GRAVELS:			
								70% BASALT, 15% QTZ. GRANITICS, 15%			
								CARBONATE CLASTS & OTHER SR; SAND: 60% BASALT			
								40% QTZ, FELSIC, TR. MICA SR-SA; LIGHT		1200-1230	LUNCH
								OLIVE BROWN (2.5Y5/4), MOD RXN TO HCl			
								UNCONSOLIDATED			

WHC-MR-0208

DAILY BOREHOLE LOG	Boring or Well Number 299 W22-40 Location 200 WEST	Date 3/2/90 Project W-017 216-U-12 CRIB	Sheet No. 2 of 2

Logged by P.S. INNIS Pamela S. Innis	Date 3/2/90	Drilling Contractor KEH	
Reviewed by J.L. Westman	Date 4-24-90	Driller LOUIS WATKINS	
Lith. Class. Scheme FOLK	Procedure DOI REV 0	Rig/Method CABLE TOOL RE #22-14103	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										1245	RPT ON SITE
											DRILLING BEGIN
35'	GM	KDET	D	LITH	2		S	SAND, 4% GRAVEL, 90% SAND, 6% MUD		1340	PULLED CB SAMPLE
	PID	KDET		MOIST	1			1% CP, 1% MP, 1% FP, 1% VFP, 5% VCS, 25% CS,			
								35% MS, 15% FS, 10% VFS, 6% MUD; MOD. SORTED			
								GRAVELS: 55% BASALT, 20% QTZ, GRANITICS,			
								25% CARBONATE CLASTS. SR; SAND: 60% BASALT		1405	DRILLER WELDING
								30% QTZ FELSIC, 10% HIGH ANGLE BASALT; OTHER SR-			10.2' OF 8" C.S.
								SA; LT. OLIVE BROWN 2.5Y5/4, MOD. BRN			CASING TOTALING
								TO HCl, UNCONSOLIDATED			49.6' (49'-7 3/4")
										1530	OFF SITE
								TOTAL FOOTAGE 11'			
								CASING AT 39'			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/5/90 Sheet No. 1 of 3 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS, Pamela S. Innis (GAI) Date 3/5/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme FOLK Procedure DD 1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
35'	AT START									0700	GEOLOGIST ON SITE
										0815	DRILLER ON SITE
										0940	RPT ON SITE —
											DRILLING BEGAN
40	GM	KDET	D	LITH	2		S	SAND, 2% GRAVEL, 90% SAND, 8% MUD; 1% FP		1010	PULLED CB SAMPLE
				MOIST 40 ml	1			1% VFP, 1% VCS, 4% CS, 40% MS, 30% FS,			CHAIN OF CUSTODY
				VOA 250 ml	2			15% VFS, 8% MUD; WELL TO MOD. SORTED;			030590 216U12W22-40
				CHEM	2			GRAVELS: 35% BASALT, 20% QTZ, GRANITICS,			
								5% DIORITE, 40% CARBONATE CLASTS & CALICHE			
								SR-A; SAND: 20% BASALT 77% QTZ, FELSIC			
								3% MICA SR-A, LT OLIVE BROWN (2.5Y5/4)			
						43		MODERATE RXN TO HCL, UNCONSOLIDATED			
43'	GM	KDET	M	LITH	2	44	mS	MUDDY SAND, 70% SAND, 20% MUD, 70% VFS		10:25	PULLED SPECIAL CB
				MOIST 40 ml	1			20% MUD; WELL SORTED; SAND. 20% BASALT			SAMPLE.
				VOA 250 ml	2			60% QTZ, FELSIC, 20% MICA SR-SA; LT. OLIVE			CHAIN OF CUSTODY
				CHEM	2			BROWN (2.5Y6/4); STRONG RXN TO HCL, SLIGHTLY			030590 216U12W22-40
								CONSOLIDATED, 1 FT INTERVAL			
45	GM	KDET	D	LITH	2		S	SAND, 3% GRAVEL, 91% SAND, 6% MUD, TR CP		1050	PULLED CB SAMPLE
	PID	KDET		MOIST	1			TR. MP, 1% VFP, 2% VFP, 15% VCS, 25% CS,			
								30% MS, 15% FS, 6% VFS, 6% MUD; MODERATELY			
								SORTED; GRAVEL: 50% BASALT, 20% QTZ,			

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9413223.0575

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-110	Date 3/5/90	Sheet No. 2 of 3
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. INNIS Date 3/5/90
Reviewed by W.L. McElhan Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL RE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
45								(CONT) GRANITICS, 30% CARBONATE CLASTS R-SA; SAND: 35% BASALT, 65% QTZ, FELSIC, TR. MICA SR-A; LT. OLIVE BROWN (2.5Y5/4), MOD RXN TO HCl, UNCONSOLIDATED MATERIAL FINER AT 48'-49'		1130	RPT OFF SITE DRILLER WELDING 9.9' OF 2" C.S. CASING TOTALING 59.5' (59'-6 3/4")
										1200-1230	LUNCH
										1240	RPT ON SITE, WELDING CONTINUED
										1305	DRILLING BEGINS
50'	GM	KDET	D	LITH	2		S	SAND 1% GRAVEL, 93% SAND, 6% MUD, 1% VFP, 2% VCS, 11% CS, 45% MS, 20% FS, 15% VFS, 6% MUD, WELL TO MOD. SORTED; GRAVELS 50% BASALT, 15% QTZ, FELSIC, 30% CARBONATE CLASTS & CALICHE, 5% MICA, SR-SA; SAND: 20% BASALT, 70% QTZ, FELSIC 5% QUARTZITE, 5% MICA SR-A; LT. OLIVE BROWN 2.5Y5/4, MOD RXN TO HCl, UNCONSOLIDATED		1330	PULLED CB SAMPLE
				MOIST	1						
55	GM	KDET	D	LITH	2		S	SAND, 4% GRAVEL, 91% SAND, 5% MUD 1% FP, 3% VFP, 3% VCS, 20% CS, 40% MS 20% FS, 8% VFS 5% MUD; WELL - MOD. SORTED		1410	PULLED CB SAMPLE
				MOIST	1						

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9413223.0576

DAILY BOREHOLE LOG	Doring or Well Number 299-W22-40 Location 200 WEST	Date 3/5/90 Sheet No. 3 of 3 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS Pamela S. Innis Geo. Date 3/5/90
Reviewed by N.L. McGhan Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV.0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL B.E #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
55'								(CONT) GRAVELS: 60% BASALT, 15% QTZ, GRANITICS, 20% DIORITE, 5% CARBONATE CLASTS 1 OTHER SR-SA; SAND: 30% BASALT, 70% QTZ FELSIC, SR-A; LT. YELLOWISH BROWN 2.5Y6/4; MOD RXN TO HCl, UNCONSOLIDATED, LESS [illegible] PREVIOUS SAMPLE		1445	DRILLER WELDING 10.2' OF 10" CS CASING TOTALING 67.7' (67'-9")
								TOTAL FOOTAGE 20' CASING AT 55'		1530	OFF SITE

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9413223.0577

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/6/90 Sheet No. 1 of 3 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS, Pamela S. Innis (GAI) Date 3/6/90
Reviewed by V.L. McElhaney Date 4-24-90
Lith. Class. Scheme FOLK Procedure p.0 1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKIN
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
55'	AT	START								0700	GEOLOGIST, DRILLER &
											S.S.O. ON SITE
											DRILLERS CONTIN. WELDING
										0840	RPT ON SITE - DRILLING BEGAN
60'	GM	KDET	D	LITH	2		(g)S	SLIGHTLY GRAVELLY SAND, 5% GRAVEL, 90% SAND,		0900	PULLED CB SAMPLE
				MOIST 40 ml	1			5% MUD, 1% CP, TR. MP, 2% FT, 2% VFP, 10% VCS			CHAIN OF CUSTODY
				VOA 250 ml	2			25% CS, 35% MS, 12% FS, 8% VFS, 5% MUD			030690 216-U-12 W22-40
				CHEM	2			MODERATELY SORTED; GRAVELS: 60% BASALT,			
								25% QTZ, GRANITIC, 10% DIORITE, 5% CARBONATE			
								CONCRETION R-SA; SAND: 30% BASALT,			
								70% QTZ FELDS TR MICA SR-A; LT YELLOWISH			
								BROWN 2.5Y6/4; SLIGHT [illegible] HCl, UNCONSOLIDATED.			
						63.5					
64'	GM	KDET	M	LITH	2	64	(m)S	SLIGHTLY MUDDY SAND, 82% SAND, 18% MUD		0955	PULLED SPECIAL CB
				MOIST 40 ml	1			5% FS, 77% VFS, 18% MUD, WELL SORTED;			SAMPLE
				VOA 250 ml	2			SAND: 15% BASALT, 75% QTZ, FELDS, 10% MICA			CHAIN OF CUSTODY
				CHEM	2			SR-A; LT OLIVE BROWN (2.5Y5/4); MODERATE			030690 216-U-12 W22-40
								TO STRONG RXN TO HCl, SLIGHTLY CONSOLIDATED, 0.5' THICK.			
65'	GM	KDET	D	LITH	2		gS	GRAVELLY SAND, 10% GRAVEL, 90% SAND,		1005	PULLED CB SAMPLE
				MOIST	1			5% MUD; 1% MP, 4% FT, [illegible], 10% VCS,			
								25% CS, 35% MS, 9% FS, 6% VFS, 5% MUD			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/6/90 Sheet No. 2 of 3 Project W-017 216-U-12

Logged by P.S. INNIS (GAI) Date 3/6/90
Reviewed by D.L. Weldon Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.I REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
65'								(CONT) MODERATELY SORTED; GRAVELS - 45% BASALT		1035	DRILLER WELDING
								20% QTZ [illegible], 15% DIOR[illegible], 10% CALICHE			10-1' OF 10" C.S.
								10% VOLC. ALTERATIONS, MUDSTONE MICA & OTHER			CASING TOTALING
								SR-SA; SAND: 30% BASALT, 65% QTZ			79.8' (79-9 3/4)
								FELSIC, 5% AMPHIBOLES SR-A; LT. YELLOWISH			CORRECTED BY +2.0'
								BROWN (2.5Y6/4); MOD-STRONG RXN TO HCl			FROM 3/5/90 TOTAL
								UNCONSOLIDATED		11.15	RFT ON SITE
										11.45	DRIVING CASING
										1200-1220	LUNCH
										1315	RFT ON SITE DRILLING READY
70'	GM	KDET	D	LITH	2		S	SAND, TR. GRAVEL 94% SAND, 6% MUD,		1330	PULLED CB SAMPLE
				MOIST	1			TR. VFP, 6% VCS, 28% CS, 40% MS, 12% FS,			
								8% VFS, 6% MUD; WELL TO MODERATELY SORTED;		1345	RFT OFF SITE
								GRAVELS - 40% BASALT, 10% QTZ, GRANITIC, 10% DIORITIC		1400	RFT ON SITE
								40% CARBONATE CALICHE SR-SA; SAND: 20% FELSIC			
								80% QTZ FELSIC WITH MICA, SR-A; LT. YELLOWISH			
								BROWN (2.5Y6/4), MODERATELY SORTED			
								UNCONSOLIDATED, INCLUDES FELDSPARS IN SAND			
75'	GM	KDET	D	LITH	2		S	SAND 2% GRAVEL, 93% SAND, 5% MUD,		1410	PULLED CB SAMPLE
				MOIST	1			1% FP, 1% VFP 5% VCS, 31% CS, 40% MS, 10% FS,			
								7% VFS, 5% MUD, WELL TO [illegible]			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/6/90 Sheet No. 3 of 3 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS, [illegible] Date 3/6/90 Reviewed by [illegible] Date 4-24-90 Lith. Class. Scheme FOLK Procedure DO.1 REV 0	Drilling Contractor KEH Driller LOUIS WATKINS Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class.	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
75								(CONT) GRAVELS: 50% BASALT, 30% QTZ. GRANITICS 20% CARBONATE CLASTS: CALICHE R-SA; SAND: 15% BASALT, 85% QTZ, FELSIC WITH MICA & AMPHIBOLES SR-A; LT. YELLOWISH BROWN (2.5Y6/4); MOD. RXN TO HCl, UNCONSOLIDATED			
80	GM	KDET	D	LITH	2		S	SAND, 4% GRAVEL, 90% SAND, 6% MUD, TR. MP, 2% FP, 2% VFP, 3% VCS, 32% CS, 40% MS, 9% FS, 6% VFS, 6% MUD; WELL TO MODERATELY SORTED; GRAVELS 40% BASALT, 15% QTZ. GRANITICS, 45% CARBONATE CLAST: CALICHE SR-SA; SAND: 20% BASALT, 80% QTZ, FELSIC SR-A; LT. YELLOWISH BROWN (2.5Y6/4); MOD RXN TO HCl, UNCONSOLIDATED		1440	PULLED CB SAMPLE CHAIN OF CUSTODY 03061902 216U12W22-40
				MOIST 40 ml	1						
				UOA 250 ml	2						
				CHEM	2						
								INCREASE IN CARBONATE CLASTS		1500	RIG SHUT DOWN
										1530	OFF SITE
								TOTAL FOOTAGE 25' CASING AT 77'			

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9413223.0580

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/7/90 Sheet No. 1 of 3 Project W-017 216-U-12

Logged by P.S. INNIS [signature] (GAI) Date 3/7/90
Reviewed by D K McBean Date 4-24-90
Lith. Class. Scheme FOLK Procedure DOI REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method UELE TOOL B.S. #[illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
80'	AT	START								0700	ARRIVE ON SITE
										0710	DRILLER WELDING 10.4'
											OF 10" C.S. CASING
											TOTALING 90.2'
											(90'-2¼") USING DEAD-
											MAN TO KEEP CASING OFF
											GROUND
										0805	RPT ON SITE
								WHC-S-014 REV. 4 SECT. 7.5		0830	COVERED CASING/TOOLS
											WITH PLASTIC
										0900	DRILLING BEGAN
85'	PID	KOH	M	LITH	2		S	SAND, TR GRAVEL, 93% SAND, 7% MUD		0955	PULLED CB SAMPLE
	GM			MOIST	1			TR VFP, 3% VCS, 10% CS, 50% MS, 20% FS,			
								10% VFS, 7% MUD WELL TO MOD. SORTED;			
								GRAVELS: 60% F[illegible] 20% [illegible] GRANITIC,			
								5% DIORITE, 15% CARBONATE [illegible]; SR-SA			
								SAND 25% BASALT, 75% QTZ, FELSIC W/AMPHIBOLES			
								¼ MICA SR-F; BROWN (10YR5/3); MOD			
								REN TO HCl, UNCONSOLIDATED			
										1020	71'
										1035	90'

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9413223.0581

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/7/90 Sheet No. 2 of 3 Project W-17 216-W-12 [illegible]

Logged by P.S. INNIS, Pamela S. Innis Date 3/7/90
Reviewed by V.L. McKellar Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.I Rev.2

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL RIG #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
87'	GM	(DET)	M	LITH	2	87' 88'	(m)S	SLIGHTLY MUDDY SAND, 85% SAND, 15% MUD		1020	PULLED SPECIAL
				MOIST 110 ml	1			30% FS, 55% VFS, 15% MUD; WELL SORTED			CB SAMPLE
				VOA 250 ml	2			SAND 20% BASALT, 70% QTZ, FELSIC, 10% MICA			CHAIN OF CUSTODY
				CHEM	2			SR-A; YELLOWISH BROWN 10YR5/4, STRONG			03079021611W22-40
								RXN TO HCl, SLIGHTLY CONSOLIDATED; 1.0' THICK			
90'	GM	(DET)	M	LITH	2		S	SAND, 3% GRAVEL, 90% SAND, 7% MUD		1035	PULLED CB SAMPLE
				MOIST	1			1% FP, 2% VFP, 3% VCS, 12% CS, 50% MS,			
								18% FS, 7% VFS, 7% MUD; WELL TO MOD. SORTED			
								GRAVELS: 65% BASALT, 10% QTZ, GRANITICS, 5% DIORITE		1050	DRILLER WELDING
								15% CARBONATE CLASTS, CALICHE, 5% MICA/OTHER			12.6 OF 10" C.S
								SR-SA; SAND: 20% BASALT, [illegible]			CASING TOTALING
								FELSIC WITH [illegible]; BROWN 10YR5/3			102.8' (102'-10")
								MOD. RXN TO HCl, UNCONSOLIDATED.		1115	RPT OFF SITE
										1200-1230	LUNCH
										1230	
										1315	S-10 PROJECT MEETING
										1320	DRILLING BEGAN
95'	GM			LITH	2		S	SAND, TR GRAVEL, 92% SAND, 8% MUD,		1420	PULLED CB SAMPLE
				MOIST	1			TR FP, 3% VCS, 10% CS, 50% MS, 20% FS,			
								9% VFS, 8% MUD; WELL TO [illegible]			
								GRAVELS, 70% BASALT, 10% QTZ, [illegible]			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/7/90 Sheet No. 3 of 3 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS (Pamela S. Innis) Date 3/7/90 Reviewed by W.K. Ritchie Date 4-24-90 Lith. Class. Scheme FOLK Procedure D.O.1 REV 0	Drilling Contractor KEH Driller LOUIS WATKINS Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
95								CONT 10% DIORITE, 10% CARBONATE CLASTS;			
								OTHER SR-SA SAND; 20% BASALT, 75% QTZ,			
								FELSIC, 5% MICA, AMPHIBOLES; OTHER, SR-A			
								LT YELLOWISH BROWN (2.5Y6/4), MODERATE RXN			
								TO HCl, UNCONSOLIDATED; INNER BEDS OF			
								MUDDY SAND SIMILAR TO 87' FOUND 92-93			
						A7		94'-94.5'.			
100	GM	LOET	M	LITH	2		mS	MUDDY SAND, 78% SAND, 22% MUD,		14:50	PULLED CR SAMPLE
				MOIST 40ml	1	100		34% FS, 44% VFS, 22% MUD, WELL TO MOD			CHAIN OF CUSTODY
				VOA 250 ml	2			SORTED, SAND: 20% BASALT, 70% QTZ,			030790 216U12 W22-40
				CHEM	2			FELSIC, 10% MICA SR-A; LT YELLOWISH		1500	RIG SHUT DOWN
								BROWN (2.5Y6/4); MOD. RXN TO HCl,		1530	OFF SITE
								UNCONSOLIDATED LITHOLOGY CHANGE			
								AT 97'.			
								TOTAL FOOTAGE 20'			
								CASING AT 99'			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/8/90 Sheet No. 1 of 2 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS Pamela S. Innis (GAE) Date 3/8/90
Reviewed by D.K. McKelvey Date 4-27-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKIN
Rig/Method CABLE TOOL B.E. #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0700	ARRIVE ON SITE.
100	PID	KDET									DRILLER & SSO ON SITE
										0720	DRILLER WELDING
											10.4' OF 10" C.S.
											CASING TOTALING
											113.2 (113' 2 3/4")
										0830	DRILLING BEGAN
										0920	J. GIBSON ON SITE -
						102					WHC SURVEILLANCE
105	GM	KDET	D	LITH	2		S	SAND, 4% GRAVEL, 90% SAND, 6% MUD,		0935	PULLED CB SAMPLE
				MOIST	1			2% FF, 2% VFF, 4% VCS, 20% CS, 40% MS, 16% FS			
								10% VFS, 6% MUD; MODERATELY SORTED, GRAVELS:			
								60% BASALT, 15% QTZ GRANITICS, 25% CALICHE/			
								CARBONATE CLASTS, SR-SA; SAND: 20% BASALT			
								75% QTZ FELDSPAR, 5% MICA, L.A.; LT. YELLOWISH			
								BROWN 2.5Y 6/4, MOD. RXN TO HCl, UNCONSOLIDATED			
								CHANGE TO SAND FROM MUDDY SAND AT 102'.			
						108					
110	GM	KDET	M	LITH	2		(m)S	SLIGHTLY MUDDY SAND, 82% SAND, 18% MUD		1015	PULLED [illegible]
				MOIST	1			35% FS, 47% VFS, 18% MUD; WELL SORTED;			
								SAND: 10% BASALT, 75% QTZ FELDSPAR, 15% MICA			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/8/90 Sheet No. 2 of 2 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS [signature] Date 3/8/90
Reviewed by D.L. McElhaney Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.I REV. 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
110'								(CONT) SR-A; LT OLIVE BROWN 2.5Y5/4		1040	DRILLER WELDING
								STRONG RXN TO 10% HCl, SLIGHTLY CONSOLIDATED			10.2' OF 10" C.S.
								LITH CHANGE AT 108'			CASING TOTALING
											123.4 (123'-4¾")
										1200-1230	LUNCH
										1240	RPT ON SITE
										1245	WELDING CONTINUED
										1300	DRILLING BEGAN
115	GM	KDET	D	LITH	2		(m)S	SLIGHTLY MUDDY SAND; 82% SAND, 18% MUD,		1330	PULLED CB SAMPLE
				MOIST	1			15% FS, 67% VFS, 18% MUD, WELL SORTED;			
								SAND: 15% BASALT, 70% QTZ, FELSIC, 15% MICA			
								SR-A; LT OLIVE BROWN (2.5Y5/6); STRONG			
								RXN TO HCl, SLIGHTLY CONSOLIDATED			
120	GM	KDET	D	LITH	2		S	SAND, 91% SAND, 9% MUD, TR. VCS, 11% CS		1420	PULLED CB SAMPLE
				MOIST 40 ml	1			35% MS, 30% FS, 15% VFS, 9% MUD; MODER.			CHAIN OF CUSTODY
				VOA 250 ml	2			SORTED; LT. YELLOWISH BROWN (2.5 6/4)			030890 216-U-12 W22-40
				CHEM	2			MODERATE RXN TO HCl, UNCONSOLIDATED		1500	RIG SHUT DOWN
										1530	OFF SITE
								TOTAL FOOTAGE 20'			
								CASING AT 120'			

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9413223.0585

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/9/90	Sheet No. 1 of 3
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by C.D. Conrad (GJ) Date 3/8/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV 0

Drilling Contractor KEH
Driller Louis Watkins
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	GEOLOGIST AND DRILLER
											ON SITE. RIG IS WARM-
											ING UP.
119.6'	SIP1000 PID	DET									SSO MON. BOREHOLE
								DEPTH TO BOTTOM: 120.7' - 3.6' + 2.5' = 119.6'		0710	DEPTH TO BOTTOM
								TOTAL 10" C.S. CASING = 123.4'		0720	DRILLER PREPARING TO
											ADD 10" C.S. CASING
										0750	RAT ON SITE
								CLEANING OF 8" CARBON STEEL CASING WAS		0825	TRUCK AND CRANE ON
								USUALLY WITNESSED AND INSPECTED ON 3/8/90.			SITE TO UNLOAD 8" C.S.
								ACCEPTED. REFERENCE WHC-6-014 REV. 4 SECT. 7.6			CASING
								123.4' + 10.0' = 133.4'		0905	10" C.S. CASING ADDED
										0910	DRILLING WITH C.B.
											BEGINS
										0930	BCS CAMERA CREW ON
											SITE. PHOTOGRAPHING
											AND VIDEO TAPING
											DRILLING ACTIVITIES
125'	SIP1000 PID	DET	SM	LITH	2	125'	S	SAND (97% SAND, 3% MUD) 3% VCS, 5% CG,		0955	SAMPLE - C.B.
	SM	DET		MOIST	1			50% MS, 30% FG, 9% VFS, 3% MUD. MODERATE			
								TO WELL SORTED. SAND; 36% BASALTIC/MAFIC		1000	DRILLING RESUMES

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9413223.0586

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/9/90 Sheet No. 2 of 3 Project W-017 216-U-12 CRIB
Logged by C.D. CONDIT (GAI) Date 3/9/90 Reviewed by D.L. McElhan Date 4-24-90 Lith. Class. Scheme FOLK Procedure DO-1 REV. 0		Drilling Contractor KEH Driller LOUIS WATKINS Rig/Method CAFLE TOOL BE #22-14/03

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
125'								(125 FT. SAMPLE DESCR. CONT.) 50% QUARTZ, 15%			
								FELSIC, GR-SR, COLOR: 5Y4/4 OLIVE, SLIGHT REN			
								TO 10% HCL. NOTED SLIGHT CONSOLIDATION OF			
								SAND.			
130'	GM	DET	GM	LITH	2	130'	S	SAND (97% SAND, 3% MUD) SAMPLE DESCRIP-		1025	SAMPLE - C.B.
				MOIST	1			TION SIMILAR TO 125 FT. SAMPLE.		1030	RESUME DRILLING
										1055	DRILLING DIONS, INSTALLING
											TO ADD 10" C.S. CASING.
										1110	RPT OFF SITE
										1200	DRILLER BEGINS FOR LUNCH
										1230	CONTINUING TO WELD
											10" C.S. CASING. RPT
											IC ON SITE
								133.4' + 10.1' = 143.5'		1250	10" C.S. CASING ADDED
										1300	DRILLING RESUMES
135'	GM	DET	D	LITH	2	135'	S	SAND (2% GRAVEL, 93% SAND, 5% MUD) 1% MP,		1330	SAMPLE - C.B.
				MOIST	1			1% FP, 5% VCS, 10% CS, 56% MS, 20% FS, 3% VFS		1335	DRILLING RESUMES.
	SIEVED FM	DET						5% MUD. MODERATE TO WELL SORTED. GRAVEL: 50%		1345	GEO MON. BOREHOLE
								BASALTIC/MAFIC, 50% FELSIC, SA-SR. SAND: 30%			
								BASALTIC/MAFIC, 50% QUARTZ, 20% FELSIC, SA-SR			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/9/90 Sheet No. 3 of 3 Project WBS 17-216-012

Logged by C.D. CONDIT (GAI) Date 3/9/90 Reviewed by [illegible] Date 4-24-90 Lith. Class. Scheme FOLK Procedure DD-1 REV. 0	Drilling Contractor KEH Driller LOUIS WATKINS Rig/Method RE 60L / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
135'								(135 FT. SAMPLE DESCR. CONT) COLOR: 5Y 4/2 OLIVE			
								GRAY, SLIGHT RXN TO 10% HCL - UNCONSOLID.			
140'	GM	DET	D	LITH	2	140'	S	SAND (2% GRAVEL, 93% SAND, 5% MUD) 1% FP.		1410	SAMPLE - C.B.
				CHEM	2			1% VFP, 5% VFS, 10% CS, 50% MS, 26% FS, 3%			
				NDA	2			VFS, 5% MUD, MODERATE TO WELL SORTED.		1415	DRILLING RESUMES.
				MOIST	1			GRAVEL: 50% BASALTIC/MAFIC, 50% FELSIC, SA-SR			
								SAND: 30% BASALTIC/MAFIC, 50% QUARTZ, 20%			
								FELSIC, SA-SR. COLOR: 5Y 4/2 OLIVE GRAY. SLIGHT			
								RXN TO 10% HCL. NOTED SLIGHT CONSOLIDATION			
								OF SAND. (RXN TO 10% HCL = MODERATE). CHAIN			
								OF CUSTODY # 020990-W22-40			
145'	GM	DET	SM	LITH	2	145'	S	SAND (2% GRAVEL, 93% SAND, 5% MUD)		1600	SAMPLE - C.B.
				MOIST	1			SAMPLE DESCRIPTION SIMILAR TO 140 FT. SAMPLE		1510	RPT DEPARTS SITE
								TOTAL FT. DRILLED FOR DAY = 120' TO 145' = 25 FT.		1520	GEOLOGIST AND DRILLER
								10" C.S. CASING ADDED = 20.1' TOTAL = 143.5'			OFF SITE
								GALLONS H2O ADDED TODAY: Ø			

9413223.0588

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/12/90	Sheet No. 1 of 1
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. INNIS Pamela S. Innis (GAI) Date 3/12/90
Reviewed by D.L. McGhan Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	GEOLOGIST ON SITE
											DRILLER CHANGING
								FOOD GRADE OIL USED - WHC S-014 REV 4			TO 8" TOOLS FROM
								SECTION 7.2			10" - CORE BARREL
										0815	10" STICK-UP 1.4'
											8" SHOE O/D 9 5/16"
											DRILLER WELDING
											SHOE ON 6" CASING
										0945	VERN. McGHAN ON SITE
											TO DO GEOPHYSICAL
											LOGGING
								LOGGED INTERVAL = 143' - 3'		1045	LOGGING COMPLETE
								8" C.S. CASING TALLY			TO 143' - DRILLER
								20.7' + 20.6 + 20.5 + 20.5			PLACING PIPE OVER HOLE
								TOTAL CASING 82.3' (82' 3 3/4")			& WELDING 8" C.S. CASING
										12:00-1230	LUNCH
										1240	DRILLER CONTINUED
											WELDING 8" CASING
										1500	RIG SHUT DOWN
								THACKERBERRY, GILKINSON, SVANSON, YARBROUGH			WHC SURVEILLANCE
										1530	OFF SITE

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9413223.0589

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/13/90	Sheet No. 1 of 1
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. INNIS Pamela S. Innis (GAI) Date 3/13/90
Reviewed by V.L. Wilkins Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 Rev 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0700	DRILLER & GEOLOGIST
											ON SITE
143	PID	KDET								0725	S.S.O ON SITE
										0745	DRILLER WELDING
											8" CARBON STEEL CASING
										0815	DRILLER OFF SITE
											FOR TRAINING CLASS
										1020	DRILLER BACK ON SITE
								8" CASING TALLY			WELDING CONTINUED
								17.9 + 17.3 + 15.3 + 13.9 + 10.9		12:00-1230	LUNCH
								TOTALING 75.3' (75'-3½")		12:40	DRILLER CONTINUED
								Σ = 157.6' (157'-7¼")			WELDING 8" C.S. CASING
								CASING OVER HOLE		1500	RIG SHUT [illegible]
										1530	[illegible]

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9413223.0590

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/14/90	Sheet No. 1 of 2
	Location 200 WEST	Project W-017 200-W-12 CRIB	

Logged by P.S. INNIS, Pamela S. Innis (GAI) Date 3/14/90
Reviewed by V.L. McGhan Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV. 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
143'	PID	LDET								0700	DRILLER & GEOLOGIST
											ON SITE. SSO ON SITE
											DRILLER CONT. WELDING
										0820	DRILLING BEGAN
150	GM	LDET	D	LITH	2		S	SAND Tr. GRAVEL, 94% SAND, 6% MUD,		0845	PULLED CB SAMPLE
	PID	LDET		MOIST	1			Tr FP, Tr VFP, Tr VCS, 2% CS, 35% MS, 45% FS			
								12% VFS, 6% MUD, WELL SORTED; GRAVELS:			
								30% BASALT, 40% QTZ FELSIC, 30% [illegible]			
								SR; SAND: 25% BASALTIC 65% QTZ. FELSIC			
								10% MICA, SR-A; LT OLIVE BROWN (2.5Y5/4)			
								MODERATE REN TO HCl, UNCONSOLIDATED			
155'	GM	LDET	M	LITH	2		S	SAND Tr. GRAVEL, 91% SAND, 9% MUD;		0910	PULLED CB SAMPLE
	PID	LDET		MOIST	1			Tr. FP, Tr. VFP, Tr. VCS, 2% CS, 35% MS			
								40% FS, 14% VFS, 9% MUD: WELL TO MOD SORTED			
								GRAVELS: 25% [illegible], 10% QTZ FELSIC, 65% CARBONATE		0925	DRILLER WELDING
								CLASTS & CRUSHED SR, SAND: 20% BASALTIC, 73%			8.42' OF 8" C.S.
								QTZ. FELSIC, 7% MICA SR-A; LT OLIVE BROWN			CASING TOTALING
								2.5Y5/4, MOD. REN TO HCl, UNCONSOLIDATED			166.02' (166'-1/4")
								THIN MUDDY SAND TO SANDY [illegible] ~			
								154.5' LESS THAN 0.1'			
										1030	DRILLING CONTINUED

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9413223.0591

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/14/90	Sheet No. 2 of 2
	Location 200 WEST	Project W-017 2116-U-12 CRIB	

Logged by P.S. INNIS	Date 3/14/90	Drilling Contractor KEH	
Reviewed by D.C. McClain	Date 4-24-90	Driller LOUIS WATKINS	
Lith. Class. Scheme FOLK	Procedure D.O.I REV 0	Rig/Method CABLE TOOL	BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
160	GI'	KDET	M	LITH	2		(m)S	SLIGHTLY MUDDY SAND, 81% SAND, 19% MUD		1115	PULLED CB SAMPLE
		KDET		MOIST 40ml	1			10% FS, 71% VFS, 19% MUD, WELL SORTED,			CHAIN OF CUSTODY
				VOA 250ml	2			SAND: 15% BASALT, 75% QTZ, FELSIC, 10% MICA			031490216U12W22-40
				CHEM	2			SR-SA; LT OLIVE BROWN (2.5Y5/4) TO OLIVE		1120	RPT OFF SITE
								BROWN (2.5Y4/4), STRONG RXN TO HCl,		1130	RIG SHUT DOWN
								SLIGHT TO MODERATE CONSOLIDATION; CHANGE		1200-1230	LUNCH
								OF LITH APPRX. 157', LAMINAR BEDDING		1240	RPT ON SITE
											DRILLING BEGAN
								* MATERIAL TOO FINE AND CONSOLIDATED TO		1315	DRILLER SWITCHING
								EFFECIENTLY DRIVE BARREL AND TAKES APPRX			FROM CORE BARREL
								15 MIN TO REMOVE SAMPLE FROM CORE BARREL			TO HARD TOOL *
								USED FOOD GRADE VEG OIL TO CHANGE TOOLS		1400	DRILLER WELDING
								WHC-S 014 REV 4 SECTION 7.2			8.35' OF 8" C.S
											CASING TOTALING
								TOTAL FOOTAGE 18'			174.37' (174'-4½")
								CASING AT 161			ADDED 15 GAL. OF
								15 GAL H_2O USED			WATER TO HOLE
										1500	DRILLER HAS TOOLING
										1515	BAILED WELL
											USING DART BAILER
										1530	OFF SITE

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9413223.0592

DAILY BOREHOLE LOG	Boring or Well Number 399-W22-40 Location 200 WEST	Date 3/15/90 Sheet No. 1 of 3 Project W 017 216 U 12 CRIB

Logged by P.S. INNIS (GAI) Date 3/15/90
Reviewed by V.C. McGlohn Date 4-24-90
Lith. Class. Scheme FOLK Procedure DC 1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								NOTE: THE 8" CASING HAD BEEN STEAM		0700	GEOLOGIST & DRILLER
								CLEANED - WITNESSED BY C. CONDIT (GAI) -			ON SITE. SSO ON SITE
164'	PID	KDET						VISUAL INSPECTION OF MATERIAL BEFORE		0745	RPT ON SITE
								WELDING BEGAN - 8" C.S. CASING APPEARED			DRILLER WELDING ON
								CLEAN. WHC-S-014 REV 4 SECT 7.6			HARD TOOL.
										0820	ADDED 3½ GAL.
											WATER TO HOLE
165'	GM	KDET	–	LITH	2		(m)S	SLIGHTLY MUDDY SAND 85% SAND, 15% MUD		0840	PULLED HT SAMPLE
								15% FS, 70% VFS, 15% MUD; WELL SORTED			USING DART BAILER
								SAND: 15% BASALT (MAFIC), 75% QTZ, FELSIC			
								10% MICA, SA A; LT OLIVE BROWN (2.5Y5/4)			
								MOD. RXN TO HCl, UNCONSOLIDATED			
170'	GM	KDET	–	LITH	2		(m)S	SLIGHTLY MUDDY SAND 85% SAND, 15% MUD		0905	PULLED HT SAMPLE
								SAMPLE DESCRIPTION SIMILAR TO PREVIOUS		0915	KEH DRILLER [illegible]
								SAMPLE			FELL 10' TO EAST
										0940	DRILLER WELDING
											10.75' OF 8" C.S.
											CASING, TOTALING
											185.12' (185-1½")
										1045	DRILLING CONTINUED

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9413223.0593

DAILY BOREHOLE LOG	Boring or Well Number 219-W22-40	Date 3/15/90	Sheet No. 2 of 3
	Location 200 WEST	Project W-017 216 U-12 CRIB	

Logged by P.S. INNIS Pamela S. Innis Date 3/15/90
Reviewed by D.K. McKlem Date 4-24-90
Lith. Class. Scheme FOLK Procedure DC 1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS / DARREL LUDTKE
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
175'	GM	KDE1	–	LITH	2		mS	MUDDY SAND 70% SAND, 30% MUD		1055	PULLED HT SAMPLE
								TR MG, 10% FS, 60% VFS, 30% MUD; WELL			
								SORTED; SAND, 13% BASALT, 77% QTZ FELSIC			
								5% MICA, SA; LT OLIVE BROWN 2.5Y5/4			
								MOD RXN TO HCl, UNCONSOLIDATED			
180'	GM	KDE1	–	LITH 40ml	2		(m)S	SLIGHTLY MUDDY SAND, 83% SAND, 17% MUD		1110	PULLED HT SAMPLE
				VOA 250ml	2			10% FS, 73% VFS, 17% MUD; WELL SORTED;			CHAIN OF CUSTODY
				CHEM	2			SAND, 15% BASALT, 90% QTZ, FELSIC, 5% MICA			031590 216U12 W22-40
								SA; LT OLIVE BROWN (2.5Y5/4) MOD RXN		1120	DRILLER WELDING
								TO HCl, UNCONSOLIDATED			9-70' OF 8" C.S.
											CASING TOTALING
											194.84' (194-10')
										12:00	
										1230	LUNCH
										1240	DRILLER LUDTKE TOOK
											OVER FOR DRILLER WATKINS
											CONTINUED WELDING
										1300	DRILLING, REGAN
185'	PID	KDE1	–	LITH	2		mS	MUDDY SAND 65% SAND, 35% MUD,		1310	PULLED HT SAMPLE
	GM	KDE1						5% FS, 60% VFS, 35% MUD, WELL SORTED;			
								SAND: 15% BASALT, 70% QTZ FELSIC, 15% MICA		1400	KEH REMOVED STRAIGHT-
								SA; LT OLIVE BROWN 2.5Y5/4, STRONG			NESS TESTER FOR CLEANING

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/15/90 Sheet No. 3 of 3 Project W-017 216-U-12 CRIB

Logged by P.S. INNIS Pamela S. Innis Date 3/15/90
Reviewed by J.T. McGhan Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL B.E. # 22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
185'								(CONT) RXN TO 10% HCl, UNCONSOLIDATED		1400	TOOK DRILL SUPPLY H_2O SAMPLE -(2) 40 ml JARS GEC 031590 216U12W22-40
190'	GM	KDET	–	LITH 40 ml	2		(gm)S	SLIGHTLY GRAVELLY SLIGHTLY MUDDY SAND		1410	PULLED HT SAMPLE
				VOA 250 ml	2			8% GRAVEL, 80% SAND, 12% MUD; TR CP			CHAIN OF CUSTODY
				CHEM	2			1% MP, 3% FP 4% VFP, 5% VCS, 5% CS			031590 216U12W22-40
								8% MS, 12% FS, 50% VFS, 12% MUD.			
								MODERATELY SORTED; GRAVELS: 15% BASALT		1420	L. WATKINS ON SITE
								10% QTZ, GRANITICS, 75% CALICHE SR-SA			TO REPLACE LUDTKE
								SAND: 15% BASALT, 70% QTZ FELSIC,			CONTINUED DRILLING
								15% CALICHE SR-A; LT OLIVE BROWN 2.5Y5/4		1500	RIG SHUT DOWN
								STRONG RXN TO HCl, SLIGHT CONSOLIDATION			
								APPEARANCE OF GRAVELS & CALICHE APPRX 188'		1530	OFF SITE
								TOTAL FOOTAGE			
								CASING AT			
								115 GAL WATER USED			

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DAILY BOREHOLE LOG

Boring or Well Number 299-W22-40 Date 3/16/90 Sheet No. 1 of 3
Location 200 WEST Project W-017 216-U-12 CRIB

Logged by P.S. INNIS Date 3/16/90
Reviewed by D.L. McKellar Date 4-24-90
Lith. Class. Scheme FOLK Procedure DO 1 REV 0

Drilling Contractor KEH
Driller LEWIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	GEOLOGIST & DRILLER
192	PID	<DET									ON SITE. SSO ON SITE
										0740	DRILLER WELDING
											11.42 OF 8" C.S
											CASING TOTALING
											206.25' (206'-3")
										0845	DRILLING BEGIN
195	GM	<DET	-	LITH	2		(m)gS	SLIGHTLY MUDDY GRAVELLY SAND		0900	PULLED HT SAMPLE
								17% GRAVEL, 70% SAND, 13% MUD			USING DART BALLER
								1% MP, 9% FP, 7% VFP, 5% VCS, 5% CS,			
								8% MS, 30% FS, 22% VFS, 13% MUD,			
								MODERATELY SORTED; GRAVELS: 70% BASALT			
								5% QTZ. GRANITICS, 5% DIORITE, 15% CALICHE,			
								5% QUARTZITE, MUDSTONE & CALICHE SR-SA			
								SAND: 15% BASALT, 75% QTZ. FELSIC, 10% CALICHE			
								SR-A; OLIVE YELLOW 2.5Y 6/6, STRONG RXN			
								TO HCl, SLIGHTLY CONSOLIDATED INDURATED			
								[illegible]			
200	GM	<DET	-	LITH (40 ml)	2		(m)S	SLIGHTLY MUDDY SAND, 2% GRAVEL, 86% SAND		0910	PULLED HT SAMPLE
				VOA (250 ml)	2			12% MUD; 1% FP, 1% VFP, 4% VCS, 10% CS, 22% MS			CHAIN OF CUSTODY
				CLEAN	2			30% FS, 30% VFS, 12% MUD, MODERATELY SORTED			03/16/90 216-U-12 DEEP-40

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-110	Date 3/16/90	Sheet No. 2 of 3
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. Willis (GAI) Date 3/16/90
Reviewed by D.L. Mellan Date 4-24-90
Lith. Class. Scheme FOLK Procedure DOI REV 0

