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ENGINEERING DATA TRANSMITTAL

Page 1 of 1

1. EDT 156739

2. To: (Receiving Organization) Distribution	3. From: (Originating Organization) Geosciences	4. Related EDT No.: NA
5. Proj./Prog./Dept./Div.: RCRA Geohydrology Section	6. Cog. Engr.: C. D. Delaney	7. Purchase Order No.: NA
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15. DATA TRANSMITTED

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1	WHC-SD-EN-DP-046		0	Borehole Completion Data Package for the CY 1991 216-B-3 Pond Drilling Project	4			

16. KEY

Impact Level (F)	Reason for Transmittal (G)	Disposition (H) & (I)
1, 2, 3, or 4 (see MRP 5.43)	1. Approval 2. Release 3. Information 4. Review 5. Post-Review 6. Dist. (Receipt Acknow. Required)	1. Approved 2. Approved w/comment 3. Disapproved w/comment 4. Reviewed no/comment 5. Reviewed w/comment 6. Receipt acknowledged

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2	1	Cog.Eng. C. D. Delaney	C.D. Delaney	7/20/92	H4-56						
2	1	Cog. Mgr. K. R. Fecht		7/20/92	H4-12						
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Cynthia Delaney 7/20/92 Signature of EDT Originator Date	Authorized Representative for Receiving Organization Date	Cognizant/Project Engineer's Manager Date 7/20/92	Ltr. No. [] Approved [] Approved w/comments [] Disapproved w/comments

BD-7400-172-2 (07/91) GEF097

BD-7400-172-1 (02/89)

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BD-7400-172-1R (02/89)

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SUPPORTING DOCUMENT		1. Total Pages ~~218~~
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7. Abstract

This data package summarizes 1991 RCRA drilling and completion activities at the 216-B-3 Pond System. Seven groundwater monitoring wells were installed under RCRA detection monitoring at the B Bond system.

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1.0 INTRODUCTION

This data package summarizes the drilling, well completion, aquifer testing, well development, and pump installation activities for seven Resource Conservation and Recovery Act of 1976 (RCRA) wells drilled at the 216-B-3 Pond during CY 1991. All 1991 RCRA groundwater monitoring wells were drilled to meet Tri-Party Agreement Milestone M-24-15 (Ecology et al. 1990). A compilation of data generated from the drilling, testing, and completion of the wells is provided. Drilling and well completion for the CY 1991 216-B-3 Pond activities began June 25, 1991, and continued through November 26, 1991. Four wells were constructed to monitor the upper portion of the uppermost aquifer and the remaining three were constructed to monitor an intermediate portion of the aquifer.

A description of the B Pond facility is contained in the *Interim Hydrogeologic Characterization Report for the 216-B-3 Pond* (WHC 1990a). B Pond is a series of unlined, interconnected wastewater disposal ponds that lie east of the 200 East Area (Figure 1). Elements that are considered part of the B Pond site include:

- 216-B-3 Pond
- 216-B-3A, 3B, and 3C Ponds
- 216-B-3-3 Ditch
- Part of an inactive overflow area (Figure 2).

All seven wells were installed and justified according to specifications outlined in *40 CFR 265 Interim-Status Ground-Water Monitoring Plan for the 216-B-3 Pond* (Luttrell et al. 1989) and *Generic Specifications - Groundwater Monitoring Wells* (WHC 1990b). Drilling, sampling, and documentation at the wells was performed according to procedures presented in the *Environmental Investigations and Site Characterization Manual* (WHC 1988). Specifically, the collection and documentation of borehole samples followed (Environmental Investigation Instruction (EII) 5.1, 5.2, and 9.1 (WHC 1988), and the construction of wells followed EII 6.1 and 6.8. Well locations and the strategies behind these locations are outlined in Engineering Change Notice Number 144245, supplement to the 216-B-3 Pond System Groundwater Monitoring Plan (WHC 1991a) (Figure 3).

2.0 DRILLING

All seven of the B Pond 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 collected with a bailer. Two 1-pint lithologic 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 and calcium carbonate content analyses from intervals that were drilled using drive barrel techniques. Samples for radiologic analyses were obtained from the same intervals as the lithologic samples. All samples analyzed for radionuclides and hazardous chemicals were measured less than the detectable limits.

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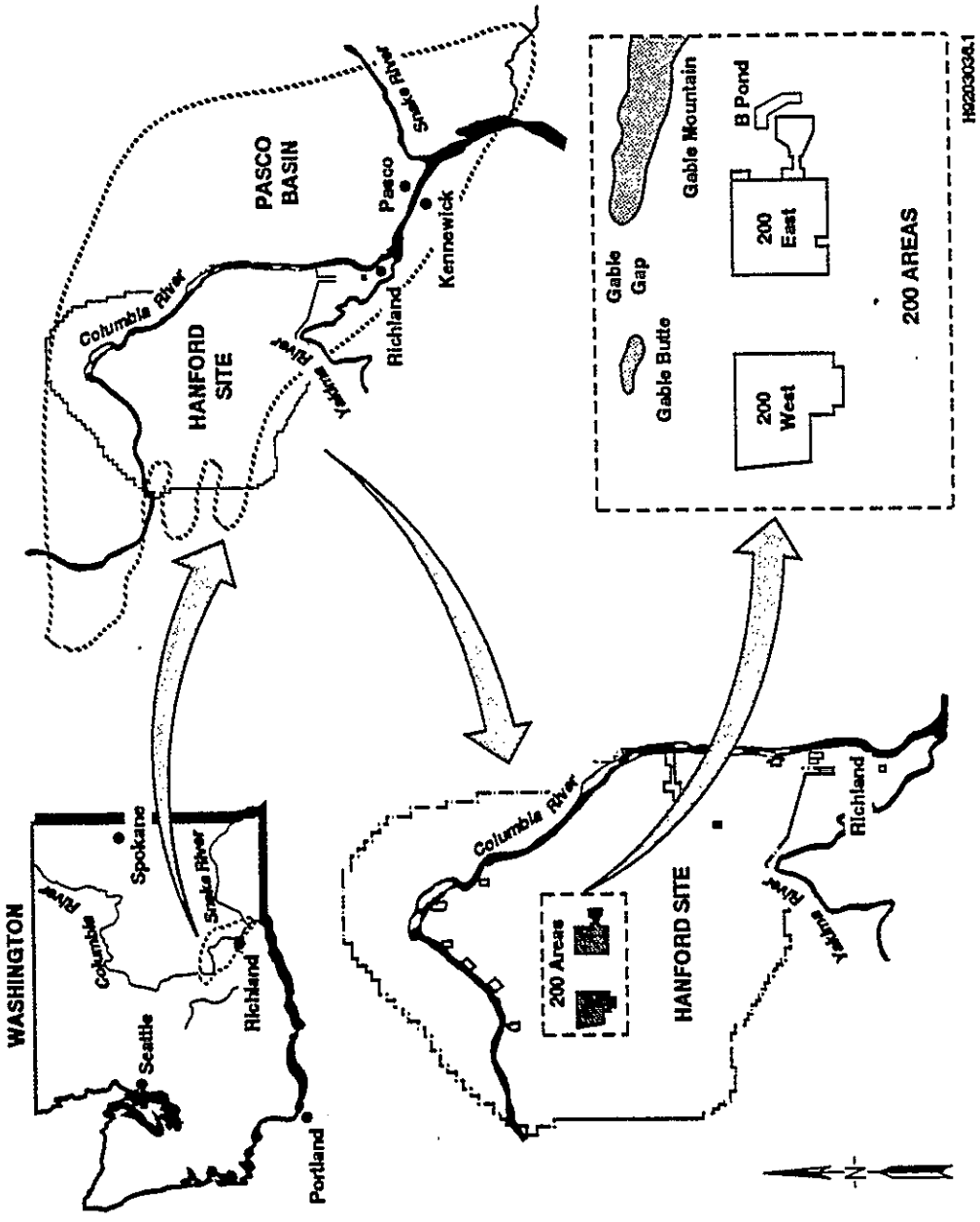

Figure 1. Map Showing the Locations of the Hanford Site and 216-B-3 Pond System.

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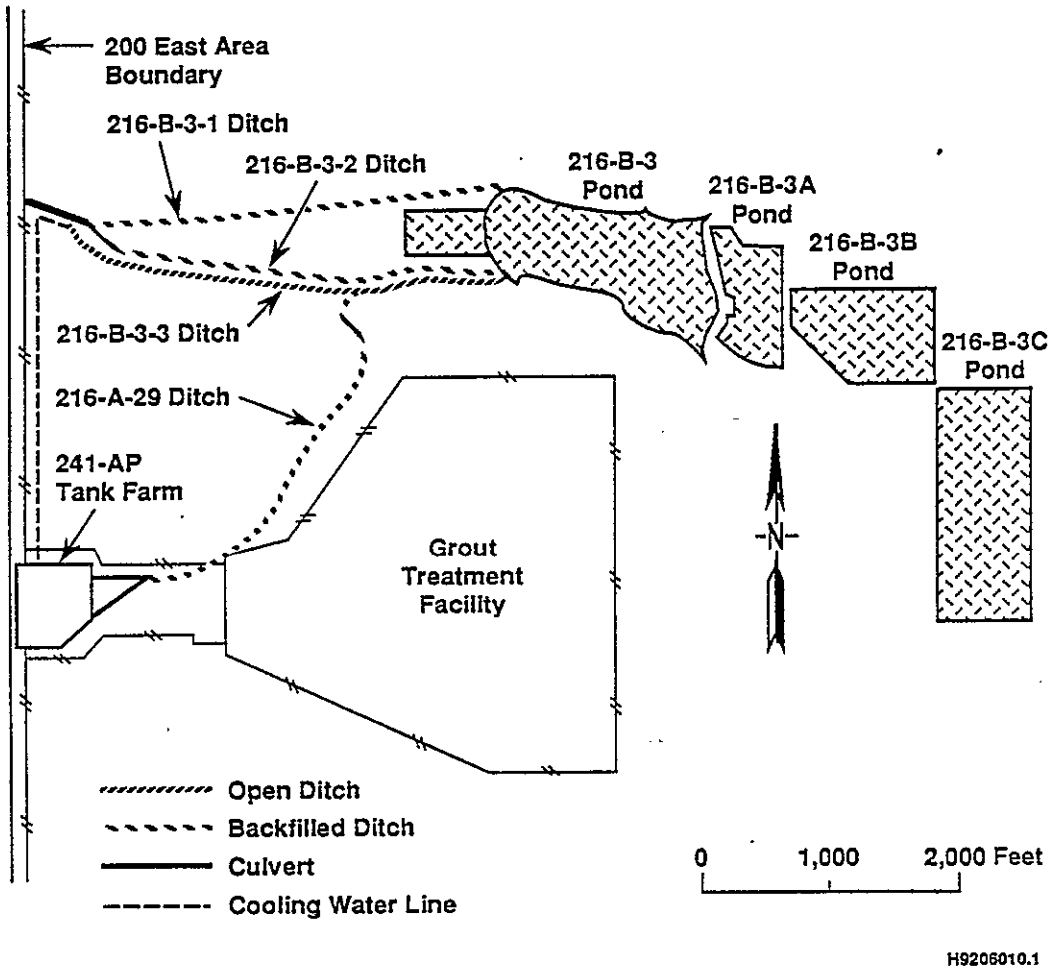

Figure 2. Location Map of the 216-B-3 Pond System.

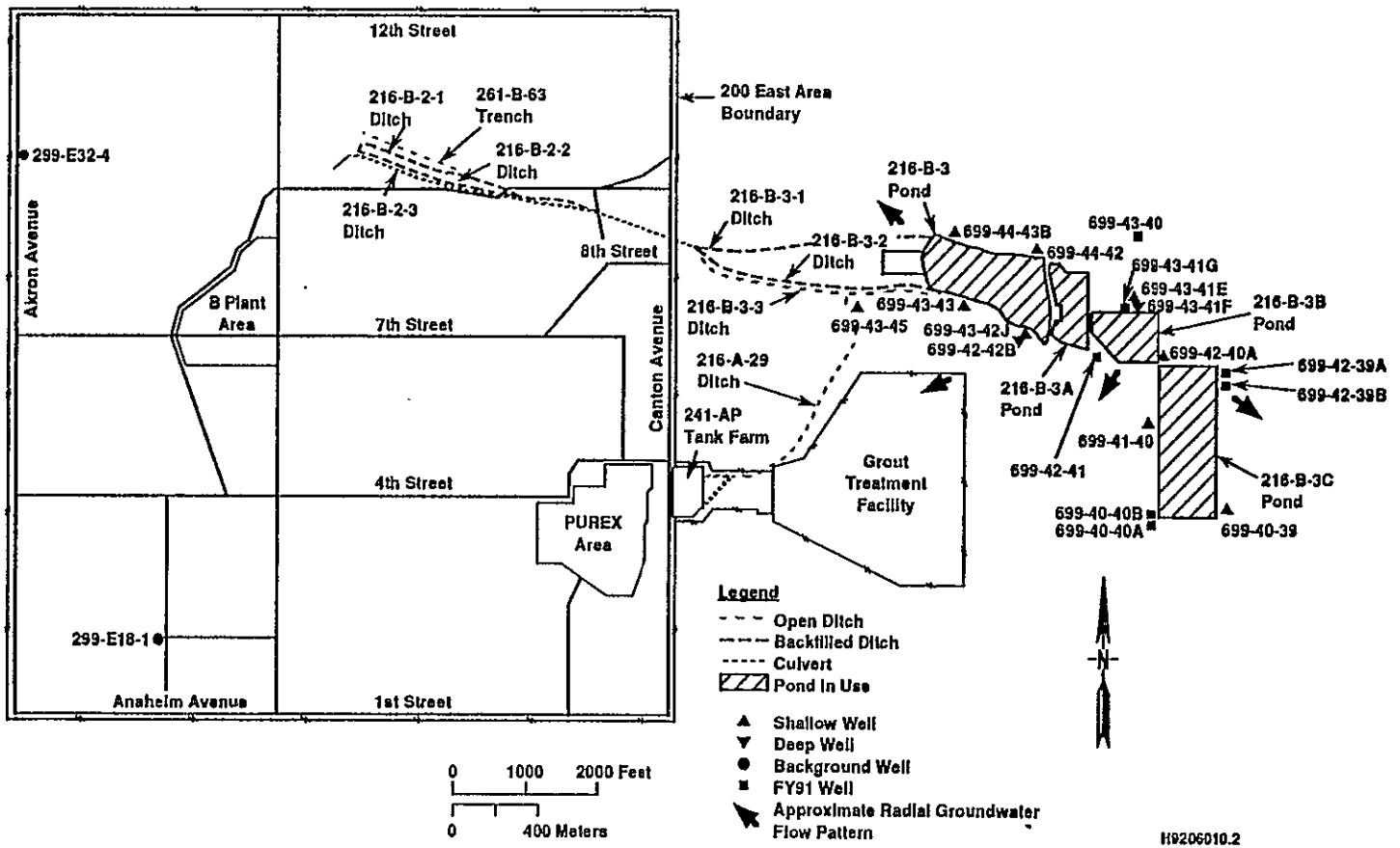

Figure 3. 216-B-3 Pond System Well Location Map.

Physical and chemical sample data are contained in Appendix B. Split-spoon samples were collected at specified intervals for the determination of physical properties. Specific gravity, moisture content, moisture retention, particle size, hydraulic conductivity, and porosity analyses were performed on split-spooned intervals. Data from the analyses is contained in Appendix B. Wells were drilled using telescoping carbon-steel casings with drive shoes.

The boreholes were geophysically logged with a gross-gamma probe before telescoping down to a smaller diameter carbon-steel casing; geophysical logs are included in Appendix A. Gross-gamma geophysical logging was in accordance with procedure EII 11.1 (WHC 1988).

3.0 WELL COMPLETION

After total depth was reached, the wells were bailed to remove any remaining material from the borehole and to confirm water depths. A straightness test was then performed to ensure the plumbness of the borehole by passing a length of casing to the bottom of the borehole with a minimum length of 20 ft and a minimum diameter of one pipe size smaller than the final temporary casing size. Six of the B Pond wells passed the straightness test. Well 699-43-40 failed the 8-in. dia straightness test, but was accepted upon passing a 6-in. dia straightness test.

The permanent 4-in. dia, type 304, schedule 5 stainless-steel casing and type 304 continuous wrap stainless-steel screen was then installed with a hydraulic crane. Factory welded stainless-steel casing centralizers were placed approximately 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 generally consisted of a silica sand pack, a bentonite pellet seal, an 8-20 mesh granular bentonite seal, and a cement grout seal. Bentonite grout was added above the pellet seal to the top of the unconfined aquifer on wells that penetrated the aquifer more than 15 ft. A concrete pad was poured upon completion of the annular fill and seal materials, and the final 4-in. stainless- steel casing stickup was reduced to a height of approximately 1 ft above the concrete pad. A 6-in. dia protective stainless-steel casing was installed at a height of 2.5 ft above the top of the 4-in. final casing and four yellow guard posts were set in concrete. A brass marker was then placed on the pad, and both the outer casing and the brass marker were stamped with the applicable well number.

4.0 WELL DEVELOPMENT

All B Pond wells were developed by pumping at a rate of approximately 10 gpm until the turbidity of a collected water sample was below 5 NTU or the sediment content was less than 8 mg/L. Submersible 1/2 hp pumps were used for development of all wells. Procedure EII 10.4 in WHC (1988) was utilized during well development activities. A summary table of water removed during well development activities is contained in Appendix C. HydroStar HS-80001

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(a tradename of Instrumentation Northwest, Inc.), positive displacement reciprocating cylinder pumps, were set in all seven wells and tested for proper operation. Sample pump installation logs are included in Appendix D; installation of the HydroStar pumps was in accordance with the manufacture's instruction manual.

5.0 AQUIFER TESTING

Slug tests were performed on all seven B Pond wells by quickly injecting or withdrawing a slugging rod in the well to displace the water column while measuring the water-level response with a pressure transducer data-logger system. The field procedure can be found in EII 10.1, Appendix A (WHC 1988). Data and analyses from the slug tests are in Appendix D.

A slug interference test was conducted in a three well cluster, which included wells 699-43-41E, 699-43-41F, and 699-43-41G. An instantaneous head decrease was initiated in the confined aquifer (Ringold Unit A gravels) at the stress well (699-43-41G), and the associated formation response was monitored at the two neighboring observation wells (699-43-41E and 699-43-41F). Analysis of the monitored pressure response at the observation wells provided estimates of the formation transmissivity and storativity. Transmissivity estimates obtained between the stress well and the observation wells ranged between 145 to 310 ft^2/day. Equivalent hydraulic conductivity values range between 2.8 ft/day and 6.0 ft/day. The hydraulic conductivity values obtained from the slug interference test compare favorably with hydraulic conductivity results from the slug injection/withdrawal tests. Storativity estimates obtained from slug interference test analysis for the observation wells provided results ranging between 2.9×10^{-3} and 4.4×10^{-3} (Spane 1992).

6.0 PUMP INSTALLATION

Hydrostar pumps were installed and tested between October 16, 1991, and November 24, 1991. Well development for all seven wells took place November 22 through November 25, 1991, until a turbidity reading less than 5 NTU was obtained. Slug injection and withdrawal tests were performed for all wells August 21 through August 22, 1991, and on November 25, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D.

7.0 WELL SUMMARIES

The following paragraphs describe the drilling, completion, aquifer testing, and development activities at individual wells; the datum for the measurements listed is below land surface. Well summary sheets in Appendix A graphically illustrate the lithologies encountered, depths of the temporary casings, and placement of the permanent materials.

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7.1 WELL 699-40-40A

Drilling began August 14, 1991, and continued until September 17, 1991, when a final depth of 226.1 ft was reached. A total of 120 ft of 12-in. dia and 225 ft of 10-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include: slightly sandy gravel and sandy gravel to silty sandy gravel from 0 to 120 ft; silty clay to silty sand 120 to 200 ft; sandy gravel to silty sandy gravel 200 to 225 ft; and slightly silty sand 225 to 227 ft. The well was logged with the gross-gamma geophysical probe on August 30, and September 17, 1991. The static water level measured on October 10, 1991, was 130.0 ft below ground surface. During drilling, approximately 235 gal of drill supply water were added to the borehole, 185 gal of which were added below the water table.

Well completion activities began October 10, 1991, and continued through October 17, 1991. A total of 218.1 ft of type 304, schedule 5 casing and 10.77 ft of 10-slot, type 304 continuous wrap channel pack screen was installed. The screen was placed from 225.87 to 215.1 ft, and the casing was placed from 215.1 to 3.0 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 226.1 to 211.6 ft, and 40-100 mesh sand 211.6 to 208.5 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 30 gal were removed to develop the sand pack. Bentonite pellets were placed from 208.5 to 205.3 ft, followed by bentonite grout 205.3 ft to 118.9 ft. Bentonite crumbles were then placed 118.9 ft to 21.0 ft, and a cement grout seal poured from 21.0 to 1.91 ft. The cement pad was installed from 1.91 to 0.5 ft above land surface. The well design is classified as lower semiconfined.

Well development took place on November 20, 1991, until a turbidity reading of 4.7 NTU was obtained. Slug injection and withdrawal tests were performed on November 22, 1991, to provide estimates on aquifer hydraulic conductivity and/or transmissivity. Data from the slug tests can be found in Appendix D. The Hydrostar pump was installed and tested on November 22, 1991. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-40-40A. Vertical reference point elevations for well 699-40-40A were surveyed to the National Geodetic Vertical Datum (NGVD) of 1929 (NGVD 29) and can be found in Appendix A.

7.2 WELL 699-40-40B

Drilling began August 2, 1991, and continued until September 19, 1991, when a final depth of 202.0 ft was reached. A total of 40.2 ft of 16-in. dia, 98.36 ft of 12-in. dia, 129.54 ft of 10-in. dia, and 201.1 ft of 8-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include: silty sand to gravelly sand from 0 to 45 ft; sandy gravel and gravel to silty sandy gravel from 45 to 123 ft; silt and clay to sandy silt 123 to 170 ft; slightly gravelly sandy clay to silty sand 173 to 193 ft; and sandy gravel from 193 to 200 ft. The well was logged with the gross-gamma geophysical probe on August 12, 1991, and September 19, 1991. The static water level measured on October 15, 1991, was 125.9 ft below ground surface. During drilling, approximately

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230 gal of drill supply water were added to the borehole, 165 gal of which were added below the water table.

Well completion activities began October 10, 1991, and continued through October 16, 1991. A total of 190.03 ft of type 304, schedule 5 casing and 10.82 ft of 10-slot, type 304 continuous wrap channel pack screen was installed. The screen was placed from 198.6 to 187.8 ft, and the casing was placed from 187.8 to 2.23 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 199.6 to 184.9 ft, and 40-100 mesh sand 184.9 to 183.0 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 35 gal were removed to develop the sand pack. Bentonite pellets were placed from 183.0 to 180.0 ft, followed by bentonite grout 180.0 ft to 107.75 ft. Bentonite crumbles were then placed 107.75 ft to 22.6 ft, and a cement grout seal poured from 22.6 to 1.5 ft. The cement pad was installed from 1.5 to 0.5 ft above land surface. The well design is classified as upper semiconfined.

Well development took place on October 28, 1991, and November 19, 1991, until a turbidity reading of 4.8 NTU was obtained. Slug injection and withdrawal tests were performed on November 20, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D. The Hydrostar pump was installed and tested on November 20, 1991. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-40-40B. Vertical reference point elevations for well 699-40-40B were surveyed to the NGVD of 1929 (NGVD 29) and can be found in Appendix A.

7.3 WELL 699-42-39A (TEMPORARY NO. 699-BP91-2)

Drilling began June 25, 1991, and continued until August 12, 1991, when a final depth of 180.65 ft was reached. A total of 143.52 ft of 12-in. dia and 180.12 ft of 10-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include: gravelly sand to sandy gravel 0 to 135 ft; clayey and sandy silt to silty sand 135 to 165 ft; and sandy gravel 165 to 180 ft. The well was logged with the gross-gamma geophysical probe on August 2, 1991, and August 9, 1991. The static water level measured on August 5, 1991, was 143.0 ft below ground surface. During drilling, approximately 221 gal of drill supply water were added to the borehole, 108 gal of which were added below the water table.

Well completion activities began September 6, 1991, and continued through September 26, 1991. A total of 173.03 ft of type 304, schedule 5 casing and 10.67 ft of 10-slot, type 304 continuous wrap screen was installed. The screen was placed from 180.1 to 169.4 ft, and the casing was placed from 169.4 to 3.6 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 179.9 to 165.5 ft, and 40-100 mesh sand 165.5 to 162.6 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 35 gal were removed to develop the sand pack. Bentonite pellets were placed from 162.6 to 159.6 ft, followed by bentonite grout 159.6 ft to 128.5 ft. Bentonite crumbles were then placed 128.5 ft to 20.3 ft, and a cement grout seal poured from 20.3 to 2.5 ft. The cement pad was installed from 2.5 to 0.5 ft above land surface. The well design is classified as upper semiconfined.

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Well development took place on October 21, 1991, until a turbidity reading of 4.2 NTU was obtained. Slug injection and withdrawal tests were performed on October 22, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D. The Hydrostar pump was installed and tested on October 22, 1991. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-42-39A. Vertical reference point elevations for well 699-42-39A were surveyed to the NGVD of 1929 (NGVD 29) and can be found in Appendix A.

7.4 WELL 699-42-39B (TEMPORARY NO. 699-BP91-3)

Drilling began August 13, 1991, and continued until September 16, 1991, when a final depth of 216.0 ft was reached. A total of 136.7 ft of 12-in. dia and 213.89 ft of 10-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include: sandy gravel to silty sandy gravel 0 to 130 ft; clayey silt to sandy clayey silt 130 to 170 ft; silty sandy gravel 170 to 210 ft; and silt 210 to 216 ft. The well was logged with the gross-gamma geophysical probe on September 5, 1991, and September 17, 1991. The static water level measured on August 22, 1991, was 134.7 ft below ground surface. During drilling, approximately 564 gal of drill supply water were added to the borehole, 510 gal of which were added below the water table.

Well completion activities began September 27 through October 9, 1991. A total of 208.01 ft of type 304, schedule 5 casing and 10.79 ft of 10-slot, type 304 continuous wrap channel pack screen was installed. The screen was placed from 213.8 to 203.0 ft, and the casing was placed from 203.0 to 5.0 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 214.2 to 197.2 ft, and 40-100 mesh sand 197.2 to 194.2 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 40 gal were removed to develop the sand pack. Bentonite pellets were placed from 194.2 to 188.7 ft, followed by bentonite grout 188.7 ft to 130.3 ft. Bentonite crumbles were then placed 130.3 ft to 21.3 ft, and a cement grout seal poured from 21.3 to 2.5 ft. The cement pad was installed from 2.5 to 0.5 ft above land surface. The well design is classified as lower semiconfined.

Well development took place on October 23, 1991, until a turbidity reading of 3.0 NTU was obtained. Slug injection and withdrawal tests were performed on October 24, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D. The Hydrostar pump was installed and tested on October 24, 1991. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-42-39B. Vertical reference point elevations for well 699-42-39B were surveyed to the NGVD of 1929 (NGVD 29) and can be found in Appendix A.

7.5 WELL 699-42-41

Drilling began June 27, 1991, and continued until July 31, 1991, when a final depth of 156.72 ft was reached. A total of 49.11 ft of 12-in. dia and

9 3 1 2 7 0 3 7 5

154.91 ft of 10-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include sandy gravel to silty sandy gravel from 0 to 156.72 ft, with a lens of gravelly sand from 85 to 95 ft, and a confining layer of silty sand from 154 to 156 ft. The well was logged with the gross-gamma geophysical probe on July 30, 1991. The static water level measured on July 25, 1991, was 142.0 ft below ground surface. During drilling, approximately 12 gal of drill supply water were added to the borehole, none of which was added below the water table.

Well completion activities began August 27, 1991, and continued through August 29, 1991. A total of 140.0 ft of type 304, schedule 5 casing and 21.0 ft of 10-slot, type 304 continuous wrap channel pack screen was installed. The screen was placed from 155.2 to 134.2 ft, and the casing was placed from 134.2 to 5.8 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 154.8 to 130.3 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 35 gal were removed to develop the sand pack. Bentonite pellets were placed from 130.3 to 125.6 ft, followed by bentonite crumbles from 125.6 ft to 20.4 ft, and then a cement grout seal was poured from 20.4 to 2.0 ft. The cement pad was installed from 2.0 to 0.5 ft above land surface. The well design is classified as a water table well.

Well development took place on October 16, 1991, until a turbidity reading of 3.8 NTU was obtained. Slug injection and withdrawal tests were performed on October 16, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D. The Hydrostar pump was installed and tested on October 16, 1991. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-42-41. Vertical reference point elevations for well 699-42-41 were surveyed to NGVD of 1929 (NGVD 29) and can be found in Appendix A.

7.6 WELL 699-43-40

Drilling began July 8, 1991, and continued until August 27, 1991, when a final depth of 137.0 ft was reached. A total of 38.60 ft of 12-in. dia and 136.27 ft of 10-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include sandy gravel and silty sandy gravel. The well was logged with the gross-gamma geophysical probe on August 27, 1991, and the magnetic geophysical log on October 24, 1991, to locate the 10-in. dia drill shoe. The 10-in. dia drill shoe separated from the temporary carbon-steel casing during completion activities; approximately 95% of the shoe remains at 129.5 ft below ground surface. The static water level measured on October 21, 1991, was 118.3 ft below ground surface. During drilling, approximately 189 gal of drill supply water were added to the borehole, 35 gal of which were added below the water table.

Well completion activities began October 17, 1991, and continued through October 26, 1991. A total of 129.1 ft of type 304, schedule 5 casing and 11.0 ft of 10-slot, type 304 continuous wrap screen was installed. The screen

9 3 1 2 7 0 3 7 6

was placed from 135.3 to 124.3 ft, and the casing was placed from 124.3 to 4.8 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 134.4 to 109.5 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 30 gal were removed to develop the sand pack. Bentonite pellets were placed from 109.5 to 106.9 ft, followed by bentonite crumbles from 109.5 ft to 20.0 ft, and a cement grout seal poured from 20.0 to 2.0 ft. The cement pad was installed from 2.0 to 0.5 ft above land surface. The well design is classified as a water table well.

This well does not comply with Washington Administrative Code (WAC) 173-160-520 because a portion of the temporary casing shoe inadvertently detached from the temporary 8 in. casing during pull back operations. The shoe is located adjacent to the stainless-steel screen interval (see Well Summary Report in Appendix A). A variance was granted from the State of Washington Department of Ecology.

Well development took place on November 26, 1991, until a turbidity reading of 4.8 NTU was obtained. Slug injection and withdrawal tests were performed on November 26, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D. The Hydrostar pump was installed and tested on November 26, 1991. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-43-40. Vertical reference point elevations for well 699-43-40 were surveyed to NGVD of 1929 (NGVD 29) and can be found in Appendix A.

7.7 WELL 699-43-41G

Drilling began July 31, 1991, and continued until September 9, 1991, when a final depth of 201.0 ft was reached. A total of 41.86 ft of 16-in. dia, 127.89 ft of 12-in. dia, 181.75 ft of 10-in. dia, and 201.34 ft of 8-in. dia temporary carbon-steel casing was used to reach the final depth. Sediments encountered are graphically represented in the well summary sheets in Appendix A. The primary lithologies encountered include: gravelly sand and sandy gravel 0 to 60 ft; silty sandy gravel from 60 to 75 ft; and gravelly sand and sandy gravel from 75 to 125 ft. The well was logged with the gross-gamma geophysical probe on September 4, 1991, and September 10, 1991. The static water level measured on October 17, 1991, was 137.9 ft below ground surface. During drilling, approximately 186 gal of drill supply water were added to the borehole, the total sum of which was added below the water table.

Well completion activities began October 17, 1991, and continued through October 21, 1991. A total of 195.2 ft of type 304, schedule 5 casing and 10.36 ft of 10-slot, type 304 continuous wrap screen was installed. The screen was placed from 198.6 to 188.3 ft, and the casing was placed from 188.3 to 6.9 ft above land surface. The Colorado silica sand filter pack consisted of 20-40 mesh sand 198.7 to 183.9 ft, and 40-100 mesh sand 183.9 to 181.8 ft. The sand pack was settled by bailing inside the screen with a dart bailer; approximately 30 gal were removed to develop the sand pack. Bentonite pellets were placed from 181.8 to 176.5 ft, followed by bentonite grout 176.5 ft to 135.5 ft. Bentonite crumbles were then placed 135.5 ft to 20.0 ft, and a cement grout seal poured from 20.0 to 3.0 ft. The cement pad was installed

from 3.0 to 0.5 ft above land surface. The well design is classified as bottom of semiconfined.

Well development took place on November 25,1991, until a turbidity reading of 4.7 NTU was obtained. Slug injection and withdrawal tests were performed on August 21 and 27, 1991, and November 25 and 26, 1991, to provide estimates on aquifer properties. Data from the slug tests can be found in Appendix D. A slug interference test was conducted on August 28, 1991, using 699-43-41G as the test well. Wells 699-43-41E and 699-43-41F were used as observation wells. Data and analyses for the slug interference test can be found in Spane (1992). The Hydrostar pump was installed and tested on November 25, 1991. Once the sample-pump was installed and satisfactorily tested, the well was considered complete. Well development and pump installation information is contained in Appendix C. The successful testing of the sampling pump completed installation activities at well 699-43-41G. Vertical reference point elevations for well 699-43-41G were surveyed to NGVD of 1929 (NGVD 29) and can be found in Appendix A.

9.0 REFERENCES

Luttrell, S. P., M. A. Chamness, S. Dudziak, 1989, *Interim-Status Indicator-Evaluation Ground-Water Monitoring Plan for the 216-B-3 Pond*, WHC-SD-EN-AP-013, Rev. 0, prepared by Pacific Northwest Laboratory for Westinghouse Hanford Company, Richland, Washington.

Spane, F. A., Jr., 1992, *Applicability of Slug Interference Tests Under Hanford Site Test Conditions: Analytical Assessment and Field Test Evaluation*, PNL-8070, Pacific Northwest Laboratory, Richland, Washington.

WHC, 1988, *Environmental Investigations and Site Characterization Manual*, WHC-CM-7-7, Westinghouse Hanford Company, Richland, Washington.

WHC, 1990a, *Interim Hydrogeologic Characterization Report for the 216-B-3 Pond*, WHC-SD-EN-EV-002, Westinghouse Hanford Company, Richland, Washington.

WHC, 1990b, *Generic Specifications-Groundwater Monitoring Wells*, WHC-S-014, Westinghouse Hanford Company, Richland, Washington.

WHC, 1991a, *Interim-Status Indicator-Evaluation Ground-Water Monitoring Plan for the 216-B-3 Pond*, WHC-SD-EN-AP-013, Rev. 0, Engineering Change Notice No. 144245, supplement to the Ground-Water Monitoring Plan for the 216-B-3 Pond, Westinghouse Hanford Company, Richland, Washington.

WHC, 1991b, *Geotechnical Engineering Procedures Manual*, Vol. 1 and 2, WHC-IP-0635, Rev. 0, Westinghouse Hanford Company, Richland, Washington.

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APPENDIX A

WELL CONSTRUCTION REPORTS
BOREHOLE LOGS
WELL SUMMARY SHEETS
GEOPHYSICAL LOGS
WELL SURVEY DATA

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9 3 1 2 7 3 9 0 3 9 0

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WELL CONSTRUCTION REPORT

SIGNATURE/DATE 2/4/92

Page 1 of 2

Specification No. WHC-S-014 Rev No. 5

ECNs 144240, 144241

Project W017 / B-Pond

Location 216 B-3 Pond C-Lobe

Drilling Company KEH

Driller Darrel Ludtice, Jim Smith, J. Carpenter, Gt Hale

Other (Companies) Ebasco, Salem, Hart Crowser

Geologist(s) Chris Wright [signature]
Dale Drewry Dale Drewry
Storey Callison R. Weingart
Edward C. LaFase Edward C. LaFase

Well No. 699-40-40A Temp. Well No. N/A

Coordinates N 39710.4 Hanford W: 40071.5 Lambert N135, 594.31 E 573, 680.25

Casing Elev. 541.21' Ground Elev. 537.75'

Drilling Method

Verification Method Visual Observation

Criteria WHC-S-014 5.2, 5.3, 7.5 EII 6.7 Sec 6.2

			Initials	Date
Rotary	Air —	Mud —	—	—
Cable Tool	D 0-121	H 180-225' 121-164	S.T.-225-227' S.T.-164-180	9/17/91 DBD
Drilling Fluid	Raw Water	235 gal	DBD	9/3/91
Other	—	—	—	—

Geophysical Logging

Sondes	Interval	Date
gross gamma log	4.0' - 119.3'	8/30/91
gross gamma log	90.0' - 226.9'	9/17/91
	-	
	-	
	-	

Completion Data

Drilled Depth 227.0

Completed Depth 226.1'

Date Started 8/14/91

Date Completed 10-7-91

Static Water Level/Date ~~230.0'~~ 130.0' Rev 10-10-91, - 10-10-91

Aquifer Testing

Type Instantaneous Scag

Flow Meter I.D. No. -NA-

Cal. Due Date -NA-

Length of Test 1 Hr

Volume Pumped -NA-

Drawdown -NA-

Date of Test 11-22-91

Completion Results

Cleaning

Verification Method Visual Inspection (Document Review)

Criteria WHC-S-014 Sec 4.2.2, 7.6, 7.7, WHC-CM-7.7 Sec 5.4

	Initials	Date
Drilling Tools/Rig	CSW	8/14/91
Temporary Materials	[signature]	9/17/91
Permanent Materials	[signature]	10-10-91

Screen

Type	Length	Slot Size
T304 SS Channel Pack	10.7	10

Depth(s) 225.87 - 215.1'

Verification Method Steel Tape

Criteria WHC-S-014 4.2.3, 4.25, 22.1, 4.21

Initials [signature] Date 10-17-91

Material Storage/Packing

Verification Method Visual Observation

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	[signature]	10-17-91
Material Packing	[signature]	10-17-91

Lubricants/Additives

Verification Method Visual Observation

Criteria WHC-S-014 Sec 7.2

	Identify	Initials	Date
Additives	*Raw Water	DBD	9/3/91
Lubricants	Well Guard	DBD	8/30/91

Straightness Test

Verification Method Visual Observation

Criteria WHC-S-014 - Sec 8.2

Initials DBD [signature] Date 9-17-91

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WELL CONSTRUCTION REPORT
(continuation sheet)

299-43-41G

Page 2 of

Casing (permanent)

Type	Size	Placement
T 304 SS 4" ID ~~Tamerpack~~	4"	215.1 - -3'
		-
		-
		-

Verification Method Measure w/ Steel Tape

Criteria WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials MW Date 10-17-91

Well Protection

Verification Method Measure w/ Steel Tape

Criteria WHC-S-014 4.2.10

	Initials	Date
Protective Posts	ECN	1/24/92
Protective Casing	ECN	1/24/92
Site Restored	ECN	1/24/92
Cap, Hasp and Lock	ECN	1/24/92
Surface Pad	ECN	1/24/92

Annular Seal/Filter Pack

* Verification Method Measure w/ Steel Tape Criteria WHC-S-014, 4.2.6, 4.2.7, 4.2.8, 4.2.9, 5.3.1

Type	Interval	Volume	Initials	Date
20-40 - Silica Sand	226.1 - 211.6	6 bg 6.72 ft³	MW	10-17-91
40-100 Sand	211.6 - 208.5	2 bg 2.30 ft³	MW	10-17-91
3/8" bentonite Pellets	208.5 - 205.3	1 bucket .62 ft³	MW	10-17-91
Bentonite Grout	205.3 - 118.9	54 bg 35.10 ft³	MW	10-17-91
20-8 Bentonite Crumbles	118.9 - 21.0	114 bg 80.94 ft³	MW	10-17-91

Well Survey/Labeling

Verification Method Review of Survey Reports & Visual

Criteria WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	ECN	1/24/92
Protective Casing/Brass Cap Surveyed	ECN	1/24/92
Well Number Stenciled	ECN	1/24/92
Brass Cap Labeled	ECN	1/24/92

Pump Installation

Verification Method Visual observation

Criteria WHC-S-014 4.2.11, 4.2.3

	Initials	Date
Pump Decon/Prep	JAC	11/22/91
Installed	JAC	11/22/91
Pump Tested	JAC	11/22/91

Other (initial if performed)

N/A Well Abandonment N/A Downhole TV Inspection E.C.L Complete As-Built Diagram, Driller's/Geologist's Logs

JAC 11/24/91 11/22/91 Well Development

Comments/Remarks * Raw water added - 9/3/91 (15 gal) - 9/4/91 (35 gal) - 9/5/91 (60 gal) - 9/6/91 (75 gal) - 9/9/91 (50 gal)

* Cement Grout 21.0 - 1.9' 19 bgs 29.4 ft³ MW 10-17-91

Reviewed By (Sign/Print Name) Edward C. Rafuse / Edward C. Rafuse Date 1/29/92

A-6000-436 (09/90)

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WELL SUMMARY SHEET

Boring or Well No. 299-40-40A

Sheet 1 of 2

Location 216-B3-Pond . C lobe

Project WC17-B pond

Elevation ~~Land surface~~ 12/14/91 SW 537.75'

Drilling Contractor KEH

Driller D. Cuddle

Drilling Method and Equipment Cable tool, BE22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9/17/91

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 1/28/92

CONSTRUCTION DATA Description	Diagram	Depth in Feet	GEOLOGIC/HYDROLOGIC DATA Graphic Log	Lithologic Description
bottom of 12" casing		0.0-5.5 ~~10~~		SILTY-SANDY GRAVEL
@ 120.5' bls ↓		10		" " "
Cement Grout 19'-21.0'				" " "
		20		SANDY-GRAVEL
8-20 Bent Crumbles				" "
21.0' - 118.9'		30		" "
				" "
		40		" "
				" "
		50		" "
				" "
		60		" "
				" "
		70		" "
		80		SLIGHTLY-SANDY GRAVEL
				" " "
		90		" " "
				" " "
		100		" " "
Bentonite Slurry 205.3 -				SANDY-GRAVEL
118.9		110		" "
12" csg set @ 120.03 b.l.s.				SILTY-SANDY GRAVEL Hanford
12" drive shoe = 1.10 ft		118 120		SILTY-CLAY Rinsold
8/30/91				SILTY-CLAY
water level 10-10-91		130		SLIGHTLY-SILTY CLAY
130'				" " "
		140		" " "
				slightly muddy silty-CLAY
		150		" " " "
				slightly muddy silty CLAY
		160		slightly-silty CLAY
				" " "

A-6000-384 (04/90)

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4 of 5

WELL SUMMARY SHEET

Boring or Well No. 699-40-40A

Sheet 2 of 2

Location 216-B3-pond - C-lobe

Project W-017 / B-pond

Elevation ~~Land Surface~~ 12/19/91 Surv 537.75'

Drilling Contractor KEH

Driller D. Ludtke

Drilling Method and Equipment Cable Tool / BE-22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9/17/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 1/28/92

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram 10"		Graphic Log	Lithologic Description
bottom of 10" casing		170		slightly silty - SAND
@ 225 ↓ b.l.s.				Sandy - SILT
		180		slightly - silty SAND
				" " "
		190		slightly silty - slightly gravelly SAND
3/8" bentonite Pellets 208.5 - 205.3				" " " " "
1100 Sand 211.6 - 208.5		200		Silty sandy - GRAVEL
20-40 SS Sand 226.1 - 211.6				Sandy - GRAVEL
		210		" "
10" set @ 225' bls				" "
10" drive shoe = 0.86 ∅		220		" "
9/17/91				Silty - SAND @ 224' bls
4" STAINLESS SET @ 215.1'	TD = 227.0	230		Silty - SAND @ 227' bls = T.D.
POSLOT CHANNEL PACK SCREEN		TD = 227.0		
PLACED FROM 225.87' TO 215.1'		2/4/92		
2/4/92				

A-6000-384 (04/90)

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BOREHOLE LOG

SIGNATURE/DATE 2/4/92

Boring or Well No. 699-40-40A

Sheet 1 of 13

Location 216-B3-pond C-lobe

Project W017-B pond

Elevation 537.75'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool - BE 22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 8-16-91

Reviewed By Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
0	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		5' SILTY SANDY-GRAVEL (70% gravel, 25% sand, 5% silt) 5% sC, 10% vcP 10% cP 20% mP, 20% fP, 5% vfP SAND - 15% vcS, 7% cS, 2% mS color dry (5Y, 6/1) gray - color wet (5Y, 4/2) olive gray, sample dry, poorly sorted Pebbles; sub-rounded / sub-angular SAND: sub-rounded to subangular; 70% Basalt 20% Felsic, 10% Quartz; strong rx to 10% HCL	0915 8-16-91
5'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		10' SILTY SANDY-GRAVEL (75% gravel 20% sand, 5% silt) GRAVEL: 10% cC, 20% cP, 20% mP, 25% fP SAND: 15% cS 5% mS: dry color (5Y, 6/1) gray, color wet (5Y, 4/2) olive-gray - sample dry. rounded to subrounded - 70% basalt, 30% Felsic strong rx to 10% HCL	0935 8-16-91
10'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		15' SILTY SANDY-GRAVEL (80% gravel 15% sand, 5% silt) Gravel: 5% sC, 15% vcP 20% cP, 15% mP, 25% mP; Sand: 8% cS 7% mS dry color (5Y 6/1) gray, color wet (5Y 4/2) olive gray - sample dry rounded to subrounded - 70% basalt 30% Felsic / Quartz - strong rx to 10% HCl	1355 8-16-91
15	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		20-25 SANDY-GRAVEL (80% gravel, 20% sand) gravel: 5% sC, 20% vcC, 20% cP 15% mP, 10% fP, 10% vfP Sand: 10% cS, 5% mS 5% fS; wet color (5Y, 3/1) very dark gray, dry color (5Y, 6/1) gray sample damp, subround - subangular 80% basalt, 20% Felsic, strong rx to 10% HCl	1425 8-16-91
20					

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 2 of 13

Location 216 - B3 pond - L lobe

Project W017 - B

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool AE 22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 8-19-91

Reviewed By Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (20)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
ECL 8/21/91 25 ~~20~~	2 lith 1 rad 1 mois/ $CACO_3$	D.B.		25' - SANDY-GRAVEL (80%, 20% sand) gravel: 5% sC, 20% vcC, 20% cP, 15% mP 10% fp, 10% vfP, Sand: 10% vcS, 5% mS 5% fS; wet color (5Y 3/1) very dark gray, dry color (5Y 6/1) gray, sample damp, sub-round to angular, 80% basalt, 20% Felsic strong rx to 10% HCL	1450 8-16-91
ECL 8/21/91 30 ~~25~~	2 lith 1 rad 1 mois/ $CACO_3$	D.B.		30' SANDY GRAVEL 75% angular to rounded gravel, 20% lC, 20% sC, 20% vcP 10% cP, 5% mP Sand: 15% cS, 5% mS 5% fS, moderate rx to 10% HCL, poorly sorted, 80% mafic, 20% Felsic, (5Y 7/1) light gray, (5Y 3/1) very dark gray > wet	1033 D.A. 8-20-91 ~~1050~~ 8-19-91
ECL 8/21/91 35 ~~30~~	2 lith 1 rad 1 mois/ $CACO_3$	D.B		35' SANDY-GRAVEL 70% Angular to rounded gravel, 20% lgC, 20% sC 20% vcP, 10% cP, Sand = 30% - 20% cS 10 mS, slightly moderate rx to 10% HCL fairly to poorly sorted, 80% mafic, 20% Felsic, (5Y 7/1) light gray ~~wet~~ dry D.A. 8-20-91 - (5Y 3/1) very dark gray, ~~wet~~ wet D.A. 8-20-91, slightly moist	1050 8-19-91
ECL 8/21/91 40 ~~35~~	2 lith 1 rad 1 mois/ $CACO_3$	D.B		40' SANDY-GRAVEL (see above) D.A. 8-20-91 ~~see page~~	1415 8-19-91

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WHC-SD-EN-DP-046, Rev. 0

BOREHOLE LOG

Boring or Well No.

Sheet 3 of 13

Location 216-B3 Pond - C Lobe

Project W 017-B

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller Daniel Lutter

Drilling Method and Equipment Cable Tool - BE 22W

Prepared By Dale Drewry, Dale Drewry (Sign/Print Name) Date 8-20-91

Reviewed By Edward C. Rafuse, Edward C. Rafuse (Sign/Print Name) Date 08/21/91

Depth (40)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 lith 1 rad 1 mois/ $CACO_3$	D.B.		45' SANDY-GRAVEL - 70% rounded to subrounded gravel, 10% SmC, 25% VCP 20% CP, 15% mP, 30% sand, 20% CS, 10% mS, wet color (5Y 3/1) dry color (5Y 6/1) Very dark gray, gray, - sample slightly moist, 75% mafic, 25% Felsic, poorly sorted, weak rx to 10% HCl	~~[illegible]~~ 1015 8/20/91
45	2 lith 1 rad 1 mois/ $CACO_3$	D.B.		50' SANDY-GRAVEL (80% gravel 20% sand) gravel: 5% LC, 5% SC, 10% VCP, 20% CP, 30% mP, 10% fP, Sand: 10% CS, 5% mS, 5% fS wet color (5Y 5/1) gray, dry color (5Y 6/1) gray slightly moist, poorly sorted, rounded to sub-rounded 75% mafic, 25% Felsic, weak rx to 10% HCl	1105 8-20-91
50	2 lith 1 rad 1 mois/ $CACO_3$	D.B.		~~50~~ 53'-60 SANDY-GRAVEL (90% gravel 10% sand) gravel - 10% LC, 10% SC, 15% VCP 10% CO.P 30% mP, 15% fP, sand - 10% mS wet color, (5Y 3/1) very dark gray, dry color (5Y 6/1) gray, sample moist, poorly sorted sub-rounded to subangular, 80% mafic, 20% Felsic, weak rx to 10% HCl	1442 8-20-91
55	2 lith 1 rad 1 mois/ $CACO_3$	D.B.		60'-65' - SANDY-GRAVEL (85% gravel, 15% sand) 5% SC, 20% VCP, 25% CP 30 mP, 5% SP, sand - 10% CS, 5% mS dry color (10YR 5/1) gray, wet color (10YR 4/1) dark gray, sample slightly moist, poorly sorted subrounded-subangular, 80% mafic, 20% Felsic, weak to moderate rx to 10% HCl	1516 8-20-91
60					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 4 of 13

Location 216 - B3 pond - C lobe

Project W 017-13

Elevation G.S. 537.75'

Drilling Contractor LEH

Driller Darrel Ludtke

Drilling Method and Equipment cable tool - BE 22 W

Prepared By Dale Onsrud / Dale Onsrud (Sign/Print Name) Date 8-22-91

Reviewed By [illegible] / [illegible] (Sign/Print Name) Date [illegible]

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
60	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		65' (SANDY-GRAVEL) 90% GRAVEL, 10% SAND - Gravel: 5% LC, 5% SC, 10% VCP 20% CP, 30% MP 10% FP, 10% VFP, Sand; 8% CS, 2% MS, dry color (10YR, 5/1) gray wet color (10YR, 4/1) dark gray, sample dry poorly sorted, rounded to sub-angular 80% Mafic 20% Felsic, weak rx to 10% HCL	1010 8-21-91
65	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		70' - SANDY-GRAVEL (90% gravel, 10% Sand) gravel - 10% LC, 5% SC, 10% VCP, 20% CP 30% MP, 10% FP, 5% VFP, sand - 5% CS, 5% MS dry color (10YR, 5/1) gray, wet color (10YR, 4/1) dark gray - sample dry - poorly sorted - gravel: sub angular to angular (crushed boulder) sand: subrounded - subangular, 90% mafic, 20% Felsic, weak rx to 10% HCL	1340 8-21-91 Boulder at ≈ 68'
70	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		75' - SANDY-GRAVEL - (90% gravel, 10% Sand) gravel - 10% LC, 10% SC, 10% VCP, 10% CP 35% MP, 15% FP, sand - 9% CS, 1% MS dry color, (10YR, 5/1) gray - wet color (10YR, 4/1) dark gray - sample slightly moist - poorly sorted - subangular & angular (pulverized basalt) 80% mafic, 20% Felsic, weak rx to 10% HCL	DO 8-21-91 1045 8-22-91 Boulders
75	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		80' - SLIGHTLY-SANDY-GRAVEL (95% gravel 5% sand) 20% LC, 10% SC, 20% VCP, 25% CP 10% CP, 10% mf sand - 5% CS - dry color (10YR 5/1) gray - wet color (10YR, 4/1) dark gray sample dry - poorly sorted - sub-round to angular (crushed cobble) - 80% mafic 20% Felsic - weak rx to 10% HCL	1115 8-22-91
80					

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 5 of 13

Location 216-B3 pond - Globe

Project W017-B

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment cable tool - BE22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 8-25-91

Reviewed By [illegible] (Sign/Print Name) Date 08/29/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
80	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		85' SLIGHTLY - SANDY GRAVEL (95% gravel, 5% sand) 20% mB, 20% SB, 25% vcP, 15% cP, 20% SAC, 10% fP, 5% mP sand - 5% cS dry color (10YR 7/1) light gray, wet color (10YR 3/1) very dk. gray sample, sl. moist; poorly sorted, sub-rounded (natural cobble) to angular (broken boulders) 80% mafic 20% felsic, very weak rx to 10% HCL	1030 8-23-91 Hard drilling (Boulders)
85'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		90' SLIGHTLY - SANDY GRAVEL (see above for description)	1320 8-23-91 chunks of boulders
90'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		95' - SLIGHTLY-SANDY GRAVEL (90% gravel, 10% sand), 20% mB 10% SB, 30% vcP, 10% cP, 10% mP 10% fP sand - 5% cS, 5% FS - wet color (10YR 4/1) dark gray, dry color (10YR 4/1) gray sample slightly moist and partially consolidated poorly sorted, sub-rounded (natural) to angular (chunks of boulders), 80% mafic, 20% felsic (10% Qtz), no rx to HCL	Hard drilling Large boulder @ 93' - sample recovered similar to broken boulders
95'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		100' - SLIGHTLY-SANDY GRAVEL similar to above - sand and gravel mainly composed of pulverized boulder	
100					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 6 of 13

Location 216-B3-Pond, C-lobe

Project W017-B

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller Darrel Ludthe

Drilling Method and Equipment Cable Tool - BE22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9-30-91

Reviewed By [signature] / [signature] (Sign/Print Name) Date 09/03/91

Depth (100')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		105' - SANDY-GRAVEL (90% gravel, 10% sand) 10% LC, 10% SC, 30% VCP, 25% CP, 10% MP, 5% FP sand - 8% CS, 7% MS, wet color (5YR 3/1) very dk. gray - dry color (5YR 6/1) gray, sample moist poorly sorted, subangular to subrounded, 80% mafic, 20% Felsic (10% Qtz), no rx to HCl	sample moist, smaller gravels 1350 9-28-91
105'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		110' - SANDY-GRAVEL similar to 105' sample above some angular pieces from broken cobbles	csg driving hard 0900 8-29-91
110'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B.		115' - SILTY-SANDY GRAVEL (80% gravel ~~15% sand 5% silt) 30% SC, 35% VCP, 15% CP 5% MP, Sand~~ 15% DD 8-30-91 ~~15% sand 5% silt) 30% SC, 35% VCP, 15% CP 5% MP, Sand~~ D.D. 8-30-91 (80% gravel, 15% sand, 5% silt) 30% SC, 35% VCP, 10% CP, 5% MP sand - 10% CS 5% MS, 5% silt - wet color (10YR 5/1) gray (10YR 7/1), light gray, sample wet, poorly sorted natural (sub-round, rounded) - 80% mafic, 20% Felsic, no rx to HCl	1400 8-29-91 pulverized boulders wet sample increase in silt possible "rip-up" clast from Ringold ?
115'	2 lith 1 rad 1 mois/ $CaCO_3$	D.B. Hanford Ringold		120' silty - CLAY (70% silt, 30% clay) wet color (10YR 5/4) medium brown moderately sorted / subangular - subrounded 80% Felsic, 20% mafic; no reaction to HCl - sample moist - dry color (10YR 7/3) very pale brown	0835 8-30-91 ≈118' - contact H/Ri 120' hit silty clay
120'					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 7 of 13

Location 216-B3-pond-c lobe

Project W017-B pond

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller Darrel Cuttke

Drilling Method and Equipment Cable Tool - BE22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9-6/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 09/07/91

Depth (120)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 lith 1 rad 1 mois/ $CaCO_3$ D.D. 9-2-91	H.T.		125' - SILTY - CLAY (55% clay, 40% silt 5% fine sand) Dry color (10YR, 4/4) very pale brown, wet color (10YR, 4/3) pale brown, sample is wet (H.T.), well sorted, particles are angular to subangular; 20% mafic, 80% Felsic, weak rx to 10% HCL (most of sample) very strong rx to HCl in white clasts ($CaCO_3$) medium plasticity	121' - some small gravels interbedded - $CaCO_3$ clasts 1445 9-3-91
125	2 lith 1 rad 1 mois/ $CaCO_3$	H.T.		130' - SLIGHTLY SILTY - CLAY (90% clay, 10% silt) Dry Color (2.5, 7/2) pale yellow, wet color (2.5, 7/6) yellow, sample wet (H.Tool) 80% Felsic, 20% mafic, no rx to 10% HCL	1120 9-4-91 moisture unknown
130'	2 lith 1 rad 1 mois/ $CaCO_3$	H.T.		135' - SLIGHTLY SILTY - CLAY (90% clay, 10% silt) similar to above	1430 9-5-91
135'	2 lith 1 rad 1 $CaCO_3$	HT		(140') slightly silty CLAY (90% clay 10% silt) same as above, trace gravel	815 9/6/91 casing depth @ 128' bls 10" casing

A-6000-382 (04/90)

9 3 1 2 7 9 0 3 9 1

BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 8 of 13

Location 216-B3-Pond-Clohe

Project W-017 / B-Pond

Elevation L.S. 537.75'

Drilling Contractor Kaiser Engineers Hanford

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool, BE-22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9-9-91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 9/10/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
140'	2 Lith 1 Rad 1 CaCO3	HT		(145') slightly muddy silty CLAY 90% CLAY 10% silty, Dry (10YR 8/3) pale brown; wet 10YR 4/2) dark yellowish brown some sand present - VF gr to VF clear, subangular - subrounded 90% Felsic 10% mafic no reaction to HCl	10:32 9/06/91 Bond Tool - adding water
145'	2 Lith 1 Rad 1 CaCO3	HT		(150') slightly muddy silty Clay 85% clay 10% silty 5% sand Dry (10YR 8/3) very pale brown wet (10YR 5/1) gray - some grayish brown, occ interbedded sands - clear, VF to F gr, poorly sorted, pale subangular to subrounded 90% Felsic 10% mafic no reaction to 10% HCl.	11:10 9/06/91
150'	2 Lith 1 Rad 1 CaCO3	H.T.		(155') slightly muddy silty CLAY. (85% clay, 10% silt, 5% sand Dry color (10YR 7/3) very pale brown wet (10YR 5/1) gray, subangular to subrounded 90% felsic, 10% mafic, moderately sorted	1445 9/6/91
155'	2 Lith 1 Rad 1 CaCO3	H.T.		(160)' slightly-silty CLAY (80% clay, 12% silt, 5% sand, 3% gravel) wet (10YR 6/1) gray, dry (10YR 7/1) lt. gray well to mod sorted, sub-round to sub- angular, 90% felsic, 10% mafic weak rx to 10% HCl (some CaCO3 nodules)	1145 9-9-91 - checked water level = 0 - drilling slowly looking for H2O - increase in silt -

A-6000-382 (04/90)

9 3 1 2 7 5 9 0 3 9 2

BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 9 of 13

Location 216-B3-Pond-C Lobe

Project W-017 / B Pond

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller Darrel Luttke

Drilling Method and Equipment Cable Tool / BE22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9-10-91

Reviewed By Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
160'	H.T	2 lith 1 rod 1 $CaCO_3$		(165') slightly silty-SAND similar to below - interbedded or "veins" of silty-SAND, green in color - wet (5Y 5/2) olive gray	1635 9-9-91 water @ 164'
164'	S.T.	13/23/34/47		Slightly silty-SAND - (80% sand, 20% silt) (sand - 50% mS, 25% fS, 25% vfS) dry (5YR 7/1) lt. gray - wet (10YR, 5/1) gray; sample wet; well sorted sub(angular/rounded) 70% Felsic 30% mafic, no rx HCl	S.T. from 164'-166' 100% recovery - sent 165.5 & 166 for tests
165'					
166'	S.T.	8/18/34/44		Slightly silty-SAND (166'-166.5') ↑ see above (166.5-168') SILTY-SAND (60% sand 40% silt) wet (2.5 5/2) grayish br. dry (2.5 7/2) lt. gray, well sorted sub(round/angular); 70% Felsic 30% mafic, no rx to HCl	0850 9-10-91 S.T. from 166'-168' 100% recovery - sand contact 166.5 - sample dry from (167'-168')
167'					
168'	S.T.	7/21/33/41		(168-169') SILTY-SAND - similar to above nodules of $CaCO_3$ in places, some gravels	1030 9-10-91
169'				(169'-170') slightly silty-SAND (75% sand, 25% silt) sand - 25% mS, 50% fS, 25% vfS wet (2.5 5/2) grayish brown; dry (2.5 7/2) pale yellow sample moist, well sorted, sub(round/angular) 80% Felsic, 20% mafic, no rx to 10% HCl	contact @ 169' S.T. from 168'-170' 100% recovery
170'	S.T.	11/23/43/67		(170'-170.75') slightly silty-SAND (see above)	- gradational contact @ 170.75
171				(170.75)-172') ~~silty-SILT~~ - sandy-SILT (25% vf sand, 75% silt) wet (5YR 4/1) pinkish gray; dry (10YR 8/3) very pale brown sample moist (slightly), rounded to subrounded 80% Felsic, 20% mafic, no rx to 10% HCl in matrix, some $CaCO_3$ "veins and nodules"	O.D. 9-10-91 S.T. from 170'-172' 100% recovery - ~~1645~~ 1445 O.D. 9-10-91 9-10-91
172				Next page	

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 10 of 13

Location 216-B3-pond - C lobe

Project W-017 / B pond

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller D. Ludtke

Drilling Method and Equipment Cable Tool / BE 22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 9-11-91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 09/3/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
172	S.T.	9/27/37/39		(172'-174') slightly-sandy SILT	1610 9-10-91
				(75% silt; 25% vf Sand)	
				similar to above, sample dry	- S.T from 172-174
				some "layers" of CaCO3, slightly	100% recovery
173				gravelly	- some pebbles
174	S.T.	11/23/37/41		(174-175.5') slightly-sandy SILT	0905 9-11-91
				similar to above	
		21th			S.T. from 174-176
		1 rad			100% recovery
		1 CaCO3			
175					
				(175.5-176) silty-SAND (60% sand	
175.5		175.5'		40% silt) sand-fine to vf-(2.5 4/2) lt. br gray	contact @ 175.5'
				dry (2.5Y 7/2) lt gray, sample moist, well sorted	
176				20% mafic, 80% felsic, no rxn w/ 10% HCl	
	S.T.	11/19/31/33			
				(176-177) silty-SAND (60% sand, 40% silt)	1010 9-11-91
				similar to above	
				- some gravels (pebbles)	gradational contact @ 177'
177					water @ 177.25'
				(177-178) slightly-silty SAND (85% sand	
				15% silt) sand-80% fS, 20% vfS; wet (2.5Y 6/2)	S.T. from 176'-178'
				lt. brownish gray; dry (2.5Y 7/2) lt gray, sample wet	100% recovery
				80% felsic; 20% mafic (microcrys) no rxn to 10% HCl	
178	S.T.	8/10/28/34		(178-180) slightly-silty SAND	1447 9-11
		2 lith		(90% sand, 10% silt)	S.T from 178-180'
		1 rad		sample wet, similar to above	100% recovery
		1 CaCO3 (180)		- no gravel	
179					sent 178.5-179 & 179-179.5
					for physical tests
180					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 12 of 13

Location 216-B3-Pond C-Lobe

Project W-017/B-Pond

Elevation 6.5 537.75'

Drilling Contractor KEH

Driller D. Ludtke

Drilling Method and Equipment Calic Tool/Bezzw

Prepared By De D Sea / David Seaver (Sign/Print Name) Date 9/13/91

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 09/18/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
200	2 Lith 1 Rad 1 Mois/CaCO3	H.T		(205) Sandy Gravel (60% gravel 30% sand 10% silt) Heavily broken clasts (Lots of Rx flour) wet = (2.5Y 5/2) Little Brown Dry = (2.5Y 7/2) tan 50% mafic 40% Felsic 10% qtz Very weak Rxn to HCl	1640 9-12-91
205	2 Lith 1 Rad 1 mois/CaCO3	H.T		(210) Sandy Gravel (50% gravel) 40% sand, 10% silt) Broken angular clasts wet = (2.5Y 5/2) Dry = (2.5Y 7/2) mafic = 60%, Felsic = 25%, qtz = 15% Very weak rxn to HCl	1400 9-13-91
210	2 lith 1 Rad 1 mois/CaCO3	H.T.		(215) Sandy GRAVEL similar to above - broken fragments	1050 9/16/91
215	2 lith 1 Rad 1 mois/CaCO3	H.T.		(220') Sandy GRAVEL - similar to above - pulverized rocks	1415 9/16/91
220					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40A

Sheet 11 of 13

Location 216-B3-pond - Globe

Project W-017 / B-pond

Elevation L.S.