Drilling Contractor K.L.H
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE H22-11HC3

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
200								(CONT) GRAVELS: 50% BASALT, 10% QTZ.			
								GRANITICS, 35% CALICHE, 5% OTHER SR-SR;			
								SAND 25% BASALT, 65% QTZ, FELSIC, 10%			
								OTHER, SR-A; LT. OLIVE BROWN (2.5Y5/4)			
								MOD-STRONG RXN TO HCl, SLIGHTLY CONSOLIDATED			
205	GM	<DET	—	LITH	2		(gm)S	SLIGHTLY GRAVELLY SLIGHTLY MUDDY SAND		0950	PULLED HT SAMPLE
								6% GRAVEL, 82% SAND, 12% MUD; 2% FP, 4% VFP,			
								8% VCS, 10% CS, 24% MS, 25% FS, 15% VFS			
								12% MUD, MOD. TO POORLY SORTED; GRAVEL:		1020	DRILLER WELDING
								30% BASALTIC, 5% QTZ FELSIC, 60% CALICHE,			13.02' OF 8" CS.
								5% OTHER SR-SA; SAND: 25% BASALTIC,			CASING TOTALING
								55% QTZ FELSIC, 15% CALICHE, 5% OTHER,			219.27' (219-3¼')
								SR-A; OLIVE YELLOW 2.5Y6/4, STRONG		1110	CONTINUED DRILLING
								RXN TO HCl, SLIGHTLY CONSOLIDATED		1140	RPT ON SITE
										1200-1230	LUNCH
										1245	RPT ON SITE
										1255	DRILLING BEGAN
210	GM	<DET	—	LITH 40 ml	2		mS	MUDDY SAND, 2% GRAVEL, 63% SAND, 35% MUD		1330	PULLED HT SAMPLE
				VOA 250 ml	2			TR. MP, 1% FP, 1% VFP, 5% VCS, 10% CS, 10% MS			CHAIN OF CUSTODY
				CHEM	2			20% FS, 1[illegible] VFS, 35% MUD, MOD. TO POORLY SORTED			0316902160U12W22-110

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9413223.0597

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/16/90 Sheet No. 3 of 3 Project W-017 216-U-12 CRIB
Logged by P.S. INNIS (GFG) Date 3/16/90 Reviewed by D. Buckelew Date 4-24-90 Lith. Class. Scheme FOLK Procedure DOI REV 0		Drilling Contractor KEH Driller LOUIS WATKINS Rig/Method CABLE TOOL BE B22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
210								(CONT) GRAVEL 15% [illegible] 65% [illegible]			
								20% [illegible] SR-SA; SAND: 60% [illegible]			
								10% [illegible] 10% [illegible] A;			
								BROWN 10YR 5/3; [illegible]			
								[illegible]			
215	GM	KDET	–	LITH	2		mS	MUDDY SAND, 55% SAND		1345	PULLED [illegible]
								45% MUD, TR VFG, 5% MS, 5% CS, [illegible] FS,			
								20% FS, 20% VFS 45% MUD, WELL TO MOD			
								SORTED, SAND 15% FELSIC, 5% [illegible]			
								[illegible] 80% [illegible] SR-R; LT. OLIVE			
								BROWN (2.5Y 5/4), MOD RXN TO HCl,			
								SLIGHTLY CONSOLIDATED.			
220	GM	KDET	–	LITH 40ml	2		mS	MUDDY SAND, 75% SAND, 25% MUD,		1400	PULLED HT SAMPLE
				VOA 250ml	2			TR VCS, TR CS, TR MS, 15% FS, 60% VFS			
				CHEM	2			25% MUD. WELL SORTED; SAND: 20%		1420	DRILLER WELDING
								BASALT 70% QTZ FELSIC, 10% OTHER SR-			8.97' OF 8" CS
								A; LT OLIVE BROWN, 2.5Y 5/4, MOD RXN			CASING TOPPLING
								TO HCl, SLIGHTLY CONSOLIDATED			228.25 (228.3')
								CASING @ 220'		1500	[illegible]
								TOTAL FOOTAGE 28'		1530	[illegible]
								120 GPM [illegible]			

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9413223.0598

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/19/90 Sheet No. 1 of 3 Project W-017 216 U-12 CRIB

Logged by J.C. INNIS, [illegible] (CH.1) Date 3/19/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme FOLK Procedure DO1 REV0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL B.E. #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	DRILLER & GEOLOGIST
220'	PID	KDET									ON SITE. SSO ON SITE
											DRILLER [illegible]
											[illegible]
										0750	RPT ON SITE -
											DRILLING [illegible]
225'	GM	KDET	-	LITH	2		(M) S	SLIGHTLY MUDDY SAND, 1% GRAVEL, 82% SAND,		815	PULLED HT SAMPLE
	PID	KDET						17% MUD; TR. MP, TR TP, 1% VFP, 1% VCS,			WITH LORT BAILER
								2% CS, 5% MS, 24% FS, 50% FS, 17% MUD, WELL-		0825	CONTACTED BY S. GOODWIN
								MOD. SORTED; GRAVELS: 15% BASALT, TR. QTZ			STRAIGHTNESS TESTER
								FELSIC, 80% CALICHE, 5% OTHER R-SA; SAND:			BEING STEAM CLEANED
								15% BASALT, 75% QTZ, FELSIC, 3% MICA, 1% OTHER		0830	DRILLER YELLING @
								SR-A; LT OLIVE BROWN (2.5Y5/6), SLIGHT			9.75' OF 8" O.S.
								EXN TO HCL, MAXIMUM [illegible]			CASING TOTALING
											[illegible] (0'-0")
										0900	CONTINUED DRILLING
230'	GM	KDET	—	LITH 40ml	2		(M) S	MUDDY SAND, TR. GRAVEL, 78% SAND, 22% MUD		1025	PULLED HT SAMPLE
				YOA 250ml	2			TR VFP, TR VCS, TR CS, 8% MS, 30% FS,			CHAIN OF CUSTODY
				CHEM	2			40% VFS, 22% MUD; WELL-MOD SORTED;			03170016 [illegible]
								GRAVELS: 10% BASALT, 75% CALICHE, 15% OTHER			
								SR-SA; SAND: 10% BASALT, 10% QTZ FELSIC			

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9413223.0599

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/19/90	Sheet No. 2 of 3
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. INNIS [signature] Date 3/19/90
Reviewed by [signature] Date 4-24-90
Lith. Class. Scheme FOLK Procedure DOI Rev D

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
230'								(CONT.) 13% MICA, 7% OTHER. SR-A; LT OLIVE BROWN (2.5Y5/4); MOD. RXN TO 10% HCl, UNCONSOLIDATED;		1040	DRILLER REPORTED HE MAY HAVE HIT WATER - BAILING INTO BARRELS. MATERIAL IS HEAVING
										1055	DRILLER WELDING 9-94' OF 8" C.S. CASING TOTALING 247.94' (247'-11¼")
										1145	L. DOREMUS WITNESSED STEAM CLEANING OF SAND PUMP BAILER TO BE USED NOW
										1200-1230	LUNCH
										1240	RPT ON SITE. DRILLING BEGIN
235	GM	LDET	–	LITH	2		MSG	MUDDY SANDY GRAVEL 52% GRAVEL, 30% SAND, 18% MUD; 2% VCP, 3% CP, 10% MP, 22% FP, 15% VFP, 3% VCS, 5% CS 9% MS, 10% FS, 8% VFS, 18% MUD; POORLY - VERY POORLY SORTED; GRAVELS: 25% BASALT, 30% QTZ, GRANITICS, 35% DIORITE, 5% QUARTZITE		1255	PULLED HT SAMPLE. NOTE: SAMPLE APPEARS REPRESENTATIVE. A 4 FT PLUG HEAVED INTO CASING - UNABLE TO DETERMINE MATERIAL

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9413223.0600

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 3/19/90 Sheet No. 3 of 3 Project WHC17 216-U-12 CRIB

Logged by [illegible] (GH) Date 03/19/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme FOLK Procedure DO1 REV 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
235								CONT 5% OTHER R-SA; SAND: 10% [illegible]			
								20% QTZ [illegible]			
								OLIVE BROWN, 2.5Y4/4; MOD REA TO HCl			
								UNCONSOLIDATED			
240	GH	MED	–	LITH 40ml	2		msG	MUDDY SANDY GRAVEL: 30% GRAVEL, 60% SAND		1345	PULLED HT SAMPLE
	HL	MED		VOA 250ml	2			10% [illegible]; TRCP, 5% MI, 10% [illegible]			CHANGE GREASE
				CHEM	2			5% VCS, 8% CS, 27% MS, 11% FS, [illegible] 10% [illegible]			031990 216U12 W22-40
								POORLY TO VERY POORLY SORTED, GRAVELS: 20% BASALT			
								40% QTZ [illegible], 30% DIORITE, 10% OTHER			
								R-SA; SANDS: 30% BASALT 60% QTZ, FELSIC, 10%			
								OTHER SR-A, LT OLIVE BROWN 2.5Y5/4			
								MOD REA TO HCl, UNCONSOLIDATED			
245	GM	MED	–	LITH	2		msG	MUDDY SANDY GRAVEL: 55% GRAVEL, 35% SAND,		1415	PULLED HT SAMPLE
	pH	6.5						10% [illegible], TRCP, 5% MI 30% [illegible]		1430	DRILLER REPORTS HEAVING
								5% VCS, 5% CS, 10% MS 8% FS, 7% VFS, 10% MUD			MATERIAL: SWITCHED
								VERY POORLY SORTED: GRAVELS: 20% BASALT, 40% QTZ			TO SAND PUMP BAILER
								GRANITICS, 30% DIORITE, 5% QUARTZITE, 5% OTHER			BAILED TO WET SET
								SR-SA; SAND: 25% BASALT, 65% QTZ FELSIC,			TOP D/W
								10% OTHER SR-A; LT OLIVE BROWN 2.5Y5/4		1530	OFF SITE
								RXN TO HCl, UNCONSOLIDATED			
								TOTAL FOOTAGE 25' CASING AT 245			
								WATER TABLE [illegible]			

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9413223.0601

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/20/90	Sheet No. 1 of 2
	Location 200 WEST	Project W-017 216-U-12	

Logged by P.S. INNIS [signature] Date 3/20/90
Reviewed by [signature] Date 4-24-90
Lith. Class. Scheme FOLK Procedure DD.1 Rev 0

Drilling Contractor KEH
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	GEOLOGIST & DRILLER
								STEEL TAPE - PNL - S/N L300-016			ON SITE. SSO ON SITE
								D/W 233.2 - 4.4 = 228.8'		0715	TOOK L/W & D/B
								D/B 242.5 + 0.5 - 4.4 = 238.6		0725	DRILLER BAILING WILL
								CASING AT 247.9 - 4.4 = 243.5			W/SAND PUMP TO CLEAN
											OUT HEAVING SAND.
								247.9 - 3.1 = 244.8' CASING DEPTH		0735	DRILLER DRIVING CASING
										0745	LABELED 50GAL
								WATER TOTAL FROM 3/19/90 55 GAL			DRUMS U-2012-90-
											007 THRU 013
											DRILLER CONTINUED BAILING
										0830	ADDED 105 GAL WATER
										0930	ADDED 95 GAL WATER
											CONTINUED DRILLING / CASING
								247.0 + 0.5 - 3.1 = 244.5'		0955	TOOK D/B
								STRAIGHT. PIPE DIMENSIONS 21'-6 7/8" x 6 1/2"		1000	OBSERVED STRAIGHTNESS
											TEST. TEST PIPE
											PASSED CLEARLY
											TO BOTTOM.
										1020	DRILLER BREAKING
											DOWN RIG

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9413223.0602

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40	Date 3/20/90	Sheet No. 2 of 2
	Location 200 WEST	Project W-017 216-U-12 CRIB	

Logged by P.S. INNIS Pamela S. Innis Date 3/20/90
Reviewed by D.L. McKhan Date 4-24-90
Lith. Class. Scheme FOLK Procedure D.O.1 REV.0

Drilling Contractor K E H
Driller LOUIS WATKINS
Rig/Method CABLE TOOL BE #22-14103

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										1200-1230	LUNCH
								TOTAL WATER FOR DAY 200 GAL			DRILLER CONTINUED
											SITE CLEAN-UP
								WELDED PLATE ON TOP OF 8" CASING		13:15	PULLED RIG OFF SITE
										14:00	BEGAN STEAM CLEANING
								WHC-S-014 REV. 4 SECT. 7.6			RIG AT TEMP DECON
								WATER TEMP 184° OUTLET PRESSURE 1600 PSI			PAD - 200 EAST SIDE YARD
											WATER GENERATED
											PLACED IN DRUMS
											U-200W-90-
											034 THRU 037
										1530	OFF SITE

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D/ BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-1 40	Date 3/5/90	Sheet No. 1 2
	Location 200 West 200-W-12	Project W-027 W-12	

Logged by S M Goodwin
Reviewed by D R McGillan
Measuring Equip. L3-15 Procedure DA-1, Rev. 0
Date 3/5/90
Date 4-24-90

Drilling Contractor KEH
Driller Thomas A Bettinson
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
0900	CARBON STEEL	8"	247.67	3.17	244.5				0.87	D/BOTTOM = 243.63
										STANDBY; WAITING FOR COMPLETION
										MATERIALS TO ARRIVE
1100										UNLOADING COMPLETION MATERIALS
1130										WELDING ON 8" DIA. CARBON
										STEEL CONSTRUCTION PIECE FOR
										HYDRAULIC JACKS
1200-1230										LUNCH
1240										FINISHING WELD
1250	"	"	250.87	6.37	244.5					FINISHED WITH CONSTRUCTION PIECE,
										LENGTH = 7.2'
1300										SETTING JACKS OVER HOLE
1320	JOHNSON DIV. TYPE 304 CHANNEL PASS (0 SLOT), NOT PASSIVATED	4"	10.02'	BOTH GREEN TAGGED BY C. HOOVER, 2/23/90						SETTING STAINLESS STEEL SCREEN
			10.02'	NO PCP OR P.O. # ON TAGS						& CASING
	TYPE 304 S.S. END CAP, NON-PASS.	4"	0.31'	GREEN TAGGED BY C. HOOVER 2/24/90; NO PCP OR P.O. # ON TAG.						
			20.35'	TOTAL SCREEN & END CAP						
1330	JOHNSON DIV. TYPE 304 SCH. 5 T-304 STAINLESS STEEL CASING	4"	20.00'	W/ CENTRALIZERS		ALL 4" S.S. CASING WAS				CASING CENTRALIZERS WERE
1335	"	4"	20.00'	W/o CENTRALIZERS		"GREEN" TAGGED BY R. STEVENS				PLACED JUST ABOVE TOP OF SCREEN
1340	"	4"	20.00'	W/ CENTRALIZERS		ON 3/29/90				& THEN EVERY 40' TO GROUND
1345	"	4"	19.99'	W/o "		PCP NO. CR-9112				SURFACE. ALL CENTRALIZERS
1350	"	4"	19.99'	W/ "		P.O. NO. 42493 REL. 16				WERE FACTORY WELDED 1/2 HOOPS.
1355	"	4"	19.99'	W/o "		ALL FINAL MATERIAL WAS				DRILLERS WEARING CLEAN COTTON
1400	"	4"	20.00'	W/ "		SEALED IN PLASTIC & HAD				GLOVES DURING INSTALLATION.
	SUB-TOTAL = 139.97					THREAD PROTECTORS.				

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-43 OW3273 Date 4/5/90 Sheet No. 2 of 2 Location 200 WEST 216-U-12 CRIB Project W-017 U-12

Logged by S.M. Goodwin Date 4/5/90
Reviewed by J.L. McGhan Date 4-24-90
Measuring Equip. L300-15 Procedure DO-1, Rev. 0

Drilling Contractor KSH
Driller Thomas & Betterworth
Rig/Equipment Crane & Jack

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
	Johnson Dia. Type 304 S.S. "Assmb	4"	139.97'	(SUB-TOTAL FROM P 1)						CONTINUE W/ CASING SETTING;
1405	"	"	20.00'	W/O CENTRALIZERS						SEE PAGE 1 FOR PCP & P.O.
1410	"	"	20.01'	W/	"					#'S FROM GREEN TAGS
1415	"	"	19.99'	W/O CENTRALIZERS						
1420	"	"	20.00'	W/	"					
1425	"	"	5.01'	W/O	"					
	TOTAL 4" CASING = 224.98'									
		+	20.35' SCREEN							
		=	245.33' CASING & SCREEN							
1440		+	5.0' CONSTRUCTION PIECE							
1445		=	250.33'							FINISHED SETTING 4" CASING &
										SCREEN; TOTAL FINAL CASING
										& SCREEN = 245.33'
1450										RESEALING S.S. CRATES &
										CLEANING UP SITE; WILL
										START WITH 40 MESH SAND
										IN THE A.M.
1455	CARBON STEEL	8"	250.87	6.37	244.5					
1456	S.S. CASING	4"	250.33	6.43	243.9					

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DR BOREHOLE/WELL COMPLETION LOG	Boring or Well No. 2-40 9413223.0605 Date 4-6-90 Sheet No. 1 of 1
	Location 200 West [illegible] Project 0017 012

Logged by LA Downing Date 4-6-90
Reviewed by JK McKenna Date 4-24-90
Measuring Equip. Steel Tape & [illegible] Procedure [illegible]

Drilling Contractor KEH
Driller G Downing, L Bowman
Rig/Equipment Cable and Casing Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
745	Carbon Steel	8"	250.87	6.37	244.5					Geologist on site
								243.2	1.4	D/B 247.4 - 6.4 + 2.2
										Drillers Prepare Site
840	Stainless Steel	4"						244.17		D/B 248.34 - 6.37 + 2.2
						40 mesh silica sand	(½) 94 lb bag	240.4	4.1	D/B 244.6 - 6.4 + 2.2
										Pull
	Carbon Steel	8"	250.87	7.32	243.05			239.0	4	D/B 244.6 - 7.82 + 2.2
						"	(½) 94 lb bag	236.7	6.4	D/B 242.3 - 7.8 + 2.2
										Pull
	"	8"	250.87	9.15	241.7			236.0	4.7	D/B 243.0 - 9.2 + 2.2
	"	8"	248.5	6.8	241.7					Cut 2.4'
				6.85				235.5	6.2	D/B 240.1 - 6.8 + 2.2
										Pull casing and try to drop
										D/B 240.1 - 6.95 + 2.2
										Pull & drop casing, casing loose
										Try to drop sand but it
										appears to be bridging
										Pull ~6"
	"	8"	248.5	7.37	241.1			235.2	5.9	D/B 240.4 - 7.37 + 2.2
						"	(½) 94 lb bag	232.5	5.6	D/B 237.7 - 7.37 + 2.2
	"	8"	248.5	8.45	240.1					Pull
								231.1	8.7	D/B 237.6 - 8.45 + 2.2
										Discuss situation w/ Steve decide
										to continue & monitor depth while
										pulling (switch weights on tape)

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-40 9413223.0616	Date 7-6-90	Sheet No. 2 of 7
	Location 200 West 216-U-12 Crib	Project West UIZ	

Logged by CA Lovejoys
Reviewed by D.E. Mathews
Measuring Equip. Steel Tape #1 500-03 Procedure 1.01 1.00

Date 4-6-90
Date 7-24-90

Drilling Contractor ECH
Driller Gilmore Cleveland
Rig/Equipment Crane and Cement Tools

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
	Carbon Steel	8"	248.5	9.15	239.4			231.1	7.7	Full 238.9 - 9.2 + 2.7 (D/B)
	"	8"	248.5	10.1	238.4					Pull new weight (0.5')
								231.5	6.9	D/B 238.9 - 10.1 + 2.7
	"	8"	245.2	6.8	238.4					Cut 3.3 (slip cutter used)
								231.6	6.8	D/B 235.7 - 6.8 + 2.7
1:50										Vision representative on site
										Lunch break
12:35										Resume work
								231.5	6.9	D/B 235.6 - 6.8 + 2.7
	"	8"	245.2	7.8	237.3					Pull
								231.8	5.5	D/B 237.0 - 7.87 + 2.7
						40 mesh silica sand	(1/2) 94 lb bag	229.8	7.5	D/B 235.0 - 7.87 + 2.7
	"	8"	245.2	8.07	236.7					Pull
								230.8	5.9	D/B 236.6 - 8.07 + 2.7
	"	8"	245.2	9.1	236.1					Pull
								230.7	5.4	D/B 237.1 - 9.1 + 2.7
	"	8"	242.9	6.8	236.1					Cut 2.3' (slip cutter used)
								231.0	5.1	D/B 235.1 - 6.8 + 2.7
	"	8"	242.9	7.9	235.0					Pull
								231.1	5.9	D/B 234.3 - 7.9 + 2.7
						"	(1) 94 lb bag	229.2	9.8	D/B 230.4 - 7.9 + 2.7
	"	8"	242.9	9.1	233.8					Pull
12:30								228.5	8.3	D/B 231.9 - 1.1 + 2.7
										Pull

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D. BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-E-40 [illegible] Date 4-6-90 Sheet No. 1 of 1
	Location 200 East 216-U-12 Crib Project 0017 012

Logged by LA Tomillos
Reviewed by VE McAllen
Measuring Equip. Steel Tape DCS00-03 Procedure DOI 1000
Date 4-6-90
Date 4-24-90

Drilling Contractor CEM
Driller [illegible]
Rig/Equipment Cable tool [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
	Carbon Steel	8"	242.7	11.0	231.7					Pull 18' [illegible] ~13"
										repeat pull [illegible] drop in
										effort to make small pick,
										settle or drop cut - Cavings
										in very loose in hole
	"	8"	238.7	6.8	231.9					Cut 4.2' (slug cutter used)
								229.6	2.3	D/B 233.7 - 6.8 + 2.7
						40 mesh silica sand	(1) 94 lb bag	223.4	6.5	D/B 227.5 - 6.8 + 2.7
	"	8"	238.7	8.7	230.0					Pull
1400								225.6	4.4	D/B 231.6 - 8.7 + 2.7
	"	8"	235.7	4.8	228.9					Pull Cut 3.0' (slug cutter used)
								226.4	2.5	D/B 230.5 - 6.8 + 2.7
						"	(1) 94 lb bag	220.7	8.2	D/B 224.8 - 6.8 + 2.7
										Site safety officer monitors
										hole finds PIDS [illegible] 113A < det
	"		235.1	6.8	226.3					Pull, cut 2.6' (slug cutter used)
								222.2	4.1	D/B 226.3 - 6.8 + 2.7
						"	(1/2) 94 lb bag	220.1	6.2	D/B 224.2 - 6.8 + 2.7
						"	(1/2) 94 lb bag	217.6	8.7	D/B 221.7 - 6.8 + 2.7
	"		228.3	7.0	221.3					Pull cut 4.8' (slug catcher used)
								223.5	-1.2	D/B 226.8 - 7.0 + 2.7
							(1/2) 94 lb bag	221.6	-0.3	D/B 225.7 - 7.0 + 2.7
							(1/2) 94 lb bag	219.3	2.0	D/B 223.6 - 7.0 + 2.7
							(1/2) 94 lb bag	217.3	4.0	D/B 221.6 - 7.0 + 2.7

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-90	Date 4-6-90	Sheet No. 4 of 4
	Location 200 West 216-U-12 crib	Project W017 W2	

Logged by LA Jovanovich
Reviewed by [illegible]
Measuring Equip. Steel Tape # [illegible] Procedure DOI [illegible]

Date 4-6-90
Date 4-24-90

Drilling Contractor LEH
Driller G Moore, L Fairchild
Rig/Equipment Cable and casing shock

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1500	Carbon Steel	8"	228.3	7.0	221.3	40 mesh silica sand	(½) 94 lb bag	214.4	6.9	B/B 218.7 - 7.0 + 2.7
		8"	224.7	6.9	217.8					Pull, Cut 3.6 (silica catcher used)
								218.4	-0.6	P/B 222.7 - 6.9 + 2.7
							(½) 94 lb bag	216.4	1.4	P/B 220.6 - 6.9 + 2.7
1515										Geologist Off site
										Ready to Bail on Monday
1911										
						40 mesh silica sand	8 bags			Bailed

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DAILY BOREHOLE/WELL C .ETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. [illegible] of [illegible]
	Location 200 West 216-U- [illegible] Project [illegible]

Logged by [illegible] Date 4-9-90	Drilling Contractor KEF
Reviewed by [illegible] Date 4-24-90	Driller [illegible]
Measuring Equip. Steel Tape 1L500-03 Procedure [illegible]	Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
7:35										[illegible]
	Carbon Steel	8"	224.7	6.8	217.9			216.5	1.4	D/B 220.6-6.8+2.7
										Drillers (and [illegible]) waiting
										for pump truck to be [illegible]
										cleaned to haul out hose
8:40										Pump Truck Steam Cleaned
										and on site. Set up to [illegible]
8:50										Boring into barrel #U-2012 90-013
9:00										Surging fill barrel (add ~20 min.
										[illegible] drilling [illegible] PID<det
9:15										Surge and bail into barrel
										# U-2012-90-001. Bail ~25 gals
										Bailed water very dirty and
										oily, will drain 1/2 tsp
										seal in 5 gallon bucket
9:30										Fill barrel, waiting on
										more barrels to be [illegible]
								217.1	0.8	D/B 221.2-6.8+2.7
11:20										John Kelly [illegible] barrel to site
										Bailed 50 gallons into barrel
										# U-2012-90-024. Water clouded
										5 gallon bucket shows ~1/4 tsp
										fine sand at bottom
1025										[illegible]

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9413223.0610

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-40	Date 4/9/90	Sheet No. 2 of 4
	Location KEH Decon. Facility 200-E Area	Project W-017 U-12	

Logged by S.P. AIRHART SPAirhart Date 4-9-90
Reviewed by W.L. McGlynn Date 4-24-90
Measuring Equip. N/A Procedure N/A

Drilling Contractor KEH
Driller MEL THORESEN
Rig/Equipment PUMP RIG

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
										Witnessed steam-cleaning of 3" dia. dart bailer to be used during completion @ W22-40. Temperature of washing 170°-180° F. Pressure 1600 psi.
										Reference WHC-S-014 Rev. 4 section 7.6 + ECN # 124427.

DAILY BOREHOLE/WELL C .ETION LOG	Boring or Well Number 299-[illegible]-40 Date [illegible] Sheet No. [illegible] of [illegible]
	Location 200 West 24-U UA Project [illegible]

Logged by [illegible] Date 4 9 [illegible]	Drilling Contractor EEH
Reviewed by D.L. McElhaney Date 4-24-90	Driller G Thomas, C Bel[illegible]
Measuring Equip. Steel Tape # L500-03 Procedure [illegible]	Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
	[illegible] Steel	8"	224.7	6.8	217.9			218.1	-0.2	D/B 222.2 - 6.8 + 2.7
11:05						1/2" dia Volclay Tablets	(2) 5 gallon buckets	212.7	5.2	D/B [illegible] - 6.9 + 2.7
										Pull (casing is loose, slips back into hole ~1.0' [illegible] 5' pull)
								216.4	1.7	D/B 222.3 - 8.1 + 2.7 (1.3' [illegible])
11:20			224.7	8.1	216.6	3/8" Volclay Tablets	(1) 5 gallon bucket	213.6	3.0	D/B 219.0 - 8.1 + 2.7
			224.7	9.7	215.0			215.6	-0.6	Pull D/B 222.6 - 9.7 + 2.7
11:25										Seal appears 2.5' thick, [illegible] for more pellets on site
[illegible]			221.8	6.8	215.0					Cut 2.9'
1200										Lunch break
1235										Resume work
						1/2" dia Volclay Tablets	(1) 5 gallon bucket	213.4	1.6	D/B 217.5 - 6.8 + 2.7
						"	(1) 5 gallon bucket	210.7	4.3	D/B 214.8 - 6.8 + 2.7
			221.8	8.0	213.8					Pull
								211.4	2.4	D/B 216.7 - 8.0 + 2.7
						8-20 mesh granular	(1) 50 lb bag	206		Pull to 206' (weld)
			206	7	199	[illegible]				Cut
								193	6	D/B 199 - 7 + 3
						"	(1) 50 lb bag	152	51	D/B 152.5 - 7 + 2.7
			185							Pull to 185' (weld

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. [illegible]
	Location [illegible] 216-U-12 Crib Project [illegible]

Logged by [illegible]	Date 4-9-90	Drilling Contractor KEH	
Reviewed by DE McBlan	Date 4-24-90	Driller [illegible]	
Measuring Equip. Steel Tape # [illegible]	Procedure [illegible]	Rig/Equipment [illegible]	

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1330	Cut on steel	8"	185	7	178					Cut @ 185' weld
								164.6	13	D/B 168.7 - 6.8 + 2.7
						8 20 mesh Granular	(12) 50 lb bags	135	43	
	"	8"	166	7	157	Bentonite Granules				Pull to 166' weld
										Cut @ 166' weld
								148	11	D/B 152.5 - 7 + 2.7
						"	(15) 50 lb bags	111		
			147	7	140					[illegible] 147' weld, cut
								118	22	D/B 122 - 7 + 2.7
						"	(6) 50 lb bags	18		
			133'	7	126					Pull to 133' weld cut
								105	23	D/B 109.2 - 7 + 2.7
1430						"	(5) 50 lb bags	93		D/B
			118'							Pull to 118' weld, cut
			100'							Pull to 100' weld, cut
1455										Site Secure, drill [illegible]
										[illegible] TD 200'
										Stop work, [illegible]
								106		D/B 110 - 7 + 2.7
1510										[illegible] off site
						Bentonite Granules	5 bags			Total
						Calcium Pellets	5 buckets			Total
										Total bailed 105 gallons

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DAILY BOREHOLE/WELL C[illegible]ETION LOG

Boring or Well Number [illegible] Date [illegible] Sheet No. [illegible] of [illegible]
Location 200 East 216-U-12 Project U-17 [illegible]

Logged by LA Dannis
Reviewed by JRMcBlank Date 4-24-90
Measuring Equip. Steel Tape 6505-03 Procedure [illegible]

Date [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
7[illegible]										[illegible]
		8"	0							Dollies pulled [illegible] 5"
										Casing [illegible]
	[illegible]	10"	143.5	13	142.2			107	35	109.5 - 5 + 2.7
7[illegible]										Unload 10" nipple to weld
										onto casing for [illegible] to pick up
7 40										Remove jacks preparing to
										weld on 10" nipple
7.50										welding
9 [illegible]										Drilling Company
										Geologist at Standing Work stop
										C Rutherford cutting casing [illegible]
										drill tools to be hoisted up for
										hoist
12:10										Work resumes: cut off [illegible]
										length of 10" casing
	"	10"	148.2	6.0	142.2					Total 10" added - 4.7'
10 30										Replace jacks
10 45			133	7	126					Pull to 133' weld, cut
								113	13	D/B 117.3 - 7 + 2.7
						B20 [illegible] gravel	(15) 50 lb bag	90	36	D/B 142 - 7 + 2.7
						Bentonite Crumbles				
11 5						"	(8) 50 lb bags	73	48	
			113	7	106					Pull to 113' weld, cut

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DAILY BOREHOLE/WELL COMPLETION LOG

Boring or Well Number [illegible] Date [illegible]
Location [illegible] Project [illegible]

Logged by [illegible] Date 4-10-90
Reviewed by [illegible] Date 4-24-90
Measuring Equip. [illegible] Procedure [illegible]

Drilling Contractor KEH
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
	Carbon Steel	10"	113'	7	106			85	21	D/B 89-7+3
11:40						8-20 mesh Granular	(10) 50 lb bags	70	36	
		10"	90'	7	83	Bentonite Crumbles				Pull to 90' weld cut
1:00										Lower back
12:10								82	1	D/B 86-7+3
						"	(30) 50 lb bags	56	31	D/B 56-7+3
		10"	68'	7	61					Pull to 68' weld cut
								59	2	D/B 63-7+3
1330						"	(26) 50 lb bags	20	41	
			50'	7	43					Pull to 50' weld, cut
								28	15	D/B 32-7+3
										No crumbles on site
1350										Waiting on crumbles
1355										On site - Follow crane as
										escort (w/ G Thomas) to
										Basin and Range completed
										well. Load pallet of crumbles
										onto truck to bring back for
										completion.
1430										Geologist on site
						"	(10) 50 lb bags	13	30	
1430										Truck [illegible] on site w/
										7 pallets of crumbles. Unloading
										crumbles @ 29 - 12:45.

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet no. ___ of ___
	Location [illegible] 216-U-1 [illegible] Project [illegible]

Logged by LA Dominic [illegible] Date 6/10/[illegible]
Reviewed by W.E. McKlem Date 4-24-90
Measuring Equip. Steel Tape #1505-03 Procedure [illegible]

Drilling Contractor KEH
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1530										Compare [illegible]
								11.8		P 100-6.9.2.7
										For water in effect [illegible]
										of casing)
1510										Geologist of [illegible]
						Bentonite Crumbles - 89 bags				TOTAL

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. [illegible] of [illegible] Location [illegible] Project [illegible]

Logged by [illegible] Date [illegible] Reviewed by [illegible] Date 4-24-90 Measuring Equip. [illegible] Procedure [illegible]	Drilling Contractor [illegible] Driller [illegible] Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
7:50			50'	7	43'					Geologist on site
8:00	Carbon Steel	10"	29.5'	7.2	32.3					Pull to 29.5' and cut
								19.4	2.9	D/B 32.9-7.2+2.7
8:15										Waiting for [illegible]
										Mix Grout
	"	10"	29.5	8.5	21.0					Pull
								20.1	0.9	D/B 35.9-8.5+2.7
										Pull
	"	10"	29.5	8.9	20.6			20.5	0.1	D/B 26.7-8.9+2.7
			27.2	6.6	20.6					Cut 2.3'
8:30										Crane [illegible] Unload
										[illegible] for W22-19
										Completion Geologist on site
8:50										Water Truck on site
9:05						Portland Type I-II	(7) 100 lb bags			Mix Grout
9:20						cement		4.6		Pump Grout D/B (11.3 7.2)
						"	(6) 100 lb bags			Mix Grout
9:30										Pump Grout
	"	15'	19.0	7.5	11.5					Pull to 19' and weld
										Pump Grout
10 AM	"	10"	0							Pull remaining casing
										Remove Jacks
								3.0		D/grout
1:45	Stainless Steel	4"		0.83				24.14		D/B 24.58-0.83+2.74 BLS

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DAILY BOREHOLE/WELL C ETION LOG

Boring or Well Number [illegible] Date 4-11-90 Sheet No. [illegible]
Location 200 East 216-U-12 Project 1317 U12

Logged by L.A. Dawson Date 4-11-90
Reviewed by J.E. McElhaney Date 4-24-90
Measuring Equip. Steel Tape LSD12-03 Procedure DOI Rev 0

Drilling Contractor KEH
Driller G. Thomas, Bechtel
Rig/Equipment

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
10:45										Clean-Up Cycle
12:10										Geologist Dismissed

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. 1 of 1
	Location 200 West Project [illegible]

Logged by [illegible] Date [illegible]
Reviewed by [illegible] Date 5-7-90
Measuring Equip. _____ Procedure [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Equipment _____

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1225										Backfill the [illegible] with [illegible] concrete pad. [illegible] 1/4" [illegible] 1/4" [illegible] 16 gage wire mesh screen. No [illegible] could [illegible] to accurate. 6" [illegible] steel protective casing [illegible] 30" above top of 4" [illegible] casing. Top [illegible] 6" [illegible] casing and cap is present. [illegible] [illegible] has been [illegible] that it can be removed. [illegible] steel casing is still [illegible] 4" [illegible] steel casing. Concrete batch # 08317. Pour Worker [illegible] 1) [illegible] of pad. Pad will harden [illegible] before pouring.

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CENTRAL PRE-MIX CONCRETE CO.

INSPECTORS COPY

11919 HARRIS ROAD • PASCO, WA 99301

WA REG #223 01-CE-NT-RP-M311J8

ID REG #5894-AAA-1-2-3 MT REG #3461A

UNLOADING
unlo. time 7½ minutes per cubic yard increase. Charge thereafter at posted truck rates. This concrete designed in accordance specifications indicated below. make deliveries inside the curb line at cus-r's risk only and accept no responsibility soever for damages resulting from such eries.

CONCRETE
SAND & GRAVEL
545-8405
CRUSHED ROCK
FILL

CAUTION: May cause eye or skin injury. Contains Portland cement. Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible, and wash exposed skin areas promptly with water. If any cement or cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. All claims for damages or shortages must be made within 24 hours of delivery.

LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	ARRIVE PLANT
7 : 44	2:22	12:37	:	:

☐ TEST CYLINDERS TAKEN
ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE ITS STRENGTH.

ESTIMATED SLUMP AT UNLOADING _____

ADDED ____ GAL. WATER AT CUSTOMER REQUEST.

SIGNATURE

ORDER NO.	CUSTOMER NO.	CPM PROJECT NO.	CUSTOMER PO/JOB NO.	TICKET NO.		DRIVER	
[illegible]	[illegible]	[illegible]	B-2012/REL#28	08917	00008254	DICK	1

CUSTOMER [illegible]SER

DELIVERY ADDRESS 200 WEST.. HANFORD

DATE 01-May-90

DELIVERY INSTRUCTIONS

MAP

TIME DUE 12:30

LOAD QTY.	DELIVERED QTY.	ORDER QTY.	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
5.00	[illegible]	5.00	0304H	5000 7SK 3/4 5%		

WC RATIO ALLOWED [illegible]
TOTAL WATER ALLOWED 1246
MOISTURE'S
3/4 1% 9520 9425 95
SAND 3% 6360 6174 186
SUB TOTAL
WATER BATCHED 905
TOTAL AVAILABLE 7 GAL 60

LOAD SIZE	MIX NO.	MIX DESCRIPTION	SLUMP	AIR	CC	USE	TRUCK	PLANT	SUBTOTAL / TAX / TOTAL DUE
5.00	0304H	5000 7SK 3/4 5%	4.00	100	0.00		956	1	

Truck no.: 956 Batch size: 5.00 Yds. Mix name: 0304H
5000# 7.0 SK. 3/4 AGG. Time 11:39:11 AM Date 1 May, 1990

		Zero				Zero		
3/4 RND	1.0	9494	9520 Lbs C		LAFS-1-2	3290	3280 Lbs C	
ASTM.SAN	3.0	15016	15920 Lbs C					
			Zero				Zero	
			Zero				Zero	
SEP-2	100	55	56 Oz C		WATER 1	906	905 Lbs C	
PLAST-3		195	194 Oz C					
			Zero				Zero	

Water trim: -10.0 / Yd. Time 11:42:37 AM

95o

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WELL CHECK LIST

Well Number: 299-W22-40 Location: U12

Date: 5-15-90

	Yes	No
Hasp on protective casing	X	
Lock	X	
Proper cap fit	X	
Well ID number on brass cap	X	
Protective post painted	X	
Well ID number stenciled on post		X
Well ID number stenciled on protective casing		X
Survey mark on casing		?
Stock tank		X
Site neat		X

Comments: needs general cleanup & landscaping

Signature: [illegible] Date: 5-15-90

9413223.0620

9413223.0621

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41 Location 200W U-12	Date 2/7/90 Sheet No. 1 of 1 Project W017 216-U-12 Crib

Logged by R Miller (GAI) [signature] Date 2/7/90
Reviewed by [signature] Date 4-24-90
Lith. Class. Scheme Folk Procedure DO-1, Rev 0

Drilling Contractor KEH
Driller Craig Wimsley
Rig/Method RE-22-14100

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								Rig was steam cleaned on KEH decon pad		0715	At site - begin set-up
								located at 200E, tools & casing were also cleaned			of rig
								at same location on 2/6/90 - witnessed by		0815	geol. on site -
								R D Miller (GAI)		1200	driller stops - lunch
										1230	resume activity - make
											a call for an SSO for
											this site.
								10"ø casing - drive shoe O.D = 0.94' (11¼")		1408	SSO - D. Wright arrives
								Food grade vegetable oil used as lubrication on			for H_2S briefing
								tools		1418	H_2S briefing completed.
										1420	begin to drill RFT arrives
5.0	PID	<det	dry	lith	2		(m) S	Slightly Muddy SAND, (89% Sand, 11% Mud) 9% vcs		1424	to 5.0' - sample DB
	Gas	<det		moist	1	5.0		10% cs 15% ms 25% fs 30% vfs, 11% Mud, mod. sorted		1430	add 10"ø casing w/ shoe.
								80% subr 20% Subang, SA-SR, dk gray brn (10YR			12.17'
								4/2 mst), strong rx to 10% HCl, unconsolidated		1450	add H_2O to air recovery
								trace of roots, traces of caliche pockets.		1509	SSO checks monitoring & det.
								total 10" casing = 12.17' w/ drive shoe.		1519	SSO departs site
											stop drilling - RFT dep.
								total footage = 5.0'		1525	Dep. site
								total 10" casing = 12.17'			
								total H_2O added = 5gal			

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9413223.0622

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/8/90	Sheet No. 1 of 2
	Location 200 W U-12	Project W017 216-U-12 Crib	

Logged by R. Miller (GAI), [illegible]	Date 2/8/90	Drilling Contractor KEH	
Reviewed by D.R. McGhan	Date 4-24-90	Driller Craig Womsley	
Lith. Class. Scheme Folk	Procedure DO-1, Rev 0	Rig/Method BE-22-14103 / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10"ø casing = 12.17'		0700	Arr site - SSO (J. Wright)
											is here, p.cloudy, 36°F
								cobbles? at ~7.0' bls			wind N-NW - 5mph.
										0740	SSO - checks borehole
										0804	begin drilling - RPT arrives
										0810	add H_2O to borehole
10.0'	PID	<det	n/a	lith	2	10.0	S	SAND (1% Gravel 95% Sand 4% Mud) 1% vfp,		0845	to 10.0' - sample DB
	GM	<det						15% vcs 20% cs 20% ms 20% fs 20% vfs, 4% mud,			
								mod. sorted, Gravel 100% mafic, Sand 80% mafic			
								20% felsic, SA-SR, dk gray brn (10YR 4/2 wet)			
								slight rx to 10% HCl, unconsolidated - loose, trace			
								of f-vf micaceous sands, trace of cp-fp occasional			
								sample may be damp due to added H_2O		0855	SSO - checks borehole
								10" - 12.17 + 8.91' = 21.08' total		0900	add 10" - field
										1045	resume drilling
										1128	RPT departs - lunch.
										1134	SSO - checks borehole
										1135	stop - no RPT on site -
											work on casing
										1200	stop - lunch.
										1230	resume activity

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9413223.0623

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-91	Date 2/8/90	Sheet No. 2 of 2
	Location 200W 11-12	Project W017-216-U-12 Crib	

Logged by R. Miller, (GAI) [signature] Date 2/8/90
Reviewed by [signature] Date 4-24-90
Lith. Class. Scheme Folk Procedure DO-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10" casing = 21.08'		1235	RPT - R. Wyer arrives
											SSO checks borehole
15.0	PID	<det	n/a	lith	2	15.0'	S	SAND (92% Sand 8% Mud) 12% mg 40% fs 40% vfs,		1240	to 15.0' - sample DB
	GM	<det						8% mud, v well sorted, 80% mafic 20% felsic, SA-SR,			
								dk gray brn (10YR 4/2 d) moderate rx to 10% HCl,			
								unconsolidated - loose to compact, f sands are			
								micaceous, no apparent gravel or c sands.			
								10" - 21.08' + 8.58' = 29.66' total		1303	add 10" ⅞" weld
										1433	resume drilling
20.0'	PID	<det	0	lith	2	20.0	S	SAND (92% Sand 8% Mud) similar to 15.0'		1443	to 20.0' - sample DB
	GM	<det		mirrst	1						
				25% mf glass	2						
				10% lmb glass	2			@ 22.0' traces of white (10YR 8/1) ASH or			
								vitric tuff			
								will have to log in am 2/9/90		1516	to 25.0' - sample DB
											RPT - may have readings
								total footage = 20.0		1522	stop - RPT departs site
								total 10" casing = 17.49'		1525	SSO departs site - w/o
								total H_2O - 5 gal			survey sample
										1530	Op site
											Sample on cole. 020890

009

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41 Location 200W U-12 crib	Date 2/9/90 Sheet No. 1 of 2 Project WD17 216-U-12 crib

Logged by R. Miller (GAI) [illegible]	Date 2/9/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date 4-24-90	Driller Craig Wamsley	
Lith. Class. Scheme Folk	Procedure DD-1, Rev 0	Rig/Method RE-22-14100 / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10"Ø casing = 29.66'		0705	Ar site - SSO - D. Wright
											there, warm rig & Pref.
25.0	PID	n/a	nA	lith	2		S	SAND (92% Sand 8% mud) 12% ms 40% fs 40% vfs,			to drill
	GM	<det				25.0		8% mud, v. well sorted, 80% mafic 20% felsic, SA-SR,		0720	SSO checks borehole
								dk gray brn (10YR 4/2 wet) mod rx to 10% HCl,		0730	trim drive barrel.
								unconsolidated - loose to compact, f sands are		0752	RPT - R. Wyer arrives
								micaceous, no apparent gravels or c sand, trace		0755	begin to drill
								of white ash (prob. interbeds - fluvial)			
								10" - 29.66' + 9.08' = 38.74' total.		0820	add 10" - & weld
								(cut 0.25 off.)		0850	SSO - departs site
										0855	resume drilling
30.0	PID	n/a	D-SM	lith	2		S	SAND (97% Sand 3% mud) 7% vcs 20% cs 40% ms		1015	to 30.0' - sample OB
	GM	<det		moist	1	30.0		20% fs 10% ms, 3% mud, well sorted, 75% mafic 25% felsic		1025	SSO - arrives site
								SA-SR, dk gray brn (10YR 4/2 wet) slight rx to 10% HCl			
								unconsolidated - loose.			
35.0'	PID	<det	D-SM	lith	2		S	SAND (4% Gravel 94% Sand 2% mud) 1% mp 1% fp		1040	to 35.0' - sample OB
	GM	<det		moist	1	35.0		2% vfp, 2% vcs 2% cs 10% ms 40% fs 40% vfs, 2% mud,		1050	add 10" - & weld - cut 0.25'
								v. well sorted, 80% mafic 20% felsic, SA-SR, dk gray brn		1145	stop for lunch.
								(10YR 4/2 wet) mod-strong rx to 10% HCl, unconsolid-		1230	resume welding
								ated - loose to compact, f. sands are micaceous.		1307	resume drilling
								10" - 38.49' + 9.67' = 48.16' total			

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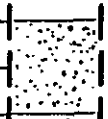
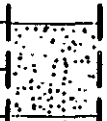
9413223.0625

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/9/90	Sheet No. 2 of 2
	Location 200W U-12 crib	Project W017 216-U-12 crib	

Logged by R Miller (GAI) [signature] Date 2/9/90
Reviewed by [signature] Date 4-24-93
Lith. Class. Scheme Folk Procedure OO-1, Rev 3

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10" casing = 48.16'			
40.0'	PID	Ldet	D-SM	lith	2		S	SAND (94% Sand 6% Mud) 2% vcs 2% cs 30% ms		1340	to 40.0' - sample DB
	GAI	Ldet		moist 250ml	1	40.0		35% fs 25% vfs, 6% mud, well sorted, 75% mafic			
				glass 40ml	2			25% felsic, SA-SR, dk gray brn (10YR 4/2 wet)			
				ziplock	2			strong rx to 10% HCL, unconsolidated - loose to			
								compact, f. sand is micaceous.			
45.0	PID	n/a	D-SM	lith	2		S	SAND (1% Gravel, 92% Sand, 7% Mud) 1% mp,		1403	to 45.0' - sample DB
	GAI	Ldet		moist	1	45.0		1% fp 2% vfp, 10% vcs 20% cs 20% ms 20% fs 22% vfs,			
								4% mud, mod-well sorted, Gravel 80% mafic 20% felsic,			
								Sand 60% mafic 40% felsic, SA-SR, dk gray brn			
								(10YR 4/2 wet) strong rx to 10% HCL, unconsol-			
								idated. loose.			
								10" - 48.16' + 8.0' = 56.16' total		1415	add 10" - 5' well
										1515	stop for day
								footage = 20.0'		1525	Dp site
								casing added = 26.75'			
											sample on CoC 020990

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-91	Date 2/12/90	Sheet No. 1 of 2
	Location 200W U-12 crib	Project W017 216-U-12 crib	

Logged by R. Miller (GAI) [signature] Date 2/12/90
Reviewed by [signature] Date 4-24-90
Lith. Class. Scheme Folk Procedure CO-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method GE 22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 10"Ø casing = 56.16'		0700	Air sick - prepare wind
											damage & finish welding
											P. Cloudy, 32°F, wind N-NW
											5-10mph - SSD - here,
											D Wright.
										0753	RPT - R. Wyer arrives
										0910	begin to drill
50.0	PIC	<1%	0-5%	lith	2		(g)S	Slight Gravelly SAND (7% Gravel, 91% Sand, 2% Fines) 1% vcs, 2% fs		0930	to 50.0' - sample D.B.
	GAI	<dd		moist	1			4% vfs, 20% mcs, 20% cs, 25% ms, 22% fs, 1% vfs, 2% mud,			
								mod. well sorted, Gravel 75% mafic, 25% felsic, Sand			
								55% mafic, 45% felsic, SA-R, dk gray brn (10YR			
								4/2 wet) slight rx to 10% HCl, unconsolidated -			
								loose,			
								10" = 56.16' + 9.33' = 65.49' total		0949	Add 10" casing
										0950	C. Hodges, J. Keller &
											camera crew arrive
										1030	camera crew KFW-42
											and others depart.
										1149	resume drilling
										1155	stop - lunch.
										1235	resume drilling

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9413223.0627

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/12/90	Sheet No. 2 of 2
	Location 200W U-12 crib	Project W017 216U-12 crib	

Logged by R. Miller (GAI) [signature] Date 2/12/90
Reviewed by D.R. Mittelstaedt Date 4-24-90
Lith. Class. Scheme Folk Procedure M-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE-22-14100

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10" casing = 65.49'			
55.0	PID	n/t	D-SM	lith	2	55.0	S	SAND (4% Gravel 95% Sand 1% mud) 1% fg 3% vfg,		1240	to 55.0' - sample DB
	GAM	Edet		moist	1			25% vcs 25% cs 25% ms 15% fs 5% vfs. 1% mud, mod-			
								well sorted, Gravel 90% mafic 10% felsic, Sand 40% mafic			
								60% felsic, SA-SR, dk gray brn (10YR 4/2 wet)			
								slight to no rx to 10% HCL, unconsolidated - loose			
60.0	PID	Edet	C-SM	lith	2	60.0	S	SAND (4% Gravel 95% Sand 1% mud) - similar		1303	to 60.0' - sample DB
	GAM	Edet		moist	1			to 55.0' sample. - trace mp			sample on LOF C021290
				2Gal glass	2			10" - 65.49' + 10.29' = 75.78' total		1325	add 10" - & weld
				40ml amb glass	2					1452	resume drilling
65.0	PID	Edet	D-SM	lith	2	65.0	S	SAND (4% Gravel 95% Sand 1% mud) similar		1500	to 65.0' - sample DB
	GAM	Edet		moist	1			to 55.0' sample			
70.0	PID	n/t	D-SM	lith	2	70.0	S	SAND (4% Gravel 95% Sand 1% mud) similar		1513	to 70.0' - sample DB
	GAM	Edet		moist	1			to 55.0' sample.			
										1522	stop for day life site
								footage = 25.0'			
								10" casing = 19.62'			

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9413223.0628

DAILY BOREHOLE LOG	Boring or Well Number [illegible]	Date [illegible]	Sheet No. 1 of 2
	Location [illegible]	Project [illegible]	

Logged by [illegible]	Date [illegible]	Drilling Contractor [illegible]	
Reviewed by D.L. McBlan	Date 4-24-90	Driller [illegible]	
Lith. Class. Scheme [illegible]	Procedure [illegible]	Rig/Method [illegible]	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 10" [illegible] 75.78'		710	Ar air [illegible]
											[illegible] 26°F, wind N-NW
											impact [illegible]
										0900	CPT - C layer [illegible]
										0930	begin drilling
								10" - 75.78' + 8.50' 84.28' total		0930	add 10" [illegible]
										1037	resume drilling
75.0	PID	<det	0-50	lith	I		S	SAND (3% Gravel 75% Sand 2% Mud) 5% vf.		1045	to 75.0' - sample N
	GM	<det		moist	1	75.0		10% vcs 25% cs 40% ms 10% fs 10% vfs, 2% Mud,			
								well sorted, Gravel 80% mafic 20% felsic, Sands			
								25% mafic 75% felsic SA-SR, dk gray brn (10YR			
								4/2) wet, slight rx to 10% HCL, unconsolidated-			
								loose, trace mica - fp.			sample on CoC 021390
80.0'	PID	<det	0-50	lith	I		S	SAND (2% Gravel 96% Sand 2% Mud) similar		1105	to 80.0' - sample N
	GM	<det		moist	1	80.0		to 75.0' sample.		1130	RPT - depth's stop drilling
				25%							cmnt on casing
				glass	2						
				50%						1200	stop - lunch
				20%	I						
										1250	resume activity
										1240	CPT [illegible] - resume
											drilling
								10" 84.28' + 8.50' 92.78' total		1250	add 10" [illegible]

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9413223.0629

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/13/90	Sheet No. 2 of 2
	Location 200W 216-U-12	Project W017 216-U-12 Crib	

Logged by R. Miller (GAI) [signature] Date 2/13/90
Reviewed by [signature] Date 4-2-1-93
Lith. Class. Scheme Folk Procedure DO-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method CE-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10"ø casing = 92.70'		1415	resume drilling
85.0	PID	<det	SM	lith	2		S	SAND (97% Sand 3% Mud) 55% fs 42% vfs,		1420	to 85.0' - sample DB
	GM	<det		moist	1	85.0		3% mud, v. well sorted, 20% mafic 80% felsic, SA-SR,			
								dk gray brn (10YR 4/2 wet), slight rx to 10% HCL,			
								unconsolidated - loose to compact, f sands are			
								micaceous.			
								SAND (4% Gravel, 94% Sand, 2% Mud) 2% fg		1500	to 90.0' - sample DB
90.0	PID	<det	SM	lith	2		S	2% vfg, 10% vcs 15% cs 40% ms 15% fs 14% vfs, 2% mud,		1522	stop for day
	GM	<det		moist	1	90.0		mod sorted, Gravel 80% mafic 20% felsic, Sand 70%		1526	Dp site
								mafic 30% felsic, SA-SR, dk gray brn (10YR 4/2)			
								slight rx to 10% HCL, unconsolidated - loose			
								f sands are micaceous.			
								footage = 20'			
								10" casing = 17.0'			

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9413223.0630

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/14/90	Sheet No. 1 of 2
	Location 200 W 216-U-12 Crib	Project W017 216-U-12 Crib	

Logged by R. Miller (GAI) / [illegible] Date 2/14/90
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme Folk Procedure EO-1, [illegible]

Drilling Contractor KEH
Driller Mel Thoresen / Craig Wimsley
Rig/Method BE-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10" casing = 92.78'		0715	Arrive site - Mel to safety
											briefing on site, p.cloudy
											13°F, wind N-NE 5-10mph
										0750	begin to warm equip
											& prepare to weld 10"
											rig unit start
										0815	EPT arrives - L. Olveda
										0830	mechanic fixes rig shutdown
								10" - 92.78' + 8.75' = 101.53' total		0845	add 10" & weld
								cut 0.08' of 10" off = 101.45		0955	resume drilling
95.0	PID	<det	SM	lith	2		S	SAND (97% Sand ≤ 70 μm) 2% vcs 5% cs 50% ms		1015	to 95.0' - sample CE
	GAI	<det		moist	1			20% fs 20% vfs, 3% mud, well sorted, 25% mafic			
								75% felsic, SA-SR, dk gray brn (10YR 4/2 wet), no			
								to slight rx to 10% HCl, uncemented - loose to			
								compact, f. sands are micaceous.			
100.0'	PID			lith	2		S	SAND (1% Gravel, 97% Sand 2% mud) 1% vfg, 7% vcs		1110	to 100.0' - sample CE
	GAI			moist	1			20% cs 40% ms 15% fs 15% vfs, 2% mud, mod sorted,		1120	cut 0.08' off & add 10'
				250ml				Gravel 90% mafic 10% felsic, Sand 25% mafic 75% felsic,		1155	stop for lunch
				glass	C			A-SC, dk gray brn (10YR 4/2 wet), no rx to 10% HCl,		1230	resume drilling
				40ml VOA	2			uncemented - loose. (C. of C. # 021490 216-U-12)		1245	C. Wimsley arrives,
								10" - 101.45' + 7.92' = 109.37' total		1250	M. Thoresen departs

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9413223.0631

DAILY BOREHOLE LOG	Boring or Well Number [illegible]	Date [illegible]	Sheet No. [illegible] of 2
	Location [illegible]	Project [illegible]	

Logged by [illegible]	Date [illegible]	Drilling Contractor [illegible]	
Reviewed by D.E. McGlew	Date 4-27-90	Driller [illegible]	
Lith. Class. Scheme [illegible]	Procedure [illegible]	Rig/Method [illegible]	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 10" casing = 109.37'			
										1410	Alan Pearson takes over log
										1415	Drive Casing
										1420	Resume Drilling - CB
										1430	Drive Casing
										1435	Resume Drilling - CB
105'	G/M	<Det	SM	Lith	2		S	SAND: (2% Gravel, 94% Sand, 4% Mud)		1440	Take Sample w/CB
	PID	<Det		Moist	1			1% FP, 1% VFP, 14% VCS, 20% CS, 25% MS, 20% FS, 15% VFS, 4% Mud;			
								Moderately Sorted: Gravel 70% Basaltic, 30% Felsic;			
								Sand 30% Mafic, 20% Qtz, 50% Felsic: Gravel			
								SA-SR: Sand SA: Wet Color light olive brown			
								2.5Y 5/4: Moderate Reaction w/10% HCL:			
								Unconsolidated except for thin interbeds of			
								slightly cement Sand. Interbeds 1"-½" thick		1445	Resume Drilling - CB
								& strong reaction w/10% HCL		1500	Begin Welding Casing
										1445	Resume Drilling - CB
										1515	Quit for Day
								footage = 12'			
								10" Casing added = 16.67'			
								No H2O added Today			

HW Pearson Alan Pearson

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/15/90	Sheet No. 1 of 3
	Location 200 West	Project W-017-216-U12	

Logged by AW Pearson Alan Pearson Date 2/15/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme Folk Procedure DO-1, Rev. 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE 60L / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	Geologist & Driller arrive at site
										0705	Driller warming up rig & waiting for RPT.
107.4'	PID	<Det.						109.3'-4.0'-2.1' = 107.4' O/B (1300-303)		0750	Take O/B
								109.4'-4.0' = 105.4' O/casing from ground surface.			
										0800	Driller prepares to weld / RPT arrives
								109.4' + 7.3' = 116.7' Total 10" casing		0815	Begin welding 8" casing
										0925	Drive Casing
										0930	Begin Drilling - CB
110'	PID	<Det	SM	Lith	2		MS	Muddy SAND: (tr. gravel, 75% Sand, 25% Mud)		0940	Take Sample w/CB
	GM	<Det		Moist	1			tr. VFP, 5% VCS, 10% CS, 20% MS, 20% FS, 20% VFS, 25% Mud:			
								Moderately Sorted: Sand 30% Lithic, 20% Qtz, 50%			
								Felsic, SA: Wet Color light olive brown 2.5Y 5/4:			
								Moderate reaction w/ 10% HCl: Unconsolidated:			
								Mud present in very thin lenses:			
										0950	Resume Drilling
										0955	8" Carbon Steel Casing Delivered all was clean

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/15/90	Sheet No. 2 of 3
	Location 200 West	Project W-017-216-W2	

Logged by AW Pearson, Alan Pearson — Date 2/15/90
Reviewed by [illegible] — Date [illegible]
Lith. Class. Scheme Folk — Procedure DO-1, Rev. 0

Drilling Contractor KEH
Driller Craig Walmsley
Rig/Method BE60L / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
115'	PID	<Det	SM	Lith	2		S	Sand: (1% Gravel, 95% Sand, 4% Mud)		1020	Take sample w/CB
	GM	<Det		Moist	1			1% VFP, 3% VCS, 12% CS, 20% MS, 30% FS, 30% VFS, 4% Mud:			
								Well-Moderately Sorted:			
								Gravel 70% Basaltic, 10% Qtz, 20% Felsic, SA:			
								Sand 30% Mafic, 20% Qtz, 50% Felsic, SA:			
								Wet Color light olive brown 2.5Y5/4:			
								Weak reaction w/10% HCL: Unconsolidated:			
								Note decrease % Mud - No Mud lenses.			
										1030	Prepare to add casing
								116.7' + 8.3' = 125.0' Total 10" Carbon Steel Casing		1100	Begin welding casing
										1200	Break for Lunch
										1240	Resume welding
	PID	<Det								1305	Drive Casing
	GM	<Det								1310	Resume Drilling - CB
120'	PID	<Det	SM	Lith	2		S	SAND: (1% Gravel, 95% Sand, 4% Mud)		1330	Take special sample - CB
	GM	<Det		Moist	1			1% VFP, 2% VCS, 3% CS, 20% MS, 30% FS, 40% VFS, 4% Mud.			COC# 021590112W2241
				VOA	2			Well sorted: Gravel 70% Basalt, 10% Qtz, 20% Felsic, SA			
				Chem	2			Sand 40% Mafic, 10% Qtz, 50% Felsic, SR:			
								Wet Color light olive brown 2.5Y5/4:			
								Moderate Reaction w/10% HCL: Unconsolidated			
								Note grain size decrease in sand.			

9413223.0634

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/15/90	Sheet No. 3 of 3
	Location 200 West	Project W-017-216-1112	

Logged by AW Pearson, Alan Pearson Date 2/15/90
Reviewed by [illegible] Date [illegible]-90
Lith. Class. Scheme Folk Procedure DO-1, Rev. Ø

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE 60L / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										1340	Resume Drilling - CB
								125.0' + 8.1' = 133.1' Final Total of Temporary		1400	Prepare to add casing
								Carbon Steel Casing		1415	Begin Welding
										1515	Finished Welding
										1520	Quit for day
								23.7' of 10" Carbon Steel Casing added Today			
								footage = 122 - 107.4' = 14.6'			
								No H_2O added today			

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9413223.0635

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41 Location 200W U-12 Crib	Date 2/16/90 Sheet No. 1 of 2 Project W017 216-U-12 Crib

Logged by R. Miller, (GAI) Gerald Miller Date 2/16/90
Reviewed by D.K. McElhaney Date 2-24-90
Lith. Class. Scheme Folk Procedure OO-1, Rev B

Drilling Contractor KEH
Driller Craig Wamsley / Gene Thomas
Rig/Method BE-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 10"Ø casing = 133.1'		0700	Arrive site - prepare to
								cloudy, 23°F, wind N-NE 0-3mph			drill & wait for RPT.
								129.7'bk + 2.1' cor - 9.4' s.u. = 122.4' bls (1320-303)		0745	take depth to bottom
											RPT arrives
										0802	begin to drill
125.0'	PID	<det	SM	lith	2		S	SAND (97% Sand 3% Mud) 3% vcs 4% cs 30%		0814	to 125.0' - sample DB
	GM	<det		moist	1	125.0		ms 30% fs 30% vfs, 3% Mud, well sorted, 30% mafic			
								70% felsic, SA-SR, lt. ol. brn (2.5Y 5/4 wet)		0850	to 128.5' slight det w/
								no to slight rx to 10% HCL, unconsolidated - loose			GM < 50cpm RPT.
								to compact, f sands are micaceous			R. Myer - main drive
											belt slipping on rig
										0905	mechanic arrives
										0945	resume drilling
130.0	PID	<det	SM	lith	2		S	SAND (96% Sand 4% Mud) 1% vcs 1% cs 25% ms		0950	to 130.0' - sample DB
	GM	<det		moist	1	130.0		39% fs 30% vfs, 4% mud, well sorted, 25% mafic		1020	begin tool change to
								75% felsic, SA-SR, lt. ol. brn. (2.5Y 5/4 wet) slight			6" DB
								rx to 10% HCL, unconsolidated - loose to compact.		1110	tool change completed
								f sands are micaceous.			w/ "car" on 10"
										1110	advance 10" to 132.1' bls
								8"Ø casing w/ 0.77' (9¼") OD drive shoe = 21.75'		1115	begin to add 8"Ø casing
								no geophysical logging of the 10" due to log truck is in shop for repairs - A. Pearson			

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9413223.0636

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/16/90	Sheet No. 2 of 2
	Location 200W 216-U-12 Crib	Project W017 U 12 Crib	

Logged by R Miller (GAI)	Date 2/16/90	Drilling Contractor KEH	
Reviewed by D C Mulliken	Date 1/ /90	Driller Gene Thomas	
Lith. Class. Scheme Folk	Procedure OO-1, Rev 4	Rig/Method EE-60L - 22-141XT / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										1155	stop for lunch
										1230	resume preparation of
											8" casing
										1410	driller departs site
										1421	driller arrives site -
											resume welding
										1440	install first 8" section
											(21.75)
										1510	stop activity - clean-up
										1520	Dp site
								footage drilled = 10'			
								10" casing added = 0.0'			
								8" casing added = 21.75' w/drive shoe			
								H_2O added to borehole = 0 gallons			

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lll

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-A1	Date 5/20/90	Sheet No. 1 of 1
	Location 200 WEST AREA	Project 216-U-12 CRIB W-017	

Logged by R Miller (GAI) Geologist w/ driller	Date 5/20/90	Drilling Contractor KEH	
Reviewed by W.E. McGlynn	Date 4-24-90	Driller Mel Thoresen	
Lith. Class. Scheme Folk	Procedure 10.1, Rev 0	Rig/Method CE 60L - 27-14.00 / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing = 21.75' w/ drive shoe		0657	Arr site - driller will be
											late, cloudy, 56°F, wind
											N-NE, 3-6mph, SSO-
											D. Wright.
										0745	driller arrives - prepare
											to add 8"
										0755	RIT R. Wyer arrives
								8" - 21.75' + 20.46' = 42.21' total		0810	add 8" casing
										0925	welding completed - lower
											into borehole & prepare
											8"
								8" - 42.21' + 19.92' = 62.13' total		1005	add 8" casing
										1105	welding completed - lower
											into borehole & prep 8"
								8" 62.13' + 21.50' = 83.63' total		1108	add 8" casing
										1150	stop for lunch
										1230	resume welding
										1300	welding completed - lower
											into borehole & prep 8"
								8" 83.63' + 21.08' = 104.71' total		1350	add 8" casing
										1523	stop - depart site

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/21/90	Sheet No. 1 of 3
	Location 200 West	Project W-017-216-1112-Grib	

Logged by AW Pearson Alan Pearson Date 2/21/90
Reviewed by J.E. McElhan Date 4-24-90
Lith. Class. Scheme Folk Procedure DO-1, Rev. 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method REBOR / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0710	Driller & Geologist arrive on site
								Total 8" casing = 104.7'		0730	Begin Welding 8" Casing
								104.7' + 21.3' = 126.0' Total 8" C.S. casing		0905	Finished Welding
										0915	Prepare to Weld 8" Casing
								126.0' + 21.3' = 147.3' Total 8" C.S. casing		0920	Begin Welding
										1020	Finished Welding
	GM	<Det								1035	Begin Drilling - CB
125'	GM	<Det	SM	Lith	2		S	SAND: (96% Sand, 4% Mud)		1050	Take Sample w/CB
	PID	<Det		Moist	1			2% VCS, 8% CS, 20% MS, 30% FS, 36% VFS, 4% Mud;			
								Well-Moderately Sorted:			
								Sand: 30% Mafic, 10% Qtz, 60% Felsic, SR:			
								Wet Color olive gray 5Y 5/2:			
								Weak reaction w/10% HCL: Unconsolidated			
	GM	<Det								1100	Resume Drilling - CB
										1115	Stopped Drilling because RPT left for lunch/Fixing CB

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9413223.0639

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/21/90	Sheet No. 2 of 3
	Location 200 West	Project WI-017-216-112-Crib	

Logged by AW Pearson, Alan Pearson Date 2/21/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme Folk Procedure DO-1, Rev. D

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE40L / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										1200	Stop for lunch
										1245	Resume Drilling
140'	GM	<Det	D	Lith	2		S	SAND: tr gravel, 92% Sand, 8% Mud:		1300	Take Special Sample
	PID	<Det		Moist	1			tr. VFP, 5% VCS, 10% CS, 20% MS, 25% FS, 32% VFS, 8% Mud			w/ CB
				Chem	2			Moderately Sorted:			COC* 022190112W2241
				VOA	2			Gravel 50% Basalt, 50% Felsic: SA			
								Sand 35% Mafic, 10% Qtz., 55% Felsic SA-SR:			
								Wet Color olive 5Y5/3: Moderate			
								Reaction w/10% HCL: Unconsolidated: Noted			
								increase in % Mud		1305	Resume Drilling-CB
145'	GM	<Det	SM	Lith	2		S	SAND: tr gravel, 94% sand, 6% Mud		1315	Take Sample w/CB
				Moist	1			tr. VFP, 6% VCS, 8% CS, 20% MS, 30% FS, 30% VFS, 6% Mud			
								Well - Moderately Sorted			
								Gravel: 60% Basalt, 20% Muscovite, 20% Felsic SA			
								Sand: 30% Mafic, 10% Qtz. 60% Felsic: SA-SR:			
								Wet Color olive 5Y5/3: Strong Reaction			
								w/10% HCL: Unconsolidated except for			
								thin lenses of slightly cemented ($CaCO_3$) Sand.			
								147.3' + 9.1' = 156.4' Total 8" Carbon Steel Casing		1320	Begin Welding 8"
	PID	<Det								1430	Resume Drilling-CB
	GM	<Det								1445	

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41 Location 200 West	Date 2/21/90 Sheet No. 3 of 3 Project W-017-216-112-C.B

Logged by AW Pearson Alan Pearson Date 2/21/90
Reviewed by [illegible] Date 4-24-92
Lith. Class. Scheme Folk Procedure DO-1, Rev. Ø

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE60L / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
150'	PID	<Det	SM	Lith	2		S	SA-U: 94% Sand, 6% Mud		1500	Take Sample w/ CB
	GM	<Det		Moist	1			4% VCS, 10% CS, 20% MS, 30% FS, 30% VFS, 6% Mud.			
								Well - Moderately Sorted.			
								Sand 30% Mafic, 10% Qtz, 60% Felsic SA-SR			
								Wet Color: olive 5Y5/3: Strong Reaction			
								w/10% HCL: Unconsolidated except for			
								thin lenses of slightly Cemented (CaCO3) Sand.			
										1505	Resume Drilling-CB
										1520	Quit for Day
								footage 132'-152' = 20'			
								Total 8" Casing Added Today = 51.7'			
								No H_2O Added to borehole today.			

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9413223.0641

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/22/90	Sheet No. 1 of 2
	Location 200W 216-U-12	Project W017 216-U-12 Crib	

Logged by R. Miller (GAI) [signature] Date 2/22/90
Reviewed by D.L. Mecklenburg Date 4-24-90
Lith. Class. Scheme Folk Procedure AD-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method SE WOL-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 8" casing = 156.4'		0703	Arr site, clear, 32°F
								sound depth of hole 155.07' blk + cor 0.54' s.v. 5.2'			wind S-SE 0-3 mph
								= 150.41' blk tape #			warm-up rig & lubricate
										0758	RPT - R. Wyer arrives
										0806	begin to drill
								8" - 156.4' + 9.8' = 166.2' total		0820	set 8" & weld
										0821	stop - driller & SSO
											depart site - weld complete
										0932	driller & SSO arrive
											site - prob w/a brake
										0946	resume activity to drill
										0947	resume drilling
155.0'	PID	<det	SM	lith	2		S	SAND (94% Sand 6% Mud), 4% vcs 10% cs 20% ms		1002	to 155.0' - sample DB
	GAI	<det		moist	1	155.		30% fs 30% vfs, 6% mud, mod well sorted, 30% mafic			
								70% felsic, SA-SR, lt ol brn (2.5Y 5/4 wet),			
								strong rx to 10% HCl, unconsolidated - loose to			
								compact, trace of sl. cemented layers.			
160.0'	PID		SM	lith	2		MS	Muddy SAND (70% Sand 20% Mud) 10% ms, 30%		1102	to 160.0' - sample DB
	GAI	<det		moist	1	160.		fs 30% vfs, 30% mud, mod well sorted, 25% mafic		1105	driller to change to HT.
				200 ml glass	2			75% felsic, SA, lt ol brn (2.5Y 5/4 wet) v. strong		1155	stop - lunch
				1000 ml [illegible]	2			rx to 10% HCl, unconsolidated - compact, trace mud layers			

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9413223.0642

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/22/90	Sheet No. 2 of 2
	Location 200W 216-U-12	Project W017 216-U-12 Crib	

Logged by Rand Miller (GAI) Rand M Miller — Date 2/22/90
Reviewed by [illegible] — Date 4:4:90
Lith. Class. Scheme Folk — Procedure DO-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE CME-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 8"Ø casing = 166.2'		1230	resume activity - wait
											for RPT
										1242	RPT arrives - R. Wyer
										1245	resume drilling
								too difficult to obtain sample from DB, ~		1310	begin tool change to HT
								20min spent on extraction		1345	tool change compl - resume
											drilling - add H_2O
								8" - 166.2' + 8.9' - 175.1'		1410	add 8" & weld
										1515	stop for day
										1523	Off site
								footage = 10'			
								8" casing added = 18.7'			
								H_2O added = 10 gallons			

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DAILY BOREHOLE LOG

Boring or Well Number 299-W22-91 | Date 2/23/90 | Sheet No. 1 of 2
Location 200W 216-U-12 | Project W017 216-U-12 Crib

Logged by R. Miller (GAI) | Date 2/23/90 | Drilling Contractor KEH
Reviewed by D.K. McGillan | Date 4-11-90 | Driller Craig Wlamsley
Lith. Class. Scheme Folk | Procedure DD-1, Rev 0 | Rig/Method RE-WOL, ZZ-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8"Ø casing = 175.1'		0658	Ar site, warm equip
											continue welding 8"
											clear, 33°F wind E,
											0-1 mph, SSO-D. Wright
								RPT - R. Wyer arrives		0745	resume drilling - HT
165.0'	PID	<det	n/a	lith	2	165.0	SM	Sandy MUD (40% Sand 60% Mud) 10% fs 30% vfs,		0810	to 165.0' - sample HT
	GAI	<det						60% mud, well sorted, 25% mafic 75% felsic, ol. brn			obtain w/ flat bottom bailer
								(2.5Y 4/4 wet), strong rx to 10% HCL, unconsol-			
								idated - stiff, f sands are micaceous, fairly plastic			
170.0	PID	<det	n/a	lith	2	170.0	SM	Sandy MUD (40% Sand 60% Mud) similar to		0826	to 170.0' - sample HT - f.b. bailer
	GAI	<det						165.0' sample		0835	add 8" f weld
								8" - 175.1' + 10.3' = 185.4'		1010	resume drilling
										1015	stop for driller's meeting
										1033	resume drilling
175.0	PID	<det	n/a	lith	2	175.0	SM	Sandy MUD (45% Sand, 55% Mud) 10% fs 35% vfs,		1048	to 175.0' sample HT,
	GAI	<det						55% mud, well sorted, 25% mafic 75% felsic, ol. brn			obtain w/ f.b. bailer
								(2.5Y 4/4 wet), strong rx to 10% HCL, unconsoli-		1103	RPT departs site
								dated, firm, f sands are micaceous.			
180.0	PID	<det	n/a	lith 250 ml	2	180.0	SM	Sandy MUD (45% Sand, 55% Mud) similar to		1140	to 180.0' - sample HT
	GAI	<det.		glass 40 ml	2			175.0' sample.			obtain w/ f.b. bailer -
				sub glass	2						no RPT will sample

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/23/90	Sheet No. 2 of 2
	Location 200W 216-U-12	Project WMT 216-U-12 Crib	

Logged by R. Miller (GAI) [signature] Date 2/23/90
Reviewed by [signature] Date 4-2-90
Lith. Class. Scheme Folk Procedure DO-1, Form B

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE-60L, 22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 8" ↑ casing = 185.4'		1155	stop - lunch
										1230	resume activity - prep
											to add 8" casing
										1243	RPT. R. Wyer arrives
											sample checked
								8" 185.4' + 9.4' = 195.3' total		1245	add 8" ↑ weld.
										1345	resume drilling
185.0	PID	n/t	n/a	lith	2	185.0	SM	Sandy MUD (35% Sand 65% Mud) 2% ms 13% fs		1350	to 185.0' - sample HT
	GM	<det						20% vfs, 65% mud, well sorted, 25% mafic 75% felsic			obtain w/ f.b. bailer
								dl. brn (2.5Y 4/4 wet) v. strong rx to 10% HCl,			
								unconsolidated - stiff, f sands are micaceous		1420	SSD deposits
190.0	PID	<det	n/a	lith	2	190.0	MSG	Muddy Sandy GRAVEL (31% Gravel, 45% Sand		1433	to 190.0' - sample HT
	GM	<det		250ml glass	2			24% Mud) 6% mp 10% fp 15% vfp, 5% vcs 5% cs			obtain w/ f.b. bailer
				40ml subgloss	2			10% ms 10% fs 15% vfs, 24% mud, poorly sorted,		(1430)	took a blank sample.
								Gravels 95% mafic 5% felsic, Sands 25% mafic			
								75% felsic, SA: R, lt. dl brn (2.5Y 5/4 wet),			
								v. strong rx to 10% HCl, slight consolidated -		1440	add 8" ↑ weld 5'
								traces of caliche.		1505	stop for day
								8" - 195.3' + 9.8' = 205.1'		1520	off site
								footage = 30', 8" casing added: 30.0', H_2O = 160 gallons			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41 Location 200W 216-U-12	Date 2/26/90 Sheet No. 1 of 2 Project W017 216-U-12 Crib

Logged by R. Miller (GAI)	Date 2/26/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date 4-24-90	Driller Craig Wramsley	
Lith. Class. Scheme Folk	Procedure CS-1, Rev. 0	Rig/Method BE 600L-22-14100 / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 8" ⌀ casing = 205.1'		0700	Ar site - clear, 32°F
											wind N - 0-2 mph - rig
											won't start.
										0727	mechanic arrives -
										0741	rig started - resume welding
										0742	RPT - R. Olveda arrives
										0910	resume drilling - HT
195.0	PID	<det	n/a	lith	2	195.0	MSGa	Muddy Sandy GRAVEL (40% Gravel 30% Sand 30%		0935	to 195.0' - sample HT w/
	GAI	<det						Mud) 10% mp 20% fp 10% vfp, 5% vcs 5% cs 5% ms			bottom valve bailer
								5% fs 10% vfs, 30% mud, v. poorly sorted, Gravels 90%			
								mafic 10% felsic, Sands 40% mafic 60% felsic, SA-			
								SR, H. ol brn (2.5Y 5/4 wet) v. strong rx to 10% HCl,			
								slight consolidated, trace of caliche.			
200.0'	PID	<det	n/a	lith	2	200.0	MSGa	Muddy Sandy GRAVEL (35% Gravel 45% Sand 20%		0951	to 200.0' - sample HT w/ sample matrix 022690
	GAI	<det		250ml glass	2			Mud) 5% mp 10% fp 20% vfp, 5% vcs 5% cs 10% ms 10% fs			bottom valve bailer
				40ml amb glass	2			15% vfs, 20% mud, - similar to 195.0' sample		1030	add 8" ⌀ weld
								8" - 205.1' + 10.6' = 215.7' total		1155	stop - lunch.
										1230	resume activity - welding
										1230	resume drilling
205.0'	PID		n/a	lith	2	205.0	MGa	MUDDY GRAVEL (31% Gravel 34% Sand 35% Mud)		1305	to 205.0' - sample HT w/
	GAI							Similar to 200.0' sample			bottom valve bailer

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9413223.0646

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/26/90	Sheet No. 2 of 2
	Location 200 W 216-U-12	Project WOIT 216-U-12 Crit.	