Drilling Contractor KEH

Driller D. Ludtke 537.75'

Drilling Method and Equipment Cable Tool / BE 22 W

Prepared By Dale Owens / Dale Brown (Sign/Print Name) Date 9-12-91

Reviewed By Edward C. Rogers / Edward C. Rogers (Sign/Print Name) Date 09/14/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
180	H.T. 2 lith 1 Rad 1 mois/ $CaCO_3$	H.T.		(185) slightly silty - SAND (90% sand; 10% silt) sand - 40% fS, 20% vfS wet (2.5Y 6/2) lt. brown gray, dry (2.5Y 7/2) lt. gray well sorted; 80% felsic, 20% mafic no rxn to HCL - similar to above	0935 9-12-91
185	H.T. 2 lith 1 Rad 1 mois/ $CaCO_3$	H.T		(190)' slightly silty - slightly gravelly SAND (80% sand, 10% gravel, 10% silt) sand - 10% vcS, 10% cS, 20% mS, 30% fS, 30% vfS gravel - 10% fine to vf pebbles - wet (2.5Y 7/2) lt. olive brown; dry (2.5 7/2) lt. gray, moderately sorted, gravel subangular; 80% felsic, 20% mafic no rxn to 10% HCL	0900 9-12-91 increase in gravel @ 190' - hard drilling
190	2 lith 1 Rad 1 mois/ $CaCO_3$	H.T.		(195)' slightly silty - slightly gravelly SAND (similar to above) - gravel being pulverized by H.T. - difficulty interpreting size of gravels	0955 9-12-91 ringold gravels
195	2 lith 1 Rad 1 mois/ $CaCO_3$	H.T		(200)' (silty sandy) - GRAVEL (60% gravel, 35% sand, 5% silt) all material has been broken up by H.T. - wet (2.5Y 7/2) olive brown; dry (2.5 7/2) lt. gray; poorly sorted angular, 60% mafic, 30% felsic, 10% Qtz weak rxn to 10% HCL	1220 9-12-91

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 696-40-40A

Sheet 13 of 13

Location 216-B3-pond / c-lobe

Project W-017 / B-pond

Elevation L.S. 537.75'

Drilling Contractor KEH

Driller D. Ludtke

Drilling Method and Equipment Cable tool / RE-22W

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date

Reviewed By EDWARD C. RAFUSE / Edward C. Rafuse (Sign/Print Name) Date 09/19/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
220	2 lith 1 Rad 1 mois/ LAcOx	H.T.		(225) Sandy - GRAVEL (60% gravel 40% sand) most of the gravel reduced to vfp + c Sand, due to H.T.; wet (2.5Y, 5/2) grayish brown, dry (2.5Y 7/2) lt. gray; sample wet (H.T.); moderately sorted, subangular to angular 50% mafic, 40% felsic, 10% Qtz, no rxn to HCl	1600 9/16/91 - drilling more easy from 224 → 225' 09-17-91 - hard drilling 223-224' - contact @ ≈ 224'
*225'	1 rad 2 physical	S.T.		(125'-126') slightly silty - SAND (15% silt 85% sand) sand - vfs + mS (appears to be "weathered" S. stone?) wet (10YR, 4/2) dk. grayish br.; dry (10YR, 7/1) lt. gray sample dry; well sorted; 80% felsic, 20% mafic; no rxn to 10% HCl, some interbedded gravels @ 125'	1700 9/16/91 S.T. for physical properties (sieve analysis) 100% recovery - contact (gradational) @ 126'
226'				(126'-127') silty - SAND (25% silt, 75% sand) sand - mS + vfs; wet (2.5Y, 6/3) lt. yellowish br.; dry (2.5Y 8/2) white; sample moist; very well sorted; 90% Felsic 10% mafic; no rxn to 10% HCl	- sample moist @ 126'-127' - sent (125.5' → 126') & (126 → 126.5) for analysis
227'					

A-6000-382 (04/90)

* note change in scale

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9 3 1 2 7 3 9 0 3 9 8

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-40-40A Area 600 Area Date 8/30/91

Log Run #1 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description R-Pond / C-Lake

Ground Surface Elevation _____

Surface Temperature 32.3°C Weather Clear/Windy/Hot

BOREHOLE INFORMATION

Driller Darrel Ludtke

Drill Rig Type Cable Tool | Bit Type/Diameter Drive Barrel / 12"

Borehole Diameter(s)/Depth 12"/122.0

Depth Driller 122' | Depth Logger 119.3'

Liquid Level NA | Liquid Density NA

Temperature NA

CASING RECORD

Type 12" Carbon Steel Sch.40 | Interval +1.05' - 120.03'

Type _____ | Interval _____

Type _____ | Interval _____

Type _____ | Interval _____

Well Screen Interval NA

Comments: Return Error = +0.25' high
Centralizer used

A-4000-120(05/90)

WHC-SD-EN-DP-046, Rev. 0

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand NLS | Equipment Type Analog

Tool Type Gamma Ray | Serial No. C627A97

Base Calibration Date 5/91 | Calibration Reference —

Calibration/Probe Factor 0.84x12u @ 2.5 | Calibration Datum (eU): Position 1 297.4 eU | Position 2 64.3 eU

Dead Time 11.8 μsec | Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 119.3' To 4.0'

Rerun(s) 119.3' to 80.0'

Pre Survey Verification: Position 1 296.1 eU | Position 2 64.5 eU | Background 50 cps

Base Calibration Difference: Position 1 1.3 eU | Position 2 0.2 eU

Logging Speed 5 ft/min. | Rerun Speed, CPSmin. 50 cps/in.

Start Time 1230 | Completion Time 1400

Chart Speed(s), /min. 10 ft/in. | Time Constant(s) TC-1

Chart Recorder Horizontal Scale, CPS/in. 50 cps/in.

Post Survey Verification: Position 1 296.1 eU | Position 2 64.5 eU | Background 50 cps

Percent Change: Position 1 0.0% | Position 2 0.0%

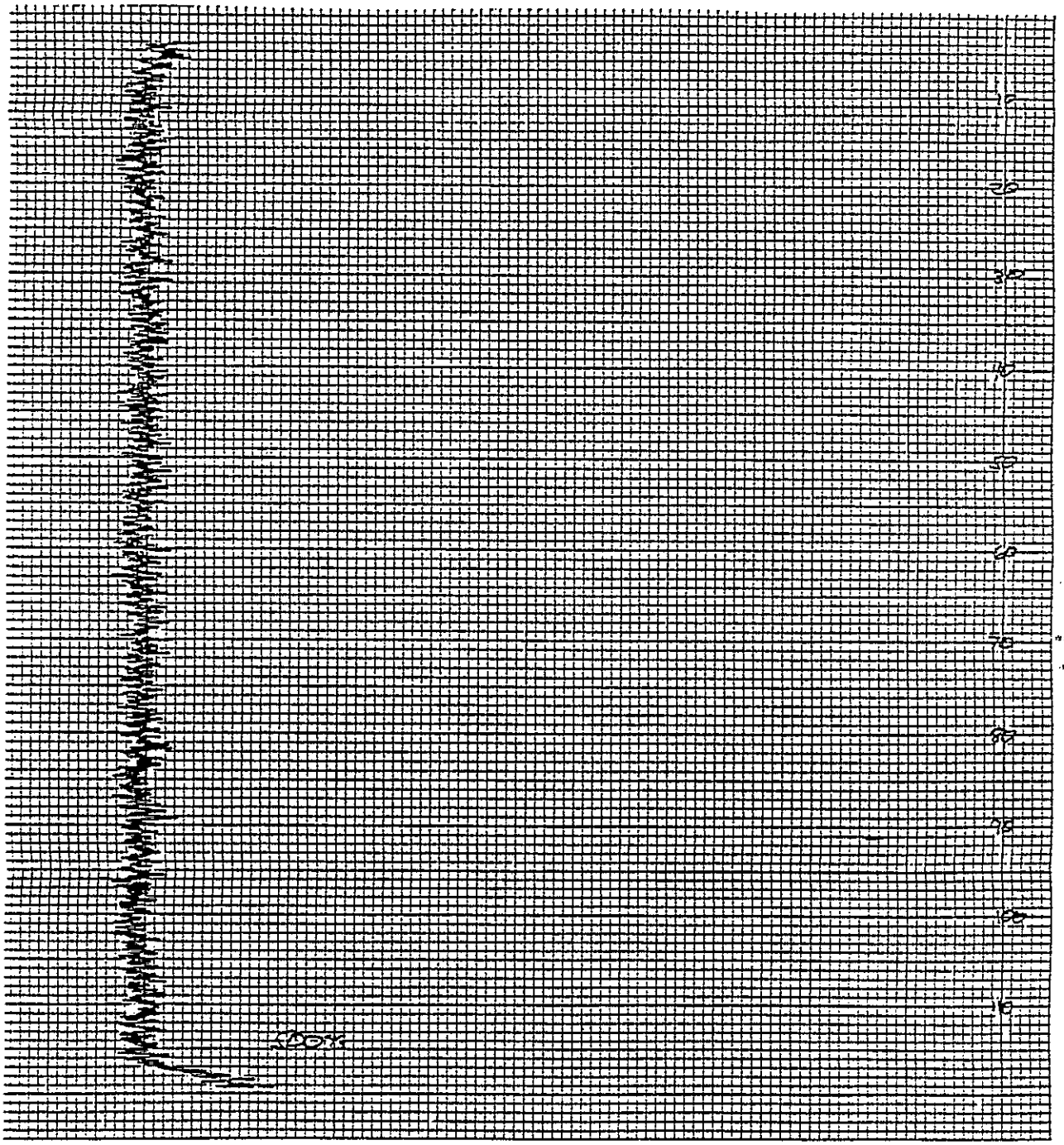
Comments: Return Error = +0.25' high
Centralizer used

Witnessed and Verified by: (sign and print name) Alan Pearson A-19 Alan Pearson | Date: 8/30/91

A-4000-120 (05/90)

9 3 1 2 7 0 0 3 9 9

699-40-40A RUN#1 8/30/1991



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WHC-SD-EN-DP-046, Rev. 0

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-40-40A Area 600 Area Date 9/17/91
Log Run #2 Log Type Gross Gamma
Elevation Datum _____ Elevation _____
Survey Coordinates _____ N _____ E
Log Measured From Ground Surface
Location Description B-Pond / SW of C-Lake
Ground Surface Elevation _____
Surface Temperature 25.3 °C Weather Clear-Warm

BOREHOLE INFORMATION

Driller Darrel Luetke
Drill Rig Type Cable Tool | Bit Type/Diameter Hard Tool / 10"
Borehole Diameter(s)/Depth 12"/120.0' 10"/227.0'
Depth Driller 227.0' | Depth Logger 226.9'
Liquid Level 167.9' | Liquid Density Muddy
Temperature 18.7°C

CASING RECORD

Type 12" Carbon Steel Sch.40 | Interval +1.2'-120.0'
Type 10" Carbon Steel Sch.40 | Interval +2.0'-225.0'
Type _____ | Interval _____
Type _____ | Interval _____
Well Screen Interval NA
Comments: Return Error = +0.27' high
Centralizer used

A-6000-520 (05/90)

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS | Equipment Type Analog
Tool Type Gamma Ray | Serial No. C027A97
Base Calibration Date 5/91 | Calibration Reference —
Calibration/Probe Factor 8.84x2 ell 8/22/91 | Calibration Datum (eU): Position 1 297.4 ell | Position 2 64.3 ell
Dead Time 11.8 μsec | Warm Up Time 7.15 min

LOGGING INFORMATION

Log Interval From 226.9' To 90.0'
Return(s) 160.0' to 110.0'
Pre Survey Verification: Position 1 300.6 ell | Position 2 64.1 ell | Background 50%
Base Calibration Differences: Position 1 3.2 ell | Position 2 0.2 ell
Logging Speed 5 ft/min. | Return Scales, CPS/in. 50 c/s/in.
Start Time 1130 | Completion Time 1545
Chart Speed(s), in/min. 10 ft/in. | Time Constant(s) TC-1
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in.
Post Survey Verification: Position 1 300.6 ell | Position 2 64.1 ell | Background 50%
Percent Change: Position 1 0.0% | Position 2 0.0%
Comments Return Error = +0.27' high
Centralizer used

Witnessed and Verified by: (Sign and print name) Alan Pearson / Alan Pearson Date: 9/17/91

A-6000-520 (05/90)

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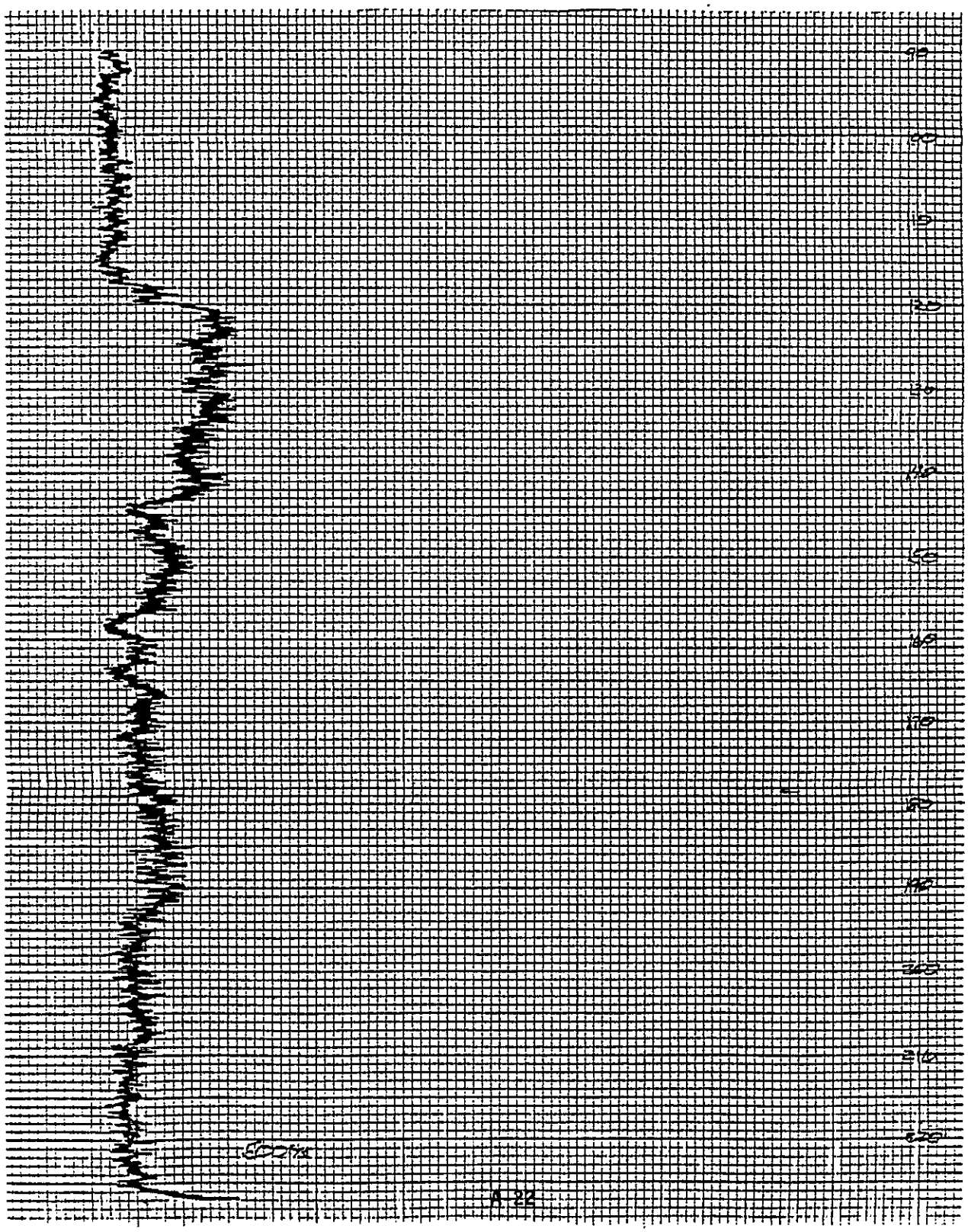
9 3 1 2 7 0 9 0 4 0 1

699-40-40A RUN#2 9/17/1991



9 3 1 2 7 3 9 0 4 0 2

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KAISER ENGINEERS HANFORD

FIELD SKETCH

Attachment To Or Description: Date: 12/10/91

3-Pond Wells

921-057-WELL-119

Sheet 2 of 2

WELL NO.	COORDINATES (C/L CASING) 200-E AREA (FEET)	LAMBERT WCS83S (METERS)	VERT. DATUM	ELEVATIONS (FEET) BRASS CAP IN CONC.	TOP HYDRO STAR PLATE, N. SIDE	TOP OUTER CASING N. SIDE	
699-40-40A	N:39710.4	N:135,594.31	NGVD'29	537.75	541.23	541.21	
	W:40071.5	E:577,680.25	200-E	537.53	541.00	540.99	
699-40-40B	N:39761.4	N:135,609.86	NGVD'29	538.69	542.20 ~~542.20~~	542.18	
	W:40079.8	E:577,677.65	200-E	538.46	541.97	541.96	

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9 3 1 2 7 1 9 0 4 0 4

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WELL SUMMARY SHEET

Boring or Well No. 699-40-40B1

Sheet 1 of 2

Location 216 B3 Pond

Project W017/B-Pond

Elevation LS-Land Surface 538.69'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool BE22W

Prepared By Chris Wright (Sign/Print Name) Date

Reviewed By Edward C. Rogers (Sign/Print Name) Date 12/27/91

CONSTRUCTION DATA: Description	Depth in Feet	GEOLOGIC/HYDROLOGIC DATA: Lithologic Description
16" Drive Shoe 1.43'Ø		
Top portland cement at 1.5' BLS	10	Gravelley Silty Sand
		" "
	20	Slightly Silty Sand
Top 8-20 crumbls at 22.6' BLS		Slightly Gravelly Slightly Silty Sand
	30	Sandy Gravel
		Slightly Silty Slightly Gravelly Sand
16" CS Casing Set at 40.20	40	" "
12" Drive Shoe 1.17Ø		Gravelley Sand
	50	Silty Sandy Gravel
		Sandy Gravel
	60	Sandy Gravel
		Sandy Gravel
	70	" "
		" "
	80	" "
		Gravel
	90	"
		"
12" CS Casing Set at 98.30	100	Silty Sandy Gravel
10" Drive Shoe .95Ø		Gravel
Top Slurry 107.75' BLS	110	"
		"
	120	"
Perched Water at 121.25 07/26/91		120 Gravel 123 Slightly Gravelley Sandy Silt
10" CS Casing Set at 131.20	130	Silt
Bentonite Plug Put in 08/05/91		Clay
8" Drive Shoe .78Ø	140	"
Static Water Level 140.6 BLS		"
8/6/91 From Inner Water	150	"
Bearing Unit (160-165)		"
Sat 120.2' BLS 10/10/91	160	"

Diagram

Graphic Log

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A-6000-384 (04/90)

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WELL SUMMARY SHEET

Boring or Well No. 699 40-40B

Sheet 2 of 2

Location 216 B3 Pond

Project W017/B-Pond

Elevation LS = Land Surface

Drilling Contractor KEH

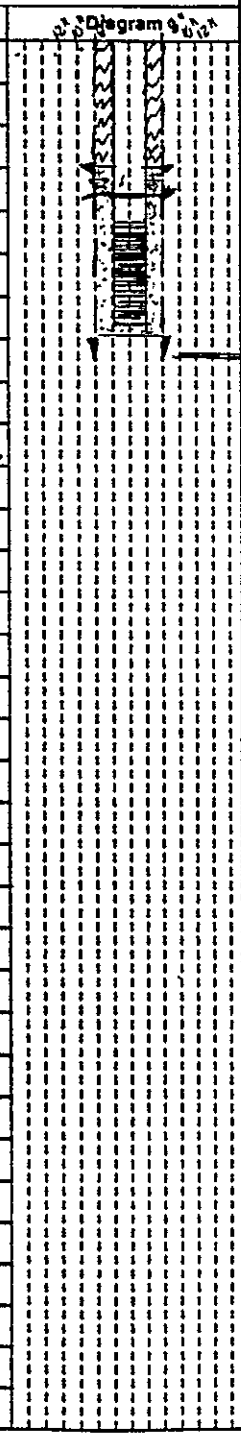
Driller Darrel Ludtke

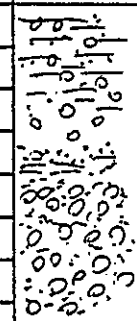
Drilling Method and Equipment BE22V

Prepared By Chris Wright [signature] (Sign/Print Name) Date

Reviewed By Edward C. Rafuse [signature] (Sign/Print Name) Date 12/22/91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
Top Pellets 180' BLS Top 40-100 Sand 183.0' BLS		170'		Slightly Gravelly SANDY Clay
Top 20-40 Sand 184.9' BLS				" "
8" casing set at 180.59		180'		" "
8/12/91 184' TD				" "
8" Drive Shoe = .78Ø		190'		SILTY Sand ± 184
Top Screen at 187.8' BLS				Sandy Gravel
9/20/91 8" casing set		200		Sandy Gravel
@ 201.1' bls		201.1		Sandy Gravel
Bottom Screen at 198.6' BLS				
TD of hole @ 202.0' bls				
Screen is 10 Slot Channel Pack				
Bottom Sand at 199.6' BLS				





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WELL CONSTRUCTION REPORT

Specification No. WHC-S-014 Rev No. 5

ECNs 127437, 144240, 144241

Project W017/B Pond RCRA

Location 216 B-3 Pond

Drilling Company KEH

Driller Darrel Ludtke, 9/20/91 SWC

Other (Companies) N/A

Geologist(s) Chris Wright (HC) [signature]
William Brennan, Dale Drewry
Sue Havens, Stacey Callison
Ken Lane

Well No. 699-40-40B Temp. Well No. N/A

Coordinates N39761.4 Hanford W40079.8 Lambert N135,609.86, E577,677.65

Casing Elev. 542.18' Ground Elev. 538.69'

Drilling Method

Verification Method Visual Observation

Criteria WHC-S 014, 5.2, 7.5, EII 6.7 Sec 6.2

			Initials	Date
~~Rotary~~	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D00-~~[illegible]~~90	H 90-184 (184-201)	CSW	8/12/91
~~Drilling Fluid~~	N/A	N/A	225 GAL	—
~~Other~~	N/A	NA	→	

Geophysical Logging

Sondes	Interval	Date
Gross Gamma [initials]	99.3' - 3.7'	7/24/91
" [initials]	128.1 - 65	7/31/91
Spectral Gamma [initials]	116 - 125	8/1/91
Gross Gamma [initials]	181.6 - 100.0	8/12/91
Gross Gamma	150.0 - 200.1	9/19/91

ECC 9/10/91

Completion Data

Drilled Depth 202.0'

Completed Depth 198.6' BIS

Date Started 7/2/91

Date Completed ~~[illegible]~~ CW 10/17/91 RW

Static Water Level/Date 140.60 BIS 9/12/91
135.9' 10/15/91, 127.8 10/10/91

Aquifer Testing

Type Instantaneous Slug

Flow Meter I.D. No. -NA-

Cal. Due Date -NA-

Length of Test -NA-

Volume Pumped -NA-

Drawdown NA

Date of Test 11-20-91

Completion Results

Cleaning

Verification Method Visual, Direct Observation by designee

Criteria WHC-CM-7-7E115.4, WHC-S-014-4.2.2, 7.6, 7.7,

	Initials	Date
Drilling Tools/Rig	CW	7/2/91
Temporary Materials	CW	8/12/91
Permanent Materials	SWC	10/10/91

Screen

Type	Length	Slot Size
T-304 4" stainless channel pack	10.82	10 slot channel pack

Depth(s) 198.6' - 187.8'
— - —

Verification Method Steel tape

Criteria WHC-S-014 4.2.3, 4.2.5, 2.2.1, 4.2.1

Initials [initials] Date 10-17-91

Material Storage/Packing

Verification Method Visual Observation

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	SWC	10/10/91
Material Packing	SWC	10/10/91

Lubricants/Additives

Verification Method Visual Observation

Criteria WHC-S-014 7.2

	Identify	Initials	Date
Additives	Raw Water	SWC	9/20/91
Lubricants	Wellguard	CSW	7/2/91

Straightness Test

Verification Method Visual Observation

Criteria WHC-S-014 8.2

Initials CSW Date 8/12/91
* SWC 9/20/91

A-6000-436 (09/90)

93127 90407

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WELL CONSTRUCTION REPORT
(continuation sheet)

Well # 699-40-40B

Page 2 of

Casing (permanent)

Type	Size	Placement
T-304 stainless steel	4"	187.8 ~~[illegible]~~ 2.23

Verification Method measure w/ steel tape

Criteria WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials [illegible] Date 10-7-91

Well Protection

Verification Method measure w/ steel tape

Criteria WHC-S-014 4.2.10

	Initials	Date
Protective Posts	ECN	1/24/92
Protective Casing	ECN	1/24/92
Site Restored	ECN	1/24/92
Cap, Hasp and Lock	ECN	1/24/92
Surface Pad	ECN	1/24/92

Annular Seal/Filter Pack

Verification Method measure w/ steel tape Criteria WHC-S-014 4.2.6, 4.2.7, 4.2.8, 4.2.9, 5.3.2

Type	Interval		Volume	Initials	Date
20-40 silica sand	199.6	184.9	3½ bgs (3.9 ft³)	SWC	10/11/91
40-100 silica sand	184.9	183.0	1½ bgs (1.7 ft³)	SWC	10/11/91
3/8" bentonite pellets	183.0	180.0	2-50# buc (1.4 ft³)	SWC	10/11/91
bentonite grout	180.0	107.75	17.25 ft³ 29 bg	CSW	10/15/91
Bentonite Crumbles	107.75	22.6	8 bg 57.47 ft³	CSW	10/16/91
Portland Cement	22.6	0	29 bg 25.074 ft³	CSW	10/16/91

Well Survey/Labeling

Verification Method Review of Survey Report

Criteria WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	ECN	1/24/92
Protective Casing/Brass Cap Surveyed	ECN	1/24/92
Well Number Stenciled	ECN	1/24/92
Brass Cap Labeled	ECN	1/24/92

Pump Installation

Verification Method Visual Observation

Criteria WHC-S-014 4.2.11, 4.2.2

	Initials	Date
Pump Decon/Prep	JAC	11/20/91
Installed	JAC	11/20/91
Pump Tested	JAC	11/20/91

Other (initial if performed)

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

JAC 10/28/91 11/19/91 Well Development

Comments/Remarks

Reviewed By (Sign/Print Name) BRUCE A WILLIAMS A-28 [signature] Date 2/4/92

A-6000-436 (09/90)

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BOREHOLE LOG

SIGNATURE DATE 2/4/92

Boring or Well No. 699-40-40B

Sheet 1 of 11

Location 216 B3 Pond

Project Waiff

Elevation Land Surface 538.69'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool Bazz

Prepared By Chris Wrigan (Sign/Print Name) Date 07/08/91

Reviewed By Edward C. Logan (Sign/Print Name) Edward C. Logan Date 07/09/91

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
0					
5'	2 Lith 1 Red 1 Moist	DB		(5) Gravelly Silty Sand (10% Gravel 15% Silt 75% Sand) 20% CS 40% MS 20% FS – 10% SC 30% LP 30% MP 30% FP – 2.5Y 6/2 Lt Greyish Brown Dry 2.5Y 4/2 D. Greyish Brown Wet. Rounded To Sub Rounded Cobbles Subrounded Sand 50% Basalt 40% Qtzite 10% Granite, Strong-Rxn To 10% HCl	07/09/91
10'	2 Lith 1 Red 1 Moist	DB		(10) See Above – 15% Gravel, 10% Silt 75% Sand	- Cobbles Slightly Larger Strong Rxn To 10% HCl Cobbles up To 8cm Across
				Sand	
15'	2 Lith 1 Red 1 Moist	DB		(15) Slightly Silty Sand (90% Sand 10% Silt) 80% MS, 10% FS 10% Silt 5Y 4/1 D. Grey Dry 5Y 5/1 V. D. Grey Wet Slightly damp, V. Well Sorted, Sub Angular To Sub Rounded, 60% Mafic, 40% Felsic Some Mica Granite present. Slight Rxn To 10% HCl Non plastic, Some magnetic Grains	

A-6000-382 (04/90)

93127 0409

BOREHOLE LOG

Boring or Well No. 699-40-40 B

Sheet 2 of 11

Location 216 B-3 Pond

Project WOIT / B Pond

Elevation Land Surface 538.69'

Drilling Contractor KCH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool BE 22W

Prepared By Chris Wright (Sign/Print Name) Date 7/8/91

Reviewed By Edward C. Lane (Sign/Print Name) Date 07/11/91

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
20	2 with 1 Rad 1 moist	DB		20' Slightly Gravelly Slightly Silty Sand (15% Gravel 10% Silt 75% Sand)	Gravel Encountered at 21
			Gravel at 21'	5% LP 30% mp 65% SP – 75% CS	
				15% MC 10% FS – 10% Silt 5Y 5/6 Grey	
				Dry 5Y 3/1 D. Grey Wet. Moderately	
				Well Sorted. Pebbles Rounded to Subrounded	
				Sand Gen Sub Angular 20% Qtz 50% Basalt	
				30% Granitics, Some mica – No Rxn to 10% HCl	
				Slightly Damp, Non plastic	
				pw 7/10/91	
25	2 with 1 Rad 1 moist	DB		25' Sandy Gravel (50% Gravel, 45% Sand – 5% Silt.) 25% LP 25% mp	
				50% SP – 80% CS 20% MS+FS	
				5Y 5/1 Grey dry 5Y 3/1 D. Grey wet	
				Moderately to Poorly Sorted Pebbles	
				Sub Angular to Sub Rounded, Sand Sub Angular	
				50% Basalt, 30% Quartz, 20% Granitics	
				No Rxn to HCl, Slightly moist, Non plastic	
				pw 7/9/91	
30'	2 with 1 Rad 1 moist	DB		30' Slightly Silty Slightly Gravelly Sand (15% Gravel 10% Silt 75% Sand)	
				20% mp, 80% FS – 60% CS, 20% MS, 20% FS	
				Dry 5Y 5/1 Grey damp 5Y 3/1 D. Grey	
				Well Sorted, Sub Angular Sand + pebbles	
				40% Basalt, 30% Qtz, 30% Granitic Rxs	
				No Rxn to 10% HCl, Non plastic, Slightly	
				moist	
35'	2 with 1 Rad 1 moist	DB		s 35' See Above – Some Slightly	
				larger cobbles –	

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-40-40B

Sheet 3 of 11

Location 216 B-3 Pond

Project W017/B-Pond

Elevation 15 538.69'

Drilling Contractor KEH

Driller Darrel Cudtke

Drilling Method and Equipment BE22W Cable Tool

Prepared By [signature] (Sign/Print Name) Date 07/15/91

Reviewed By [signature] (Sign/Print Name) Date 07/15/91

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
40'	2 Lith 1 Red 1 Moist	DB		40' (GRAVELLY SAND) (20% Gravel 7% SILT 73% SAND) 5% SC 20% Lp 30% mp 45% FP — 60% CS 20% MS 20% FS 2.5Y 5/2 Greyish Brown Dry 2.5Y 3/2 V. dark Greyish Brown Damp, Sub Angular - 60% Basalt 20% QTZ 20% Granitic, Slight Rxn To 10% HCL Non plastic, Dry	DB = 8"
45'	2 Lith 1 Red 1 Moist	DB		45' SILTY SANDY GRAVEL (40% Gravel 40% Sand 20% SILT.) - 20% SC 20% Lp 30% mp 30% FP — 40% CS 30% MS 30% FS 10YR 5/1 Grey Dry 10YR 3/1 D. Grey Wet. Poorly Sorted. Cobbles Rounded To Sub Rounded Pebbles + Sand Sub Rounded To Sub Angular 75% Basalt, 15% Granite 10% Quartz No Rxn To 10% HCL, Slightly damp.	Large Cobbles DB = 8"
50'	2 Lith 1 Red 1 Moist	DB		50' (SANDY GRAVEL) (50% Gravel, 45% Sand 50% SILT) 20% SC, 20% Lp 20% mp 40% Sp — 80% CS 10% MS 10% FS 5Y 5/1 Grey dry 5Y 3/1 d. Grey Wet, Slightly moist, Cobbles Rounded Pebbles Sub Rounded To Sub Angular Sand Sub Angular To Angular. 50% Basalt 20% Granite 20% Gneiss, 10% Chert, Quartzite Very Slight Rxn To 10% HCL	DB = 8"
55	2 Lith 1 Red 1 Moist	DB		55 (SANDY GRAVEL) 60% Gravel 35% SAND, 5% SILT) See Above	DB = 8"

CW 7/15/91

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No 699-40-40B

Sheet 4 of 11

Location 216 B-3 Pond

Project WOIT/B Pond

Elevation LS 538.69'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool BE22W

Prepared By Chris Wright (HC) [signature] Date 7/16/91 (Sign/Print Name)

Reviewed By [signature] Edward C. Meyer Date 07/17/91 (Sign/Print Name)

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
60	24th 1 Rad 1 moist	DB		60' SANdy GRAvel (60% Gravel, 35% Sand) 5% SILT) 10% MC, 10% SC 20% LP 30% MP 30% FP — 80% CS, 10% MS 10% FS - 5Y5/1 Grey dry 5Y3/1 d Grey Wet Slightly damp, Poorly Sorted Pebbles Sub Rounded to Round, Fine pebbles SubAngular. Sand SubAngular to Angular 60% Basalt, 20% Quartzite, 20% Granitic Slight Rxn TO TO% HCl	Some large (±10cm) Cobbles
65'	24th 1 Rad 1 moist	DB		65' SANdy Gravel (60-70% Gravel 25-35% SAnd, 5% SILT AS Above, W/Slightly less Sand.	Large Cobbles Broken up to Fit In Drill Barr.
70'	24th 1 Rad 1 moist	DB		70 (SANdy Gravel) (75% Gravel 20% SAND, 5% SILT) 10% SP 10% LP, 30% MP 50% FP — 80% CS 10% MS 10% FS 5Y5/1 Grey dry 5Y3/1 d. Grey Wet Very Slightly moist Moderately Well Sorted, Pebbles Subrounded Sand Sub ~~Rounded~~ Angular to Angular 60-70% Basalt, 10% Granitic, 20-30% QTZITE. No Rxn To 10% HCl	No Large Cobbles In This SAmple - Better Sorted Than Before Difficult Drilling
75'	24th 1 Rad 1 moist	DB		75' SANdy GRAVEL - Similar TO Above, Slightly Larger Cobble Size. More Granite, Diorite	Hole Collapsed From 72' To 68' Night 7/15-7/16 ±77' Large Cobbles ±15-20 cm Encountered

A-6000-382 (04/90)

9 3 1 2 7 5 9 0 4 1 2

BOREHOLE LOG

Boring or Well No. 655-40-49B

Sheet 5 of 11

Location 216-B3 Pond

Project W017/B-Pond

Elevation 15 538.69'

Drilling Contractor Cable Tool BE22W

Driller Daniel Ludtke

Drilling Method and Equipment KEH

Prepared By Chris Wright (HC) [signature] Date

(Sign/Print Name)

Reviewed By [signature] / Edward C. Boese Date 07/25/91

(Sign/Print Name)

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
80	2 Lith 1 Rad 1 moist	DB	Cemented?	80' Gravel (80% Gravel, 15% Sand 5% Silt) 10% MC 20% SC 20% LP 25% MP 25% FP — 80% CS, 10% MS 10% FS 5Y 5/1 Grey dry 5Y 4/1 dark Grey damp. Slightly moist. Poorly Sorted Cobbles Sub Rounded Tending To become Angular With Small Particle size. 60% Basalt - 20% Granitic, 20% Quartzite/qtz No Rxn To 10% HCL.	Starts at ±77' 82' - Cemented layer? Very difficult to drive Casing
85'	2 Lith 1 Rad 1 moist	DB		85' Gravel - See Above	Cobbles up to 8" Across, Some Green Volcanics. ±87 Large Cobbles (8" Across) (Footballs) in Drive Barrel
90'	2 Lith 1 Rad 1 moist	DB		90' Gravel See Above	
95'	2 Lith 1 Rad 1 moist	DB		95' Silty Sandy Gravel (70% Gravel, 20% Sand, 10% Silt) 10% MC 10% SC 10% LP 30% MP 40% SP — 60% CS 20% MS 20% FS 5Y 5/1 Grey dry 5Y 4/1 D. Grey Damp, Slightly moist, Poorly Sorted, Pebbles Sub Angular To Sub Rounded, Sand Similar, 80% Basalt, 20% Quartzite, Rare Granite. No Rxn To 10% HCL	Cobbles up to 8" in DB

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A-6000-382 (04/90)

93127 90413

BOREHOLE LOG

Boring or Well No. 699-40-40B

Sheet 6 of 11

Location 216 B3 Pond

Project W017/B pond

Elevation LS 538.69'

Drilling Contractor KEH

Driller Daniel Ludtke

Drilling Method and Equipment BEZZW

Prepared By Chas Wright (Sign/Print Name) Date 7/24/6

Reviewed By Eugene C. Rafuse / Eugene C. Rafuse (Sign/Print Name) Date 08/08/8

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate; Casing Size & Type, Bit Size, Water Level
100	2 Lith 1 Rad 1 Moist	DB		100 GRAVEL (85% Gravel, 10% Sand) 5% SILT) 20% MC, 20% SC 20% CP 20% MP 20% FP, – 80% CS, 20% MS – Trace FS 2.5Y6/0 Grey dry 2.5Y 4/0 Dark Grey Wet. Damp. Poorly Sorted, Subrounded To Sub Angular 80% Basalt 20% Quartzite Rare Granite No Rxn To 10% HCl	Damp From Hand Tooling
105	1 Rad 2 Lith 1 Moist/ $CaCO_3$	DB		105 GRAVEL (85% GRAVEL, 10% SAND, 5% SILT) 25% MC, 25% SC, 15% CP, 20% MP 15% FP – 65% CS, 30% MS 5% FS. 2.5Y6/0 V. DRY, 2.5Y4/0 VERY WET. MOIST ~~Damp~~ HCl ~~Dry~~ POORLY SORTED SUBROUNDED TO ROUNDED, 80% BASALT, 20% QUARTZITE No Reaction To HCl (10%)	CASING DEPTH = 104, 07-25-91 DRILLING RATE ~5'/hr CASING 10" CS
110	1 Rad 2 Lith 1 Moist/ $CaCO_3$	DB		110 GRAVEL (85% GRAVEL, 10% SAND, 5% SILT) 25% MC 25% SC, 15% CP, 20% MP 15% FP – 65% CS 30% MS, 5% FS. 2.5Y6/0 V. DRY, 2.5Y4/0 V. WET. MOIST, POORLY SORTED SUBROUNDED TO ROUNDED. 80% BASALT 20% QUARTZITE. NO REACTION TO HCl (10%)	7/26/91
115	1 Rad 2 Lith 1 Moist/ $CaCO_3$	DB		115 GRAVEL (80% GRAVEL, 10% SAND 8% SILT, 2% CLAY), 25% MC, 20% SC 20% CP 20% MP 15% FP – 65% CS, 30% MS 5% FS. 2.5Y6/0 V. DRY, 2.5Y4/0 V. WET. MOIST, POORLY SORTED, SUBROUNDED TO SUBANGULAR, 80% BASALT 18% QUARTZITE, 2% GRANITE. NO REACTION TO 10% HCl	

A-6000-382 (04/90)

93127590414

BOREHOLE LOG

Boring or Well No. 699-40-40B

Sheet 7 of 11

Location 216 B3 POND

Project WO 17 B-POND

Elevation LAND SURFACE 538.69'

Drilling Contractor KEH

Driller DARREL LUDTKE

Drilling Method and Equipment CABLE TOOL BE 20 W

Prepared By [illegible] (Sign/Print Name) Date 07-26-91

Reviewed By [illegible] (Sign/Print Name) Date 8/08/91

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
120	1 RAD 2 LITH 1 MOIST GLOS	DB		120 GRAVEL (90% GRAVEL, 8% SAND, 2% SILT)	
				50% BOULDER, 20% MC, 10% SC, 15% CP, 5% MP	
				65% CS, 30% MS, 5% FS. 2.5 Y 6/6 - V. DRY	
				2.5 Y 4/6 V. WET. MOIST. POORLY SORTED.	
				SUBROUNDED TO SUBANGULAR, 95% BASALT	
123				5% OTHER, NO RXN TO 10% HCL	
				123 SLIGHTLY GRAVELLY SANDY SILT (10% GRAVEL,	REACHED WATER LEVEL 121.25 07-26-91
				40% SAND, 60% SILT/CLAY. 35% CP, 35% MP,	
				30% FP. 35% CS, 30% MS, 35% FS. ~80% SILT,	
125				20% CLAY. 10YR 6/6 WET, 10YR 4/4 DRY. MOD	
				SORTING SUBROUNDED TO ROUNDED CLASTS	
				85% BASALT 15% OTHER. NO RXN TO HCL (10%)	
				125 (124.8-126.8) SILT (60% SILT, 40% CLAY)	07-29-91 SAMPLE
				2.5Y 7/3 DRY, 2.5Y 5/6 WET. WELL SORTED	
130'				NO RXN TO 10% HCL	
	1 RAD 1 MOIST 2 LITH			130' Clay (90% Clay 10% Sand)	Water From Perched
				10YR 6/4 Lt Yellowish Brown Dry 10YR	Aquifer? Difficult Drilling
				5/4 Yellowish Brown Wet, Well Sorted,	
				Damp No Rxn To HCL	
		DB			
					Switched To Hard Tool
135				135' Clay (90% Clay, 10% Sand)	
	2 Lith Wet Moist			See Above	15 Gal H2O Added 8/6/91
		HT			15 Gal " " "
					5 Gal " " "
					Wet From ~~Dump~~ Hard
					Tooling. ~600# Gas cut off 8/7/91
140					
				140' (90% Clay, 10% Sand)	15 Gal H2O Added
		HT		See Above.	

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. L99-40-40B

Sheet 8 of 11

Location 216 B-3 Pond Globe

Project W017/B Pond

Elevation LS

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment Cable Tool BE22W

Prepared By Chris Wright [signature] (Sign/Print Name) Date

Reviewed By RA Williams [signature] (Sign/Print Name) Date 6/4/92

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
145	2 Lith 1 Rad 1 moist	HT		145' Clay (90% Clay, 10% Sand) 10 YR 6/4 Lt Yellowish Brown Dry 10 YR 5/4 Yellowish Brown Wet, Well Sorted Soaked No Rxn To 10% Vcl, Sticky, Plastic	15 Gal H_2O Added To Hole
150	2 Lith 1 Rad 1 moist 3 Split Tube 4 in	HT, ST 6+ 34, 71 for 3"		See Above	15 Gal H_2O Added 8/7/91 15 Gal " " " - Split Tube Refused at 1'
155	2 Lith 1 Rad 1 moist	HT		155' Clay (See Above	15 Gal H_2O Added To Hole 8/7/91
160	2 Lith 1 Rad 1 moist			160' Clay see Above	

A-6000-382 (04/90)

9312759041 6

BOREHOLE LOG

Boring or Well No. 699-40-40B

Sheet 9 of ~~10~~ 11

Location 216 B3 Pond C Cabe

Project Wolf/B pond

Elevation LS 538.69'

Drilling Contractor KEH

Driller Darrel Ludtke

Drilling Method and Equipment BERCW Cable Tool

Prepared By Chris Wright [signature] (Sign/Print Name) Date

Reviewed By [signature] / Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
165'	2 Lith 2 Rad 1 moist	HT		(165) Slightly Gravelley SANdy Clay (10% Gravel, 20% Sand, 70% Clay) 100% FG - 20% CS 20% MS, 60% FS. 10YR 6/2 LT Brownish Grey Dry 10YR 4/2 D Grayish Brown Wet. Damp, Saturated, Moderately Well Sorted Sand Sub Angular To Sub Rounded Basalt Pebbles, Sand 70% Felsic 30% Mafic Moderate Rxn To 10% HCL	Starts ±164' Wet - Possibly Water Bearing
170'	2 Lith 1 Rad 1 moist	HT		170' Slightly Gravelly Sandy Clay (Similar To Above) -	Possibly Less, Gravely Wet
175'	2 Lith 1 Rad 1 moist	HT		175' Slightly Gravelly SAndy Clay Similar To Above	STATIC Water Level 140.6 BLS 8/9/91
180	HT			180' Slightly Gravelley SANdy Clay See Above	
182	2 Lith 1 Rad 1 moist	ST 19/24/34/60 ey Recovery		~~St~~ 182 Slightly Gravelly Sandy Clay (5% Gravel, 250% Sand 70% Clay) 100% FG 10% CS 10% MS 80% FS) 2.5Y 7/2 LT Grey Dry 2.5Y 5/2 LT Grayish Brown Wet Moderately Sorted, Pebbles Sub Angular To Angular, 60% Quartzite 40% Basalt Sand 50% Mafic No Rxn To 10% HCL Plastic	Dry In Split Tube Grades Into Sand by 184'

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A-6000-382 (04/90)

93127 90417

WHC-SD-EN-DP-046, Rev. 0

BOREHOLE LOG

Boring or Well No. 699-40-40B

Sheet 10 of ~~10~~ 11

Location 699-B3 Pond C-Lobe

Project W017 B-Pond

Elevation LS 538.69'

Drilling Contractor KEH

Driller Daniel Ludtke

Drilling Method and Equipment BEZZW Cable Tool

Prepared By [signature] (Sign/Print Name) Date

Reviewed By [signature] / Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
184'	ST	See 182		184' SILTY SAND (80% Sand, 20% SILT	Dry in Split Tube
				30% CS, 30% FS 2.5Y 7/2 LT Grey	TD at 184' 8/12/91
				Dry 2.5Y 5/2 Greyish Brown Wet	
				Dry, Well Sorted 50% Mafic, 50% Felsic	
				Sand Angular To Sub Angular, No Rxn To	
				10% HCl, Plastic.	

A-6000-382 (04/90)

9312759041 8

BOREHOLE LOG

Boring or Well No. 699-40-40B

Sheet 11 of 11

Location: 216-B3-Pond - C-lobe
Project: W017 / B-Pond
Elevation: Land Surface 538.69'
Drilling Contractor: KEH
Driller: D. Ludtke
Drilling Method and Equipment: Cable Tool / BE22W
Prepared By: Dale Drewry / Dale Drewry (Sign/Print Name) Date: 9-19-91
Reviewed By: E.C. Rostow / E.C. Rostow (Sign/Print Name) Date: 09/22/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
185	2 lith 1 rad 1 mois/ $CaCO_3$	H.T.		(185') slightly silty - SAND (90% sand 10% silt) sand - 50% fs, 20% vfs, 10% cS, 20% mS; wet (2.5Y 6/2) lt. brown gray; dry (2.5, 7/2) lt. gray; well sorted 70% felsic, 30% mafic, no rxn to 10% HCl	0805 9-19-91
190	2 lith 1 Rad 1 $CaCO_3$/ mois	H.T.		(190)* silty - sandy - GRAVEL (60% gravel 30% sand, 10% silt) gravel pulverized by H.T.; ~~wet~~ dry (2.5, 7/2) lt. gray; ~~dry~~ wet (2.5 4/2) olive brown; moderately sorted, 70% felsic 30% mafic, ~~no~~ slight rxn to 10% HCl	0900 9-19-91 - increase in gravel @ 190 - contact (gradational) @ 189' bls
* 193	2 physical 2 lith 1 rad 1 mois/ $CaCO_3$	S.T. 23/65/91		(193-195)' sandy - GRAVEL (60% gravel 40% sand) 10% vcP, 10% cP, 20% mP 10% fP 10% vfP; 10% vcS, 10% cS 15% mS, 5% fS wet (5Y 6/8) olive yellow; dry (5Y 6/6) yellow; sample wet; poorly sorted; gravel (rounded to well rounded); sand (subangular to subrounded) 60% felsic, 30% mafic, 10% Qtz; strong rxn to 10% HCl	1200 9-19-91 - S.T. from 193-194.5 - 75% recovery - ringold gravel
194					
* 195	2 lith 1 rad 1 mois/ $CaCO_3$	H.T.		(195-200') sandy - GRAVEL (similar to above)	1530 9-19-91 T.D. = 202' bls
200					

* note change in scale

A-6000-382 (04/90)

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WHC-SD-EN-DP-046, Rev. 0

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-40-40B Area 600 Area Date 7/24/91

Log Run #1 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description B-Pond / C Lobe

Ground Surface Elevation _____

Surface Temperature 40.0°C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Darrel Ludtke

Drill Rig Type Cable Tool | Bit Type/Diameter Drive Barrel / 12" 8"

Borehole Diameter(s)/Depth 16"/40.2' 12"/100.2'

Depth Driller 100.2' | Depth Logger 99.3'

Liquid Level NA | Liquid Density NA

Temperature NA

CASING RECORD

Type 16" Carbon Steel Sch.40 | Interval +1.0' -40.2'

Type 12" Carbon Steel Sch.40 | Interval 7.4' -99.76'

Type _____ | Interval _____

Type _____ | Interval _____

Well Screen Interval NA

Comments: Return Error = +0.45' high
Centralizer used

A-6000-520 (05/90)

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand MLS | Equipment Type Analog

Tool Type Gamma Ray | Serial No. C627A97

Base Calibration Date 5/91 | Calibration Reference PNL-7460 UC-606

Calibration/Probe Factor 787 x10⁻⁶ cu pR/hr/cps | Calibration Datum (eU): Position 1 291.4 eU | Position 2 48.5 eU

Dead Time 17.8 usec | Warm Up Time 7.15 min

LOGGING INFORMATION

Log Interval From 99.3' To 3.7'

Rerun(s) 45.0' ± 10.0

Pre Survey Verification: Position 1 275.1 eU | Position 2 47.6 eU | Background 55 c/s

Base Calibration Difference: Position 1 16.3 eU | Position 2 0.9 eU | Rerun Scales, CPS/in. 50 c/s/in

Logging Speed 5 ft/min. | Completion Time 1500

Start Time 1345

Chart Speed(s), i/hr. 10 ft/in | Time Constant(s) TC-1

Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in.

Post Survey Verification: Position 1 271.1 eU | Position 2 47.6 eU | Background 55 c/s

Percent Change: Position 1 1.5% | Position 2 0.0%

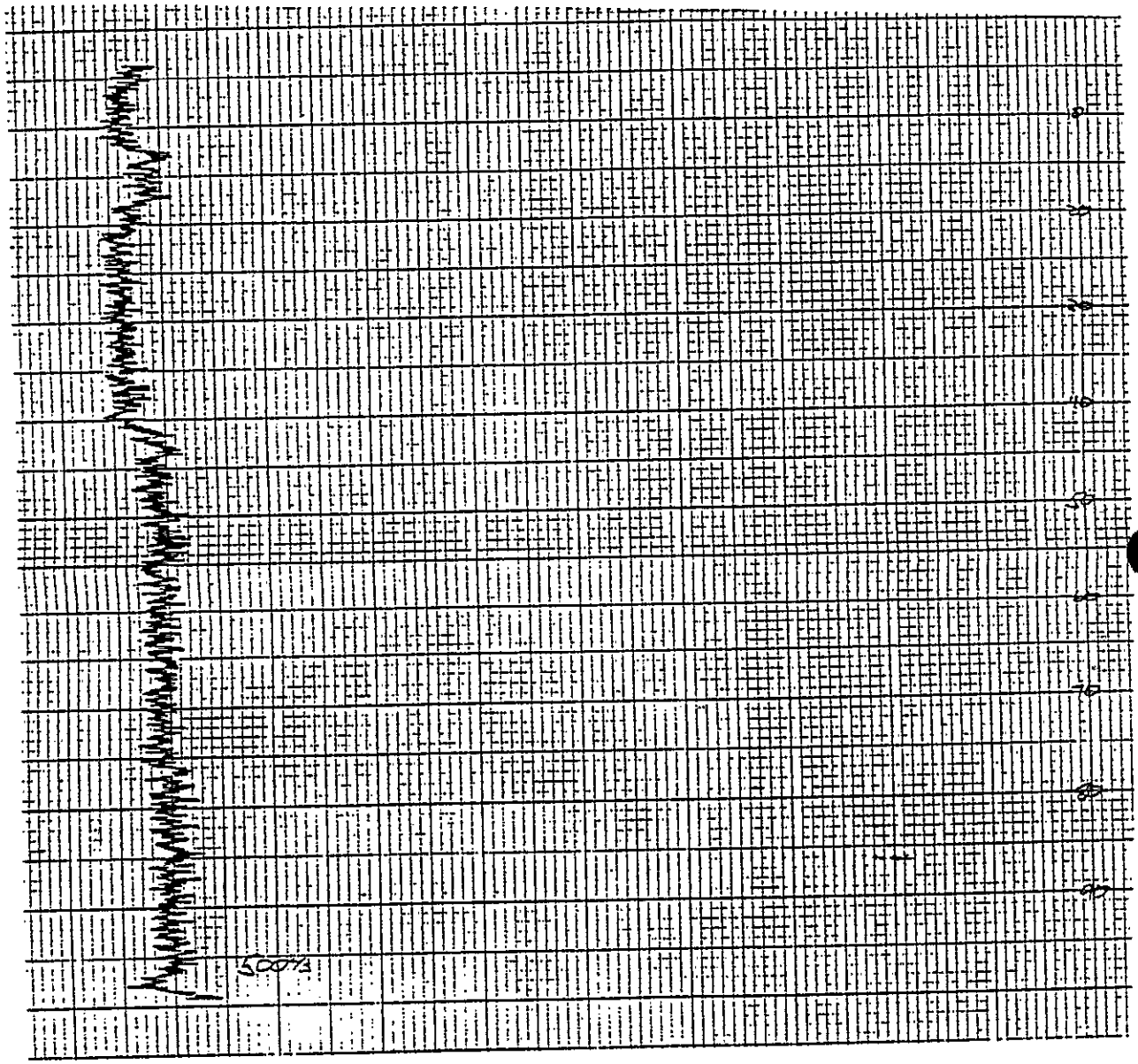
Comments Return Error = +0.45' high
Centralizer used

A-41

Witnessed and Verified by: (sign and print name) Randall Grad / Rowan Price Date: 27 Jul 91

9 3 1 2 7 0 0 4 2 1

699-40-40B RUN#1 7/24/1991



9 3 1 2 7 5 9 0 4 2 2

Westinghouse Hanford Company | LOG HEADER | Page 1 of 2

Well No. 699-40-40B Area 600 Area Date 7/31/91
Log Run #2 Log Type Gross Gamma
Elevation Datum Elevation
Survey Coordinates N
Log Measured From Ground Surface
Location Description B-Pond C Lobe
Ground Surface Elevation
Surface Temperature 32.7 °C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Darrel Ludtke
Drill Rig Type Cable Tool Bit Type/Diameter Drive Barrel /8"
Borehole Diameter(s)/Depth 16"/40.2' 12"/98.3' 10"/130.0'
Depth Driller 130.0' Depth Logger 128.1'
Liquid Level NA Liquid Density NA
Temperature NA

CASING RECORD

Type 16" Carbon Steel Sch.40 Interval +1.0' - 40.20'
Type 12" Carbon Steel Sch.40 Interval +1.5' - 98.30'
Type 10" Carbon Steel Sch.40 Interval +3.8' - 124.3'
Type Interval
Well Screen Interval NA
Comments: Return Error = +0.1' high
Centralizer used
Perched H_2O 119.0' - 120.0'

A-6000-520.05-901

9 3 1 2 7 9 0 4 2 3

LOG HEADER | Page 2 of 2

EQUIPMENT DATA

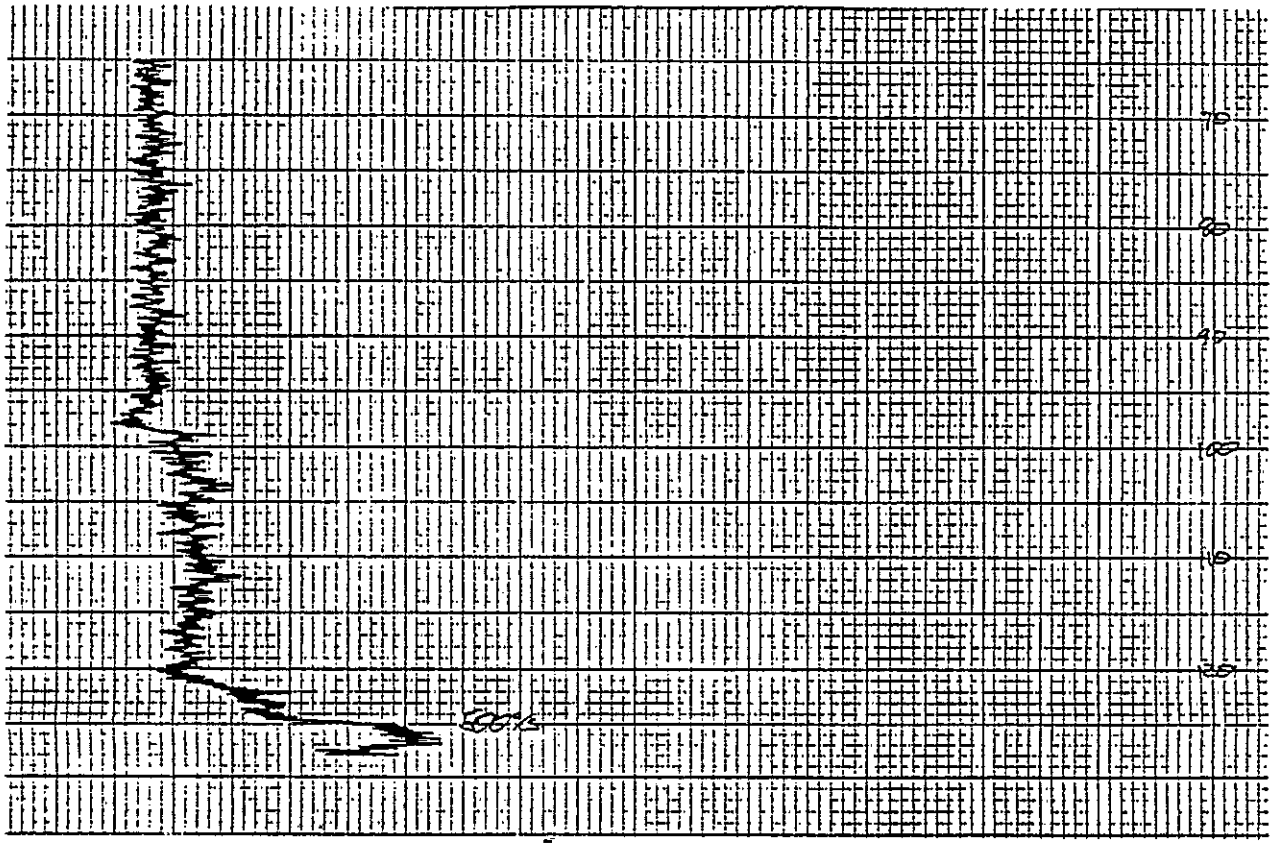
Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS Equipment Type Analog
Tool Type Gamma Ray Serial No. C627A97
Base Calibration Date 5/91 Calibration Reference PNL-7785 UC-606
Calibration/Probe Factor 8.84 x 10^-3 eU P/m/c/s Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU
Dead Time 11.8 μsec Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 128.1' To 65.0'
Rerun(s) 128.1' to 90.0'
Pre Survey Verification: Position 1 298.4 eU Position 2 64.5 eU Background 50 c/s
Base Calibration Difference: Position 1 1.0 eU Position 2 0.2 eU
Logging Speed 5 ft./min. Rerun Scales, CPS/in. 50 c/s/in
Start Time 1000 Completion Time 1145
Chart Speed(s), ft/in. 10 ft/in.
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1
Post Survey Verification: Position 1 302.8 eU Position 2 65.4 eU Background 50 c/s
Percent Change: Position 1 1.5% Position 2 1.4%
Comments Return Error = +0.1' high
Centralizer used

Witnessed and Verified by: (sign and print name) Randall Price / RANDALL PRICE Date: 31 JULY 91

699-40-40B RUN#2 7/31/1991



9 3 1 2 7 5 9 0 1 2 4

Westinghouse Hanford Company | LOG HEADER | Page 1 of 2

Well No. 699-40-40B Area 600 Area Date 8/12/91
Log Run #3 Log Type Gross Gamma
Elevation Datum Elevation
Survey Coordinates N
Log Measured From Ground Surface
Location Description B-Pond / C-Lobe
Ground Surface Elevation
Surface Temperature 37.6°C Weather Clear - Hot

BOREHOLE INFORMATION

Driller Daniel Ludtke
Drill Rig Type Cable Tool Bit Type/Diameter Hand Tool / 8"
Borehole Diameter(s)/Depth 16"/40.2' 12"/98.3' 10"/129.5' 8"/182.0'
Depth Driller 182.0' Depth Logger 181.6'
Liquid Level NA Liquid Density NA
Temperature NA

CASING RECORD

Type 16" Carbon Steel Sch 40 Interval 1.0'-40.20
Type 12" Carbon Steel Sch. 40 Interval 1.4' 98.30
Type 10" Carbon Steel Sch 40 Interval 1.6' 129.54
Type 8" Carbon Steel Sch. 40 Interval 2.4'-180.59
Well Screen Interval NA
Comments: Return Error = +0.27' high
Centralizer used
Water bearing zone 164'-172' Shut off = 7 No
Water in borehole.

A-6000-523 (05-90)

93127 90425

LOG HEADER | Page 2 of 2

EQUIPMENT DATA

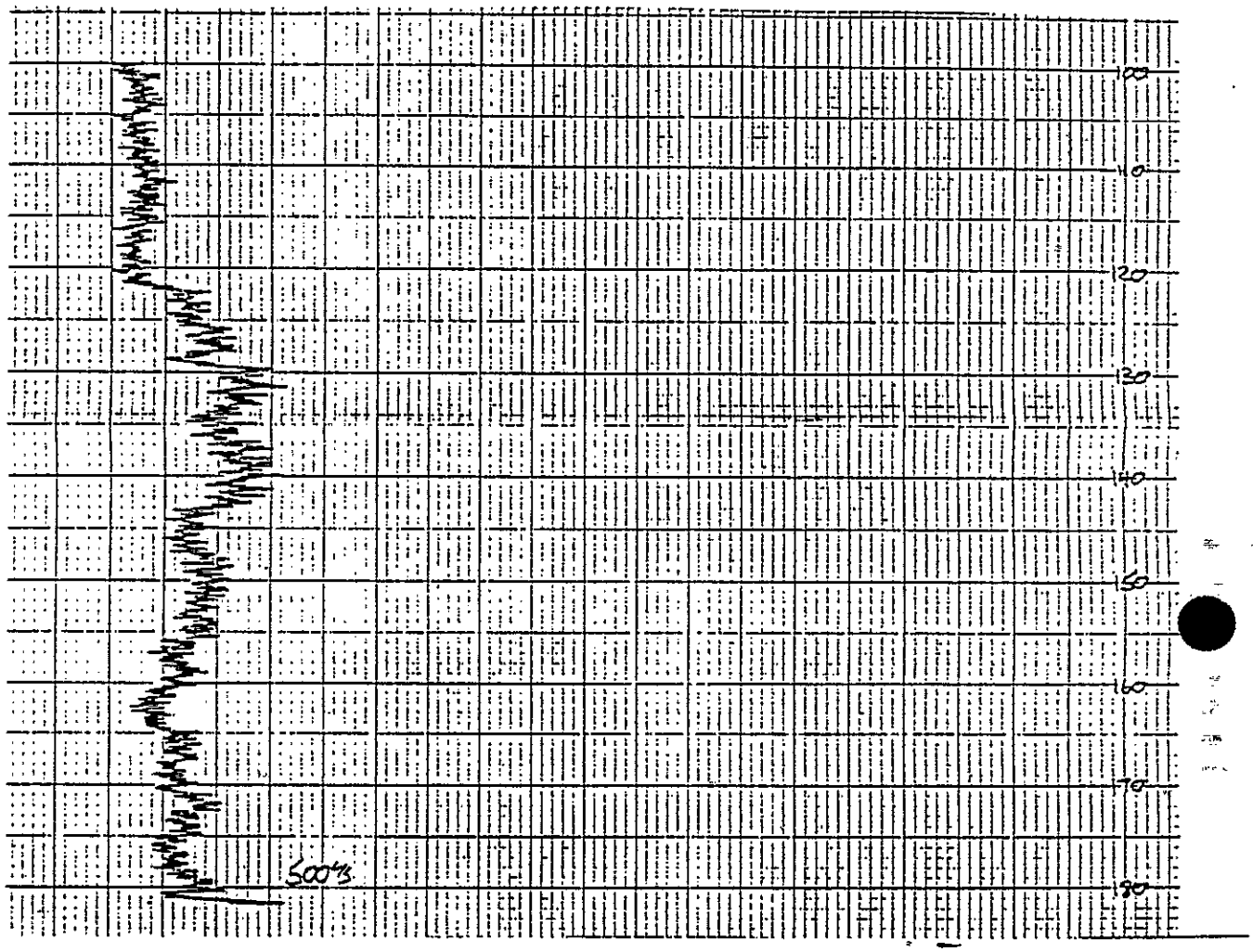
Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS Equipment Type Analog
Tool Type Gamma Ray Serial No. CG27A97
Base Calibration Date 5/91 Calibration Reference ~~Not Yet Assigned~~ PNL-7785 UC-606 RK Prime
Calibration/Probe Factor 8.84x10⁻³ eU p/mR/s Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU
Dead Time 11.8 μ sec Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 181.6' To 100.0'
Rerun(s) 181.6' to 120.0'
Pre Survey Verification: Position 1 298.4 eU Position 2 64.5 eU Background 50 c/s
Base Calibration Difference: Position 1 1.0 eU Position 2 0.2 eU
Logging Speed 5 ft./min. Rerun Scales, CPS/in. 50 c/s/in
Start Time 1420 Completion Time 1630
Chart Speed(s), ft/in. 10 ft/in.
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1
Post Survey Verification: Position 1 298.4 eU Position 2 65.0 eU Background 50 c/s
Percent Change: Position 1 0.0% Position 2 0.9%
Comments Return Error = +0.27' high
Centralizer used

Witnessed and Verified by: (sign and print name) Alan Pearson Alan W. Pearson Date: 8/12/91

699-40-40B RUN#3 8/12/1991



9 3 1 2 7 3 9 0 4 2 6

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-40-40B Area 600 Area Date 9/19/91
Log Run #4 Log Type Gross Gamma
Elevation Datum Elevation
Survey Coordinates N
Log Measured From Ground Surface
Location Description B Pond / C-Lobe
Ground Surface Elevation
Surface Temperature 28.1 °C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Darrel Ludtke
Drill Rig Type Cable Tool Bit Type/Diameter Hard Tool / 8"
Borehole Diameter(s)/Depth 16"/40.2' 12"/98.3' 10"/131.2' 8"/202.0'
Depth Driller 202.0' Depth Logger 200.1'
Liquid Level 138.25 Liquid Density Muddy
Temperature 18.9°C

CASING RECORD

Type 16" Carbon Steel Sch. 40 Interval +0.8 - 40.20'
Type 12" Carbon Steel Sch. 40 Interval +1.0' - 98.30'
Type 10" Carbon Steel Sch. 40 Interval +1.3' - 131.20'
Type 8" Carbon Steel Sch. 40 Interval +2.9' - 190.07'
Well Screen Interval NA
Comments: Return Error = +0.21' high
Centralizer used.
Thick Mud in borehole.

A-6000-520 (05/90)

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS Equipment Type Analog
Tool Type Gamma Ray Serial No. C627A97
Base Calibration Date 5/91 Calibration Reference PNL-7785 UC-606
Calibration/Probe Factor 8.84x10³ eU ft/m/c/s Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU
Dead Time 11.8 μsec Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 200.1' To 150.0'
Rerun(s) AWD 9/19/91 ~~200.1'~~ 199.9' to 150.0'
Pre Survey Verification: Position 1 303.0 eU Position 2 64.4 eU Background 47 c/s
Base Calibration Difference: Position 1 5.6 eU Position 2 0.1 eU
Logging Speed 5 ft./min. Rerun Scales, CPS/in. 50 c/s/in
Start Time 1800 Completion Time 1800
Chart Speed(s), ft/in. 10 ft./in.
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1
Post Survey Verification: Position 1 305.4 eU Position 2 64.1 eU Background 45 c/s
Percent Change: Position 1 0.8% Position 2 0.5%
Comments Return Error = +0.21' high
Centralizer used

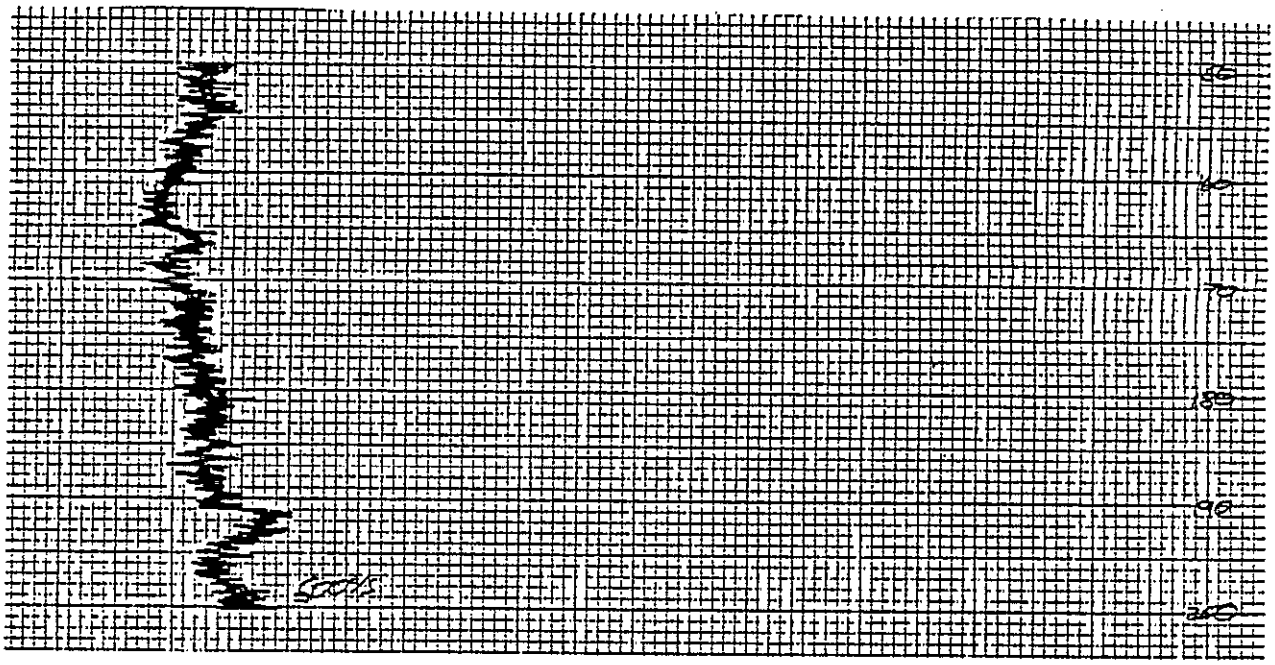
A-47

Witnessed and Verified by: (sign and print name) Alan Pearson / Alan Pearson Date: 9/19/91

A-6000-520 (05/90)

9 3 1 2 7 0 4 2 7

699-40-40B RUN#4 9/19/1991



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595

KAISER ENGINEERS HANFORD

FIELD SKETCH

Attachment To Or Description: Date: 12/10/91

3-Pond Wells

921-057-WELL-119

Sheet 2 of 2

WELL NO.	COORDINATES (C/L CASING) 200-E AREA (FEET)	LAMBERT WCS83S (METERS)	VERT. DATUM	ELEVATIONS (FEET) BRASS CAP IN CONC.	TOP HYDRO STAR PLATE, N. SIDE	TOP OUTER CASING N. SIDE	
699-40-40A	N:39710.4 W:40071.5	N:135,594.31 E:577,680.25	NGVD'29	537.75	541.23	541.21	
			200-E	537.53	541.00	540.99	
699-40-40B	N:39761.4 W:40079.8	N:135,609.86 E:577,677.65	NGVD'29	538.69	542.20 ~~542.20~~	542.18	
			200-E	538.46	541.97	541.96	

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WELL CONSTRUCTION REPORT

2/4/92

Page 1 of 2

Specification No. WHC-S-014 Rev No. 5

ECNs 144240, 144741

Project W-017 / B. Pond

Location B. Pond - Lobe 3c

Drilling Company Kaiser Engineers Hanford

Driller Moe Wraspir, Jim Smith, Jody Carpenter

Other (Companies) WHC, ESI

Geologist(s) Paul Anderson (E.S.I.)
Myra Vaag (ESI)
Stacey Callison, Rick Weingarz

Well No. ~~699-BP91-2~~ 699-42-39 A 12/19/91 SM Temp. Well No. 699-BP91-2

Coordinates: N 41866.5 Hanford W 39484.6 Lambert N 136,251.95, E 577,

Casing Elev. 558.14' Ground Elev. 554.61'

Drilling Method

Verification Method Visual Observation

Criteria WHC-S-014 5.2, 5.3, 7.5, EII, 6.7 sec. 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D 92-130' 0-25' 30-88'	H 25-30' 88-92' 130-180'	PWA.	6/27/91
Drilling Fluid	raw water		PWA	8/14/91
Other	N/A			

Geophysical Logging

Sondes	Interval	Date
Gross Gamma	4.5' ~~0~~ - 143.6'	8/2/91
Gross Gamma	PWA 8/2 ~~110.0~~ - 179.7'	8/9/91
	-	
	-	
	-	

Completion Data

Drilled Depth 180.6' bls

Completed Depth 179.9' bls

Date Started 6/25/91

Date Completed 9/26/91

Static Water Level/Date 143.0' bls 8/5/91

Aquifer Testing

Type INSTANTANEOUS SLUG

Flow Meter I.D. No. -NA-

Cal. Due Date -NA-

Length of Test 1 HR

Volume Pumped -NA-

Drawdown -NA-

Date of Test 10-22-91

Completion Results

Cleaning

Verification Method Visual Inspection (Document Review)

Criteria WHC-S-014 sec's 4.2.2, 7.6, 7.7 WHC-CM-7-7 sec. 5.4

	Initials	Date
Drilling Tools/Rig	PWA	6/25/91
Temporary Materials	SWC	6/25/91 *
Permanent Materials	SWC	9/6/91

Screen

Type	Length	Slot Size
T-304 stainless steel 4"	10.67'	0.010 10 slot

Depth(s) 169.4' - 180.1' bls

Verification Method Steel Tape

Criteria WHC-S-014, 4.2.3, 4.2.5, 12.2.1, 4.2.1

Initials SWC Date 9/11/91

Material Storage/Packing

Verification Method Visual Inspection

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	SWC	9/6/91
Material Packing	SWC	9/6/91

Lubricants/Additives

Verification Method Visual Observation

Criteria WHC-S-014 sec. 7.2

	Identify	Initials	Date
Additives	Raw Water	PWA.	8/12/91
Lubricants	Well Guard	SWC	9/6/91

Straightness Test

Verification Method Visual Observation

Criteria WHC-S-014 sec. 8.2

Initials PWA, MOE Date 8/12/91

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A-6000-436 (09/90)

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WELL CONSTRUCTION REPORT
(continuation sheet)

Well No. 699-BP91-2

Casing (permanent)

Type	Size	Placement
T-304 stainless steel	4"	13.6 - 180.1
		-
		-
		-

Verification Method: Visual w/ steel tape measure

Criteria: WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials: SWC Date: 9/11/91

Well Protection

Verification Method: Visual Measure w/ steel tape

Criteria: WHC-S-014 4.2.10

	Initials	Date
Protective Posts	ECR	1/24/92
Protective Casing	ECR	1/24/92
Site Restored	ECR	1/24/92
Cap, Hasp and Lock	ECR	1/24/92
Surface Pad	ECR	1/24/92

Annular Seal/Filter Pack

8/20/91 SWC

Verification Method: Steel Tape Criteria: WHC-S-014 4.2.6, 4.2.7, 4.2.8, 4.2.9, ~~5.3.1~~ 5.3.2

Type	Interval	Volume	Initials	Date
20-40 silica sand	179.9' - 165.5'	8-100# bags (9.0 ft³)	SWC	9/9/91
40-100 silica sand	165.5' - 162.6'	2-100# bags (2.3 ft³)	SWC	9/10/91
3/8" bentonite pellets	162.6' - 159.6'	3-50# bags (1.9 ft³)	SWC	9/11/91
"pure gold" bentonite grout	159.6' - 128.5'	12-50# bags (26.4 ft³)	SWC	9/12/91
~~8-20~~ mesh bentonite crumbles	128.5' - 20.3	167-50# bags (118.6 ft³)	SWC	9/26/91
type I+II cement grout	20.3 - 2.5	16-94# bags (20.6 ft³)	SWC	9/26/91

Well Survey/Labeling

Verification Method: Review of Survey Report

Criteria: WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	ECR	1/24/92
Protective Casing/Brass Cap Surveyed	ECR	1/24/92
Well Number Stenciled	ECR	1/24/92
Brass Cap Labeled	ECR	1/24/92

Pump Installation

Verification Method: Visual Observation

Criteria: WHC-S-014 4.2.11, 4.2.2

	Initials	Date
Pump Decon/Prep	JAC	10/30/91
Installed	JAC	10/30/91
Pump Tested	JAC	10/30/91

Other (initial if performed)

N/A Well Abandonment ~~ECR~~ ECR 10/21/91 Downhole TV Inspection SWC Complete As-Built Diagram, Driller's/Geologist's Logs

JAC 10/31/91 Well Development Partial Sand Pack Development SWC 9/9/91

Comments/Remarks: * Original casing rejected due to numbers painted on outside/inside. See NCR#; MYRA VAAG (GEOLOGIST) WAS PRESENT ON SITE FROM 7/18/91 TO 7/20/91;

Reviewed By (Sign/Print Name): Edward C. Refuse / EDWARD C. REFUSE Date: 12/27/91

A-6000-436 (09/90)

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WELL SUMMARY SHEET

Boring or Well No. 699-BP91-2 (TEMP.

Sheet 1 of 2

Location B-Pond Lobe 3C
Project W-017 / B-Pond
Elevation 554.61'
Drilling Contractor Kaiser Engineers Hanford
Driller Moe Wraspir, Jim Smith, Jody Carpenter
Drilling Method and Equipment Cable Tool
Prepared By SW Callison / SW Callison (Sign/Print Name) Date 8/4/91
Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 10/01/91

CONSTRUCTION DATA: Description	Diagram	Depth in Feet	GEOLOGIC/HYDROLOGIC DATA: Graphic Log	Lithologic Description
12" OD carbon steel				Sandy GRAVEL
temporary casing		10		Sandy GRAVEL
set @ 143.5' bls				Sandy GRAVEL
		20		gravelly SAND
10" carbon steel		20.3		Sandy GRAVEL
temporary casing		30		slightly sandy GRAVEL
set @ 180.1' bls				Sandy GRAVEL
		40		Sandy GRAVEL
bottom of cement grout				Sandy GRAVEL
and top of bentonite		50		Sandy GRAVEL
crumbles @ 20.3' bls				sandy GRAVEL
		60		sandy GRAVEL
bottom of bentonite				Sandy GRAVEL
crumbles @ 128.5' bls		70		sandy GRAVEL
				slightly silty sandy GRAVEL
"Pure Gold" bentonite		80		sandy GRAVEL
grout from 128.5 to				gravelly SAND
159.6' bls		90		slightly sandy GRAVEL (blowdown)
				slightly sandy GRAVEL
3/8" bentonite pellets		100		sandy GRAVEL
from 159.6' to 162.6' bls				slightly sandy GRAVEL
		110		slightly sandy GRAVEL
40-100 silica sand				Sandy GRAVEL
from 162.6' to 165.5' bls		120		slightly gravelly SAND
				Sandy clayey GRAVEL
20-40 silica sand		128.5' 130		slightly clayey sandy GRAVEL
from 165.5' to 180.1' bls		134		sandy GRAVEL
		140		silty SAND
10 slot 4" SS wire		143.5'		Sandy SILT
wrap T-304 screen		150		clayey SILT
from 169.4' to 180.1' bls		159.6'		clayey SILT
	162.6	160		clayey SILT
		165.5'		Silty SAND

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699-42-39 A (PERM)

WELL SUMMARY SHEET

Boring or Well No. 699-BP91-2 (TEMP)

Sheet 2 of 2

Location B-Pond Lobe 3C

Project W-017 / B-Pond

Elevation 554.61'

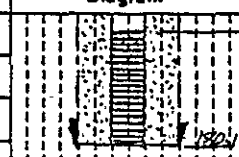
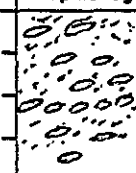
Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir, Jim Smith, Jody Carpenter

Drilling Method and Equipment Cable Tool

Prepared By SW Callison / SW Callison (Sign/Print Name) Date 9/4/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 10/01/91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
water level @ 134' bls		169.4		sandy silty GRAVEL
		170		sandy GRAVEL
bottom of ~~10"~~ 12" cs				sandy GRAVEL
casing @ 143.5' bls		180		
bottom of 10" cs				
casing @ 180.1' bls				
TD of borehole				
@ 180.1' bls				

A-6000-384 (04/90)

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BOREHOLE LOG

SIGNATURE/DATE 2/4/93

Boring or Well No. 699-BP91-2 (TEMP.)

Sheet 1 of 10

Location B-Pond, Lobe 3c

Project W-017 / B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment cable tool/drive barrel

Prepared By Paul W. Anderson / Paul Anderson (Sign/Print Name) Date 7/1/91

Reviewed By Edward C. Rogers / Edward C. Rogers (Sign/Print Name) Date 12/27/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
0.0				surface: small to large cobbles, fine to coarse pebbles, sand	12" casing, 8 1/2" nominal dia. core barrel
	1 moist. 2 lith. 1 rad.	D.B.			
5.0				5.0: sandy GRAVEL 60% angular to rounded gravel: 20% small cobbles, 20% vcp, 5% cp, 5% mp, 5% fp, 5% vfp 35% sand: 20% med, 15% fine; 5% silt; slight rxn. to 10% HCl, very poorly sorted, loose, slightly moist, 85% mafic, 15% felsic; 2.5Y 4/2 - dark grey, sh brown - wet 2.5Y 6/2, light to brownish grey - dry	PID < det. FILL (berm material)
	1 moist. 2 lith. 1 rad.	D.B.			
10.0				10.0: sandy GRAVEL 80% subangular to rounded gravel; 20% small cobbles, 20% vcp, 15% cp, 10% mp, 10% fp, 5% vfp; 20% sand: 10% coarse, 5% med., 5% fine; very strong reaction to HCl, very poorly sorted, loose, slightly moist, 60% mafic, 40% felsic 5Y 7/1 light grey - dry 2.5Y 4/2 dark grayish brown - wet	PID < det. FILL (berm)
	1 moist. 2 lith. 1 rad.	D.B.			
15.0				15.0: sandy GRAVEL similar to last sample	PID < det. FILL (berm)
20.0					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-B9-2 (TEMP)

Sheet 2 of 10

Location B-pond, Lobe 3c

Project W-017 / B pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrasoir

Drilling Method and Equipment cable tool / drive barrel, hard tool

Prepared By Paul W Anderson / Paul Anderson (Sign/Print Name) Date 7/1/91

Reviewed By EDWARD C. RAFUSE / Edward C. Rafuse (Sign/Print Name) Date 8/27/92

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
20.0	1 moist 21th. 1 rad.	D.B.		20.0': gravelly SAND 70% sand: 10% coarse, 20% med, 40% fine; 30% angular (small) to rounded (large) gravel: 20% vcp, 5% mp, 5% fp moderate reaction to HCl, poorly sorted, loose, slightly moist 2.5Y 4/3 olive brown-wet 2.5Y 6/2 light brownish grey-dry sand is 80% felsic, 20% mafic; gravel 60% mafic, 40% felsic	PID < det. FILL (berm material)
25.0	1 moist. 21th. 1 rad.	H.T.		25.0: sandy GRAVEL 70% angular gravel; fine to very fine - all are fragments from large boulder; 30% sand subround to angular, 20% cse, 5% medium, 5% fine; no reaction to HCl, poorly sorted, 80% mafic, 20% felsic, 5Y 3/1 very dark grey-wet; 5Y 5/1 grey-dry	PID < det. moisture content unknown due to water added to hole to help drilling
30.0	1 moist 21th. 1 rad.	D.B.		30.0: slightly sandy GRAVEL 80% rounded gravel: 70% lg. cobbles, 70% sm. cobbles, 20% vcp, 10% cp, 10% mp; 20% sand: 15% cse, 5% med.; moderate reaction to 10% HCl, very poorly sorted, loose, 80% mafic, 20% felsic 5Y 7/1 light grey-dry 5Y 3/1 very dark grey-wet	PID < det. moisture content unknown
35.0	1 moist 21th. 1 rad.	D.B.		35.0': sandy GRAVEL 75% angular to rounded gravel: 15% lg. cobbles, 20% sm. cobbles, 20% vcp, 10% cp, 5% mp, 5% fp (m+fp are angular, probably broken fragments of larger material), 25% sand: 5% cse, 10% med., 10% fine; very strong reaction to 10% HCl, very poorly sorted, loose, slightly moist, 80% mafic, 20% felsic, 10YR 6/1 grey-dry 5Y 4/1 dark grey-wet	PID < det.
40.0					

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BOREHOLE LOG

Boring or Well No. 699-BP91-2 (TEMP.)

Sheet 3 of 10

Location B-Pond, Lobe 3c

Project W-071/B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrospir

Drilling Method and Equipment cable tool / drive barrel

Prepared By Paul W. Anderson / Paul Anderson (Sign/Print Name) Date 7/9/91

Reviewed By Edward C. Lafferty / Edward C. Lafferty (Sign/Print Name) Date 12/27/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
40.0	1 moist. 21th. 1 rad.	D.B.		40.0': sandy GRAVEL similar to last sample interval	occasional boulder
45.0	1 moist. 21th. 1 rad.	D.B.		45.0': sandy GRAVEL 70% rounded to subangular gravel: 20% sm. cobbles, 20% vcp, 20% cp, 10% mp; 30% sand; 20% cse, 10% med.; very poorly sorted, loose, mod. rxn. to 10% HCL, 80% mafic, 20% felsic, 2.5Y 3/2 very dark grayish brown (wet); 2.5Y 6/2 light brownish grey - dry	moisture content unknown; water added to borehole to enable recovery
50.0	1 moist 21th. 1 rad.	D.B.		50.0': sandy GRAVEL 80% rounded to angular gravel: 25% lg. cobbles, 10% sm. cobbles, 10% vcp, 5% cp, 5% mp, 10% fp, 15% vfp; 20% sand: 5% coarse 5% med, 10% fine; very well graded, poorly sorted, loose, slightly moist, moderate reaction to 10% HCL, 90% mafic, 10% felsic, 5Y 6/1 - gray (dry); 5Y 3/1 very dark grey (wet)	occasional boulder; 52-54': cohesive, some silt present
55.0	1 moist. 21th. 1 rad.	D.B.		55.0': sandy GRAVEL 70% rounded to angular gravel: 20% lg. cobbles, 10% sm. cobbles, 15% vcp, 10% cp, 5% mp, 10% fp; 30% sand: 5% cse, 10% med, 15% fine; strong reaction to 10% HCL, loose, very poorly sorted, slightly moist, 80% mafic, 20% felsic 5Y 4/2 olive grey - wet 5Y 6/2 light olive grey - dry	occasional boulder
60.0					

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BOREHOLE LOG

Boring or Well No. 699-BP91-2 (TEMP)

Sheet 4 of 10

Location B-Pond, Line 3C

Project W-017 / B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrasir

Drilling Method and Equipment cable tool / drive barrel

Prepared By Paul W. Anderson / Paul Anderson (Sign/Print Name) Date 7/10/91

Reviewed By Edward C. Rowe / Edward C. Rowe (Sign/Print Name) Date 8/19/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
60.0	1 moist. 21th. 1 rad.	D.B.		60.0': sandy GRAVEL similar to last sample interval	
					occasional boulders
65.0	1 moist 21th. 1 rad.	D.B.		65.0: sandy GRAVEL 85% rounded (coarse) to angular (fine) gravel: 15% lg. cobbles, 5% sm. cbbls., 15% vcp, 10% cp, 20% mp, 10% fp, 10% vfp; 15% sand: 10% med, 5% fine; very poorly sorted, sl. rxn. to HCl, loose, sl. moist.; 85% mafic, 15% felsic; 5Y 4/1 dark grey-wet 5Y 6/1 gray-dry	
70.0	1 moist 21th. 1 rad.	D.B.		70.0: sandy GRAVEL similar to last sample interval	
					occasional boulders
75.0	1 moist 21th. 1 rad.	D.B.		75.0: slightly silty sandy GRAVEL 70% rounded to angular gravel: 10% lg. cobbles, 10% small cobbles, 20% vcp, 10% cp, 5% mp, 10% fp, 5% vfp; 30% sand: 15% cse, 10% med., 5% fine; trace silt, very strong reaction to HCL, very poorly sorted, loose, moist, 85% mafic, 15% felsic; 5Y 4/2 olive grey-wet 5Y 6/2 light olive grey-dry	
80.0					

9 3 1 2 7 1 9 0 4 3 8

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BOREHOLE LOG

Boring or Well No. 699-BP91-2 (TEMP.)

Sheet 5 of 10

Location B Pond, Lobe 3c

Project W-017/B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment cable tool / drive barrel, hard to

Prepared By Paul W. Anderson / Paul Anderson (Sign/Print Name) Date 7/12/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 12/27/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
80.0	1 moist. 21ith. 1rad.	D.B.		80.0': sandy GRAVEL similar to last sample; no silt and only slight reaction to 10% HCL	
					82.0': large boulder
					84.0': sand layer to 85'
85.0	1 moist. 21ith. 1rad.	D.B.		85.0: gravelly SAND 45% rounded to angular gravel (80% mafic, 20% felsic) 10% lg. cob., 5% sm. cob., 10% vcp, 5% cp, 5% fp, 10% vfp; 55% sand: 5% csse, 30% med., 20% fine (60% felsic, 40% mafic) poorly sorted, loose, dry, mod. reaction to 10% HCL; 2.5Y 6/2 light brownish grey - dry, 2.5Y 4/2 dark grayish brown - wet	
90.0	1 moist 21ith 1rad.	H.T.		90.0: Boulder angular gravel and sand size basalt fragments, 90% mafic, 10% felsic, no reaction to HCL, 2.5Y N2/ black - wet 2.5Y N3/ very dark grey - dry	PID: 1.4 ppm in borehole
95.0	1 moist. 21ith 1rad.	D.B.		95.0: slightly sandy GRAVEL 85% rounded to angular (fragmented) gravel: 30% sm. cobbles, 20% vcp, 10% cp, 10% mp, 10% fp, 5% vfp: 15% sand: 5% coarse, 5% med., 5% fine; 70% mafic, 30% felsic, loose, well graded, slightly moist, 5Y 3/1 very dark grey - wet 7.5Y 6/2 light brownish grey - dry	98.0' probable Hanford/ Ringold contact: drilling became harder, see next sample description
100.0					

A-6000-382 (04/90)

9 3 1 2 7 0 1 3 9

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BOREHOLE LOG

Boring or Well No. 699-BP91-2 (Temp.)

Sheet 6 of 10

Location B Pond, Lobe 3c

Project W-017 / B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment cable tool/drive barrel

Prepared By Paul W Anderson / Paul Anderson (Sign/Print Name) Date 7/29/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 12/27/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
100.0	1 moist. Zlith. 1 rad.	D.B.		100.0: sandy GRAVEL 70% rounded to angular gravel: 15% large cobbles, 20% sm. cobbles, 10% vcp, 10% cp, 10% mp, 5% fp; 75% mafic, 25% felsic; 30% sand 60% mafic, 40% felsic; 15% cs, 10% ms, 5% fs. no rxn to HCl, cemented, well graded, slightly moist; 5Y 3/1 very dark grey-wet 2.5Y N4/ dark grey-dry	PID < det.
105.0	1 moist. Zlith. 1 rad.	D.B.		105.0: slightly sandy GRAVEL 85% rounded to angular gravel: 20% lg. cobbles, 20% sm. cobbles, 20% vcp, 10% cp, 5% mp, 5% fp, 5% vfp; 15% sand: 10% coarse, 5% med.; 80% mafic, 20% felsic, strong rxn. to HCl, well graded, slightly cemented, slight moisture, 5Y 5/1 grey-dry 5Y 4/1 dark grey-wet	PID < det.
110.0	1 moist Zlith. 1 rad.	D.B.		110.0: slightly sandy GRAVEL 90% rounded to angular (broken) gravel: 30% lg. cobble, 20% sm. cobble, 20% vcp, 10% cp, 10% med.; 10% sand: 7% vc sand, 2% coarse, 1% med., very poorly sorted, well graded, strong rxn. to HCl, slightly cemented, slightly moist 5Y 5/1 grey-dry; 5Y 3/1 very dark grey-wet	
115.0	1 moist Zlith. 1 rad.	D.B.		115.0: sandy GRAVEL 75% rounded to subrounded gravel: 5% sm. cobble, 30% vc pebble, 70% cp, 10% med. peb 5% fp; 60% mafic, 40% felsic; 25% sand: 5% vc, 10% cs, 5% ms, 3% fs, 2% vfs; 5% silt + clay; moderate rxn to HCl, moist, slightly cemented; 10YR 5/2 grayish brown dry; 10YR 3/2 very dark grayish brown-wet	Probable Hanford (top), Ringold (bottom) contact; 119.0: lithology change sand
120.0				A-60	

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BOREHOLE LOG

Boring or Well No. 699-BP91-2 (TEMP.)

Sheet 7 of 10

Location B Pond, Lobe 3c
Project W-017 / B Pond
Elevation 554.61' BRASS CAP
Drilling Contractor Kaiser Engineers Hanford
Driller Moe Wraspir
Drilling Method and Equipment cable tool / drive barrel
Prepared By Paul W. Anderson / Paul Anderson Date 7/30/91 (Sign/Print Name)
Reviewed By Edward C. Rafuse / Edward C. Date 12/27/91 (Sign/Print Name)

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
120.0	~~D.B.~~ AWA 7/30 1 moist. 2 lith. 1 rad.	D.B.		120.0': slightly gravelly SAND 20% rounded gravel: 10% vcp, 10% cp; 70% sand, angular to subangular: 20% cs, 40% ms, 10% fine sand; 10% fines; 70% felsic, 30% mafic, strong rxn to HCl, moderately well sorted, slightly moist 10YR 6/2 light brownish grey-dry 10YR 5/4 yellowish brown-wet	PID < det. 119.0 ft. lithology change to predominantly sand; 124.0 ft. back to gravel & sand harder drilling
125.0	1 moist 2 lith 1 rad.	D.B.		125.0: sandy clayey GRAVEL 70% subangular to rounded gravel: 15% small boulder, 20% sm. cobbles, 20% vcp, 10% cp, 5% mp; 20% sand: 15% vcoarse, 5% med.; 10% fines (mostly clay); 80% felsic, 20% mafic; very poorly sorted, slight rxn to HCl, moist; 5Y 4/2 olive grey-wet; 2.5Y N4/ dark grey-dry	
130.0	1 moist 2 lith. 1 rad.	D.B.		130.0: slightly clayey, sandy GRAVEL similar to last sample interval	PID < det. 131.0 ft. water table
135.0	1 moist. 2 lith. 1 rad.	H.T.		135.0': sandy GRAVEL 70% angular gravel (all fragments of larger sized material, all smaller than med. pebbles); 30% sand: 10% coarse, 10% medium, 10% fine; 80% mafic, 20% felsic; no reaction to 10% HCl, saturated 5Y 4/1 dark grey-wet 5Y 6/1 gray-dry (ave. color of grains)	
8.0					
140.0					

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-BP91-2 (TMN.)

Sheet 8 of 10

Location B Pond, Lobe 3C

Project W-017/B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment cable tool/split tube, hard too

Prepared By Paul W. Anderson/Paul Anderson (Sign/Print Name) Date 8/2/91

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 12/27/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
140.0	S.T.	11/12/10/34 100% recovery		140.0: silty SAND 60% sand: 40% fine, 20% very fine sand, 40% silt; no reaction to HCl, well sorted, medium density, slightly moist, 10YR 7/2 light grey-dry 10YR 5/2 grayish brown-wet	PID < det. probable Ringold/Hanford contact betw. 140+145 ft.
	1 moist. 2 lith 1 rad.				
145.0	~~H.T.~~ PWA 8/2	H.T.		145.0: sandy SILT 60% silt, 40% v fine sand; tr. vfp (angular) no reaction to 10% HCl, well sorted, 90% felsic, 10% mafic; 2.5Y 6/2 light brownish grey-dry; 2.5Y 5/2 grayish brown-wet	moisture content is unknown, water added to borehole to enable hard tool drill
	1 moist. 2 lith 1 rad.				
150.0		H.T.		150.0: clayey SILT 55% silt, 40% clay, 5% very fine angular gravel; plastic, sticky, cohesive, no reaction to 10% HCl; 10YR 5/3 brown-wet; 7.5YR 6/2 pinkish grey-dry	PID < det. moisture content unknown
	1 moist 2 lith 1 rad.				
155.0		H.T.		155.0: clayey SILT similar to last sample interval	
160.0					

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699-42-39 A

BOREHOLE LOG

Boring or Well No. 699-BP91-2 (TEMP.)

Sheet 9 of 10

Location B Pond; Lobe 3c

Project W-017 / B Pond

Elevation 554.61' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment cable tool / hard tool

Prepared By Paul Anderson / Paul Anderson (Sign/Print Name) Date 8/8/91

Reviewed By Edward C. Kaiser (Sign/Print Name) Date 12/27/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
160.0	1 moist 21th. 1 rad.	H.T.		160.0: clayey ~~silt~~ SILT	PID < det
				similar to last sample interval; 5% medium and fine angular gravel	moisture content unknown, water added to borehole
					water zone entered between 160-165 ft.
	1 moist 21th. 1 rad.	H.T.			
165.0				165.0: silty SAND 60% very fine sand; 40% silt; trace very fine gravel; moderate reaction to 10% HCL, very well sorted, loose, moisture content ~~wet~~ saturated, 95% felsic, 5% mafic, 2.5Y 7/3 pale yellow-dry 2.5Y 5/4 light olive brown-wet	
	1 moist 21th. 1 rad.	H.T.			
170.0				170.0: sandy silty GRAVEL 60% angular to subround gravel: 40% mg, 10% fg, 10% vfg; 10% vf sand; 30% silt; some caliche; strong rxn. to HCL, cohesive, wet poorly sorted, cemented 10YR 6/4 light yellowish brown-dry; 10YR 5/4 yellowish brown-wet	
					gravels are cemented from 170 ft. to 180 ft.
	1 moist 21th. 1 rad.	H.T.			
175.0				175.0: sandy GRAVEL 70% angular gravel (all fragments of larger material) fine pebbles or smaller. 30% sand: 15% cs, 10% ms, 5% fs; 50% mafic, 50% felsic no rxn. to 10% HCL, cemented, poorly sorted, wet, 10YR 6/8 brownish yellow (wet) - dominant color 10YR 7/6 yellow-dry	
180.0					

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BOREHOLE LOG

Boring or Well No. 699-BP91-2

Sheet 10 of 10

Location B Pond, Lobe 3c

Project W-017/B Pond

Elevation 554.61 Brass Cap

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Lerasgis

Drilling Method and Equipment cable tool/hard tool

Prepared By Paul W. Anderson/Paul Anderson (Sign/Print Name) Date 8/12/91

Reviewed By [illegible] (Sign/Print Name) Date 08/29/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCL	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
180.0	H.T. 1 moist. 2 lith. 1 rnd.	H.T.		180.0 sandy GRAVEL	PID < det.
				similar to last sample; gravel slightly	
				coarser, more rounded	moisture content unknown

A-6000-382 (04/90)

9312759041 4

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-BP91-2 Area 600 Area Date 8/2/91
Log Run #1 Log Type Gross Gamma
Elevation Datum Elevation
Survey Coordinates N E
Log Measured From Ground Surface
Location Description B-Pond / C Lobe
Ground Surface Elevation
Surface Temperature 27.6 °C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Mo Wrasbir
Drill Rig Type Cable Tool Bit Type/Diameter Hand Tool / 10"
Borehole Diameter(s)/Depth 12"/144.5
Depth Driller 144.5 Depth Logger 143.6
Liquid Level 143.68' Liquid ~~Density~~ Appearance Muddy
Temperature Could not retrieve sample

CASING RECORD

Type 12" Carbon Steel Sch. 40 Interval +0.58'-143.52
Type Interval
Type Interval
Type Interval
Well Screen Interval NA
Comments: Return Error = +0.2' high
Centralizer used

A-6000-520 (05-90)

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS Equipment Type Analog
Tool Type Gamma Ray Serial No. C627A97
Base Calibration Date 5/91 Calibration Reference PNL-7785 UC-606
Calibration/Probe Factor 8.84x10^-3 eU/mR/cs Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU
Dead Time 11.8 μsec Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 143.6' To 4.5'
Rerun(s) 143.6' to 110.0'
Pre Survey Verification: Position 1 301.0 eU Position 2 65.9 eU Background 45 c/s
Base Calibration Difference: Position 1 3.6 eU Position 2 1.6 eU
Logging Speed 5 ft./min. Rerun Scales, CPS/in. 50 c/s/in
Start Time 0730 Completion Time 1030
Chart Speed(s), ft/in. 10 ft/in.
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1
Post Survey Verification: Position 1 294.4 eU Position 2 65.0 eU Background 45 c/s
Percent Change: Position 1 2.2% Position 2 1.4%
Comments Return Error = +0.2' high
Centralizer used

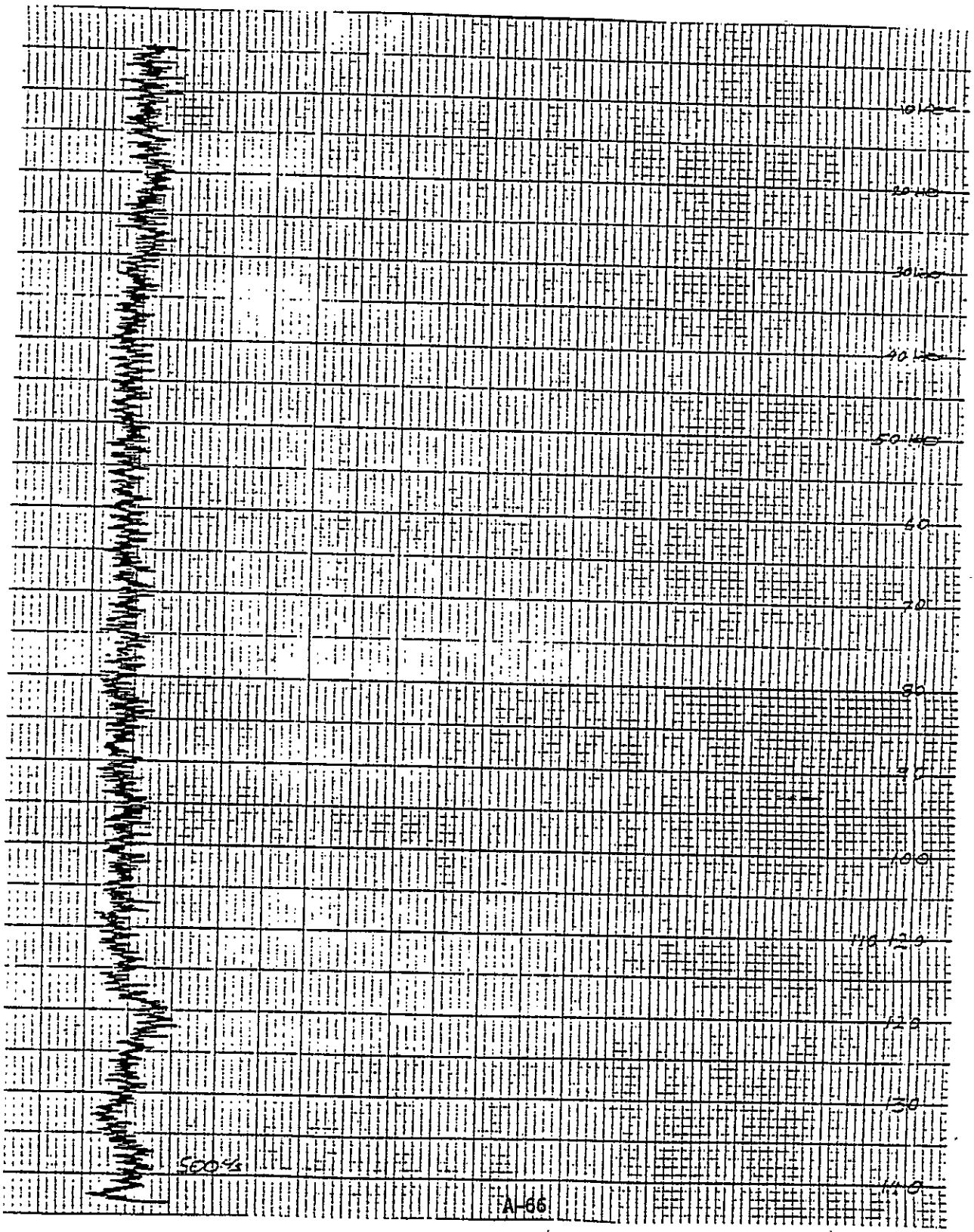
A-65

Witnessed and Verified by: (sign and print name) Randall Price / RANDALL PRICE Date: 2 AUG 91

A-6000-520 (05-90)

9 3 1 2 7 9 0 4 4 5

699-BP91-2 RUN#1 8/2/1991



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Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-BP91-2 Area 600 Area Date 8/9/91

Log Run #2 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description B-Pond / C-Lobe

Ground Surface Elevation _____

Surface Temperature 29.2°C Weather Clear - Hot

BOREHOLE INFORMATION

Driller Mo Wraspin

Drill Rig Type Cable Tool | Bit Type/Diameter Hard Tool / 8"

Borehole Diameter(s)/Depth 12"/143.5' 10"/180.7' 8"

Depth Driller 180.65' | Depth Logger 179.7'

Liquid Level 166.39' (Not @ Static) | Liquid Density Appearance Silty

Temperature 18.7°C

CASING RECORD

Type 12" Carbon Steel Sch. 40 | Interval +1.0'-143.52'

Type 10" Carbon Steel Sch. 40 | Interval +1.15'-180.12'

Type 8" Carbon Steel Sch. 40 | Interval

Type | Interval

Well Screen Interval NA

Comments: Return Error = +0.25' high

Centralizer used

Static Water level rising during logging run.