Logged by R. Miller (GAI) [signature] Date 2/26/90
Reviewed by [signature] Date 4/24/90
Lith. Class. Scheme Folk Procedure EO-1 Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method PE 600 - 22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" ∅ casing = 215.7'			
210.0	PID	Hdl	n/a	lith	2		SM	Sandy MUD (45% Sand 55% Mud) 5% cs, 10% ms		1325	to 210.0' - sample HT w/
	1/4M	Hdl		250ml glass	2	210.0		15% fs 15% vfs, 55% Mud, well sorted, 40% mafic			bottom valve bailer
				40ml amb glass	2			60% felsic, SA, H d. brn (2.5Y 5/4 wet), strong			sample on Coal C 022490
								rx to 10% HCl, unconsolidated - firm to stiff.			
215.0	PID	nil	n/a	lith	2	215.0	SM	Sandy MUD (35% Sand 65% Mud) similar		1350	to 215.0' - sample HT w/
								to 210.0 sample.			bottom valve bailer
								8" = 215.7' + 10.6' = 226.3' total		1405	add 8" ∅ weld
										1515	resume drilling
										1520	stop for day.
								footage = 25'			
								8" casing added = 21.2'			
								H_2O added = 65 gallons			

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9413223.0647

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/27/90	Sheet No. 1 of 2
	Location 200 W 216-U-12	Project W01T 216-U-12 Crib	

Logged by R Miller (GAI) [signature] Date 2/27/90
Reviewed by [signature] Date 4-24-90
Lith. Class. Scheme Folk Procedure 10-1, Rev 0

Drilling Contractor KEH
Driller Craig Wamsley
Rig/Method BE 60L-22-14100 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 8" ϕ casing = 226.3'		0654	Arr site - clear 32°F,
											wind N 0-3 mph, SSO
											D. Wright driller prep.
											to drill.
										0759	take a w/L on 299-W22-
											22 - 227.9' bls - 2.0' s.u. =
											227.9' bls
										0815	RPT - R Olveda arrives
										0840	begin to drill
220.0	PID	<det	n/a	lith	2		SM	Sandy MUD (45% Sand 55% Mud) 5% ms 15% fs		0900	to 220.0' - sample HT w/
	GM	<det		250ml	2	220.0		25% vfs, 55% mud, poorly sorted, 30% mafic, 70% felsic,			bottom valve bailer - sample
				glass				A-SR, lt ol brn (2.5Y 5/4 wet), nonrx to 10% HCl,			on CoC 022790
				4 oz	2			unconsolidated - firm to stiff, f sand are micaceous			
				subsamples	2						
225.0	PID	n/a	n/a	lith	2		SM	Sandy MUD (15% Sand 55% Mud) similar to 220.0'		0921	to 225.0' - sample HT w/
	GM	<det				225.0		sample			bottom valve bailer
								8" - 226.3' + 8.8' = 235.1' total		0945	add 8" ϕ casing
										1110	resume drilling
										1120	RPT - departs
										1128	stop - no RPT
										1200	lunch.
										1230	resume activity

9413223.0648

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 2/27/90	Sheet No. 2 of 2
	Location 200W [illegible]	Project WRAP [illegible]	

Logged by L. Miller (GAI) [illegible] Date [illegible]
Reviewed by [illegible] Date 4-24-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor KEH
Driller [illegible]
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing = 235.1'		1246	RT - C. Olverda arrives
											resume drilling
230.0'	PID	1/d	n/a	lith	2		SM	Sandy MUD (15% Sand [illegible] 5% ms 15% fs		1250	to 230.0' sample HT w/
	GAI	1/d		250ml glass	2	230		25% vfs, 55% mud, v. well sorted, 30% mafic 70% felsic			bottom valve bailer
				40ml w-b glass	2			A-SR, lt dl brn. (2.5Y 5/4 wet), mod-strong			sample on Cell OCET 90
								rx to 10% HCl, concentrated - firm to stiff,		1305	M. Thomson OCE & D.
								f sands mor micaceous, trace of c. sand.			Myers arrive site. 7 wells
								8" - 235.1' + 8.5' = 243.6'		1350	and 8" f well
										1405	M. Thomson (OCE) D. Myers
											(IT) depart site
										1312	take drill water sample
											299-W22-41-DW
										1919	resume drilling
										1511	SSC dept site
235.0'	PID	n/a	n/a	lith	2			will log on 2/28/90 - in am		1513	to 235.0' sample HT w/
	GAI	1/d				15m					bottom valve bailer
								redrill = 20'		1518	stop for day
								8" casing added = 17.3'		1525	Cp site
								H_2O added = 550 gallons			

9413223.0649

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 5/29/90	Sheet No. 1 of 3
	Location 200W 216-U-12	Project W/S 216-U-12	

Logged by R. Miller (GAI) and [illegible] Date [illegible]
Reviewed by V. McKhan Date 4-24-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor [illegible]
Driller Craig Wamsley
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8"d casing = 243.6'		0550	At site - move equip
								w/ 237.1' btc - 6.8' s.i. = 229.6' btc		[illegible]	take o/c -
								H/d 240.5' btc - 3.4' s.i. - [illegible] = 231.1' btc		0720	s/t # L320-19
										0725	begin to drill
											clear 50', mud 5-[illegible]
										0746	[illegible]
											begin to dump cuttings
235.0							NSG	Muddy Sandy GRAVEL (35% Gravel 45% Sand			sample from 2/27/90
								20% Mud) 5% cp 10% mp 10% fp 10% vfp, 5% vcs 5% cs			drilling barrier
								10% ms 10% fs 15% vfs, 20% mud, poorly sorted,			
								Gravel 35% mafic 65% felsic, Sands 20% mafic,			
								80% felsic, A-SR, H ol. bra. (2.5Y 5/4 wet),			
								mod-strong rx to 10% HCl, unconsolidated - compact			
								to hard, f sand are micaceous, Gravel is frag.			
240.0	PID		wet	lith	2		NSG	Muddy Sandy GRAVEL (45% Gravel, 45% Sand,		1900	to 240.0' - sample 115 ft
	GAI			2 gal	2			10% Mud) 5% cp 10% mp 10% fp 15% vfp, 10% vcs 10%			bottom valve broken
				40 ml	3			cs 10% ms 10% fs 5% vfs, 10% mud, poorly sorted,			sample on cell 07:30
								Gravel 40% mafic 60% felsic, Sand 30% mafic 70%			
								felsic, A-SR, H ol. bra (2.5Y 5/4 wet) slight rx to			
								10% HCl, unconsolidated - compact to hard, f sand			
								are micaceous, Gravel is fragments			

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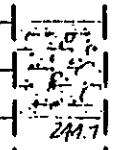
9413223.0650

DAILY BOREHOLE LOG	Boring or Well Number 299-W23-11	Date 2/29/90	Sheet No. 2 of 3
	Location 200W 216-U-12	Project WMT 216-U-12 Crib	

Logged by [illegible]	Date 2/28/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date 4-24-90	Driller Craig Wanamaker	
Lith. Class. Scheme Folk	Procedure [illegible]	Rig/Method [illegible] / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								8" - 243.6' + 7.8' = 251.4' total		0955	at 8" 5 world
										1055	resume drilling
								w/l 237.1' b/c - 7.8' s.u. = 229.3' b/s		1130	take w/l - to 244.0 b/s
										1146	stop - let w/l equil.
											and cuttings settle
										1200	lunch
										1230	drillers meeting
										1245	resume activity
								w/l 237.1' b/c - 7.8' s.u. = 229.3' b/s		1250	take w/l
								H/d. 242.8' b/c - 7.8' s.u. + 2.5' corr = 237.5' b/s		1255	take H/d
											hole bridged 6.8'
										1305	resume drilling - advance
											8" to 244.4
								8" - 251.4' - 2.4' = 249.0' total		1320	at 8" 2.4'
								246.8' b/c - 7.8' s.u + 2.5' corr = 241.7' T.D		1350	take H/d - 5th Cam.
241.7'	PID	Cl'd	wet	lth	2	 241.7	MSG	Muddy Sandy GRAVEL - similar to 240.0'			to 241.7' - sample lift w/
	GRI	Cl'd						sample			bottom valve sampler
										1425	prep for simulated test
										1430	[illegible]
										1435	passed

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9413223.0651

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-11	Date 2/28/90	Sheet No. 3 of 5
	Location 200W 216-U-12	Project W-7 216-U-12 [illegible]	

Logged by R. Miller (GAI) [illegible]	Date 2/28/90	Drilling Contractor PEI	
Reviewed by D.L. McKeehan	Date 4-24-90	Driller Craig Wanamaker	
Lith. Class. Scheme Folk	Procedure DD-1, Part C	Rig/Method PE Cable-Tool-Mixer	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" ø casing = 249.0'		1436	begin to break down rig
								forlegs = 9.7'		1515	stop activity
								8" casing acted = 7.8'		1525	Dp site
								H_2O added = 100 gal			
								8" casing cut off = 2.4'			

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9413223.0652

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 3/1/90	Sheet No. 1 of 1
	Location 200 WEST	Project W017-216-412	

Logged by C.D. CONDIT (GAI) Date 3/1/90
Reviewed by D.E. McGlam Date 4-24-90
Lith. Class. Scheme FOLK Procedure DO-1 | REV. Ø

Drilling Contractor KEH
Driller CRAIG WANDLEY
Rig/Method BE 60L | CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0700	GEOLOGIST AND DRILLER
											ON SITE. RIG IS WARM-
											ING UP.
								249.0' - 2.1' = 246.9'		0710	CUT 8" C.S. CASING
										0715	DRILLER WELDING PLATE
											TO TOP OF 8" C.S. CASING
										0730	DRILLER BEGINNING TO
											BREAK DOWN RIG.
										1025	DRILLER HAS COMPLETED
											RIGGING DOWN AND
											EN MOVING RIG OFF
											WELL SITE.
								8" CASING STICKUP = 2.2'		1030	GEOLOGIST OFF SITE

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-41	Date 3/5/90	Sheet No. 1 of 1
	Location 200 West	Project W-017-216-[illegible]	

Logged by AW Pearson, Alan F[illegible] Date 3/5/90
Reviewed by V L McGhan Date 4-24-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor KEH
Driller Craig Wolfley
Rig/Method BE22W/Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0830	Vern McGhan
											arrives to Not. Gamma
											Log the 8" casing
											inter vol
										1030	Log 237.0-2.5'
											w/Not. Gamma
											[illegible]

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9413223.0653

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-41	Date [illegible]	Sheet No. 1 of 2
	Location Slow Wand (200 E)	Project W-317 U-12	

Logged by [illegible] Date 3-28-90
Reviewed by [illegible] Date 4-24-90
Measuring Equip. [illegible] Procedure [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
920										[illegible] casing [illegible]
										[illegible]
										[illegible] 1500 psi
										Temp 190°F
										[illegible] to WHC-S-014
										Sec 7.6
										[illegible] water to [illegible]
1030										[illegible] steam cleaning
										completed
										This well requires a 5 foot
										screen which is not available
										at present. Completion will
										not begin today.
										Steam Clean Start Tape
										# LS10-03

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9413223.0655

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] 41	Date 3-28-90	Sheet No. 2	2
	Location 300 grid (TOSE)	Project [illegible]		

Logged by L.A. Dorenius — Date 3-28-90
Reviewed by D.C. McElhaney — Date 4-24-90
Measuring Equip. Steel Tape #LS00-03 Procedure DOI Rev 0

Drilling Contractor EEH
Driller H. Thorsen
Rig/Equipment Pump Truck

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1100										Contact of witnesses
										[illegible]
										submersible pump
										in accordance to WHC-S-011
										sec 4 Z.Z.
										Temp 170° F
										Pressure 1500 psi
										Pump # FB8203495
										[illegible] F-Type HV
										water level measurements
										Steam Clean Pump Truck
1200										Lunch break
										Accumulators
										Steam Clean Truck [illegible]
										Pressure 1700 psi
										Temp 180°
										Clean barrel and 2 [illegible]
										in about [illegible]
										Every used pump [illegible]
										Labels # U-2DCW-90-054
										F U-2DCW-90-055
										D U-2DCW-90-056
1400										Equipment off site

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-4 PNL3223 Date 3-29-90 Sheet No. 1 of 1 Location 200 West 200 Area Project 60017 UR
Logged by LA Dawkins Date 3-29-90 Reviewed by DE McGhan Date 4-24-90 Measuring Equip. Steel tape & [illegible] Procedure DOI Rev 0	Drilling Contractor KEH Driller [illegible] Rig/Equipment Cable tool casing jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
7:40										Geologist arrives on site
										Driller and Operator
										witnessing well completion
										equipment
	Carbon Steel	8"	244.9	2.5	244.0			237.4		D/B 237.7-2.6 + 2.2
										(TL = 244.7) needs to be
										bailed
8:30										[illegible] to weld on 8"
										[illegible] for
		8"	250.9	6.5	244.4					[illegible] well grip (5')
9:00										complete welding
										water on boiler
										4" [illegible] and water delivered
10:10										Pump truck arrives and sets
10:15										up over drill hole
										Boiler and pump truck [illegible]
										cleared and witnessed
										3-28-90 by L Dawkins
10:40										begin to bail
										Bailer leaks water out and
										onto ground, impossible to
										direct downhole from base
										Driller initiates [illegible]
										bailing below bottom collar
										(because of downhole [illegible])

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D/ ' BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] 2-41 9W5223.0657 Date [illegible] Sheet No. 2 of 1 Location 200 West Project [illegible]

Logged by LA Dorrity Date [illegible]
Reviewed by DS McKhan Date 4-24-90
Measuring Equip. Steel tape #[illegible] Procedure [illegible]

Drilling Contractor LEH
Driller [illegible]
Rig/Equipment Pump truck [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1100										Pulling and [illegible] water, very sticky material, [illegible] progressing [illegible] gravel with depth to coarse sands (at intake level)
1130										Stop Bailing, allow to settle
1140			250.9	6.5	244.4			242.3		D/B 248.6 - 7.5 = 2.2
1145										Bail again (into barrel)
								243.7		D/B 249.6 - 7.5 = 2.2
12:00										Lunch break
12:40										return to site
								242.7		D/B 248.0 - 7.5 = 2.2
										Bail (into barrel)
1305								243.9		D/B 249.2 - 7.5 = 2.2
										Settle
								243.1		D/B 248.4 - 7.5 = 2.2
										Settle
1:20								242.9		D/B 248.2 - 7.5 = 2.2
										add water to put back pressure on sediments to keep hole open since bailed
1330										water truck on site, Add 25 gallons H_2O
										Bail (into barrel)

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-41 9413223.0650 Date 3-29-90 Sheet No. 3 of 4 Location 200 West Project 19017 U12

Logged by LA Lawrence Date 3-29-90
Reviewed by D C McBrand Date 4-24-90
Measuring Equip. Steel Tape Procedure EDI 1.10

Drilling Contractor KEH
Driller Gardner Drilling Company
Rig/Equipment Rotary Wash Casing Drill

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
1245										Add 25 gal H2O
										Bail (into barrel)
								246.0		D/B 251.3 -7.5 = 2.2
1410	Johnson Type 304	4"								
	Stainless Steel									
	S slot screens		20.97	(including con)		steam cleaned and etched			(3.4)	by Kaiser, C. Hoover
	w/ centralizer									Green Tag:
	adapter	4"	.27	Σ screen	= 21.24					Inspection # 42493 Release #15
	Stainless Steel									
	w/ centralizer	4"	20.02							
	Type 304									Welding an adapter to a bottom
	Schedule # 55									screen (inner threads) and
										casing (outer threads)
										Adapter on site
1430	Stainless Steel	4"	20.01							
1450	Stainless Steel	4"	20.01							
1455	Stainless Steel	4"	20.01							
	Stainless Steel	4"	20.01							
1500	Stainless Steel	4"	20.00							
	Stainless Steel	4"	20.02							
1505	Stainless Steel	4"	20.00							
	Stainless Steel	4"	20.01							
1510	Stainless Steel	4"	20.01							
	Stainless Steel	4"	20.01							
	Stainless Steel	4"	5.90	Σ casing	= 225.12					

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DR BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299 Date [illegible] Sheet No. 1 of 1
	Location 200 West 216-[illegible] Project WIPP U-2

Logged by LA Dorenius Date [illegible]
Reviewed by JP McKhann Date 4-24-90
Measuring Equip. steel tape # [illegible] Procedure DOI [illegible]

Drilling Contractor K&H
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
										Add 5' temporary, [illegible] piece
										Total = 246.36
										(15' temporary) = 251.36'
1515										Geologist off site
							50 gallons			Total H_2O added
							75 gallons			Total H_2O boiled
							246.36'			Total stainless installed
										Water boiled into 2 barrels
										#s U2U12-90-014
										U2U12-90-015

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] 04A3223.0668 Date [illegible] Sheet No. 1 of [illegible]
	Location 200 West 216-U-12 [illegible] Project [illegible]

Logged by [illegible] Date [illegible]
Reviewed by DK McKlean Date 4-24-90
Measuring Equip. [illegible] Procedure [illegible]

Drilling Contractor KEH
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
7:50										[illegible]
	[illegible]	8"	250.7	6.5	244.1			243.4		T/B 243.7 - 7.5 12.2
						40-100 silica sand	(1/2) 94 lb bag	243.1	3.4	P/B 243.1 - 7.5 12.2
		8"	250.4	6.0	244.4					Cut 2.5' casing
	"	8"	250.4	6.6	243.6					Full
								244.4	-0.8	P/B 243.0 - 6.8 12.2
						"	(1/2) 94 lb bag	243.6	0.0	P/B 243.2 - 6.8 12.2
		8"	250.4	7.6	242.8			243.5	0.7	Full → 243.5 - 7.6 12.2 (P/B)
						"	(1/2) 94 lb bag	242.2	0.6	P/B 242.6 - 7.6 12.2
	"	8"	250.4	8.3	242.1					Full
								242.2	-0.1	P/B 242.3 - 8.3 12.2
						"	(1/2) 94 lb bag	240.5	1.6	P/B 240.6 - 8.3 12.2
		8"	247.8	7.1	240.7					Full. Cut 2.6' (slag cutter used)
								240.4	0.3	P/B 240.3 - 7.1 12.2
						"	(1/2) 94 lb bag	238.0	2.7	P/B 240.7 - 7.1 12.2
	"	8"	247.8	8.4	239.4					Full
								238.7	0.7	P/B 239.9 - 8.4 12.2
							(1/2) 94 lb bag	237.3	2.1	P/B 239.5 - 8.4 12.2
1000										Silt, sand, gravel, cobbles
										PID < detectable
			245.1	7.0	238.1					Full, Cut 2.7' (slag cutter used)
								237.3	0.8	P/B 238.1 - 7.0 12.2
			245.1	7.1	238.0		(1/2) 94 lb bag	235.1	2.9	P/B 240.0 - 7.1 12.2

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DA[illegible] BOREHOLE/WELL LETION LOG	Boring or Well Number 299-[illegible] H [illegible] Date [illegible] Sheet No. 2 of 3
	Location 200 West [illegible] Project [illegible]

Logged by LA Dowell[illegible] Date 3-[illegible]-90	Drilling Contractor KEH
Reviewed by D.R. McClanahan Date 4-24-90	Driller [illegible]
Measuring Equip. Steel Tape [illegible] Procedure [illegible]	Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1035										Truck w/ [illegible] on site unload
	Carbon Steel	8"	245.1	8.6	236.5			235.5	1.0	P/B 241.9 - 8.6 + 2.2
						10-16 silica sand	(1) 94 lb bag	233.6	2.9	P/B 240.0 - 8.1 + 2.2
	"	8"	242.2	7.0	235.2					Pull, Cut 2.9' (slag catcher used)
						"	(1) 94 lb bag	233.0	2.2	P/B 238.8 - 7.0 + 2.2
	"	8"	240.2	8.1	233.8					Pull
								231.1	-0.3	P/B 234.3 - 8.1 + 2.2
						"	(1) 94 lb bag	225.1	8.7	P/B 232.0 - 8.4 + 2.2
	"	8"	238.4	7.1	231.3					Pull, Cut 3.8'
1200										Lunch break
1230										Geologist on site
	"							230.3	1.0	P/B 235.2 - 7.1 + 2.2
						"	(1) 94 lb bag	224.5	6.8	P/B 229.4 - 7.1 + 2.2
	"	8"	238.4	9.6	228.8					Pull
								227.2	1.6	P/B 234.2 - 9.6 + 2.2
	"	8"	235.9	7.1	228.8					Cut 2.5' Slag Catcher Used
						"	(1) 94 lb bag	221.5	7.3	P/B 226.4 - 7.1 + 2.2
	"	8"	235.9	8.4	227.5					Pull
						"	(1) 94 lb bag	219.5	8.0	P/B 225.7 - 8.4 + 2.2
		8"	231.8	7.0	224.8					Pull Cut 4.1' Slag Catcher Used
								221.0	3.8	P/B 225.8 - 7.0 + 2.2
			221.8	8.4	223.4			221.4	2.0	Pull P/B 227.6 - 8.4 + 2.2
			231.8	9.3	222.5			221.9	0.6	Pull P/B 229.0 - 9.3 + 2.2

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299 W2-[illegible] 1-9413273 Date 3-5-90 Sheet No. 2 of 3 Location 200 West Project 2017 U12

Logged by L A Lorenzos Date 3/20/90
Reviewed by [illegible] Date 4-24-90
Measuring Equip. Steel Tape #L500-03 Procedure [illegible]

Drilling Contractor K.E.H
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
			228.4	5.9	222.5				0.6	Cut 2.3', and 1.1' = 3.4'
1400										Wait for pump truck to be
1425										Pump Truck on site
1440										Start surging, bailing
										Bail 50 gallons into buckets
										# U2-012-90-015
										# U2-012 90-016
1515										Geologist Off site
						40-100 Silica Sand	7 3/4 bag			Total
							50 gallons			Total Bailed

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D' BOREHOLE/WELL ..LETION LOG	Boring or Well Number 299 [illegible] 9413223.0663 Date [illegible] Sheet No. [illegible]
	Location [illegible] Project [illegible]

Logged by [illegible] Date [illegible]
Reviewed by [illegible] Date 4-24-92
Measuring Equip. [illegible] Procedure [illegible]

Drilling Contractor KEH
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
7 10										Grabbed onsite
										Boring into bowl
		3"	226.1	6.1	222.5			222.3	0.2	P/B 222.5-6.1+2.2
										Surge and bail ~50 gallons
										into bowl (sand [illegible])
8 45								222.7	-0.2	P/B 226.6-6.1+2.2
						Holbosine sand	(1/2) 94 lbs	220.4	2.1	P/B 224.3-6.1+2.2
										Bail and surge (into bowl)
										~35 gallons
										Continue surge and bail into
										bowls ~100 gallons
10 15										move bowls [illegible]
										Bail dry (Total 5 bowls
										50 gal)
										Sand continues through screen
										up to 10% formation material
										coming through
10 55										Continue boring
11 30										Site Safety Officer [illegible]
										hole and finds PID < [illegible]
										Continue boring into bowl
										(~50 gallons)
								221.4	1.1	P/B 225.3-6.1+2.2
12 00										[illegible] break

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W23-41 OU3223 Date 4-2-90 Sheet No. 2 of [illegible]
	Location 200 West Project

Logged by LA Dorenus Date 4 2 90
Reviewed by [illegible] Date 4-24-90
Measuring Equip. Steel Tape # L500-03 Procedure LO1 1.2V6

Drilling Contractor LEH
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
1240										Arrive to site
										Surge, Bail into Lower
								221.4		U/B 225.3-6.1 12.2
1345										Surge into Lower
1440								221.1		U/B 225.3-6.1 12.2
1445										Site Safety Officer monitors
										hole [illegible] [illegible]
										continue bailing
										surge in H_2O < 1 tsp / 5 gallons
1455								221.1		U/B 225.6-6.1 12.2
										bailing complete
										Total bailed in PM
										~240 gallons
										[illegible] on site
										Total bailed 405 gallons
										Barrels # U2-U12-90-015,
										U2-U12-90-016, U2-U12-90-017
										U2-U12-90-018, U2-U12-90-019,
										U2-U12-90-020 U2-U12-90-021
										U2-U12-90-022 U2-U12-90-023

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D BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W-11	Date 4-3-92	Sheet No. 1 of 2
	Location 200 West 216-U-1 & 2	Project W-011 U12	

Logged by S.H. Gossman / R.H. Hall — Date 4/-/92
Reviewed by L.E. Hulstrom — Date 4/24/92
Measuring Equip. Steel Tape & Lead-line — Procedure DO-1, Ch. 8

Drilling Contractor PCH
Driller Thomas A. Pettenbrook
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0710	Carbon Steel	8	228.4	6.1	222.5	40-100 Sand		222.5	0	D/Sand = 222.5'
0715										D/inside 4" = 214.77', while
										Bring Sand to ~220.0'
0725	"	"	"	"	"	40-100 Sand	1/2 Bag	219.95	2.55	Adding Sand
0730										Pulling 5"
0735	"	"	228.4	7.0	221.4	"		220.7	0.7	Final D/Sand = 220.7'
0740	"	"	"	"	"	3/8" Volclay Tablets	2 Buckets			Adding Pellets
0743	"	"	"	"	"	"	(5 Gal)	213.7	7.7	D/Pellets = 213.7
0750	"	"	228.4	9.6	218.8	"		214.6	4.2	Pulling 6"; D/Pellets = 214.6
0805	"	"	"							Pulling 8"
0810	"	"	226.03	8.4	217.63	"		215.4	2.23	D/Pellets = 215.4 Final D/Pellets
0812	"	"	"	"	"	8-20 Frac Acc	12 Bags			Adding Crumbles
0817	"	"	"	"	"	Bentonite Crumbles	(50 lb)	178.4	39.23	D/Crumbles = 178.4
0826	"	"								Pulling 8"
0835	"	"	215.7	6.85	208.85	"		182.75	25.1	D/Crumbles = 182.75
0845	"	"	"	"	"	"	12 Bags	147.45	61.4	Adding Crumbles
0850	"									Pulling 8"
0915	"	"	195.3	6.9	188.4	"		156.15	32.25	D/Crumbles = 156.15
0917	"	"	"	"	"	"	10 Bags	126.4	62.0	Adding Crumbles, D/Crumbles = 126.4
0940	"	"	175.1	6.6	168.6	"		134.45	34.05	Pulled ~20'; D/Crumbles =
0945	"	"	"	"	"	"	8 Bags	111.2	57.3	Adding Crumbles; D/Crumbles = 111.2
0950	"	"	156.4	6.55	149.55	"		120.6	28.95	Pulling 8"; D/Crumbles = 120.6
1000	"	"	"	"	"	"	10 Bags	90.45	58.60	Adding Crumbles
1015	"	"	147.3	7.1	140.2	"		95.75	44.45	Pulling 8"; D/Crumbles 95.75

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-41 9413223.0666 Date 4/[illegible] Sheet No. 2 of 2
	Location 200 West 216-W-12 Crib Project W-017 W-12

Logged by [illegible] Date [illegible]
Reviewed by [illegible] Date [illegible]
Measuring Equip. LS60-03 Procedure DO-1, [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1020	Carbon Steel	5"	147.3	7.1	140.2	8-20 crumbs		95.75	44.45	Pulling 5" free water is 15"
1025										8" is free; Removing 5" casing
	"	10"	133.1	1.05	132.02	"		113.95	18.07	Cutting from bottom
										Welding on 10" piece to pull w/
										jacks; Length = 5.0'
1100										SSO monitors borehole, OVA
1355	"	10"	138.1	6.05	132.02					Finished setting jacks over hole
1400	"	"	"	"	"	"	15 Bags	91.85	40.17	Adding crumbles; D/crumbles: 40.17
1410	"									Pulling 10"
1425	"	"	125.0	6.95	118.05	"		95.85	22.2	D/crumbles = 95.85
1428	"	"	"	"	"		15 Bags	73.85	44.2	Adding crumbles, D/crumbles = 73.85
1500	"	"	109.37	6.85	102.52	"		78.05	24.47	D/crumbles = 78.05'
1505										Cleaning up site; can't cut
										casing after 1500.
1515										Done for day

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D BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-[illegible] 41	Date 4/4/90	Sheet No. 1 of 2
	Location 200 West - 216-U [illegible]	Project W-017 U-12	

Logged by S.M. Goodwin / [illegible]	Date 4/4/90	Drilling Contractor Kell	
Reviewed by [illegible]	Date [illegible]	Driller Thomas & [illegible]	
Measuring Equip. L500-03	Procedure DO-1, Rev. 0	Rig/Equipment Crane & [illegible]	

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0705	Carbon Steel	10"	109.37	6.85	102.52	3-7 Crumbles		78.05	24.47	D/Crumbles = 78.05 (4/3/90)
0720	"	"	"	"	"	"	15 Bags	56.35	46.17	Adding Crumbles, D/Crumbles = 56.35
0735	"	"	92.78	6.85	85.93	"		61.55	24.38	Pulling 10", D/Crumbles = 61.55
0745	"	"	"	"	"	"	12 Bags	43.75	42.18	Adding Crumbles, D/Crumbles = 43.75
0800	"	"	"	"	"					Pulling 10"
0845	"	"	75.78	6.90	68.88	"		47.55	21.33	D/Crumbles = 47.55
0907	"	"	"	"	"	"	15 Bags	25.2	43.68	D/Crumbles = 25.2
0910	"	"	56.16	6.75	49.41	"		29.95	19.46	Pulling 10", D/Crumbles = 29.95
0930	"	"	"	"	"	"	10 Bags	14.95	34.46	Adding Crumbles, D/Crumbles = 14.95
0945	"	"	38.74	6.95	31.79	"		20.05	11.74	Pulling 10", D/Crumbles = 20.05
1005	"	"	"	"	"	"	2 Bags	17.01	14.78	Adding Crumbles, D/Crumbles =
1015	"	"	29.66	7.1	22.56			23.3	7.34	Pulling 10", D/Crumbles = 23.3
1025	"	"	"	"	"	"	4 Bags	17.4	5.16	Adding Crumbles, D/Crumbles = 17.4
1032	"	"	29.66	8.4	21.26	"		18.1	3.16	Pulling 10"
1035	"	"	"	9.4	20.26	"		18.4	1.86	Pulling 10" Final D/Crumbles = 18.4'
1037										Waiting for water truck to mix cement grout
1330	"	"	26.96	6.7	20.20					Mixing cement grout
1350	"	"	"	"	"	Cement Grout	1 Batch*	+2.9	23.16	Pouring cement grout
	* 1 Batch Cement Grout = 6 94 lb. sacks of Portland Type I-II Cement (Acme Brand), 13 oz. of Aluminum Powder, 1 ~30 gallons potable water for 200 foot pad water. Surfactant Alum. Powder was mixed with pad cement prior to adding to water.									
1355	"	"	"	"	"					Mixing Grout

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-41 (W-17-27) Date 4/4/90 Sheet No. 2 of 2 Location 200 West, 216-U-12 Crib Project U-017 U-12

Logged by S.M. Goodwin Date 4/4/90 Reviewed by [illegible] Date 4/24/90 Measuring Equip. L500-03 Procedure DO-1, Rev. 0	Drilling Contractor KEH Driller THOMAS T. BETTENDORF Rig/Equipment CRANE & JACKS

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1400	CARBON STEEL	10"	26.96	6.7	20.26	CEMENT GROUT	3/4 BATCH	5.5	25.76	POURING GROUT, *BATCH CONSISTED
										OF 4 94 LB. SACKS OF PORTLAND
										CEMENT, ~20 GALLONS OF WATER
										& 12 OZ OF ALUMINUM POWDER.
										POURED ~ 1/4 OF 4 SACK BATCH.
										PULLING 10"
1420	"	"	21.08	7.1	13.98	"				CAN'T GET GOOD D/B, MIXING
										MORE GROUT.
								+1.6	15.58	GOOD D/CEMENT GROUT
		"	"	"	"	"	4 SACK	+5.95	19.93	ADDING GROUT; MIXED 4 1/2 94#
							BATCH			SACK, 5 GALLONS H_2O & 3 OZ
							(POURED 1/2 OF BATCH)			ALUMINUM POWDER W/ GROUT
										LEFT FROM PREVIOUS BATCH
1425	"	"	"	"	"	"				PULLING 10"
1428	"		12.17	7.4	4.77	"		0.7	5.47	D/CEMENT GROUT
1430	"									SSO VISITS SITE
1437	"	"	"	"	"	"		+3.0	7.77	ADDING CEMENT GROUT, POURED
										1/4 OF REMAINING BATCH.
1440					Ø	"		2.5		REMOVED 10" CASING FROM BOREHOLE;
										FINAL D/GROUT = 2.5'
										WILL GET D/B & D/W LATER W/
										CLEAN E. TAPE & STEEL TAPE

CEMENT GROUT USED - 9 94 LB. SACKS OF PORTLAND CEMENT, 27 OZ OF ALUMINUM POWDER, & ~45 GALLONS OF WATER
(~1 SACK BATCH OF GROUT WAS WASTED)

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D BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-[illegible] 41	Date 9/5/90	Sheet No. 1 of 1
	Location 200 West 216-U-12 [illegible]	Project U-012	

Logged by S. M. [illegible] Date 9/5/90
Reviewed by [illegible] Date [illegible]
Measuring Equip. L300-15 Procedure [illegible]

Drilling Contractor PEH
Driller THOMAS & BETHELDORF
Rig/Equipment N/A

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0710	STAINLESS STEEL	4"		1.03						D/BOTTOM = 245.9' − 1.03' STICKUP = 244.87 BLS
0720	" "	4"		1.03						D/WATER = 228.99' − 1.03' STICKUP = 227.96' BLS
0730										WELDING CAP ON S.S. CASING TO PREVENT TAMPERING
0740										CLEANING UP SITE & PREPARING FOR COMPLETION AT W22-10.

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. 1 of 1 Location [illegible] Project [illegible]

Logged by [illegible] Date [illegible] Reviewed by [illegible] Date 5-7-90 Measuring Equip. _____ Procedure [illegible]	Drilling Contractor [illegible] Driller [illegible] Rig/Equipment _____

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
[illegible]										Cushed Hi-Max Co. pounce [illegible] for a [illegible] 1' [illegible] [illegible] [illegible] [illegible]. Form is 1' x 4' x 6" hardware mesh. Place in [illegible] [illegible] above and all center [illegible] 4" st. steel. NE quadrant [illegible] removed. 6" d. steel [illegible] hasp and cap. Place [illegible] at [illegible] side of [illegible] Cap will locked or [illegible] [illegible]

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CENTRAL PRE-MIX CONCRETE CO.

INSPECTORS COPY

11919 HARRIS ROAD • PASCO, WA 99301

WA REG #223 01-CE-NT-NP-M311J8

ID REG #5864-AAA-1-2-3 MT REG #3461A

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CONCRETE

SAND & GRAVEL

545-8405

CRUSHED ROCK

FILL

UNLOADING

Unloading time 7½ minutes per cubic yard concrete. Charge thereafter at posted truck rates. This concrete designed in accordance specifications indicated below. Make deliveries inside the curb line at customer's risk only and accept no responsibility whatsoever for damages resulting from such deliveries.

CAUTION: May cause eye or skin injury. Contains Portland cement. Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible, and wash exposed skin areas promptly with water. If any cement or cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. All claims for damages or shortages must be made within 24 hours of delivery.

LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	ARRIVE PLANT
: VA	2:26	12:37	:	:

☐ TEST CYLINDERS TAKEN

ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE ITS STRENGTH.

ESTIMATED SLUMP AT UNLOADING _____

ADDED ____ GAL. WATER AT CUSTOMER REQUEST.

K Thank You

SIGNATURE

ORDER NO.	CUSTOMER NO.	CPM PROJECT NO.	CUSTOMER PO/JOB NO.	TICKET NO.		DRIVER	
[illegible]	[illegible]	[illegible]	B-2012/REL#28	08917	00008254	DICK	1

CUSTOMER	DELIVERY ADDRESS	DATE
[illegible]-SER	200 WEST..HANFORD	01-May-90

DELIVERY INSTRUCTIONS	MAP	TIME DUE
		12:30

LOAD QTY.	DELIVERED QTY.	ORDER QTY.	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
5.00	5.00	5.00	0304H	5000 7SK 3/4 5%		

WC RATIO ALLOWED .45

TOTAL WATER ALLOWED 1246

MOISTURE'S

3/4 % 9520 9425 95

SAND 3 % 6360 6174 186

SUB TOTAL

WATER BATCHED 465

TOTAL AVAILABLE 7 GAL. 60

LOAD SIZE	MIX NO.	MIX DESCRIPTION	SLUMP	AIR	CC	USE	TRUCK	PLANT	SUBTOTAL / TAX / TOTAL DUE
5.00	0304H	5000 7SK 3/4 5%	4.00	100	0.00		956	1	

Truck no.: 956 Batch size: 5.00 Yds. Mix name: 0304H

5000# 7.0 SK. 3/4 AGG. Time 11:39:11 AM Date 1 May, 1990

		Zero				Zero		
3/4 PND	1.0	9494	9520 Lbs C		LAF2-1-2	3290	3280 Lbs C	
ASTM.SAD	3.0	15916	15930 Lbs C					
			Zero				Zero	
			Zero				Zero	
AEA-2	100	55	56 Oz C		WATER 1	906	905 Lbs C	
PLAST-3		195	194 Oz C					
			Zero				Zero	

Water trim: -10.0 / Yd. Time 11:42:37 AM

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WELL CHECK LIST

Well Number: 299-W22-41 Location: W-12

Date: 5-19-90

	Yes	No
Hasp on protective casing	X	
Lock	X	
Proper cap fit	X	
Well ID number on brass cap	X	
Protective post painted	X	
Well ID number stenciled on post		X
Well ID number stenciled on protective casing		X
Survey mark on casing		?
Stock tank		X
Site neat		X

Comments: need general cleanup and leveling

Signature: [illegible] Date: 5-15-90

9413223.0672

9413223.0673

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/12/90	Sheet No. 1 of 1
	Location 200 WEST	Project WO17-216-U12	

Logged by C.D. Conduit Date 2/12/90
Reviewed by [illegible] Date 4/24/91
Lith. Class. Scheme Folk Procedure DO-1 / Rev. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22 W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								VISUALLY WITNESSED STEAM CLEANING OF DRILL RIG		0900	GEOLOGIST AND DRILLER
								EARLIER THIS MORNING. AND VISUALLY INSPECTED RIG			ON SITE. DRILLER BEGIN-
								AFTER CLEANING. - ACCEPTED.			NING TO SET UP RIG.
										1200	DRILLER BREAKING FOR
											LUNCH
										1235	DRILLER CONTINUING TO
											SET UP RIG.
										1515	DRILLER HAS COMPLETED
											SETTING UP RIG. SHUT-
											TING DOWN OPERATIONS
											FOR THE DAY
										1520	GEOLOGIST OFF SITE

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9413223.0674

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/13/90	Sheet No. 1 of 3
	Location 200 WEST	Project WOW-216-U12	

Logged by C.D. Condit
Reviewed by [illegible]
Lith. Class. Scheme Folk
Date 2/13/90
Date 2-21-90
Procedure DO-1 / REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22 W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0715	GEOLOGIST AND DRILLER
											ON SITE. DRILL RIG
											WARMING UP.
										0800	NOTED: CANNOT BEGIN
											DRILLING OPERATIONS
											UNTIL RPT IS AVAILABLE
											TO GIVE CONTINUOUS SURVEY
										0830	DRILLING WITH CORE
											BARREL BEGINS
										0840	DRILLING STOPS DUE TO
											RPT OFF SITE
								10" C.S. CASING = 10.2'		0845	10" C.S. CASING ADDED
										0850	RPT ON SITE. DRILLING
						0'					RESUMES.
6'	GM	DET	D	LITH	2		S	SAND. (1% GRAVEL, 94% SAND, 5% MUD) · 5% FP, · 5%		0855	SAMPLE - CB
				MOIST	1	5'		VFP, 5% VFS, 5% CS, 25% MA, 40% FS, 19% VFS, 5%			
								MUD. WELL SORTED, GRAVEL: 75% BASALTIC/MAFIC,		0900	DRILLING RESUMES.
								25% QUARTZITE, SR. SAND: 45% BASALTIC/MAFIC, 45%			DRILLER ADDING H2O TO
								QUARTZ, 10% FELSIC, SA-SR, COLOR: 5YR 5/2 BLACK			AID FIRST LENGHT OF 10"
								MODERATE RXN TO 10% HCL. UNCONSOLIDATED.			C.S. CASING TO ADVANCE
											IN BOREHOLE

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9413223.0675

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/10/90	Sheet No. 2 of 3
	Location 200 WEST	Project W017-216-012	

Logged by C.D. CONDIT	Date 2/13/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date [illegible]	Driller GARY LYDIN	
Lith. Class. Scheme FOLK	Procedure DO-1 REV. 0	Rig/Method BE22W / CABLE TOOL	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0920	DRILLING SUPERV. PREPARING TO ADD 10" C.S. CASING
								10.2' + 7.1' = 17.3'		1045	10" C.S. CASING ADDED
										1050	RESUME DRILLING
	SIP1000 PID	DET								1100	SSO MOVE SPOILS
										1115	DRILLING STOPS. RPT DEPARTING SITE
										1200	DRILLER BREAKS FOR LUNCH
										1230	DRILLER AND GEOLOGIST BACK ON SITE
										1245	RPT ON SITE
	SIP1000 PID	DET									SSO MOV. BOREHOLE
										1250	DRILLING RESUMES
10'	GM	DET	N/A	LITH	2	5' 10'	S	SAND. (1% GRAVEL, 99% SAND) 1% MP. 5% VCS. 65% FS. 29% MS. VERY WELL SORTED. GRAVEL: 100% BASALTIC/MAFIC. R. SAND: 47% BASALTIC/MAFIC, 40% QUARTZ, 10% FELSIC, 3% RED SANDSTONE. SA-SR. COLOR: 2.5Y 2/0 BLACK. NO REAC TO 10% HCL. UNCONSOLIDATED. MOIST; WET COLOR DIFFICULT TO ACCURATELY DUE TO LACK OF FINES		1255	SAMPLE - C.B.
										1300	DRILLING RESUMES

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9413223.0676

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/13/90	Sheet No. 3 of 3
	Location 200 WEST	Project WBN-216-U12	

Logged by C.D. CONDIT — Date 2/13/90
Reviewed by [illegible] — Date 4-2-1-98
Lith. Class. Scheme FOLK — Procedure DO-1 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
15'	SIP1000 PID	DET	SM	LITH	2	10'	S	SAND. (1% GRAVEL, 99% SAND) SIMILAR SAMPLE		1325	SAMPLE - C.B.
	6M	DET		MOIST	1	15'		DESCRIPTION AS 10' SAMPLE.			DRILLING STOPS. REPAR-
											ING TO ADD 10" C.S.
											CASING.
								17.3' + 8.0' = 25.3'		1455	10" C.S. CASING ADDED.
	SIP1000 PID	DET								1500	SSO MON. BOREHOLE
											DRILLER WELDING 10"
											DRIVE PLATE
										1520	DRILLER SHUTTING DOWN
											OPERATIONS FOR DAY
										1525	GEOLOGIST AND DRILLER
											OFF SITE
								TOTAL FT. DRILLED FOR DAY: 0' TO 15' = 15 FT			
								10" C.S. CASING WELDED ON TODAY = 25.3' TOT: 25.3'			
								GALLONS H_2O USED DOWNHOLE : 20			

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9413223.0677

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/14/90	Sheet No. 1 of 3
	Location 200 WEST	Project W017-216-012	

Logged by C.D. Condit (BAE) Date 2/14/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme Folk Procedure DO-1/REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	GEOLOGIST AND DRILLER
											ON SITE. RIG IS WARM-
											ING UP.
										0815	RPT ON SITE
										0800	DRILLING WITH CORE
											BARREL BEGINS
	SIP100 AD	DET				15'				0835	500 DRILLING AREA
20'	GM	DET	GM	LITH	2		S	SAND (2% GRAVEL, 96% SAND, 2% MUD). 5%		0856	SAMPLE - C.B.
				CHEM	2	20'		MP, 1% FP, .5% VFP, 20% VCS, 40% CS, 30% MS,			
				VOA	2			6% FS, 2% MUD, WELL SORTED, GRAVEL: 75% BASALT		0900	DRILLING RESUMES
	SIP100 PID	DET		MOIST	1			TIC/MAFIC, 25% QUARTZITE, SA-SR, SAND: 50% BASALTIC		0905	500 MON. BOREHOLE
								MAFIC, 40% QUARTZ, 7% FELSIC, 3% RED SANDSTONE,			
								SA-SR, COLOR: 2.5Y 2/0 BLACK. VERY SLIGHT RXN		0925	DRILLING STOPS. REDAR-
								TO 10% HCL. UNCONSOLIDATED. CHAIN OF CUSTODY			ING TO ADD 10" C.S. CASING
								#021490-W22-42			
								25.3' + 9.0' = 34.3'		1035	10" C.S. CASING ADDED
	SIP100 PID	DET								1037	500 MON DRILL SITE
										1040	DRILLING RESUMES

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9413223.0678

DAILY BOREHOLE LOG	Boring or Well Number 219-W22-42	Date 2/14/90	Sheet No. 2 of 3
	Location 200 WEST	Project W017-216-012	

Logged by C.D. Condit (GRE) Date 2/14/90
Reviewed by [illegible] Date 4.25.90
Lith. Class. Scheme Folk Procedure DO-1 REV. 0

Drilling Contractor KEH
Driller GARY LYNN
Rig/Method RE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
24.5'	SIP 1000 PID	DET				20'				1045	550 MON DRILL SITE
25'	GM	DET	SM	LITH	2		S	SAND (3% GRAVEL, 94% SAND, 3% MUD) TR. SC,		1055	SAMPLE - C.B.
				MOIST	1	25'		TR. CP, 1% MP, 1% FP, 1% VFP, 15% VCS, 25% CS, 30%			
								MS, 20% FS, 4% VFS, 3% MUD. MODERATE TO WELL		1100	RESUME DRILLING
								SORTED. GRAVEL; 60% BASALTIC/MAFIC, 35% QUARTZITE,			
	SIP 1000 PID	DET						5% FELSIC. SA-R. SAND; 35% BASALTIC/MAFIC,		1125	550 MON. DRILL SITE
								50% QUARTZ, 10% FELSIC, 4% RED SANDSTONE, 1%			
								CHALCOPHYTE, SA-SR. COLOR: 7.5YR 3/2 VERY DARK		1130	RPT DEPARTING SITE
								GRAYISH BROWN. SLIGHT REN TO 10% HCL. UNCON-			DRILLING CONTINUES
								SOLIDATED. NOTED CHANGES; COLOR MORE BROWN			
								THAN BLACK. HIGHER QUARTZ CONTENT, TRACE OF CP		1140	DRILLING GOOD. PREPARING
								HAD VESICULAR APPEARANCE ON SURFACE.			TO ADD 10" C.S. CASING
										1200	DRILLER BREAKS FOR LUNCH
										1230	DRILLER CONTINUES TO
											PREPARE TO ADD 10"
						25'					C.S. CASING.
30'	GM	DET	SM	LITH	2		S	SAND (2% GRAVEL, 97% SAND, 1% MUD) .5% MP,		1240	SAMPLE - C.B.
				MOIST	1	30'		1% FP, .5% VFP, 15% VCS, 40% CS, 36% MS, 7%			
								FS, 1% MUD. WELL SORTED. GRAVEL; 75% BASALTIC/			
								MAFIC, 20% QUARTZITE, SR-R, SAND; 35%			

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9413223.0679

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-112	Date 2/14/90	Sheet No. 3 of 3
	Location 200 WEST	Project WMP-PH-112	

Logged by C.B., Comm. (Geo.) [illegible] Date 2/14/90
Reviewed by [illegible] Date 4-25-90
Lith. Class. Scheme Folk Procedure DO-11 Rev. 0

Drilling Contractor KEH
Driller [illegible]
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
20'								(SOFT SEMI-LITH. LEACH. COM.) BASALTIC/MAFIC, 55%			
								QUARTZ, 10% FELSIC, SA-SR, COLOR: 2.5Y 3/2 VERY			
								DARK GRAYISH BROWN, SLIGHT RXN WITH 10% HCL,			
								UNCONSOLIDATED,			
								34.3' + 9.0' = 43.3'		1410	10" C.S. CASING ADDED
	HNU					20'				1420	500 MGN DRILL SITE
36'	GM	DET	M	LOH	2		(m)			1420	DRILLING RESUMES
				PORT	1	35'		SLIGHTLY MUDDY SAND (1% GRAVEL, 84% SAND, 15% MUD)		1450	SAMPLE - C.B.
	SHIPPED							1% FP, 10% VFG, 25% FG, 20% MG, 20% CG, 9% VCG, 15%		1455	DRILLING RESUMES
	PID	DET						MUD, MODERATE TO POORLY SORTED, GRAVEL: 100%		1500	500 MGN DRILL SITE
								BASALTIC/MAFIC, OR, SAND: 85% BASALTIC/MAFIC, 50%		1510	DRILLING SIGNS. RPT
								QUARTZ, 15% FELSIC, SA-SR, COLOR: 2.5Y 4/2 DARK			OFF SITE.
								GRAYISH BROWN, SLIGHT RXN TO 10% HCL. MODERATE			
								CONSOLIDATION. CHANGES NOTED: WET COLOR LIGHTER		1525	GEOLOGIST AND DRILLER
								IN SHADE. SMALL SILT LENSES WERE NOTED AS MMERI			OFF SITE
								ALL WAS REMOVED FROM CORE BARREL, THEREFORE			
								INCREASE IN CONSOLIDATION.			