(162.0' run) (160.0' repeat section)

A-6000-520 (05/90)

u

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand MLS

Equipment Type Analog

Tool Type Gamma Ray

Serial No. C627A97

Base Calibration Date 5/91

Calibration Reference # Not Yet Assigned PNL-7785 VC-606

Calibration/Probe Factor 8.84x10³ Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU

Dead Time 11.8 μsec

Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 179.7' To 110.0'

Rerun(s) 179.6' to 140.0'

Pre Survey Verification: Position 1 298.6 eU Position 2 64.4 eU Background 47 c/s

Base Calibration Difference: Position 1 1.2 eU Position 2 0.1 eU

Logging Speed 5 ft/min. Rerun Scales, CPS/in. 50 c/s/in

Start Time 0800 Completion Time 1000

Chart Speed(s), ft/in. 10 ft/in.

Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1

Post Survey Verification: Position 1 296.6 eU Position 2 64.5 eU Background 45 c/s

Percent Change: Position 1 0.7% Position 2 0.2%

Comments Return Error = +0.25' high

Centralizer used

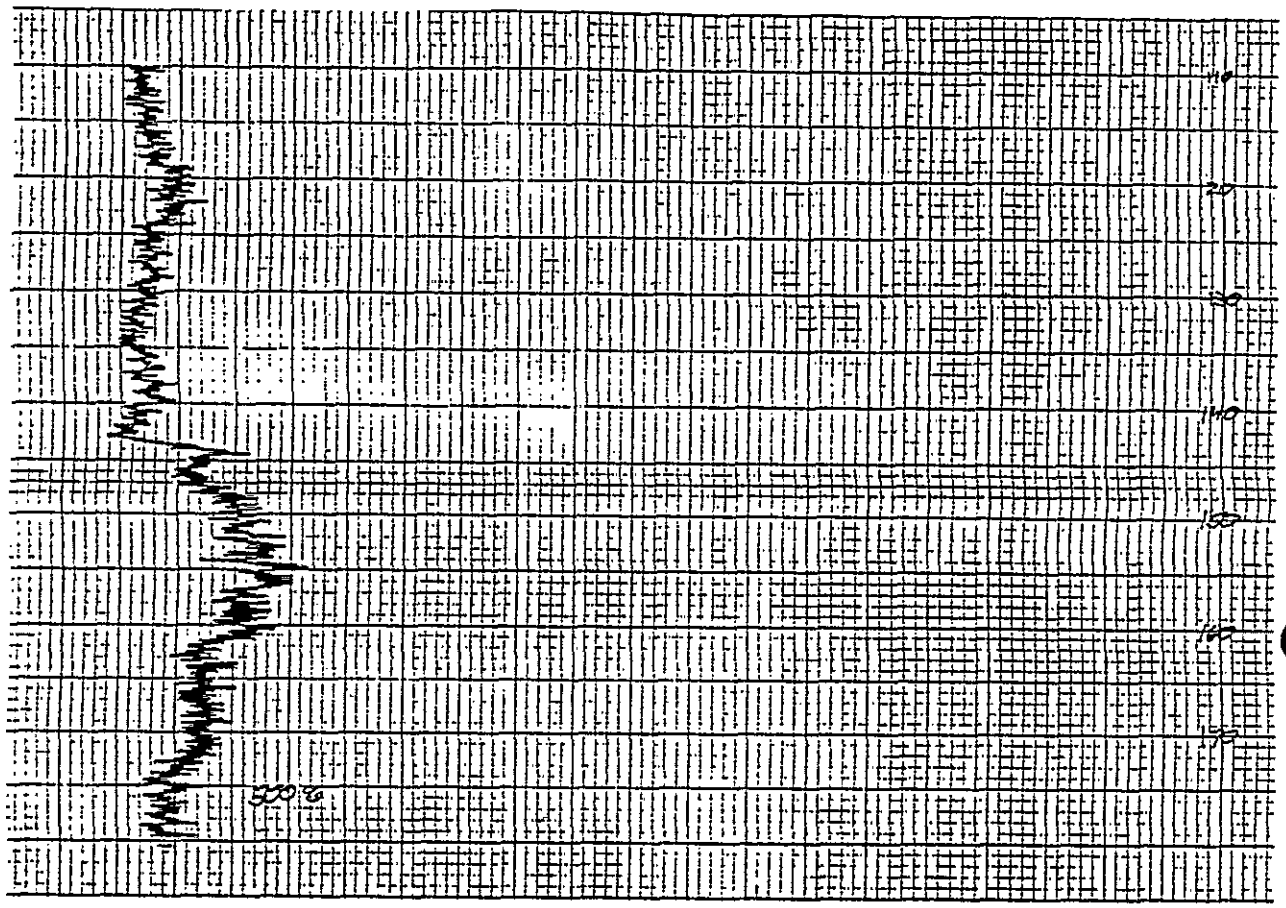
A-67

Witnessed and Verified by: (sign and print name) Alan Pearson Alan W. Pearson Date: 8/9/91

A-6000-520 (05/90)

9 3 1 2 7 9 0 4 4 7

699-BP91-2 RUN#2 8/9/1991



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KAISER ENGINEERS HANFORD

SURVEY DATA REPORT

Request No. —|9|2|1|—|0|5|7

Project/W.O. No.	Title	File No.
W-017H	B-Pond Wells	W|E|L|L|—|1|1|9

KER Job No.	Prepared By	Date	Reviewer
CR9560	N. P. Fastabend	6/9/92 TVC ~~12-10-91~~	Michael W. Polster 1|2

DESCRIPTION OF WORK

Locate wells around B-POnd for horizontal and vertical position.

Horizontal: WCS83S and 200-E Datum

Vertical: NGVD '29 and 200-E Datum

ACCEPTABILITY (Within Plan Tolerance)

- Yes ☐
- No ☐
- NA ☒
- TBD by Requestor ☐

DISTRIBUTION

Survey File	OR
Field Project File	1
D. Foucault	1
T. Nemzek	1
J. Geiger	1
J. Rieger	1
D. Weekes	1

SURVEY RESULTS AND COMMENTS

CONTROL MONUMENTS:

BP-1
N:136,716.89
E:577,129.74

BP-3
N:136,571.07
E:577,596.34

NOTE: A). Horizontal control points used to locate wells were part of a traverse with a linear closure of better than 1:50,000.

B). Vertical control monument used to establish elevations on wells (2E-18) was part of a vertical network with misclosure of all run sections less than 8mm√K. Holding USC & GS benchmarks J-317, K-317 & L-317.

WELL NO.	COORDINATES (C/L CASING) 200-E AREA (FEET)	LAMBERT WCS83S (METERS)	VERT. DATUM	ELEVATIONS (FEET) BRASS CAP IN CONC.	TOP HYDRO-STAR PLATE, N. SIDE	TOP OUTER CASING N. SIDE
699-43-40	N:43357.4 W:40379.1	N:136,705.54 E:577,583.34	NGVD'29	538.76	542.22	542.20
			200-E	538.53	541.99	541.98
699-43-41G	N:42969.0 W:40763.2	N:136,586.83 E:577,466.61	NGVD'29	547.96	551.36	551.34
			200-E	547.73	551.13	551.12
699-42-39A 699-BP91-2	N:41866.5 W:39484.6	N:136,251.95 E:577,857.26	NGVD'29	554.67 ~~554.51~~	558.15	558.14
			200-E	554.44	557.93	557.91
699-42-39B 699-BP91-3	N:41816.1 W:39478.3	N:136,236.59 E:577,859.21	NGVD'29	554.86	558.33	558.32
			200-E A-69	554.63	558.11	558.09

9 3 1 2 7 0 0 1 9

9 3 1 2 7 5 9 0 4 5 0

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WELL CONSTRUCTION REPORT

699-42-39B
~~699-42-39B~~ NB

Page 1 of 2

Specification No. WHC-S-014 Rev No. 5

ECNs 144240 144241

Project W-017/B Pond

Location B-Pond - Lobe 3C

Drilling Company Kaiser Engineers Hanford

Driller Moe Wrasper

Other (Companies) WHC EST

Geologist(s) Paul Anderson (ESI)
Nancy Ballantyne (ESI)
Myra Varg (ESI)
Stacey Callison, E.C. Lafuse

Well No. ~~699-BP91-3~~ 12/19/91 SWL Temp. Well No. 699-BP91-3

Coordinates N 41816.1 (Hanford) W 39478.3 | N 136,236.59, E 577,859. (Lambert ~~(NGVD)~~ NB)

Casing Elev. 558.32' Ground Elev. 554.86'

Drilling Method

Verification Method Visual Observation

Criteria WHC-S-014 5.2, 5.3, 7.5, E.I.I. 6.7 sec. 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D 0-115 (125-145)	H 120-125 (145-216)	NB	9/16/91 D - 9/9/91
Drilling Fluid	Raw Water	4/14 gal	NB	9/16/91
Other	N/A			

Geophysical Logging

Sondes	Interval	Date
Gross Gamma	138.1' - 1.9'	9/5/91
Gross Gamma	209.4' - 100'	9/17/91
	-	
	-	
	-	

Completion Data

Drilled Depth 216.0'

Completed Depth 214.2'

Date Started 8/13/91

Date Completed 10/9/91

Static Water Level/Date 134.7 8/22/91

Aquifer Testing

Type Instantaneous Slug

Flow Meter I.D. No. -NA-

Cal. Due Date -NA-

Length of Test 1 HR

Volume Pumped -NA-

Drawdown -NA-

Date of Test 10/24/91

Completion Results

Cleaning

Verification Method Visual Inspection (Document Review)

Criteria WHC-S-014 sec's 4.22, 7.6, 7.7 WHC-CM-7-7 sec. 5.4

	Initials	Date
Drilling Tools/Rig	PWA	8/17/91
Temporary Materials	NB	8/19
Permanent Materials	SWC	9/30/91

Material Storage/Packing

Verification Method Visual Inspection

Criteria WHC-S-014 4.22, 7.3

	Initials	Date
Mtl. Handling/Storage	SWC	9/30/91
Material Packing	SWC	9/30/91

Screen

Type	Length	Slot Size
T-304 stainless steel 4" wire wrap channel pack	10.79'	0.010 10 slot channel pack

Depth(s) 203.0' - 213.8'

Verification Method Measure w/ steel tape

Criteria WHC-S-014 4.2.3, 4.2.5, 2.2.1, 4.2.1

Initials SWC Date 10/9/91

Lubricants/Additives

Verification Method Visual Observation

Criteria WHC-S-014 sec. 7.2

	Identify	Initials	Date
Additives	Raw Water	NB	9/16/91
Lubricants	Well Guard	NB	9/16/91

Straightness Test

Verification Method Visual Observation

Criteria WHC-S-014 sec 8.2

Initials E.C.L. NB Date 09/16/91

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WELL CONSTRUCTION REPORT
(continuation sheet)

699-BP91-3
699-42-39B

Page 2 of

Casing (permanent)

Type	Size	Placement
T-304 4" stainless	4"	+5.0 - 213.8'
		-
		-
		-

Verification Method: measure w/ steel tape

Criteria: WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials: SWC Date: 10/9/91

Well Protection

Verification Method: measure w/ steel tape

Criteria: WHC-S-014, 4.2.10

	Initials	Date
Protective Posts	ECR	1/24/92
Protective Casing	ECR	1/24/92
Site Restored	ECR	1/24/92
Cap, Hasp and Lock	ECR	1/24/92
Surface Pad	ECR	1/24/92

Annular Seal/Filter Pack

Verification Method: measure w/ steel tape Criteria: WHC-S-014, 4.2.6, 4.2.7, 4.2.8, 4.2.9, ~~5.3.1~~ 5.3.2

Type	Interval	Volume	Initials	Date
20-40 silica sand	214.2' - 197.2'	7½-100# bgs (8.4 ft³)	SWC	10/1/91
40-100 silica sand	197.2' - 194.2	2-100# bgs (2.3 ft³)	SWC	10/2/91
3/8" bentonite pellets	194.2' - 188.7'	3½-50# bgs (2.2 ft³)	SWC	10/4/91
bentonite grout	188.7' - 130.3	30-50# bgs (64.3 ft³)	SWC	10/9/91
8-20 bentonite crumbles	130.3 - 21.3	145-50# bgs (103.0 ft³)	SWC	10/9/91
type I + II cement grout	21.3 - 2.5'	15-94# bgs (19.3 ft³)	SWC	10/9/91

10/1/91 SWC

Well Survey/Labeling

Verification Method: Review of Survey Report

Criteria: WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	ECR	1/24/92
Protective Casing/Brass Cap Surveyed	ECR	1/24/92
Well Number Stenciled	ECR	1/24/92
Brass Cap Labeled	ECR	1/24/92

Pump Installation

Verification Method: Visual Observation

Criteria: WHC-S-014 4.2.11, 4.2.2

	Initials	Date
Pump Decon/Prep	JAC	10/24/91
Installed	JAC	10/24/91
Pump Tested	JAC	10/24/91

Other (initial if performed)

N/A Well Abandonment _____ Downhole TV Inspection SWC Complete As-Built Diagram, Driller's/Geologist's Logs

JAC 10/23/91 Well Development SWC 10/1/91 Partial Development

Comments/Remarks: Raw Water added:

2 gal 8/22/91 +46'	5 gal 8/30/91 119+	40 gal 9/16/91 210+
2 gal 8/23/91 +65'	15 gal 9/6/91 140+	40 gal 9/16/91 215
2 gal 8/26/91 +80'	5 gal 9/6/91 140	
3 gal 8/27/91 +90'	15 gal 9/6/91 140+	Sum TOTAL = 414 gal
2 gal 8/27/91 +100'	10 gal 9/6/91 150+	
2 gal 8/28/91 +105'	15 gal 9/10/91 155+	
2 gal 8/29/91 +111'	15 gal 9/10/91 155+	
2 gal 8/29/91 +111'	15 gal 9/10/91 165+	Note: 3-20' lengths of tremmy pipe dropped into hole
2 gal 8/29/91 +115'	5 gal 9/10/91 170+	
10 gal 8/30/91 +119'	120 gal 9/13/91 200+	retrieved after 2 days, pipe stuck into 20-4
10 gal 8/30/91 +119'	50 gal 9/13/91 200+	
10 gal 8/30/91 +119'	15 gal 9/16/91 205+	sand about 3"

Reviewed By (Sign/Print Name): Edward C. Rafuse / EDWARD C. RAFUSE Date: 12/28/91

A-6000-435 (09/90)

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WELL SUMMARY SHEET

Boring or Well No. 699-BP91-3

Sheet 1 of 2

Location B-Pond Lobe 3C

Project W-017 / B-Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Jody Carpenter

Drilling Method and Equipment Cable Tool

Prepared By SW Callison / SW Callison (Sign/Print Name) Date 10/8/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 10/08/91

CONSTRUCTION DATA: Description	Diagram	Depth in Feet	GEOLOGIC/HYDROLOGIC DATA: Graphic Log	Lithologic Description
type I+II cement				Sandy gravel
grout to 21.3' bls		10		Sandy gravel
				Sandy gravel
		20		gravelly Sand
8-20 mesh bentonite		21.3		Sandy Gravel
crumbles from 21.3'		30		Sandy Gravel
to 130.3' bls				Sandy Gravel
		40		gravelly Sand
				Sandy Gravel
		50		Sandy Gravel
				Sandy Gravel
		60		Sandy Gravel
				Gravel
		70		Sandy Gravel
				silty sandy Gravel
		80		Sandy Gravel
				Sandy Gravel
		90		Sandy Gravel
12" CS casing to				silty sandy Gravel
136.7' bls		100		Sandy Gravel
				silty Gravel
water level @		110		silty sandy Gravel
134.7' bls on 8/22/91				Sandy Gravel
		120		Gravel
bentonite grout from				silty Sandy Gravel
130.3' to 188.7' bls		130		silty Sandy Gravel
		130.3' 134.7'		clayey SILT
		140		clayey SILT
				sandy clayey SILT
		150		sandy clayey SILT
				sandy, clayey SILT
		160		sandy clayey SILT
				Sandy, clayey SILT

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WELL SUMMARY SHEET

Boring or Well No. 699-BP91-3

Sheet 2 of 2

Location B-Pond Lobe 3C

Project W-017 / B-Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

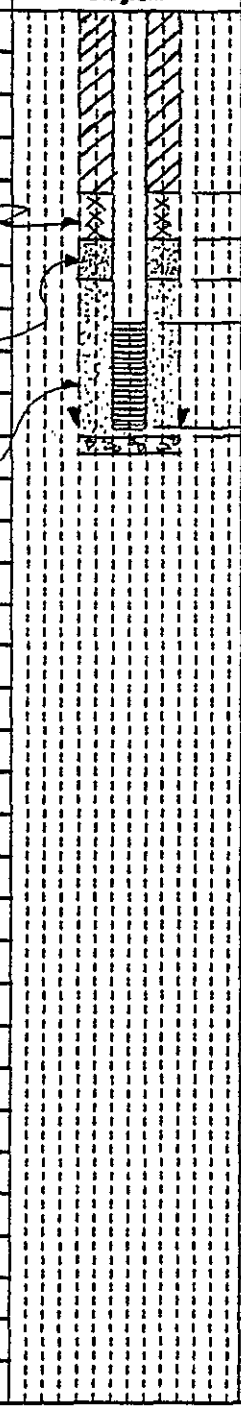
Driller Jody Carpenter

Drilling Method and Equipment Cable Tool

Prepared By SW Callison / SW Callison (Sign/Print Name) Date 10/8/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 1/29/92

CONSTRUCTION DATA: Description	Diagram	Depth in Feet	GEOLOGIC/HYDROLOGIC DATA: Graphic Log	Lithologic Description
10" CS casing set @ 213.88'		170		sandy clayey SILT
				silty sandy GRAVEL
		180		silty sandy GRAVEL
3/8" bentonite pellets from 188.7' to 194.2' bls		188.7		silty sandy GRAVEL
		190		silty sandy GRAVEL
		194.2		silty sandy GRAVEL
40-100 silica sand from 194.2' to 197.2' bls		197.2		silty sandy GRAVEL
		200		silty sandy GRAVEL
		203.0'		silty sandy GRAVEL
		210		silty sandy GRAVEL
20-40 silica sand from 197.2' ~~194.2~~ to 214.2 ~~197.2~~ bls 10/9/91 SWC		213.8'		SILT
		214.2		2K' T.D.
		220		
4" stainless steel 10 slot channel pack T-304 wire wrap screen from 203.0' to 213.8' bls				
TD of hole @ 216' bls				



A-6000-384 (04/90)

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699-42-39B

WHC-SD-EN-DP-046, Rev. 0

BOREHOLE LOG

SIGNATURE/DATE 5/4/92

Boring or Well No. 699-BP-3 (TEMP)

Sheet 1 of 11

Location B-Pond, Lobe 3C

Project W-017/B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wespie

Drilling Method and Equipment Cable Tool/Drive Barrel

Prepared By Nancy Ballentyne (Sign/Print Name) Date 8/19/91

Reviewed By E.C. Rafes (Sign/Print Name) Date 8/19/91

Edward C. Rafes

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
0.0				Surface: Small to large cobbles, fine to coarse pebbles, sand	12" casing, cable barrel (10") FILL (Berm)
	1 moist 2 lith 1 rad	D.B.			
5.0				5.0 sandy GRAVEL V. poorly sorted, unconsolidated, 40% mafic, 60% felsic. Dry-greyish brown 10YR 5/2 60% subangular to rounded GRAVEL (10% c.p., 25% m.p., 20% v.f.p., 5% v.c.p.-cobbles) 30% subangular to rounded SAND (10% silt) Sand-stg rxn to HCL.	60 PID < det. FILL (Berm)
	2 lith 1 moist 1 rad	D.B			
10.0				10.0 sandy GRAVEL V. poorly sorted, moist, unconsolidated, 40% mafic 60% felsic. Dry-light brownish grey 2.5Y 6/2. 75% subangular to rounded GRAVEL (40% c.p., 20% v.f.p., 7.5% v.c.p., 7.5% cobbles) 20% subangular to subrounded SAND (6% c.s., 8% m.s., 6% f.s.), 5% silt. SAND-stg rxn to HCL	60 PID < det. FILL (Berm)
	2 lith 1 moist 1 rad	D.B			
15.0				15.0 sandy GRAVEL V. poorly sorted, moist, unconsolidated 40% mafic, 60% felsic. Dry-light brownish grey 2.5Y 6/2. 70% subangular to rounded GRAVEL (40% c.p., 20% v.f.p., 10% v.c.p.-cobbles) 25% subangular to subrounded SAND (8% c.s., 9% m.s., 8% f.s.), 5% SILT. SAND-strong rxn. to HCL	60 PID < det. FILL (Berm)
	2 lith 1 moist 1 rad	D.B			
20.0				20.0	

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WHC-SD-EN-DP-046; Rev. 0

BOREHOLE LOG

Boring or Well No. 699-42-39 B

Sheet 2 of 11

Location B-Pond, Lobe 3c

Project W-017/B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrasoir

Drilling Method and Equipment Cable Tool/Drive Barrel

Prepared By Nancy Ballantyne (Sign/Print Name) Date 8/21/91

Reviewed By E.C. [signature] (Sign/Print Name) Date 8/17/91

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
20.0'		D.B		20.0' gravelly SAND 70% SAND (45% m.s., 15% f.s., 10% v.f.s.), 25% GRAVEL (15% v.f.p., 8% m.p., 2% v.c.p.), 5% silt. Sand/silt: subangular to subrounded, weak rxn to HCl, 40% mafic, 60% felsic. Gravel: subangular to rounded, 60% mafic, 40% felsic. Dry - greyish brown, 10YR 5/2. Wet - dk greyish brown, 10YR 4/2. Moderately sorted.	PID/CGI <det occasional boulder
	2 Lith 1 moist 1 Rad	D.B			
25.0'				25.0': sandy GRAVEL Slightly moist, v.p. sorted, unconsolidated. Dry - gray - 10YR 5/1. 40% mafic, 60% felsic. 80% - Subangular to rounded GRAVEL (30% - c to v.c. pebbles, 30% m.p., 10% f.p., 10% v.f.p.) 20% subangular to subrounded SAND (10% c to v.c.s., 5% m.s., 5% <f.s.). SAND - weak rxn to HCl	PID/CGI <det. occasional boulder
30.0'	2 Lith 1 moist 1 Rad	D.B.		30.0' sandy GRAVEL slightly moist, v.p. sorted, unconsolidated, Dry - grayish brown - 2.5Y 5/2. 40% Mafic, 60% Felsic. 80% rounded GRAVEL (broken pieces probably from drilling) (20% l. cobbles, 20% v.c. pebbles to s.c., 20% m. to c. pebbles, 20% v.f. to f. pebbles) 20% subangular to subrounded SAND (10% m. to c. sand, 8-10% f. to v.f. sand, <2% silt). Fine sand - mild rxn to HCl	occasional boulder
35.0'	2 Lith 1 moist 1 Rad	D.B.		35.0' sandy GRAVEL 75% angular to rounded gravel (angularity likely due to drilling, 15% l.c., 20% s. cobbles, 20% vcp, 10% cp, 10% fp - mp). 25% subangular to subrounded SAND (5% cs, 10% m.s., 10% v.f.s. to < f.s.). Dry, v.p. sorted, unconsolidated, Dry - grayish brown - 2.5Y 5/2. 40% mafic, 60% felsic. Sand/silt - slight rxn. to HCl.	

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A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-42-39 B

Sheet 3 of 11

Location B-Pond, Lobe 3C

Project WS-017 / B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrasper

Drilling Method and Equipment Cable Tool / Drive Barrel

Prepared By Nancy Ballantyne (Sign/Print Name) Date 8/22/91

Reviewed By E.C. Lifsey / E.C. Lifsey (Sign/Print Name) Date 08/26/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
40.0'	2 Lith 1 Moist 1 Rad	D.B.		40.0' gravelly SAND 70% subangular to subrounded SAND (25% c. to v.c. sand, 25% m.s., 25% v.f. sand) < 2% silt, 30% GRAVEL (20% v.f. to f.p., 5% m to c.p., 5% c.p.) Dry - grayish brown, 10YR 5/2, wet - dk grayish brown - 10YR 6/2, slightly moist, w.p. sorted, unconsolidated, 40% mafic, 60% felsic, sand/silt - slight rxn to HCl.	occasional boulder
45.0'	2 Lith 1 Moist 1 Rad	D.B.		45.0' sandy GRAVEL 75% subangular to well-rounded GRAVEL (25% v.c. pebbles to cobbles, 40% m.p., 10% v.f. to f.p.), 25% subangular to subrounded SAND (15% c. to v.c.s., 15% < m.s.) Sand 50% mafic 50% felsic. Fine sands/silt - slight rxn to HCl. Dry, w.p. sorted, unconsolidated, 40% mafic, 60% felsic? Dry - grayish brown - 10YR 5/2.	occasional boulder
50.0	2 Lith 1 Moist 1 Rad	D.B.		50.0' - sandy GRAVEL 80% - subrounded to well rounded GRAVEL (50% l. cobbles, 20% s. cobbles, 10% v.c. pebbles, 15% m.p., 15% f.p. to v.f.p.) 20% subangular to well rounded SAND (15% c.s. to v.c.s. 5% m.s.) Sand 50% mafic 50% felsic, slight rx to 10% HCl, poorly sorted, 70% mafic 30% felsic, Dry - grayish brown - (10YR 5/2) wet color (10YR 4/1) dark gray	Moisture in sample probably due to water added to hole.
55.0	2 Lith 1 Moist 1 Rad	D.B.		55.0' SANDY GRAVEL 80% SUBANGULAR TO SUBROUNDED GRAVEL; 35% LARGE COBBLES, 25% MED. COBBLES, 10% SMALL COBBLES, 20% V.C.P., 25% M.P., 20% SAND 10% COARSE, 5% MED. 5% FINE, POORLY SORTED, LACK FINES, SLIGHTLY TO MOD. HCL; 90% MAFIC, 10% FELSIC, 54% gray (Hue), 54% VERY DK GRY	SAMPLE @ 0920 - DRILLING SLOW - COBBLES; W/ OCCASIONAL BOULDERS @ 57 TO 59'
60.0					

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BOREHOLE LOG

Boring or Well No. 699-BP91-3 (TEMP)

Sheet 4 of 11

Location B-POND LOBE 3C

Project W-017 / B POND

Elevation 554.86' BRASS CAP

Drilling Contractor KAISER ENGINEERS HANFORD

Driller MOE WRASPIR

Drilling Method and Equipment CABLE TOOL / DRIVE BARREL

Prepared By Nancy Ballantyne (Sign/Print Name) Date 8/23/91

Reviewed By Edward C. Rafes / Edward C. Rafes (Sign/Print Name) Date 08/29/91

Depth (60)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	2 Lith 1 moist 1 Rad	D.B.		60.0 Sandy Gravel - similar to last sample taken	Sampled @ 10:40; slightly moist
					Occasional Boulders
65	2 Lith 1 moist 1 Rad	DB		GRAVEL 90% rounded (coarse) 10% subrounded; GRAVEL 30% boulders; 20% large cobbles 20% m cobbles 10% small cobbles 10% large pebbles 10% medium pebbles, 1% VF pebbles, very poorly sorted; SL rxn to 10% HCl; 85% mafic; 15% felsic 5Y 4/1 dark gray wet 5Y 6/1 gray dry	Sampled @ 1425 ECL 08/23/91 Large boulders @ 68'
70	2 Lith 1 moist 1 Rad	D.B.		70' sandy GRAVEL 85% subrounded gravel (angular fragments due to drilling) (90% v.c.p., 20% m.t.c.p., 20% v.f. to f.p., 10% cobbles) 15% subangular to subrounded SAND (10% c. to v.c. sand, 5% m.s.) Silt forms coating on sands. No rxn to HCl. Slightly moist, unconsolidated, wet - v. dark gray 5YR 3/1, Dry - Gray 5YR 5/1, v. poorly sorted (gravel - 90% mafic, 10% felsic) ~~sand~~ 8/27/91	Boulders encountered @ 70.0'
75	2 Lith 1 moist 1 Rad	D.B.		75.0' silty sandy GRAVEL 70% subrounded to rounded GRAVEL (10% l. cobbles, 10% s.c., 20% v.c.p., 10% c.p., 10% m.p., 10% f.p. to v.f.p.), 20% subangular to subrounded sand (10% c. to v.c.s., 5% m.s., 5% f. to v.f.s.) 10% silt (some minor clay). Silt - very strong rxn to HCl. V. poorly sorted, very moist! Unconsolidated wet - v. dark gray 10YR 3/1, dry gray - 10YR 5/1	- broken gravel probably from drilling - silt as coating to all size grains. - more cohesive but still unconsolidated.
80					

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BOREHOLE LOG

Boring or Well No. 699-BP91-3 (TEMP.)

Sheet 5 of 11

Location B-Pond, Lobe 3c

Project WOLF / B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrasgir

Drilling Method and Equipment Cable Tool / Drive Barrel

Prepared By Nancy Ballantyne (Sign/Print Name) Date 8/26/91

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 8/29/91

Depth (ft)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
80.0'	2 Lith 1 moist 1 Rad	D.B.		80.0' sandy GRAVEL similar to 75.0' sample - less silt/clay.	82.0' - Boulder 83.0' - Boulder (bent drive barrel)
85.0'	2 Lith 1 moist 1 Rad	D.B.		85.0' sandy GRAVEL 80% rounded to subrounded GRAVEL (25% boulders, 30% cobbles, 20% v.c.p., 5% c. to m.p.) 20% angular sand (15% m. to v.c.s., 5% f.s. + smaller). Silt as grain coating. Occasional cementing (silty, rxn to HCl), Fe stains + dk grey silt/clay clasts in cemented fragments. Fe stained sand grains. Dry (color) - Grayish brown - 2.5Y 5/2. Gravel - 90% mafic, 10% felsic, sand - 50% mafic, 50% felsic	- frequent boulders - hard drilling - some boulders larger than borehole - rock flour from drilling
90.0'	2 Lith 1 moist 1 Rad	D.B.		90.0' sandy GRAVEL 70% c. to s.c. GRAVEL (10% boulders, 25% cobbles, 15% c.p. to v.c.p., 20% f.p. to v.f.p.) 30% sand (10% c. to v.c.s., 10% m.s., 10% f. to v.f.s.) Silt as coatings, occassionally cemented (slight rxn to HCl). Sand - 50% mafic, 50% felsic, (gravel - 70% mafic, 30% felsic). Some Fe staining in cements and on grains. Slightly moist, v. poorly sorted, Dry - Grayish brown - 2.5Y 5/2	- occasional boulders - angular frag. probably from coring - hard drilling (rock flour from drilling)
95.0'	2 Lith 1 moist 1 Rad	D.B.		95.0' slightly sandy GRAVEL 85% rounded GRAVEL (70% s.c., 20% v.c.p., 10% c.p., 10% m.p., 10% f.p., 5% v.f.p., <5% boulders/(cobbles). 15% angular SANDS (5% course sand, 5% m.s., 5% f.s.) silt as grain coating + in occasional cements (slt. rxn to HCl) Sands 60% mafic, 40% felsic, gravel - 40% mafic, 60% felsic - quartzite cobbles) Occasional Fe staining on grains, and in cemented clasts. Dry color - gray 10YR 5/1	- Sample wet from H_2O added - Angular fragments (cobbles, boulder) probably from coring - occasional boulders - hard drilling
100'					

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BOREHOLE LOG

Boring or Well No. 699-B291-3 (TEMP.)

Sheet 6 of 11

Location B-Pond, Lobe 3c

Project W-017 / B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrasgir

Drilling Method and Equipment Cable Tool, Drive Barrel

Prepared By Nancy Ballantyne (Sign/Print Name) Date 8/27/91

Reviewed By E.C. Fitzpatrick (Sign/Print Name) Date 09/05/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
100'	2 Lith 1 moist 1 Rad	D.B.		100' sandy GRAVEL	occassional boulders
				same as 95.0' sample	
105		D.B.		105' - silty GRAVEL	boulder - v. hard drilling
				60% rounded GRAVEL (15% v.f. to f.p., 10% m.p., 25% c.p. to v.c.p., 10% s.c. to boulders) 20% SAND (5% m.s., 15% f.s. to v.f.s.) 20% silt/clay. Weak rxn to HCl. Wet - 5Y4/1 dark gray. Dry - 5Y6/1 - light gray. 80% Mafic, 20% felsic (whole)	(from 106' to 110') some cobbles broken pieces of boulders, broken during drilling
110		D.B.		110' silty sandy GRAVEL	- hard drilling
				70% rounded GRAVEL (10% boulders, 15% cobbles, 25% c.p. to v.c.p., 20% f.p. to v.f.p.) 20% angular to subangular SAND (10% c.s., 5% m.s., 5% f.s.) 10% silt/clay. Occassional cementation of smaller gravels (weak rxn to HCl) Sand - 50% mafic, 50% felsic. Gravel - 60% mafic, 40% felsic. Dry - olive gray - 5Y 5/2, Wet - 5Y 4/1	- course pebble/v.c. pebbles, - fragments of boulders/cobbles broken during drilling
115'		D.B.		115' sandy GRAVEL 70% GRAVEL (10% boulders, l.c., 15% cobbles, 5% v.c.p., 20% m.p. to c.p., 10% f.p., 15% v.f.p.) 30% subangular SAND (10% c.s. to v.c.s., 5% m.s., 5% f.s. to v.f.s.) SILT < 10%. cobbles/boulders are very broken. Dry - light gray 5Y 7/1, Wet - very dark gray 5Y 3/1. Moderate rxn to HCl. V. poorly sorted	- frequent boulders - boulder @ 16' (larger than core barrel) - difficult drilling - boulder @ 19' (larger than core barrel)
		H.T.			- 119' - very diff. drilling - very large boulder - losing circulation - H.T. dry
120				A-80	

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BOREHOLE LOG

Boring or Well No. 699-13P91-3 (TEMP.)

Sheet 7 of 11

Location B-Pond, Lobe 3c

Project W-017 / B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment Cable Tool / Hard Tool Drive Barrel

Prepared By Nancy Ballantyne (Sign/Print Name)

Date

Reviewed By E.C. Lindsay / E.C. Rylander (Sign/Print Name)

Date 07/05/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
120'	2Lith 1moist 1Rad	H.T.		120' Gravel 80% GRAVEL - Broken pieces of larger boulder or cobbles (mostly mafic - basalt fragments) 20% sand - Mostly angular pieces of larger grains, mostly Mafic (basalt). Felsic sands (≤10%) tend to be more subangular ~~to subrd~~ 5/30/91	- v. hard drilling - on a boulder larger than casing
125'	2Lith 1moist 1Rad	D.B.		125' silty sandy GRAVEL 75% rounded GRAVEL (25% s.c., 20% v.c.p., 15% c.p.; 10% m.p., 5% v.f.p.-f.p.) 15% SAND - subrounded to angular (7.5% c. to c.s., 7.5% m. to v.f. sand - coarser sands tend to be more mafic + angular) 10% silt/clay. Occasional $CaCO_3$ cementing (strong rxn to HCl). Generally ubiquitous HCl on most grains. Moist, v.p. sorted. Dry - Gray - 5Y 6/1 Wet - dark gray 5Y 4/1	cobbles - many are broken pieces of cobbles + boulders - occassional boulder - coarser sands probably fragments of larger grains
130'	2Lith 1moist 1Rad	D.B.		130' silty sandy GRAVEL Same as above - slightly less moist 133'-134' - wet gravels - (no free water) 134' - Clayey SILT	- occasional boulders ~134' - very moist to wet may have hit Ringold contact - change to silt.
135'	2Lith 1moist 1Rad	D.B.		135' Clayey SILT, massive, Dry - Light gray, 10YR 7/2, wet - Brown - 10YR 5/3, slightly moist 136' At same as above 137' same as above 138 - same as above - somewhat sandier 139' - same as 139 - slightly moister	

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BOREHOLE LOG

Boring or Well No. 699-B291-3

Sheet 8 of 11

Location B-Pond, Lobe 3c

Project 93-017 / B Pond

Elevation Land Surface 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment Cable Tool / Drive Barrel Rotary Tool

Prepared By Nancy Ballantyne (Sign/Print Name) Date 9/9/91

Reviewed By Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
140'	2 Lith 1 moist 1 Rad	D.B.		140' Clayey SILT - same as 135'-139'	
145'					
	2 Lith 1 CaCO3 1 Rad	HT		145' Sandy, Clayey Silt (10% Sandy 30% Clay, 60% Silt) (10YR 5/2) grayish brown wet, (10YR 7/2) lt gray dry, Sample wet (HT) contains 10% vfs, weak rx w/ 10% HCL, 90% felsic + qtz, 10% basaltic trace mica	9/6/91 0755 SFH
150'	2 Lith 1 CaCO3 1 Rad	HT		150' Sandy Clayey Silt (10% Sand, 30% Clay, 60% Silt) as described in 145' sample w/ minor amounts of basaltic gravel	9/6/91 0830 SFH
155'	2 Lith 1 CaCO3 1 Rad	HT		155' Sandy Clayey Silt (10% Sand, 30% Clay, 60% Silt) as described in 145' sample	9/6/91 0915 SFH

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BOREHOLE LOG

Boring or Well No. 699-BP91-3 (TEMP.)

Sheet 8 of 11

Location B Pond, Lobe 3c

Project W-017/B Pond

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe, Wraspir

Drilling Method and Equipment Cable Tool

Prepared By Nancy Ballantyne (Sign/Print Name) Date 9/18/91

Reviewed By E.C. Rafuse/E.C. Rafuse (Sign/Print Name) Date 09/20/91

Depth ( )	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
140'	2 Lith 1 moist 1 Rad	D.B.		140' Clayey SILT - same as 135'-139'	
145'	2 Lith 1 $CaCO_3$ 1 Rad	H.T.		145' - sandy clayey SILT (10% sandy, 30% clay, 60% silt) (10YR 5/2) grayish brown - wet (10YR 7/2) lt. gray - dry Wet (HT) contains 10% vfs, weak rxn to HCl, 90% felsic, 10% mafic, trace mica	
150'	2 Lith 1 $CaCO_3$ 1 Rad	H.T.		150' sandy, clayey SILT (10% sand, 30% clay, 60% silt) as described in 145'. Sample w/ minor amts basaltic gravel	
155'	2 Lith 1 $CaCO_3$ 1 Rad	H.T.		155' sandy, clayey SILT - as described in 145'	
160'					

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BOREHOLE LOG

Boring or Well No. 699-BP91-3

Sheet 9 of 11

Location B Pond, Lobe 3c

Project W-017 / B Pond

Elevation

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wrusor

Drilling Method and Equipment Cable Tool

Prepared By Nancy Ballantyne (Sign/Print Name) Date 9/18/91

Reviewed By E.C. Rates / E.C. Rates (Sign/Print Name) Date 09/20/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
160'	1 Rad 2 Lith 1 $CaCO_3$	H.T.		160' - sandy, clayey SILT	
				strong rxn to HCl	
				Dry - v. pale brown, 10YR 8/3	
				Wet - pale brown, 10YR 6/3	
165'	1 Rad 2 Lith 1 $CaCO_3$	H.T.		165' - sandy, clayey SILT	
				See above description	
170'	1 Rad 2 Lith 1 $CaCO_3$	H.T.		170' - sandy, clayey SILT	
				See description for 160' sample	
				171' - GRAVELS	- also hit water
				- sandy, silty GRAVEL	- GRAVELS VERY
				~30% GRAVEL (20% Broken pieces	ground up due to
				of large cobbles and some small	H.T. drilling.
				cobbles, 10% pebbles). 35% SAND	
				(Subangular to subrounded). 35%	- slurry - strong rxn to HCl.
				SILT/CLAY (silt/clay mostly rock flour)	Color → from slurry
				Dry - v. pale brown 10YR 8/3, wet - pale brown 10YR 6/3	
175'	1 Rad 2 Lith 1 $CaCO_3$	H.T.		175' - Same as 171'	
					- Drillers encountered v. hard intervals - probably cemented.

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BOREHOLE LOG

Boring or Well No. 699-BP91-3 (TEMP.)

Sheet 9 of 11

Location B Pond, Lake 3C
Project W017
Elevation 554.86' BRASS CAP
Drilling Contractor Kaiser Engineers Hanford
Driller Moe Wraspr
Drilling Method and Equipment Cable Tool
Prepared By Nancy Ballantyne (Sign/Print Name) Date 9/12/91
Reviewed By Edward C. Rafuse (Sign/Print Name) Date 09/12/91

Depth ( )	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
160'	1Rad 2Lith 1CaCO3	HT		160' - sandy clayey SILT strong rxn to HCL dry - v. pale brown, 10YR 8/3 wet - pale brown 10YR 6/3	
165'	1Rad 1CaCO3 ~~2Rad~~ 2Lith	HT		165' - sandy clayey SILT see above description - strong rxn to HCL	
170'	1Rad 1CaCO3 2Lith	HT		170' - sandy clayey SILT see above description - strong rxn to HCL 171' - Gravels - SILT in gravels - strong rxn to HCL	- hit GRAVEL @ 171' / water - gravels gravel up during drilling.
175'	1Rad 1CaCO3 2Lith	HT		175' - ~~Sandy~~ Bolder slightly gravelly, sandy SILT 5% GRAVEL (mostly m. to v. f.p.) ~~95%~~ Bolder 60% SILT (some clay) 35% sand strong rxn to HCl	Hard Drilling - more GRAVEL 173'-175' - drillers hit gravel - maybe cemented.

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-BP91-3 (Test)

Sheet 10 of 11

Location B Pond, Lobe 3c

Project W-017

Elevation 554.86' BRASS CAP

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Wraspir

Drilling Method and Equipment Cable Tool

Prepared By Nancy Ballantyne (Sign/Print Name) Date 9/11/91

Reviewed By E.C. Lotter/E.C. Palmer (Sign/Print Name) Date 09/20/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
180'	1 Moist 1 Rad 2 Lith	HT		180' sandy, silty GRAVEL	
				30% GRAVEL (Broken pieces of large cobbles and some small cobbles, 10% pebbles)	HT - produces a lot of rock flour (i.e. SILT/mud)
				35% SAND (subangular to subrounded)	- Drilling slowing
				Subangular pieces tend to be basalt.	
				35% SILT/CLAY (rock flour)	
				Dry - V. pale brown, 10YR 8/3	
				wet - pale brown 10YR 6/3	
*				v. strong rxn to HCl - 65% felsic	X-184 - sandy lense - heaves in hole, water/sand
				35% mafic.	
185'	1 $CaCO_3$ 1 Rad 2 Lith	H.T.		185' - same as 180', MORE sand (sand - f.g. sand probably from 184' interval).	
				188' - very thin sandy lense	
190'	1 $CaCO_3$ 1 Rad 2 Lith	H.T.		190' - same as 180' sample	
195'	1 $CaCO_3$ 1 Rad 2 Lith	H.T.		195' - same as 180' sample	

A-6000-382 (04/90)

9312790456

699-42-39 B

BOREHOLE LOG

Boring or Well No. 699-BP91-3 (TEMP.)

Sheet 11 of 11

Location B Pond, Lobe 3c

Project W-017, B Pond

Elevation

Drilling Contractor Kaiser Engineers Hanford

Driller Moe Weaspir

Drilling Method and Equipment Cable Tool

Prepared By Nancy Ballantyne (Sign/Print Name) Date

Reviewed By E.C. Rafuse / E.C. Rafuse (Sign/Print Name) Date 09/20/91

Depth ( )	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
200'	2 Lith 1 Rad 1 $CaCO_3$	H.T.		Same as 180' sample - NO RXN to HCl.	- Slower drilling than 195'
				- occasional sand lenses	- only advancing 2' because of hole caving in. (from sand).
				205'	
205'	2 Lith 1 Rad 1 $CaCO_3$	H.T.		Same as 180' sample - no rxn. to HCl	Continued slow drilling
210'	2 Lith 1 Rad 1 $CaCO_3$	H.T.		210' - Same as 180' sample - slight rxn. to HCl	Continued slow drilling
				214.5' - change in lithology	
215'	2 Lith 1 Rad 1 $CaCO_3$	S.T. 22 B.C.		215 - SILT/CLAY	
				No rxn to HCl, massive, crumbly	
216' TD		T.D.		Wet - dark olive gray 5YR 3/2	
				Dry - light gray 5YR 7/1	
				215-217 - Split spoon sample of SILT/CLAY	- only recovered 215' to 216' TD at 216', 22 Blow counts

A-6000-382 (04/90)

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Westinghouse Hanford Company | LOG HEADER | Page 1 of 2

Well No. 699-BP91-3 Area 600 Area Date 9/5/91
Log Run #1 Log Type Gross Gamma
Elevation Datum Elevation
Survey Coordinates N in
Log Measured From Ground Surface
Location Description B-Pond, East of C-Lobe
Ground Surface Elevation
Surface Temperature 36.0°C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Mo Wraspir
Drill Rig Type Cable Tool Bit Type/Diameter Drive Barrel/10
Borehole Diameter(s)/Depth 12"/140.0' AWP 9/5/91
Depth Driller 140.0' Depth Logger ~~138.7'~~ 138.1'
Liquid Level NA Liquid Density NA
Temperature NA

CASING RECORD

Type 12" Carbon Steel Sch. 40 Interval +3.24 - 133.76'
Type Interval
Type Interval
Type Interval
Well Screen Interval NA
Comments: Return Error = +0.1' high
Centralizer used

A-6000-520 (05/90)

9312790469

LOG HEADER | Page 2 of 2

EQUIPMENT DATA

Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS Equipment Type Analog
Tool Type Gamma Ray Serial No. C627A97
Base Calibration Date 5/91 Calibration Reference
Calibration/Probe Factor 8.84x10⁻³ eU P/M/C/S Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU
Dead Time 11.8 μsec Warm Up Time >15 min

LOGGING INFORMATION

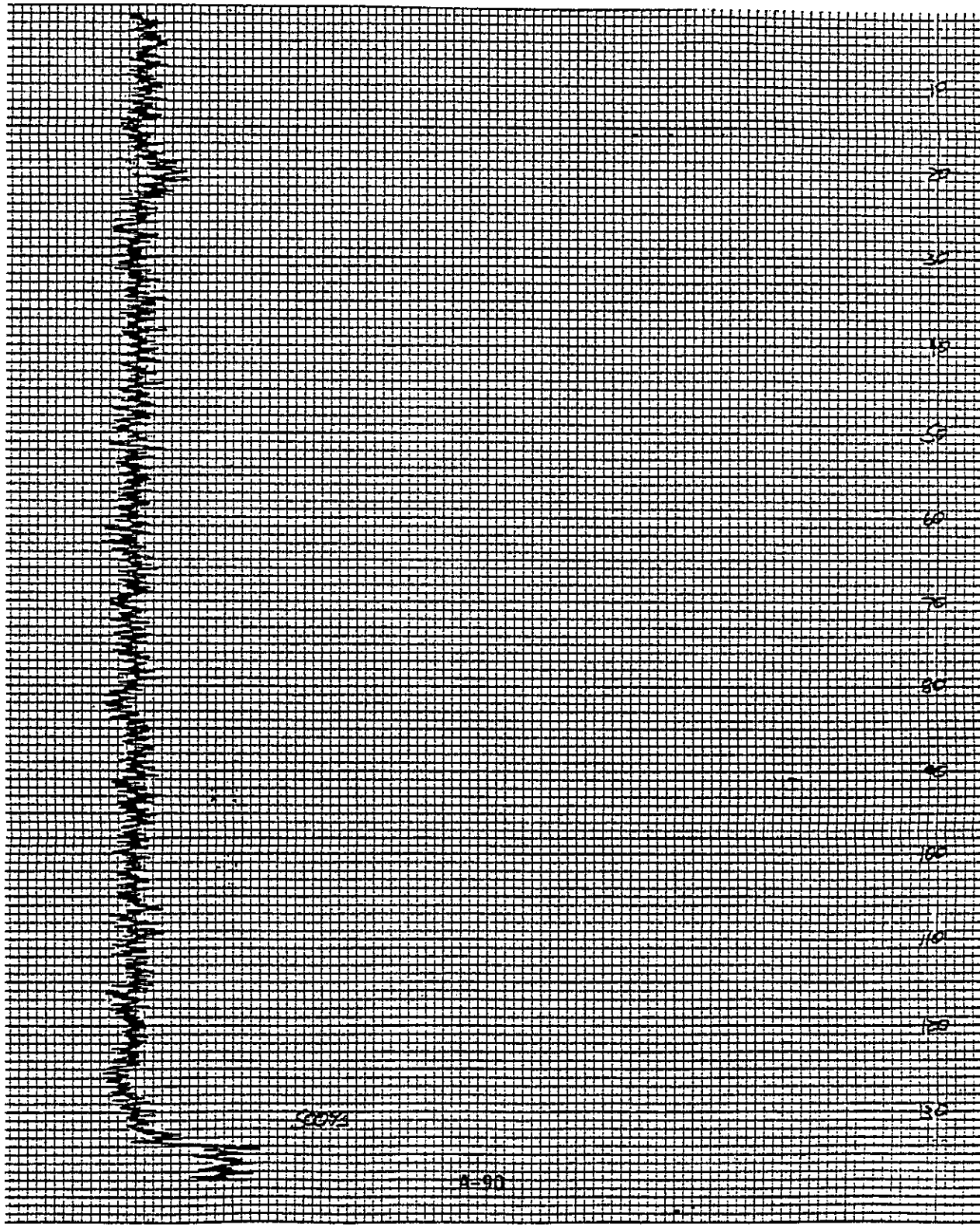
Log Interval From ~~138.7'~~ 138.1' AWP 9/5/91 To 1.9'
Rerun(s) 138.1' to 100.0'
Pre Survey Verification: Position 1 300.6 eU Position 2 64.1 eU Background 50 c/s
Base Calibration Difference: Position 1 3.2 eU Position 2 0.2 eU
Logging Speed 5 ft./min. Rerun Scales, CPS/in. 50 c/s/in
Start Time 1245 Completion Time 1430
Chart Speed(s), ft/in. 10 ft./in.
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1
Post Survey Verification: Position 1 298.6 eU Position 2 64.4 eU Background 47 c/s
Percent Change: Position 1 0.7% Position 2 0.5%
Comments Return Error = +0.1' high
Centralizer used

A-89

Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson Date: 9/5/91

A-6000-520 (05/90)

699-BP91-3 RUN#1 9/5/1991



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WHC-SD-EN-DP-046, Rev. 0

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-B-91-3 Area 600 Area Date ~~6/17/91~~ 9/17/91 AKP

Log Run #2 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description B-Pond / East of C-Lake

Ground Surface Elevation _____

Surface Temperature 21.3°C Weather Clear - Warm

BOREHOLE INFORMATION

Driller Mo Wrasspin

Drill Rig Type Cable Tool | Bit Type/Diameter Hard Tool / 8"

Borehole Diameter(s)/Depth 12"/136.7' | 10"/210.1

Depth Driller 210.1' | Depth Logger 209.4'

Liquid Level 141.38' | Liquid ~~Density~~ Appearance Cloudy

Temperature 18.6°C

CASING RECORD

Type 12" Carbon Steel Sch. 40 | Interval +0.5' - 136.7'

Type 10" Carbon Steel Sch. 40 | Interval +1.2' - 213.89'

Type | Interval

Type | Interval

Well Screen Interval NA

Comments: Return Error = ±0.15' high
Centralizer used.

A-6000-120 (05/90)

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand MLS | Equipment Type Analog

Tool Type Gamma Ray | Serial No. C627A97

Base Calibration Date 5/91 | Calibration Reference PNL-77785 UC-606

Calibration/Probe Factor 8.84×10²¹ API/CS | Calibration Datum (eU): Position 1 297.4 cell | Position 2 64.3 cell

Dead Time 11.8 μ sec | Warm Up Time 7.15 min

LOGGING INFORMATION

Log Interval From 209.4' To 100.0'

Rerun(s) 190.0' to 140.0' | Position 2 65.0 cell | Background 45 cps

Pre Survey Verification: Position 1 303.2 cell | Position 2 0.7 cell

Base Calibration Difference: Position 1 5.8 cell | Rerun Scaler, CPS/in. 50 cps/in

Logging Speed 5 ft/min. | Completion Time 0950

Start Time 0730

Chart Speed(s), f/in. 10 ft/in. | Time Constant(s) TC-1

Chart Recorder Horizontal Scale, CPS/in. 50 cps/in.

Post Survey Verification: Position 1 299.8 cell | Position 2 64.5 cell | Background 45 cps

Percent Change: Position 1 1.5% | Position 2 0.8%

Comments Return Error = ±0.15' high
Centralizer used

Witnessed and Verified by: (sign and print name) Alan Pearson | Date: 9/17/91

A-6000-110 (05/90)

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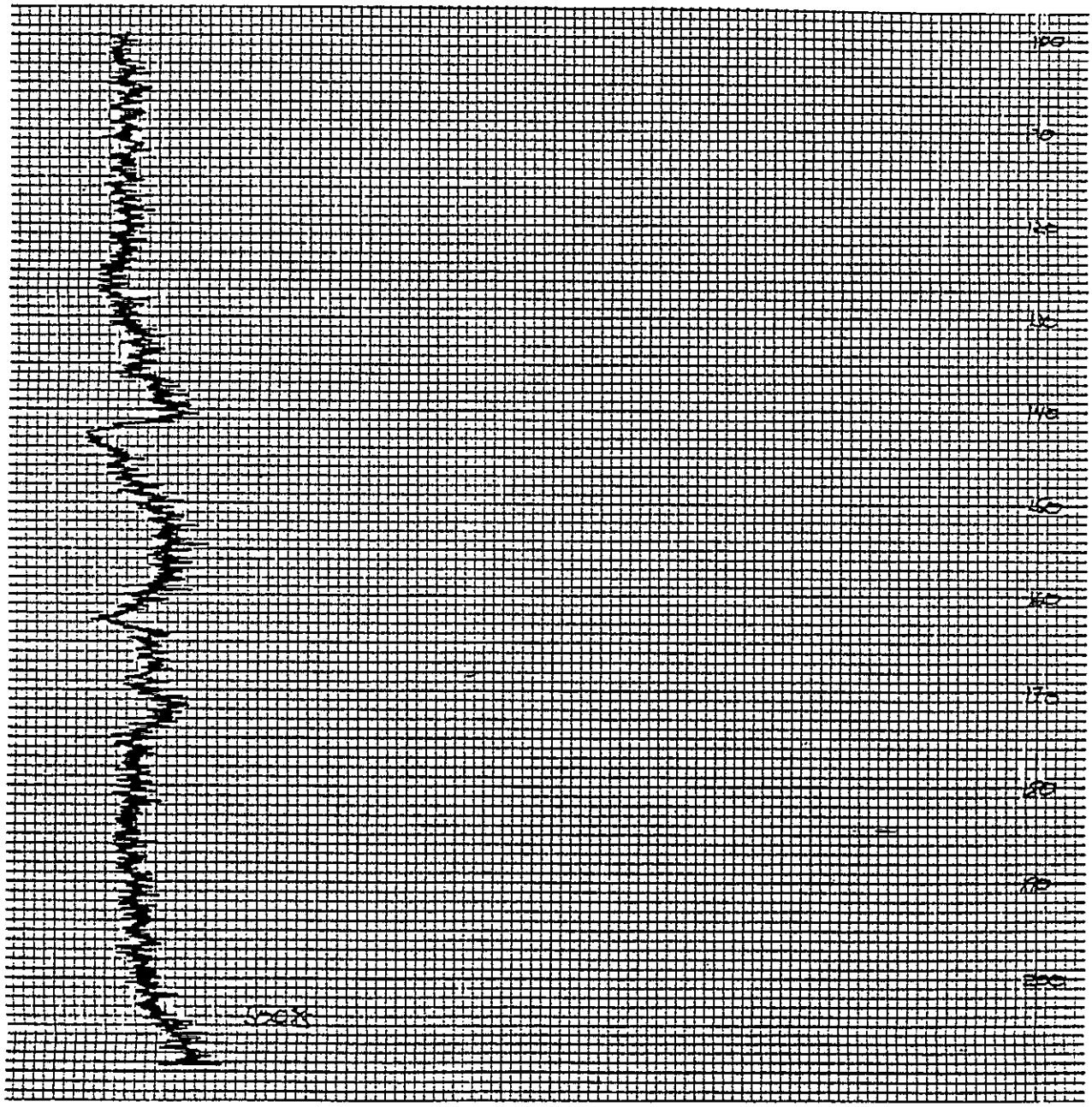
699-BP91-3 RUN#2 9/17/1991



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KAISER ENGINEERS HANFORD

SURVEY DATA REPORT

Request No. —|9|2|1|—|0|5|7

Project/W.O. No.	Title	File No.
W-017H	B-Pond Wells	W|E|L|L|—|1|1|9

EH Job No.	Prepared By	Date	Reviewer	
CR9560	N. P. Fastabend	12-10-91	Michael W. Polster	1|2

DESCRIPTION OF WORK

Locate wells around B-POnd for horizontal and vertical position.

Horizontal: WCS83S and 200-E Datum

Vertical: NGVD '29 and 200-E Datum

ACCEPTABILITY (Within Plan Tolerance)

- Yes ☐
- No ☐
- NA ☒
- TBD by Requestor ☐

DISTRIBUTION

	OR
Survey File	
Field Project File	1
D. Foucault	1
T. Nemzek	1
J. Geiger	1
J. Rieger	1
D. Weekes	1

SURVEY RESULTS AND COMMENTS

CONTROL MONUMENTS:

BP-1
N:136,716.89
E:577,129.74

BP-3
N:136,571.07
E:577,596.34

NOTE: A). Horizontal control points used to locate wells were part of a traverse with a linear closure of better than 1:50,000.

B). Vertical control monument used to establish elevations on wells (2E-18) was part of a vertical network with misclosure of all run sections less than 8mm√K. Holding USC & GS benchmarks J-317, K-317 & L-317.

WELL NO.	COORDINATES (C/L CASING) 200-E AREA (FEET)	LAMBERT WCS83S (METERS)	VERT. DATUM	ELEVATIONS (FEET) BRASS CAP IN CONC.	TOP HYDRO-STAR PLATE, N. SIDE	TOP OUTER CASING N. SIDE	
699-43-40	N:43357.4	N:136,705.54	NGVD'29	538.76	542.22	542.20	
	W:40379.1	E:577,583.34	200-E	538.53	541.99	541.98	
699-43-41G	N:42969.0	N:136,586.83	NGVD'29	547.96	551.36	551.34	
	W:40763.2	E:577,466.61	200-E	547.73	551.13	551.12	
699-42-39A 699-BP91-2	N:41866.5	N:136,251.95	NGVD'29	554.61	558.15	558.14	
	W:39484.6	E:577,857.26	200-E	554.44	557.93	557.91	
699-42-39B * 699-BP91-3	N:41816.1	N:136,236.59	NGVD'29	554.86	558.33	558.32	
	W:39478.3	E:577,859.21	A-93 200-E	554.63	558.11	558.09	

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WELL CONSTRUCTION REPORT

2/4/92

Specification No. WHC-S-014 Rev No. WHC-SD-EN-DP 045-REV 0

Well No. 699-42-41 Temp. Well No. N/A

Coordinates N 136,365.6, E 577,335.6 Lambert ~~NCVD~~ NB

Casing Elev. 567.30' Ground Elev. 564.03'

Project 200 E AREA

Location 216-B-3, POND SYSTEM

Drilling Company Kaiser Engineers Hanford

Driller Ken Blackman, Jody Carpenter, Joe McKnight

Other (Companies) NONE

Geologist(s) E.C. Rafuse, S.M. Goodwin (PNL), Stacey W. Callison

Drilling Method

Verification Method Visual observation

Criteria WHC-S-014 5.2, 5.3, 7.5, EII 6.7 sec. 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A		
Cable Tool	D 0'-156'	H 143'	SWL	7/31/91
Drilling Fluid	Drill Supply H_2O		SWL	7/31/91
Other	NONE	—	SWL	7/31/91

Geophysical Logging

Sondes	Interval	Date
Gross Gamma	154.5'-3.6'	7/30/91
	-	
	-	
	-	
	-	

Completion Data

Drilled Depth 156.72' BLS

Completed Depth 155.2' bls

Date Started 6/27/91

Date Completed 8/29/91

Static Water Level/Date 142.0' bls 7/25/91

Aquifer Testing

Type Instantaneous Slug

Flow Meter I.D. No. -NA-

Cal. Due Date -NA-

Length of Test 1 hr

Volume Pumped -NA-

Drawdown -NA-

Date of Test 10-16-91

Completion Results

Cleaning

Verification Method Visual Inspection (and direct observation of drill rig cleaning)

Criteria WHC-S-014 7.6, 4.2.2, 7.7 WHC-CM 7-7 EII 5.4

	Initials	Date
Drilling Tools/Rig	E.C.L	06-25-91
Temporary Materials	SWL	7/31/91
Permanent Materials	SWL	8/27/9

Material Storage/Packing

Verification Method Visual observation

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	SWL	8/27/9
Material Packing	SWL	8/27/91

Screen

Type	Length	Slot Size 0.010
T-304 stainless steel 4" wire wrap	21.0'	10 slot

Depth(s) 134.2 - 155.2

Verification Method Verify using steel tape

Criteria WHC-S-014 4.2.3 4.2.5 12.21, 4.2.1

Initials SWL Date 8/29/91

Lubricants/Additives

Verification Method Visual observation

Criteria WHC-S-014 7.2

	Identify	Initials	Date
Additives	Drill Supply Water ~~NONE~~ 7/31/91	SWL	7/31/91
Lubricants	Jet Lube	SWL	7/31/91

Straightness Test

Verification Method Visual observation

Criteria WHC-S-014 8.2

Initials SWL [signature] Date 7/31/91

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A-6000-436 (09/90)

WELL CONSTRUCTION REPORT
(continuation sheet)

Well No. 699-42-41

Casing (permanent)

Type	Size	Placement
T-304 stainless steel	4"	+5.8 - 155.2
		-
		-
		-

Verification Method: Verify using STEEL TAPE

Criteria: WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials: SWC Date: 11 8/29/91

Well Protection

Verification Method: Visual, measure w/tape

Criteria: WHC-S-014 4.2.10

	Initials	Date
Protective Posts	SWC	1/24/92
Protective Casing	ECR	1/24/92
Site Restored	ECR	1/24/92
Cap, Hasp and Lock	ECR	1/24/92
Surface Pad	ECR	1/24/92

Annular Seal/Filter Pack

Verification Method: MEASURE WITH STEEL TAPE Criteria: WHC-S-014 4.2.6, 4.2.7, 4.2.8, 5.3.1 or 5.3.2

Type	Interval	Volume	Initials	Date
20-40 silica sand	154.8' - 130.3'	12.5-100#bags (14.0 ft³)	SWC	8/28/91
3/8" bentonite pellets	130.3' - 125.6'	5-50#buc (3.1 ft³)	SWC	8/28/91
8-20 mesh bentonite crumbles	125.6' - 20.4'	96-50#bags (68.2 ft³)	SWC	8/28/91
type I-II cement grout	20.4' - 2.0'	20-~~100~~ 94#bags (25.7 ft³)	SWC	8/29/91

Well Survey/Labeling

Verification Method: REVIEW OF SURVEY REPORT

Criteria: WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	SWC	1/24/92
Protective Casing/Brass Cap Surveyed	ECR	1/24/92
Well Number Stenciled	ECR	1/24/92
Brass Cap Labeled	ECR	1/24/92

Pump Installation

Verification Method: VISUAL OBSERVATION

Criteria: WHC-S-0-014 4.2.11, 4.2.2

	Initials	Date
Pump Decon/Prep	JAC	10-16-91
Installed	JAC	10-16-91
Pump Tested	JAC	10-16-91

Other (initial if performed)

N/A Well Abandonment; N/A Downhole TV Inspection; SWC Complete As-Built Diagram, Driller's/Geologist's Logs

JAC 10-16-91 Well Development; Partial Sand Pack Development SWC 8/28/91

Comments/Remarks: There is only 13.2' of water in the well, because there is a confining unit that was not drilled into.

Reviewed By (Sign/Print Name): Edward C. Rafuse / EDWARD C. RAFUSE Date: 2/28/92

A-6000-436 (09/90)

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3 of 4

WELL SUMMARY SHEET

Boring or Well No. 699-42-41

Sheet 1 of 1

Location 216-B-3 POND

Project W-017 B-POND

Elevation 564.03' BRASS CAP

Drilling Contractor KAISER ENGINEERS

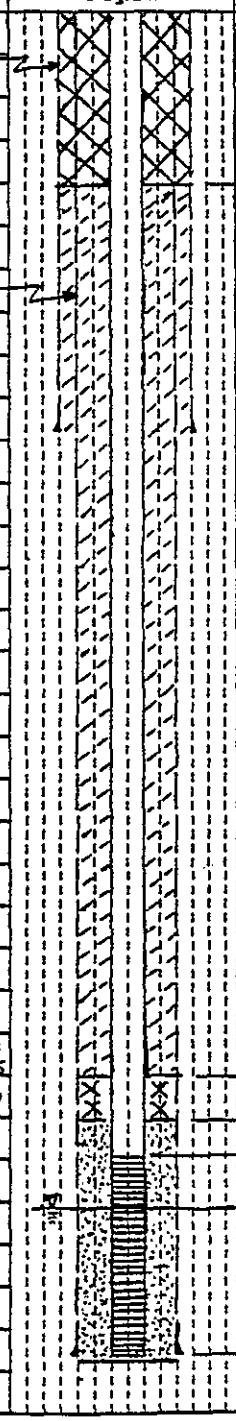
Driller KEN BLACKMAN

Drilling Method and Equipment CABLE TOOL, WALKER-NEER

Prepared By SW Collison / SW Collison (Sign/Print Name) Date 8/20/92

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 08/27/91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
12" Ø TEMPORARY CARBON STEEL CASING TO 49.11' BLS				SAND
		10		SANDY GRAVEL
				GRAVELLY SAND
		20.4 20		SANDY GRAVEL
				" "
		30		" "
10" Ø TEMPORARY CARBON STEEL CASING TO 154.91' BLS				" "
		40		" "
				" "
bottom of type I+II cement grout and top of 8-20 bentonite crumbles @ 20.4' bls		50		SILTY ~~MUDDY~~ SANDY GRAVEL
		60		" " "
				" " "
		70		" " "
3/8" bentonite pellets from 125.6' to 130.3' bls		80		SL. SILTY GRAVELLY SAND
				SL. GRAVELLY SAND
20-40 silica sand from 130.3' to 155.2' bls		90		GRAVELLY SAND
				" "
		100		SANDY GRAVEL
10 slot 4" stainless steel T-304 wire wrap screen from 134.2' to 155.2'				SILTY SANDY GRAVEL
		110		" " "
				" " "
		120		" " "
water level @ 142.0' bls as measured on 7/25/91		125.6		" " "
		130		" " "
		130.3 134.2		" " "
Note: There is only 13.2' of water,		140 142.0		SANDY GRAVEL
				" "
		150		SILTY ~~MUDDY~~ SANDY GRAVEL
		154		SILTY SAND - RINGOLD FM. @ 154'
		155.2		SILTY SANDY GRAVEL
		156		T.D. = 156.72'



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A-6000-384 (04/90)

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BOREHOLE LOG

VALID 2/4/92 SIGNATURE/DATE

Boring or Well No. #699-42-41

Sheet 1 of 8

Location 216-B-3 Pond System

Project 100/OU

Elevation Top Brass Mon: 564.03 NGVD 29

Drilling Contractor KEH

Driller Ken Blackburn

Drilling Method and Equipment Cable Tool - United Nerad

Prepared By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 06/27/91

Reviewed By Kent Reynolds / Kent Reynolds (Sign/Print Name) Date 1/29/92 BH

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
0.0	1 Lab 1 Moist 2-Litho			(0-5.0) Sand, Sand 80% Silt 20% 20% vcgr, 50% cgr, 20% mgr 10% Fgr. 7.5yr 5/2 lt brown Poor sorting-sbrd, mod. sat, Some w. Sat. wet 7.5yr 4/6 dk brn, mod sat, sbang-ang, Some qtz, 70% qtz, 20% Feldspars, 10% basalts, N. calc	Sampled @ 9:00 - 06/27/91
	2-Litho 1 Lab 1 Moist				
5.0		DB		(5.0-10.0) Sandy gravel 10% vcgr, 15% cgr, 30% mgr, 40% vfgr, 10% ufgr, all some Rock Fragm, Dry 7.5 6/2 lt gr. Some dk gy Fe sat, poor sorting-sbrd, sl. sltly ip. wet - no sample moisture 2.5yr 4/1 mk dk gr sorting-sbrd, Fe-p sat, sltly ip, sl. HCl, 80% basalt, 20% qtz, some Feldspars	Sampled @ 12:45 06/27/91
	1 Lab 1 Moist 2-Litho	DB			
10.0				(10-15.0) Gravelly Sand 50% vcrs, 50% cs, Tr vfgr Dry 7.5yr 6/0 lt brown mgr, poorly poor sorting-sbrd, occ sr, Fe sat, sltly ip, wet 2.5yr 4/0 mk dk gy, gyscl 0/10%, p-Fe sat poor sorting-sbrd, 5% HCl 70% qtzs, 20% basalt, 10% Feldspars	
	1 Lab 1 Moist 2-Litho	DB			
15.0				(15.0-20.0) Sandy gravel 10% mg, 30% fg, 40% vfg, 20% vcgr, 10% crs, Dry 7.5 6/0 dk gy, Fe sat, sbang-sbrd, sltly ip, wet 7.5yr 4/1 dk gy. sbang-sbrd, some gyscl, Fe sat, sltly ip, 10% basalts, 20% qtzs, some Feldspars, Tr HCl reaction	Sampled @ 10:35 07/01/91
20.0					

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BOREHOLE LOG

Boring or Well No. 699-42-41

Sheet 2 of 8

Location 216-B-3 Pond System

Project WMI/017

Elevation TOP BRASS MON: 564.03 NGVD 29

Drilling Contractor KEH

Driller KEH Blackman

Drilling Method and Equipment Cable Tool, Walker Neer HO-22-530

Prepared By Edward C Rose, Frances C Rose (Sign/Print Name) Date 07/2/91

Reviewed By Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 LRD 1 MOIST 2-Litho	DB		(20.0-25.0) SANDY GRAVEL 60% GRAVEL 30% SAND 10% SILT, 30% Fp 40% Cap 30% VCap, dry 2.5 4/0 H-m gy, p sort, sandy-sand, N-calc, WET-10 moist 2.5 4/0 l dk gy, Fr sort, sandy-sand sand lm gcs, 10% HCL, 70% BASALTS, 30% qtz, sme FELDS	SAMPLED @ 11:45 am 7/1/91
25.0	1 LRD 1 MOIST 2-Litho	DB		(25.0-30.0) SANDY GRAVEL 50% 40% SANDS, 10% SILT; 40% Cap 40% Fp, 20% VFp dry H-m gy Fr-p sort, sandy-sand, N-calc, WET - 2.5/3.1 dk gy -m gy, mod sort, silty in, p sand sandy-sand, N calc 70% BASALT, 20% SANDS, 10% ~~SILT~~ SILT FELD 7/1/91	SAMPLED @ 11:45 am 7/1/91
30.0	1 LRD 1 MOIST 2-Litho	DB		(30.0-35.0) AS ABOVE - SANDY GRAVEL	SAMPLED @ 13:15 7/1/91
35.0	1 LRD 1 MOIST 2-Litho	DB		(35.0-40.0) SANDY GRAVEL 40% GRAVEL 50% SAND, 10% SILT, 40% Fp 50% Cap 10% VFp dry 2.5 y 5/0 H-m gy, p sand p-m sort, p sand sandy-sand, sand lm WET 2.5 3/0 l dk gy p sand sandy-sand, p sort, mod silty in. 70% BASALTS, 30% qtz lm FELDS	SAMPLED @ 0740 7/2/91
40.0					

A-100

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BOREHOLE LOG

Boring or Well No. 699 42-41

Sheet 3 of 8

Location 216-B-3 Pond System

Project UN/OIT B Pond

Elevation TOP BRASS MON: 564.03 NGVD'29

Drilling Contractor KEH

Driller KEW Black mon

Drilling Method and Equipment Crane Tool, Wireline - Alex 40-41-53

Prepared By Shannon Goodwin KDR (Sign/Print Name) Date 1/28/92

Reviewed By Kat Reynolds (Sign/Print Name) Date 1/28/92

Depth (Feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
40.0	1 RAD 1-MOIST 2-LITH			(40-45.0) SANDY GRAVEL 60% GRAVEL 40% SAND, 10% SILT, 70% CSGP, 20% FP, 40% VFP, 40% VCRS Dry Sym 6/1 gry, Fe SET, SANDY SAND, WET 2.5y 3/0 V dk gry Fe-MND SLT, 70% BASALTS 30% SANDS, 5% HCL	SAMPLED @ 10:10 7/2/91
	1 RAD 1 MOIST 2 LITH	DB		(45.0-50.0) SANDY GRAVEL 40% GRAVEL 40% SANDS 20% SILT 10% VFP 10% VCS 60% CS, 20% MS Dry Sym 6/1 gr-SAME Hue, Fe MND SET, WET 2.5y 3/1 dk gr Fe-MND SET, PRED SANDY-SAND, Sly ip, slightly CaCO-HCL 70% BASALTS, 30% FELS, TR FELDS	SAMPLED @ 10:35 7/2/91 SET 10" csg @ 50.0'
50.0	1 RAD 1 MOIST 2 LITH	DB		(50.0-55.0) MUDDY SANDY GRAVEL: 40% GRAVEL, 50% SAND, 10% SILT. 5% CP, 10% MP, 15% FP, 10% VFP, 5% VCS, 10% CS, 15% MS, 15% FS, 5% VFS. DRY: 2.5y 5/2 WET. 2.5y 3/2, SL. MOIST; POORLY SORTED, SA-SR; 60% BASALTIC, 40% FELSIC, T. MICA, MOD. RX TO HCL.	SAMPLED @ 0905 7/3/91 S.M. GOODWIN - PNL
55.0	1 RAD 2 LITH 1 MOIST	DB		(55.0-60.0) MUDDY SANDY GRAVEL: 60% GRAVEL, 30% SAND, 10% SILT. T SC 5% VCP, 10% CP, 15% MP, 15% FP, 15% VFP, T VCS, 5% CS, 5% MS, 10% FS, 10% VFS, 10% SILT. VP SORTED. DRY: 2.5y 5/2 WET: 2.5y 3/2. SL. MOIST. GRAVELS: SA-R SAND. SA-SR. 60% MAFIC, 40% FELSIC. MOD RX TO HCL INCREASE IN GRAVELS; HARD TO KEEP MATERIAL IN DB.	SAMPLED @ 1020 7/3/91 S.M. GOODWIN - PNL

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BOREHOLE LOG

Boring or Well No. 699-42-41

Sheet 4 of 8

Location 216-B-3 POND SYSTEM

Project WO-017 B-POND

Elevation TOP BRASS MONI 564.03 NGVD 29

Drilling Contractor KEH

Driller KEN BLACKMAN

Drilling Method and Equipment CABLE TOOL / WALKER - NEER

Prepared By [signature] S.M. GOODWIN (Sign/Print Name) Date 7/10/91

Reviewed By [signature] EDWARD C. [signature] (Sign/Print Name) Date 07/11/91

Depth (60.0')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1 RAD 1 MOIST 2 LITH	DB		(60.0 - 65.0) MUDDY SANDY GRAVEL: 60% GRAVEL, 35% SAND, 5% SILT. T. LC & SB, 5% VCP, 10% CP, 20% MP, 15% FP, 10% VFP, 5% VCS, 10% CS, 10% MS, 5% FS, 5% VFS, 5% SILT. VP SORTED. DRY: 2.5Y 5/2 (GRY. BRN) WET: 2.5Y 3/2 (V. DRK GRY BRN). SL. MOIST. GRAVELS: SA-WR. SAND: SA-SR. 60% MAFIC, 40% FELSIC. MOD. RX. TO HCL.	SAMPLED @ 1355 7/9/91 S.M. GOODWIN - PNL
65.0	1 RAD 1 MOIST 2 LITH	DB		(65.0 - 70.0) MUDDY SANDY GRAVEL: 60% GRAVEL 35% SAND, 5% SILT. SIMILAR TO 65' SAMPLE. SLIGHT INCREASE IN GRAVEL SIZE: 10% VCP, 15% CP, 15% MP, 10% FP, 10% VFP. REMAINDER = SAME AS 65'	SAMPLED @ 1425 7/9/91 S.M. GOODWIN - PNL
70.0	1 RAD 1 MOIST 2 LITH	DB		(70.0 - 75.0) MUDDY SANDY GRAVEL: 60% GRAVEL, 35% SAND, 5% SILT. P. SIZE DIST. SAME AS 65' SAMPLE. VP SORTED. DRY: 2.5Y 5/2 WET: 2.5Y 3/2. SL. MOIST. GRAVEL: SA-WR SAND: SA-SR. GRANITE & Q-ZITE COBBLES. NO RX. TO 10% HCL. 60% MAFIC, 40% FELSIC IN GRAVEL & SANDS	SAMPLED @ 0810 7/10/91 S.M. GOODWIN - PNL
75.0	1 RAD 1 MOIST 2 LITH	DB		(75.0 - 80.0) SL. SILTY GRAVELLY SAND: 15% GRAVEL, 75% SAND, 10% SILT T. CP & MP, 5% FP, 10% VFP, 15% VCS, 25% CS, 15% MS, 10% FS, 10% VFS, 10% SILT. DRY: 2.5Y 6/3 (LT. YEL. BRN) WET: 2.5Y 4/3 (OL. BRN). P. SORTED. GRAVEL: SA-SR. SAND: A-SA. 30% MAFIC, 70% FELSIC. STRONG RX. TO HCL. FM. Δ TO MOVE SAND @ 77'	SAMPLED @ 0850 7/10/91 S.M. GOODWIN
80.0		DB			

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BOREHOLE LOG

Boring or Well No. 699-42-41

Sheet 5 of 8

Location 216-B-3 POND SYSTEM

Project W-017 B-POND

Elevation TOP BRASS MON: 564.03 NAVD '29

Drilling Contractor KEH

Driller KEN BLACKMAN

Drilling Method and Equipment CABLE TOOL / WALKER-NEER

Prepared By [signature] S.M. GOODWIN (Sign/Print Name) Date 7/11/91

Reviewed By [signature] (Sign/Print Name) Date 07/11/91

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
80.0	1 RAD 1 MOIST 2 LITH	DB		(80.0 - 85.0) SL. GRAVELLY SAND: 5% GRAVEL, 90% SAND 5% SILT. T. FP, 5% VFP, 15% VCS, 40% CS, 15% MS, 10% FS, 10% VFS, 5% SILT. DRY: 2.5Y 7/2 (P. GRY). WET: 2.5Y 5/3 (BRN). SL. MOIST. M-P SORTED. SA-SR. 20% MAFIC, 80% FELSIC. NO RX. TO HCL. LESS SILT & GRAVEL, LESS BASALT	SAMPLED 7/10/91 1045 S.M. GOODWIN - PNL
85.0	1 RAD 1 MOIST 2 LITH	DB		(85.0 - 90.0) GRAVELLY SAND: 25% GRAVEL, 70% SAND, 5% SILT. T CP, 5% MP, 10% FP, 10% VFP, 15% VCS, 20% CS, 15% MS, 10% FS, 10% VFS, 5% SILT. DRY: 2.5Y 7/2 WET: 2.5Y 5/3. SL. MOIST. P-VP SORTED. SA-R. 25% MAFIC, 75% FELSIC. SL. RX - TO 10% HCL. INCREASE IN GRAVEL.	SAMPLED 7/10/91 @ 1340 S.M. GOODWIN - PNL
90.0	1 RAD 1 MOIST 1 LITH	DB		(90.0 - 95.0) GRAVELLY SAND: SAME AS ABOVE W/ SL. INCREASE IN GRAVEL CONTENT.	SAMPLED 7/10/91 @ 1355 S.M. GOODWIN - PNL
95.0	1 RAD 1 MOIST 2 LITH	DB		(95.0 - 100.0) SANDY GRAVEL: 35% GRAVEL, 60% SAND, 5% SILT. T. LC, SB, & VCP, 5% CP, 10% MP, 10% FP, 10% VFP, 10% VCS, 20% CS, 15% MS, 8% FS, 7% VFS, 5% SILT. VP SORTED. DRY: 2.5Y 6/3 (LT. YEL. BRN) WET: 2.5Y 4/3 (OL. BRN). SL. MOIST. SA-R. 25% MAFIC, 75% FELSIC. MOD. RX. TO 10% HCL	SAMPLE 7/11/91 @ 1100 S.M. GOODWIN - PNL
100.0		DB			

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BOREHOLE LOG

Boring or Well No. 699-42-41

Sheet 6 of 8

Location 216-B-3 POND SYSTEM

Project W-017 B-POND

Elevation TOP BRASS MON: 564.03 NGVD '29

Drilling Contractor KEH

Driller KEN BLACKMAN

Drilling Method and Equipment CABLE TOOL / WALKER-NEGR 8A

Prepared By Shannon Goodwin KDR (Sign/Print Name) Date 1/25/92

Reviewed By Edward C. [illegible] Earl C. [illegible] (Sign/Print Name) Date 07/14/91

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
100.0	1 RAD 1 MOIST 2 LITH E.C.L. 7/12/91	DB		(100.0 - 105.0) MUDDY SANDY GRAVEL: T LC & SC, 5% VCP, 10% CP, 15% MP, 15% FP, 15% VFP, 5% VCS, 10% CS, 5% MS, 5% FS, 5% VFS, 10% SILT & ROCK FLOUR. DRY: 2.5Y 5/2 (GRY. BRN) WET: 2.5Y 3/2 (V. DRK GRY BRN). VP. SORTED. A TO SR. 40% MAFIC, 60% FELSIC. NO RX TO 10% HCL FM. IS COARSER; BROKEN COBBLES & LARGE GRAVELS.	SAMPLED 7/11/91 @ 1245 S.M. GOODWIN - PNL
105.0	1 RAD 1 MOIST 2 LITH	DB		(105.0 - 110.0) MUDDY SANDY GRAVEL: 60% GRAVEL, 30% SAND, 10% SILT. T. LC & SC. 5% VCP, 10% CP, 10% MP, 15% FP, 20% VFP, SAND DIST. SAME AS 105'. SAMPLE SIMILAR TO 105'; FM. APPEARS TO BE SL. CEMENTED. HAVING PROBLEMS KEEPING MATERIAL IN DRIVE BARREL.	SAMPLED 7/12/91 @ 0740 S.M. GOODWIN - PNL
110.0	1 RAD 1 MOIST 2 LITH	DB		(110.0 - 115.0) MUDDY SANDY GRAVEL: SIMILAR TO 105' & 110' SAMPLES, SLIGHT INCREASE IN MOISTURE; COULD BE FROM ADDING DRILL WATER TO BOREHOLE.	SAMPLED 7/12/91 @ 0845 S.M. GOODWIN - PNL
115.0	1 RAD 1 MOIST 2 LITH	DB		(115.0 - 120.0) MUDDY SANDY GRAVEL: 70% GRAVEL, 25% SAND, 5% SILT. 10% VCP, 10% CP, 15% MP, 15% FP, 20% VFP, 10% VCS, 5% CS, 5% MS, 5% FS-VFS, 5% SILT. SEVERAL LC & SC. DRY: 2.5Y 5/2 WET: 2.5Y 3/2 MOIST. VP SORTED. SA-R. 40% MAFIC, 60% FELSIC. M-S RX. TO HCL. SOME $CaCO_3$ CEMENT ON GRAVELS & COBBLES.	SAMPLED 7/12/91 @ 1140 S.M. GOODWIN - PNL
120.0					

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BOREHOLE LOG

Boring or Well No. 699-42-41

Sheet 7 of 8

Location 216-B-3 POND SYSTEM

Project W-017 B-POND

Elevation TOP BRASS MON: 564.03 NGVD 29

Drilling Contractor KEH

Driller KEN BLACKMAN

Drilling Method and Equipment CABLE TOOL / WALKER-NEGR

Prepared By Shannon Goodwin (KDR) (Sign/Print Name) Date 1/28/92

Reviewed By [illegible] / [illegible] (Sign/Print Name) Date [illegible]

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
120.0	1 RAD 1 MOIST 2 LITH			(120.0 - 125.0) MUDDY SANDY GRAVEL: 70% GRAVEL, 25% SAND, 5% SILT. SAME DESCRIPTION AS 120' SAMPLE MOIST; COULD BE IN CAPILLARY FRINGE.	SAMPLED 7/12/91 @ 1305 S.M. GOODWIN - PNL
125.0	1 RAD 1 MOIST 2 LITH	DB		(125.0 - 130.0) MUDDY SANDY GRAVEL: 75% GRAVEL, 20% SAND, 5% SILT. T. LC & SC, 10% VCP 15% CP, 15% MP, 15% FP, 20% VFP, 5% VCS, 5% CS, 5% MS, 5% FS-VFS, 5% SILT. VP SOLTED. DRY: 2.5Y 4/2 (D. GRAY BRN), WET: 2.5Y 3/2 (V. DKL. GRAY. BRN). A-R; MUCH OF SAMPLE IS BROKEN UP. 40% MAFIC, 60% FELSIC. MOD. RX. TO HCL. MOIST; HAS BEEN INCREASE IN MOISTURE SINCE 120'.	SAMPLED 7/16/91 @ 1400 S.M. GOODWIN - PNL
130.0	1 RAD 1 MOIST 2 LITH	DB		(130.0 - 135.0) MUDDY SANDY GRAVEL: 75% GRAVEL 20% SAND 5% SILT. SIMILAR TO 130' SAMPLE.	SAMPLED 7/16/91 @ 1305 S.M. GOODWIN - PNL
135.0	1 RAD 1 MOIST 2 LITH	DB		SANDY (135.0 - 140.0) GRAVEL (5% SAND, 95% GRAVEL 25% VCS, 25% CS, 20% MS, 20% FS, 10% VFS, 5% LC, 5% SOC, 25% VCP, 25% CP, 25% MP, 10% FP, 10% VFP, dk. 2.5Y 3/2 (d. gray) WET 2.5Y 3/2 V. dk gr. gray, 70% mafic 30% FELSIC, FE LX & HCL, very MOIST @ 138-140	SAMPLED @ 7/8/91 @ 10:00 EC LAFLUR
140.0					

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WHC-SD-EN-DP-046, Rev. 0

BOREHOLE LOG

Boring or Well No. 699-42-41

Sheet 8 of 8

Location 216-B-3 POND SYSTEM

Project W-017 B-POND

Elevation TOP BRASS MON: 564.03 NGVD'29

Drilling Contractor KEH

Driller KEN BLACKMAN

Drilling Method and Equipment CABLE TOOL / WALKER NEER

Prepared By SHANNON [signature] (Sign/Print Name) Date 07/21/91

Reviewed By EDWARD C. [signature] (Sign/Print Name) Date 08/01/91

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
140.0	2 LITH 1 RAD	DB		(140.0 - 145.0) SANDY GRAVEL: 65% GRAVEL, 35% SAND, TRACE SILT. T SC, 5% VCP, 10% CP, 15% MP, 20% FP, 15% VFP, 5% VCS, 10% CS, 10% MS, 5% FS, 5% VFS, T SILT. WET: 2.5Y 3/2 (V. DRK. GRAY. BRN) DRY: 2.5Y 4/2 (D. GRAY. BRN). WET. VP SORTED. UNBROKEN: SA - R. 60% MAFIC 40% FELSIC. NO RX. TO HCL.	SAMPLED @ 1050 7/26/91 S.M. GOODWIN - PNL
145.0	2 LITH 1 RAD	DB		(145.0 - 150.0) MUDDY SANDY GRAVEL: 70% GRAVEL, 25% SAND, 5% SILT. T SC, 10% VCP, 10% CP, 15% MP, 20% FP, 15% VFP, 5% VCS, 10% CS, 10% MS, 5% FS, 5% VFS, 5% SILT. REMAINDER OF SAMPLE DESCRIPTION SAME AS 145'.	SAMPLED @ 0800 7/29/91 S.M. GOODWIN - PNL
150.0	2 LITH 1 RAD	DB		(154.0') SILTY SAND: 70% SAND, 30% SILT. 70% FS & VFS. VERY WELL SORTED. WET COLOR: 10YR 4/3 (BRN). DRY COLOR: 10YR 6/3 (PALE BRN). 5% MAFIC, 95% FELSIC. NO RX. TO 10% HCL. DRILLING IS TIGHT; FM. APPEARS CONSOLIDATED. FINE LAMINATIONS PRESENT.	SAMPLED @ 0850 7/29/91 S.M. GOODWIN - PNL HIT RINGOLD FM @ 154' BLS
154.0	1 SS	SS		(156.0) SILTY SANDY GRAVEL: 70% GRAVEL, 25% SAND, 5% SILT. CEMENTED GRAVEL IN A SILTY SANDY MATRIX, 10% VCP, 10% CP, 15% MP, 20% FP, 15% VFP, 25% F & VFS. WET: 10YR 5/3 (BROWN) DRY: 10YR 7/3. DRY TO SL. MOIST. VP SORTED. UNBROKEN = SA TO WR. 90% FELSIC, 10% MAFIC. STRONG RX. TO 10% HCL.	SAMPLED @ 1145 7/29/91 S.M. GOODWIN - PNL SPLIT SPOON 154.72'-156.72'
156.0					

A-6000-382 (04/90)

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Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-42-41 Area 600 Area Date 7/30/91

Log Run #1 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description SE corner of B-Pond

Ground Surface Elevation _____

Surface Temperature 37.2°C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Ken Blackman

Drill Rig Type Cable Tool	Bit Type/Diameter Drive Barrel / 8"
Borehole Diameter(s)/Depth 12"/49.11	10"/156.0
Depth Driller 156.0'	Depth Logger 154.5'
Liquid Level 142.0'	Liquid Density Appearance Silty-Muddy
Temperature 18.8°C	

CASING RECORD

Type 12" Carbon Steel Sch. 40	Interval 0.0' - 49.11'
Type 10" Carbon Steel Sch. 40	Interval +1.5' - 155.02
Type	Interval
Type	Interval

Well Screen Interval NA

Comments: Return Error = +0.2' high
Centralizer used.

A-6000-120 (05-90)

HHF+SD-EN-DP-046 Rev. 0

LOG HEADER — Page 2 of 2

EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson

Equipment Brand MLS — Equipment Type Analog

Tool Type Gamma Ray — Serial No. CG27A97

Base Calibration Date 5/91 — Calibration Reference RAY PNL-7785 UC-604 Decommissioned 10-1-92 as stated

Calibration/Probe Factor 8.84 x 10^2 cpm/pCi/g — Base Calibration Datum (eu): Position 1 297.4 eu — Position 2 64.3 eu

Dead Time 11.8 μsec — Warm Up Time 715 min

LOGGING INFORMATION

Log Interval From 156.0' to 3.6' — Rerun(s) 154.5' to 120.0'

Pre Survey Verification: Position 1 295.7 eu — Position 2 65.9 eu — Background 55 c/s

Base Calibration Difference: Position 1 1.7 eu — Position 2 1.6 eu

Logging Speed 54 ft/min. — Rerun Scales, CPS/in. 50 c/s/in.

Start Time 1230 — Completion Time 1415

Chart Speed(s), in/in. 10 ft/in. — Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. — Time Constant(s) TC-1

Post Survey Verification: Position 1 291.1 eu — Position 2 65.2 eu — Background 57 c/s

Percent Change: Position 1 1.6% — Position 2 1.1%

Comments Return Error = +0.2' high
Centralizer used

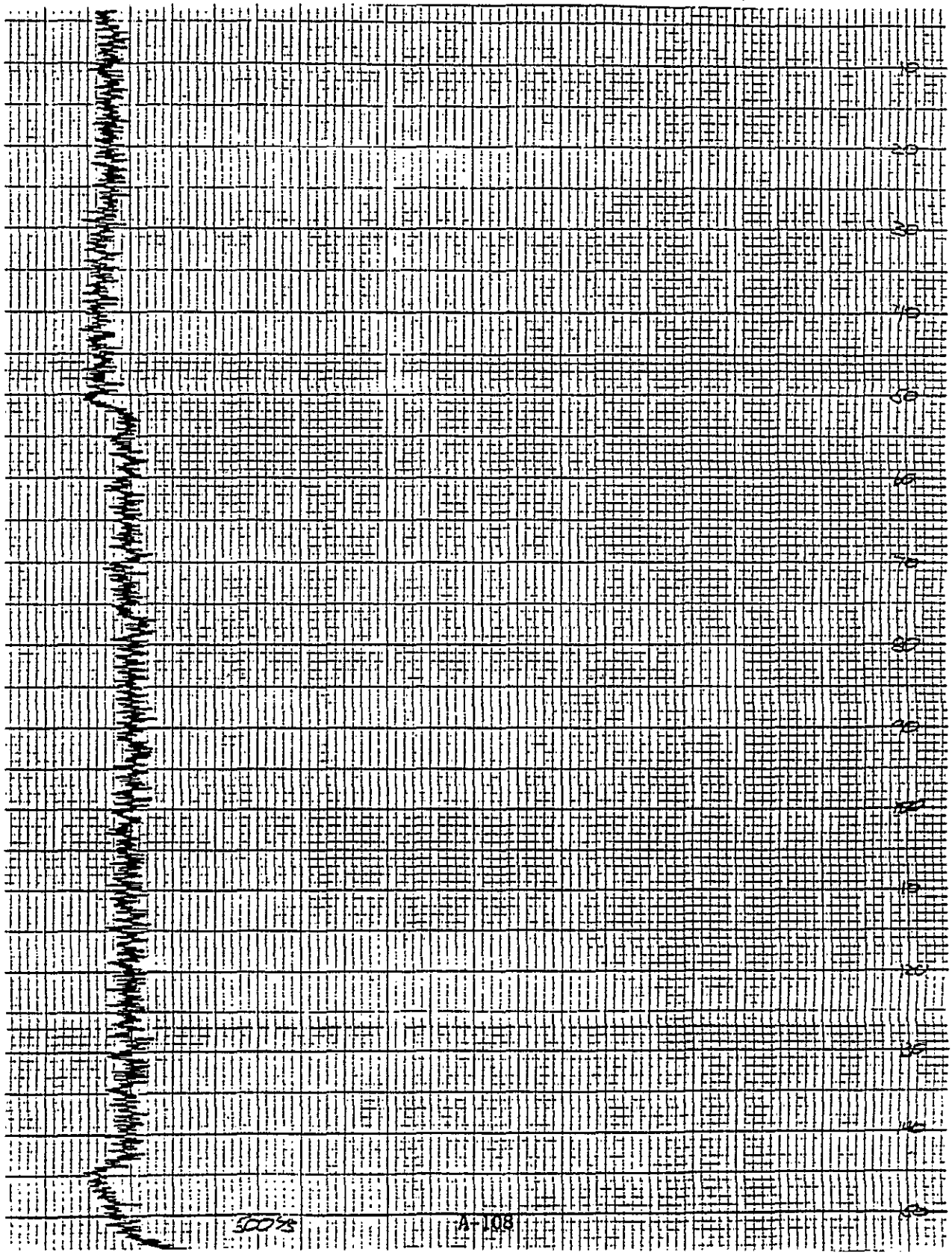
Witnessed and Verified by: (sign and print name) ~~Not Required~~ No Witness Available — Date:

Rodell Pace / Robert Price / RAP

A-107

A-6000-120 (05-90)

699-42-41 RUN#1 7/30/1991



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KAISER ENGINEERS HANFORD	SURVEY DATA REPORT	Request No. —9 2 1 —0 2 4

Project/W.O. No.	Title	File No.
W017	216-B-3 Wells	W E L L —1 1 9

KEH Job No.	Prepared By	Date	Reviewer
CR9560-31	R. L. Hackwith	10-31-91	Vern Coyne 1 1

DESCRIPTION OF WORK	ACCEPTABILITY (Within Plan Tolerance)	DISTRIBUTION	
Locate well 699-42-41 for horizontal and vertical locations.	Yes XX	Survey File	OR
	No ☐	Field Project File	1
	NA ☐	J. Geiger	1
	TBD by Requestor ☐	D. Weekes	1
		J. Rieger	1

SURVEY RESULTS AND COMMENTS

CONTROL MONUMENTS:

BP-1	BP-2
N:136,716.7	N:136,578.9
E:577,129.9	E:576,624.7

NOTE: (A). Horizontal control points used to locate well were part of a traverse with a linear closure of 1:50,000 +.

(B). Vertical control used to locate wells was based on a 5.8 mile level loop with a closure of 0.024 feet from monument at N:41,000, W:47,300 (2E-18).

WELL NO.	COORDINATES C/L CASING PLANT 200E (FEET)	COORDINATES C/L CASING LAMBERT NAD 83 (METERS)	VERT. DATUM	ELEVATIONS (FEET) TOP BRASS MON	OUTER CASING	HYDRO STAR PLATE	INNER CASING
* ~~299-42-41~~ 699-42-41	N:42,245.8 W:41,195.9	N:136,365.6 E:577,335.6	NGVD 29	564.03	567.30	567.31	N/A
			PLANT 200-E	563.80	567.07	576.09	N/A

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3 of 4

WELL SUMMARY SHEET

Boring or Well No. BP 699-43-40

Sheet 1 of 1

Location 216-B-3-Pond System

Project RCRA W-017-B POND

Elevation 538.76 ft

Drilling Contractor KEH

Driller Ron Thomas

Drilling Method and Equipment CABLE TOOL - WALKER NEER

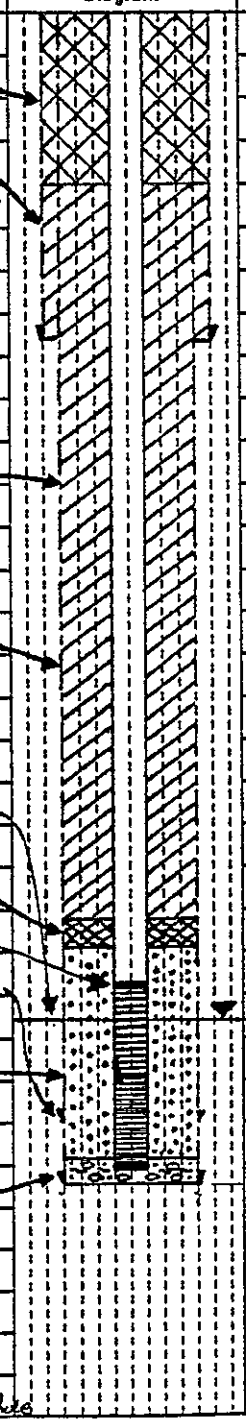
Prepared By DENNIS ANDERSON / Ken Lane (Sign/Print Name) Date 7/9/91

Reviewed By Edward C. Rafuse (Sign/Print Name) Date 12/28/91

CONSTRUCTION DATA

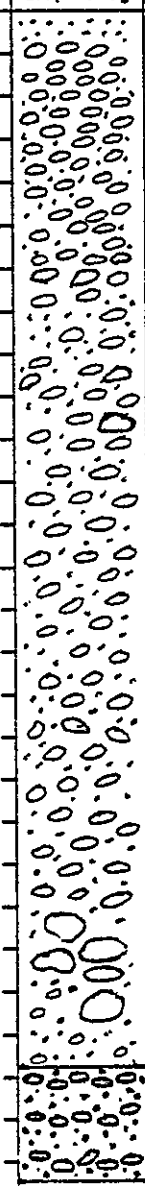
Description	Depth in Feet
CEMENT GROUT TO 20.0'	5, 10
12" I.D. TEMPORARY C.S. CASING W/FORGED STEEL SHOE SET ~38.6'	15, 20, 25
BENTONITE CRUMBLES 20.0-106.9'	30, 35, 40, 45, 50, 55
10" I.D. TEMPORARY C.S. CASING W/FORGE STEEL SHOE SET ~136.3'	60, 65, 70, 75
STATIC WATER TABLE ~118.3' bLS	80, 85, 90, 95
BENTONITE PELLETS 106.9'-109.5'	100, 105
TOP OF SCREEN ~114.3' bLS	110
* 10" FORGED STEEL SHOE ESTIMATED AT DEPTH ~129.5' bLS	115, 120
SAND FILTER (20-40) 109.5-134.4	125
BOTTOM OF SCREEN 135.0'	130
BOTTOM OF WELL SUMP 135.3'	135
NATIVE SOILS/SLOFF 134.4'-136.7'	137
BOTTOM OF CASING 136.3'	
BOTTOM OF HOLE 136.7'	
* ~85% of ORIGINAL FORGED STEEL SHOE SEPERATED & LEFT IN WELL HOLE	

Diagram



GEOLOGIC/HYDROLOGIC DATA

Graphic Log



Lithologic Description
SILTY SANDY GRAVEL
SANDY GRAVEL
SLIGHTY SANDY GRAVEL
SLIGHTY SANDY GRAVEL
GRAVEL
GRAVEL
GRAVELLY SAND
SANDY GRAVEL
SANDY GRAVEL
GRAVEL
GRAVEL W/TRACE SAND
SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
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SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
SANDY GRAVEL
SLIGHTLY GRAVELLY SILTY SAND
INTERBEDDED SAND AND GRAVEL
INTERBEDDED SAND AND GRAVEL

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A-6000-384 (04/90)

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1 of 4

WHC-SD-EN-DP-046, Rev. 0

WELL CONSTRUCTION REPORT

VALIDATED 5/4/92 SIGNATURE/DATE

Page 1 of 2

Specification No. WHC-S-014 (SEE COMMENTS) Rev No. 5 (SEE COMMENTS)

ECNs 144240, 144241

Project RCRA W017 / B-3 Pond

Location 216-B-3 POND SYSTEM

Drilling Company Kaiser Engineering Hanford

Driller Ron Thomas

Other (Companies) WHC, SALEM TECH

Geologist(s) Dennis Anderson - SALEM
William C. Brennan - EBASCO
Myra K. Varg - EBASCO
Paul W. Anderson - Ebasco
Ken Lane - Hart Crowser

Well No. 699-43-40 Temp. Well No. BP 91-7

Coordinates Hanford N 43357.4 W 40379.1 | Lambert N 136,705.54, E577,583.34

Casing Elev. 542.20' Ground Elev. 538.76'

Drilling Method

Verification Method VISUAL OBSERVATION

Criteria WHC-S-014 5.2, 5.3, 7.5 EII 6.7 Sec 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D 124-137 0-104	H 104-124	MKV	8/27/91
Drilling Fluid	164 CALS	RAW H2O	DJA	7/10/91
Other	N/A			

Geophysical Logging

Sondes	Interval	Date
Gross Gamma	133.8' - 0.0'	8/27/91
Down hole camera	0' - ~119'	10-23-91
Magnetic Logging	0' - ~135'	10-24-91

Completion Data

Drilled Depth 137.0'

Completed Depth 135.3'

Date Started 7/9/91

Date Completed 10/24/91

Static Water Level/Date ~119.3' bls / 10-21-91

Aquifer Testing

Type Instantaneous Slug

Flow Meter I.D. No. -NA-

Cal. Due Date -NA-

Length of Test 1 HR

Volume Pumped -NA-

Drawdown -NA-

Date of Test 11-26-91

Completion Results

Cleaning

Verification Method VISUAL INSP & direct obs of doc.

Criteria WHC-S-014 4.2.2, 7.6, 7.7 WAC-CM-7-7

	Initials	Date
Drilling Tools/Rig	WCB DJA	7/9/10 ① ④ ⑤ 08/09/91
Temporary Materials	WCB DJA	7/9/10 08/09/91
Permanent Materials	K.L (Green Gauss)	10/18/91

Material Storage/Packing

Verification Method VISUAL OBSERVATION

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	K.L	10/18/91
Material Packing	K.L	10/18/91

Screen

Type	Length	Slot Size
T-304 4"	2 (10') sections 20.04 w end cap	10 slot

Depth(s) 124.3' - 135.3' w/end cap

Verification Method STEEL TAPE MEASUREMENT

Criteria WHC-S-014 4.2.3, 4.2.5, 12.2.1, 4.2.1

Initials K.L. Date 10-18-91

Lubricants/Additives

Verification Method VISUAL OBSERVATION

Criteria WHC-S-014 7.2

	Identify	Initials	Date
Additives	RAW H2O	DJA	7/10/91 ③ ⑥
Lubricants	WELL GUARD	DJA	7/9/91 ②

Straightness Test

Verification Method VISUAL OBSERVATION

Criteria WHC-S-014 8.2 (REFERENCE OPEN ITEM NO. W-017-E-9 8/29/91)

Initials ~~6" ID~~ MKV (MKV 9-3-91) Date 8/26/91 ⑦

KDK After Document #10/2/91 review as per ECN # 150204

Received closure Form 10/17/91 K.L.

A-6000-436 (09/90)

A-113

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WELL CONSTRUCTION REPORT
(continuation sheet)

699-43-40

Casing (permanent)

Type	Size	Placement
T-304 10 SLOT Screen	4"	224.3 - 135.3
T-304 blank	4"	45' ALL - 1243' bls
		-
		-

Verification Method WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Criteria MEASURING USING STEEL TAPE

Initials K.L. Date 10-24-91

Well Protection

Verification Method VISUAL INSPECTION WITH TAPE

Criteria WHC-S-014 4.2.10

	Initials	Date
Protective Posts	ECW	1/24/92
Protective Casing	ECW	1/24/92
Site Restored	ECW	1/24/92
Cap, Hasp and Lock	ECW	1/24/92
Surface Pad	ECW	1/24/92

Annular Seal/Filter Pack

Verification Method MEASURING USING STEEL TAPE Criteria WHC-S-014 4.2.6, 4.2.7, 4.2.8, 4.2.9, 5.3.1

Type	Interval	Volume	Initials	Date
SAND 20-40	109.5 - 134.4	1750 lb 17½ bags	K.L	10-24-91
Pellets (BENTONITE)	106.4 - 109.5	150 lb 3 boxes	K.L	10-24-91
BENTONITE CRUMBLES	109.5 - 20.0	4400 lb 88 bags	K.L	10-24-91
CEMENT GROUT	20.0 - 2.0	2304 lb 24 bags	K.L	10-24-91

Well Survey/Labeling

Verification Method Review of survey report

Criteria WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	ECW	1/24/92
Protective Casing/Brass Cap Surveyed	ECW	1/24/92
Well Number Stenciled	ECW	1/24/92
Brass Cap Labeled	ECW	1/24/92

Pump Installation

Verification Method VISUAL OBSERVATION

Criteria WHC-S-014 4.2.11, 4.2.2

	Initials	Date
Pump Decon/Prep	~~11-26-91~~ JAC	11-26-91
Installed	JAC	11-26-91
Pump Tested	JAC	11-26-91

Other (initial if performed)

N/A Well Abandonment _____ Downhole TV Inspection ECW Complete As-Built Diagram, Driller's/Geologist's Logs

JAC 11-26-91 Well Development

Comments/Remarks (1) 2 pieces of 12" CASING WERE Rejected due to lg. AMTS. of RUST & BENTONITE. 7/12/91
(2) WELL GUARD Also USED ON 7/10/91; 7/29/91; 8/2/91; 8/7/91; 8/9/91; 8/14/91; 8/22/91
(3) RAW H_2O added on 7/10/91 (2gal); 7/17/91 (2gal); 7/24/91 (2gal); 7/25/91 (2gal); 7/29/91 (7gal);
(4) 2 pieces of 10" CASING WAS rejected for oil / cutting lub. cont. and WAS hauled away 7/16/91
(5) REPLACEMENT RIG MOBILIZED ON SITE 08 06 91 (6) RAW H_2O ADDED ON 7/30/91 (2GAL); 8/1/91 (6GAL); 8/2/91 (17GAL); 8/7/91 (28 GAL); 8/8/91 (12GAL); 8/9/91 (8GAL); 8/12/91 (3GAL); 8/14/91 (3GAL); 8/15/91 (2GAL); 8/16/91 (37GAL); 8/19/91 (21 GAL); 8/20/91 (20 GAL) (7) K. REYNOLDS SAID PERMANENT CASING WILL BE 4" ID SO BOREHOLE IS ADEQUATE 8/27/91, PASSED 6" ID STRAIGHTNESS TEST 8/26/91; FAILED 8" ID STRAIGHTNESS TEST 8/27/91

WITNESSED STRAIGHTNESS TEST UTILIZING A 6" STRAIGHTNESS TESTER ON 8/26/91 (VERIFIED SUCCESSFUL TEST, HOWEVER WITNESSED AN UNSUCCESSFUL STRAIGHTNESS TEST UTILIZING THE APPROVED 8" STRAIGHTNESS TESTER ON 8/27/91 WILL WRITE AN OPEN ITEM REPORT. [illegible] KEMALL 8/28/91)

Reviewed By (Sign/Print Name) EDWARD C. RAGUNE / EDWARD C. RAGUNE Date 1/29/92

REV 6 took effective 10/2/91

ECN 169 FOR REV 6 AND 150132, 169223, 127439

A-6000-436 (09/90)

9 3 1 2 7 5 9 0 4 9 4

BOREHOLE LOG

VALIDATED 2/4/91 SIGNATURE DATE

Boring or Well No. BP 43-40

Sheet 1 of 7

Location 216-B-3-Pond System

Project RCRA W017-B Pond

Elevation 538.76' BRASS CAP

Drilling Contractor KEH

Driller Ron Thomas

Drilling Method and Equipment CABLE TOOL - WALKER NEER

Prepared By Dennis Anderson DENNIS ANDERSON (Sign/Print Name) Date 7/9/91

Reviewed By Edward C. Rafer EDWARD C. RAFER (Sign/Print Name) Date 07/14/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
				surface - sand.	
				gravel w/silt & sand	2 ft.
5.0'	1 rad 1 moist 2 lith	DB		silty sandy GRAVEL (15% silt 20% sand, 65% GRAVEL) 5% vcs 10% cs 20% ms 40% fs 30% vfs - 15% vcp 15% cp 20% mp 25% fp 25% vfp, 2.5y 6/2 lt brn gry DRY, 2.5y 4/2 dk gry brn WET, sample is dry, very poor sorting subrnd - rnd / spherical - discoidal No Rxn to 10% HCl Basalt (80% w/ Qtz Qtze, sample is non plastic, magnetic material to 1mm.	5.0' sample @ 10:05 7-10-91 poor recovery 2 gal H2O added for recovery
10.0'	1 rad 1 moist 2 lith	DB		sandy GRAVEL (10% sand 90% GRAVEL) 15% vcs 10% cs 20% ms 25% fs 30% vfs w/ rock flour 10% sc 30% vcp 20% cp 15% mp 15% fp 10% vfp, 2.5y N3 vy dk gry WET, 2.5y N5 grey DRY very poor sorting, Dry sample, subrnd - wellrnd / subprismoidal - discoidal Strong Rxn to 10% HCl 90% BASALT 10% Qtz Qtze trace sulfide, serp olivine, Nonplastic, Mag. mat. to 1mm	sample @ 13:20 7-11-91 improved recovery
15.0	1 rad 1 moist 2 lith	DB		slightly sandy GRAVEL (5% sand 95% GRAVEL) 20% vcs 15% cs 15% ms 20% fs 30% vfs w/ rock flour 10% sc 25% vcp 25% cp 20% mp 10% fp 10% vfp, Dry sample, mod - poorly sorted subang - wellrnd / discoidal - subprismoidal, moderate Rxn to 10% HCl 80% basalt 10% Qtz - Qtze, 10% granitics, porph vol. w/ trace micas, sulfides Non plastic, Magnetic material to 2mm	sample @ 1400 7-12-91

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BOREHOLE LOG

Boring or Well No. BP 699-43-40

Sheet 2 of 7

Location 216-B-3 Pond System

Project RCRA W017 / B Pond

Elevation 538.76' BRASS CAP

Drilling Contractor KEH

Driller Ron Thomas

Drilling Method and Equipment CABLE TOOL - WALKER-NEER

Prepared By Dennis Anderson (Sign/Print Name) Date 7/15/91

Reviewed By Edward C. Rogers / EDWARD C. ROGERS (Sign/Print Name) Date 07/18/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
20.0'	1rad 1moist 2lith	DB		Slightly sandy GRAVEL (<5% sand >95% GRAVEL) 25% vcs, 25% cs, 20% ms, 20% fs, 10% vfs and rock flour, 5% sc 25% vcp, 20% cp 20% mp, 15% fp, 15% vfp, dry sample, mod sorted, subrnd-wellrnd / subprismoidal-discoidal, 2.5y N3 vy dk gry WET, 2.5 N5 grey Dry, moderate Rxn to 10% HCl, 90% basalt, 10% Qtz, gran porph vol., Qtze, Non plastic Magnetic material to 2mm.	sample @ 0815 7-15-91
25.0'	1rad 1moist 2lith	DB		GRAVEL 5% lc 10% sc, 25% vcp, 30% cp, 20% mp, 5% fp, 5% vfp, 2.5y N3 vy dk gry WET 2.5 N5 grey Dry, Dry sample mod sorting, sub ang-wellrnd / subprismoidal-discoidal, faintly strong Rxn to HCl (10%) 80% basalt, 10% Qtz, 10% Qtze gran. musc, porph vol., det. $CaCO_3$ cementation and/or precip, Non plastic, Slight mag material upto 2mm, (less than 2% of sample is ve-c sand w/ $CaCO_3$ cement. w/ vfp)	sample @ 1415 7-15-91 CaCO3 cementation det. noted at 24.0' w/ lg. amt of calcareous material cementing vfp composed of predom. Basalt and Qtz in minor amts
30.0'	1rad 1moist 2lith.	DB		GRAVEL w trace sand <1% 25% vcp 20 cp 20% mp 15% fp 20% vfp 2.5y N3 very dk grey WET, 2.5 N5 grey Dry, dry sample, mod sorting, sub ang-rnd / subdiscoidal-subprismoidal, moderate Rxn to 10% HCl, 90% basalt, 10% Qtz-Qtze w/ minor gran. musc. sulfds, porph vol. Non-plastic, magnetic material to 2 mm, some $CaCO_3$ cementation noted @ ~30.0'	sample @ 1055 7-16-91 gravels terminate @ 34.8' bls -
35.0'	1rad 1moist 2lith	DB		gravelly SAND (20% gravel - 80% SAND) 10% cp 15% mp, 25% fp, 50% vfp, 35% vcs, 25% cs 15% ms, 15% fs, 10% vfs, 5y 3/1 vy dk grey WET, 5y 5/1 grey Dry, sample is dry but >moist ant, well sorted, sub ang-sub rnd / subdiscoidal-discoidal, No Rxn to 10% HCl, gravels predom Qtz-Qtze w/ basalts, sands are predom basalts w/ ~20% Qtz and trace gran. musc., Non plastic, magnetic mat. to 1mm	sample @ 1100 7-17-91 sands continuing to 40' w/ >moist < gravels sands < @ 38' BLS and gravels >