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9413223.0680

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/15/90	Sheet No. 1 of 3
	Location 200 WEST	Project W017-216-012	

Logged by C.D. Condit (GAI) Date 2/15/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme Folk Procedure DO-1 (REV. 0)

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	GEOLOGIST AND DRILLER
											ON SITE. DRILL RIG
											WILL NOT START. MECHANIC
											IS CALLED ON SITE.
										0800	RPT ON SITE. MECHANIC
											CONTINUES TO WORK ON RIG.
										0840	RIG IS STARTED AND
											WARMING UP.
								DEPTH TO BOTTOM = 38.2'		0845	DEPTH TO BOTTOM
						36'				0905	DRILLING BEGINS
40'	GM	DCT	SM	LITH	2		S	SAND (90% SAND, 10% MUD) 5% VCS, 10% CS,		0915	SAMPLE - C.B.
				CHEM	2	40'		35% MS, 35% FS, 5% VCS, 10% MUD, MODERATELY		0920	DRILLING RESUMES
				VOA	2			SORTED, SAND; 40% BASALTIC/MAFIC, 45% QUARTZ, 15%			
				MOIST	1			FELSIC, SA-SR, COLOR; 5Y3/1 VERY DARK GRAY, NO			
								RXN TO 10% HCL, UNCONSOLIDATED, CHAIN OF CUSTODY			
								H 021590 - W22-42, NOTED PRESENCE OF SMALL			
								SILT LENSES, BUT NOT AS MUCH AS 35' SAMPLE		0930	DRILLING STOPS, PREPAR-
											ING TO ADD 10" C.S.
											CASING.
								43.3' + 9.4' = 52.7'		1050	10" C.S. CASING ADDED

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9413223.0681

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/15/90	Sheet No. 2 of 3
	Location 200 WEST	Project WO17-216-412	

Logged by C.D. CONDIT (S.A.E.) Date 2/15/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure DO-1 / REV. 4

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										1055	DRILLING RESUMES
~43'	SIPIOOD PID	DET								1110	660 MON. DRILL SITE
										1115	RPT OFF SITE. DRILL-
											ING CONTINUES
										1120	DRILLING STOPS.
										1200	DRILLER BREAKING FOR
											LUNCH
~43'	SIPIOOD PID	DET								1230	660 MON BOREHOLE
										1240	RPT ON SITE. DRILLING
						40'					RESUMED.
45'	SIPIOOD PID	DET	D	LITH	2		S	SAND (1% GRAVEL, 98% SAND, 1% MUD) .5%		1310	SAMPLE - C.B.
	GM	DET		MOIST	1	46'		FP, .5% VFP, 15% VFS, 35% FS, 35% MS, 10% CS,			
								3% VCS, 1% MUD, MODERATE TO WELL SORTED. GRAVEL:		1315	DRILLING RESUMED
								75% BASALTIC/MAFIC, 25% QUARTZITE, SA-SR. SAND:			
								30% BASALTIC/MAFIC, 60% QUARTZ, 10% FELDIC.			
								SA-SR. COLOR: 5Y3/2 DARK OLIVE GRAY. SLIGHT			
								RXN TO 10% HCL. UNCONSOLIDATED			
47'	SIPIOOD PID	DET				46'				1330	660 MON. BOREHOLE
50'	SIPIOOD PID	DET	D	LITH	2		gS	GRAVELLY SAND (24% GRAVEL, 74% SAND, 2% MUD)		1360	SAMPLE - CB
	GM	DET		MOIST	1	50'		7% MP, 10% FP, 7% VFP, 15% VFS, 15% FS, 25%			
								MS, 15% CS, 4% VCS, 1% GRAVEL. POORLY SORTED		1355	DRILLING RESUMES

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9413223.0682

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/15/90	Sheet No. 3 of 3
	Location 200 WEST	Project WO17-216-012	

Logged by C.D. CONDIT (GAE) Date 2/15/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure NO-1 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method DEZZW CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
50'								(50 FT. SAMPLE INTERV. CONT.) GRAVEL: 30% BASALTIC/		1400	DRILLER IS ADDING
								MAFIC, 14% QUARTZITE, 5% FELSIC, 1% RED SAND-			H2O TO BOREHOLE TO
								STONE, SA-R, SAND: 40% BASALTIC/MAFIC, 50%			AID IN MATERIAL
								QUARTZ, 10% FELSIC, SA-SR, COLOR: 5Y4/2 OLIVE			REMOVAL.
								GRAY, SLIGHT RXN TO 10% HCL. UNCONSOLIDATED,			
								CHANGES NOTED: INCREASE IN GRAVEL FRACTION.			
								COLOR IS LIGHTER SHADE OF OLIVE GRAY.			
										1440	DRILLING STOPS, PRE-
											PARING TO ADD 10"
											C.S. CASING
										1510	RPT OFF SITE
										1520	DRILLER SHUTTING DOWN
											OPERATIONS FOR THE
											DAY
										1525	DRILLER AND GEOLOGIST
											OFF SITE
								TOTAL FT. DRILLED FOR DAY: 35' TO 50' = 15 FT.			
								10" C.S. CASING ADDED FOR DAY: 4.4' TOT = 52.7'			
								GALLONS H2O ADDED TO BOREHOLE: 10			

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9413223.0683

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/16/90	Sheet No. 1 of 3
	Location 200 WEST	Project WO17-216-U12	

Logged by C.D. CONDIT (GAE) Date 2/16/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure DO-1 / REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method RE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	GEOLOGIST AND DRILLER
											ON SITE. RIG IS WARM-
											ING UP.
										0710	DRILLER CONTINUES TO
											ADD 10" C.S. CASING
								52.7' + 10.0' = 62.7'		0755	10" C.S. CASING ADDED
										0800	RPT ON SITE. DRILLING
						50'					WITH C.B. BEGINS
55'	GM	DET	D	LITH	2		S	SAND (2% GRAVEL, 96% SAND, 2% MUD) • 5% MP,		0815	SAMPLE - C.B.
				MOIST	1	55'		1% FP, • 5% VFP, 15% VFS, 35% FS, 40% MS, 6%			
56'	SIPIOOD PID	DET						FS, 2% MUD, WELL SORTED, GRAVEL: 45% BASALTIC/		0820	DRILLING RESUMES.
								MAFIC, 40% QUARTZITE, 14% FELSIC, 1% RED SANDSTONE			550 MON. DRILL AREA
	SIPIOOD PID	DET						SR-R. SAND: 30% BASALTIC/MAFIC, 55% QUARTZ, 15%		0905	550 MON. DRILL AREA
								FELSIC, SA-SR, COLOR: 2.5Y 4/2 DARK GRAYISH BROWN			
								NO RXN TO 10% HCL. UNCONSOLIDATED. NOTED WET			
								COLOR HARD TO DETERMINE DUE TO LACK OF FINES			
						55'					
60'	SIPIOOD PID	DET	D	LITH	2		S	SAND (2% GRAVEL, 96% SAND, 2% MUD) • 5%		0925	SAMPLE - C.B.
	GM	DET		CHEM	2	60'		IMP, 1% FP, • 5% VFP, 15% VFS, 35% FS, 40% MS,			
				LDPA	2			6% FS, 2% MUD, WELL SORTED, GRAVEL: 50%			
				MOIST	1			BASALTIC/MAFIC, 40% QUARTZITE, 10% FELSIC, SR-R			

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9413223.0684

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/16/90	Sheet No. 2 of 3
	Location 200 WEST	Project WOM-216-412	

Logged by C.D. Condit (GRI) Date 2-16-90
Reviewed by [illegible] Date 4-23-90
Lith. Class. Scheme FOLK Procedure WO-1/Rev. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method REZZW / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
60'								(CONT. SAMPLE DESCR. CONT.) SAND: 30% BASALTIC/MAFIC		0925	DRILLING STOPS. PREPAR-
								55% QUARTZ, 15% FELSIC, SA-SR, COLOR 2.5Y 4/2			ING TO ADD 10" C.S.
								DARK GRAYISH BROWN, NO RXN TO 10% HCL, UNCON-			CASING.
								SOLIDATED. CHAIN OF CUSTODY #0216910-W22-42			
								62.7' + 9.9' = 72.6'		1055	10" C.S. COUPLING ADDED
	KR1000 PID	DET								1100	600 MON. DRILL AREA
										1110	RESUME DRILLING
										1125	RPT DEPARTS SITE.
											DRILLING STOPS
										1200	DRILLER BREAKS FOR LUNCH
						60'				1245	RPT ON SITE, RESUME
											DRILLING.
65'	SP1000 PID	DET	D	LITH	2		S	SAND (1% GRAVEL, 98% SAND, 1% MUD) .5% FP,		1255	SAMPLE - C.B.
	6M	DET		MONT	1	65'		.5% VFP, 25% VFS, 40% FS, 30% MS, 3% CS, 1% MUD			
								WELL SORTED, GRAVEL: 75% BASALTIC/MAFIC, 10%		1300	DRILLING RESUMES.
								QUARTZITE, 10% CALICHE, 5% FELSIC, SR. SAND:			
								30% BASALTIC/MAFIC, 60% QUARTZ, 10% FELSIC, SA-			
								SR, COLOR: 2.5Y 4/2 DARK GRAYISH BROWN, SLIGHT			
								RXN TO 10% HCL, UNCONSOLIDATED. CALICHE RE-			
								TAINED ON SIEVE. HAD STRONG RXN TO 10% HCL.			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/16/90	Sheet No. 3 of 3
	Location 200 WEST	Project WX017-216-W12	

Logged by C.D. CONDIT (GAI) Date 2/16/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure WO-1 / REV. Ø

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method CE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
70'	GIP1000 PID	DET	D	LATH	2	65'		SAND (98% SAND, 2% MUD) 10% VCS, 10% CS,		1025	SAMPLE - C.B.
	GM	DET		MOIST	1	70'	S	50% MS, 30% FS, 4% VFS, 2% MUD, WELL SORTED			
								SAND: 20% BASALTIC/MAFIC, 70% QUARTZ, 10% FELSIC		1330	RESUME DRILLING.
								SA-SR. COLOR: 2.5Y 4/2 DARK GRAYISH BROWN. SLIGHT			
								RXN TO 10% HCL, UNCONSOLIDATED. NOTED: INCREASE		1400	DRILLING STOPD. PRE-
								IN MG FRACTION AND SILICA CONTENT.			PARING TO ADD 10"
											C.S. CASING.
								72.6' + 9.6' = 82.2'		1500	10" C.S. CASING ADDED
										1515	DRILLER SHUTTING DOWN
											OPERATIONS FOR THE DAY
								TOTAL FT. DRILLED FOR DAY: 50' TO 70' = 20 FT.			
								10" C.S. CASING ADDED TODAY = 29.6' TOT = 82.2'		1520	GEOLOGIST AND DRILLER
								GALLONS H_2O ADDED TODAY = Ø			OFF SITE

9413223.0686

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/20/90	Sheet No. 1 of 3
	Location 200 WEST	Project W017-216-U12	

Logged by C.D. Condit (GTE) Date 2/20/90
Reviewed by [illegible] Date 4-15-90
Lith. Class. Scheme FOLK Procedure DU-1 | REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22W | CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								TOTAL 10" C.S. CASING = 82.2'		0700	GEOLOGIST AND DRILLER
											ON SITE. DRILLER BE-
											GINNING TO WELD
											SHOE ONTO 8" C.S.
											CASING.
										0800	RPT ON SITE
										0820	DRILLING WITH CORE
											BARREL COMMENCES
~73'	SIP 1000 PID	DET				70'				0830	600 MON. DRILL SITE
76'	SIP 1000 PID	DET	D	LITH	2	75'	S	SAND (2% GRAVEL, 96% SAND, 2% MUD) TR. CP, 1% FP,		0900	SAMPLE - C.B.
	6M	DET		MOIST	1			1% VFP, 10% VCS, 20% CS, 40% MS, 20% FS, 6% VFS,			
								2% MUD, MODERATE TO WELL SORTED. GRAVEL: 69%		0905	DRILLING RESUMES
								BASALTIC/MAFIC, 80% QUARTZIC, 9% FELSIC, 2% MICA,			
~79'	SIP 1000 PID	DET						SR-R. SAND: 25% BASALTIC/MAFIC, 65% QUARTZ,		0940	SSD MON. BOREHOLE
								5% FELSIC, 3% RED SANDSTONE, 2% MICA, SA-SR,			
								COLOR: 5Y4/3 OLIVE. NO RXN TO 10% HCL. UNCON-			
								SOLIDATED. NOTED: PRESENCE OF WEAKLY CEMENTED			
								SAND RETAINED ON SIEVE THAT REACTED STRONGLY			
								WITH 10% HCL, ONE CP WAS FOUND AMONG ST			
								ENTIRE SAMPLE, MICA RETAINED ON SIEVE WAS			
								PLATE LIKE.			

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9413223.0687

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/20/90	Sheet No. 2 of 3
	Location 200 WEST	Project WO17-216-012	

Logged by C.D. CONDIT (GAI) Date 2/20/90
Reviewed by [illegible] Date 7-25-90
Lith. Class. Scheme FOLK Procedure DO-1 / REV. 4

Drilling Contractor KEM
Driller GARY LYDIN
Rig/Method BE 22 W/ CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
80'	GM	DET	M	LITH	2	75'	S	SAND (93% SAND, 7% MUD) 7% MS, 56% FS, 36%		09:55	SAMPLE - C.D.
				CHEM	2			VFS, 7% MUD, WELL TO VERY WELL SORTED, SAND;			
				VOA	2	80'		15% BASALTIC/MAFIC, 70% QUARTZ, 15% FELSIC, SA-SR.		1000	DRILLING STOPS. PRE-
				MOIST	1			COLOR 5Y4/4 OLIVE, VERY SLIGHT RXN TO 10% HCL.			PARING TO ADD 10"
								UNCONSOLIDATED, MOIST; INCREASE IN FINE TO			C.S. CASING.
								VERY FINE PORTION OF SAND FRACTION AND AB-			
								SENCE OF GRAVEL AND COARSE SAND. CHAIN			
								OF CUSTODY # 022090-W22-42.			
										1110	RIG DEPARTS SITE
								82.2' + 10.3' = 92.5'		1115	10" C.S. CASING ADDED
										1120	DRILLING RESUMES
92.5'	SIP100, PID	DET								1135	600 MM. DRILL SITE
											DRILLING STOPS. DRILLER
											CONTINUES TO WELD SHOE
											ON 8" C.S. CASING
										1200	DRILLER BREAKS FOR LUNCH
										1240	DRILLER CONTINUES TO WELD
											SHOE TO 8" C.S. CASING
										1245	RIG ON SITE
										1300	DRILLING RESUMES

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9413223.0688

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/20/90	Sheet No. 3 of 3
	Location 200 WEST	Project W017-216-U12	

Logged by C.D. CONDIT (GRE) Date 2/20/90
Reviewed by [illegible] Date 4-26-90
Lith. Class. Scheme FOLK Procedure DO-11 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22 W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
80'	SIPHOND PID	DET				80'				1305	550 MON. DRILL SITE
85'	GM	DET	SM	LITH	2		S	SAND (1% GRAVEL, 97% SAND, 2% MUD) · 5% FP,		1315	SAMPLE - C.R.
				MOIST	1	85'		· 5% UFP, 5% VCS, 15% CS, 55% MS, 15% FS, 7%		1320	DRILLING RESUMES
								VFS, 2% MUD, WELL SORTED, GRAVEL: 50% BA-			
88'	SIPHOND PID	DET						SALTIC / MAFIC, 20% QUARTZITE, SA-SR, SAND: 19%		1355	550 MON. BOREHOLE
								BASALTIC / MAFIC, 70% QUARTZ, 10% FELSIC, 1% IRON			
								COPPER OUTSIDED, SA-SR. COLOR: 5Y4/3 OLIVE,			
								SLIGHT RXN TO 10% HCL, UNCONSOLIDATED.			
						85'					
90'	SIPHOND PID	DET	SM	LITH	2		S	SAND (1% GRAVEL, 97% SAND, 2% MUD) SIMILAR		1415	SAMPLE - C.R.
	GM	DET		MOIST	1	90'		SAMPLE DESCRIPTION AS REST. SAMPLE.			
										1420	DRILLING STOPS. REFAR
											ING TO ADD 10" C.S.
											CASING
										1515	DRILLER SHUTTING DOWN
											OPERATIONS FOR THE DAY
										1520	DRILLER AND GEOLOGIST
											OFF SITE
								TOTAL FT. DRILLED FOR DAY: 70' TO 90' = 20 FT			
								10" C.S. CASING ADDED TODAY: 62.3' TOTAL = 92.5'			
								GALLONS H2O USED TODAY = 0			

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9413223.0689

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/21/90	Sheet No. 1 of 3
	Location 200 WEST	Project W017-216-U12	

Logged by C.D. CONDIT (GAI) Date 2/21/90
Reviewed by [illegible] Date 4-25-90
Lith. Class. Scheme FOLK Procedure DO-11 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BEZZW / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								TOTAL 10" C.O. CASING = 92.5'		0700	GEOLOGIST AND DRILLER
											ON SITE. RIG IS WARM-
											ING UP.
										0710	DRILLER CONTINUING TO
											WELD 10" C.O. CASING
								92.5' + 8.2' = 100.7'		0730	10" C.O. CASING ADDED
										0800	RPT ON SITE
										0805	DRILLING WITH CORE
											BARREL COMMENCES
~92.5'	SIP1000 PID	DET				90'				0835	500 MON DRILL SITE
95'	GM	DET	GM	LITH	2		S	SAND (1% GRAVEL, 96% SAND, 3% MUD) - 5% FP		0855	SAMPLE - C.B.
				MOIST	1	95'		- 6% VFP, 5% VKS, 10% RCO, 40% MS, 38% FS, 3% VFS,			
								3% MUD. WELL SORTED. GRAVEL: 100% BASALTIC/		0900	DRILLING RESUMES
								MAFIC. SA-SR. SAND: 15% BASALTIC/MAFIC, 70% QUARTZ,			
								10% FELSIC, 3% RED SANDSTONE, 1% MICA, 1% FE/CU			
								SULFIDES. SA-SR. COLOR: 5Y 4/3 OLIVE. NO RXN			
								TO 10% HCL. UNCONSOLIDATED.			
~98'	SIP1000 PID	DET								0940	500 MON. DRILL SITE
										0950	DRILLING STOPS. DRILLER
											WELDING REPAIR ON
											CABLE SPOOL

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9413223.0690

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/21/90	Sheet No. 2 of 3
	Location 200 WEST	Project WO17-216-012	

Logged by C.D. CONDIT (GAI) Date 2/21/90
Reviewed by [illegible] Date 4-25-90
Lith. Class. Scheme FOUR Procedure DO-1 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
						95'				1015	DRILLING RESUMES
100'	SM	DET	SM	LITH	2		S	SAND (95% SAND, 5% MUD) 15% MG, 60% FS, 20%		1020	SAMPLE - CD.
				CHEM	2	100'		VFS, 5% MUD, WELL SORTED, SAND; 15% BASALTIC			DRILLING STOPS. PRE-
				VOA	2			MAFIC, 70% QUARTZ, 10% FELSK, 3% MICA, 1%			PARING TO ADD 10" C.S.
				MOIST	1			RED SANDSTONE, 1% FE/CU SULFIDED, 5A-5R. COLOR:			CASING.
								5Y4/2 OLIVE GRAY, SLIGHT RXN TO 10% HCL, UN-			
								CONSOLIDATED. NOTED: INCREASE IN FINES OF SAND		1115	RPT DEPARTS SITE
								FRACTION, CHAIN OF CUSTODY # 022190-W22-42			
								100.7' + 9.0' = 109.7'		1120	10" C.S. CASING ADDED
										1200	DRILLER BREAKS FOR LUNCH
										1230	DRILLER BACK ON SITE
										1245	RPT ON SITE. DRILLING
											CONTINUES
~102'	SP1000 PID	DET				100'				1305	350 MON. DRILL SITE
105'	SP1000 PID	DET	SM	LITH	2		S	SAND (95% SAND, 5% MUD) 5% VFS, 10% CS, 40% MG,		1425	SAMPLE - C.B.
	GM	DET		MOIST	1	105'		35% FS, 5% VFS, 5% MUD, WELL SORTED, SAND;			
								15% BASALTIC/MAFIC, 70% QUARTZ, 14% FELSK, 1%			
								FE/CU SULFIDES, 5A-5R. COLOR; 5Y4/3 OLIVE.			
								MODERATE RXN TO 10% HCL, UNCONSOLIDATED			
										1430	DRILLING RESUMED

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/21/90	Sheet No. 3 of 3
	Location 200 WEST	Project W017-216-012	

Logged by C.D. CONDIT (GAE) Date 2/21/90
Reviewed by [illegible] Date 4-15-90
Lith. Class. Scheme FOLK Procedure DO-1 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method DE 22W CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										1445	DRILLING STOPS. PREPAR-
											ING TO ADD 10" C.S.
											CASING
										1515	DRILLER SHUTTING DOWN
											OPERATIONS FOR THE DAY
										1520	GEOLOGIST AND DRILLER
											OFF SITE
								TOTAL FT. DRILLED FOR DAY = 90' TO 105' = 15 FT.			
								10" C.S. CASING ADDED TODAY = 17.2' TOT = 109.7'			
								GALL. H_2O USED DOWNHOLE = Ø			

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9413223.0692

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/22/90	Sheet No. 1 of 3
	Location 200 WEST	Project WBI7-216-012	

Logged by C.D. Condit (SAI) Date 2/22/90
Reviewed by D.T. McSlan Date 4-25-90
Lith. Class. Scheme Folk Procedure DO-1 / REV. 4

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								TOTAL 10" C.S. CASING = 109.7'		0700	GEOLOGIST AND DRILLER
											ON SITE. DRILLER CON-
											TINUING TO PREPARE
											TO ADD 10" C.S. CASING
								109.7' + 9.8' = 119.5'		0735	10" C.S. CASING NEEDED
										0805	PPI ON SITE DRILLING
											WITH CORE BARREL PICKUP
~109'	OILY MUD	DET				105'				0810	OBO MON. DRILL SITE
110'	GM	DET	GM	LITH	2		S	SAND (15% SAND, 5% MUD) 10% MG, 56% FG,		0830	SAMPLE - C.B.
				MOIST	1	110'		30% VFG, 5% MUD, WELL TO VERY WELL SORTED,			
								SAND; 15% BASALTIC/MAFIC, 68% QUARTZ, 13%		0835	DRILLING RESUMES
								FELSIC, 3% RED SANDSTONE, 1% FERRO SULFIDES,			
								SA-SR, COLOR: 5Y4/3 OLIVE, SLIGHT RXN TO 10%			
								HCL, UNCONSOLIDATED,			
						110'					
115'	GM	DET	GM	LITH	2		S	SAND (1% GRAVEL, 94% SAND, 5% MUD) 1% FP, 5%		0900	SAMPLE - C.B
				MOIST	1	115'		VCS, 5% CS, 50% MS, 25% FS, 9% VFS, 5% MUD			DRILLING STOPS. PREPARING
								WELL SORTED, GRAVEL: 75% BASALTIC/MAFIC, 25% QUARTZ.			TO ADD 10" C.S. CASING
								SA-SR, SAND: 15% BASALTIC/MAFIC, 68% QUARTZ, 13%			
								FELSIC, 3% RED SANDSTONE, 1% FERRO SULFIDES, SA-SR			
								COLOR: 5Y4/3 OLIVE, SLIGHT RXN 10% HCL, UNCONSOLIDATED.			

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9413223.0693

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/22/90	Sheet No. 2 of 3
	Location 200 WEST	Project WMT-216-112	

Logged by C.D. CONDIT — Date 2/22/90
Reviewed by [illegible] — Date 4-25-90
Lith. Class. Scheme FOLK — Procedure DO-11 REV. 0

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method RE 22 / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								119.5' + 10.4' = 129.9'		1005	10" C.S. CASING ADDED
115'	SIPHON PID	DET								1010	660 POND LINE [illegible]
						115'				1015	DRILLING RESUMED
120'	SIPHON PID	DET	SM	LITH	2		S	SAND (90% SAND, 5% MUD) 5% MG, 60% FG,		1035	SAMPLE-CD
	6M	DET		CHEM	2	120'		30% VFS, 5% MUD, WELL TO VERY WELL SORTED,			
				WOA	2			SAND: 15% BASALTIC/MAFIC, 70% QUARTZ, 13%		1040	DRILLING RESUMES
				MOIST	1			FELSIC, 1% RED SANDSTONE, 1% FE/CU SULFIDES, SA			
								ER, COLOR: 5Y4/3 OLIVE, SLIGHT REA TO 10%		1115	RPT OFF SITE.
								HCL, UNCONSOLIDATED, NOTED: SANDS APPEAR TO			DRILLING STOPS
								DISCOLOR BETWEEN CONTAINING A SMALL COARSE		1200	DRILLER PREPARES FOR LUNCH
								SAND FRACTION AND NONE AT ALL. CHAIN OF			
								CUSTODY # 022290-W22-42.			
~124.5'	SIPHON PID	DET								1240	660 MON. BOREHOLE
										1245	RPT ON SITE. DRILLING
						120'					RESUMED.
125'	6M	DET	SM	LITH	2		S	SAND (93% SAND, 5% MUD) 3% VCG, 7% CG,		1255	SAMPLE-CD
				MOIST	1	125'		45% MG, 35% FG, 5% VFG, 5% MUD, WELL TO VERY			
								WELL SORTED, SAND: 15% BASALTIC/MAFIC, 70% QUARTZ,		1300	DRILLING STOPS. PREPARING TO PULL 10" C.S. CASING
								10% FELSIC, 3% RED SANDSTONE, 2% PUMA, SA ER			
								COLOR 5Y4/3 OLIVE, SLIGHT REA TO 10% HCL,			
								UNCONSOLIDATED.			

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9413223.0694

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/22/90	Sheet No. 3 of 3
	Location 200 West	Project W017-216-U12	

Logged by C.D. Condit (GAI) Date 2/22/90
Reviewed by D.R. McKenna Date 4-25-90
Lith. Class. Scheme Folk Procedure DO-1 / Rev. 0

Drilling Contractor KEH
Driller Gary Lydin
Rig/Method PE 2261 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								129.9' + 7.0' = 136.9'		1355	10" C.S. CASING ADDED
						125'				1400	RESUME DRILLING
130'	GM	DET	GM	LITH	2		S	SAND (15% GRAV, 5% MUD) 40% MG, 50% FS,		1410	SAMPLE - C.B.
	PWD	DET		MOIST	1	130'		5% VFS, 5% MUD, WELL TO VERY WELL SORTED.			
								SAND: 15% BASALTIC/MAFIC, 70% QUARTZ, 14%		1415	DRILLING RESUMES
								FELDS, 1% MICA, SA-SR COLOR: 5Y4/3 OLIVE, SLIGHT			
								RXN TO 10% HCL. UNCONSOLIDATED.			
						130'					
135'	GM	DET	GM	LITH	2		S	SAND (97% SAND, 3% MUD) 5% VCS, 20% CS,		1430	SAMPLE-CB
				MOIST	1	135'		50% MS, 10% FS, 7% VFS, 3% MUD. WELL		1435	DRILLING RESUMES
								SORTED. SAND: 25% BASALTIC/MAFIC, 60%			
								QUARTZ, 10% FELDS, 2% RED SANDSTONE, 1%			
								MICA, SA-SR, COLOR 5Y4/3 OLIVE, SLIGHT RXN			
								TO 10% HCL. UNCONSOLIDATED.			
						135'					
140'	GM	DET	GM	LITH	2		S	SAND (97% SAND, 3% MUD) SIMILAR TO 130 FT.		1500	SAMPLE-CB
				CHEM	2	140'		SAMPLE. CHAIN OF CUSTODY #C-2-22-90-W22-42		1500	RIG OFF SITE. DRILLING
				VOA	2						STOPS
				MOIST	1					1515	DRILLER SHUTS DOWN
										1525	GEOLOGIST HAS LEFT
											THE SITE

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9413223.0695

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date [illegible]	Sheet No. 1 of 1
	Location 200 West	Project [illegible]	

Logged by C.D. Conner (WCC)	Date [illegible]
Reviewed by W.C. McClean	Date 4-25-90
Lith. Class. Scheme Folk	Procedure [illegible]

Drilling Contractor KEH	
Driller Gary Lyon	
Rig/Method Reverse Circ. Rig	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	Geological and Drillers
											on site. [illegible]
											[illegible]
										0730	Driller waiting for
											Geophysical Truck to
											log well.
										0815	Geophysical logging
											truck on site. Begin-
											ning to set up to log
								Gross Gamma => Top of Basalt = 3.8' to 137.3'		0945	Geophysical logging com-
											pleted.
								Outside diameter of 8" c.s. shoe = 9¼" = 0.77'		1000	Driller begins to install
								8" - 21.4' w/ drive shoe			8" c.s. casing.
								8" - 19.1'		1130	Turned over loc. to
								8" - 21.0'			R. Miller (Geo)
								8" - 19.5'		1155	stop - lunch.
								8" - 20.1		1230	resume welding 8"
								8" casing weld = [illegible] in [illegible]		1505	stop for day
								H2O - 0 gallons		1500	Lr air
								volume [illegible]			

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9413223.0696

DAILY BOREHOLE LOG	Boring or Well Number [illegible]	Date 2/26/90	Sheet No. 1 of 1
	Location 200 W [illegible]	Project [illegible]	

Logged by [illegible] (GAI) Date 2/26/90
Reviewed by D.R. McKlean Date 4-25-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing = 101.1'		0700	Arr site - [illegible]
											wind [illegible] - warm
											rig and [illegible] to add 8"
								8" 101.1' + 19.4 = 120.5'		0730	add 8" to well
								8" - 120.5' + 19.5' = 140.0'		0900	add 8" to well
										0950	Alan Pearson takes
											over log
								8" → 140.0' + 10.7 = 150.7' total		1000	add 8" & weld
										1030	Driller left site
											to get his back
											looked at
										1100	Driller returns -
											continues welding
										1130	R Miller (GAI) resumes
											log of well
										1155	stop - lunch
										1230	resume activity - well comp
										1240	begin to drill
145.0'	PID		0-30'	lith	2		S	SMD (77% Sand 35% Med) Sl gravel 20% cs & sh		1335	to 145.0' sample [illegible]
	GM			moist	1	18%		w/ 27% fs Sl gravel, 35% med, med-well sorted, 20% angular			
								30% fabric, SA-SR, dk gray brn (10YR 4/2 wet) cont. [illegible]			

AW Pearson. Alan [illegible]

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9413223.0697

DAILY BOREHOLE LOG	Boring or Well Number 299-W6A-112 Location 200 West	Date 2/26/90 Sheet No. 3 of 5 Project W-017-216-U12-Crib

Logged by R. Miller (GAI) [illegible] Date 2/26/90
Reviewed by V.T. McKlem Date 4-25-90
Lith. Class. Scheme Folk Procedure DO-1, Rev. 0

Drilling Contractor KEH
Driller Gary Lydin
Rig/Method REZCON / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								145.0' cont.			
								mud - strong rx to 10% HCL, unconsolidated - loose			
								sands are micaceous			
150.0'	Pic	Cdd	D-Sat	Lith	2		S	SAND (7.1% Sand, 9% Mud) 1% vcs 5% cs 15% ms		1410	to 150.0' - sample OK
	Gas	Cdd		moist	1	150.0		30% fs 30% vfs 9% mud, well sorted, 20% mafic		1415	driller changing to
								80% felsic SA-SR, dk gray tan (10YR 4/2 wet)			HT - to difficult to
								strong rx to 10% HCL, unconsolidated - loose to			empty drive barrell
								compact, trace of mud lenses (laminae) f. sands			
								are micaceous.		1530	stop for day
								Footage = 10'			
								8" casing added = 19.6'			
								H_2O added = 0 gallons			

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9413223.0698

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42 Location 200 West	Date 2/27/90 Sheet No. 1 of 4 Project W-017-216-W12-Crib

Logged by AW Pearson Alan Pearson Date 2/27/90 Reviewed by [illegible] Date [illegible] Lith. Class. Scheme Folk Procedure DO-1, Rev. Ø	Drilling Contractor KEH Driller Gary Lydin Rig/Method DE22W / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	Geologist & Driller arrive on site Warm-up rig - Waiting for RPT coverage
								Driller switched to hard tool - due to increasing % Mud & silt @ 150'		0710	
										0715	Building up bit
								149.7' - 3.2' su + 0.5' cor. = 147.0' D/B Casing @ 150.7' - 3.2 su = 147.5' bgs. Must have driven casing into sluff after 150' sample.		0820	Take D/B w/ L300-06
										0825	RPT on site
	PID	SDet								0830	SSO monitors site
								150.7' + 9.2' = 159.9' Total 8" Carbon Steel Casing		0840	Welding 8" Casing
										0845	Take VOA Sample Blank & Drill water Sample COC# 022790W12W22-42
										0930	Begin Drilling - HT

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9413223.0699

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/27/90	Sheet No. 2 of 4
	Location 200 West	Project W-017-216-W12-Coib	

Logged by AW Pearson Alan Pearson Date 2/27/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme Folk Procedure DO-1, Rev.0

Drilling Contractor KEH
Driller Gary Lydin
Rig/Method RE22W/ Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
155	PID	<Det	N/A	Lith	2		(M)S	SLIGHTLY MUDDY SAND: 81% Sand, 19% Mud		1000	Take sample w/
	GM	<Det						1% VCS, 4% CS, 15% MS, 25% FS, 36% VFS, 19% Mud:			Dart Bailer
								Well-Moderately Sorted:			
								Sand 25% Mafic, 10% Qtz., 60% Felsic, 5% Micas SA-SR:			
								Wet Color light olive brown 2.5Y5/4:			
								Moderate reaction w/ 10% HCl, Unconsolidated			
								% Mud is increasing.			
								159.9' + 9.9' = 169.8'		1100	Welding 8" casing
										1110	Resume Drilling - HT
										1120	RPT leaves for lunch
										1130	Driller shuts down
											⇒ No RPT coverage
										1200	Lunch
										1230	Finish Lunch - Wait
											for RPT coverage
160	PID	<Det	N/A	Lith	2		MS	MUDDY SAND: 70% Sand, 30% Mud		1250	Take Special Sample
	GM	<Det		VOA	2			1% VCS, 3% CS, 16% MS, 20% FS, 30% VFS, 30% Mud			w/ Dart Bailer
				Chem	2			Well-Moderately Sorted: SAND 25% Mafic, 10% Qtz,			COC #
								60% Felsic, 5% Micas, SA-SR: Wet Color			CR2290112W2242
								light olive brown 2.5Y5/4: Strong react. w/10% HCl			
								Unconsolidated: increase in % Mud			

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DAILY BOREHOLE LOG	Boring or Well Number 249-W22-42 Location 200 West	Date 2/27/90 Sheet No. 3 of 4 Project W-017-216-W12-Grib

Logged by AW Pearson Alan Pearson Date 2/27/90
Reviewed by Date 4-25-90
Lith. Class. Scheme Folk Procedure DO-1, Rev.0

Drilling Contractor KEH
Driller Gary Lydin
Rig/Method BE22 W/ Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										1255	Resume Drilling - HT
165'	PID	<Det	N/A	Lith	2		SM	SANDY MUD: 45% Sand, 55% Mud:		1315	Take Sample w/
	GM	<Det						1% VCS, 4% CS, 10% MS, 15% FS, 15% VFS, 55% Mud:			Dart Bailer
	pH	6-7						Well - Moderately Sorted			
								Sand: 30% Mafic, 10% Qtz., 55% Felsic, 5% Mica			
								SA-SR, Wet Color light olive brown 2.5Y5/4:			
								Strong reaction to 10% HCL, Unconsolidated:			
								increase in % Mud as thin lenses of mud:			
										1320	Resume Drilling - HT
								169.8' + 9.8' = 179.6' Total 8" Carbon Steel Casing		1340	Welding 8" Casing
										1345	M. Thomson DOE 4
											Dave Meyers IT Corp.
											Visit site.
170'	PID	<Det	N/A	Lith	2		SM	SANDY MUD: 48% Sand, 52% Mud		1430	Resume Drilling - HT
	GM	<Det						1% VCS, 7% CS, 10% MS, 15% FS, 15% VFS, 52% Mud,		1440	Take Sample w/
	pH	6-7						Well - Moderately Sorted,			Dart Bailer
								Sand: 30% Mafic, 10% Qtz., 55% Felsic, 5% Mica.			
								SA-SR: Wet Color light olive brown,			
								2.5Y5/4: Strong reaction w/ 10% HCL:			
								Unconsolidated. Very similar to 165' sample.			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42 Location 200 West	Date 2/27/90 Sheet No. 4 of 4 Project W-017-216-1412-Crib

Logged by AW Pearson Alan Pearson Date 2/27/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme Folk Procedure DO-1, Rev.0

Drilling Contractor KEH
Driller Gary Lydin
Rig/Method RE22W/Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										1450	Resume Drilling - HT
175'	PID	<Det	N/A	Lith	2		MS	MUDDY SAND: (55% Sand, 45% Mud):		1500	Take Sample w/
	GM	<Det						1% VCS, 4% CS, 10% MS, 15% FS, 25% VFS, 45%:			Dart Bailer
								Well-Moderately Sorted.			
								Sand: 30% Mafic, 10% Qtz, 55% Felsic, 5% Mica.			
								SA-SR: Wet color light olive brown			
								2.5Y5/4: Moderate reaction w/10% HCL:			
								Unconsolidated: % Mud decreasing:			
										1515	Drive Casing &
											Prep. for welding
										1530	Quit for Day
								Footage = 147.0'-175.5' = 28.5'			
								Total H_2O added Today = 75 gal.			
								28.9' of 8" Carbon Steel Casing added Today			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/28/90	Sheet No. 1 of 3
	Location 200 WEST	Project WBI-216-U12	