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BOREHOLE LOG

Boring or Well No. BP 699-43-40

Sheet 3 of 7

Location 216-B-3-Pond

Project RCRA W017 / B Bnd

Elevation 538.76' BRASS CAP

Drilling Contractor KEH

Driller Ron Thomas

Drilling Method and Equipment CABLE TOOL - WALKER NEER

Prepared By Dennis Anderson DENNIS ANDERSON (Sign/Print Name) Date 7/17/91

Reviewed By Edward C. Rogers / EDWARD C. ROGERS (Sign/Print Name) Date 07/30/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
40	1 rad 1 moist 2 lith	DB		sandy GRAVEL (5% sand 95% GRAVEL) 30% vcs 25% cs, 20% ms, 15% fs, 10% vfs, 15% sc 30% vcp, 25% cp, 15% mp, 10% fp, 5% vfp + rock flour, 5y 3/1 vydk grey WET, 5y 3/1 grey Dry, sample is dry, def. < moist than 35.0', subrnd-well rnd / discoidal - spherical, very weak Rxn to 10% HCl, 90% basalt in both sands and gravels 10% Qtz-Qtze w/ porph vol, Non plastic, > in magnetic material up to 2mm.	sample @ 1340 7-17-91
45.0'	1 rad 1 moist 2 lith	DB		sandy GRAVEL (10% sand 90% GRAVEL) 10% sc, 15% vcp, 20% cp, 25% mp, 15% fp, 10% vfp, 30% vcs, 20% cs, 20%, ms, 20% fs, 10% vfs w/minor rock flour, 5y 3/1 vydk gry WET, 5y 5/1 grey Dry, mod-poor sorting subang-rnd / discoidal - subdiscoidal, weak Rxn to 10% HCl, 95% basalt, 5% Qtz, Qtze, gran. in gravels, 90% basalt 10% Qtz, Qtze in sands Non plastic, magnetic mat. (magnetite) to 2mm, sample had 1 g amt of rock flour	sample @ 1300 7-18-91
50.0'	1 rad 1 CaCO3 2 lith	DB		GRAVEL w/ trace sand < 2% (5% sc 20% vcp, 15% cp, 15% mp, 25% vfp, 20% vfp, 5y 3/1 vdk grey WET, 5y 3/1 grey Dry, sample is Dry, mod. sorted, subrnd-rnd / discoidal - subdiscoidal, slight Rxn to 10% HCl, 90% basalt, 10% Qtz, Qtze, gran, Non-plastic, Mag. material up to 1mm. in size, sand grns vcs-15%, cs 20%, 30% ms 35% vfs-fs	2 gal H2O added @ 49.0' sample @ 50.' is sat. taken 1145 7/24/91
55.0'	1 rad 1 moist 2 lith	DB		GRAVEL w/ trace sand < 2% (5% sc, 20% vcp, 15% cp, 15% mp, 20% fp, 25% vfp 5y 3/1 vydk grey WET, 5y 5/1 grey Dry, sample is Dry, mod. sorted, subrnd-rnd / discoidal - subdiscoidal, very slight Rxn to 10% HCl, 85% basalt, 15% Qtz Qtze, gran, magnetite fragments to 2mm, Non plastic, sand grns are cs - fs same as 50.0' sample.	sample @ 1445 7-24-91

9 3 1 2 7 0 4 9 7

BOREHOLE LOG

Boring or Well No. BP 699-43-40

Sheet 4 of 7

Location 216-B-3-Pond

Project RCRA W017 / B Pond

Elevation 538.76' BRASS CAP

Drilling Contractor KEISER

Driller Ron Thomas

Drilling Method and Equipment CABLE TOOL - WALKER NEER

Prepared By Dennis Anderson DENNIS ANDERSON (Sign/Print Name) Date 7/25/91

Reviewed By Edward C. Lofgren / EDWARD C. LOFGREN (Sign/Print Name) Date 07/31/91

Depth (feet)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
60.0'	1 rad 1 moist 2 lith	DB		sandy GRAVEL (20% vcs 20% cs 15% ms, 15% fs, 30% vfs w/ rock flour, 5% sc 10% vcp, 15% cp, 25% mp, 20% fp, 25% vfp, 5Y 3/1 vvydk grey WET, 5/y 5/1 grey DRY, mod.-well sorted, sample is dry, subang-subrnd, discoidal-subprismoidal weak Rxn to 10% HCl, 85% basalt, 15% Qtz, Qtze, gran in gravels, 75/25% ratio in sands, Non plastic, magnetite frag to 2mm	sample @ 1045 7/26/91 good recovery on this sample section 55'-60' sand / Gravel ratio is 15% sand - 85% GRAVEL
65.0'	1 rad 1 moist 2 lith	DB		sandy GRAVEL (20% sand-80% GRAVEL) 15% vcs, 15% cs, 20% ms, 25% fs 25% vfs w/ some rock flour-2% sc, 13% vcp, 15% cp, 20% mp, 30% fp, 20% vfp, 5Y 3/1 vydk gry wet, 5Y 5/1 grey DRY, mod. sorting-well, dry samp angular-round. / discoidal-subprismoidal slight-weak Rxn to 10% HCl, 85% basalt, 15% Qtz, Qtze, gran in gravels < in basalts in sands, Non plastic, slight mag mat. to 1mm.	sample @ 1400 7/26/91 1g COBBLE @ 69.0'
70.0'	1 rad 1 moist 2 lith	DB		sandy GRAVEL (20% sand 80% GRAVEL) 10% vcs 15% cs 25% ms, 20% fs 30% vfs w/ rock flour-2% lc 3% sc, 20% vcp 15% cp, 20% mp 20% fp, 20% vfp, sample is dry, 5Y 3/1 vydk gry WET, 5Y 5/1 grey DRY, mod-poorly sorted, subrnd-wellrnd / discoidal-spherical, weak Rxn to 10% HCl, 90% basalt, 10% Qtz, Qtze, granitics, Non-plastic material, magnetite to 2mm.	sample @ 1455 7/29/91 7 gals H_2O added before sample @ 70.0' was taken. SAMPLE @ 1325 7/30/91
75.0'	1 RAD 1 MOIST 2 LITH	DB		SANDY GRAVEL (20% SAND 80% GRAVEL) 30% VCS, 20% CS, 15% MS, 10% FS, 10% VFS, 15% SILT AND CLAY WITH SOME ROCK FLOUR - 2% LC, 3% SC, 30% VCP, 20% CP, 15% MP, 15% FP, 15% VFP; SAMPLE IS WET 5Y 3/1 V DK GRAY WET, 5Y 5/1 GRAY DRY, POORLY SORTED, SUBRND - WELL RND, DISCOIDAL - SPHERICAL, WK REACTION TO 10% HCl, 80% MAFIC (BASALT) 20% FELSIC	2 GALS H_2O ADDED BEFORE SAMPLE @ 75.0' WAS TAKEN

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BOREHOLE LOG

Boring or Well No. BP 699-43-40

Sheet 5 of 7

Location 216-B-3-POND

Project RCRA W017 / B POND

Elevation 538.76' BRASS CAP

Drilling Contractor KEH

Driller RON THOMAS

Drilling Method and Equipment CABLE TOOL - WALKER NEER

Prepared By / MYRA VANG (Sign/Print Name) Date 07/31/91

Reviewed By / (Sign/Print Name) Date 08/01/91

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
80.0'	1 RAD 1 MOIST 2 LITH	DB		SANDY GRAVEL (20% SAND 80% GRAVEL) 30% VCS, 20% CS, 20% MS, 20% FS, 5% VFS, 5% SILT & CLAY - 5% SC, 30% VCP, 20% CP, 15% MP, 15% FP, 15% VFP; SAMPLE IS WET 5Y 3/1 VDK GRAY WET, 5Y 5/1 GRAY DRY POORLY SORTED SUBRND - WELL RND DISCOIDAL - SPHERICAL, WK REACTION TO 10% HCl, 90% MAFIC (BASALT), 10% FELSIC	SAMPLE @ 1400 7/30/91
85.0'	1 RAD 1 MOIST 2 LITH	DB		85.0 SANDY GRAVEL (10% SAND 90% GRAVEL) 40% VCS, 30% CS, 10% MS, 10% FS, 5% VFS, 5% SILT & CLAY - 30% BOULDER, 20% LC, 25% SC, 10% VCP, 5% CP, 10% MP, 5% FP. SAMPLE IS MOIST. 5Y 5/1 GRAY DRY, 5Y 4/1 DARK GRAY WET. POORLY SORTED, SUBROUNDED TO WELL ROUNDED WEAK RXN TO 10% HCL. 90% MAFIC (BASALT), 10% FELSIC	SAMPLE @ 0915 07/31/91
90.0	1 RAD 1 MOIST 2 LITH	DB		90.0 SANDY GRAVEL (10% SAND, 90% GRAVEL) 40% VCS, 30% CS, 10% MS, 10% FS, 5% VFS, 5% SILT/CLAY - 30% LC, 20% SC, 20% VCP, 10% CP, 10% MP, 5% FP, 5% VFP SAMPLE IS DRY 5Y 5/1 GRAY (DRY). 5Y 4/1 DARK GRAY (WET). POORLY SORTED, SUBROUNDED TO WELL ROUNDED, NO RXN TO 10% HCL. 90% MAFIC (BASALT), 10% FELSIC	SAMPLE @ 1015 07/31/91
95.0	1 RAD 1 MOIST 2 LITH	DB		95.0 SANDY GRAVEL (10% SAND 90% GRAVEL) 40% VCS, 30% CS, 10% MS, 10% FS, 5% VFS, 5% SILT/CLAY - 25% LC, 25% SC, 20% VCP, 10% CP, 10% MP, 5% FP, 5% VFP SAMPLE IS DRY. 5Y 5/1 GRAY (DRY), 5Y 4/1 DARK GRAY (WET). POORLY SORTED. SUBROUNDED TO WELL ROUNDED. NO RXN TO 10% HCL. 90% MAFIC (BASALT), 10% FELSIC	SAMPLE @ 1415 07/31/91

9 3 1 2 7 0 4 9 9

BOREHOLE LOG

Boring or Well No. BP 699 - 43 - 90

Sheet 6 of 7

Location 216 - B - 3 POND

Project RCRA W017 / B POND

Elevation 538.76' BRASS CAP

Drilling Contractor KEH

Driller RON THOMAS

Drilling Method and Equipment CABLE TOOL - WALKER NEER

Prepared By [illegible] / William [illegible] (Sign/Print Name) Date

Reviewed By [illegible] (Sign/Print Name) Date 08/21/91

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
100.0	1 RAD 1 MOIST 2 LITH	DB		100.0 SANDY GRAVEL (10% SAND 90% GRAVEL)	SAMPLE @ 1115 080191
				40% VCS, 30% CS, 10% MS, 10% FS, 5% VFS,	
				5% SILT/CLAY - 25% LC 25% SC, 20% VCP	
				10% CP 10% MP, 5% FP 5% VFP. SAMPLE IS	2 GAL H_2O ADDED @ 100+
				DRY. 5Y5/1, GRAY (DRY), 5Y4/1 - DARK	(AFTER 100' SAMPLE)
				GRAY (WET). POORLY SORTED. SUBROUNDED	
				TO WELL ROUNDED, DISCOIDAL TO SPHERICAL,	2 GAL H_2O ADDED @ 103'
				WK RXN TO 10% HCL, 90% MAFIC (BASALT)	2 GAL ADDITIONAL H_2O @ 103'
				SOME MAGNETITE PRESENT, 10% FELSIC	
					SAMPLE 8-8-91 1310
105.0	1 RAD 1 MOIST 2 LITH	HT		105.0 SANDY GRAVEL AS ABOVE	5 GAL H_2O added @ 103+
				SAMPLE IS COMPOSED ENTIRELY OF	5 " " "
				ANGULAR COARSE SAND TO FINE	2 GAL " " 104+
				PEBBLE SIZED FRAGMENTS OF ROCKS,	5 GAL "
				90% MAFIC, 10% FELSIC	10 GAL RAW H_2O ADDED @ 104+ 0800
					5 GAL H_2O ADDED @ 104+ 0800+
					13 GAL H_2O ADDED @ 104+ 8-7-91
					12 GAL H_2O ADDED @ 105+ 8-8-91
					8 GAL H_2O ADDED @ 107 8-9-91
					5 GAL H_2O ADDED @ 108 8-12-91
110.0	1 RAD 1 $CaCO_3$ 2 LITH	HT		110.0 SANDY GRAVEL AS ABOVE	3 GAL H_2O ADDED @ 108 8-14-91
				SAMPLE IS COMPOSED ENTIRELY OF	2 GAL H_2O ADDED @ 109 8-15-91
				ANGULAR COARSE SAND TO FINE PEBBLE	37 GAL H_2O ADDED @ 110-114 8-16-91
				SIZED FRAGMENTS OF ROCKS.	
				85% MAFIC, 15% FELSIC	SAMPLE 8-16-91 1040
115.0	1 RAD 1 $CaCO_3$ 2 LITH	HT		115.0 SANDY GRAVEL AS ABOVE	SAMPLE 8-19-91 0835
				SAMPLE IS COMPOSED ENTIRELY OF ANGULAR	
				COARSE SAND TO FINE PEBBLE SIZED	21 GAL H_2O ADDED @ 114-118 8-19-91
				FRAGMENTS OF ROCKS	
				85% MAFIC 15% FELSIC	

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BOREHOLE LOG

Boring or Well No. BP699-43-40

Sheet 7 of 7

Location 216-B-3 POND

Project RCRA W017/B POND

Elevation 538.76' BRASS CAP

Drilling Contractor KEH

Driller RON THOMAS

Drilling Method and Equipment CABLE TOOL - WALKER MFG

Prepared By MYRA VARG (Sign/Print Name) Date 8-20-91

Reviewed By Edward C. Lafferty (Sign/Print Name) Date 08/27/91

Depth (FEET)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
120.0	1 RAD 1 $CaCO_3$ 2 LITH	HT		120.0 SANDY GRAVEL AS ABOVE	SAMPLE 8-26-91 1145
				121.0 SLIGHTLY GRAVELLY SILTY SAND	DRILLING FASTER 121.0-123.0
				(10% GRAVEL, 80% SAND, 10% FINES)	SAMPLE FROM DART BAILER
				10% P? 20% VCS, 30% CS, 20% MS,	STILL DARK IN COLOR LIKE HANFORD
				10% FS, 10% FINES, VERY DK GRAY 10YR3/1	
				WET, GRAY 10YR 5/1 DRY, SAMPLE IS WET,	
HANFORD				MED SORTING, ANG.-SUBRND, NO REACTION	
RINGOLD		DB		TO 10% HCl, 60% MAFIC, 40% FELSIC	COLOR CHANGE FROM GRAY TO
				124.0 SILTY SANDY GRAVEL	BROWN @ 124.0, LITH CHANGE
125.0	1 RAD 1 MOIST/ $CaCO_3$ 2 LITH	DB		125.0 SILTY SANDY GRAVEL	FROM SAND TO SANDY GRAVEL.
				(60% GRAVEL, 20% SAND, 20% FINES)	SAMPLE 8-22-91 1116
				5% COBBLE, 20% VC PEBBLE, 20% C PEBBLE,	
				5% M PEBBLE, 5% F PEBBLE, 5% VF PEBBLE,	
				5% CS, 10% MS, 5% FS, 10% SILT, 10% CLAY,	DRILLING FASTER 127.0-128.0
				DARK GRAYISH BROWN 10YR4/2 WET, LIGHT	GRAVELLY SAND
				GRAYISH BROWN 10YR6/2 DRY, SAMPLE IS	
				WET, NO REACTION TO HCl, 50% FELSIC,	
				50% MAFIC	
130.0	1 RAD 1 MOIST/ $CaCO_3$ 2 LITH	DB		130.0 SILTY SANDY GRAVEL AS ABOVE	SAMPLE 8-23-91 1140
				60% FELSIC, 40% MAFIC	
				INTERBEDDED WITH SLIGHTLY GRAVELLY SAND	DRILLING RATE ALTERNATES
				(10% GRAVEL, 85% SAND, 5% FINES) 5% PEBBLE	FROM FAST TO SLOW EVERY
				5% VF PEBBLE, 10% CS, 60% MS, 10% FS,	0.5-1.0 FEET INDICATING
				5% VFS, 5% SILT + CLAY, DK GRAYISH	INTERBEDDED SAND & GRAVEL
				BROWN 10YR4/2 WET, LT GRAYISH BROWN	
				10YR6/2 DRY, SAMPLE IS WET, ~~MODERATE~~ WEAK (MAG 8-28-91)	
				REACTION TO 10% HCl, 70% FELSIC, 30% MAFIC	
135.0	1 RAD 1 MOIST/ $CaCO_3$ 2 LITH	DB		135.0 SILTY SANDY GRAVEL	SAMPLE 8-26-91 1135
				(30% GRAVEL, 60% SAND, 10% FINES)	
				2% VC PEBBLE, 3% C PEBBLE, 5% M PEBBLE,	
137.0				10% F PEBBLE, 10% VF PEBBLE, 10% VCS,	TD 137.0 8-27-91
				10% CS, 20% MS, 10% FS, 10% VFS, 10% SILT	
				+ CLAY, DK GRAYISH BROWN 10YR4/2 WET, LT	
				GRAYISH BROWN 10YR6/2 DRY, SAMPLE IS WET,	
				WEAK REACTION TO 10% HCl, 70% FELSIC, 30% MAFIC	
				INTERBEDDED WITH SAND AS ABOVE	

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WHC-SD-EN-DP-046, Rev. 0

Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-43-40 Area 600 Area Date 8-27-91

Log Run #1 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description B-Pond / A Lake

Ground Surface Elevation _____

Surface Temperature 26.7°C Weather Clear-Hot

BOREHOLE INFORMATION

Driller Ron Thomas	
Drill Rig Type Cable Tool	Bit Type/Diameter Drive Barrel 18"
Borehole Diameter(s)/Depth 12"/38.6'	10"/137.0'
Depth Driller 137.0'	Depth Logger 133.8'
Liquid Level 119.4' (Static) (122.0' During Logging)	Liquid ~~Density~~ Appearance Muddy
Temperature 19.8°C	

CASING RECORD

Type 12" Carbon Steel Sch. 40	Interval 1.4'-38.6'
Type 10" Carbon Steel Sch. 40	Interval 5.7'-~~137.0'~~ 136.27'
Type	Interval
Type	Interval

Well Screen Interval NA

Comments: Return Error = 0.05' high
Centralizer used.

A-6000-520 (05-90)

LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL	
Operator(s) Alan Pearson	
Equipment Brand MLS	Equipment Type Analog
Tool Type Gamma Ray	Serial No. CG27A97
Base Calibration Date 5/91	Calibration Reference
Calibration/Probe Factor 8.84×10³ eU/mR/cfs Base Calibration Datum (eU): Position 1 297.4 eU	Position 2 64.3 eU
Dead Time 11.8 μsec	Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 133.8'	To 0.0'		
Rerun(s) 133.8' to 100.0' & 80.0' to 70'			
Pre Survey Verification:	Position 1 299.7 eU	Position 2 64.5 eU	Background 60 c/s
Base Calibration Difference:	Position 1 2.3 eU	Position 2 0.2 eU	
Logging Speed 5 ft/min.	Rerun Scales, CPS/in. 50 c/s/in		
Start Time 1000	Completion Time 1230		
Chart Speed(s), ft/in. 10 ft/in.			
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in.	Time Constant(s) TC-1		
Post Survey Verification:	Position 1 293.0 eU	Position 2 65.0 eU	Background 60 c/s
Percent Change:	Position 1 2.2%	Position 2 0.8%	
Comments Return Error = 0.05' high			
Centralizer used			

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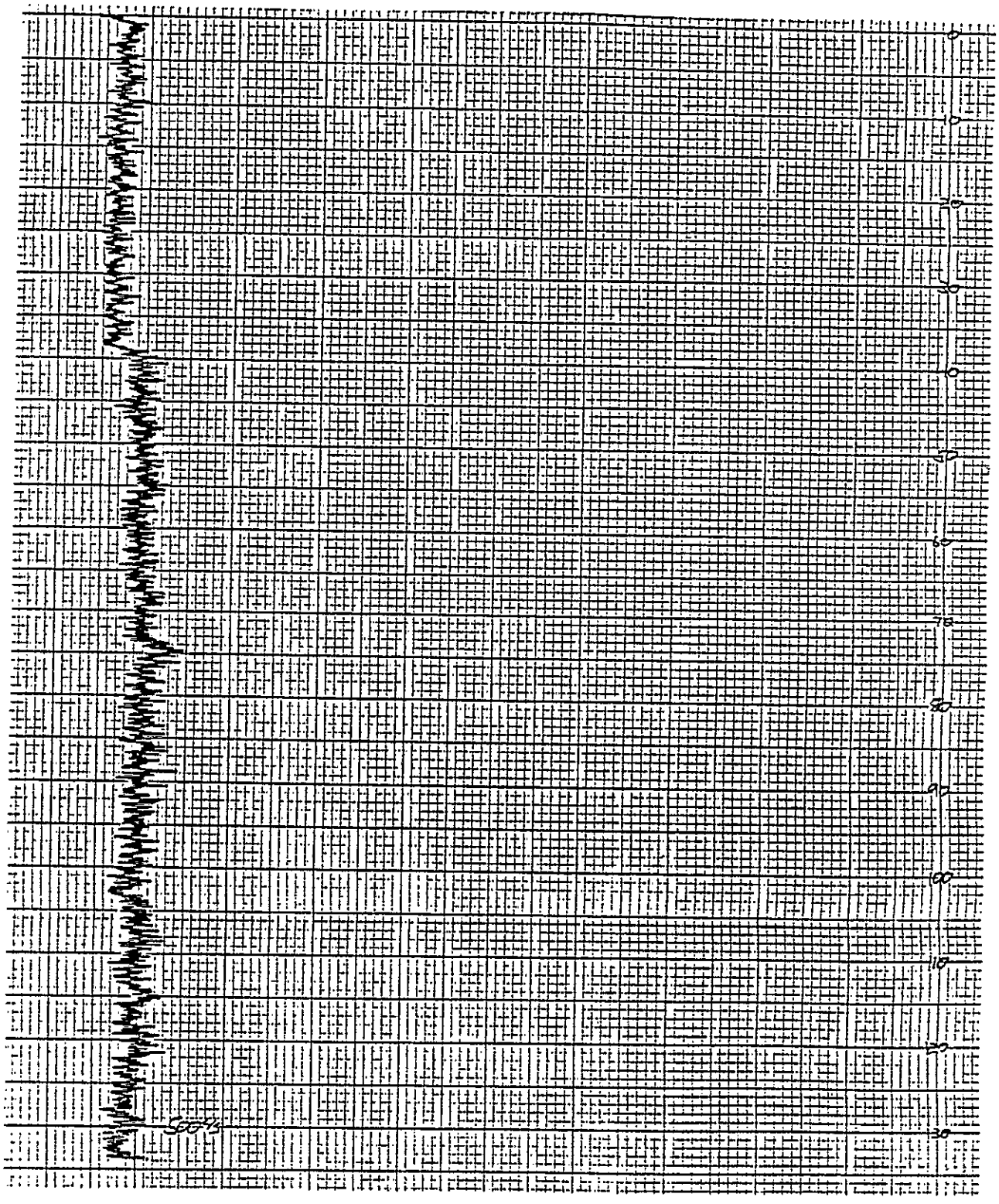
Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson Date: 8/27/91

A-6000-520 (05-90)

9 3 1 2 7 9 0 5 0 3

699-43-40 RUN#1 8/27/1991



9 3 1 2 7 3 9 0 5 0 4

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KAISER ENGINEERS HANFORD

SURVEY DATA REPORT

Request No. —|9|2|1|—|0|5|7

Project/W.O. No.	Title	File No.
W-017H	B-Pond Wells	W|E|L|L|—|1|1|9

EH Job No.	Prepared By	Date	Reviewer	
CR9560	N. P. Fastabend	12-10-91	Michael W. Polster	1 | 2

DESCRIPTION OF WORK

Locate wells around B-POnd for horizontal and vertical position.

Horizontal: WCS83S and 200-E Datum

Vertical: NGVD '29 and 200-E Datum

ACCEPTABILITY (Within Plan Tolerance)

- Yes ☐
- No ☐
- NA ☒
- TBD by Requestor ☐

DISTRIBUTION

Survey File	OR
Field Project File	1
D. Foucault	1
T. Nemzek	1
J. Geiger	1
J. Rieger	1
D. Weekes	1

SURVEY RESULTS AND COMMENTS

CONTROL MONUMENTS:

BP-1	BP-3
N:136,716.89	N:136,571.07
E:577,129.74	E:577,596.34

NOTE: A). Horizontal control points used to locate wells were part of a traverse with a linear closure of better than 1:50,000.

B). Vertical control monument used to establish elevations on wells (2E-18) was part of a vertical network with misclosure of all run sections less than 8mm√K. Holding USC & GS benchmarks J-317, K-317 & L-317.

WELL NO.	COORDINATES (C/L CASING) 200-E AREA (FEET)	LAMBERT WCS83S (METERS)	VERT. DATUM	ELEVATIONS (FEET) BRASS CAP IN CONC.	TOP HYDRO-STAR PLATE, N. SIDE	TOP OUTER CASING N. SIDE	
699-43-40	N:43357.4	N:136,705.54	NGVD'29	538.76	542.22	542.20	
	W:40379.1	E:577,583.34	200-E	538.53	541.99	541.98	
699-43-41G	N:42969.0	N:136,586.83	NGVD'29	547.96	551.36	551.34	
	W:40763.2	E:577,466.61	200-E	547.73	551.13	551.12	
699-42-39A 699-BP91-2	N:41866.5	N:136,251.95	NGVD'29	554.61	558.15	558.14	
	W:39484.6	E:577,857.26	200-E	554.44	557.93	557.91	
699-42-39B 699-BP91-3	N:41816.1	N:136,236.59	NGVD'29	554.86	558.33	558.32	
	W:39478.3	E:577,859.21	A-125 200-E	554.63	558.11	558.09	

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1 of 5

WELL CONSTRUCTION REPORT

2/4/92

Specification No. WHC-S-014 (SEE COMMENTS) Rev No. 5 (SEE COMMENTS)

ECNs 144240, 144241,

Project W-017 / B-Pond

Location 216-B-3 Pond

Drilling Company Kaiser Engineers

Driller J. Carpenter, K. Olsen

Other (Companies) WHC, ESI

Geologist(s) S. Havens, M. Vaag, E.C. Rafuse, N. Ballantyne, R. Weingart, Klane

Well No. BP99-43-41-G (BP91-1) Temp. Well No. N/A

Coordinates N 42969.0 (Hanford) W 40763.2 (Lambert) N136,586.83, E577,466

Casing Elev. 551.34' Ground Elev. 547.96'

Drilling Method

Verification Method Visual observation

Criteria WHC-S-014 5.2, 5.3, 7.5, EII 6.7 sec 6.2

			Initials	Date
Rotary	Air N/A	Mud N/A	N/A	N/A
Cable Tool	D 0-135'	H 135-201'	NA	
Drilling Fluid	raw water	186 GALLONS	NA	
Other	N/A			

Geophysical Logging

Sondes	Interval	Date
Gross Gamma	181.2' - 2.6'	9/4/91
Gross Gamma	198.3' - 150.0'	9/10/91
	-	
	-	
	-	

Completion Data

Drilled Depth 201.3

Completed Depth 198.8

Date Started 7-31-91

Date Completed 10/21/91

Static Water Level/Date 137.9 MW-10-27-91

Aquifer Testing

Type INSTANTANEOUS SLUG

Flow Meter I.D. No. NA

Cal. Due Date NA

Length of Test -1HR-

Volume Pumped NA

Drawdown NA

Date of Test 11-25-91

Completion Results

Cleaning

Verification Method Visual inspection (direct observation by licensed driller)

Criteria WHC-S-014 sec. 4.2.2 + 7.6, 7.7 WHC-CM-7-7 sec 5.4

	Initials	Date
Drilling Tools/Rig	SJH	7/31/91
Temporary Materials	SJH	7/31/91 a,b ~~xxx~~ 9/11/91
Permanent Materials	RW	10-22-91

Screen

Type	Length	Slot Size
T 304 C.S. 4" ID	10.36 w/cap	10

Depth(s) 198.6' - 188.3'

Verification Method verify using steel tape

Criteria WHC-S-014 4.2.3, 4.2.5, 12.2.1, 4.2.1

Initials MW Date 10-22-91

Material Storage/Packing

Verification Method visual observation

Criteria WHC-S-014 4.2.2, 7.3

	Initials	Date
Mtl. Handling/Storage	MW	10-22-91
Material Packing	MW	10-22-91

Lubricants/Additives

Verification Method Visual Observation

Criteria WHC-S-014 7.2

	Identify	Initials	Date
Additives	Raw Water	SJH	8/19/91
Lubricants	Jet Lube	SJH	7/31/91

Straightness Test

Verification Method Visual Observation

Criteria WHC-S-014 8.2

Initials NB NDE Date 9/6/91

A-6000-436 (09/90)

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WELL CONSTRUCTION REPORT
(continuation sheet)

699-43-41G

Page 2 of

Casing (permanent)

Type	Size	Placement
T 304 SS	4" ID	148.3 - -6.9'
		-
		-
		-

Verification Method: Visual Observation using steel tape

Criteria: WHC-S-014 4.2.1, 4.2.4, 4.2.5, 12.2.1

Initials: MW Date: 10-22-91

Well Protection

Verification Method: Visual Observation Measure with tape

Criteria: WHC-S-014 4.2.10

	Initials	Date
Protective Posts	ECW	1/24/92
Protective Casing	ECW	1/24/92
Site Restored	ECW	1/24/92
Cap, Hasp and Lock	ECW	1/24/92
Surface Pad	ECW	1/24/92

Annular Seal/Filter Pack

Verification Method: Visual Observation using steel tape

Criteria: WHC-S-014 4.2.6, 4.2.7, 4.2.8, 4.2.9, 5.3.1 or 5.3.2

Type	Interval	Volume	Initials	Date
20-40 Silica Sand	198.7 - 183.9	4.75 bag 5.32 ft³	MW	10-22-91
40-100 Silica Sand	183.9 - 181.8	2 bag 2.30 ft³	MW	10-22-91
3/8 bent Pellets	181.8 - 176.5	2 bag 1.24 ft³	MW	10-22-91
bent Slurry	176.5 - 135.5	75 bag 9.75 ft³	MW	10-22-91

* more below

Well Survey/Labeling

Verification Method: Review of Survey Report

Criteria: WHC-S-014 3.4

	Initials	Date
Measurement Point/Surveyed	ECW	1/24/92
Protective Casing/Brass Cap Surveyed	ECW	1/24/92
Well Number Stenciled	ECW	1/24/92
Brass Cap Labeled	ECW	1/24/92

Pump Installation

Verification Method: Visual Observation

Criteria: WHC-S-014 4.2.11, 4.22

	Initials	Date
Pump Decon/Prep	JAC	11/25/91
Installed	JAC	11/25/91
Pump Tested	JAC	11/25/91

Other (initial if performed)

N/A Well Abandonment; N/A Downhole TV Inspection; RW Complete As-Built Diagram, Driller's/Geologist's Logs

11/22 23/91 JAC Well Development

Comments/Remarks: * 9/11/91 SJH 180' 16" csg & 200' 8" csg delivered to site, checked for cleanliness 8/8/91 SJH

b 30' 8" csg delivered to site, inspected for cleanliness 8/5/91 SJH

(cont) - Bent 8-20 mesh crumbles 135.5' - 20.0' 168 bag 119.28 ft³ MW 10-22-91

- Cement Grout - Type I - II portland 200 - 3.0' 37 bag 41.12 ft³ MW 10-22-91

SEE COMMENTS REV. 6 TAK EFFECT 12/2/91

FCN's for REV. 6 are 150132, 164223, 127439

Reviewed By (Sign/Print Name): Edward C. Rafes / Edward C. Rafes Date: 01/29/92

A-6000-436 (09/90)

3 1 2 7 5 9 0 5 0 3

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WELL SUMMARY SHEET

Boring or Well No. 699-43-41G

Sheet 1 of 2

Location 26-83-Pond

Project W-OIT / B-Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan O. Havens / S.J. Havens (Sign/Print Name) Date 8/23/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 12/20/91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
16" ID Temporary C.S. casing to 41.86' BLS				5' Gravelly SAND (DB)
		10		" "
Type I-II Cement Grout 200-2.1'				15' Sandy GRAVEL
		20		" "
				25' Gravelly SAND
		30		30' Sandy GRAVEL
				" "
				" "
		40		" "
				" "
		50		" "
12" ID Temporary C.S. casing to 127.89' BLS		60		60' Silty Sandy GRAVEL
				" " "
				" " "
		70		75' SAND
				80' Gravelly SAND
		80		" "
				90' Sandy GRAVEL
		90		" "
				" "
		100		" "
				" "
		110		" "
				" " Hanford /
8-20 mesh Bent Crumbles 1355-20'		120		122' Clayey SILT Ringold contact
				" " 127.8-129.8 (ST)
		130		DTW = 128.6' 2/4/92
				" "
		140		142' Silty Sandy GRAVEL (HT)
				146.7-148.1 (ST) " cemented
		150		" " "
				" " "
		160		" " "

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A-6000-384 (04/90)

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WELL SUMMARY SHEET

Boring or Well No. 299-43-41 G

Sheet 2 of 2

Location 216-B3-Pond

Project W-017/B-Pond

Elevation 547.96 BRASS CAP

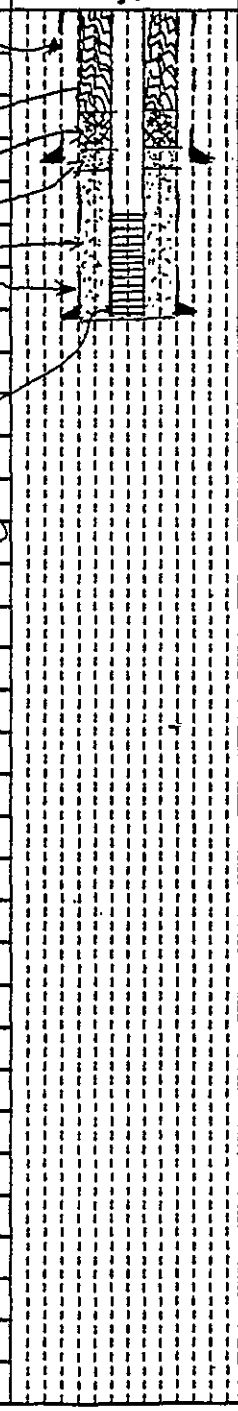
Drilling Contractor Kaiser Engineers

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J. Havens / SJ HAVENS (Sign/Print Name) Date 9/11/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 10/22/91

CONSTRUCTION DATA		Depth in Feet	GEOLOGIC/HYDROLOGIC DATA	
Description	Diagram		Graphic Log	Lithologic Description
10" ID Temporary C.S. Casing to 181.25 BLS		170		Silty Sandy GRAVEL
Bent Slurry - 176.5 - 135.5		180		179' CLAY (Gravelly Sandy CLAY)
3/8" Bent Pellets 181.8 - 176.5				
40-60 Sand 183.9 - 181.8		190		188' Clayey Sandy GRAVEL (H_2O)
20-40 Sand 148.7 - 183.9				195' Silty SAND
8" ID Temporary C.S. Casing to 201.34'		200		201' Sandy SILT
4" ID Perm S.S. T.304 Casing - set at 198.7 w/ 10.01' 10 slot screen @ (198.6' to 188.5') 2/4/92			TD: 201.34	

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WHC-SD-EN-DP-046, Rev 0

BOREHOLE LOG

SIGNATURE DATE

Boring or Well No. 699-43-41G

Sheet 1 of 10

Location 216-B-3 Pond

Project W-017/B Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser Eng.

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J. Havens/S.J. Havens (Sign/Print Name) Date 7/31/91

Reviewed By Edward C. Bates/Edward C. Bates (Sign/Print Name) Date 08/08/91

Depth (5')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
5'	1 rad 2 lith 1 moist/ CaCO3	DB		5' Gravelly SAND (10% Gravel, 90% Sand 3% lrg cobble, 2% sm cobble, 5% vc to c.p, 2% m to f.p, 80% vc to c.s, 2% ms, 3% f to vfs color wet (2.5Y 4/0) dark gray, color dry (2.5Y 6/0) gray, sample dry to slightly moist, unconsolidated, ang to subrd, strong rx to 10% HCL, poorly sorted, 90% mafic, 10% felsic.	7/31/91
10'	1 rad 2 lith 1 moist/ CaCO3	DB		10' Gravelly SAND (25% Gravel, 75% Sand) 10% sm cobble, 3% vc to c.p, 2% m.p, 10% f to vfp, 65% vc to c sand, 8% ms, 2% f to vfs color wet (2.5Y 4/0) dark gray, color dry (2.5Y 6/0) gray, sample slightly moist,* poorly sorted, ang to subrd, strong rx w/ 10% HCL, 90% basalt, 10% felsic, loose unconsolidated material	~~slight~~ SSH 8/1/91 0950 * sample slightly moist from last night's rain
15'	1 rad 2 lith 1 moist/ CaCO3	DB		15' Sandy GRAVEL (60% GRAVEL, 40% sand) 15% lrg c to Boulder*, 10% sm c, 10% vc to c.p 10% mp, 15% f to vfp, 20% vc to c s, 10% ms 9% f to vf s 1% silt color wet (2.5Y 3/0) v dark gray, color dry (2.5Y 6/0) gray sample dry, poorly sorted, ang to sub rd, strong rx w/ 10% HCL, 90% basalt 10% felsic loose unconsolidated material	8/5/91 0835 * broken boulder sized - SSH 8/5/91 ~~and~~ basalt
20'	1 rad 2 lith 1 moist/ CaCO3	DB		20' Sandy GRAVEL (40% Gravel, 60% Sand) 5% lrg c, 5% sm c, 10% vc to c.p, 10% mp, 10% f to vfp, 45% vc to c s, 10% ms, 3% f s, 2% vf to silt, color wet (2.5Y 3/0) v dark gray, color dry (2.5Y 6/0) gray sample dry to v slightly moist, poorly sorted, ang to subrd, strong rx w/ 10% HCL 90% basalt, 10% felsic, loose unconsolidated material	8/5/91 1020
25'					

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A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-43-41G

Sheet 2 of 10

Location 216-B-3-Pond

Project W-017 / B Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser Eng

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J Havens / S.J. Havens Date 8/6/91 (Sign/Print Name)

Reviewed By [illegible] / [illegible] Date 08/08/91 (Sign/Print Name)

Depth (25')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
25'	1rad 2lith 1moist/ 1CaCO3	DB		25' Gravelly SAND (25% Gravel, 75% Sand) 10% sm c, 10% c to mp, 5% f to vfp, 60% vc to cs, 10% ms, 3% f to vfs, 2% silt color wet (2.5Y 3/0) v dk gray, color dry (2.5 6/0) gray, Sample sltly moist to moist* poorly sorted, ang to subrd, strong rx w/ 10% HCl, 90% basalt, 10% felsic, loose unconsolidated material	8/6/91 0725 * moist due to last nights rain
30	1rad 2lith 1CaCO3/ moist	DB		30' Sandy GRAVEL (30% Gravel, 70% Sand) 5% sm c, 5% vcp, 10% c to mp, 10% fp to vfp 40% vc to cs, 20% ms, 10% vfs & silt same as described in 25' sample	8/6/91 0920
35	1rad 2lith 1CaCO3/ moist	DB		35' Sandy GRAVEL (50% Gravel, 50% Sand) 15% sm c, 10% vc to cp, 10% mp, 10% fp, 5% vfp 35% vc to cs, 10% ms, 5% f to vfs Color (2.5Y 3/0) v dk gray (wet), color dry (2.5Y 6/0) gray, sample moist, poorly sorted, ang to subrd, strong rx w/ 10% HCl 90% basalt, 10% felsic, loose unconsolidated	8/6/91 1005
40	1rad 2lith 1CaCO3/ moist	DB		40' Sandy GRAVEL (50% Gravel, 50% Sand) same as described in 35' sample	8/6/91 1330
45					

A-6000-382 (04/90)

93127590512

BOREHOLE LOG

Boring or Well No. 699-43-41G

Sheet 3 of 10

Location 216-B-3 Pond

Project W-017/B-Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser Eng

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan A Havens / Susan J Havens (Sign/Print Name) Date 8/6/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 08/10/91

Depth (45')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
45'	1rad 2lith 1CaCO3/ moist	DB		45' Sandy GRAVEL (50% Gravel, 50% Sand) 15% sm c, 10% vc to cp, 10% mp, 10% fp, 5% vfp, 35% vc to c sand, 10% ms, 5% f to vfs. Color wet (2.5Y 3/1) v dark gray color dry (2.5Y 6/1) gray Sample moist, poorly sorted, ang to subrd, mild rx w/10% HCl 90% basalt, 10% felsic, loose unconsolidated	8/6/91 1505 moist
50'	1rad 2lith 1CaCO3/ moist	DB		50' Sandy GRAVEL (40% Gravel 60% Sand) ~~8/6/91~~ STH 8/7/91 10% sm cobble, 10% vc to cp, 10% mp, ~~5%~~ fp 5% vfp, 55% vc to cs, 5% f to vfs Color wet (2.5Y 3/1) v dark gray, Color dry (2.5Y 6/1) gray, Sample damp, poorly sorted, ang to subrd, mild rx w/10% HCl 90% basalt, 10% felsic	1420
55	1rad 2lith 1CaCO3/ moist	DB		55' Sandy GRAVEL (50% Gravel, 50% Sand) 20% vc to cp, 10% mp, 10% fp, 10% vfp, 40% vc to cs, 5% ms, 5% f to vfs Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample damp, poorly sorted, ang to subrd ~~at~~ STH 8/8/91 Strong rx w/10% HCl 90% basalt, 10% felsic	8/7/91 1445
60	1rad 2lith 1CaCO3/ moist	DB		60' Silty, Sandy GRAVEL (50% sand + silt, 50% GRAVEL) 20% vc to cp, 10% mp, 10% fp, 10% vfp 25% vc to cs, 5% ms, 15% f to vfs, 5% silt Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample damp, poorly sorted, ang to subrd, strong rx w/10% HCl 90% Basalt 10% felsic, Limonite staining	8/8/91 1000

A-6000-382 (04/90)

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BOREHOLE LOG

Boring or Well No. 699-43-41G

Sheet 4 of 10

Location 216-B3-Pond

Project W-017 / B-Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser Eng.

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J. Havens / S.J. Havens (Sign/Print Name) Date 8/9/91

Reviewed By Edward C. Rafes / Edward C. Rafes (Sign/Print Name) Date 08/10/91

Depth (65)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
65	1 rad 2 lith 1 CaCO3 / moist	DB		65' silty, Sandy GRAVEL (50% sand & silt, 50% GRAVEL) 20% sm cobble, 10% vc to cp, 10% mp, 10% f to vfp, ~~20%~~ 15% vc to cs, 15% ms, 10% f sand, 10% vfs to silt. Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample damp, poorly sorted, ang to subrd, strong rx w/ 10% HCL 90% Basalt, 10% Felsic SJH 8/8/91	8/8/91	1030
					8/8/91	1350
70	1 rad 2 lith 1 CaCO3 / moist	DB		70' Silty Sandy GRAVEL (50% GRAVEL, 50% Sand & silt) 30% vc to cp, 10% mp, 10% f to vfp, 15% vc to cs, 15% ms, 10% fs, 10% vfs to silt. Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample damp, poorly sorted, ang to subrd, ~~strong~~ weak rx w/ 10% HCl 90% Basalt, 10% Felsic SJH 8/8/91		
75'	1 rad 2 lith 1 CaCO3 / moist	DB		75' SAND 90% vc to c sand 10% f to vf sand. Color wet (10YR 4/1 dark gray. Color dry (10YR 7/1) light gray Sample damp, poorly sorted, ang to subrd strong rx w/ 10% HCL 80% Basalt, 10% Felsic, 10% qtz	8/8/91	1420
80'	1 RAD 2 LITH 1 CaCO3 / MOIST	DB		80' GRAVELLY SAND (80% SAND 20% GRAVEL), 10% sm BOULDER, 5% sm COBBLE, 5% VCP, 70% MS, 10% CS, COLOR WET (10YR 4/1) DARK GRAY, COLOR DRY (10YR 7/1) LIGHT GRAY, SAMPLE DAMP, POORLY SORTED, ANG TO SUBRND SLIGHT RX W/10% HCl, ~~50%~~ 50% MAFIC (BASALT), 10% FELSIC, 10% QUARTZ, SOME CALICHE ON PEBBLES	8/9/91	0900

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BOREHOLE LOG

Boring or Well No. 699-43-41G

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Location 216-B3-POND

Project W-017 / B-POND

Elevation 547.96' BRASS CAP

Drilling Contractor KAISER ENG.

Driller KELLY OLSON

Drilling Method and Equipment BE CABLE TOOL

Prepared By / MYRA K VANG (Sign/Print Name) Date 8/12/91

Reviewed By (Sign/Print Name) Date 08/19/91

Depth (85)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
85'	1 RAD 2 LITH 1 CaCO3/ MOIST	DB		85' GRAVELLY SAND (60% SAND 40% GRAVEL), 5% L COBBLE, 5% SM COBBLE 10% VCP, 10% CP, 5% MP, 5% FP, 40% VCS, 10% CS, 10% MS, COLOR WET (10YR 4/1) DARK GRAY, COLOR DRY (10YR 7/1) LIGHT GRAY, SAMPLE DAMP, POORLY SORTED, ANG TO SUBRND, MODERATE RX W/10% HCl, 75% MAFIC (BASALT), 15% QUARTZ, 10% FELDSPAR	8/9/91	0935
90'	1 RAD 2 LITH 1 CaCO3/ MOIST	DB		90' SANDY GRAVEL (80% GRAVEL, 20% SAND) 40% SM COBBLE, 25% VCP, 5% CP, 5% MP, 5% FP, 10% VCS, 5% CS, 5% MS, TRACE ROCK FLOUR, COLOR WET (10YR 4/1) DARK GRAY, COLOR DRY (10YR 7/1) LIGHT GRAY, SAMPLE DAMP, POORLY SORTED, SUBANG TO WELL RND, MODERATE RX TO 10% HCl, 85% MAFIC (BASALT) 15% FELSIC	8/9/91	1330
95'	1 Rad 2 Lith 1 CaCO3/ moist	DB		95' Sandy GRAVEL (80% GRAVEL, 20% SAND) 5% LC, 40% SMC, 20% VCP, 5% CP, 5% MP, 5% FP, 5% VCS, 10% CS, 5% MS trace rfs, Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, sample slightly moist, poorly sorted, ang to subrd moderate Rx to 10% HCl, 90% mafic 10% felsic	8/12/91	0900
100'	1 Rad 2 Lith 1 CaCO3/ moist	DB		100' Sandy GRAVEL Same as described in 95' Sample	8/12/91	1110

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BOREHOLE LOG

Boring or Well No. 699-43-41G

Sheet 6 of 10

Location 216-B3-Pond

Project W-017/B Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser Eng.

Driller Kelly Olson

Drilling Method and Equipment BF Cable Tool Rig

Prepared By Susan J Havens / S.J. Havens (Sign/Print Name) Date 8/13/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 08/15/91

Depth (105)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
105 ~~105~~ SJH 8/13/91	1 rad 2 lith 1 CaCO3/ Moist	DB		105' Sandy GRAVEL (85% GRAVEL, 15% sand) 5% lrg c, 40% smc, 10% mp, 20% cp, 5% mp, 5% f to fp, 10% vc to vfs, 5% ms, trace silt, Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, SJH 8/13/91 Sample damp, poorly sorted, subang to rded, weak rx to 10% HCl 85% basaltic (mafic), 15% felsic	8/12/91 1500
110	1 rad 2 lith 1 CaCO3/ Moist	DB		110' Sandy GRAVEL (85% Gravel, 15% Sand) 20% smc, 30% vcp, 20% cp, 5% mp, 5% fp, 5% vfp 5% vc to cs, 7% ms, 3% f to vfs, Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample damp, poorly sorted, sub ang to rd, weak rx to 10% HCL 85% basalt, 15% felsic	8/13/91 0830
115'	1 rad 2 lith 1 CaCO3/moist	DB		115' Sandy GRAVEL (80% GRAVEL, 20% Sand) 40% vcp, 30% cp, 5% mp, 5% fp, 5% vfp 2% vcs, 3% cs, 10% ms, 5% fs to silt Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample v damp, poorly sorted, subang to rd, weak rx to 10% HCL 85% basalt, 15% felsic	8/13/91 1000
120	1 rad 2 lith 1 CaCO3/ moist	DB		120' Sandy GRAVEL (85% Gravel, 15% Sand) 5% sm cobble, 15% vcp, 40% cp, 10% mp, 5% ~~vfp~~, 5% vfp, 2% cs, 3% ms, ~~10%~~ 5% fs ~~to~~ 5% vf to silt Color wet (10YR 4/1) dark gray, Color dry (10YR 7/1) light gray, Sample v damp, poorly sorted, subang to rd, weak rx to 10% HCL 85% mafic, 15% felsic	8/13/91 1400
				122 - lithology change; Clayey-SILT ~~Silty CLAY~~ see sample 125' for description	DED 8-14-91

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BOREHOLE LOG

Boring or Well No. 699-43-41G

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Location 216-B3-Pond

Project W-017 / B-Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser Eng.

Driller Kelly Olson

Drilling Method and Equipment RE Cable Tool Rig

Prepared By Dale Drewry / Dale Drewry (Sign/Print Name) Date 8/14/91

Reviewed By Edward C. Rafford / Edward C. Rafford (Sign/Print Name) Date 08/21/91

Susan J. Havens / Susan J. Havens 8/14/91

Depth 8-14-91 (1205)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level	
125	1 rad 21.th 1 CaCO3 moist	DB		125' clayey-SILT (80% silt; 20% clay) color wet (10YR 5/6) yellowish-brown color dry (10YR 7/3) very pale brown, sample dry, well sorted; strong rx to 10% HCL; ≈100% Felsic, Trace Mafic	1047	8-14-91
127.8	1 rad 4 6" plastic tubes for analyses	S.T. 4/5/4/16		127.8' clayey-SILT (80% silt 20% clay) as described in 125' sample	1349	8-14-91
129.8						
130	1 rad 21.th 1 CaCO3/ moist	DB		130' clayey-SILT (80% silt 20% clay) color wet (10YR 5/4) yellowish brown color dry (10YR 7/4) very pale brown sample wet, well sorted, weak rx to 10% HCL, 99% Felsic 1% Mafic	1420	8-14-91
135'	1 rad 21.th 1 CaCO3/ moist	DB		135' clayey SILT (80% silt, 20% clay) color wet (10YR 5/4) yellowish brown color dry (10YR 7/4) very pale brown. sample damp, well sorted, strong rx to 10% HCL, 98% Felsic, 2% Mafic, traces of mica and sugary qtz	1045	8/19/91
140	1 rad 21.th 1 CaCO3	HT		140' clayey SILT (80% silt, 20% clay) same as described in 135' sample Trace pebbles & of sand	1405	8/19/91
				142' Transition into gravels & sand	Drilling indicates transition into gravels	

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BOREHOLE LOG

Boring or Well No. 699-43-41G

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Location 216-B3-Pond

Project W-017/ B-Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J. Havens / S.J. Havens (Sign/Print Name) Date 8/20/91

Reviewed By E.C. Rafuse / E.C. Rafuse (Sign/Print Name) Date 08/25/91

Depth (145')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1rad 2lith 1CaCO3	HT		145' Silty Sandy GRAVEL (30% GRAVEL, 50% Sand, 20% Silt) (2.5Y 5/3) lt olive brn wet (2.5Y 7/2) lt gr dry, sample wet,* poorly sorted strong rx w/10% HCL, 70% felsic+qtz, 30% basalt	8/20/91 0950 * wet from hard tool
146.7	1rad 1 lith	18/85/200 for 5" ST		146.7-148.1 Silty Sandy GRAVEL (60% GRAVEL, 30% Sand, 10% Silt) 10% cp, 10% mp, 20% fp, 20% vfp, 20% vc to cs, 10% ms, 10% fs to silt (rock flour*) (2.5Y 5/3) lt olive brn wet (2.5Y 7/2) lt gr dry, sample moist to dry,** poorly sorted, Gravel subang to rd, sand ang, weak rx w/10% HCL, 60% felsic + qtz, 40% basalt, trace pyrite + mica	8/20/91 1235 hard drilling very cemented
148.1					
150'	1rad 2lith 1CaCO3	HT		150' Silty, Sandy, GRAVEL as described in 146.7 to 148.1 sample	8/20/91 1505
155'	1rad 2lith 1CaCO3	HT		155' Silty Sandy GRAVEL (60% GRAVEL, 30% Sand, 10% Silt) as described in 146.7 to 148.1' sample, ~~very~~ SSH 8/21/91 cemented	8/21/91 sample for this interval mostly sand, mud to thin to support gravel during bailing
160'	1rad 2lith 1CaCO3	HT		160' Silty Sandy GRAVEL (50% Gravel 40% Sand, 10% Silt) (2.5Y 5/3) lt olive brn wet (2.5Y 7/2) lt gr dry sample wet (HT) poorly sorted, cemented,* strong rx w/10% HCL 60% Felsic+qtz, 40% Basalt subang to rd, trace pyrite	8/22/91 1410 * hard drilling indicates cementation

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BOREHOLE LOG

Boring or Well No. 299-W23-41G

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Location 216-B3-Pond

Project W-017/B Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser

Driller Kelly Olsen

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J. Stevens / S.J. Stevens (Sign/Print Name) Date 8/23/91

Reviewed By Edward C. Rafuse / Edward C. Rafuse (Sign/Print Name) Date 08/07/91

Depth (165')	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1rad 2lith 1CaCO3	HT		165' Silty Sandy GRAVEL (60% Gravel,	8/23/91 0725
166.0'				30% Sand, 10% Silt) (2.5Y 5/3) lt olive brn	
	1rad 1lith *	22/110/150 for 2" ST		wet (2.5Y 7/2) lt gry dry, sample wet (HT)	
167.2'				poorly sorted, cemented, subang to rd, strong rx w/	
				10% HCl, 50% felsic & 50% Basaltic, trace mica	
				166-167.2 Silty Sandy GRAVEL (40% Gravel,	8/23/91 1235
				25% Sand, 15% Silt) (2.5Y 5/2) lt olive brown wet,	* several lab tests
				(2.5Y 7/3) lt gry dry, sample moist poorly sorted,	
				cemented, ang to rd, weak to strong rx w/10% HCl	
170'				50% felsic qtz 50% Basalt, feldspars breaking	
	1rad 2lith 1CaCO3	HT		down into clay, iron staining 10% cp, 10% mp	
				10% fp, 10% vfp, 20% vc to cs, 15% ms, 15% fs to silt	
				170' Silty Sandy GRAVEL as described	8/23/91 1435
				in 166-167.2' sample	
					very slow drilling
					from 172-175'
175'	1rad 2lith 1CaCO3	HT		175' Silty Sandy GRAVEL (30% Gravel, 50%	8/26/91 1030
				Sand, 20% Silt) (2.5Y 5/2) lt olive brn wet,	
				(2.5Y 7/2) lt gry dry, sample wet (HT)	
				poorly sorted, cemented, ang to rd, strong rx	
				w/10% HCl, 60% Felsic qtz, 40% Mafic	
				trace mica	
	1rad 2lith 1CaCO3			179' Lithology change into CLAY	9/3/91 0915
180'		HT		180' Gravelly Sandy CLAY	179 clay found on HT
180.5	1rad 1lith *	ST 12/12/11/10 100% rec		180.5-182.5' Gravelly Sandy CLAY	
				(10% Gravel, 30% Sand, 60% Clay)	9/3/91 1145 ST
				(10YR 5/1) gray wet (10YR 5/2 7/1) lt gray	* several lab tests
182.5				dry, sample damp to moist, poorly sorted	
				ang to subrd, Gravel 5% vcp, 5% fp + a vfp	
				sand - 10% vc to cs, 5% ms, 15% f to vfs	
				Silt, Clay low plastic, weak rx w/10% HCl	
				Sand & Gravel - Felsic 60%, 40% mafic	
185				185' Gravelly Sandy CLAY	

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BOREHOLE LOG

Boring or Well No. 699-43-41G

Sheet 10 of 10

Location 216-B3-Pond

Project W-017 / B Pond

Elevation 547.96' BRASS CAP

Drilling Contractor Kaiser

Driller Kelly Olson

Drilling Method and Equipment B.E. Cable Tool

Prepared By Susan J Havens / SJ Havens (Sign/Print Name) Date 9/6/91

Reviewed By [signature] Kent Reynolds (Sign/Print Name) Date 1/28/92

Depth (185)	Sample Type and No.	Sample Blows or Recovery	Graphic Log	Sample Description: Soil Classification, Particle Size Distribution, Color, Moisture Content, Sorting, Angularity, Mineralogy, Reaction to HCl.	Comments: Depth of Casing, Drilling Rate, Casing Size & Type, Bit Size, Water Level
	1rad 2lith 1CaCO3	HT		185' Gravelly Sandy Clay (10% Gravel, 20% Sand, 70% Clay) as described in 180.5-182.5' Sample	9/6/91 1110 Sample contaminated w/ hole plug
				188' Lithology change to SAND, H2O in borehole	Depth to Water 135' + rising
188.95 ~~185~~ 190'		ST 15/35/40/80		188.95-190.95' (189-190 SAND, 190-191 Clayey, Sandy GRAVEL) (70% Gravel, 20% Sand, 10% Clay) Sand - 70% vcs to cs, 20% ms, 10% f to vf sand	9/6/91 1330
190.95'		HT		Gravel - 70% vcp to cp, 10% mp, 20% f to vf p* Clay low plastic, sample poorly sorted, sub ang to rd, no rx to 10% HCl, sample damp, partly cemented, iron stained	* pebbles broken by ST
195'	1Rad 2Lith 1CaCO3	HT		195' silty SAND 60% sand (20% vcs to cs, 20% ms, 20% fs to vfs) 40% silt/clay. No rxn to HCl, subangular to subrounded, 60% Felsic, 40% mafic. Felsics - some iron staining on qtz grains, mafics = basalt. VERY WET - From HT Grayish brown - 10YR 5/2 (slurry)	SAMPLE received as a slurry. Actual interval probably a cemented gravel according to driller
201' (T.D.)	1Rad 2Lith 1CaCO3	HT		201' sandy SILT 50% sand (20% vcs to cs, 15% ms, 20% fs to vfs) 50% silt/clay No rxn to HCl, subangular to subrounded, 60% Felsic, 40% mafic (see above). Grayish Brown - 10YR 5/2 (slurry	- see above

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Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-43-41G Area 600 Area Date 9/4/91

Log Run #1 Log Type Gross Gamma

Elevation Datum _____ Elevation _____

Survey Coordinates _____ N _____ E

Log Measured From Ground Surface

Location Description B-Pond/B-Lobe

Ground Surface Elevation _____

Surface Temperature 21.5 °C Weather Clear-Warm

BOREHOLE INFORMATION

Driller Kelly Olsen

Drill Rig Type Cable Tool | Bit Type/Diameter Hand Tool/10"

Borehole Diameter(s)/Depth 16"/41.9' 12"/127.89' 10"/181.7'

Depth Driller 181.7' | Depth Logger 181.2'

Liquid Level 180.4' | Liquid Density NA (See Notes Below)

Temperature NA (See Notes Below)

CASING RECORD

Type 16" Carbon Steel Sch. 40	Interval +0.8' - 41.86'
Type 12" Carbon Steel Sch. 40	Interval +1.5' - 127.89'
Type 10" Carbon Steel Sch. 40	Interval +2.5' - 181.7'
Type	Interval

Well Screen Interval NA

Comments: Return Error = +0.4' high
Centralizer used
Could not get enough water in bailer to sample

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LOG HEADER

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EQUIPMENT DATA

Logging Company PNL

Operator(s) Alan Pearson & Brad Gilmore

Equipment Brand MLS | Equipment Type Analog

Tool Type Gamma Ray | Serial No. CG27A97

Base Calibration Date 5/91 | Calibration Reference

Calibration/Probe Factor 8.84x10^-2 μR/MCS | Base Calibration Datum (eU): Position 1 297.4 eU | Position 2 64.3 eU

Dead Time 11.8 μsec | Warm Up Time >15 min

LOGGING INFORMATION

Log Interval From 181.2' To 2.6'

Rerun(s) 181.2 to 114.5'

Pre Survey Verification: Position 1 304.1 eU Position 2 65.9 eU Background 60 c/s

Base Calibration Difference: Position 1 6.7 eU Position 2 1.6 eU

Logging Speed 5 ft/min. | Rerun Scales, CPS/in. 50 c/s/in

Start Time 0710 | Completion Time 0945

Chart Speed(s), ft/in. 10 ft/in. | Time Constant(s) TC-1

Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in.