Logged by C.D. CONDIT (GAE) Date 2/28/90
Reviewed by [illegible] Date 1-25-90
Lith. Class. Scheme FOLK Procedure DO-1 (REV. 0)

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								DEPTH TO BOTTOM UNOBTAINABLE DUE TO MUD AT		0700	GEOLOGIST AND DRILLER
								BOTTOM OF HOLE AND CAKED ON INSIDE OF 8" C.S.			ON SITE. DRILLER PRE-
								CASING.			PARING TO ADD 8"
											C.S. CASING
										0740	APT ON SITE.
								179.6' + 10.1' = 189.7'		0830	8" C.S. CASING ADDED
										0835	BEGIN DRILLING WITH
						175'					HT AND DART BAILER
180'	GM	DET	N/A	LITH	2		MS	MUDDY SAND (55% SAND, 45% MUD) 6% MG.		0845	SAMPLE - HT AND
				CHEM	2	180'		15% FG, 35% MG, 45% MUD. WELL SORTED.			DART BAILER
				VOA	2			SAND: 30% BASALTIC/MAFIC, 65% FELSIC, 5% MICA.		0850	RESUME DRILLING
								SA-SR. COLOR: 2.5Y 4/4 OLIVE BROWN. SLIGHT RAN			
185'	GIPLOOD, PID	DET						TO 10% HCL. UNCONSOLIDATED. NOTES: ROUNDNESS		0900	650 MGN DRILL SITE
								DIFFICULT TO DETERMINE DUE TO SMALL PARTICLE SIZE			
								CHAIN OF CUSTODY # 022990-W22-42			
						180'					
185'	GM	DET	N/A	LITH	2		MS	MUDDY SAND (55% SAND, 45% MUD) SAMPLE		0905	SAMPLE - HT AND
						185		DESCRIPTION SIMILAR TO 180 FT. SAMPLE DESCR.			DART BAILER
										0920	DRILLING STOPS. PREPAR-
											ING TO ADD 8" C.S. CASING
								189.7' + 9.8' = 199.5'		1020	8" C.S. CASING ADDED

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 2/28/90	Sheet No. 2 of 3
	Location 200 W Gen	Project W011-216-412	

Logged by C.D. Condit (GAI) Date 2/28/90
Reviewed by D.R. McKillian Date 4-25-90
Lith. Class. Scheme Folk Procedure DO-1 | R-1.4

Drilling Contractor KEH
Driller GARY LYDIN
Rig/Method BE 22W | CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
						105'				1025	DRILLING RESUMES
110'	GM	DET	N/A	LITH	2		gm S	GRAVELLY MUDDY SAND (15% GRAVEL, 60% SAND,		1040	SAMPLE - HT AND DART
	SIPHOON										
	MO	DET		CHEM	2	110'		25% MUD) 3% MP, 7% FP, 5% VFP, 5% VCS, 5% CO,			BAILER
				VOA	2			15% MO, 20 to FG, 15% VFG, 25% MUD. POORLY		1045	DRILLING RESUMES
								SORTED. GRAVEL: 70% BASALTIC/MAFIC, 10%			
								QUARTZITE, 20% CALICHE', SA-R. SAND: 40%			
								BASALTIC/MAFIC, 60% FELSIC, SA-SR. COLOR: 2.5Y			
								4/4 OLIVE BROWN. MODERATE RXN TO 10% HCL			
								UNCONSOLIDATED. CHAIN OF CUSTODY #022790-W22-42			
						170'					
195'	GM	DET	N/A	LITH	2		gm S	GRAVELLY MUDDY SAND (15% GRAVEL, 60% SAND, 25%		1105	SAMPLE - HT AND DART
						195'		MUD) 3% MP, 7% FP, 5% VFP, 5% VCS, 6% CO,			BAILER.
								15% MO, 20% FG, 15% VFG, 25% MUD. POORLY			DRILLING STOPS. DECIDE-
								SORTED. GRAVEL: 90% BASALTIC/MAFIC, 10% QUARTZITE,			ING TO ADD 8" C.S.
								10% CALICHE', SA-SR. SAND: 30% BASALTIC/MAFIC,			CASING.
								50% QUARTZ, 20% FELSIC, SA-SR, COLOR: 2.5Y 4/4			
								OLIVE BROWN. MODERATE RXN TO 10% HCL. UNCONSOL.			
										1200	DRILLER BREAKS FOR LUNCH
										1245	RPT ON SITE
										1250	DRILLER CONTINUES TO
											WELD 8" C.S. CASING

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42 Location 200 WEST	Date 2/22/90 Sheet No. 3 of 3 Project W017-216-012

Logged by C.D. Condit (GAI) Date 2/22/90 Reviewed by V.R. McGhan Date 4-25-90 Lith. Class. Scheme Folk Procedure DO 11 Rev. 0	Drilling Contractor K.E.W. Driller [illegible] Rig/Method Bezaw / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								199.5' + 9.4 = 208.9'		1305	8" C.S. CASING ADDED
										1315	DRILLING RESUMES
~200'	SUPPOSED PIB	DET				195'				1330	600 MON. BOREHOLE
200'	GM	DET	N/A	LITH	2		mS	MUDDY SAND (2% GRAVEL, 78% SAND, 20% MUD)		1340	SAMPLE - HT AND
				CHEM	2	200'		1% VFP, 1% VFP, 6% VCS, 10% CS, 25% MS, 25% FS			DART BAILER
				VOA	2			13% VFS, 20% MUD, POORLY SORTED, GRAVEL: 100%		1345	DRILLING RESUMES
								BASALTIC/MAFIC, SR-R, SAND: 40% BASALTIC/MAFIC			
								60% FELSIC, SA-SR, COLOR: 5Y 5/4 OLIVE, MODER-			
								ATE RXN TO 10% HCL, UNCONSOLIDATED, CHAIN			
								OF CUSTODY #0228970-W22-42			
						200'					
205'	GM	DET	N/A	LITH	2		mS	MUDDY SAND (2% GRAVEL, 78% SAND, 20% MUD)		1400	SAMPLE - HT AND DART
						205'		DESCRIPTION SIMILAR TO 200 FT SAMPLE DESCRIPTION			BAILER
											DRILLING STOPS. PREPAR-
											ING TO ADD 8" C.S.
											CASING
								208.9' + 9.4' = 218.3'		1515	8" C.S. CASING ADD
											DRILLER SHUTTING DOWN
								TOTAL FT. DRILLED FOR DAY = 175' TO 205' = 30 FT			FOR THE DAY
								8" C.S. CASING ADDED = 38.7' TOT = 218.3'		1525	GEOLOGIST OFF SITE
								GALL. H2O ADDED TODAY = 85			

WHC-MR-0208

DAILY BOREHOLE LOG

Boring or Well Number: 299-W22-42 | Date: 3/1/90 | Sheet No. 1 of 5
Location: 200W 216-U-12 | Project: WOIT 216-U-12 Core

Logged by: R. Miller (GAI) | Date: 3/1/90
Reviewed by: D. C. McBean | Date: 4-25-90
Lith. Class. Scheme: Fait | Procedure: DO-1, Core

Drilling Contractor: KCH
Driller: Gary Lydia
Rig/Method: EE 22W / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 213.3'		0700	Air site-prep to weld
								depth to bottom - unstable 8" casing has begun			clear, 35°F wind N 0-5 mph
										0745	CBT - Check auger
										0820	begin to drill
210.0	PID	Cell	n/a	lith	2		(g)SM	slightly gravelly Sandy Mud (16% Gravel, 34%		0830	to 210.0' sample HT w/
	GAI	Cell		4Oml glass	2			Sand, 60% Mud) 16% vfg, 2% vcs 2% co 5% ms			dart valve bailer
				4Oml arb glass	2	210.0		10% fg 15% vfs, 60% mud, mod-well sorted,			sample on ice 03-01-90
								Gravel 70% mafic 10% felsic, Sand 40% mafic 60%			
								felsic, SA, Hd brn (2.5Y 5/4 wet) mod-strong rx			
								to 10% HCl, unconsolidated, firm to stiff,			
								f sands are micaceous			
215.0	PID	Cell	n/a	lith	2		(g)SM	slightly gravelly Sandy MUD - similar to 210.0'		0855	to 215.0' sample HT w/
	GAI	Cell				215.0					dart valve bailer
220.0	PID	Cell	n/a	lith	2		SM	Sandy MUD (45% Sand 55% Mud) 2% vcs 5% co		0917	to 220.0' sample HT w/
	GAI	Cell		4Oml glass	2	220.0		5% ms 10% fg 25% vfs, 55% Mud, well sorted,			dart valve bailer
				4Oml arb glass	2			15% mafic 85% felsic, SA, Hd brn (2.5Y 5/4 wet)			sample on ice 03-01-90
								strong rx to 10% HCl, unconsolidated, firm			
								to stiff, f sand is micaceous, traces of calcite			
								8" 218.3' + 12.0' = 230.3' total		0940	add 8" casing
										1050	mechanic working on rig

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-47	Date 3/1/90	Sheet No. 2 of 3
	Location 200W 216-U-12	Project W017 216-U-12 Crib	

Logged by P. Miller (CH) Consultant site. Date 3/1/90
Reviewed by D.L. McKinney Date 4-25-90
Lith. Class. Scheme Folk Procedure EO-1 Level

Drilling Contractor KEI
Driller Gene Ludin
Rig/Method PE-ECM / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 6" casing - 220.3'		1115	resume drilling
										1125	EPT departs site
										1130	stop activity
										1200	lunch.
										1230	resume drilling
225.0'	PID	<det	n/a	lith	2		SM	Sandy MUD (45% Sand 55% Mud) 1% vcs 1% cs		1255	to 225.0' - sample HT w/
	GM	<det				225.0'		3% ms 15% ms 25% vfs, 55% mud, well sorted,			dart valve bailer
								5% mafic 95% felsic, SA, H.d brn. (2.5Y 5/4 wet)			
								v. strong rx to 10% HCl, slightly consolidated - stiff			
								f sands are micaceous, some caliche fragments.			
230.0'	PID	<det	n/a	lith	2		MS	Muddy SAND (52% Sand 48% Mud) 10% ms 15% fs		1325	to 230.0' - sample HT w/
	GM	<det		250ml glass	2	230.0'		27% vfs, 48% mud, well bound sorted, 10% mafic			dart valve bailer - sample
				40ml vials	2			90% felsic, SA, H.d.brn (2.5Y 5/4 wet) v. strong			rx. CoC 030190
								rx to 10% HCl, unconsolidated - compact, f sands		1340	set 8" ⌀ w/d
								are micaceous, trace caliche fragments.		1435	resume drilling
								6" - 230.3' + 8.1' = 238.7'			
238.0'	PID	n/a	wet	lith	2		MSG	Muddy Sandy GRAVEL (35% Gravel 50% Sand 15%		1505	to 238.0' - sample HT w/
	GM	Hd						Mud) 5% up 10% cs 20% vcs, 5% vcs 5% cs 10% ms			dart valve bailer
								15% fs 15% vfs, 15% mud, v. poorly sorted, Granule			
								45% mafic 55% felsic, Sand 15% mafic 85% felsic			
								SA-SR, H d brn. (2.5Y 5/4 wet) mod rx to 10% HCl			

9413223.0707

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42 Location 200W 216-U-12	Date 3/1/90 Sheet No. 5 of 5 Project W317 216-U-12 Crib

Logged by R Miller (GAI) [illegible] Date 3/1/90 Reviewed by [illegible] Date [illegible] Lith. Class. Scheme Folk Procedure [illegible]	Drilling Contractor KEH Driller Gary Lydon Rig/Method [illegible] / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								235.0' sample cont. - unconsolidated compact		1515	stop
								to hard, f sands are incoherent, gravel is		1520	driller departs
								fragments			KFT departs
										1530	Geologist departs
								footage = 30'			
								8" casing added = 20.1' total 4" = 238.7'			
								H_2O added = 100 gallons.			

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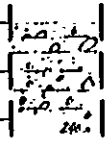
DAILY BOREHOLE LOG

Boring or Well Number 299-W[illegible]-42 Date [illegible] Sheet No. 1 of 2
Location 200W 216-U-12 Project WMT 216-U-12 Crib

Logged by R. Miller (GAI) Date 3/5/90
Reviewed by [illegible] Date 4-25-90
Lith. Class. Scheme Folk Procedure [illegible]

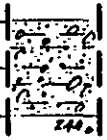
Drilling Contractor KFII
Driller Gary Lydin
Rig/Method BE 22VI / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 238.7'		0650	Driller arrives site
										0658	Geologist arrives site
											clear, 55°F, N-NW 0-3 mph
										0700	driller to move rig
								w/l 232.27' btc - 3.45' su = 228.32' b's		0715	take wl
								t.d. 234.5' btc - 3.45' su + 2.5' cor = 233.[illegible]		0720	take t/d tape [illegible]
								8" - 238.7' + 7.5' = 246.2'		0720	set 8" [illegible]
										0751	RFT - arrives site
										0810	begin to drill
										0[illegible]	begin to [illegible]
											switch to bottom water
											bailer
240.0'	Gw	Ldd	wet	bth	2		MSG	Muddy Sandy GRAVEL (45% Gravel 45% Sand 10% Mud)		0930	to 240.0' - sample HT w/
	Gw	Ldd		20ml class	2			5% mc 15% fc 25% vfc, 5% ms 10% cs 10% ms 10% fs 10% vfs			bottom water bailer, sample
	Fll	G		40ml sub glass	2			10% mud, v. poorly sorted, Gravel 35% mafic 65% felsic,			on CoC 03-07-90
								Sand 20% mafic 80% felsic, A-SR, lt. ol. brn.			
								(2.5Y 5/4 wet), none to slight rx to 10% HCL,			
								unconsolidated - compact to hard, f sand is		1100	start drilling - 242.0'
								micaceous, gravel is fragments.			casing hard to advance
								t.d. 242.3' btc - 2.25' su + 2.5' cor = 242.55' b's		1115	take t.d. tape [illegible]
										1117	RFT - departs site

9413223.0709

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-12	Date 3/2/90	Sheet No. 2 of 2
	Location 200W 216-U-12	Project W017 216-U-12 Crib	

Logged by R. Miller (GAI)	Date 3/2/90	Drilling Contractor LEH	
Reviewed by [illegible]	Date	Driller Gary Lydin	
Lith. Class. Scheme Folk	Procedure M-1, Rev 0	Rig/Method ECDR / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8"ø casing = 246.2'		1130	shut down - no PM
										1200	stop - lunch.
										1230	resume activity
										1245	RPT - arrives - resume
											drilling - 2nd drum
								t.d. 243.6' bk - 2.25' + 2.5' env. = 243.85' ±3		1310	take t.d. - tape # L3N-19
244.0'	PID	1ppl	wet	lith	2		N1SG	Muddy Sandy GRAVEL (45% Gravel 45% Sand		1315	to 244.0' - sample HT w/
	GAI							10% Mud) - similar to 240.0' sample.			bottom valve bailer
										1320	cut 8" - 0.8' off
								witnessed by: R. Miller (GAI)		1335	run straightness test
								8"ø casing total - 246.2' - 0.8' = 245.4' (SW 1.4')		1345	straightness OK'
										1350	begin to break rig
											down
								footage = 10'		1445	weld cap on well.
								8" casing added = 7.6'		1515	stop for day
								H_2O added = 5 gallons			
								8" casing removed = 0.8'			
								Drum #1 : 235-240'			
								Drum #2 = 240-244'			

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9413223.0710

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-42	Date 3/5/90	Sheet No. 1 of 1
	Location 200 West	Project W-017-216-112-Crib	

Logged by AW Ferson Alan Ferson Date 3/5/90
Reviewed by [illegible] Date 4-26-90
Lith. Class. Scheme Folk Procedure DO-1, Rev.0

Drilling Contractor KEH
Driller Gary Lydin
Rig/Method BE22W/ Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0700	Geologist on site
											Driller [illegible]
											meeting [illegible]
										0825	Driller on site
											Breaking [illegible]
								U-2112-90-002 3/1/90		0900	Labelled Drums
								Drill Cuttings 235'-245'			according to
								U-2112-90-003 3/2/90			WHC EII 4.2
								Drill Cuttings 112'-245'			Labels will be tape[illegible]
											on drums [illegible]
											(3/6/90)
										1150	Vern McGhan (CH2M)
											Responds to Not.
											Gamma Log 8"
											casing [illegible]
								logged interval 212.2'-100.0'		1310	Finished logging

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D BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W1-2	Date 4/16/90	Sheet No. 1 of 1
	Location 200 West 216-U-12	Project 200-UP-1 U-12	

Logged by S.M. Gonzales / [illegible] Date 4/16/90	Drilling Contractor KEH
Reviewed by [illegible] Date 4-25-90	Driller Thomas A Bertendorf
Measuring Equip. 6300-15 & Eng. tape Procedure DO-1, Rev. 0	Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	Carbon Steel	5"	246.2	1.7	245.4					
	"	"	252.2	6.6	245.4					Approx 6.0' Connection Piece
0830								243.2	2.2	D/Bottom = 243.2
0845	Johnson Div.	4"	0.30			Green Tagged by C. Hoover				Begin Setting Stainless Steel
	Stainless Steel					2/21/90; No PCP or P.O. #,				Casing & Screen, Driller's
	End Cap - Not Passivated					Item #14				Wearing Cotton Gloves.
0850	Johnson Div. Type	4"	10.00			Green tagged by C. Hoover				Casing & Screens are wrapped
	304 Channel Pack					2/23/90; No PCP or P.O. #				& sealed in plastic
	Screen - Not Passivated					.32 Blank section on top; 0.1'				
						Blank on Bottom				
0900	Placed Yellow Hold Tag on 3					1 Green Tagged by C. Hoover,				Standby; Rejected 2 10 slot
	Channel Pack Screens; 1					2/23/90, No PCP or P.O. #, Item #15				Channel Pack Screens which
	brought at 1015 w/ grease					1 Green Tagged w/ no signature,				were Green Tagged. Both
	Marks in shape of finger					P.O. #, or PCP #, Item #16				had black greasy material
	Prints (Item #6)									on screen wraps & between
										slots. (some look like finger prints)
0930										550 monitors borehole w/ PID,
										< Det
1100										Screen delivered & appears clean;
										Drillers unloading casing & mat-
										erial
1115	John Div Type 304	4"	10.00			Green tagged by C. Hoover, no				Setting Screen
	Channel Pack					PCP No or P.O. No. 2/23/90. Item #11				
	(Not Pass)									

Total Screen & End Cap: 20.31'

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-42	Date 4/19/90	Sheet No. 2 of [illegible]
	Location 200 West 216-U-12 Crib	Project U-Pond U-12	

Logged by S.M. Goodwin
Reviewed by [illegible]
Measuring Equip. L300-15 & Log Tape
Procedure [illegible]

Date 4/19/90
Date

Drilling Contractor YEH
Driller Thomas & Beverstorf
Rig/Equipment Crane & Jaws

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1125	Johnson Div. Type	4"	20.00	w/centralizers		Green tagged by R. Stevens 3/8/90				Setting "Packer"
	304 Sch. 5 Stainless Steel Casing					Per # CR9114, P.O. 42493	Rec. 15,	Item #1		
1135	"	"	20.02	w/o "		Green tagged by R. Stevens 3/29/90;				
						Per # CR9112 &	P.O. # 42493	Rec. 16,	Item #1	
1145	"	"	20.01	w/ "		Green tagged by R. Stevens 3/8/90;				
						Per # CR9114,	P.O. # 42493	Rec. 15,	Item #1	
1200-1230										Lunch
1240	"	"	19.98'	w/o "		Green tagged by R. Stevens 3/29/90,				Setting 4" Casing
						Per No. CR9112,	P.O. No. 42493	Rec. 16		
						Item #1				
1250	"	"	20.01'	w/ "		As Above; Item #2				
1300	"	"	20.00	w/o "		As Above, Item #1				
1305	"	"	20.00	w/ "		As Above; Item #2				
1310	"	"	19.99	w/o "		As Above; Item #1				
1315	"	"	20.00	w/ "		As Above, Item #2				
1320	"	"	19.99	w/o "		As Above; Item #1				
1325	"	"	20.00	w/ "		As Above; Item #2				
1330	"	"	5.0	w/o "		Green tagged by R. Stevens 3/9/90;				
	Total Casing	=	225.0'			Per # CR9114,	P.O. # 42493	Rec. 15,		
	w/scrapers	=	245.31'			Item #1.				
1335	"	"	3.0'	w/centralizers						Adding Construction Piece
1340	Total w/	=	248.31							SSO monitors site; < DET
	Const. Piece									w/ PID

+ Cap (0.41) - 248.72

D' BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 241-U12	Date 10/13/90	Sheet No. 3 of 3
	Location 200 WEST 216-U-12	Project U-12	

Logged by S.M. Gustavson
Reviewed by [illegible]
Measuring Equip. L300-15 & CUG. TAPE
Date 1/10/10
Date 4-25-90
Procedure PO-1 REV. 0

Drilling Contractor KEH
Driller THOMAS & BERTRIPSEF
Rig/Equipment CRANE & JAKES

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
1350	CARBON STEEL	9"	252.2	6.6	245.4			243.1	2.3	D/BOTTOM = 243.1
										BOTTOM OF 4" = 243.02'
1405	"	"	"	"	"	40 MESH CSSI	1/2 BAG			ADDING SAND; 150 LB. BAG.
						SILICA SAND		240.7	4.7	D/SAND = 240.7
1415	"	8"	"	8.15	243.75	"		241.15	2.6	D/SAND = 241.15
1425	"	"	"	"	"	"	1/2 BAG	238.65	5.1	D/SAND = 238.65
1430										PLACING THE SLAG CATCHER
1440	"	"	249.15	6.35	242.80	"		240.05	2.75	D/SAND = 240.05
1445	"	"	"	"	"	"	1/2 BAG	236.55	6.25	D/SAND = 236.55
1450	"	"	"	7.6	241.55	"		237.2	4.35	D/SAND = 237.2
1455	"	"	246.65	6.35	240.3	"		238.05	2.25	D/SAND = 238.05
1500	"	"	"	"	"	"	1/2 BAG	235.95	4.35	D/SAND = 235.95
1505	"	"	"	7.6	239.05	"		236.6	2.45	D/SAND = 236.6
1510	"	"	"	"	"	"	1/2 BAG	233.8	5.25	D/SAND = 233.8
1515	"	"	"	9.0	237.65	"		234.3	3.35	D/SAND = 234.3
1520										END OF SHIFT; CAN'T CUT CASING
										AFTER 1500

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9413223.0714

DRILL LOG	By: JP McDonald	Rig: None	Well Number: 299-W22-42	Computer Number: N/A	Project or Work Order No.: W-417
	Date: 4/18/90		Depth: Steam Cleaning		Subcontract No.: N/A

Total Casing	Depth	Drill Method	Wet/Dry Sample	LITHOLOGIC DESCRIPTION % Each Grain Size, Color, Roundness, Caliche, Etc.	Time	Drilling Comments
				Witnessed driller (Darrell Ludke) steam	0750	
				clean bailer inside and out. Unable to		
				determine water temperature - burner on steam		
				cleaner is not functioning and a portable		
				one was used. Bailer was then sealed in		
				plastic.		

REMARKS: [signature] 4/18/90

Reviewed by [signature] 4-25-90

D - Drive Barrel H - Hard Tool L - Large M - Medium S - Small VC - Very Coarse C - Coarse F - Fine VF - Very Fine ____ Standing Water

A 6000 021 (5 89)

800

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DR' ' BOREHOLE/WELL .PLETION LOG	Boring or Well Number 299-W2 42	Date 1/10/90	Sheet No. 1 of 2
	Location 200 WEST 216-U-12	Project 216-U-12	

Logged by S.H. Gardner / [illegible] Date 1/10/90
Reviewed by V.K. McElhaney Date 4-25-90
Measuring Equip. L300-15 & Eng. Tape Procedure DI-1, Rev. 0

Drilling Contractor KEH
Driller THOMAS & BETTGENDORF
Rig/Equipment CRANE & JACKS

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	CARBON STEEL	3"	241.05	6.4	237.65	40 MESH SAND		234.3	3.35	D/SAND = 234.3
0730	"	"	"	"	"	"	1 BAG	224.2	13.45	D/SAND = 224.2
0730	"	"	"	9.2	231.85	"		231.0	3.85	D/SAND = 231.0
0740	"	"	241.25	6.4	234.85	"	1 BAG	223.0	11.85	D/SAND = 223.0
0745	"	"	"	9.15	232.1	"		225.45	6.65	D/SAND = 225.45
0750	"	"	236.91	6.38	230.66	"		226.17	4.34	D/SAND = 226.17
0800	"	"	"	"	"	"	1 BAG	220.42	10.14	D/SAND = 220.42
0805	"	"	"	9.2	227.74	"		221.9	5.84	D/SAND = 221.9
0815	"	"	230.85	6.4	224.45	"		222.5	1.95	D/SAND = 222.5
0820	"	"	"	"	"	"	1/2 BAG	219.9	4.55	D/SAND = 219.9
0825	"	"	"	"	"	"	1/2 BAG	217.6	6.85	D/SAND = 217.6
0835	"	"	"	9.1	221.55	"		219.1	2.85	D/SAND = 219.1
0840	"	"	227.15	6.4	220.75	"		219.4	1.35	D/SAND = 219.4
0845										STANDBY: WAITING FOR TUBE PIC
										TO BAIL SAND PACK
1000										BAILING TO DEVELOP SAND PACK,
										BAILING WITH 55 GALLON DRUM
										# U-2412-90-027 BAILING W/
										3" DIA. DART BAILER, VOLUME
										= 5 GALLONS STEAM CLEANING OF
										BAILER WITNESSED BY J.P.
										McDONALD 1/10/90
1050										BAILED 50 GALLONS, MISP. SAND
										PACK THROUGH SCREEN IN 5 GAL.
										BUCKET. WILL CONTINUE IN DAY.

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-12 9413223 Date 04/19/90 Sheet No. 2 of 2
	Location 200 West 216-U-12 Crib Project U-017 U-12

Logged by S. M. Goodwin / [illegible] Date 4/19/90
Reviewed by D. E. McGhan Date 4-25-90
Measuring Equip. 1300-15 & Eng. tape Procedure WO-1 [illegible]

Drilling Contractor KCH
Driller [illegible]
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1100										Bailing into barrel U-2012-90 078.
1140										Finished bailing; bailed a
										total of 100 gallons w/
										tsp sand pack in 5 gallon
										bucket - very little fm.
1145	Carbon Steel	8"	227.15	6.4	220.75	4/8 mesh sand		220.6	0.15	D/sand = 220.6
										Bottom of 4" = 243.39'
1150										Driller's to lunch trailer
1245										Driller's returned
1255	"	"	"	"	"	"	1/3 bag			Adding sand
1300	"	"	"	"	"	"				D/sand = 220.3
1305	"	"	"	"	"	"	1/3 bag	219.7		D/sand = 219.7 Final D/sand
1310	"	"	"	"	"	1/2" Volclay	2 buckets	213.6	7.15	D/pellets = 213.6
1315	"	"	"	9.1	213.05	Tabs	(5 gal)	214.75	3.3	D/pellets = 214.75
1320	"	"	223.55	6.25	217.3	" "		215.25	2.05	D/pellets = 215.25 Final D/pellets
1330	"	"	"	"	"	8-20 crumbles	15 bags			Adding crumbles
1345	"	"	"	"	"	(50 lbs/bag)		169.75	47.55	D/crumbles = 169.75
1400	"	"	203.95	6.45	202.5	"		177.55	31.4	D/crumbles = 177.55
1405	"	"	"	"	"	"	7 bags	157.35	45.15	D/crumbles = 157.35
1420	"	"	189.7	6.5	183.3	"		166.2	17.1	D/crumbles = 166.2
1430	"	"	"	"	"	"	15 bags	122.3	61.0	D/crumbles = 122.3
1445	"	"	169.9	6.5	163.4	"		132.9	30.5	D/crumbles = 132.9
1450	"	"	"	"	"	"	5 bags	117.8	45.6	D/crumbles = 117.8
1505	"	"	150.8	6.4	144.4	"		126.8	17.6	D/crumbles = 126.8
1510										End of shift; can't cut after 1500

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D[illegible] OREHOLE/WELL COM[illegible]LETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. 1 of
	Location [illegible] Project [illegible]

Logged by [illegible] Date [illegible]	Drilling Contractor [illegible]
Reviewed by [illegible] Date 4-25-90	Driller [illegible]
Measuring Equip. [illegible] Procedure [illegible]	Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
7 30	Carbon Steel	8"	150.8	6.5	144.3					[illegible]
								126.7	17.6	D/B 121.[illegible] - 6.5 + 2.2
						8 20 mesh [illegible]	(3) 50 lb bag	113.7	33.6	" 115.0 - 6.5 + 2.2
	"	8"	131.8	6.4	125.4					[illegible] Cut
								108.9		D/B 12[illegible] - 6.4 + 2.2
										[illegible] 10" pipe
										[illegible]
										[illegible]
										[illegible]
9 [illegible]										[illegible]
										[illegible]
[illegible]										prepare to weld, weld
1 2[illegible]										tube test on site, [illegible]
										resume, continue welding
										on 10" dia. [illegible]
1 1[illegible]	Carbon Steel	10"	14[illegible].7	6.4	135.8					complete [illegible] replace
										welds over [illegible]
	"	10"	14[illegible].2	6.4	1[illegible]			109.7	10.9	D/B 109.1 - 6.4 + 2.2
						8 20 mesh [illegible]	(3) 50 lb bags	102.0	33.8	D/B 106.2 - 6.4 + 2.2
	"	10"	119.5	6.4	[illegible]	[illegible]				Pull to 117.5' weld
								1[illegible].1	3.0	D/B 11[illegible].3 - 6.6 + 2.2
11 35						"	(3) 50 lb bags	76.4	36.5	D/B 80.6 - 6.6 + 2.2
	"	10"								Pull to 109.7' weld
2 [illegible]										[illegible]

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-42 9413263 Date 1/18-20 Sheet No. 2 of 2
	Location 200 West 216-U-12 Crib Project 200-W UC

Logged by [illegible] Date 4-20-90
Reviewed by V.C. McClean Date 4-25-90
Measuring Equip. Steel Tape # CS00-05 Procedure [illegible]

Drilling Contractor KEH
Driller [illegible]
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1230										[illegible] work
	Cutting Steel	10"	102.7	6.5	102.2					Cut casing
								31.8	31.4	D/B 80.1 - 6.5 + 2.2
1300						8-20 mesh bentonite	(10) 50 lb bags	65.9	37.3	D/B 70.2 - 6.6 + 2.2
		10"	92.5	6.6	85.9	crumbles				Pull to 92.5' weld, cut
								71.6	14.3	D/B 76.0 - 6.6 + 2.2
						"	(15) 50 lb bags	48.7	37.2	D/B 53.1 - 6.6 + 2.2
1335		10"	72.6	7.1'	65.5					Pull to 72.6' weld, cut
1335								55.1	10.4	D/B 60.0 - 7.1 + 2.2
						"	(15) 50 lb bags	32	22.7	(estimate)
		10"	57.7	7.1	45.6					Pull to 32.7' weld, cut
								37.9	7.7	D/B 42.8 - 7.1 + 2.2
						"	(15) 50 lb bags	15.8	30.0	D/B 20.7 - 7.1 + 2.2
			34.3	6.7	27.6					Pull to 34.3' weld, cut
								21.2	6.4	D/B 25.7 - 6.7 + 2.2
						"	(2) 50 lb bags	18.8	8.8	D/B 23.3 - 6.7 + 2.2
										Pull 7.3' cut
			27.0	6.4	20.3			18.8	1.5	D/B 23.0 - 6.4 + 2.2 FINAL D/B CALCULATIONS
										Ready to pour grout Monday
1510										Geologist offsite

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DAT BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22	Date 4/29/90	Sheet No. 1 of
	Location 200 West 216-U-12 Crib	Project U-012	

Logged by S M Gunderson	Date 4/27/90	Drilling Contractor KEH	
Reviewed by D.E. McGhee	Date 4-25-90	Driller Thomas A Rothenberg	
Measuring Equip. L300-05 & G46-1004	Procedure DI-1, DE-1.0	Rig/Equipment Crane & Jack	

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	Carbon Steel	10"	27.0	6.4	20.6	8-20 Gravel		18.8	1.8	Standby; waiting for water truck
0730										Water truck arrived; pumping to mix grout.
0910	Carbon Steel	10"	27.0	6.4	20.6	Cement Grout*	9 sacks	+3.6	24.2	Pouring cement grout
0920	"	"	"	"	"	"		"	"	Pulling 10"
0925	"	"	17.3	6.6	10.7	"		0.2	10.5	D/cement grout = 0.2
0930	"	"	"	"	"	"	3 sacks	+5.0	15.7	Adding grout
0935	"	"	"	"	"	"		"	"	Pulling 10"; removed 10" casing & drive shoe
0940	—	—	—	—	—	"		2.5	Ø	D/cement grout = 2.5' FINAL D/GROUT
1020										D/B inside 4" = 243.33' BLS
1030	Stainless Steel	4"		1.92'						D/W inside 4" = 226.99' BLS

* Cement Grout = 12 94 lb. sacks of Portland Type I + II Cement, ~48 oz. Aluminum Powder & 60 gallons of Potable Water. } Total Mix for Grout Plug

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] 9415223.0720 Date [illegible] Sheet No. 1 of 1 Location [illegible] Project [illegible]

Logged by [illegible] Date 5/1/90 Reviewed by [illegible] Date 5-7-90 Measuring Equip. _____ Procedure [illegible]	Drilling Contractor [illegible] Driller [illegible] Rig/Equipment _____

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1310										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
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										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]
										[illegible]

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CENTRAL PRE-MIX CONCRETE CO.

WHC-MR-0208

INSPECTORS COPY

11919 HARRIS ROAD • PASCO, WA 99301

WA REG #223 01-CE-NT-RP-M371J6

ID REG #5694-AAA-1-3-3 MT REG #3461A

UNLOADING
e t. 1 time 7½ minutes per cubic yard
concr. harge thereafter at posted truck
rates. This concrete designed in accordance
specifications indicated below.
make deliveries inside the curb line at cus-
er's risk only and accept no responsibility
atsoever for damages resulting from such
ivenes.

CONCRETE
SAND & GRAVEL

545-8405

CRUSHED ROCK
FILL

CAUTION: May cause eye or skin injury. Contains Portland cement. Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible, and wash exposed skin areas promptly with water. If any cement or cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. All claims for damages or shortages must be made within 24 hours of delivery.

LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	ARRIVE PLANT
11:46	12:20	12:37	:	:

☐ TEST CYLINDERS TAKEN
ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE ITS STRENGTH.

X Thank You
SIGNATURE

ESTIMATED SLUMP AT UNLOADING _____
ADDED ____ GAL. WATER AT CUSTOMER REQUEST.

ORDER NO.	CUSTOMER NO.	CPM PROJECT NO.	CUSTOMER PO/JOB NO.	TICKET NO.		DRIVER	
005511	40603	0 601002	B-2012/REL#28	08917	00008254	DICK	1

CUSTOMER: FRAISER
DELIVERY ADDRESS: 200 WEST.. HANFORD
DATE: 01-May-90

DELIVERY INSTRUCTIONS
MAP
TIME DUE: 12:30

LOAD QTY.	DELIVERED QTY.	ORDER QTY.	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
5.00	5.00	5.00	0304H	5000 7SK 3/4 5%		

WC RATIO ALLOWED .45
TOTAL WATER ALLOWED 1246
MOISTURE'S
3/4 % 9520 9425 95
SAND 3 % 6360 6174 186
SUB TOTAL
WATER BATCHED 905
TOTAL AVAILABLE 7 GAL. 60

LOAD SIZE	MIX NO.	MIX DESCRIPTION	SLUMP	AIR	CC	USE	TRUCK	PLANT	SUBTOTAL / TAX / TOTAL DUE
5.00	0304H	5000 7SK 3/4 5%	4.00	100	0.00		956	1	

Truck no.: 956 Batch size: 5.00 Yds. Mix name: 0304H
5000# 7.0 SK. 3/4 AGG. Time 11:39:11 AM Date 1 May, 1990

		Zero					Zero		
3/4 RND	1.0	9494	9520	Lbs C	LAF2-1-2	3290	3280	Lbs C	
ASTM.SAN	3.0	15916	15920	Lbs C					
			Zero				Zero		
			Zero				Zero		
AEA-2	100	55	56	Oz C	WATER 1	906	905	Lbs C	
PLAST-3		195	194	Oz C					
			Zero				Zero		

Water trim: -10.0 / Yd. Time 11:42:37 AM

956

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WELL CHECK LIST

Well Number: 299-W22-42 Location: W13

Date: 5-15-90

	Yes	No
Hasp on protective casing	X	
Lock	X	
Proper cap fit	X	
Well ID number on brass cap	X	
Protective post painted	X	
Well ID number stenciled on post		X
Well ID number stenciled on protective casing		X
Survey mark on casing		?
Stock tank		X
Site neat		X

Comments: Some materials still at site
misc. pieces of wood & metal scrap around

Signature: D W Glover Date: 5-15-90

9413225.0722

9413223.0723

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-A3	Date 2/22/90	Sheet No. 1 of 1
	Location 200W 216-U-12	Project W017 216-U12 Crib	

Logged by R. Miller	Date 2/22/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date	Driller Darrell Ludke	
Lith. Class. Scheme Folk	Procedure OO-1, Rev 0	Rig/Method BE-22W-22-5211 / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										1105	rig arrives from
											210E, begin set-up
										1200	lunch
										1230	resume set-up
										1400	set-up compl. need
											tools & casing

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9413223.0724

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-13	Date 2/23/90	Sheet No. 1 of 3
	Location 200W 216-U-12	Project W017 216-U-12 Crib	

Logged by AW Pearson Alan Pearson Date 2/23/90
Reviewed by Date
Lith. Class. Scheme Folk Procedure DO-1, Rev 0

Drilling Contractor KEH
Driller Daryl Ludke
Rig/Method BE 22W, 22-5211 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0800	Geologist on site
										0825	Driller arrives
											continues setting
											up rig
										0830	Did not witness
											steam cleaning of
											rig, but it appears
											visually clean-
											free of mud &
											grease.
										0900	Driller rigging up
											tools
										1130	Log turned over to
											Cory Condit
										1200	DRILLER BREAKS FOR
											LUNCH
										1230	VISUALLY INSPECTED
											10" C.S. CASING. REJECTED
											ONE PIECE DUE TO CE-
											MENT EXPOSED ON IN-
											SIDE AND OUTSIDE

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9413223.0725

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43 Location 200 WEST	Date 2/23/90 Sheet No. 2 of 3 Project W017-216-012
Logged by C.D. CONDIT, (GAI) Reviewed by [illegible] Lith. Class. Scheme FOLK	Date 2/23/90 Date 4/25/90 Procedure DO-1 REV. 4	Drilling Contractor KEH Driller DARREL LUDTKE Rig/Method RE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										1245	CONFIRMED WITH DRILL-
											ER THAT LUBRICANT USED
											FOR TOOLS WAS CRISCO.
										1300	RIG ON SITE
										1310	DRILLING WITH CORE
											BARREL BEGINS
5'	GM	DET	D	LITH	2	0' 5'	(m) S	SLIGHTLY MUDDY SAND (85% SAND, 12% MUD)		1320	SAMPLE - C.B
				MOIST	1			1% VCS, 2% CS, 5% MS, 50% FS, 30% VFS,		1325	DRILLING RESUMES
								12% MUD. WELL TO VERY WELL SORTED, SAND:		1330	NOTED OUTSIDE DIAME-
								20% BASALTIC/MAFIC, 65% QUARTZ, 14% FELSIC,			TER OF 10" C.S. SHOE
								1% FE/CU SULFIDES. SA-SR. COLOR: 2.5Y 4/4 OLIVE			= 11 3/4" = .94'
								BROWN. STRONG RXN TO 10% HCL. UNCONSOL.			
~9'	SIDIOOO PID	DET				5'				1410	650 MGN BOREHOLE
10'	GM	DET	D	LITH	2	10'	SS	GRAVELLY SAND (10% GRAVEL, 85% SAND,		1425	SAMPLE - C.B.
				MOIST	1			5% MUD) 3% MP, 4% FP, 3% VFP, 10% VCS, 35%			
								CS, 30% MS, 10% FS, 5% MUD; MODERATELY SORTED.		1430	DRILLING RESUMES
								GRAVEL: 75% BASALTIC/MAFIC, 25% QUARTZITE,			
								SR-R. SAND: 70% BASALTIC/MAFIC, 20%			
								QUARTZ, 10% FELSIC, SA-SR, NO RXN TO			
								10% HCL, UNCONSOLIDATED, COLOR: 2.5Y 4/4			
								OLIVE BROWN.			