Post Survey Verification: Position 1 304.1 eU Position 2 65.4 eU Background 60 c/s

Percent Change: Position 1 0.0% Position 2 0.8%

Comments Return Error = +0.4' high
Centralizer used

Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson Date: 9/4/91

A-141

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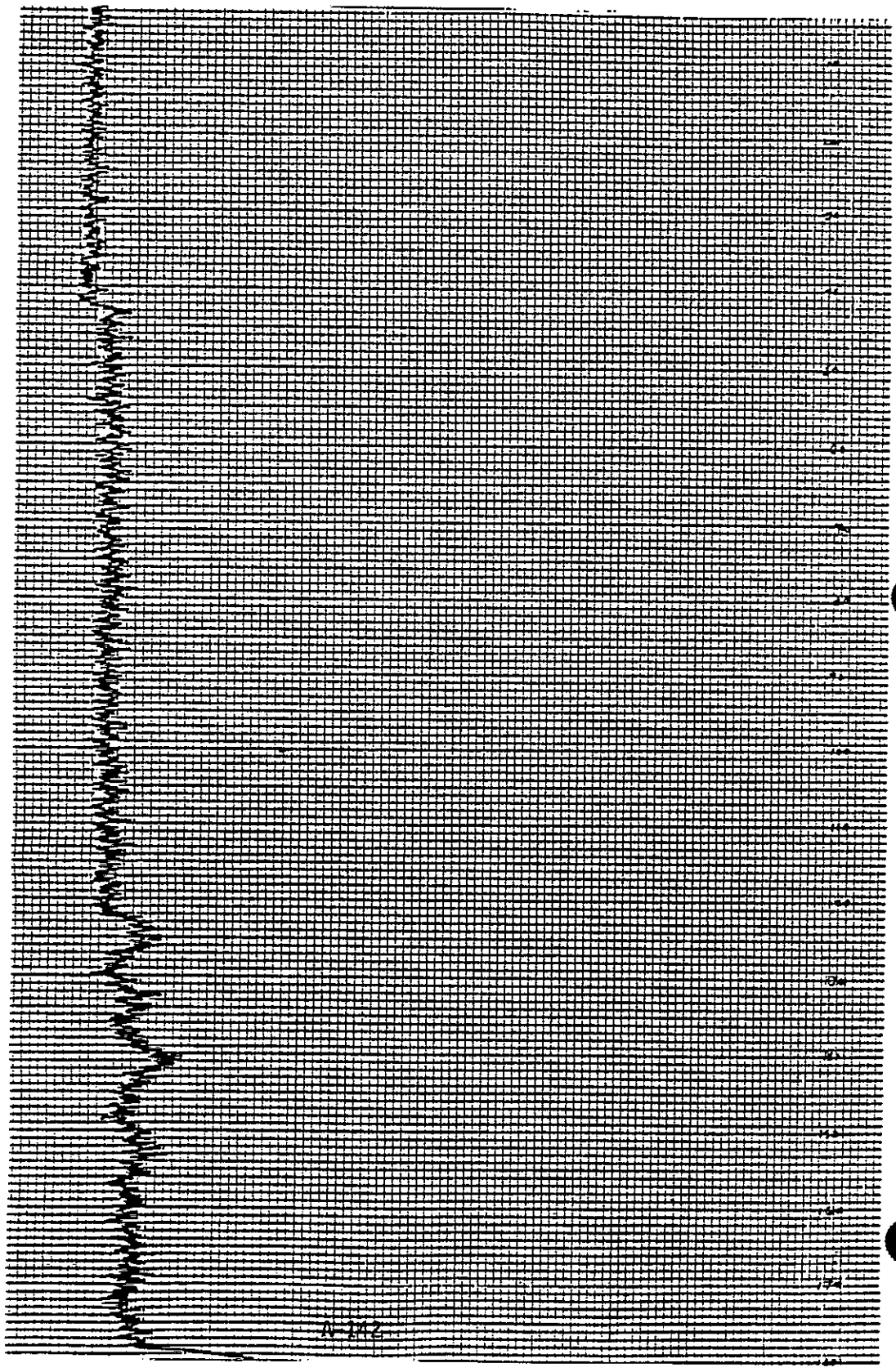
9 3 1 2 7 0 5 2 1

699-43-41G RUN#1 9/4/1991



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Westinghouse Hanford Company	LOG HEADER	Page 1 of 2

Well No. 699-43-41G Area 600 Area Date 9/10/91
Log Run #2 Log Type Gross Gamma
Elevation Datum Elevation
Survey Coordinates N
Log Measured From Ground Surface
Location Description B-Pond
Ground Surface Elevation
Surface Temperature 20.3 °C Weather Clear-Warm

BOREHOLE INFORMATION

Driller Kelly Olsen
Drill Rig Type Cable Tool Bit Type/Diameter Hard Tool/8"
Borehole Diameter(s)/Depth 16"/~~199.25'~~ 41.86' 12"/127.89' 10"/181.75 8"/199.25'
Depth Driller 199.25' Depth Logger 198.3'
Liquid Level 135.2' Liquid Density Appearance Muddy
Temperature 18.6°C

CASING RECORD

Type 16" Carbon Steel Sch. 40 Interval +1.0'-41.86'
Type 12" Carbon Steel Sch. 40 Interval +1.7-127.89'
Type 10" Carbon Steel Sch. 40 Interval +2.0'-181.75'
Type 8" Carbon Steel Sch. 40 Interval +3.5'-201.36'
Well Screen Interval NA
Comments: Return Error = 0.0'
Centralizer used.

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LOG HEADER	Page 2 of 2

EQUIPMENT DATA

Logging Company PNL
Operator(s) Alan Pearson
Equipment Brand MLS Equipment Type Analog
Tool Type Gamma Ray Serial No. CG27A97
Base Calibration Date 5/91 Calibration Reference
Calibration/Probe Factor 8.84x10 eU n/m/c/s Base Calibration Datum (eU): Position 1 297.4 eU Position 2 64.3 eU
Dead Time 11.8 μ sec Warm Up Time >15 min

LOGGING INFORMATION

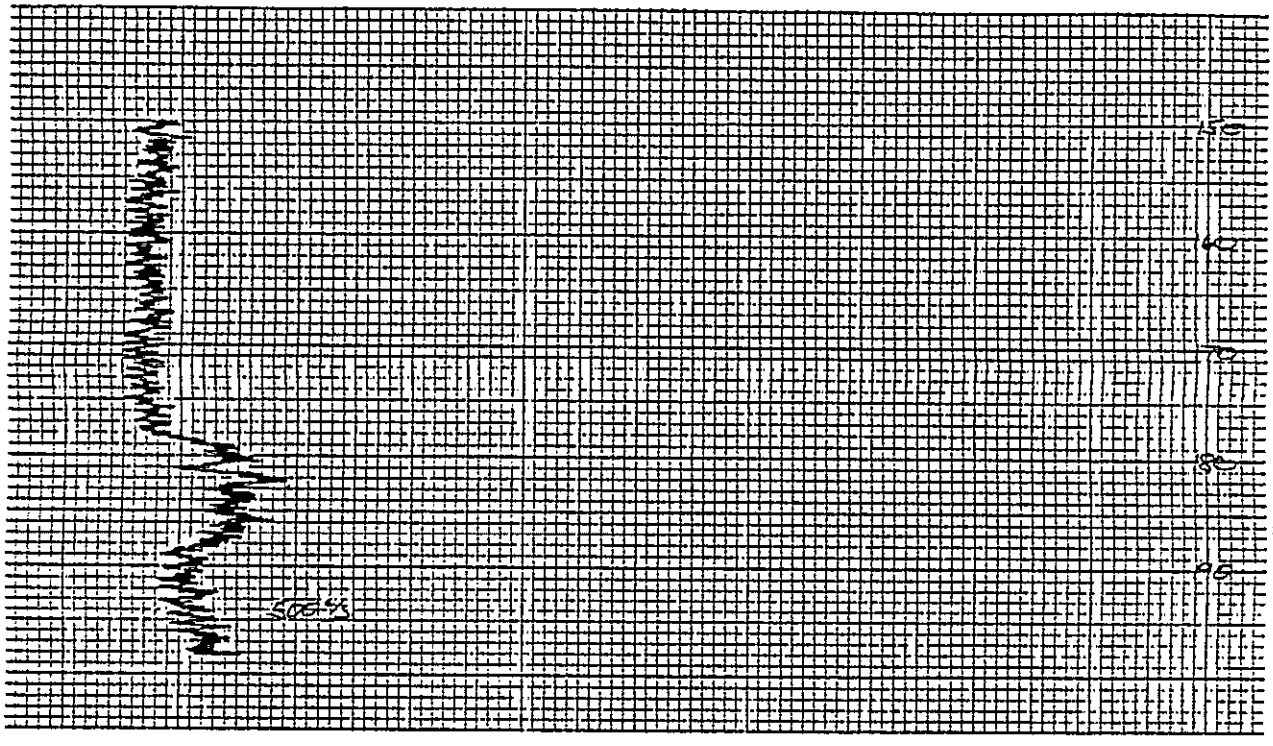
Log Interval From 198.3' to To 150.0'
Rerun(s) ~~198.1'~~ 197.7' to 150.0'
Pre Survey Verification: Position 1 301.4 eU Position 2 64.1 eU Background 65 c/s
Base Calibration Difference: Position 1 4.0 eU Position 2 0.2 eU
Logging Speed 5 ft./min. Rerun Scales, CPS/in. 50 c/s/in
Start Time 0700 Completion Time 0900
Chart Speed(s), ft/in. 10 ft./in.
Chart Recorder Horizontal Scale, CPS/in. 50 c/s/in. Time Constant(s) TC-1
Post Survey Verification: Position 1 301.4 eU Position 2 65.0 eU Background 65 c/s
Percent Change: Position 1 0.0% Position 2 1.4%
Comments Return Error = 0.0'
Centralizer used

A-143

Witnessed and Verified by: (sign and print name) Alan Pearson Alan Pearson Date: 9/10/91

9 3 1 2 7 3 0 5 2 3

699-43-41G RUN#2 9/10/1991



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KAISER ENGINEERS HANFORD

SURVEY DATA REPORT

Request No. -92111-0517

Project/W.O. No.	Title	File No.
W-017H	B-Pond Wells	WELL-1119

KEH Job No.	Prepared By	Date	Reviewer
CR9560	N. P. Fastabend	12-10-91	Michael W. Polster

DESCRIPTION OF WORK

Locate wells around B-POnd for horizontal and vertical position.

Horizontal: WCS83S and 200-E Datum

Vertical: NGVD '29 and 200-E Datum

ACCEPTABILITY (Within Plan Tolerances)

- Yes ☐
- No ☐
- NA ☒
- TBD by Requestor ☐

DISTRIBUTION

	OR
Survey File	
Field Project File	1
D. Foucault	1
T. Nemzek	1
J. Geiger	1
J. Rieger	1
D. Weekes	1

SURVEY RESULTS AND COMMENTS

CONTROL MONUMENTS:

BP-1	BP-3
N:136,716.89	N:136,571.07
E:577,129.74	E:577,596.34

NOTE: A). Horizontal control points used to locate wells were part of a traverse with a linear closure of better than 1:50,000.

B). Vertical control monument used to establish elevations on wells (2E-18) was part of a vertical network with misclosure of all run sections less than 8mm√K. Holding USC & GS benchmarks J-317, K-317 & L-317.

WELL NO.	COORDINATES (C/L CASING) 200-E AREA (FEET)	LAMBERT WCS83S (METERS)	VERT. DATUM	ELEVATIONS (FEET) BRASS CAP IN CONC.	TOP HYDRO-STAR PLATE, N. SIDE	TOP OUTER CASING N. SIDE	
699-43-40	N:43357.4	N:136,705.54	NGVD'29	538.76	542.22	542.20	
	W:40379.1	E:577,583.34	200-E	538.53	541.99	541.98	
* 699-43-41G	N:42969.0	N:136,586.83	NGVD'29	547.96	551.36	551.34	
	W:40763.2	E:577,466.61	200-E	547.73	551.13	551.12	
699-42-39A 699-BP91-2	N:41866.5	N:136,251.95	NGVD'29	554.61	558.15	558.14	
	W:39484.6	E:577,857.26	200-E	554.44	557.93	557.91	
699-42-39B 699-BP91-3	N:41816.1	N:136,236.59	NGVD'29	554.86	558.33	558.32	
	W:39478.3	E:577,859.21	A-145 200-E	554.63	558.11	558.09	

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216-B-3 POND SYSTEM ELEVATION DATA						
WELL	HANFORD COORDINATES	BRASS CAP (NGVD'29)	CASING	SCREENED INTERVAL	PUMP INTAKE	WATER TABLE MAY 92
699-40-40A	N39710 W40072	537.75	541.23	322.65 - 311.95	318.83	411.37
699-40-40B	N39761 W40080	538.69	541.97	350.89 - 340.09	344.97	411.55
699-42-39A	N41867 W39485	554.67	558.15	385.27 - 374.57	381.14	418.28
699-42-39B	N41816 W39478	554.86	558.33	351.86 - 341.06		418.07
699-42-41	N42246 W41196	564.03	567.31	429.83 - 408.83	414.91	419.88
699-43-40	N43357 W40379	538.76	542.22	424.46 - 403.76		419.21
699-43-41G	N42969 W40763	547.96	551.36	359.66 - 349.36	354.26	416.05

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APPENDIX B

PHYSICAL SAMPLE DATA
CHEMICAL SAMPLE DATA

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PHYSICAL PROPERTIES DATA SHEET
216-B-3 POND FY91 RCRA BOREHOLES

Lab Sample #	Field Sample #	Sample Depth (ft)	Specific Gravity (g/cm^3)	Moisture (%)	Moisture Retention	Sieve Analysis	Hydraulic Cond. (cm/sec)	Porosity (%)
699-40-40A								
1-2137		165.5-166	2.61	24.19	test not requested	silty sand	2.3 E-7	38.18
1-2195		171-172	2.60	22.02	test not requested	silty clay	1.5 E-9	37.76
1-2196		178-179.5	2.64	23.08	test not requested	silty sand	9.2 E-6	38.35
1-2241		225.5-226.5	2.63	14.89	test not requested	fine sand	1.0 E-7	33.64
699-40-40B								
1-1894		124.8-126.8	2.66	19.73	curve data available	sandy clay sieve data available	1.0 E-8	34.90
1-1899		150-150.25	2.60	53.90	test not requested	clay sieve data available	test not run	test not run
1-1898		150.25-150.9	2.61	24.86	test not requested	silt sieve data available	test not run	test not run
1-1897		150.9-151	2.70	10.75	test not requested	clay sieve data available	3.5 E-7	37.92
1-1901		182-184	2.67	22.85	test not requested	clay sieve data available	4 E-8	37.74
1-2242		193-195				sandy gravel sieve data available		

PHYSICAL PROPERTIES DATA SHEET
216-B-3 POND FY91 RCRA BOREHOLES

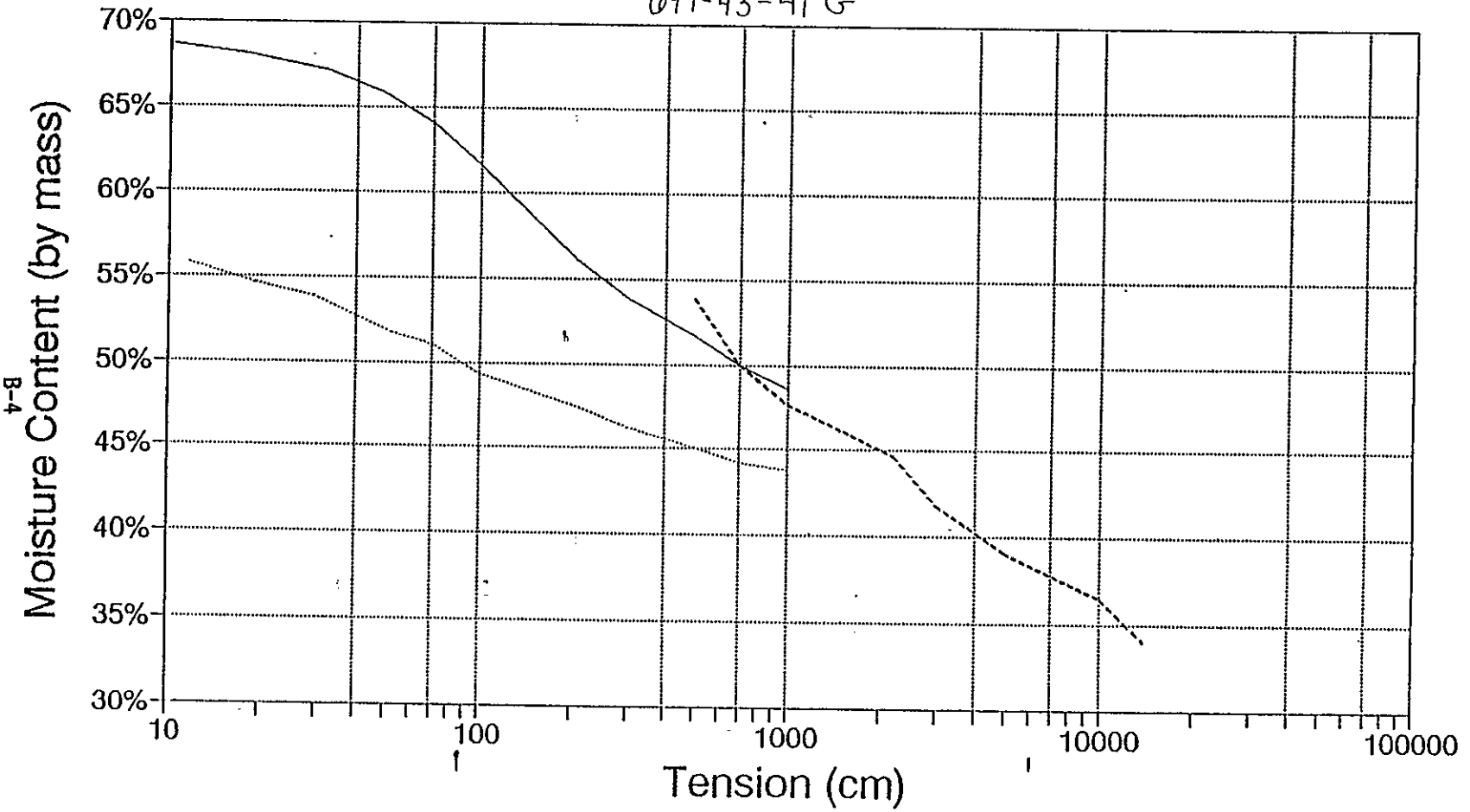
Lab Sample #	Field Sample #	Sample Depth (ft)	Specific Gravity (g/cm^3)	Moisture (%)	Moisture Retention	Sieve Analysis	Hydraulic Cond. (cm/sec)	Porosity (%)
699-42-41								
1-1896		154.72-156.72	2.64	7.16	curve data available	sandy gravel sieve data available	6.4 E-7	15.93
699-43-40								
1-2004		130-131.5	2.73	7.63	curve data available	sandy gravel /sand, sieve data avail	1.9 E-4	22.45
699-43-41G								
1-1930		127.8-129.8	2.70	23.79	test not requested	clay sieve data available	1.5 E-5	42.54
1-1931		147.2-148.1	2.68	5.47	curve data available	sandy gravel sieve data available	no test	19.89
1-2003		166.2-167.2	2.68	8.95	curve data available	sandy gravel sieve data available	1.9 E-6	17.65
1-2135		181.5-182.5	2.58	41.30	waiting on curve data	silty sand sieve data available	4.0 E-9	51.09
699-BP91-2								
1-1895		138-140	2.66	20.46	test not requested	sandy clay sieve data available	8.6 E-8	35.86
699-BP91-3								
1-2138		156.5-157	2.62	20.29	test not requested	silt sieve data available		

PHYSICAL PROPERTIES DATA SHEET 216-B-3 POND FY91 RCRA BOREHOLES								
Lab Sample #	Field Sample #	Sample Depth (ft)	Specific Gravity (g/cm^3)	Moisture (%)	Moisture Retention	Sieve Analysis	Hydraulic Cond. (cm/sec)	Porosity (%)
1-2139		157-157.5	2.62				1.1 E-7	36.87
1-2240		215-216	2.66	44.99	test not requested	silt (cemented) sieve data available	1.0 E-7	56.15

B-Pond Moisture Retention

Sample 1-2135

699-43-41 G



1 B Drying — 1 B Wetting — Kettle Drying

Tension (cm)	1 B Drying Moisture (%)	5 B Wetting Moisture (%)	1 B Wetting Moisture (%)	Kettle Drying Moisture (%)
10.4	68.67%			
18	68.09%			
32.7	67.16%			
49.3	65.82%			
71.1	64.02%			
100	61.62%			
205	56.09%			
300	53.88%			
500	51.65%			
700	50.00%			
1000	48.64%			
1000			43.79%	
700			44.16%	
500			45.11%	
300			46.21%	
205			47.46%	
97.2			49.42%	
71.0			50.99%	
51.6			51.78%	
29.4			53.82%	
19.1			54.60%	
11.7			55.77%	
500				53.87%
700				50.00%
1000				47.65%
2200				44.69%
3000				41.77%
5000				39.02%
6500				40.67%
10000				36.49%
13700				34.03%

TEMPE CELLS	Sample #	1-2135							
tension in cm	N/A	N/A	0	0	10.4	18	32.7	49.3	71.1
error in tension value +/-			0	0	0.5	2	3	2	2
container number	A8	TC-8	TC-8	TC-8	TC-8	TC-8	TC-8	TC-8	TC-8
weight of container/ring,+wet sample	35.78	491.35	533.67	534.23	532.12	531.75	531.16	530.31	529.17
weight of container/ring,+ dry sample	35.05	488.97	488.59	488.59	488.59	488.59	488.59	488.59	488.59
weight of moisture	0.73	2.38	45.08	45.64	43.53	43.16	42.57	41.72	40.58
weight of container and ring	15.62	425.58	425.20	425.20	425.20	425.20	425.20	425.20	425.20
weight of dry sample		63.39	63.39	63.39	63.39	63.39	63.39	63.39	63.39
moisture content %	3.76%	3.76%	71.12%	72.00%	68.67%	68.09%	67.16%	65.82%	64.02%
date measured	11/06/91	11/06/91	11/07/91	11/08/91	11/11/91	11/12/91	11/13/91	11/14/91	11/15/91
temperature deg. C	20	20	20	24	24	25	24	24	25
container number	TC-5	TC-5	TC-5	TC-5	TC-5	TC-5	TC-5	TC-5	TC-5
tension in cm	0	10.4	18	32.7	49.3	71.1	100	205	300
Tempe Drying Curve	72.00%	68.67%	68.09%	67.16%	65.82%	64.02%	61.62%	56.09%	53.88%
Kettle Drying Curve									
Tempe Wetting Curve									
date measured	11/08/91	#####	#####	#####	11/14/91	11/15/91	11/18/91	11/19/91	11/21/91

100	205	300	500	700	1000	N/A	N/A	N/A	N/A	1000	1000	1000	1000	700	500	300
2	5	20	20	20	20					20	20	20	20	20	20	20
TC-8	TC-8	TC-8	TC-8	TC-8	TC-8	TC-8	SML-8	A8	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15
527.65	524.14	522.74	521.33	520.28	519.42	519.35	156.60	35.78	494.82	508.62	532.67	521.82	521.91	522.15	522.77	523.49
488.59	488.59	488.59	488.59	488.59	488.59	488.59	125.75	35.05	492.36	493.25	493.25	493.25	493.25	493.25	493.25	493.25
39.06	35.55	34.15	32.74	31.69	30.83	30.76	30.85	0.73	2.46	15.37	39.42	28.57	28.66	28.90	29.52	30.24
425.20	425.20	425.20	425.20	425.20	425.20	425.20	62.54	15.62	426.92	427.81	427.81	427.81	427.81	427.81	427.81	427.81
63.39	63.39	63.39	63.39	63.39	63.39	63.39	63.21		65.44	65.44	65.44	65.44	65.44	65.44	65.44	65.44
61.62%	56.09%	53.88%	51.65%	50.00%	48.64%	48.53%	48.81%	3.76%	3.76%	23.48%	60.24%	43.66%	43.79%	44.16%	45.11%	46.21%
11/18/91	11/19/91	11/21/91	11/22/91	11/25/91	11/26/91	11/26/91		11/06/91	11/06/91	11/08/91	11/11/91	11/12/91	11/13/91	11/14/91	11/15/91	11/18/91
26	23	23	23	22	22	22		20	20	24	24	25	24	24	25	26
TC-5	TC-5	TC-5	PK5-3	PK5-3	PK5-3	PK5-3	PK5-3	PK5-3	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK15-2
500	700	1000	500	500	700	700	1000	1000	2200	2200	3000	3000	5000	5000	6500	6500
51.65%	50.00%	48.64%														
			52.98%	53.87%	51.20%	50.00%	47.65%	48.75%	45.26%	44.69%	43.40%	41.77%	40.33%	39.02%	41.15%	40.67%
11/22/91	11/25/91	11/26/91	11/14/91	11/14/91	11/15/91	11/15/91	11/18/91	11/18/91	11/14/91	11/14/91	11/15/91	11/15/91	11/18/91	11/18/91	11/14/91	11/14/91

205	97.2	71.0	51.6	29.4	19.1	11.7	0		N/A	
5	3	2	2	1	1	2	0			
TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	SML-5	
524.31	525.59	526.62	527.14	528.47	528.98	529.75	531.28	531.22	166.19	
493.25	493.25	493.25	493.25	493.25	493.25	493.25	493.25	493.25	128.33	
31.06	32.34	33.37	33.89	35.22	35.73	36.50	38.03	37.97	37.86	
427.81	427.81	427.81	427.81	427.81	427.81	427.81	427.81	427.81	62.92	
65.44	65.44	65.44	65.44	65.44	65.44	65.44	65.44	65.44	65.41	
47.46%	49.42%	50.99%	51.78%	53.82%	54.60%	55.77%	58.11%	58.02%	57.88%	
11/19/91	11/20/91	11/21/91	11/22/91	11/25/91	11/26/91	11/27/91	12/02/91,	12/02/91		
23	23	23	23	22	22	23	22			

PK15-2	PK15-2	PK15-2	PK15-2	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13
10000	10000	13700	13700	1000	700	500	300	205	97.2	72
40.39%	36.49%	34.24%	34.03%							
				43.79%	44.16%	45.11%	46.21%	47.46%	49.42%	50.99%
11/15/91	11/15/91	11/18/91	11/18/91	11/15/91	11/18/91	11/19/91	11/20/91	11/21/91	11/22/91	11/25/91

KETTLES	Sample #	1-2135		
tension in cm	500	500	700	700
error in tension value +/-	20	20	100	100
container number	A9	A10	B9	B10
weight of container/ring,+wet sample	25.08	24.80	25.55	26.45
weight of container/ring,+ dry sampl	21.70	21.53	22.14	22.73
weight of moisture	3.38	3.27	3.41	3.72
weight of container and ring	15.32	15.46	15.48	15.29
weight of dry sample	6.38	6.07	6.66	7.44
moisture content %	52.98%	53.87%	51.20%	50.00%
date measured	11/14/91	11/14/91	11/15/91	11/15/91
temperature deg. C	24	24	25	25

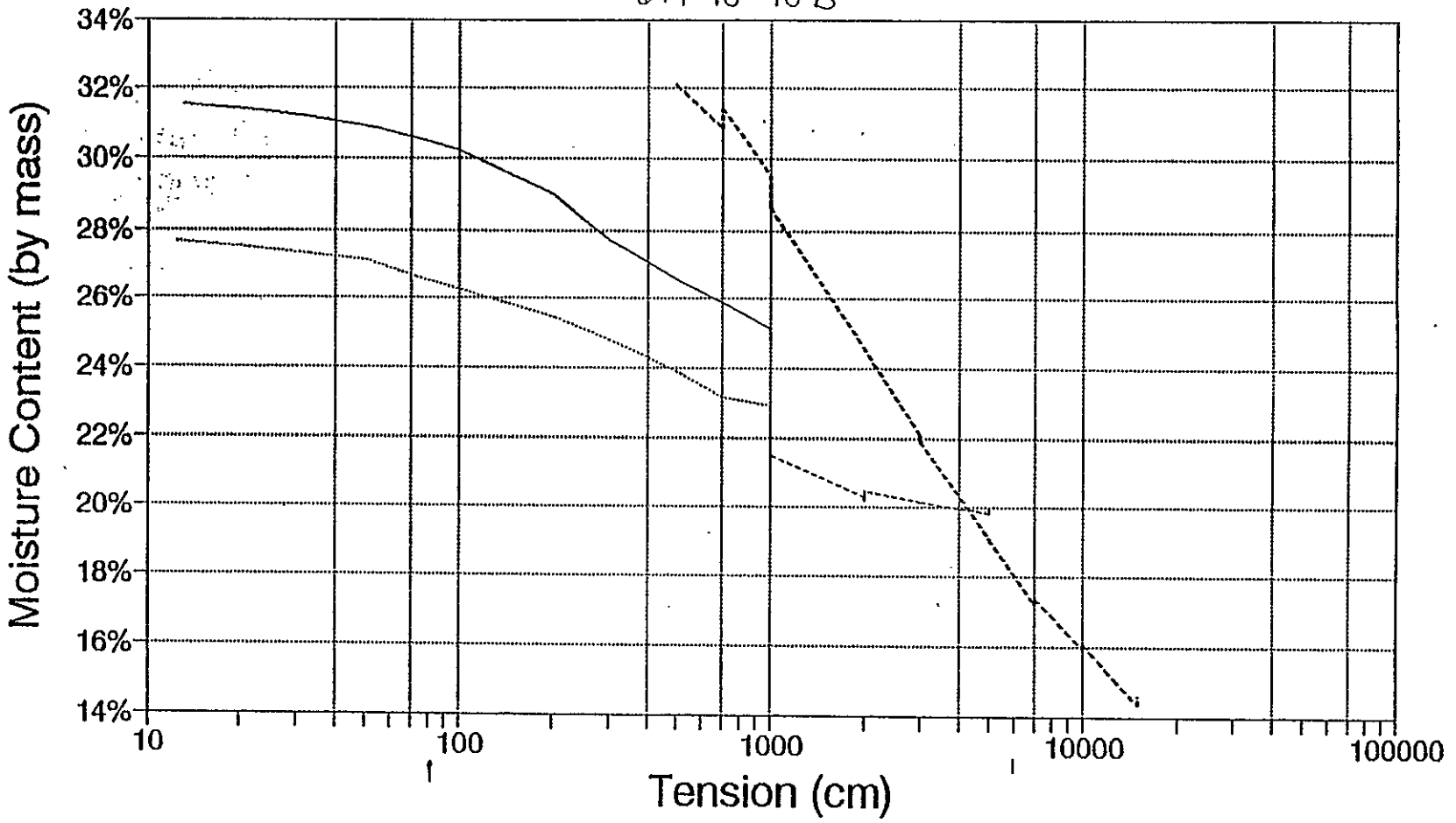
TC-13	TC-13	TC-13	TC-13	TC-13
51.6	29.4	19.1	11.7	0
51.78%	53.82%	54.60%	55.77%	58.11%
08/25/91	08/26/91	11/26/91	11/27/91	12/02/91

1000	1000	2200	2200	3000	3000	5000	5000	6500	6500	10000	10000	13700	13700
100	100	100	100	200	200	20	20	20	20	100	100	100	100
A9	A10	A19	A20	B19	B20	A19	A20	A29	A30	B29	B30	A29	A30
23.50	23.76	25.74	24.60	26.30	27.28	24.53	24.27	24.97	25.71	22.68	22.95	24.50	22.62
20.86	21.04	22.49	21.78	23.01	23.78	21.88	21.80	22.25	22.79	20.60	20.91	22.24	20.84
2.64	2.72	3.25	2.82	3.29	3.50	2.65	2.47	2.72	2.92	2.08	2.04	2.26	1.78
15.32	15.46	15.31	15.47	15.43	15.40	15.31	15.47	15.64	15.61	15.45	15.32	15.64	15.61
5.54	5.58	7.18	6.31	7.58	8.38	6.57	6.33	6.61	7.18	5.15	5.59	6.60	5.23
47.65%	48.75%	45.26%	44.69%	43.40%	41.77%	40.33%	39.02%	41.15%	40.67%	40.39%	36.49%	34.24%	34.03%
11/18/91	11/18/91	11/14/91	11/14/91	11/15/91	11/15/91	11/18/91	11/18/91	11/14/91	11/14/91	11/15/91	11/15/91	11/18/91	11/18/91
26	26	24	24	25	25	26	26	24	24	25	25	26	26

B-POND Moisture Retention

Sample 1-1894

699-40-40 B



1 B Drying — 5 B Wetting — 1 B Wetting — Kettle Drying

Tension (cm)	1 B Drying Moisture (%)	5 B Wetting Moisture (%)	1 B Wetting Moisture (%)	Kettle Drying Moisture (%)
13.2	31.56%			
23	31.36%			
31.2	31.23%			
54.5	30.86%			
73.5	30.56%			
99.2	30.24%			
202	28.98%			
300	27.70%			
500	26.56%			
700	25.87%			
1000	25.14%			
1000	24.78%			
5000		19.99%		
4980		19.83%		
3000		20.14%		
3000		20.09%		
3000		20.14%		
3000		20.17%		
2000		20.49%		
2000		20.29%		
2000		20.19%		
2000		20.32%		
1000		21.54%		
1000		21.75%		
1000		21.62%		
1000		21.53%		
1000			22.79%	
1000			22.94%	
700			23.17%	
500			23.91%	
300			24.78%	
203			25.47%	
102			26.24%	
72.9			26.63%	
50.9			27.08%	
33.1			27.30%	
21.5			27.47%	
12.6			27.67%	
500				32.11%
500				32.10%
700				30.83%
700				31.42%
1000				29.54%
1000				28.64%
3000				22.06%
3000				21.92%
5000				19.14%
5000				19.07%
7000				17.19%
7000				17.39%
10000				15.96%
10000				16.08%
15000				14.34%
15000				14.60%

TEMPE CELLS	Sample #	1-1894	1 bar tempe cell drying curve					
tension in cm	N/A	N/A	0	13.2	23	31.2	54.5	73.5
error in tension value +/-			0	2	5	5	5	5
container number	1-1894	TC-11	TC-11	TC-11	TC-11	TC-11	TC-11	TC-11
weight of container/ring,+wet sample	174.81	545.98	556.21	555.04	554.85	554.73	554.38	554.10
weight of container/ring,+ dry sample			525.35	525.35	525.35	525.35	525.35	525.35
weight of moisture			30.86	29.69	29.50	29.38	29.03	28.75
weight of container and ring	61.62	433.21	431.27	431.27	431.27	431.27	431.27	431.27
weight of dry sample	113.19	112.77	94.08	94.08	94.08	94.08	94.08	94.08
moisture content %			32.80%	31.56%	31.36%	31.23%	30.86%	30.56%
date measured	08/30/91	08/30/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91
temperature deg. C			27	25	26	25	23	23
container number	TC-11	TC-11	TC-11	TC-11	TC-11	TC-11	TC-11	TC-11
tension in cm	0	13.2	23	31.2	54.5	73.5	99.2	202
Tempe Drying Curve	32.80%	31.56%	31.36%	31.23%	30.86%	30.56%	30.24%	28.98%
Kettle Drying Curve								
Tempe Wetting Curve								
date measured	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91

						Drying curve end			5 bar tempe cell wetting curve					
99.2	202	300	500	700	1000	1000	N/A		N/A	N/A	N/A	5000	4980	3000
5	10	20	20	20	20	20						100	20	20
TC-11	TC-11	TC-11	TC-11	TC-11	TC-11	TC-11	MC-1		MC-6	MC-6	TC5-1	TC5-1	TC5-1	TC5-1
553.80	552.61	551.41	550.34	549.69	549.00	548.66	179.88		72.18	189.10	1351.64	1350.24	1350.09	1350.39
525.35	525.35	525.35	525.35	525.35	525.35	525.35	156.61		70.20		1330.80	1330.80	1330.80	1330.80
28.45	27.26	26.06	24.99	24.34	23.65	23.31	23.27		1.98		20.84	19.44	19.29	19.59
431.27	431.27	431.27	431.27	431.27	431.27	431.27	62.72		60.40	72.18	1233.53	1233.53	1233.53	1233.53
94.08	94.08	94.08	94.08	94.08	94.08	94.08	93.89		9.80	97.27	97.27	97.27	97.27	97.27
30.24%	28.98%	27.70%	26.56%	25.87%	25.14%	24.78%	24.78%		20.20%		21.43%	19.99%	19.83%	20.14%
09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91		09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91
22	25	25	26	22	25	23	24					27	25	26
TC-11	TC-11	TC-11	TC-11	A1	A2	B1	B2	C1	C2	B11	B12	C11	C12	A21
300	500	700	1000	500	500	700	700	1000	1000	3000	3000	5000	5000	7000
27.70%	26.56%	25.87%	25.14%											
				32.11%	32.10%	30.83%	31.42%	29.54%	28.64%	22.06%	21.92%	19.14%	19.07%	17.19%
09/12/91	09/13/91	09/14/91	09/15/91	09/21/91	09/21/91	09/23/91	09/23/91	08/05/91	08/05/91	08/15/91	08/15/91	08/05/91	08/05/91	07/24/91

										wetting curve ends			1 bar tempe cell wetting curve					
3000	3000	3000	2000	2000	2000	2000	1000	1000	1000	1000	N/A		N/A	N/A	N/A	1000	1000	700
20	20	20	20	20	20	20	20	20	20	20						20	20	20
TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	TC5-1	HC-11		HC-6	HC-6	TC-21	TC-21	TC-21	TC-21
1350.34	1350.39	1350.42	1350.73	1350.53	1350.44	1350.56	1351.75	1351.95	1351.83	1351.74	178.04		72.18	313.49	559.12	559.79	559.94	560.18
1330.80	1330.80	1330.80	1330.80	1330.80	1330.80	1330.80	1330.80	1330.80	1330.80	1330.80	157.16		70.20		538.59	536.20	536.20	536.20
19.54	19.59	19.62	19.93	19.73	19.64	19.76	20.95	21.15	21.03	20.94	20.88		1.98		20.53	23.59	23.74	23.98
1233.53	1233.53	1233.53	1233.53	1233.53	1233.53	1233.53	1233.53	1233.53	1233.53	1233.53	60.23		60.40	189.11	435.12	432.73	432.73	432.73
97.27	97.27	97.27	97.27	97.27	97.27	97.27	97.27	97.27	97.27	97.27	96.93		9.80	103.47	103.47	103.47	103.47	103.47
20.09%	20.14%	20.17%	20.49%	20.29%	20.19%	20.32%	21.54%	21.75%	21.62%	21.53%	21.54%		20.20%		19.84%	22.79%	22.94%	23.17%
09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91		09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91
25	23	23	22	25	25	26	22	25	23	24	26					27	25	26

A22	B21	B22	C21	C22	TC5-1	TC5-1	TC5-1	TC5-1	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21
7000	10000	10000	15000	15000	5000	3000	2000	1000	1000	700	500	300	203	102	72.9	50.9	33.1	21.5
17.39%	15.96%	16.08%	14.34%	14.60%														
					19.99%	20.17%	20.32%	21.53%	22.94%	23.17%	23.91%	24.78%	25.47%	26.24%	26.63%	27.08%	27.30%	27.47%
07/24/91	07/29/91	07/29/91	07/31/91	07/31/91	09/04/91	09/09/91	09/13/91	09/17/91	09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91

									wetting curve ends	
500	300	203	102	72.9	50.9	33.1	21.5	12.6	0	N/A
20	20	3	2	3	2	3	2	3	0	
TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	TC-21	MC-6
560.94	561.85	562.56	563.36	563.76	564.22	564.45	564.63	564.84	565.02	191.21
536.20	536.20	536.20	536.20	536.20	536.20	536.20	536.20	536.20	536.20	162.71
24.74	25.65	26.36	27.16	27.56	28.02	28.25	28.43	28.64	28.82	28.50
432.73	432.73	432.73	432.73	432.73	432.73	432.73	432.73	432.73	432.73	60.38
103.47	103.47	103.47	103.47	103.47	103.47	103.47	103.47	103.47	103.47	102.33
23.91%	24.78%	25.47%	26.24%	26.63%	27.08%	27.30%	27.47%	27.67%	27.85%	27.85%
09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
25	23	22	25	25	26	22	25	23	24	26

TC-21	TC-21
12.6	0
27.67%	27.85%
09/16/91	

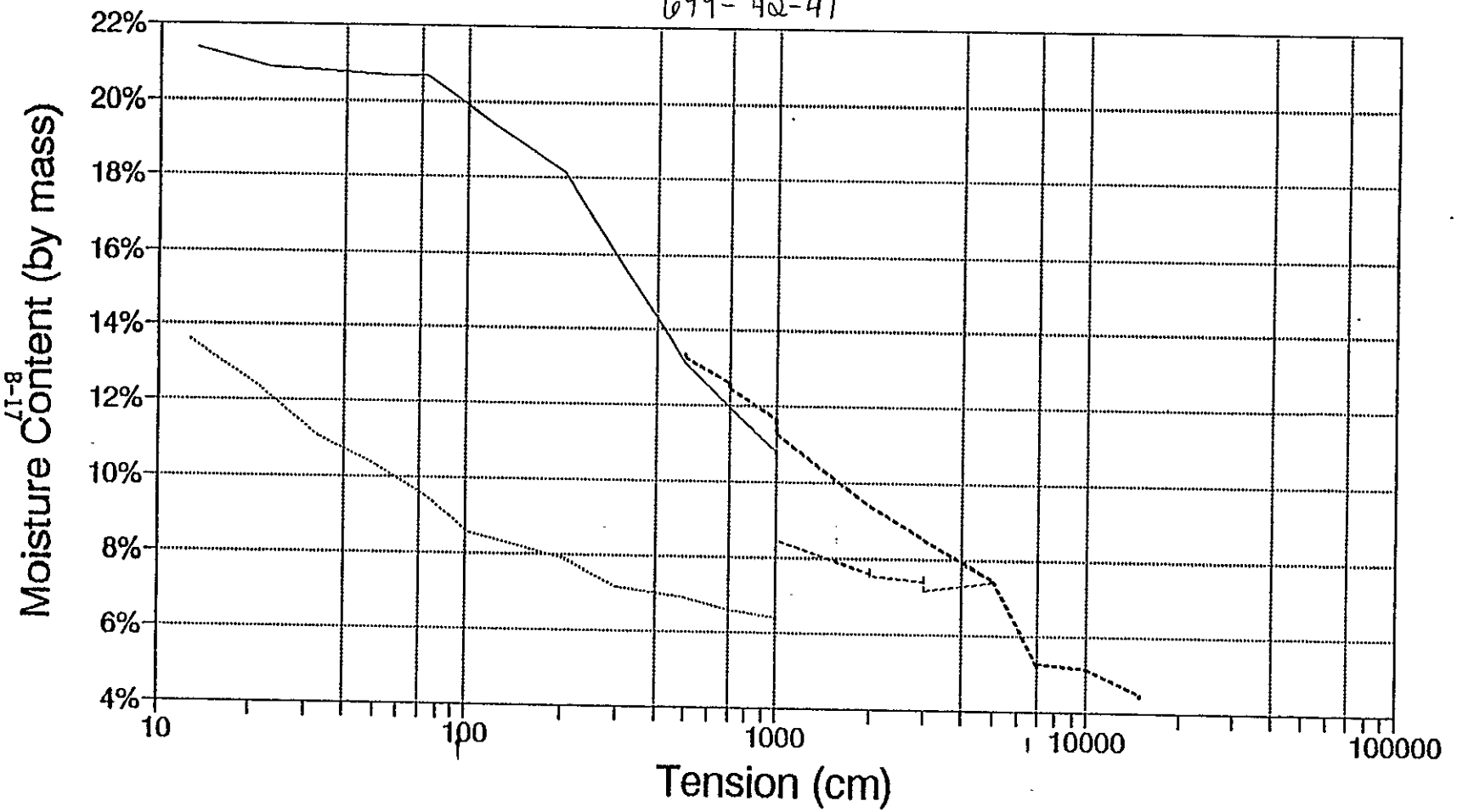
KETTLES	Sample #	1-1894
tension in cm	500	500
error in tension value +/-	20	20
container number	A1	A2
weight of container/ring,+wet sample	47.49	44.67
weight of container/ring,+ dry sample	39.73	37.58
weight of moisture	7.76	7.09
weight of container and ring	15.56	15.49
weight of dry sample	24.17	22.09
moisture content %	32.11%	32.10%
date measured	09/21/91	09/21/91
temperature deg. C	23	23

700	700	1000	1000	2000	2000	3000	3000	5000	5000	7000	7000	10000	10000	15000	15000
100	100	100	100	100	100	200	200								
B1	B2	C1	C2	A11	A12	B11	B12	C11	C12	A21	A22	B21	B22	C21	C22
44.73	44.39	37.75	42.35	46.44	53.96	40.74	42.23	41.58	39.62	25.05	24.51	25.58	29.44	31.02	31.22
37.83	37.44	32.66	36.35	26.63	26.61	36.22	37.51	37.39	35.79	23.62	23.18	24.19	27.48	29.05	29.19
6.90	6.95	5.09	6.00	19.81	27.35	4.52	4.72	4.19	3.83	1.43	1.33	1.39	1.96	1.97	2.03
15.45	15.32	15.43	15.4	15.22	15.46	15.73	15.98	15.5	15.71	15.3	15.53	15.48	15.29	15.31	15.29
22.38	22.12	17.23	20.95	11.41	11.15	20.49	21.53	21.89	20.08	8.32	7.65	8.71	12.19	13.74	13.90
30.83%	31.42%	29.54%	28.64%	173.62%	245.29%	22.06%	21.92%	19.14%	19.07%	17.19%	17.39%	15.96%	16.08%	14.34%	14.60%
09/23/91	09/23/91	09/25/91	09/25/91	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
25	25	24	24	23	23	25	25	24	24	23	23	25	25	24	24

B-POND Moisture Retention

Sample 1-1896

699- 4Q-41



1 B Drying — 5 B Wetting — 1 B Wetting — Kettle Drying

Tension (cm)	1 B Drying Moisture (%)	5 B Wetting Moisture (%)	1 B Wetting Moisture (%)	Kettle Drying Moisture (%)
13.2	21.34%			
23	20.85%			
31.2	20.78%			
54.5	20.68%			
73.5	20.69%			
99.2	19.91%			
202	18.15%			
300,	15.93%			
500	13.11%			
700	11.95%			
1000	10.79%			
1000	10.78%			
5000		7.49%		
4980		7.42%		
3000		7.18%		
3000		7.43%		
3000		7.58%		
3000		7.43%		
2000		7.54%		
2000		7.71%		
2000		7.70%		
2000		7.62%		
1000		8.46%		
1000		8.67%		
1000		8.79%		
1000		8.63%		
1000			6.43%	
700			6.59%	
500			6.92%	
300			7.18%	
203			7.88%	
102			8.55%	
72.9			9.49%	
50.9			10.29%	
33.1			11.07%	
21.5			12.33%	
12.6			13.63%	
500				13.37%
500				13.27%
700				12.56%
700				12.46%
1000				11.66%
1000				11.27%
2000				9.39%
3000				8.53%
3000				8.50%
5000				7.49%
5000				7.49%
7000				5.20%
7000				5.29%
10000				5.16%
10000				5.16%
15000				4.47%
15000				4.40%

TEMPE CELLS — Sample # 1-1896 — 1 bar tempe cell drying curve

tension in cm	N/A	N/A	0	13.2	23	31.2	54.5	73.5	99.2	202
error in tension value +/-			0	2	5	5	5	5	5	10
container number	1-1896	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12
weight of container/ring,+wet sample	295.37	547.93	571.92	570.81	570.24	570.15	570.03	570.04	569.12	567.04
weight of container/ring,+ dry sample			545.60	545.60	545.60	545.60	545.60	545.60	545.60	545.60
weight of moisture			26.32	25.21	24.64	24.55	24.43	24.44	23.52	21.44
weight of container and ring	175.39	427.98	427.45	427.45	427.45	427.45	427.45	427.45	427.45	427.45
weight of dry sample	119.98	119.95	118.15	118.15	118.15	118.15	118.15	118.15	118.15	118.15
moisture content %			22.28%	21.34%	20.85%	20.78%	20.68%	20.69%	19.91%	18.15%
date measured	08/30/91	08/30/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91
temperature deg. C			27	25	26	25	23	23	22	25

container number	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12	TC-12
tension in cm	0	13.2	23	31.2	54.5	73.5	99.2	202	300	500
Tempe Drying Curve	22.28%	21.34%	20.85%	20.78%	20.68%	20.69%	19.91%	18.15%	15.93%	13.11%
Kettle Drying Curve										
Tempe Wetting Curve										
date measured	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91	09/13/91

Drying curve end

300	500	700	1000	1000	N/A
20	20	20	20	20	
TC-12	TC-12	TC-12	TC-12	TC-12	MC-2
564.42	561.09	559.72	558.35	558.34	191.52
545.60	545.60	545.60	545.60	545.60	178.80
18.82	15.49	14.12	12.75	12.74	12.72
427.45	427.45	427.45	427.45	427.45	60.81
118.15	118.15	118.15	118.15	118.15	117.99
15.93%	13.11%	11.95%	10.79%	10.78%	10.78%
09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91
25	26	22	25	23	24
TC-12	TC-12	A3	A4	B3	B4
700	1000	500	500	700	700
11.95%	10.79%				
		13.37%	13.27%	12.56%	12.46%
09/14/91	09/15/91	09/21/91	09/21/91	09/23/91	09/23/91

5 bar tempe cell wetting curve

N/A	N/A	N/A	5000	4980	3000	3000	3000	3000	2000	2000
			100	20	20	20	20	20	20	20
MC-2	MC-2	TC5-2	TC5-2	TC5-2	TC5-2	TC5-2	TC5-2	TC5-2	TC5-2	TC5-2
187.00	293.83	1367.46	1367.49	1367.42	1367.18	1367.43	1367.58	1367.43	1367.54	1367.71
178.46		1360.34	1360.03	1360.03	1360.03	1360.03	1360.03	1360.03	1360.03	1360.03
8.54		7.12	7.46	7.39	7.15	7.40	7.55	7.40	7.51	7.68
60.83	187.00	1260.74	1260.43	1260.43	1260.43	1260.43	1260.43	1260.43	1260.43	1260.43
117.63	99.60	99.60	99.60	99.60	99.60	99.60	99.60	99.60	99.60	99.60
7.26%		7.15%	7.49%	7.42%	7.18%	7.43%	7.58%	7.43%	7.54%	7.71%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91
			27	25	26	25	23	23	22	25
PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK15-2	PK15-2	PK15-2
1000	1000	2000	2000	3000	3000	5000	5000	7000	7000	10000
11.66%	11.27%	7.73%	7.39%	8.53%	8.50%	7.49%	7.49%	5.20%	5.29%	5.16%
08/05/91	08/05/91	08/19/91	08/19/91	08/15/91	08/15/91	08/05/91	08/05/91	07/24/91	07/24/91	07/29/91

wetting curve ends

2000	2000	1000	1000	1000	1000	N/A
20	20	20	20	20	20	
TC5-2	TC5-2	TC5-2	TC5-2	TC5-2	TC5-2	HC-12
1367.70	1367.62	1368.46	1368.66	1368.78	1368.62	168.54
1360.03	1360.03	1360.03	1360.03	1360.03	1360.03	159.93
7.67	7.59	8.43	8.63	8.75	8.59	8.61
1260.43	1260.43	1260.43	1260.43	1260.43	1260.43	60.52
99.60	99.60	99.60	99.60	99.60	99.60	99.41
7.70%	7.62%	8.46%	8.67%	8.79%	8.63%	8.66%
09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
25	26	22	25	23	24	26
PK15-2	PK15-2	PK15-2	TC5-2	TC5-2	TC5-2	TC5-2
10000	15000	15000	5000	3000	2000	1000
5.16%	4.47%	4.40%				
			7.49%	7.43%	7.62%	8.63%
07/29/91	07/31/91	07/31/91	09/04/91	09/09/91	09/13/91	09/17/91

1 bar tempe cell wetting curve

N/A	N/A	N/A	1000	1000	700	500	300	203	102	72.9
			20	20	20	20				
HC-7	HC-7	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22
90.91	198.43	546.70	545.98	546.14	546.47	546.74	547.44	548.11	549.06	549.86
88.95		539.84	539.52	539.52	539.52	539.52	539.52	539.52	539.52	539.52
1.96		6.86	6.46	6.62	6.95	7.22	7.92	8.59	9.54	10.34
60.73	90.91	439.30	438.98	438.98	438.98	438.98	438.98	438.98	438.98	438.98
28.22	100.54	100.54	100.54	100.54	100.54	100.54	100.54	100.54	100.54	100.54
6.95%		6.83%	6.43%	6.59%	6.92%	7.18%	7.88%	8.55%	9.49%	10.29%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91
			27	25	26	25	23	22	25	25
TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22	TC-22
1000	700	500	300	200	102	72.9	50.9	33.1	21.5	12.6
6.59%	6.92%	7.18%	7.88%	8.55%	9.49%	10.29%	11.07%	12.33%	13.63%	15.22%
09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91	09/16/91

				wetting curve ends	
50.9	33.1	21.5	12.6	0	N/A
	3	2	3	0	
TC-22	TC-22	TC-22	TC-22	TC-22	MC-7
550.65	551.91	553.22	554.82	558.01	179.85
539.52	539.52	539.52	539.52	539.52	161.32
11.13	12.39	13.70	15.30	18.49	18.53
438.98	438.98	438.98	438.98	438.98	60.73
100.54	100.54	100.54	100.54	100.54	100.59
11.07%	12.33%	13.63%	15.22%	18.39%	18.42%
09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
26	22	25	23	24	26