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9413223.0726

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/23/90	Sheet No. 3 of 3
	Location 200 WEST	Project W017-216-012	

Logged by C.D. CONDIT, (GAI) Date 2/23/90
Reviewed by [illegible] Date [illegible]
Lith. Class. Scheme FOLK Procedure DO-1 (REV. 0)

Drilling Contractor KEH
Driller DANNEL LUDTKE
Rig/Method BE 22US / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
15'	GM	DET	D	LITH	2	10'	S	SAND (95% SAND, 5% MUD) 2% VCS, 5% CG,		1440	SAMPLE: C.B.
				MOIST	1			30% MS, 50% FS, 8% VFS, 5% MUD, MODERATE			
						15'		TO WELL SORTED. SAND: 45% BASALTIC / MAFIC,		1440	DRILLING STOPS, PRE-
								40% QUARTZ, 14% FELSIC, 1% FE/CU SULFIDES,			PARING TO ADD 10"
								SA-SR, COLOR: 5Y4/3 OLIVE, SLIGHT RXN TO 10%			C.S. CASING.
								HCL, UNCONSOLIDATED.		1445	RPT DEPARTS SITE
										1505	DRILLER DEPARTS
											SITE
										1510	GEOLOGIST OFF SITE

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9413223.0727

DAILY BOREHOLE LOG	Boring or Well Number ASA-W22-43	Date 2/26/90	Sheet No. 1 of 3
	Location 800 WEST	Project W017-216-012	

Logged by C.D. CONDIT (GAI) Date 2/26/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure DO-1 | REV. 0

Drilling Contractor KEH
Driller DARREL LUDTKE
Rig/Method DE22W/ CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0700	GEOLOGIST ON SITE
											RIG IS WARMING UP
~11'	GIPLOCD PID	DET								0746	650 MON. BOREHOLE
								10.7' + 2.4' - 2.3' = 10.8' TAPE #L3DD-08		0750	DEPTH TO BOTTOM
15'	6M	DET								0810	HDT ON SITE, SURVEYED
											TOOLS AND DRILLS
										0815	PREPARING TO ADD
											10" C.S. CASING
								13.6' + 9.9' = 23.5'		0930	10" C.S. CASING ADDED
										0935	DRILLING WITH CORE
						15'					BARREL BEGINS
20'	6M	DET	5M	LITH	2		S	SAND (90% SAND, 10% MUD) 60% FS, 30% VFS,		1030	SAMPLE - C.B.
				CHEM	2	20'		10% MUD, WELL TO VERY WELL SORTED, SAND:			
				VOA	2			35% BASALTIC/MAFIC, 50% QUARTZ, 12% FELDIC,			
				MOIST	1			2% RED SANDSTONE, 1% FE/CU SULFIDES, SA-SR,			
								COLOR: 5Y3/2 DARK OLIVE GRAY, SLIGHT RXN TO			
								10% HCL, UNCONSOLIDATED, CHAIN OF CUSTODY		1035	DRILLING RESUMED
								#0226910-W22-43			
						20'					
25'	6M	DET	5M	LITH	2		S	SAND (90% SAND, 10% MUD) SIMILAR TO		1055	SAMPLE - C.B.
				MOIST	1	25'		20' SAMPLE.			

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9413223.0728

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/26/90	Sheet No. 2 of 3
	Location 200 WEST	Project WD17-216-012	

Logged by C.D. CONDIT (GAI) Date 2/26/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure DO-1 / REV. Ø

Drilling Contractor KEH
Driller DARREL LUDTKE
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										1100	DRILLING STOPS. PRE-
											PARING TO ADD 10" C.S.
											CASING. HPT OFF SITE
										1200	WELDING STOPS. DRILLER
											BREAKS FOR LUNCH
										1230	DRILLER CONTINUES TO
											PREPARE 10" C.S. CASING
								23.5' + 10.2' = 33.7'		1245	10" C.S. CASING ADDED
										1250	HPT ON SITE, DRILL-
											ING RESUMED
	SIP1000 PID	DET								1330	660 MON. DRILL SITE
										1340	DRILLING STOPS. CORE
											BARREL HAS BROKEN OFF
											AT JARS CONNECTION AND
											IS DOWNHOLE. DRILLER
											IS PREPARING ANOTHER
											CORE BARREL TO "FISH"
											THE FIRST ONE OUT.
										1400	DRILLER CUTTING OFF
								33.7' - 3.5' = 30.2'			3.5' OF 10" C.S.
											CASING

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9413223.0729

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43 Location 200 WEST	Date 2/26/90 Sheet No. 3 of 3 Project W017-216-012

Logged by C.D. CONDIT (GAI) Date 2/26/90
Reviewed by Date
Lith. Class. Scheme FOLK Procedure DO-1 / REV. 0

Drilling Contractor KEH
Driller DARREL LUDTKE
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										1440	CORE BARREL HAS
											BEEN REMOVED FROM
											BOREHOLE
										1450	RESUME DRILLING WITH
						25'					NEW CORE BARREL
30'	GM	DET	D	LITH	2		S	SAND (1% GRAVEL, 97% SAND, 2% MUD) - 5%		1500	SAMPLE - C.B.
				MOIST	1	30'		MP, 15% FP, 10% UCS, 70% CS, 15% MS, 2% FS,			
								2% MUD. WELL TO VERY WELL SORTED. GRAVEL:		1520	DRILLER SHUTTING
								80% BASALTIC/MAFIC, 10% QUARTZITE, 10% FELSIC.			DOWN FOR DAY
								SR-R. SAND: 45% BASALTIC/MAFIC, 45% QUARTZ,			
								10% FELSIC, SA-SR. COLOR: 5Y 2.5/2 BLACK.		1530	GEOLOGIST OFF SITE
								NO RXN TO 10% HCL. UNCONSOLIDATED			
								TOTAL FT. DRILLED FOR THE DAY: 15' TO 30' = 15 FT			
								10" C.S. CASING ADDED TODAY = 16.2' TOT = 30.2'			
								GAL. H2O ADDED TO HOLE = 0			

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9413223.0730

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/27/90	Sheet No. 1 of 4
	Location 200 WEST	Project WO17-216-412	

Logged by C.D. CONDIT (GNE) Date 2/27/90
Reviewed by [illegible] Date 4-25-90
Lith. Class. Scheme FOLK Procedure DO-1 / REV. 0

Drilling Contractor KEH
Driller DARREL LUDTKE
Rig/Method DE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	GEOLOGIST ON SITE, RIG
											IS WARMING UP.
								DEPTH TO BOTTOM: 31.4' + 2.4' - 2.6' = 31.2'		0710	DEPTH TO BOTTOM
								TAPE #L300-08		0715	DRILLER PREPARING TO
											ADD 10" C.S. CASING
										0815	HPT ON SITE.
								30.2' + 9.5' = 39.7'			10" C.S. CASING ADDED
										0820	DRILLING WITH CORE
											BARREL BEGINS
32'	SIP1000, PID	DET				30'				0825	150 MON DRILL SITE
35'	GM	DET	D	LITH	2		S	SAND (1% GRAVEL, 96% SAND, 3% MUD) · 5% FD,		0845	SAMPLE - C.B.
				MOIST	1	35'		5% VFD, 5% VCS, 40% CG, 40% MS, 8% FS, 3%			
								VFS, 3% MUD. WELL TO VERY WELL SORTED.		0850	DRILLING RESUMES
								GRAVEL: 75% BASALTIC/MAFIC, 25% QUARTZITE, SR-R,			
								SAND: 45% BASALTIC/MAFIC, 45% QUARTZ, 10%			
								FELSIC, SA-SR, COLOR 5Y3/2 DARK OLIVE GRAY,			
								SLIGHT RXN TO 10% HCL. UNCONSOLIDATED			
40'	SIP1000, PID	DET	SM	LITH	2	35'	(S) S				
	GM	DET		CHEM	2			SLIGHTLY GRAVELLY SAND (5% GRAVEL, 92% SAND		0910	SAMPLE - C.B.
				VOA	2	40'		3% MUD) 1% MP, 2% FP, 2% VFP, 5% VCS, 10%			
				MOIST	1			CG, 35% MS, 35% FS, 7% VFS, 3% MUD			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/27/90	Sheet No. 2 of 4
	Location 200 WEST	Project W017-216-412	

Logged by C.D. CONDIT (GAI) Date 2/27/90
Reviewed by [illegible] Date 4-25-90
Lith. Class. Scheme FOLK Procedure DO-1 / REV. 0

Drilling Contractor KEH
Driller DARREL LUDTKE
Rig/Method BE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
40'								(40 FT. SAMPLE DEPT. CONT.) WELL SORTED,		0915	DRILLING RESUMES
								GRAVEL: 45% BASALTIC/MAFIC, 45% QUARTZITE,			
								10% FELSIC, SA-SR, SAND: 40% BASALTIC/MAFIC			
								50% QUARTZ, 10% FELSIC, SA-SR, COLOR:			
								5Y4/3 OLIVE, SLIGHT RXN TO 10% HCL, SLIGHT			
								CONSOLIDATION, NOTED PRESENCE OF WEAKLY			
								CEMENTED SAND RETAINED ON SIEVE THAT			
								HAD MODERATE RXN TO 10% HCL. CHAIN OF			
								CUSTODY #022790-W22-43			
						40'					
45'	SIPHOON PID	DET	D	LITH	2	45'	GS	GRAVELLY SAND (28% GRAVEL, 72% SAND, 3%		0950	SAMPLE-C.B.
	6M	DET		MOIST	1			MUD) 5% MP, 12% FP, 8% VFP, 10% VCD, 32% CD,			DRILLING STOPS. PRE-
								20% MD, 5% FS, 3% MUD, MODERATE TO POORLY			PARING TO ADD 10"
								SORTED, GRAVEL: 45% BASALTIC/MAFIC, 45%			C.S. CASING.
								QUARTZITE, 10% FELSIC, SA-R. SAND: 40% BA-			
								SALTIC/MAFIC, 50% QUARTZ, 10% FELSIC, SA-SR.			
								COLOR: 5Y4/3 OLIVE, SLIGHT RXN TO 10%			
								HCL. UNCONSOLIDATED			
								39.7' + 10.3' = 50.0'		1050	10" C.S. CASING ADDED
										1055	DRILLING RESUMES

9413223.0732

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/27/90	Sheet No. 3 of 4
	Location 200 WEST	Project WO17-216-412	

Logged by C.D. CONDIT (GAI) Date 2/27/90
Reviewed by [illegible] Date 4-26-90
Lith. Class. Scheme FOLK Procedure DO-1 REV. 0

Drilling Contractor KEH
Driller DARREL LUDTKE
Rig/Method BE 22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										1120	RPT DEPARTS SITE.
											DRILLING STOPS.
										1200	DRILLER BREAKS FOR
											LUNCH.
										1245	RPT ON SITE. DRILLING
						45'					RESUMES
50'	DM SIP 1000	DET	D	LITH	2	(B)	S	SLIGHTLY GRAVELLY SAND (5% GRAVEL, 93% SAND, 2%		1250	SAMPLE - C.D.
	PID	DET		MOIST	1	50'		MUD) 1% CP, 1% MP, 2% FP, 1% VFP, 25% UCS, 45%		1255	DRILLING RESUMES
								CS, 20% MS, 3% FS, 2% MUD, MODERATE TO WELL		1305	DRILLING STOPS. PREPAR-
								SORTED. GRAVEL: 60% BASALTIC/MAFIC, 30%			ING TO ADD 10" C.S.
								QUARTZITE, 10% FELSIC, SR-R. SAND: 45%			CASING.
								BASALTIC/MAFIC, 45% QUARTZ, 10% FELSIC, SA-SR.			
								COLOR: 5Y5/3 OLIVE. SLIGHT RXN TO 10% HCL			
								UNCONSOLIDATED.			
								50.0' + 10.1' = 60.1'		1400	10" C.S. CASING ADDED
						50'				1405	DRILLING RESUMES
55'	GM	DET	SM	LITH	2		S	SAND (1% GRAVEL, 96% SAND, 3% MUD). 5% FP,		1425	SAMPLE - C.D.
				MOIST	1	55'		.5% VFP, 5% UCS, 25% CCS, 50% MS, 10% FS, 6%			
								VFS, 3% MUD, MODERATE TO WELL SORTED. GRAVEL:		1430	DRILLING RESUMES
								60% BASALTIC/MAFIC, 30% QUARTZITE, 10% FELSIC			

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9413223.0733

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/27/90	Sheet No. 4 of 4
	Location 200 WEST	Project W017-216-412	

Logged by C.D. CONDIT (GAI) Date 2/27/90
Reviewed by T.E. McCutchen Date 4-24-90
Lith. Class. Scheme FOLK Procedure DO-1/REV. Ø

Drilling Contractor KEH
Driller DARREL LUDIKE
Rig/Method BE 22W/ CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
55'								(55 FT. SAMPLE DESCR. CONT.) SA-SR. SAND:			
58'	GAP1000 PID	DET						35% BASALTIC/MAFIC, 55% QUARTZ, 10% FELSIC.		1440	6512 MON DRILL SITE
								SA-SR, COLOR: 5Y4/3 OLIVE, SLIGHT RXN TO			
								10% HCL. UNCONSOLIDATED.			
						55'					
60'	GM	DET	D	LITH	2		S	SAND (1% GRAVEL, 96% SAND, 3% MUD)		1445	SAMPLE-C.B.
				CHEM	2	60'		SAMPLE DESCRIPTION SIMILAR TO 55' SAMPLE		1450	DRILLING RESUMES
				VOA	2			DESCRIPTION. CHAIN OF CUSTODY #022790-			
				MOIST	1			W22-43.		1500	DRILLING STOPD. PRE-
											PARING TO ADD 10"
											C.S. CASING
											RPT DEPARTS SITE
								TOTAL FT. DRILLED FOR DAY = 30' TO 60' = 30 FT		1520	DRILLER SHUTTING
								10" C.S. CASING ADDED TODAY = 29.9' TOT = 60.1'			DOWN FOR DAY
								GALL. H2O ADDED DOWNHOLE = Ø		1525	GEOLOGIST OFF SITE

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9413223.0734

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 2/28/90	Sheet No. 1 of 3
	Location 200 WEST	Project W017-216-012	

Logged by AW, Pearson, Alan Pearson — Date 2/28/90
Reviewed by [illegible] — Date 4-26-90
Lith. Class. Scheme FOLK — Procedure DO-1 / REV. 0

Drilling Contractor KEM
Driller GARY LUETKE
Rig/Method BE 22 W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0700	Geologist arrives
								Unable to get P/B ⇒ Driller welding			at site - Driller is
								60.1' + 8.5' = 68.6' Total 10" Carbon Steel Casing			welding 10" casing
										0815	RPT arrives - Begin
											Drilling - CB
65'	PID	<Det	SM	Lith	2		S	SAND: 1% Gravel, 97% Sand, 2% Mud		0820	Take Sample w/CB
	GM	<Det		Moist	1			tr. FP, 1% VFP, 7% VCS, 20% CS, 30% MS, 25% FS, 15% VFS, 2% Mud			
								Moderately Sorted:			
								Gravel, 70% Basalt, 30% Granitic, tr. Muscovite; SA			
								Sand: 25% Mafic, 20% Qtz., 50% Felsic, 5% Micas; SA			
								Wet Color olive 5Y5/3: Slight reaction w/			
								10% HCL, Unconsolidated			
										0825	Resume Drilling - CB
70'	GM	<Det	D	Lith	2		S	SAND: tr. Gravel, 95% Sand, 5% Mud.		0910	Take Sample w/CB
	PID	<Det		Moist	1			tr. VFP, 5% VCS, 10% CS, 30% MS, 25% FS, 25% VFS, 5% Mud			
								Well - Moderately Sorted			
								Gravel, 70% Basalt, 30% Granitic; SA-SR			
								Sand; 35% Mafic, 20% Qtz., 40% Felsic, 5% Micas; SA			
								Wet Color olive 5Y5/3, Moderate Reaction w/			
								10% HCL, Unconsolidated; Noted tr/tr. lense			
								of slightly cemented ($CaCO_3$) sand.			

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9413223.0735

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-40 Location 200 WEST	Date 2/28/90 Sheet No. 2 of 3 Project W017-216-U12

Logged by AW Pearson Alan Pearson Date 2/28/90
Reviewed by [illegible] Date
Lith. Class. Scheme FOLK Procedure 60-1/REV. 0

Drilling Contractor KEH
Driller GARY LUDTKE
Rig/Method BE22W/CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
										0915	Resume Drilling-CB
								68.6' + 10.1' = 78.7' Total 10" Carbon Steel Casing		0920	Weld 10" Casing
~73	GM	<Det								1020	Resume Drilling-CB
75'	PID	<Det	D	Lith	2		S	SAND: 4% Gravel, 94% Sand, 2% Mud		1050	Take Sample w/CB
	GM	<Det		Moist	1			1% MP, 1% FP, 2% VFP, 14% VCS, 30% CS, 20% MS, 15% FS, 15% VFS, 2% Mud			
								Moderately Sorted:			
								Gravel: 75% Basalt, 10% Qtz., Granitic 15% SA			
								Sand: 40% Mafic, 15% Qtz, 43% Felsic, 2% Micas SA			
								Wet Color olive 5Y5/3, Moderate Reaction			
								w/10% HCl, Unconsolidated, Noted increase in			
								grain size		1055	Resume Drilling-CB
80'	PID	<Det	SM	Lith	2		S	SAND: 4% Gravel, 90% Sand, 6% Mud		1110	Take Special Sample
	GM	<Det		Moist	1			1% MP, 1% FP, 2% VFP, 5% VCS, 15% CS, 30% MS, 20% FS, 20% VFS, 6% Mud			w/ Core Barrel
				VOA	2			Moderately Sorted:			Core#
				Chem	2			Gravel: 75% Basalt, 5% Qtz, 20% Granitic, SA			022890412W2243
								Sand 35% Mafic, 15% Qtz, 45% Felsic, 5% Micas SA			
								Wet Color olive 5Y5/3; Weak reaction			
								w/10% HCl, Unconsolidated, Noted increase			
								in % Mud			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43 Location 200 WEST	Date 2/28/90 Sheet No. 3 of 3 Project W017-215-012

Logged by AW Pearson, Alan Pearson Date 2/28/90
Reviewed by [illegible] Date 4-26-90
Lith. Class. Scheme FOLK Procedure DO-1 REV. 0

Drilling Contractor KEH
Driller GARY LUDTKE
Rig/Method DE22W / CABLE TOOL

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								78.7' + 10.1 = 88.8' Total 10" Carbon Steel Casing		1130	Welding 10" Casing
										1200	Break for Lunch
										1230	Drillers in meeting
										1250	Cleaning site - all temporary casing is off the ground.
										1330	Resume Welding
										1420	Begin Drilling-CB
85'	PID	<Det	D	Lith	2		S	SAND: 3% Gravel, 95% Sand, 2% Mud		1445	Take Sample w/CB
	GM	<Det		(Moist)				1%VP, 2%VFP, 5%VCS, 15%CS, 25%MS, 30%FS, 20%VFS, 2%Mud			
								Moderately Sorted.			
								Gravel 75% Basalt, 5% Qtz, 20% Granitic SA			
								Sand, 35% Mafic, 20% Qtz, 40% Felsic, 5% Mica SA			
								Wet Color olive 5Y5/3, Weak reaction w/ 10% HCL: Unconsolidated			
	PID	<Det								1450	Resume Drilling-CB
								Footage = ~62.0' - 90.0' = 28.0'		1515	Drill unable to pull 90' sample ⇒ RAT left site
								Total 10" Casing added Today = 28.7'			
								No H_2O Added Today		1520	Quit for Day

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9413223.0757

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/1/90	Sheet No. 1 of 3
	Location 200 West	Project W-017-216-412-Crib	

Logged by AW Pearson Alan Pearson Date 3/1/90
Reviewed by [illegible] Date 4-20-90
Lith. Class. Scheme Folk Procedure DO-1 Rev. 0

Drilling Contractor KEH
Driller Darrel Luttke
Rig/Method RE22 w/ Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	Geologist arrives Driller waiting for RAT
90'	PID	<Det	D	Lith	2		S	SAND: 1% Gravel, 95% Sand, 4% Mud		0810	Take Sample w/ Drive Barrel
	GM	<Det		Moist	1			tr. FP, 1% VFP, 5% VCS, 10% CS, 20% MS, 30% FS, 30% VFS, 4% Mud			
								Well-Moderately Sorted:			
								Gravel: 60% Basalt, 5% Qtz, 35% Granitic A-SA			
								Sand: 35% Mafic, 20% Qtz, 40% Felsic, 5% Mica SA			
								Wet Color olive 5Y 5/3: Weak Reaction w/ 10% HCL: Unconsolidated.			
								88.5' - 2.1' + 2.5' = 88.9' D/B from ground surface		0815	Take D/B w/ L300-08
								10" Casing @ 88.8'			
										0820	Begin Drilling - CB
								88.8' + 9.2' = 98.0' Total 10" Carbon Steel Casing		0825	Welding 10" Casing
										0950	Resume Drilling - CB
95'	PID	<Det	SM	Lith	2		S	SAND: 4% Gravel, 90% Sand, 6% Mud		1010	Take Sample w/ CB
	6M	<Det		Moist	1			1% FP, 3% VFP, 4% VCS, 6% CS, 10% MS, 30% FS, 40% VFS, 6% Mud			
								Well-Moderately Sorted:			
								Gravel 50% Basalt, 10% Qtz, 40% Felsic A-SA			
								Sand: 30% Mafic, 20% Qtz, 45% Felsic 5% Mica SA			

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/1/90	Sheet No. 2 of 3
	Location 200 West	Project W-017-216-412-Coih	

Logged by AW Pearson Alan Pearson Date 3/1/90
Reviewed by [illegible] Date 4-26-90
Lith. Class. Scheme Folk Procedure DO-1, Rev. 0

Drilling Contractor KEH
Driller Darrel Ludtke
Rig/Method RE22W/ Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
95'	cont.							95' Sample cont: Wet Color light olive brown 2.5Y 5/4			
								Weak reaction to 10% HCL: Unconsolidated			
								Sand is predominately finer grained		1015	Resume Drilling-CB
100'	PID	<Det	SM	Lith	2		(M)S	SLIGHTLY MUDDY SAND: tr Gravel, 88% Sand, 12% Mud		1020	Take Special
	GM	<Det		Moist	1			tr VFP, 1% VCS, 3% CS, 14% MS, 30% FS, 40% VFS, 12% Mud			Sample w/ Core Barrel
				VOA	2			Well-Moderately Sorted:			COC#
				Chem	2			Gravel 50% Basalt, 10% Qtz., 40% Granitic A-SA			030190W12W2243
								Sand 30% Mafic, 20% Qtz, 45% Felsic, 5% Mica SA			
								Wet Color light olive brown 2.5Y 5/4, Moderate reaction			
								w/ 10% HCL, Unconsolidated; Very similar			
								to 95' sample except increase % Mud.			
										1040	Resume Drilling-CB
								98.0' + 8.3' = 106.3' Total 10" Carbon Steel Casing		1100	Welding 10" Casing
										1200	Lunch
										1240	Resume Welding
										1310	Resume Drilling-CB
105'	PID	<Det	SM	Lith	2		(M)S	SLIGHTLY MUDDY SAND: 1% Gravel, 84% Sand, 15% Mud		1340	Take Sample w/CB
	GM	<Det		Moist	1			1% VFP, 4% VCS, 10% CS, 15% MS, 25% FS, 30% VFS, 15% Mud			
								Moderately Sorted:			
								Gravel: 60% Basalt, 10% Qtz, 30% Granitic SA			
								Sand: 30% Mafic, 15% Qtz, 50% Felsic, 5% Mica SA			

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9413223.0739

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/1/90	Sheet No. 3 of 3
	Location 200 West	Project W-017-216-112-Crib	

Logged by AW Pearson Alan Pearson Date 3/1/90
Reviewed by [illegible] Date 4-26-90
Lith. Class. Scheme Folk Procedure DO-1, Rev.0

Drilling Contractor KEH
Driller Daniel Ludtke
Rig/Method BE22W / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
105'	cont.							105' Sample cont: Wet Color light olive brown 2.5Y5/4: Moderate reaction w/10% HCL: Unconsolidated: % Mud is increasing predominately in very thin lenses.			
										1345	Resume Drilling
110'	PID	<Det	SM	Lith	2		(M)S	SLIGHTLY MUDDY SAND: 88% Sand, 12% Mud tr.VCS, 1% CS, 7% MS, 30% FS, 60% VFS, 12% Mud Well Sorted: Sand 25% Mafic, 10% Qtz, 55% Felsic, 10% Mica, SA-SR Wet color light olive brown 2.5Y5/4: Moderate reaction w/10% HCL: Unconsolidated: % Mud decreasing but sand becoming finer grained & better sorted.		1400	Take sample w/ C/B
	GM	<Det		Mass	1						
								107.8' - 2.2' + 2.5' = 108.1' D/B ~1.9' of sluff after 110.0' sample		1410	Take D/B w/ L300-08
								106.3' + 7.7' = 114.0' Total 10" Carbon Steel Casing		1420	Welding 10" casing
								footage 108.1' - 88.9' = 19.2' Total 10" Casing added = 25.2' No H_2O added Today			

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WHC-MR-0208

9413223.0740

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/7/90	Sheet No. 1 of 3
	Location 200 West	Project 0011-216-112	

Logged by C.D. Condit (GDT) Date 3/2/90
Reviewed by T.L. McAlan Date 4-26-90
Lith. Class. Scheme Folk Procedure DO-1 | Rev 0

Drilling Contractor KEH
Driller Darrel Luetke
Rig/Method BC2241 | Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0700	Geologist on site. Drill
											Rig is warming up
								Total 10" C.D. Casing = 114.0'		0715	Driller continues to
											weld 10" C.D. casing
										0755	RPT on site
										0805	Drilling with core
											barrel begins
~112'	GIPIDD	PID	DET							0820	550 mon. Borehole
										0850	Alan Pearson takes
											over logs
115'	PID	<Det	SM	Lith	2		S	SAND: tr. Gravel, 95% Sand, 5% Mud		0855	Take Sample w/CB
	GM	<Det		Moist	1			tr. VFP, 20% VCS, 25% CS, 20% MS, 15% FS, 15% VFS, 5% Mud			
								Moderately Sorted:			
								Gravel 70% Basalt, 5% Qtz., 25% Granitic SA-SR			
								Sand 40% Mafic, 10% Qtz, 48% Felsic, 2% Mica SA-SR			
								Wet Color olive 5Y 5/3: Weak reaction w/10% HCl			
								Unconsolidated. Sand is coarser grained.			
								Encountered unconsolidated thin (1/4") silt			
								lenses 111'-114'.			
										0900	Resume Drilling - CL

AW Pearson Alan Pearson

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/2/90	Sheet No. 2 of 3
	Location 200 West	Project W-017-216-U.2-C/D	

Logged by AW Pearson, Alan Pierson — Date 3/2/90
Reviewed by VR McMillan — Date 4-26-90
Lith. Class. Scheme Folk — Procedure DO-1, Rev. 0

Drilling Contractor KEH
Driller Daniel Luttke
Rig/Method Failing w/ Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
120'	PID	<Det	D	Lith	2		S	SAND: tr Gravel, 97% Sand, 3% Mud		0910	Take Special Sample
	GM	<Det		Moist	1			tr, VFP, 17% VCS, 25% CS, 25% MS, 20% FS, 10% VFS, 3% Mud			w/ Core Barrel
				VOA	2			Moderately Sorted:			COC#
				Chem	2			Gravel 70% Basaltic, 5% Qtz, 25% Granitic: SA:			030290U12W2243
								Sand 40% Mafic, 10% Qtz, 48% Felsic, 2% Mica, SA-SR:			
								Wet color olive 5Y 5/3: Weak reaction w/			
								10% HCL: Unconsolidated: Very Similar to			
								115' Sample.			
								114.0' + 7.6' = 121.6' Total 10" Carbon Steel Casing		0930	Welding 10" Casing
										1055	Resume Drilling - CB
125'	PID	<Det	SM	Lith	2		S	SAND: 97% Sand, 3% Mud		1125	Take Sample w/ CB
	GM	<Det		Moist	2			1% VCS, 16% CS, 25% MS, 30% FS, 25% VFS, 3% Mud			
								Well-Moderately Sorted			
								Sand 40% Mafic, 15% Qtz, 43% Felsic, 2% Mica, SA:			
								Wet Color olive 5Y 5/3: Strong reaction w/ 10% HCL:			
								Unconsolidated: Sand is more well sorted &			
								finer grained.			
								121.6' + 7.5' = 129.1' Total 10" Carbon Steel Casing		1135	Welding 10" Casing
										1200	Lunch
										1230	Resume Welding
										1350	Resume Drilling - CB

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/2/90	Sheet No. 3 of 3
	Location 200 West	Project W-017-216-W12-CRD	

Logged by AW Pearson Alan Pearson Date 3/2/90
Reviewed by W E McMillan Date 4-26-90
Lith. Class. Scheme Folk Procedure DO-1, Rev. Ø

Drilling Contractor KEH
Driller Darrel Ludtke
Rig/Method BE22W / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
130'	PID	<Det	SM	Lith	2		S	SAND: tr. Gravel, 98% Sand, 2% Mud		1435	Take Sample w/CB
	GM	<Det		Moist	1			tr. VFP, 1% VCS, 7% CS, 20% MS, 40% FS, 30% VFS, 2% Mud			
								Gravel 70% Basaltic, 10% Qtz., 20% Granitic, SA			
								Sand 30% Mafic, 20% Qtz, 45% Felsic, 5% Mica SA			
								Well-Moderately Sorted: Wet Color light olive brown 2.5Y 5/4			
								Weak reaction to 10% HCL: Unconsolidated.			
								Sand is finer grained & Noted slight color			
								change			
										1440	Resume Drilling-CB
										1500	Quit Drilling
								131.8' - 2.6' + 2.5' = 131.7' D/B from ground surface			Take D/B w/L300-08
								footage 131.7' - 108.1' = 23.6'			
								15.1' of 10" Carbon Steel Casing Added.			
								No H_2O added today.			

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9413223.0743

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/5/90	Sheet No. 1 of 2
	Location 200 West	Project UNPT 216-U12	

Logged by C.D. Condit (HII) — Date 3/5/90
Reviewed by DR McGhan — Date 4-26-90
Lith. Class. Scheme Folk — Procedure DO-11 Rev. 0

Drilling Contractor KEH
Driller [illegible]
Rig/Method RB 22 / Cable tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 10" casing = 127.1'		0700	GROUNDING ON SITE. DRILLERS ATTENDING MEETING
								cut 10" - 0.3' off = 128.8' total		0810	DRILLER ON SITE
										0815	TURNED LOG OVER TO R. MILLER
										0830	[illegible]
								10" 128.8' + 6.9' = 135.7' total - OB - 13.9'		0835	[illegible]
										0852	reach to drill [illegible]
										0940	left. & fluids arrives
										1012	[illegible]
135.0	PID	1/dl	D-SM	lith	2		S	SAND (98% Sand, 2% Mud) 3% vcs 15% cs		1110	to 135.0' sample OK
	GAM	<dl		moist	1			30% ms 30% fs 20% vfs, 2% mud, mod. well sorted		1115	stop drilling - 10"
								45% mafic 55% felsic, SA-SR, 11 cl. tan			casing to 134.9' ds
								(2.5Y 5/4 wet) non. rx to 10% HCl, unconsol.			
								idiomorphic loose, trace of vfg, f sands are		1126	V. McGabbe arrives -
								micaceous.			S. Koo (WHC) witness
											log hole geophys after [illegible]
								INTERVAL LOGGED = 2.0' - 135.0'		1145	logging completed
										1200	stop
										1220	resume activity
								steam cleaning witnessed by: [illegible] (KAI)		1245	8" casing arrives

Paul P. McGar (KAI) [illegible]

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9413223.0744

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/5/90	Sheet No. 2 of 2
	Location 200 WEST	Project WOU 216-U12	

Logged by L. Miller (GEI) / [illegible]	Date 3/5/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date 4-26-90	Driller DARREL LUDERS	
Lith. Class. Scheme FOLK	Procedure DO-11 REV. 0	Rig/Method RE22-1 / CABLE TOOL	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								8" casing 1% to use.			8" casing (1.68') installed
								drive shoe = 9 1/4" O.D (0.78')			by L. Miller (GEI)
										1555	begin to install
										1610	begin tool change to
											8" & clean ide out
										1555	tool change completed
								8"ø casing w/drive shoe 21.0' (20'11½")			begin to add 8"
								8"ø casing 20.5' (20'6")		1429	add 8" to well
								8"ø casing total = 41.5'		1500	stop - fire watch
										1527	Op site for day
								footage = 5'			
							10'	casing added = 6.9' total = 135.7' (0.8 st)			
								H_2O added = 0 gallons			
								8" casing added = 41.5'			

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9413223.0745

DAILY BOREHOLE LOG	Boring or Well Number 99-W22-13	Date 3/6/90	Sheet No. 1 of 1
	Location 200 W 216-U-12	Project WDT 216-U-12 [illegible]	

Logged by R Miller (GAI) [illegible]	Date 3/6/90	Drilling Contractor KEH	
Reviewed by VR McGhan	Date 4-26-90	Driller Darrel Ludtke	
Lith. Class. Scheme Folk	Procedure [illegible]	Rig/Method [illegible]	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
								total 8" casing = 41.5'		0655	Ar site - p. cloudy
											41°F, wind N - 0 [illegible]
										0700	resume welding
								8" - 41.5 + 15.8' = 57.3' total		0750	add 8" & weld
								8" - 57.3' + 15.8' = 73.1' total		0900	add 8" & weld
								8" - 73.1' + 19.4' = 92.5' total		1045	add 8" & weld
								8" - 92.5' + 19.6' = 112.1' total (19'7")		1130	add 8" & weld
										1200	stop
										1230	resume welding
								8" - 112.1' + 17.0' = 129.1' total 16'11"		1310	add 8" & weld
								8" - 129.1' + 15.3' = 144.4' total (15'3")		1420	add 8" & weld
								td 136.8' lic + 2.15' ut - 2.9' sw = 136.35' bs		1425	take td tape # 63m-28
										1505	stop - fire watch
								footage: 0'			R. Spanel on site w/
								8" casing added = 102.9' (144.4' total)			CCSI photographer
											photos for DOE [illegible]
											report
										1523	driller departs
										1526	Ar site

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DAILY BOREHOLE LOG	Boring or Well Number 299-W23-43	Date 3/7/90	Sheet No. 1 of 2
	Location 200W	Project W017 216-U-12 [illegible]	

Logged by P. [illegible] Reviewed by [illegible] Date 3/7/90 Date 4-26-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor KEH
Driller Darrel [illegible]
Rig/Method CE-22W [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 144.4'		0655	At site, cloudy, 39°F,
											wind N, 0-6 mph
										0700	resume welding
										0715	begin to drill
										0750	stop - no RFT on site
										0807	RFT & [illegible] arrives
										0808	resume drilling
140.0'	PID	144	5111	lith	2		(m)S	slightly Muddy SAND (81% Sand 19% Mud)		0840	to 140.0' - sample RF
	600	144'		Red glass	2			11% mas 40% f's 30% vfs, 19% mud, well sorted			sample on C of C 030790
				Amal glass	2			25% mafic 75% felsic, SA-SR, lt. olive brn		0910	hard to [illegible]
				Amal	1			(2.5Y 5/4 wet) strong rx to 10% HCl, mica-			
								[illegible] compact, f sand is micaceous.			
								8" - 144.4' + 8.2' = 152.6' total		1000	add 8" fluid
										1100	resume drilling
145.0'	PID	144	0	lith	2		(m)S	slightly Muddy SAND (88% Sand 12% Mud) 30% mas		1115	to 145.0' - sample RF
	[illegible]			Amal	1			30% f's 25% m's, 12% mud, well sorted, 25% mafic		1125	v. hard to [illegible] sample
								75% felsic, SA-SR, lt. olive brn (2.5Y 5/4 wet) v.			on RF, long begin
								strong rx to 10% HCl, slight [illegible]		1155	stop - no RFT
								compact in places, f sand is micaceous, have		1230	tailgate meeting for
								c. sand			[illegible]
											work plan & HASP

9413223.0747

DAILY BOREHOLE LOG	Boring or Well Number [illegible]	Date [illegible]	Sheet No. 2 of 2
	Location 200W	Project [illegible]	

Logged by R Miller (GAI) [illegible]	Date 2/7/90	Drilling Contractor LEI	
Reviewed by DK Michelson	Date 4-26-90	Driller [illegible]	
Lith. Class. Scheme [illegible]	Procedure [illegible]	Rig/Method [illegible] / [illegible]	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing = 152.6'		1315	[illegible]
										1317	[illegible]
										1400	[illegible] at 147.0'
										1410	8" casing [illegible]
											[illegible]
											[illegible]
											by [illegible]
										1500	8' unloaded
										1510	stop drilling
										1516	[illegible]
										1523	[illegible]
								footage = 10'			
								8" casing added = 8.2'			
								H_2O added = 0 gallons			

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9413223.0748

DAILY BOREHOLE LOG	Boring or Well Number [illegible]	Date 3/3/90	Sheet No. 1 of 2
	Location 200W	Project [illegible]	

Logged by [illegible]	Date [illegible]	Drilling Contractor KEH	
Reviewed by D. McGhan	Date 4-26-90	Driller Cyril [illegible]	
Lith. Class. Scheme [illegible]	Procedure [illegible]	Rig/Method CE-22W / [illegible]	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 152.6'		0730	[illegible]
											70°F, wind N 4-[illegible]
										0705	[illegible]
											SE [illegible], driller
								caving considerably [illegible]			explains to A. [illegible]
								layer [illegible]			
								[illegible] thick water, at [illegible] 147' lithology is			
								clayey to cemented sands interbedded w/			
								silts.			
								f.l. - 149.1' bc - 5.2' sw + 2.15' cor = 146.35' bc		0900	take f.l. - tape [illegible]
										0810	add H_2O & begin to drill
150.0'	F.O	Add	n/a	lith	2		MS	Muddy SAND (55% Sand 45% Mud) 10% [illegible]		0905	to 150.0' - sample HT w/
	GM	Add				150.0'		10% cs 10% ms 10% fs 15% vfs, 45% mud, mod			dart valve bailer
								sorted, 25% mafic 75% felsic, A-SE, Hol. [illegible]			
								(2.5Y 5/4 wet), strong rx to 10% HCl, slight			
								consolidation - sand appears to be cemented,			
								f sand is micaceous, rich interbeds of sandy silts			
155.0'	F.O	Add	n/a	lith	2		MS	Muddy SAND (51% Sand 49% Mud) similar to		0920	to 155.0' - sample HT w/
	GM					155.0'		150.0' sample			dart valve bailer
								8" - 152.6' + 9.9' = 162.5' total		0930	add [illegible]
										0950	[illegible]

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9413223.0749

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43 Location 200 W	Date 3/9/90 Sheet No. 2 of 3 Project WMP 216-U-12 Crib
Logged by R. Miller (GAI) Reviewed by VL McElhaney Lith. Class. Scheme Folk	Date 3/8/90 Date 4-26-90 Procedure [illegible]	Drilling Contractor KEH Driller Darrel Luttke Rig/Method EE-200W / Air Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" ⌀ casing = 162.5'			Gibson, [illegible]
											WHC-S-014 rev 4, EP1#
											146189, and hole II
										0950	Gibson deposits
										1030	resume drilling
160.0	PID	Ord	n/a	lth 250ml	Z		SM	Sandy MUD (35% Sand 65% Mud) 5% vcs 5% ccs		1055	to 160.0 - sample HT w/
	GAI	Ord		glass 40ml	Z	160.0		20% ms 10% fs 10% vfs, 65% mud, mod. well sorted,			dust valve bailer - sample
				water	Z			30% mafic 70% felsic, A-SF, lt. ol. brn. (2.5Y			on CoC 030890
								5/4 wet), strong rx to 10% HCL, slightly consol-			
								idated - compact to dense, f sand is micaceous,			
								contb. interbeds of sand & silts			
								8" - 162.5' + 9.6' = 172.1' total		1120	add 8" ⌀ weld - wind is
											very strong 25 mph
										1200	stop - lunch
										1210	wind has not let up -
											hard to weld
										1350	resume drilling
165.0	PID	Ord	n/a	lth	Z		SM	Sandy MUD (40% Sand 60% Mud) 5% ms 15% fs		1410	to 165.0 - sample HT w/
	GAI	Ord						20% vfs, 60% mud, well sorted, similar to			dust valve bailer
								160.0' sample			

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DAILY BOREHOLE LOG	Boring or Well Number 399-W22-02	Date 5/9/90	Sheet No. 3 of 3
	Location 200W	Project [illegible]	

Logged by P Miller (GAI) / [illegible] Date 3/8/90
Reviewed by VK McLehan Date 4-26-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor KEH
Driller Carol Ludtke
Rig/Method CE-3231 / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing = 172.1'		1455	to 172.1 [illegible]
								will log in am 5/7/90			[illegible]
										1500	RFT departs
								footage = 25'		1505	stop activity
								H_2O added: 70 gallons		1515	Up site
								8" casing added = 19.5'			

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9413223.0751

DAILY BOREHOLE LOG	Boring or Well Number [illegible] Location [illegible]	Date 3/9/90 Sheet No. 1 of 3 Project WAIT [illegible]
Logged by R. Miller (GM) [illegible] Reviewed by V.L. McGhan Lith. Class. Scheme Fall	Date 3/9/90 Date 4-26-90 Procedure [illegible]	Drilling Contractor CEH Driller Carol Luttke Rig/Method CE-[illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 172.1'		0655	Arrive site, cloudy, 36°F,
								bottom of borehole to refusal to get t.d. ~170.3' bls			wind E-NE 0-5 mph.
								8" - 172.1' + 7.0' = 181.1' total		0700	begin to add 8" casing
										0750	left to [illegible] - [illegible]
170.0	PID	wet	n/a	lith	2		SM	Sandy MUD (45% Sand 55% Mud) 2% vcs 3% [illegible]		0815	begin to drill
	GM	[illegible]				170.0		10% cms 15% fs 15% vfs, 55% mud, mod-well			
								sorted, 30% mafic 70% felsic, A-SR, lt. ol bro,			
								(2.5Y 5/4 wet), strong rx to 10% HCl, slight			
								consolidated - compact, f. sand is micaceous.			
175.0	PID	wet	n/a	lith	2		SM	Sandy MUD - similar to 170.0' sample.		0850	to 175.0' - sample HT w/
	GM	[illegible]				175.0					dart valve bailer
180.0'	PID		n/a	lith 250ml	2		SM	Sandy MUD (35% Sand 65% Mud) 1% vcs 1% [illegible]		0920	to 180.0' - sample HT w/
	GM			2 jars 4oz ea	2	180.0		3% cms 15% fs 15% vfs, 65% mud, v.well sorted,			dart valve bailer
				subplas	2			35% mafic 65% felsic, A-SR, lt ol bro (2.5Y 5/4			sample or [illegible]
								wet), mod-strong rx to 10% HCl, slightly consolidated,			
								compact, f. sands are micaceous, trace vfp.			
								8" - 181.1' + 8.3' = 189.4' total		0945	add 8" to well
										1000	resume drilling

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9413223.0752

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-13	Date 3/7/90	Sheet No. 2 of 3
	Location 200W	Project W.O.T 216-U-12 Crib	

Logged by R. Miller (GA) [illegible] Date 3/7/90
Reviewed by J. Kmiklian Date 4-26-90
Lith. Class. Scheme Frik. Procedure [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing: 189.4'			
185.0	PID	Lit	n/a	lith	2		SM	Sandy MUD (5% Sand 70% Mud) 1% vcs 1% cs		1120	to 185.0' - sample HT w/
	GM	Lit						5% ms 10% fs 13% vfs, 70% mud, v. poor sorted,			dual valve bailer
						185		60% mafic 40% felsic, A-SR, H.yel.brn (2.5Y		1155	stop.
								6/4 wet), v strong rx to 10% HCl, mod consolid.		1230	resume drilling
								stiff, dense to hard, ; sand is basaltic,			
								trace vfp, fragments of caliche. (from 185.5-189.0')			
190.0	PID	Lit	n/a	lith	2		MSGr	Muddy Sandy GRAVEL (35% Gravel 25% Sand		1245	to 190.0' - sample HT w/
	GM	Lit		250ml glass	2			40% Mud) 5% mp 15% fp 17% vfp, 2% vcs 3% cs			dual valve bailer
				40ml subglass	2	190		5% ms 7% fs 8% vfs, 40% mud, v. poorly sorted,			sample on COC 03/07/90
								Gravels 100% mafic, Sands 85% mafic 15%			
								felsic, A-SR, H.yel.brn (2.5Y 6/4 wet) v strong			
								rx to 10% HCl, slight - moderate consolidation			
								dense to hard, hard caliche layers.			
195.0	PID	Lit	n/a	lith	2		(g)MS	slightly gravelly Muddy SAND (8% Gravel, 52% Sand		1315	to 195.0' - sample HT w/
						195		40% Mud) 2% fp 6% vfp, 5% vcs 5% cs 10% ms			dual valve bailer
								15% fs 17% vfs, 40% mud, mod. well sorted, Gravels			
								100% mafic Sands 80% mafic 20% felsic, A-SR			
								H.yel brn (2.5Y 6/4 wet), v strong rx to 10%			
								HCl, slightly consolidated - dense, trace			
								caliche.			

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9413223.0753

DAILY BOREHOLE LOG	Boring or Well Number 299-W23-[illegible]	Date 3/9/90	Sheet No. 3 of 5
	Location 200W	Project WMT 216-U-12 Crib	

Logged by C. Miller (GAI) Gordon Nielsen	Date 3/9/90	Drilling Contractor PEI	
Reviewed by [illegible]	Date 4-26-90	Driller Daniel Ludlow	
Lith. Class. Scheme Folk	Procedure [illegible]	Rig/Method [illegible] / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8"ø casing = 189.4'			
								8" - 189.4' + 7.8' = 197.2' total		1300	at 8" & weld
										1400	resume drilling
										1430	sample of drill water
										1445	stop drilling - cleanup
											auger - 55° deviation
								footage = 28'			to ~198' bgs
								8" casing added = 75.1'		1800	drove top of 8"
								H_2O added = 60 gallons			prep to weld
										1500	stop for day
											[illegible]

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9413223.0754

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/12/90	Sheet No. 1 of 3
	Location 200W	Project W017-[illegible]	

Logged by R. Miller (Geo) / [illegible]	Date 3/12/90	Drilling Contractor KEH	
Reviewed by W.L. McKeen	Date 4-26-90	Driller [illegible]	
Lith. Class. Scheme Folk	Procedure [illegible]	Rig/Method CE 22W / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 197.2'		0655	Air site - p cloudy,
											56°F wind S 5-10 mph
								194.9' btc + 2.45 ov - 20' su = 195.[illegible]		0700	Sound depth - 57# Loss - 13
										0710	begin to [illegible]
										0717	stop - no LPT on site
										0745	LPT - on site - resume
											drilling
200.0'	P10	Lgt	n/a	lith	2		(9)MS	slightly Gravelly [illegible] Sand (6% Gravel, 54% Sand		0755	to 200.0' - sample HT wl
	GM	Lgt		25 ml glass Mason	2	200.0		40% Mud) 2% fg 4% vfg, 5% vcs 5% cs 10% ms			shut valve bailer - sample
				unbaked	2			15% fs 19% vfs, 40% mud, mod-well sorted, Gravel			on CoC 031290
								100% mafic, Sands 80% mafic 20% felsic, A-SR,			
								lt. yel brn (2.5Y 6/4 wet), v strong rx to 10% HCl,			
								slightly consolidated - dense, trace of caliche			
								8" - 197.2' + 7.6' = 204.8' total		0815	[illegible]
										0905	resume drilling
205.0'	P10	Lgt	n/a	lith	2		SM	Sandy [illegible] (15% Sand (65% fine) [illegible]		0935	to 205.0' - sample HT wl
	GM					205.0		10% fs 15% vfs, 60% mud, v well sorted, [illegible]			shut valve bailer
								15% felsic, A-SR, lt. yel brn. (2.5Y 6/4 wet),			
								v. strong rx to 10% HCl, slightly consolidated - [illegible]			
								trace of vfg, trace caliche			
								8" 204.8' + 7.2' = 212.0'		1010	[illegible]

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DAILY BOREHOLE LOG	Boring or Well Number 299-W15-43	Date 3/12/90	Sheet No. 2 of 3
	Location 200W	Project 200-UR-1 216-U-12 Crib	

Logged by R. Miller (GAI)	Date 3/12/90	Drilling Contractor KEH	
Reviewed by [illegible]	Date 4-26-90	Driller [illegible]	
Lith. Class. Scheme Folk	Procedure Cox, Gwin	Rig/Method RB-[illegible] / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing - 212.0'		1105	PPT - [illegible]
										1110	resume drilling
										1120	stop - cannot bail
											w/o PPT here - lub
											via [illegible]
										1200	stop - lunch
										1230	resume activity
										1240	PPT [illegible] resume
											drilling
210.0'	PID	Lgd	n/a	lith	2		SM	Sandy MUD (35% Sand 65% Mud) - similar		1255	to 210.0' - sample HT-w/
	GRI	Lgd		250ml glass	2	210.0'		to 205.0' sample			dart valve bailer - sample
				40ml							on LoFC 03 13 90
				Sub glass	2						
								8" - 212.0' + 7.7' = 219.7' total		1310	add 8" casing
										1400	resume drilling
215.0'	PID	Lgd	n/a	lith	2		SM	Sandy MUD (30% Sand 70% Mud) 1% res 1% res 3% [illegible]		1410	to 215.0' - sample HT-w/
	GRI	Lgd				215.0'		10% fs 15% vfs, 20% mud, v. well sorted, 70% [illegible]			dart valve bailer
								30% fs [illegible] SM-SP, lt. yel brn (10YR 6/4 wet), slight			
								2 to 10% HCl, [illegible] - [illegible]			

9413223.0756

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/12/90	Sheet No. 3 of 3
	Location 200-W	Project WMP 216 U-12 Crib	

Logged by R. Miller (GAI) [illegible] Date 3/12/90
Reviewed by V.T. McGhan Date 4-26-90
Lith. Class. Scheme Folk Procedure DOE/[illegible]

Drilling Contractor KEH
Driller Pierre Ludtke
Rig/Method RE-22W / Cable Tool

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
220.0	P:0	Cal	n/a	lith	2			with log lith on 3/12/90		1500	to 220.0' sample lith col
	Cal	Cal		Tan glass	2	220.0					dist water bailer - sample
				Amal rock chips	2						on Colt 03/12/90
										1500	W. Thorkaberg, D. Takuno-i
											G. Swanson, L. Gallegos
											arrive site - 7 about
											steam clean, lith III, 200-
											5-119
										1521	Pr site for day
								footage = 220.0'			
								8" casing setted = 22.5'			
								H_2O added = 60 gallons			

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9413223.0757

DAILY BOREHOLE LOG	Boring or Well Number 299-W17-19	Date 3/13/90	Sheet No. 1 of 2
	Location 200W	Project WMT 200-W-3 [illegible]	

Logged by R. Miller (GAI) [illegible]	Date 3/13/90	Drilling Contractor KEH	
Reviewed by J.C. Mathias	Date 4-2-90	Driller [illegible]	
Lith. Class. Scheme Folk	Procedure [illegible]	Rig/Method BE-22W / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 219.7'		0655	Arr site - clear, 34°F,
											wind W-NW 0-3mph.
										0703	driller & SSO arrive
								8" 219.7' + 6.7' = 226.4' total		0710	at 8" [illegible]
220.0'	PID	<det	n/a	lith	2		MS	Muddy SAND (65% Sand 35% Mud) 5% cs		0810	O. Amos arrives - stop
	GM	<det		200ml glass	2			10% ms 25% fs 25% vfs, 35% mud, well sorted,			welding - driller to
				40ml sub. glass	2			Sand 20% mafic 80% felsic SA-SR, lt. yel. brn.			SLA-PAL class
								(2.5Y 6/4 wet) no rx to 10% HCl, unconsolidated		1020	driller returns - resume
								firm to stiff. f sands are micaceous.		1030	begin to drill
										1033	D. Myers, S Wesler
											M Thomson DOE
											J. Rassmussen CHE
											arrive site. ? about point
											on cable, well in [illegible]
225.0'	PID	<det	n/a	lith			MS	Muddy SAND (70% Sand 30% Mud) similar to		1055	to 225.0' - sample HT w/
	GM	<det						220.0' sample			check valve bailer
								8" 226.4' + 6.9' = 233.3' total		1110	add 8" & weld
										1120	DOE - depart site
										1200	stop -
										1210	resume welding
										1240	PIT Arrives

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/13/90	Sheet No. 2 of 2
	Location 200W	Project WMP 216-U-12 Crib	

Logged by P. Miller (GAI) [illegible]	Date 3/13/90	Drilling Contractor KEH	
Reviewed by TK McGlynn	Date 4-27-90	Driller Darrel Luttke	
Lith. Class. Scheme Folk	Procedure M-1, Part A	Rig/Method CE-220 / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description (Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.)	Pene. Rate/ Blows	Time	Drilling Comments (Bit, Casing, Water level, fluid added)
								total 8" casing = 233.3'		1250	resume drilling
230.0'	PIC	GAI	wet	lith	2		MS	Muddy SAND (75% Sand 25% Mud) 2 Tones		1315	to 230.0' - sample HT w/
	GAI	GAI		glass	2	230.0'		10% ms 25% fs 30% cs, 25% med, well sorted,			check valve bailer - sample
	GH	r-1		40ml	2			20% oxidic 80% felsic, SA-SR, ol brn (2.5Y			per GOLC 021530
								4/4 wet) no rx to 10% HCL, unconsolidated			
								compact, f. sand is micaceous.			
								8" - 233.3' + 6.6' = 239.9' total		1330	actual 9' fill
										1425	resume drilling
235.0'	PIC	n/r	wet	lith	2		MS	Muddy SAND (75% Sand 25% Mud) similar		1455	to 235.0' - sample HT w/
	GAI	GAI				236.0'		to 230.0' sample			check valve bailer
										1512	stop drilling
										1520	Dp site
								Footage = 15'			
								8" casing added = 20.2'			
								H_2O added = 60 gallons			

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9413223.0759

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/14/90	Sheet No. 1 of 2
	Location 200W	Project WO-7 216-U-12 Crib	

Logged by R. Miller (GAI)	Date 3/14/90	Drilling Contractor KEH	
Reviewed by J.R. McGlynn	Date 4-27-90	Driller Darrel Ludtke	
Lith. Class. Scheme Folk	Procedure DO-1, Rev 0	Rig/Method BE-22W / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								total 8" casing = 239.9' SSD. Dwight		0700	Arr site, p. cloudy - 48°F
											N-NW 0-Sampl
								w/l 230.69' btc - 3.7' su = 226.99' bls		0730	[illegible]
								t.d. 234.5' btc - 3.7' s.u. + 5.5' cav = 233.3' bls		0735	[illegible]
								drum #2 236' - 242'		0745	begin drilling
								8" - 239.9' + 6.2' = 246.1' total		0840	add 8" casing
										0935	resume drilling
240.0	GAI	Ldel	wet	250ml glass	2		S	SAND (93% Sand 7% Mud) 15% vcs 15% cs		0950	to 240.0' sample HT wet
	PID	n/1		10ml glass	2	240.0		20% ms 20% fs 23% vfs, 7% Mud, mod-poorly sorted			check valve bailer - sample
				lith	2			25% mafic 75% felsic, SA-SR, pl. brn (2.5Y			on COC. 03/14/90
								4/4 wet) no or to 10% HCL, unconsolidated - compact		1005	drum #3 - [illegible] 241'
								trace siltstone fragments (none to 10% HCL),		1020	to 243.5' - [illegible]
								& sands are microcrystalline.			
244.0'	PID		wet	lith	2	244.0	MSG	Sandy GRAVEL (52% Gravel, 41% Sand, 7% Mud)		1030	to 244.0' sample HT wet
	GAI							10% mg 20% cg 22% vfg, 5% vcs 10% cs 10% ms 10% fs 10% vfs			check valve bailer
								7% mud, poorly sorted, Gravel 45% mafic 55% felsic		1100	borehole cleaned out
								Sand 30% mafic 70% felsic, A-SR, pl. brn (2.5Y 4/4			8" casing to 243.8' bls
								wet) no or to 10% HCL, unconsolidated - loose to			s.u. 2.25' bls. no sloughing
								compact, trace to none mica			back on site - driller to
											change tools

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9413223.0760

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/14/90	Sheet No. 2 of 2
	Location 200W	Project WMT 216-U-12 Crib	

Logged by R Miller (GAI) signature
Date 3/14/90
Reviewed by [illegible]
Date 4-27-90
Lith. Class. Scheme Folk
Procedure [illegible]

Drilling Contractor KEH
Driller Edward Ludlke
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
								U-2U12-90-004 (230-236), U-2U12-90-005 (236-242')		1145	casing down numbers
								U-2U12-90-006 (242-244')		1200	stop - lunch
										1230	resume - could use S. tool
											from -10 (grout)
										1253	Up site to 200E
								to witness steam clean & export of straightness tool		1312	Ar slab yard
								Orange paint on tool removed & steam cleaned		1330	steam clean completed-OK
										1333	Ar slab yard
										1343	Ar well site - unload tool
										1400	begin straightness test
										1400	test completed - OK
								td. 237.42' blk - 2.25' sil + 2.5' cor = 237.67' bls		1410	sound hole tape 237.67
											hole is sanding in -
											will have to clean out
											hole - re bang HT
								td. 237.10' blk = 237.35' bls - losing hole!		1425	sound hole tape [illegible]
								footage = 9'		1430	C Swanson & C Gallemore
								8" casing acted = 6.5'			[illegible]
								H_2O_2 acted = 10 gallons		[illegible]	[illegible] site
										1500	stop for day
										1510	Ar [illegible]

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9413223.0761

DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/15/90	Sheet No. 1 of 1
	Location 200W	Project WOIT 216-U-12 Crib	

Logged by R Miller (GAI) [illegible] Date 3/15/90
Reviewed by [illegible] Date 4-27-90
Lith. Class. Scheme Folk Procedure [illegible]

Drilling Contractor KEH
Driller Darrel Luttke
Rig/Method [illegible]

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description: Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments: Bit, Casing, Water level, fluid added
										0655	Arr site - clear, 46°F.
											N-NW 0-2 mph
								w/l 229.19' btc - 2.25' s.u. = 226.94' bls		0700	take w/l
								t.d. 236.9' btc - 2.25' s.u. + 2.5' cor = 237.15' bls			take t.d. tape # L300-03
								from 200E decon pad - unable to locate a full autoclave		0752	sand pump arrives -
								to clean - can't use it, will attempt to bail without using			
								state that A Pearson witnessed decon of S pump		0810	O Anno & J Kellerman
								on 3/14/90			will verify w/ A Pearson
								he witnessed decon of S pump on 3/14/90		0830	A. Pearson verified that
								inspect sand pump, remove plastic wrap - OK			prepare to sand pump
								drum #4		0840	begin clean out
								t.d 241.1' btc - 2.25' s.u + 2.5' cor = 241.35' bls		0949	take t.d. tape # L300-03
								sand is rising in casing		0955	add H_2O to stabilize
								drum #5		1010	drum #5
								t.d 241.5' btc (241.75' bls) - will drive 8"		1100	take t.d. tape # L300-03
								0.5' deeper to 244.35' bls - lower pump			
								8" casing to 244.75' bls		1115	drive 8" - s.u. 1.35'
								t.d. 241.8' btc - 1.35' s.u + 2.5' cor = 242.95' bls		1135	take t.d. tape # L300-03
								t.d 241.7' btc (242.85' bls) hole has stabilized		1150	take t.d. -
								H_2O added = 110 gallons		1155	stop - clean up

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DAILY BOREHOLE LOG	Boring or Well Number 299-W22-43	Date 3/16/90	Sheet No. 1 of 1
	Location 200W	Project WMT 216-U-12 Crib	

Logged by K. Miller (GAI)	Date 3/16/90	Drilling Contractor KEH	
Reviewed by V. McLean	Date 4-27-90	Driller Dennis Carlile	
Lith. Class. Scheme Folk	Procedure 10-1 Rev 0	Rig/Method BE-22W / Cable Tool	

Depth	Contamination Inst	Contamination Rea	Moisture	Samples Type	Samples No	Graph Log	Class	Lithologic Description Particle size dist., Sorting, Mineralogy, Roundness, Color, Reaction to HCl, etc.	Pene. Rate/ Blows	Time	Drilling Comments Bit, Casing, Water level, fluid added
										0655	Arr site, cloudy,
											42°F, wind N-NE 0-6 mph
										0700	warm up - begin to
											break rig down
								a/c 224.21' bls - 1.35' s.u. = 222.85' bls		0715	take w/c -
								t.d. 241.54' bls - 1.35' s.u. + 2.5' casing = 242.39' bls	(19.85')	0725	take t.d. [illegible]
								w/c 221.20' bls (222.85' bls) - poss due to lg		0730	take w/c
								amount of bailing to clean hole (2.06' in casing)		0735	driller depart w/ drums
								drums identified in accord w/ E114.2 from		0710	driller arrives site
								WHC-CM-7-7			resume break down of rig
								w/c 221.46' bls - 1.35' s.u. = 223.11' bls -		1015	take w/c
								water level is dropping - need to recheck			
										1100	crest down
										1105	rig off site - [illegible]
											of [illegible]
										1130	weld cap on well
										1135	fix site for decon.

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DATA BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible] Date [illegible] Sheet No. [illegible]
	Location 200 East 216-U- [illegible] Project [illegible]

Logged by [illegible] Date [illegible]
Reviewed by [illegible] Date 4-27-90
Measuring Equip. [illegible] Procedure [illegible]

Drilling Contractor KEH
Driller
Rig/Equipment

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1100										upon arrival previous D/B
										completed depth 242.0
								242.7		D/B 241.3-1.1 +2.7
										no bailing necessary
										8" pipe to be welded onto
										pipe in hole from Circuit
										according to WHC-S-019
										Sec 4.1 7.6 and ECN# 124927
										witnessed by W.E. Crouch
1220										move equipment to site
										from previous operation
										(299-W22-40)
1405										Preparing to weld on 8" pipe
1410										Geologist off site
										Drillers will weld on pipe
										while Geologist off site.

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9413222.0769

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-43	Date 4/12/90	Sheet No. 1 of 3
	Location 200 WEST 216-U-12 CRIB	Project W-DIT U-12	

Logged by S M. Goldman / [illegible] Date 4/12/90
Reviewed by D K McAlister Date 4-27-90
Measuring Equip. L300-15 & CWG. TAPE Procedure [illegible]

Drilling Contractor [illegible]
Driller [illegible]
Rig/Equipment [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	CARBON STEEL	8"	246.1	1.35	244.75			242.9		STANDBY, WAITING FOR COMPANION
										TO BEGIN
0720										FINISHING WELDING STICKUP
0745	CARBON STEEL	3"	251.5	6.75	244.15					ADDED 5.4' OF 8" STICKUP
0800										SETTING UP JACKS
0830										FINISHED SETTING UP; STANDBY
										DRILLERS WAITING FOR COTTON GLOVES
0915	JOHNSON DIV. TYPE 304 10 SLOT CHANNEL PACK-SCREEN - NOT PASSIVATED	4"	10.01'			SCREENS ACCEPTED BY C HOOVER 2/23/90, GREEN TAGGED, P.O. NO PCP ON P.O. NO.				BEGIN SETTING SS CASING & SCREEN; DRILLERS WEARING CLEAN COTTON
0930	SAME AS ABOVE	4"	10.01'							GLOVES TO INSTALL STAINLESS
0935	JOHNSON DIV TYPE 304 S.S END CAP - NOT PASSIVATED	4"	0.32'			END CAP GREEN TAGGED BY C Hoover 2/24/90; NO PCP on P.O. # RECORDED				(0.1' BLANK ON END AND 0.3' BLANK AT TOP OF BOTH SCREENS.)
0955	TOTAL SCREEN	4"	20.34'							
1000	JOHNSON DIV. TYPE 304 SCH. 5, T304 STAINLESS STEEL CASING	4"	20.02'	w/ CENTRALIZER (3 1/2 MOONS)		CASING GREEN TAGGED BY P. STEVENS 3/29/90. PCP NO. CR-9112 P.O. NO 42493 REL. 16				SETTING CASING, SAME PCP & P.O # for ALL 4" CASING. ALL SEALED IN PLASTIC & HAVE THREAD PROTECTORS.
1005	"	4"	20.01'	w/o CENTRALIZER						
1010	"	4"	20.00'	w/	"					
1015	"	4"	20.01'	w/o	"					
1035	"	4"	20.01'	w/	"					
1045	"	4"	20.01'	w/o	"					
1050	"	4"	20.02'	w/	"					
1055	"		20.01	w/o	"					

TOTAL = 160.09' of CASING + 20.34' S = 180.43'

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9413223.0765

I BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W 13	Date 4/12/93	Sheet No. 2 of
	Location 200 WEST 216-U-12 CRIB	Project 216-U-12	

Logged by S. M. [illegible] Date 4/12/93
Reviewed by T.K. McGhan Date 4-27-93
Measuring Equip. L300-15 & ENG. TAPE Procedure DO-1, REV. 0

Drilling Contractor KEH
Driller THOMAS & [illegible]
Rig/Equipment CRANE & JACKS

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
	S.S CASING	4"	160.09'	(SUBTOTAL FROM P. 1.)						(CONT. FROM P. 1; SEE P. 1 FOR
1100	"	4"	20.01'	w/ CENTRALIZERS						S.S. CASING DETAILS. CASING
1110	"	4"	20.01'	w/o CENTRALIZERS						IS ALL ON CRANE PER & P.O.
1120	"	4"	20.01'	w/	"					#).
1125	"	4"	5.00'	w/o	"					
1130	TOTAL CASING	"	225.12'	+ 20.34' SCREEN = 245.46'						FINISHED SETTING CASING & SCREEN
1135	SS CONSTRUCTION PIECE	4"	5.0'							PLACING CONSTRUCTION PIECE & CAP
1140		4"	230.12'	+ 20.34' SCREEN = 250.46' w/		CONSTRUCTION PIECE				STANDBY; 4" STICKUP IS TOO
										LONG WITH 5' SECTION.
										WAITING FOR 3' SECTION.
1200-1230			225.12'							LUNCH
1250	SS CONSTRUCTION PIECE	4"	3.0'							3' SECTION ARRIVED
1300			228.12'	+ 20.34' SCREEN = 248.46' w/		CONSTRUCTION PIECE				SS CASING IN PLACE; PREPARE
										TO ADD SILICA SAND
1305	CARBON STEEL	8"	251.5	6.75	244.75			242.65	2.1	D/BOTTOM = 242.65'
1310										STANDBY; DRILLERS GOING FOR SUPPLIES
1330	"	"	"	"	"	40 MESH SILICA	1/2 BAG	239.75	5.0	D/SAND = 239.75
1340						SAND - 100 LB BAGS				PULLING 8"
1345	"	"	251.5	7.6	243.9					PULLED 1'; CASING DROPPED 1.4' (4")
1348	"	"	"	"	"	"		239.1	4.8	D/SAND = 239.1
1351	"		251.5	8.5	243.0	"		240.1	2.9	D/SAND = 240.1
1355	"	"	251.5	9.5	242.0	"				D/SAND = 239.2' (?); CAN'T GET
										GOOD TAG - HEAVING SANDS?
1400	"	"	248.7	6.7	242.0					CUTTING 8"; USING SLAG CATCHER.

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-43	Date 4/12/90	Sheet No. 2 of 3
	Location 200 West 216-U-12 Crib	Project W-017 U-12	

Logged by S.M. Goodwin — Date 4/12/90
Reviewed by D.K. McKhan — Date 4-27-90
Measuring Equip. U300-15 & Fab. Tape — Procedure DD-1, PCD 0

Drilling Contractor KCH
Driller Thomas & Beasley
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1410	Carbon Steel	8"	248.7	6.7	242.0	40 mesh Sand	1/2 Bag	237.4	4.6	D/Sand = 237.4
	"	"	"	7.75	240.95	"		239.25	1.7	D/Sand = 239.25
1415	"	"	"	"	"	"	1/2 Bag	237.1	3.85	D/Sand = 237.1
1420	"	"	"	8.6	240.1	"				D/Sand = 236.2 (?), can't get good tag
1430	"	"	"	"	"	"	1/2 Bag	233.8	6.3	D/Sand = 233.8'
1440										SSO monitors hole; Ø ppm
1442										Oiler working on rig
1445	"	"	245.95	6.85	239.1					Pulling 8" & cutting stickup
1450	"	"	"	"	"	"		233.95	5.15	D/Sand = 233.95' (?)
1455	"	"	245.95	7.65	238.30	"		234.55	3.75	D/Sand = 234.55
1500	"	"	"	8.6	237.35	"		235.1	2.25	D/Sand = 235.1
1505	"	"	243.20	6.55	236.65	"		235.65	1.0	D/Sand = 235.65
1510										Shut down for fire watch

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D BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W7	Date 4/13/90	Sheet No. 1 of
	Location 200 West 216-U-12 crib	Project U-017 U-12	

Logged by S M Goodwin
Reviewed by D T McClain
Measuring Equip. L300-15 1 Eng. tape
Date 4/13/90
Date 4-27-90
Procedure DO-1, Rev. 0

Drilling Contractor Keil
Driller Thomas J Bettendorf
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	Carbon steel	8"	243.2	6.55	236.65	40 mesh sand		235.65	1.0	D/sand = 235.65
0715	"	"	242.55	5.9	236.65					Cutting stickup to measure inside 4"
0735	"	"	"	"	"					D/inside 4" = 243.9'
0740	"	"	"	"	"	"	1 bag	225.3	11.35	D/sand = 225.3'
0750	"	"	"	8.45	234.1	"		229.95	4.15	D/sand = 229.95
0800	"	"	239.25	6.35	232.9	"		232.55	0.35	D/sand = 232.55
0805	"	"	"	"	"	"	1 bag	225.55	7.05	D/sand = 225.55
0810	"	"	"	8.5	230.75	"		228.9	1.85	D/sand = 228.9
0815	"	"	"	"	"	"	1 bag	222.9	7.85	D/sand = 222.9
0825	"	"	235.25	6.5	228.75	"		224.5	4.25	D/sand = 224.5
0835	"	"	"	"	"	"	1 bag	219.8	8.95	D/sand = 219.8
0845	"	"	"	"	"	"	1/2 bag	217.3	11.45	D/sand = 217.3
0855	"	"	231.55	6.45	225.1	"		219.05	6.05	D/sand = 219.05
0900	"	"	"	"	"	"	1/2 bag	216.85	8.25	D/sand = 216.55
0905	"	"	"	"	"	"				SSO visits site, Ø PIM
0915	"	"	226.92	6.45	220.47	"		220.15	0.32	D/sand = 220.15
0920	"	"	"	"	"	"	1/4 bag	218.75	1.72	D/sand = 218.75
0925										Setting up rig to bail down sand pack; rig certified clean by A Pearson, PNL. Witnessed signal closing of rig 4/12/90
1030										Bailing well w/ 5 in dia dart bailer; ~vol = 5 gallons. Bailing w/ BE 22m drill rig

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9413223.0768

DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-43	Date 4/13/90	Sheet No. 2 of 3
	Location 200 West 216 U-12 Site	Project W-017 U-12	

Logged by S. M. [illegible] Date 4/13/90
Reviewed by D.E. McGhan Date 4-27-90
Measuring Equip. 200-15 & Eng. tape Procedure DD-1 Rev. 0

Drilling Contractor KGH
Driller TH-Mas & [illegible]
Rig/Equipment Crane & [illegible]

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Overlap	Comments
1115										Finished Bailing; total bailed = 50 gallons bailed with 55 gallon drum & U-2012-90-26.
1120	Carbon Steel	8"	226.92	6.45	220.47					Bottom of 4" casing = 244.0
1125	"	"	"	"	"	40 mesh sand		219.15	1.32	D/sand = 219.15'
1130										Breaking down drill rig
1200-1230										Lunch
1230										Bettendorf off site; on standby waiting for an operator to arrive
1310										SSO visits site; Ø ppm w/ PID
1320	"	"	226.92	6.8	220.12	"		219.4	0.72	D/sand = 219.4 [Final D/sand]
1325	"	"	"	"	"	1/2" volcanic tablets	2 buckets (5 gal)	213.5	6.32	D/pellets = 213.5
1335	"	"	"	8.8	218.12	"		214.5	3.62	D/pellets = 214.5
1345	"	"	"	9.8	217.12	"		215.3	1.82	D/pellets = 215.3
1350	"	"	223.92	6.6	216.82	"		215.95	0.87	D/pellets = 215.95 [Final D/pellets]
1352	"	"	"	"	"					Moving materials
1400	"	"	"	"	"	8-20 mesh ACC	15 bags			Adding crumbles
1405	"	"	"	"	"	Bentonite crumbles	(5 cu ft)	171.8	45.02	D/crumbles = 171.8
1420	"	"	209.5	6.5	198.3	"		180.6	17.7	D/crumbles = 180.6
1425	"	"	"	"	"	"	10 bags	151.9	46.4	D/crumbles = 151.9
1440	"	"	189.4	6.7	182.7	"		168.6	14.1	D/crumbles = 168.6
1450	"	"	"	"	"	"	10 bags	139.9	42.8	D/crumbles = 139.9

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9413223.0268

B BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W2	Date 4/13/90	Sheet No. 3 c
	Location 200 West 216-U-12' CR13	Project W-017 U-13	

Logged by S M Goodwin [signature] Date 4/13/90
Reviewed by D.E. McGlynn Date 4-27-90
Measuring Equip. L300-15 & Eng. Tape Procedure DO-1, Rev.0

Drilling Contractor KEH
Driller Thomas
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1505	Carbon Steel	8"	172.1	6.4	165.7	3-20 Crumbles		147.45	18.25	D/Crumbles = 147.45
1510										Shut Down; Can't cut 8" casing
										After 1500.

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-47 Date 4/16/90 Sheet No. 1 of 2 Location 200 West 216-U-12 CRIB Project W-017 U-12

Logged by S.M. Goodwin / [illegible] Date 4/16/90
Reviewed by D.L. McElroy Date 4-27-90
Measuring Equip. L300-15 & Tape Procedure DO-1, REV.0

Drilling Contractor ICEH
Driller THOMAS & BETTENDORF
Rig/Equipment RIG & JACKS

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	CARBON STEEL	8"	172.1	6.4	165.7	3-20 CRUMBLES		147.45	18.25	D/CRUMBLES = 147.45
0720	"	"	"	7.8	164.3	"		147.9	16.4	D/CRUMBLES = 147.9
0735	"	"	"	"	"	"	13 BAGS	110.4	53.9	D/CRUMBLES = 110.4
0745	"	"	152.6	6.6	146.0	"		119.1	26.9	D/CRUMBLES = 119.1
0800										REMOVING 8" CASING FROM HOLE
0830										8" CASING REMOVED; MOVING JACKS & CRANE
0900	"	10"	135.7	0.60	135.1	"		135.2	-0.1	D/CRUMBLES = 135.2
0910										PREPARING TO PULL 10" CASING; WELDING STICKUP, ETC
1050	"	10"	141.35	6.25	135.1	"		"	"	READY FOR PULLING 10"; WELDED ON 5.65' OF STICKUP
										ADDING CRUMBLES
1110	"	"	"	"	"	"	20 BAGS	104.15	30.95	D/CRUMBLES = 104.15
1115	"	"	"	"	"	"	10 BAGS	88.65	46.45	D/CRUMBLES = 88.65
1150	"	"	121.6	6.85	114.75	"		96.55	18.2	D/CRUMBLES = 96.55; 10" CASING IS PULLING HARD
1200-1230	LUNCH									
1240	CARBON STEEL	10"	"	"	"	"	15 BAGS	69.15	45.6	D/CRUMBLES = 69.15
1245										DRILLER WORKING ON CRANE
1310	"	"	106.3	6.5	99.8	"		74.6	25.2	D/CRUMBLES = 74.6
1320	"	"	"	"	"	"	10 BAGS	58.0	41.8	D/CRUMBLES = 58.0
1340	"	"	89.5	6.65	82.15	"		64.15	18.0	D/CRUMBLES = 64.15
1350	"	"	"	"	"	"	10 BAGS	47.15	35.0	D/CRUMBLES = 47.15
1410	"	"	68.6	6.7	61.9	"		55.3	6.6	D/CRUMBLES = 55.3

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BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W 43	Date 4/16/90	Sheet No. 2 of
	Location 200 WEST 216-U-12 CRIB	Project W-017 U-12	

Logged by S M Goodwin [illegible] Date 4/16/90
Reviewed by [illegible] Date 4-27-90
Measuring Equip. L300-15 & ENG. TAPE Procedure DO-1, REV. 0

Drilling Contractor KEH
Driller THOMAS & BETTENDORF
Rig/Equipment CRANE & JACKS

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1440	CARBON STEEL	10"	63.6	6.7	61.9	8-20 CRUMBLES	20 BAGS	22.0	39.9	D/CRUMBLES = 22.0
1445	"	"	50.0	6.75	43.25	"		29.95	13.3	D/CRUMBLES ~ 29.95
1450	"	"	"	"	"	"	5 BAGS	16.05	27.2	D/CRUMBLES = 16.05
1500	"	"	39.7	6.9	32.8	"		20.3	12.5	D/CRUMBLES = 20.3
										STOP WORK; CAN'T CUT AFTER 1500 HRS

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DAILY BOREHOLE/WELL COMPLETION LOG	Boring or Well Number 299-W22-13	Date 4/17/90	Sheet No. 1 of 1
	Location 200 West 216-U-12 Pond	Project U-12	

Logged by S.M. Gasquet / [illegible] Date 4/17/90
Reviewed by J.E. McKean Date 4-27-90
Measuring Equip. L300-15 / Cog. Tape Procedure DO-1, Rev 0

Drilling Contractor KEH
Driller Thresher & Bettencourt
Rig/Equipment Crane & Jacks

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
0700	Carbon Steel	10"	39.7	6.9	32.8	8-20 Crumbles		20.3	12.5	D/Crumbles = 20.3
0720	"	"	"	"	"	"	7 Bags	8.9	23.9	D/Crumbles = 8.9
0745	"	"	27.35	6.65	21.2	"		13.95	7.25	D/Crumbles = 13.95
0800	"	"	24.75	6.55	18.2	"		18.0	0.2'	D/Crumbles = 18.0 FINAL D/Crumbles
0805										Preparing to Mix Cement Grout
0830										Mixing Cement Grout; *Batch Consists of 7 94 lb. Sacks of Portland Type I-II Cement, ~28 oz. of Aluminum Powder, & 35 Gallons of Potable Water from 200 E Pond H_2O Supply.
0850	"	"	"	"	"	Cement Grout	7 Sack* Batch	19.55	+1.35	Pulling Casing
0905	"	"	13.6	6.85	6.75	"		0.50	6.25	D/Cement Grout = 6.25
0910	"	"	"	"	"					Mixing Grout
0930	"	"	"	"	"	"	5 Sack** Batch	12.0	+5.25	Pouring Grout
0935										Pulling 10"
0940					Ø	"		2.5	Ø	D/Cement Grout = 2.5 FINAL D/Grout
										** Batch Consisted of 5 94# Sacks of Portland Cement, 25 Gallons H_2O, & ~20 oz of Aluminum Powder
1000	Stainless Steel	4"	245.96	1.45	244.01					D/Bottom = 243.92 (w/ Tape L300-15)
										D/Water = 226.19 (w/ Tape L300-15)

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D' BOREHOLE/WELL COMPLETION LOG	Boring or Well Number [illegible]	Date [illegible]	Sheet No. [illegible] of [illegible]
	Location [illegible]	Project [illegible]	

Logged by [illegible]	Date [illegible]
Reviewed by [illegible]	Date 5-7-92
Measuring Equip.	Procedure [illegible]

Drilling Contractor [illegible]	
Driller [illegible]	
Rig/Equipment	

Time	Casing/Screen Type	Dia	Length	Stickup	Depth	Annular Fill Type	Quantity	Depth	Over lap	Comments
1330										Capped the [illegible] Co. out to pour concrete pad [illegible] Cap's listed in [illegible] [illegible] with [illegible] [illegible] [illegible] with [illegible] steel posts [illegible] set 30" and all center of 4"x4" steel. 6" casing has hasp and cap. Grav marker set on N side of pad. Cap was picked up before pouring.

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CENTRAL PRE-MIX CONCRETE CO.

WHC-MR-0208

INSPECTORS COPY

11919 HARRIS ROAD • PASCO, WA 99301

WA REG #223 01-CE-NT-RP-M311-J6

ID REG #5894-AAA-1-2-3 MT REG #3461A

UNLOADING
unloading time 7½ minutes per cubic yard
oncrete. Charge thereafter at posted truck
rates. This concrete designed in accordance
specifications indicated below.
make deliveries inside the curb line at cus-
er's risk only and accept no responsibility
soever for damages resulting from such
ries.

CONCRETE
SAND & GRAVEL

545-8405

CRUSHED ROCK
FILL

CAUTION: May cause eye or skin injury. Contains Portland cement. Freshly mixed cement, mortar, concrete, or grout may cause skin injury. Avoid contact with skin where possible, and wash exposed skin areas promptly with water. If any cement or cement mixtures get into the eye, rinse immediately and repeatedly with water and get prompt medical attention. All claims for damages or shortages must be made within 24 hours of delivery.

LEAVE PLANT	ARRIVE JOB SITE	START DISCHARGE	FINISH DISCHARGE	ARRIVE PLANT
:	2:2	12:37	:	:

☐ TEST CYLINDERS TAKEN
ADDITIONAL WATER ADDED TO THIS CONCRETE WILL REDUCE ITS STRENGTH.

ESTIMATED SLUMP AT UNLOADING _____

ADDED ____ GAL. WATER AT CUSTOMER REQUEST.

SIGNATURE

ORDER NO.	CUSTOMER NO.	CPM PROJECT NO.	CUSTOMER PO/JOB NO.	TICKET NO.		DRIVER	
				08917	00008254	DICK	1

CUSTOMER	DELIVERY ADDRESS	DATE
MIDEP	WEST., HANFORD	01-May-90

DELIVERY INSTRUCTIONS	MAP	TIME DUE

LOAD QTY.	DELIVERED QTY.	ORDER QTY.	PRODUCT CODE	PRODUCT DESCRIPTION	UNIT PRICE	AMOUNT
5.00	5.00	5.00	0304H	5000 7SK 3/4 5%		

WC RATIO ALLOWED _____
TOTAL WATER ALLOWED 1246
MOISTURE'S
3/4 1% 9520 9425 95
SAND 3.2 6360 6174 186
SUB TOTAL 9465
WATER BATCHED 60
TOTAL AVAILABLE 7 GAL.

LOAD SIZE	MIX NO.	MIX DESCRIPTION	SLUMP	AIR	CC	USE	TRUCK	PLANT	SUBTOTAL / TAX / TOTAL DUE
5.00	0304H	5000 7SK 3/4 5%	4.00	100	0.00		956	1	

Truck no.: 956 Batch size: 5.00 Yds. Mix name: 0304H
5000# 7.0 SK. 3/4 ASS. Time 11:39:11 AM Date 1 May, 1990

		Zero				Zero		
3/4 RND	1.0	9494	9520 Lbs C		LAFB-1-2	3290	3280 Lbs C	
ASTM SAN	3.0	15016	15920 Lbs C					
			Zero				Zero	
			Zero				Zero	
AEA-2	100	55	56 Oz C		WATER 1	906	905 Lbs C	
PLAST-3		195	196 Oz C					
			Zero				Zero	

Water trim: -10.0 / Yd. Time 11:42:37 AM

956

360

WELL CHECK LIST

Well Number: 299-W22-43 Location: 412

Date: 5-15-90

	Yes	No
Hasp on protective casing	X	
Lock	X	
Proper cap fit	X	
Well ID number on brass cap	X	
Protective post painted	X	
Well ID number stenciled on post		X
Well ID number stenciled on protective casing		X
Survey mark on casing		?
Stock tank		X
Site neat		X

Comments: needs to be leveled and equipment removed.

Signature: DW Flower Date: 5-15-90

9413227.0775

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