TC-22
0

18.39%

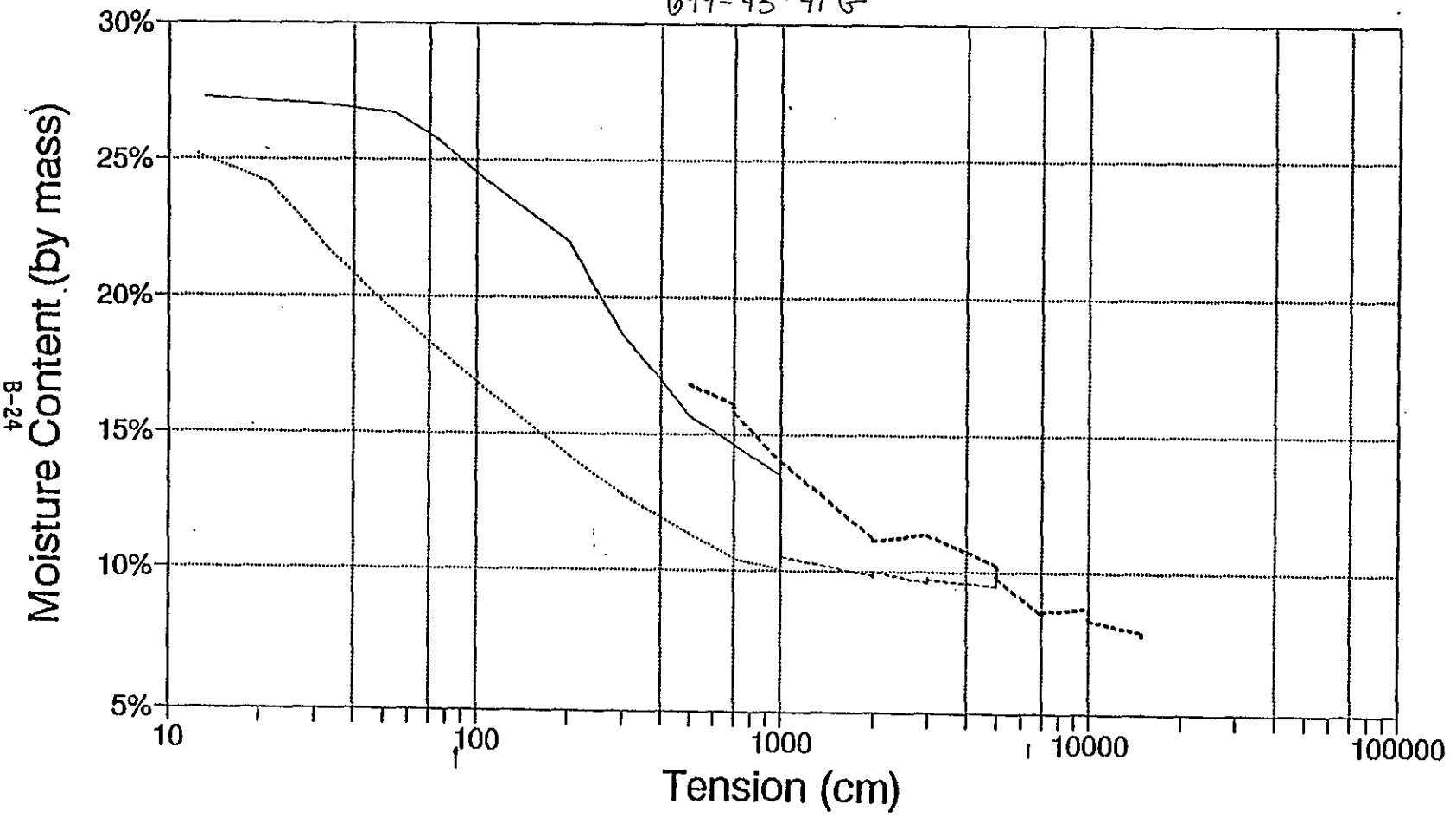
KETTLES							
Sample #	1-1896						
tension in cm	500	500	700	700	1000	1000	2000
error in tension value +/-	20	20	100	100	100	100	100
container number	A3	A4	B3	B4	C3	C4	A13
weight of container/ring,+wet sample	47.81	43.69	47.50	47.23	42.17	46.45	46.58
weight of container/ring,+ dry sample	43.99	40.39	43.92	43.71	39.39	43.31	44.34
weight of moisture	3.82	3.30	3.58	3.52	2.78	3.14	2.24
weight of container and ring	15.41	15.53	15.42	15.47	15.55	15.46	15.36
weight of dry sample	28.58	24.86	28.50	28.24	23.84	27.85	28.98
moisture content %	13.37%	13.27%	12.56%	12.46%	11.66%	11.27%	7.73%
date measured	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91
temperature deg. C	23	23	25	25	24	24	23

2000	3000	3000	5000	5000	7000	7000	10000	10000	15000	15000
100	200	200								
A14	B13	B14	C13	C14	A23	A24	B23	B24	C23	C24
44.39	47.30	46.08	44.89	44.29	48.12	46.50	44.97	45.57	43.15	45.16
42.40	44.84	43.68	42.83	42.27	46.51	44.93	43.53	44.10	41.96	43.91
1.99	2.46	2.40	2.06	2.02	1.61	1.57	1.44	1.47	1.19	1.25
15.46	16.01	15.46	15.31	15.3	15.57	15.23	15.64	15.62	15.36	15.5
26.94	28.83	28.22	27.52	26.97	30.94	29.70	27.89	28.48	26.60	28.41
7.39%	8.53%	8.50%	7.49%	7.49%	5.20%	5.29%	5.16%	5.16%	4.47%	4.40%
09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
23	25	25	24	24	23	23	25	25	24	24

B-POND Moisture Retention

Sample 1-1931

699-43-41 G



1 B Drying — 5 B Wetting — 1 B Wetting — Kettle Drying

Tension (cm)	1 B Drying Moisture (%)	5 B Wetting Moisture (%)	1 B Wetting Moisture (%)	Kettle Drying Moisture (%)
13.2	27.26%			
23	27.09%			
31.2	27.02%			
54.5	26.67%			
73.5	25.82%			
99.2	24.50%			
202	22.00%			
300	18.62%			
500	15.70%			
700	14.62%			
1000	13.50%			
1000	13.41%			
5000		9.71%		
4980		9.53%		
3000		9.76%		
3000		9.72%		
3000		9.83%		
3000		9.64%		
2000		9.99%		
2000		9.89%		
2000		9.81%		
2000		9.91%		
1000		10.56%		
1000		10.60%		
1000		10.92%		
1000		10.81%		
1000			10.00%	
1000			10.07%	
700			10.46%	
500			11.36%	
300			12.75%	
203			14.15%	
102			16.80%	
72.9			18.22%	
50.9			19.72%	
33.1			21.76%	
21.5			24.10%	
12.6			25.19%	
500				16.82%
500				16.81%
700				16.09%
700				15.82%
1000				13.97%
1000				14.07%
2000				11.23%
2000				11.10%
3000				11.41%
3000				11.35%
5000				10.29%
5000				9.80%
7000				8.56%
7000				8.65%
10000				8.77%
10000				8.36%
15000				7.95%
15000				7.69%

9 3 1 2 7 0 5 5 5

TEMPE CELLS	Sample #	1-1931	1 bar tempe cell drying curve							
tension in cm	N/A N/A		0	13.2	23	31.2	54.5	73.5	99.2	202
error in tension value +/-			0	2	5	5	5	5	5	10
container number	1-1931	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13
weight of container/ring,+wet sample	533.59	537.45	564.30	563.63	563.45	563.37	563.00	562.09	560.67	557.99
weight of container/ring,+ dry sample			534.40	534.40	534.40	534.40	534.40	534.40	534.40	534.40
weight of moisture			29.90	29.23	29.05	28.97	28.60	27.69	26.27	23.59
weight of container and ring	424.38	428.22	427.17	427.17	427.17	427.17	427.17	427.17	427.17	427.17
weight of dry sample	109.21	109.23	107.23	107.23	107.23	107.23	107.23	107.23	107.23	107.23
moisture content %			27.88%	27.26%	27.09%	27.02%	26.67%	25.82%	24.50%	22.00%
date measured	08/30/91	08/30/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91
temperature deg. C			27	25	26	25	23	23	22	25
container number	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13	TC-13
tension in cm	0	13.2	23	31.2	54.5	73.5	99.2	202	300	500
Tempe Drying Curve	27.88%	27.26%	27.09%	27.02%	26.67%	25.82%	24.50%	22.00%	18.62%	15.70%
Kettle Drying Curve										
Tempe Wetting Curve										
date measured	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91	09/13/91

Drying curve end

300	500	700	1000	1000	N/A
20	20	20	20	20	
TC-13	TC-13	TC-13	TC-13	TC-13	MC-3
554.37	551.23	550.08	548.88	548.78	182.61
534.40	534.40	534.40	534.40	534.40	168.23
19.97	16.83	15.68	14.48	14.38	14.38
427.17	427.17	427.17	427.17	427.17	61
107.23	107.23	107.23	107.23	107.23	107.23
18.62%	15.70%	14.62%	13.50%	13.41%	13.41%
09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91
25	26	22	25	23	24
TC-13	TC-13	A5	A6	B5	B6
700	1000	500	500	700	700
14.62%	13.50%				
		16.82%	16.81%	16.09%	15.82%
09/14/91	09/15/91	09/21/91	09/21/91	09/23/91	09/23/91

5 bar tempe cell wetting curve

N/A	N/A	N/A	5000	4980	3000	3000	3000	3000	2000	2000
			100	20	20	20	20	20	20	20
MC-3	MC-3	TC5-3	TC5-3	TC5-3	TC5-3	TC5-3	TC5-3	TC5-3	TC5-3	TC5-3
132.56	230.44	1330.55	1330.17	1330.01	1330.22	1330.18	1330.28	1330.11	1330.42	1330.33
126.15		1321.97	1321.52	1321.52	1321.52	1321.52	1321.52	1321.52	1321.52	1321.52
6.41		8.58	8.65	8.49	8.70	8.66	8.76	8.59	8.90	8.81
61.02	132.56	1232.86	1232.41	1232.41	1232.41	1232.41	1232.41	1232.41	1232.41	1232.41
65.13	89.11	89.11	89.11	89.11	89.11	89.11	89.11	89.11	89.11	89.11
9.84%		9.63%	9.71%	9.53%	9.76%	9.72%	9.83%	9.64%	9.99%	9.89%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91
			27	25	26	25	23	23	22	25
PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK15-2	PK15-2	PK15-2
1000	1000	2000	2000	3000	3000	5000	5000	7000	7000	10000
13.97%	14.07%	11.23%	11.10%	11.41%	11.35%	10.29%	9.80%	8.56%	8.65%	8.77%
08/05/91	08/05/91	08/19/91	08/19/91	08/15/91	08/15/91	08/05/91	08/05/91	07/24/91	07/24/91	07/29/91

wetting curve ends

2000	2000	1000	1000	1000	1000	N/A
20	20	20	20	20	20	
TC5-3	TC5-3	TC5-3	TC5-3	TC5-3	TC5-3	MC-13
1330.26	1330.35	1330.93	1330.97	1331.25	1331.15	158.99
1321.52	1321.52	1321.52	1321.52	1321.52	1321.52	149.43
8.74	8.83	9.41	9.45	9.73	9.63	9.56
1232.41	1232.41	1232.41	1232.41	1232.41	1232.41	60.65
89.11	89.11	89.11	89.11	89.11	89.11	88.78
9.81%	9.91%	10.56%	10.60%	10.92%	10.81%	10.77%
09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
25	26	22	25	23	24	26

PK15-2	PK15-2	PK15-2	TC5-3	TC5-3	TC5-3	TC5-3
10000	15000	15000	5000	3000	2000	1000

8.36%	7.95%	7.69%				
			9.71%	9.64%	9.91%	10.81%
07/29/91	07/31/91	07/31/91	09/04/91	09/09/91	09/13/91	09/17/91

1 bar tempe cell wetting curve

N/A	N/A	N/A	1000	1000	700	500	300	203	102	72.9
			20	20	20	20	20	3	2	3
MC-8	MC-8	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23
169.11	268.06	532.67	533.28	533.34	533.70	534.51	535.76	537.02	539.41	540.69
159.46		523.95	524.27	524.27	524.27	524.27	524.27	524.27	524.27	524.27
9.65		8.72	9.01	9.07	9.43	10.24	11.49	12.75	15.14	16.42
60.76	169.11	433.81	434.13	434.13	434.13	434.13	434.13	434.13	434.13	434.13
98.70	90.14	90.14	90.14	90.14	90.14	90.14	90.14	90.14	90.14	90.14
9.78%		9.68%	10.00%	10.07%	10.46%	11.36%	12.75%	14.15%	16.80%	18.22%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91
			27	25	26	25	23	22	25	25

TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23	TC-23
1000	700	500	300	203	102	72.9	50.9	33.1	21.5	12.6

10.07%	10.46%	11.43%	12.75%	14.15%	16.80%	18.22%	19.72%	21.76%	24.10%	25.19%
09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/14/91	09/15/91	09/16/91	

				wetting curve ends		
50.9	33.1	21.5	12.6	0	N/A	
2	3	2	3	0		
TC-23	TC-23	TC-23	TC-23	TC-23	MC-8	
542.04	543.88	545.99	546.97	548.82	175.21	
524.27	524.27	524.27	524.27	524.27	150.88 *	
17.77	19.61	21.72	22.70	24.55	24.33	
434.13	434.13	434.13	434.13	434.13	60.74	
90.14	90.14	90.14	90.14	90.14	90.14	
19.72%	21.76%	24.10%	25.19%	27.24%	27.00%	
09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91	
26	22	25	23	24	26	

TC-23
0

27.24%

* Lost about a gram of mass taking it out of the oven. Use the formula in AZ6

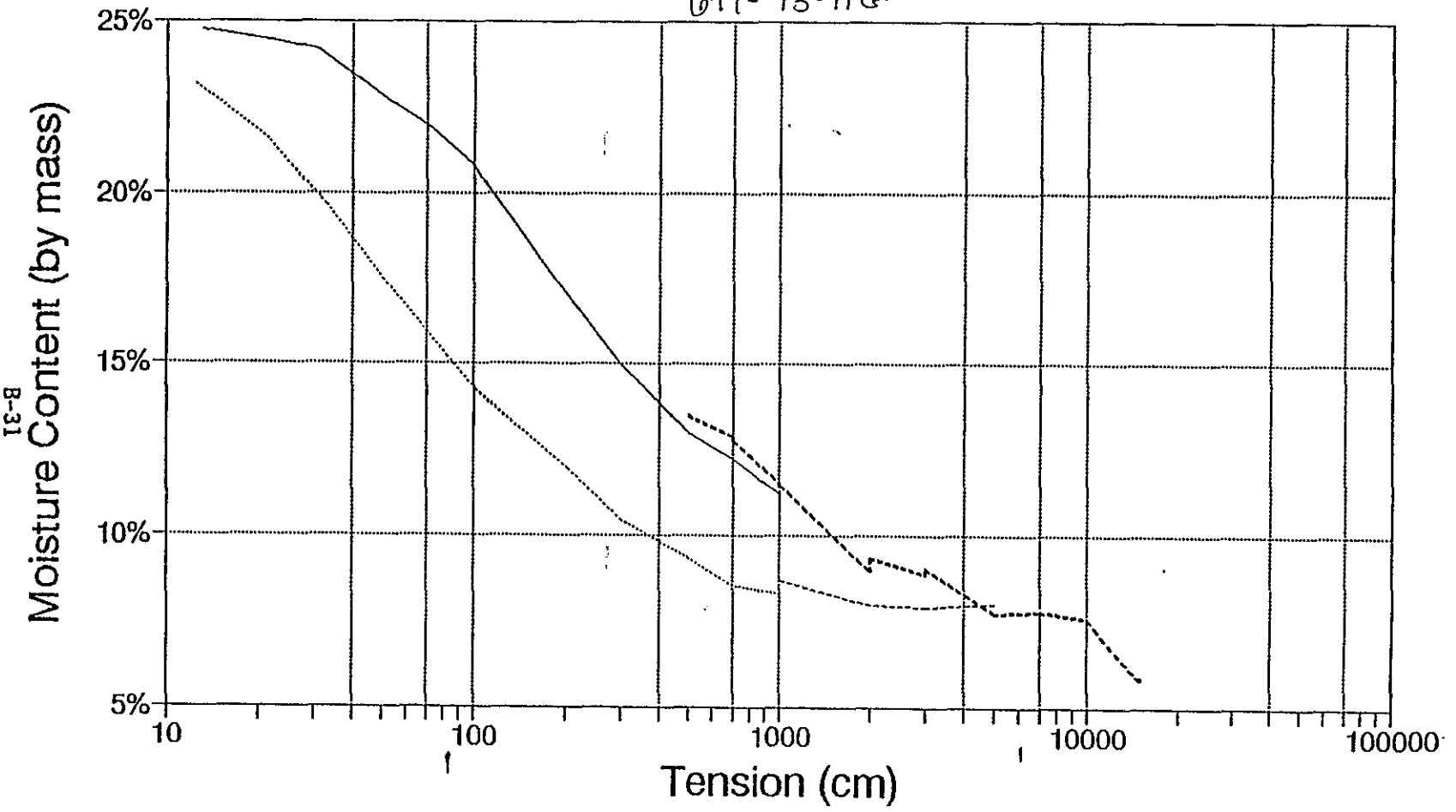
KETTLES							
Sample #	1-1931						
tension in cm	500	500	700	700	1000	1000	2000
error in tension value +/-	20	20	100	100	100	100	100
container number	A5	A6	B5	B6	C5	C6	A15
weight of container/ring,+wet sample	42.21	47.33	45.56	44.33	43.46	41.97	43.84
weight of container/ring,+ dry sample	38.36	42.78	41.38	40.46	40.05	38.68	40.98
weight of moisture	3.85	4.55	4.18	3.87	3.41	3.29	2.86
weight of container and ring	15.47	15.72	15.40	16.00	15.64	15.29	15.52
weight of dry sample	22.89	27.06	25.98	24.46	24.41	23.39	25.46
moisture content %	16.82%	16.81%	16.09%	15.82%	13.97%	14.07%	11.23%
date measured	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91
temperature deg. C	23	23	25	25	24	24	23

2000	3000	3000	5000	5000	7000	7000	10000	10000	15000	15000
100	200	200								
A16	B15	B16	C15	C16	A25	A26	B25	B26	C25	C26
46.97	44.03	43.33	47.27	44.49	47.42	43.65	45.02	45.18	44.93	44.32
43.82	41.08	40.50	44.28	41.89	44.88	41.39	42.63	42.88	42.75	42.26
3.15	2.95	2.83	2.99	2.60	2.54	2.26	2.39	2.30	2.18	2.06
15.43	15.23	15.57	15.22	15.37	15.2	15.27	15.38	15.38	15.33	15.46
28.39	25.85	24.93	29.06	26.52	29.68	26.12	27.25	27.50	27.42	26.80
11.10%	11.41%	11.35%	10.29%	9.80%	8.56%	8.65%	8.77%	8.36%	7.95%	7.69%
09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
23	25	25	24	24	23	23	25	25	24	24

B-POND Moisture Retention

Sample 1-2003

699-43-41G



1 B Drying — 5 B Wetting — 1 B Wetting — Kettle Drying

Tension (cm)	1 B Drying Moisture (%)	5 B Wetting Moisture (%)	1 B Wetting Moisture (%)	Kettle Drying Moisture (%)
13.2	24.74%			
23	24.40%			
31.2	24.20%			
54.5	22.57%			
73.5	21.83%			
99.2	20.81%			
202	17.01%			
300	14.94%			
500	13.00%			
700	12.23%			
1000	11.20%			
1000	11.08%			
4980		8.04%		
3000		7.95%		
2000		7.97%		
1000		8.66%		
1000			8.28%	
700			8.56%	
500			9.33%	
300			10.47%	
203			11.96%	
102			14.21%	
72.9			15.81%	
50.9			17.46%	
33.1			19.69%	
21.5			21.54%	
12.6			23.13%	
500				13.50%
700				12.90%
700				12.77%
1000				11.55%
1000				11.51%
2000				8.97%
2000				9.35%
3000				8.84%
3000				9.07%
5000				7.75%
5000				7.75%
7000				7.77%
10000				7.61%
15000				5.81%
15000				5.99%

9 3 1 2 7 5 9 0 5 6 2

TEMPE CELLS	Sample #	1-2003	1 bar tempe cell drying curve								
tension in cm	N/A	N/A	0	13.2	23	31.2	54.5	73.5	99.2	202	300
error in tension value +/-			0	2	5	5	5	5	5	10	20
container number	1-2003	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14
weight of container/ring,+wet sam	190.03	536.87	561.70	560.47	560.11	559.90	558.16	557.37	556.28	552.22	550.00
weight of container/ring,+ dry sample			534.04	534.04	534.04	534.04	534.04	534.04	534.04	534.04	534.04
weight of moisture			27.66	26.43	26.07	25.86	24.12	23.33	22.24	18.18	15.96
weight of container and ring	81.53	428.31	427.19	427.19	427.19	427.19	427.19	427.19	427.19	427.19	427.19
weight of dry sample	108.50	108.56	106.85	106.85	106.85	106.85	106.85	106.85	106.85	106.85	106.85
moisture content %			25.89%	24.74%	24.40%	24.20%	22.57%	21.83%	20.81%	17.01%	14.94%
date measured	08/30/91	08/30/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91
temperature deg. C			27	25	26	25	23	23	22	25	25

container number	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14	TC-14
tension in cm	0	13.2	23	31.2	54.5	73.5	99.2	202	300	500	700
Tempe Drying Curve	25.89%	24.74%	24.40%	24.20%	22.57%	21.83%	20.81%	17.01%	14.94%	13.00%	12.23%
Kettle Drying Curve											
Tempe Wetting Curve											
date measured	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91

Drying curve end

500	700	1000	1000	N/A
20	20	20	20	
TC-14	TC-14	TC-14	TC-14	SHL-9
547.93	547.11	546.01	545.88	179.52
534.04	534.04	534.04	534.04	167.88
13.89	13.07	11.97	11.84	11.64
427.19	427.19	427.19	427.19	61.03
106.85	106.85	106.85	106.85	106.85
13.00%	12.23%	11.20%	11.08%	10.89%
09/13/91	09/14/91	09/15/91	09/16/91	09/17/91
26	22	25	23	24
TC-14	A7	A8	B7	B8
1000	500	500	700	700
11.20%				
	13.50%	13.50%	12.90%	12.77%
09/15/91	09/21/91	09/21/91	09/23/91	09/23/91

5 bar tempe cell wetting curve

N/A	N/A	N/A	5000	4980	3000	3000	3000	3000	2000	2000
			100	20	20	20	20	20	20	20
MC-9	MC-9	TC5-4	TC5-4	TC5-4	TC5-4	TC5-4	TC5-4	TC5-4	TC5-4	TC5-4
116.26	224.62	1366.58	1365.70	1365.36	1365.27	1365.52	1365.42	1365.37	1365.50	1365.29
112.21		1359.30	1357.29	1357.29	1357.29	1357.29	1357.29	1357.29	1357.29	1357.29
4.05		7.28	8.41	8.07	7.98	8.23	8.13	8.08	8.21	8.00
60.86	116.26	1258.86	1256.85	1256.85	1256.85	1256.85	1256.85	1256.85	1256.85	1256.85
51.35	100.44	100.44	100.44	100.44	100.44	100.44	100.44	100.44	100.44	100.44
7.89%		7.25%	8.37%	8.04%	7.95%	8.20%	8.10%	8.05%	8.18%	7.97%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91
			27	25	26	25	23	23	22	25
PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK15-2	PK15-2	PK15-2
1000	1000	2000	2000	3000	3000	5000	5000	7000	7000	10000
11.55%	11.51%	8.97%	9.35%	8.84%	9.07%	7.75%	7.75%	7.77%	8.67%	6.14%
08/05/91	08/05/91	08/19/91	08/19/91	08/15/91	08/15/91	08/05/91	08/05/91	07/24/91	07/24/91	07/29/91

wetting curve ends1 bar tempe cell wetting curve

2000	2000	1000	1000	1000	1000	N/A	N/A	N/A	N/A	1000	1000	700	500	300	203	102	72.9	50.9
20	20	20	20	20	20					20	20	20	20	20	3	2	3	2
TC5-4	TC5-4	TC5-4	TC5-4	TC5-4	TC5-4	MC-14	MC-9	MC-9	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24
1365.35	1365.29	1365.99	1366.08	1366.12	1366.14	169.38	116.26	326.01	531.65	532.12	532.26	532.52	533.25	534.32	535.72	537.83	539.34	540.89
1357.29	1357.29	1357.29	1357.29	1357.29	1357.29	160.35	112.21		524.32	524.48	524.48	524.48	524.48	524.48	524.48	524.48	524.48	524.48
8.06	8.00	8.70	8.79	8.83	8.85	9.03	4.05		7.33	7.64	7.78	8.04	8.77	9.84	11.24	13.35	14.86	16.41
1256.85	1256.85	1256.85	1256.85	1256.85	1256.85	60.21	60.86	224.61	430.33	430.49	430.49	430.49	430.49	430.49	430.49	430.49	430.49	430.49
100.44	100.44	100.44	100.44	100.44	100.44	100.14	51.35	93.99	93.99	93.99	93.99	93.99	93.99	93.99	93.99	93.99	93.99	93.99
8.03%	7.97%	8.66%	8.75%	8.79%	8.81%	9.02%	7.89%		7.80%	8.13%	8.28%	8.56%	9.33%	10.47%	11.96%	14.21%	15.81%	17.46%
09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91	09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91
25	26	22	25	23	24	26				27	25	26	25	23	22	25	25	26

PK15-2	PK15-2	PK15-2	TC5-4	TC5-4	TC5-4	TC5-4	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24	TC-24
10000	15000	15000	5000	3000	2000	1000	1000	700	500	300	203	102	72.9	50.9	33.1	21.5	12.6	0

7.61%	5.81%	5.99%																
			8.37%	8.05%	7.97%	8.81%	8.28%	8.56%	9.33%	10.47%	11.96%	14.21%	15.81%	17.46%	19.69%	21.54%	23.13%	25.50%
07/29/91	07/31/91	07/31/91	09/04/91	09/09/91	09/13/91	09/17/91	09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	

			Wetting curve ends	
33.1	21.5	12.6	0	N/A
3	2	3	0	
TC-24	TC-24	TC-24	TC-24	HC-9
542.98	544.72	546.22	548.44	178.69
524.48	524.48	524.48	524.48	154.32
18.50	20.24	21.74	23.96	24.37
430.49	430.49	430.49	430.49	60.86
93.99	93.99	93.99	93.99	93.46
19.69%	21.54%	23.13%	25.50%	26.08%
09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
22	25	23	24	26

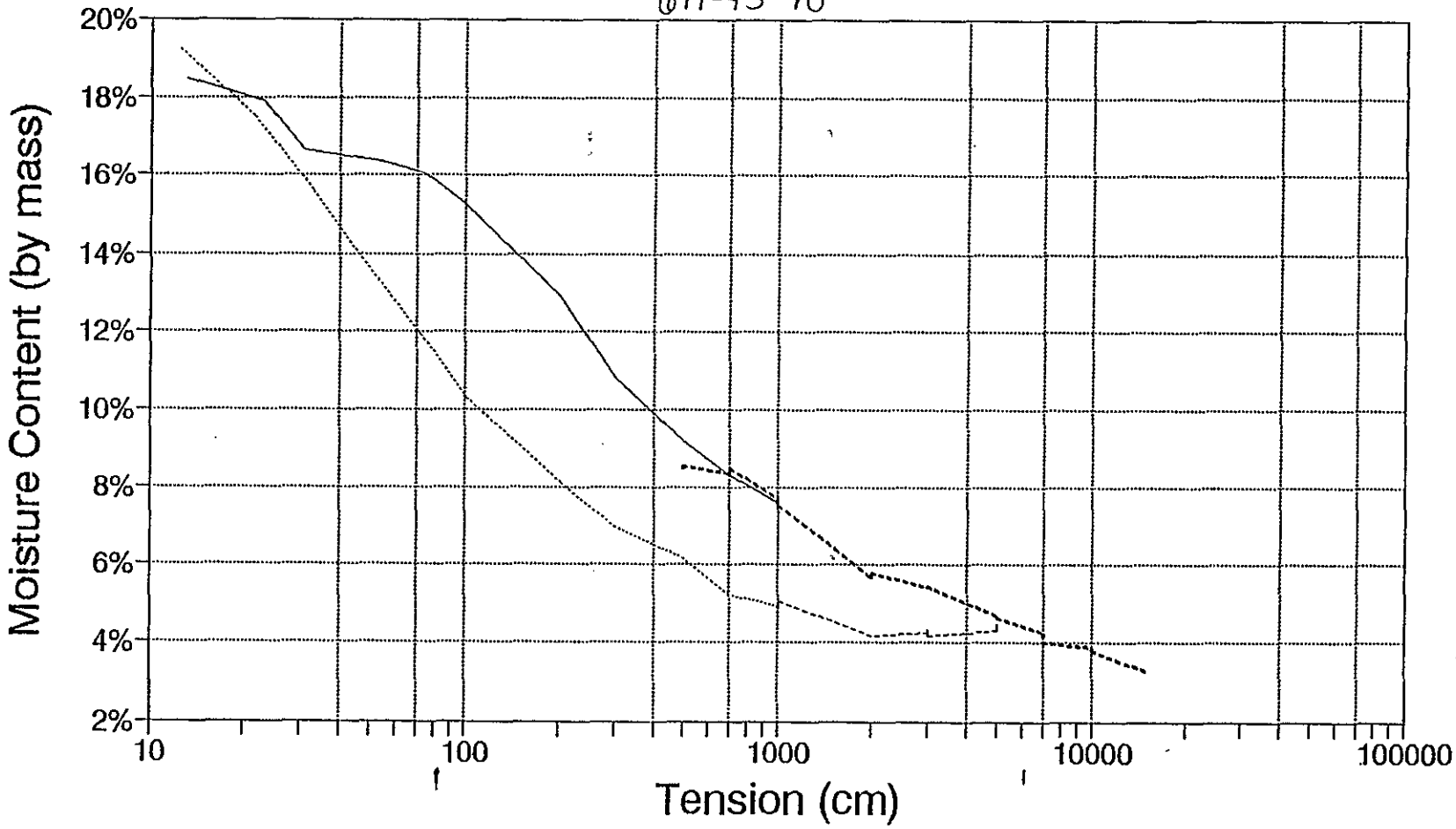
KETTLES	Sample #	1-2003										
tension I	500	500	700	700	1000	1000	2000	2000	3000	3000	5000	5000
error	20	20	100	100	100	100	100	100	200	200		
container	A7	A8	B7	B8	C7	C8	A17	A18	B17	B18	C17	C18
weight of	47.35	48.99	43.94	47.86	41.94	47.00	34.23	33.13	43.56	41.17	48.34	48.43
weight of	43.55	45.02	40.72	44.18	39.22	43.77	32.69	31.63	41.27	39.03	45.97	46.07
weight of	3.80	3.97	3.22	3.68	2.72	3.23	1.54	1.50	2.29	2.14	2.37	2.36
weight of	15.4	15.62	15.76	15.36	15.67	15.7	15.53	15.58	15.37	15.43	15.39	15.62
weight of	28.15	29.40	24.96	28.82	23.55	28.07	17.16	16.05	25.90	23.60	30.58	30.45
moisture	13.50%	13.50%	12.90%	12.77%	11.55%	11.51%	8.97%	9.35%	8.84%	9.07%	7.75%	7.75%
date meas	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
temperatu	23	23	25	25	24	24	23	23	25	25	24	24

7000	7000	10000	10000	15000	15000
A27	A28	B27	B28	C27	C28
23.41	24.04	27.02	25.01	29.04	28.92
22.85	23.35	26.35	24.33	28.29	28.16
0.56	0.69	0.67	0.68	0.75	0.76
15.64	15.39	15.44	15.4	15.39	15.47
7.21	7.96	10.91	8.93	12.90	12.69
7.77%	8.67%	6.14%	7.61%	5.81%	5.99%
09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
23	23	25	25	24	24

B-POND Moisture Retention

Sample 1-2004

699-43-40



1 B Drying — 5 B Wetting — 1 B Wetting — Kettle Drying

Tension (cm)	1 B Drying Moisture (%)	5 B Wetting Moisture (%)	1 B Wetting Moisture (%)	Kettle Drying Moisture (%)
13.2	18.47%			
23	17.91%			
31.2	16.66%			
54.5	16.37%			
73.5	16.08%			
99.2	15.30%			
202	12.90%			
300	10.84%			
500	9.20%			
700	8.29%			
1000	7.57%			
1000	7.55%			
5000		4.47%		
4980		4.31%		
3000		4.16%		
3000		4.34%		
3000		4.31%		
3000		4.27%		
2000		4.16%		
1000		5.08%		
1000			4.98%	
1000			4.93%	
700			5.21%	
500			6.15%	
300			6.97%	
203			8.14%	
102			10.29%	
72.9			11.93%	
50.9			13.51%	
33.1			15.63%	
21.5			17.55%	
12.6			19.21%	
500				8.47%
500				8.54%
700				8.33%
700				8.50%
1000				7.70%
1000				7.54%
2000				5.65%
2000				5.75%
3000				5.38%
3000				5.42%
5000				4.66%
5000				4.61%
7000				4.25%
7000				4.00%
10000				3.89%
10000				3.80%
15000				3.26%

9 3 1 2 7 0 5 6 9

TEMPE CELLS	Sample #	1-2004	1 bar tempe cell drying curve								
tension in cm	N/A	N/A	0	13.2	23	31.2	54.5	73.5	99.2	202	300
error in tension value +/-			0	2	5	5	5	5	5	10	20
container number	1-2004	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15
weight of container/ring,+wet sam	547.96	542.17	563.52	561.89	561.25	559.83	559.50	559.17	558.29	555.56	553.22
weight of container/ring,+ dry sample			540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89	540.89
weight of moisture			22.63	21.00	20.36	18.94	18.61	18.28	17.40	14.67	12.33
weight of container and ring	433.69	427.86	427.19	427.19	427.19	427.19	427.19	427.19	427.19	427.19	427.19
weight of dry sample	114.27	114.31	113.70	113.70	113.70	113.70	113.70	113.70	113.70	113.70	113.70
moisture content %			19.90%	18.47%	17.91%	16.66%	16.37%	16.08%	15.30%	12.90%	10.84%
date measured	08/30/91	08/30/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91
temperature deg. C			27	25	26	25	23	23	22	25	25

container number	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15	TC-15
tension in cm	0	13.2	23	31.2	54.5	73.5	99.2	202	300	500	700
Tempe Drying Curve	19.90%	18.47%	17.91%	16.66%	16.37%	16.08%	15.30%	12.90%	10.84%	9.20%	8.29%
Kettle Drying Curve											
Tempe Wetting Curve											
date measured	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91

Drying curve end

500	700	1000	1000	N/A
20	20	20	20	
TC-15	TC-15	TC-15	TC-15	SML-9
551.35	550.32	549.50	549.48	182.53
540.89	540.89	540.89	540.89	173.96
10.46	9.43	8.61	8.59	8.57
427.19	427.19	427.19	427.19	60.48
113.70	113.70	113.70	113.70	113.48
9.20%	8.29%	7.57%	7.55%	7.55%
09/13/91	09/14/91	09/15/91	09/16/91	09/17/91
26	22	25	23	24
TC-15	A9	A10	B9	B10
1000	500	500	700	700
7.57%				
	8.47%	8.54%	8.33%	8.50%
09/15/91	09/21/91	09/21/91	09/23/91	09/23/91

5 bar tempe cell wetting curve

N/A	N/A	N/A	5000	4980	3000	3000	3000	3000	2000	2000	2000
			100	20	20	20	20	20	20	20	20
MC-5	MC-5	TC5-5	TC5-5	TC5-5	TC5-5	TC5-5	TC5-5	TC5-5	TC5-5	TC5-5	TC5-5
136.15	248.69	1373.05	1372.77	1372.60	1372.44	1372.64	1372.60	1372.56	1372.92	1372.48	1372.48
132.98		1368.85	1367.96	1367.96	1367.96	1367.96	1367.96	1367.96	1367.96	1367.96	1367.96
3.17		4.20	4.81	4.64	4.48	4.68	4.64	4.60	4.96	4.52	4.52
60.48	136.15	1261.02	1260.13	1260.13	1260.13	1260.13	1260.13	1260.13	1260.13	1260.13	1260.13
72.50	107.83	107.83	107.83	107.83	107.83	107.83	107.83	107.83	107.83	107.83	107.83
4.37%		3.90%	4.47%	4.31%	4.16%	4.34%	4.31%	4.27%	4.60%	4.20%	4.20%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/09/91	09/10/91	09/11/91	09/12/91
			27	25	26	25	23	23	22		25
PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK5-1	PK15-2	PK15-2	PK15-2	PK15-2
1000	1000	2000	2000	3000	3000	5000	5000	7000	7000	10000	10000
7.70%	7.54%	5.65%	5.75%	5.38%	5.42%	4.66%	4.61%	4.25%	4.00%	3.89%	3.80%
08/05/91	08/05/91	08/19/91	08/19/91	08/15/91	08/15/91	08/05/91	08/05/91	07/24/91	07/24/91	07/29/91	07/29/91

wetting curve ends

2000	1000	1000	1000	1000	N/A
20	20	20	20	20	
TC5-5	TC5-5	TC5-5	TC5-5	TC5-5	MC-15
1372.44	1372.98	1373.12	1373.37	1373.43	175.28
1367.96	1367.96	1367.96	1367.96	1367.96	169.78
4.48	5.02	5.16	5.41	5.47	5.50
1260.13	1260.13	1260.13	1260.13	1260.13	62.44
107.83	107.83	107.83	107.83	107.83	107.34
4.16%	4.66%	4.79%	5.02%	5.08%	5.12%
09/13/91	09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
26	22	25	23	24	26

PK15-2	PK15-2	TC5-5	TC5-5	TC5-5	TC5-5
15000	15000	5000	3000	2000	1000
3.26%	2.99%				
		4.47%	4.27%	4.16%	5.08%
07/31/91	07/31/91	09/04/91	09/09/91	09/13/91	09/17/91

1 bar tempe cell wetting curve

N/A	N/A	N/A	1000	1000	700	500	300	203	102	72.9	50.9
			20	20	20	20	20	3	2	3	2
MC-10	MC-10	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25
161.28	269.12	541.67	542.42	542.37	542.66	543.63	544.48	545.68	547.90	549.59	551.22
156.85		537.04	537.29	537.29	537.29	537.29	537.29	537.29	537.29	537.29	537.29
4.43		4.63	5.13	5.08	5.37	6.34	7.19	8.39	10.61	12.30	13.93
60.50	161.28	433.94	434.19	434.19	434.19	434.19	434.19	434.19	434.19	434.19	434.19
96.35	103.10	103.10	103.10	103.10	103.10	103.10	103.10	103.10	103.10	103.10	103.10
4.60%		4.49%	4.98%	4.93%	5.21%	6.15%	6.97%	8.14%	10.29%	11.93%	13.51%
09/03/91	09/03/91	09/03/91	09/04/91	09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91
			27	25	26	25	23	22	25	25	26

TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25	TC-25
1000	700	500	300	203	102	72.9	50.9	33.1	21.5	12.6	0
4.93%	5.21%	6.15%	6.97%	8.14%	10.29%	11.93%	13.51%	15.63%	17.55%	19.21%	21.07%
09/05/91	09/06/91	09/07/91	09/08/91	09/10/91	09/11/91	09/12/91	09/13/91	09/14/91	09/15/91	09/16/91	

			wetting curve ends	
33.1	21.5	12.6	0	N/A
3	2	3	0	
TC-25	TC-25	TC-25	TC-25	MC-10
553.4	555.38	557.09	559.01	185.13
537.29	537.29	537.29	537.29	163.33
16.11	18.09	19.80	21.72	21.80
434.19	434.19	434.19	434.19	60.50
103.10	103.10	103.10	103.10	102.83
15.63%	17.55%	19.21%	21.07%	21.20%
09/14/91	09/15/91	09/16/91	09/17/91	09/18/91
22	25	23	24	26

KETTLES	Sample #	1-2003										
tension i	500	500	700	700	1000	1000	2000	2000	3000	3000	5000	5000
error	20	20	100	100	100	100	100	100	200	200		
container	A9	A10	B9	B10	C9	C10	A19	A20	B19	B20	C19	C20
weight of	46.45	53.97	48.90	47.87	53.34	51.50	45.22	48.56	49.44	52.52	46.46	43.65
weight of	44.02	50.94	46.33	45.34	50.63	48.97	43.62	46.76	47.70	50.63	45.08	42.41
weight of	2.43	3.03	2.57	2.53	2.71	2.53	1.60	1.80	1.74	1.89	1.38	1.24
weight of	15.32	15.46	15.48	15.57	15.44	15.4	15.31	15.47	15.37	15.76	15.46	15.54
weight of	28.70	35.48	30.85	29.77	35.19	33.57	28.31	31.29	32.33	34.87	29.62	26.87
moisture	8.47%	8.54%	8.33%	8.50%	7.70%	7.54%	5.65%	5.75%	5.38%	5.42%	4.66%	4.61%
date meas	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91	09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
temperatu	23	23	25	25	24	24	23	23	25	25	24	24

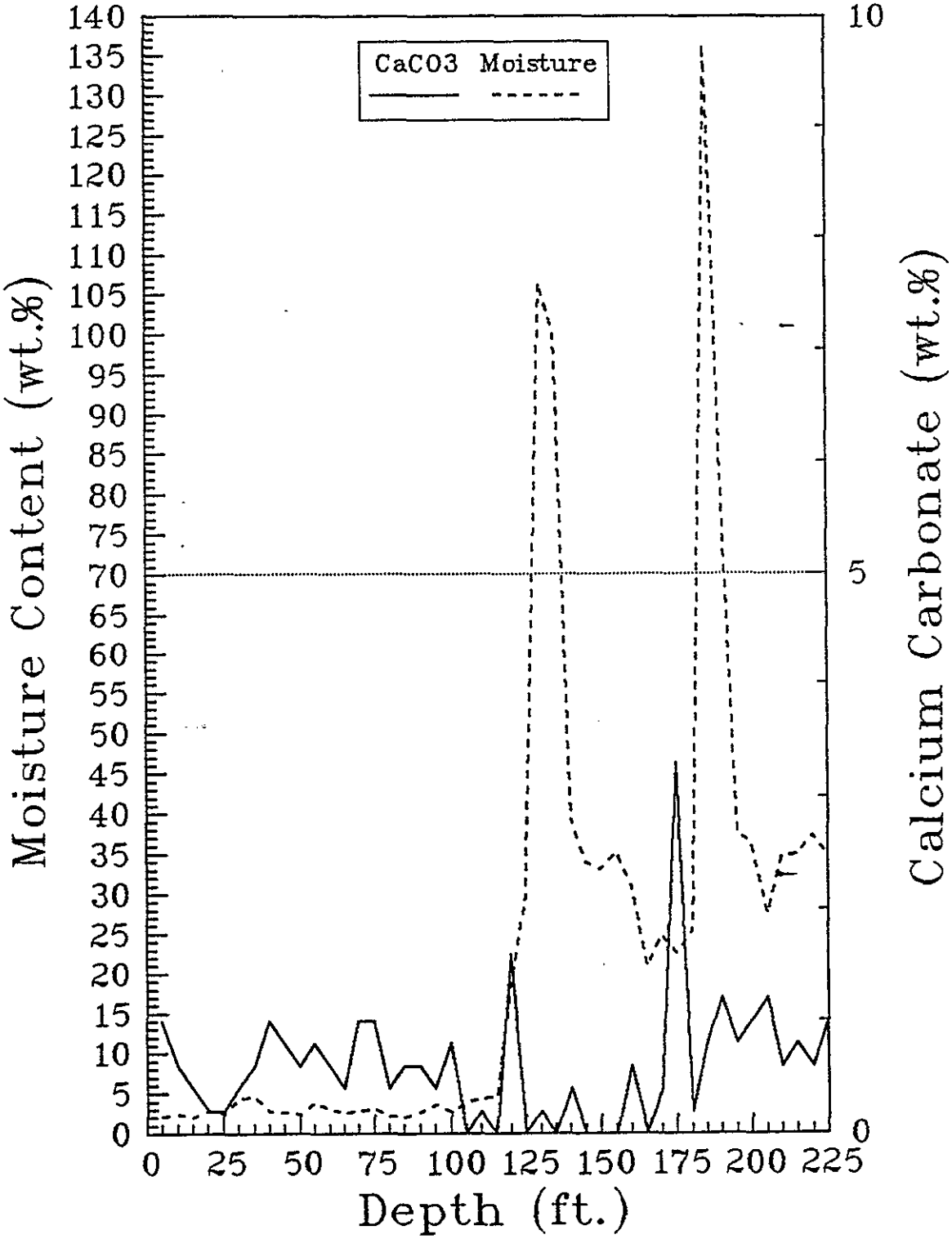
7000	7000	10000	10000	15000	15000
A29	A30	B29	B30	C29	C30
49.25	51.20	45.37	46.65	43.69	40.85
47.88	49.83	44.24	45.51	42.80	40.11
1.37	1.37	1.13	1.14	0.89	0.74
15.64	15.61	15.22	15.50	15.54	15.34
32.24	34.22	29.02	30.01	27.26	24.77
4.25%	4.00%	3.89%	3.80%	3.26%	2.99%
09/21/91	09/21/91	09/23/91	09/23/91	09/25/91	09/25/91
23	23	25	25	24	24

173

VALIDATED

SIGNATURE/DATE

WELL 699-40-40A



9 3 1 2 7 0 5 7 5

293

	A	B	C
1	WELL 699-40-40A		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	1	2.13
7	10	0.6	2.37
8	15	0.4	2.08
9	20	0.2	2.84
10	25	0.2	2.44
11	30	0.4	4.47
12	35	0.6	4.52
13	40	1	2.77
14	45	0.8	2.64
15	50	0.6	2.39
16	55	0.8	3.85
17	60	0.6	3.00
18	65	0.4	2.69
19	70	1	2.76
20	75	1	3.07
21	80	0.4	2.14
22	85	0.6	2.08
23	90	0.6	2.65
24	95	0.4	3.54
25	100	0.8	2.62
26	105	0	3.92
27	110	0.2	4.26
28	115	0	4.60
29	120	1.6	18.63
30	125	0	29.74
31	130	0.2	106.33
32	135	0	99.83
33	140	0.4	39.19
34	145	0	33.89
35	150	0	33.12
36	155	0	35.08
37	160	0.6	30.81
38	165	0	20.86
39	170	0.4	24.80
40	175	3.3	22.64
41	180	0.2	25.23
42	185	0.8	136.29
43	190	1.2	82.00
44	195	0.8	37.74
45	200	1	36.02
46	205	1.2	27.46
47	210	0.6	34.59

9 3 1 2 7 5 9 0 5 7 6

383

	A	B	C
48	215	0.8	34.92
49	220	0.6	37.17
50	225	1	34.75

9312705577

9 3 1 2 7 5 9 0 5 7 8

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SIEVE ANALYSIS DATA SHEET

Sample No. 1-2291 Page 1 of 1

Tested By: TERRY L. ENGLAND Date 9-30-91
Procedure No: GEL-07 Rev. 1 Date Issued 11-15-89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: ETAL- 3310 Calibration Due Date 12-25-91
Thermometer: ETAL- 0006 Calibration Due Date 4-1-92
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A

Sample Description FINE SAND Sieve Time 10 (min)

Reduced by (X) Splitting ( ) Quartering ( ) Stockpile

Sieve Size	Sample Weight	Cumulative Wt. Retained	Cumulative % Retained	Cumulative % Passed
16	108.4	0	0	100
40		25.6	23.6	76.4
60		32.8	30.3	69.7
100		39.8	36.7	63.3
200		56.2	50.9	49.1
N/A	N/A	N/A	N/A	N/A

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C = Percentage of material passing a 200 Sieve N/A %
D = Original Dry Weight of Sample N/A g
E = Dry Weight of Sample After Washing/Sieve N/A g
C = <(D-E)/D>*100

Remarks
WASHED GRADING

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By: R.G. ALEXANDER Date 9-27-91

A-6400-204(2-87)

9312705579

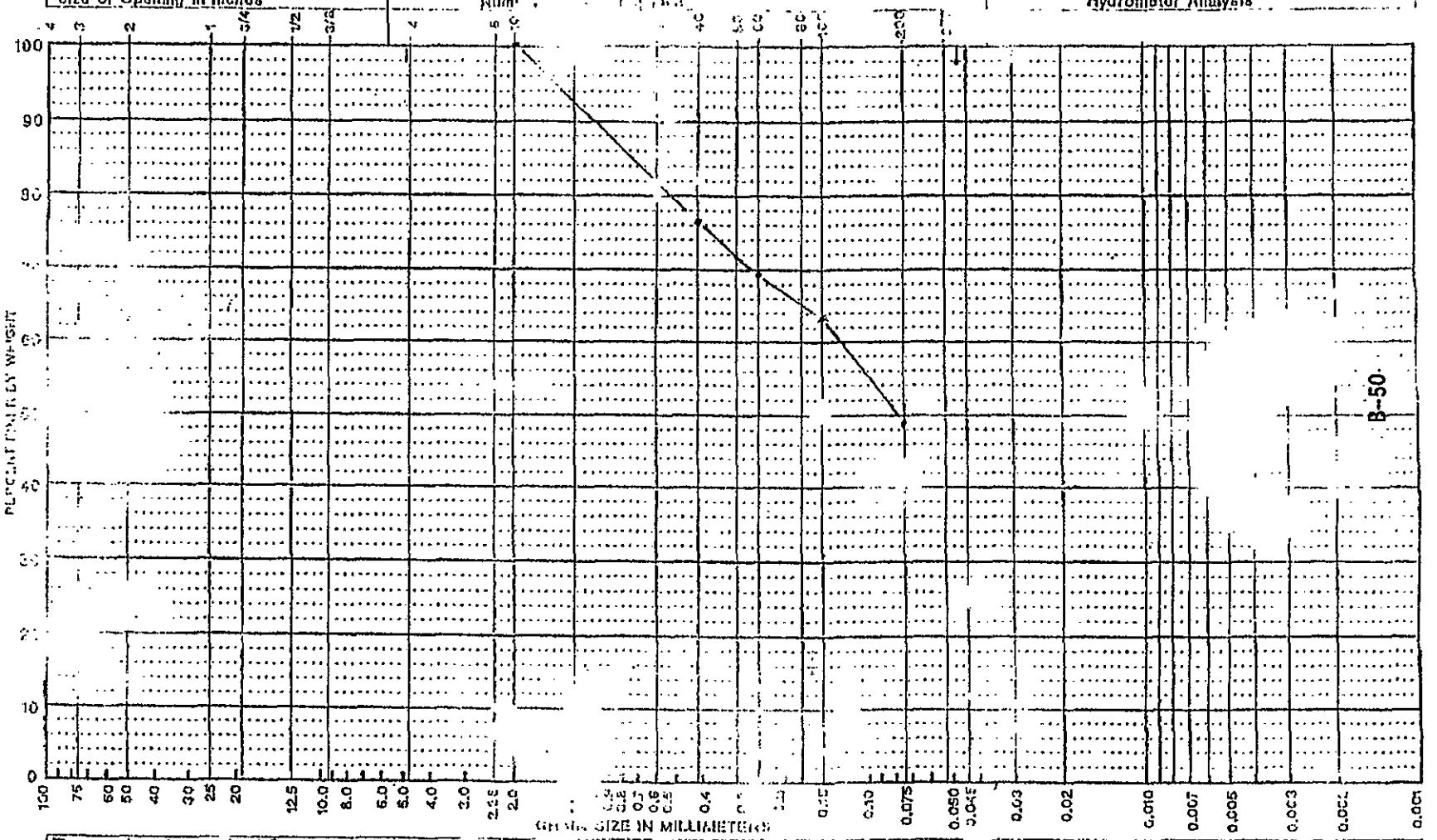
GRAIN [illegible] PLOT

Sample No. 1-2241 Page 1 of 1

Procedure No. GEL-07 Rev. [illegible] Tested By SERRY L. ENGLAND

Test Plan No. N/A Rev. [illegible] Date 9-30-91

Size of Opening in Inches | Number [illegible] | Hydrometer Analysis



Remarks: SILTY SAND

699-40-40A 215.5-265.5'

All data are accurately and completely recorded. The test operat[illegible] trained and used calibrated instruments.

Checked By [illegible] ALEXANDER Date 9-27-91

HYDRAULIC CONDUCTIVITY DATA SHEET

Specimen ID 1-2196 Page 1 of 4

Tested By R.G. ALEXANDER Date 9-26-91

Procedure GEL-09 Rev. 1 Date Issued 12-1-89

Test Plan N/A Rev N/A

EQUIPMENT	NO.	CALIBRATION DUE DATE
Balance	3310	12-25-91
Thermometer	0006	4-1-92
Thermocouple	N/A	N/A
Thermocouple		
Pressure Gauge		
Pressure Gauge		
Pressure Transducer		
Pressure Transducer		
Calipers	5623	8-15-92
Oven	N/A	N/A
Permeameter	N/A	N/A

Specimen Diameter (D) 9.53 cm

Specimen Length (L) 15.24 cm

$$A = \left(\frac{D}{2}\right)^2 \times 3.1415$$

Specimen Area (A) 71.33 cm

Darcy's Law $K = \frac{QL}{AH}$

K = Hydraulic Conductivity (cm/sec)
Q = Flow (cm^3/sec) = Vol. g/Time (sec)
A = Area (cm^2)
H = Hydraulic Head = $\frac{\text{Pressure (psi)}}{\text{14.5 psi/bar}}$ X 1020 cm/bar
L = Length (cm)

Remarks V= 1087.07

All required data are accurately and completely recorded. The test operator was appropriately trained and utalized calibrated test instruments as indicated above. Approved test procedures were followed to produce the above data.

Checked by M.G. Bachler Date 10-8-91

A-6000-405 1 (07/89)

9 3 1 2 7 3 0 5 8 1

Sample No. 1-2196

SAMPLE COMPACTION

Compaction Method Static ☒ N/A Tamping ☒ N/A

STATIC or TAMPING	Load Applied, g/ Layer length, cm	Layer 1	N/A	11	N/A
		2		12	
	No. Tamps per Layer/ Layer Length, cm	3		13	
		4		14	
		5		15	
		6		16	
Total No. of Layers N/A		7		17	
INTACT SAMPLE		8		18	
		9		19	
		10		20	

Tamper Foot Diameter cm	N/A
Tamper Applied Load, g	N/A
Sample Diameter, (d), cm	9.53
Sample Length, (L), cm	15.24
Sample Mold or Permeameter Weight & Compacted Sample, g	2351.9
Sample Mold or Permeameter Weight, g	174.4
Weight of Compacted Sample, (E), g	2177.5
Weight of Container & Uncompacted Wet Sample, (A), g	2223.3
Weight of Container & Uncompacted Dry Sample, (B), g	1828.7
Weight of Water, g	394.6
Weight of Container, (C), g	119.3
Weight of Dry Soil, (WS), g	1709.4
Water Content, %	23.08
Compacted Bulk Density of Sample, (γm), g/cc	2.00
Compacted Sample Dry Density, (γd), g/cc	1.63

$$\gamma m = \frac{E}{(\pi)(d/2)^2(L)}$$

$$\gamma d = \left(\frac{\gamma m}{W + 100}\right) 100$$

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By M. A. Bachlus Date 10-8-91

9 3 1 2 7 3 9 0 5 8 2

WHC-SD-EN-DP-046, Rev. 0

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID 1-2196 Page 3 of 4

Procedure No. GEL-09 Date Issued 12-1-89

Date Year (Mo/Day)	TIME: System Down (Hr:Min)	TIME: System Up (Hr:Min)	TIME: Time Change (Hr:Min)	VOLUME DETERMINANTS: Effluent Temp (°C)	Effluent Weight (±0.1g)	Container Tare (±0.1g)	Container ~~Tare &~~ Effluent (±0.1g)	System Temp (°C)	Pressure Pore H_2O ~~(psi)~~ cm	Pressure Back H_2O (psi)	Operator Initials
9-27	—	0730	—	24.5	—	152.57	—	24.5	415	N/A	RGA
9-27	0900	0900 ~~1200~~	1:30	24.5	259.74	152.57	107.17	24.5	415	N/A	RGA
9-27	1200	1200	3:00	25.3	245.23	152.57	92.66	25.3	192	N/A	RGA
9-27	1330	STOP	1:30	26.1	199.80	152.57	47.23 ~~43.23~~	26.1	192	N/A	RGA
930	—	0700	—	25.5	—	152.57	—	25.5	192	N/A	RGA
9-30	1000	1000	3:00	25.7	238.97	152.57	86.40	25.7	192	N/A	RGA
9-30	1300	STOP	3:00	26.0	241.41	152.57	88.84	26.0	192	N/A	RGA

All required data are accurately and completely recorded. The test operator was appropriately trained and utilized calibrated test instruments as indicated above. Approved test procedures were followed to produce the above data.

Check by M/A Baechler Date 12-9-91

A-6000-405.2 (07/89)

9312790533

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID 1-2196 Page 4 of 4

Procedure No. GEL-09 Date Issued 12-1-89

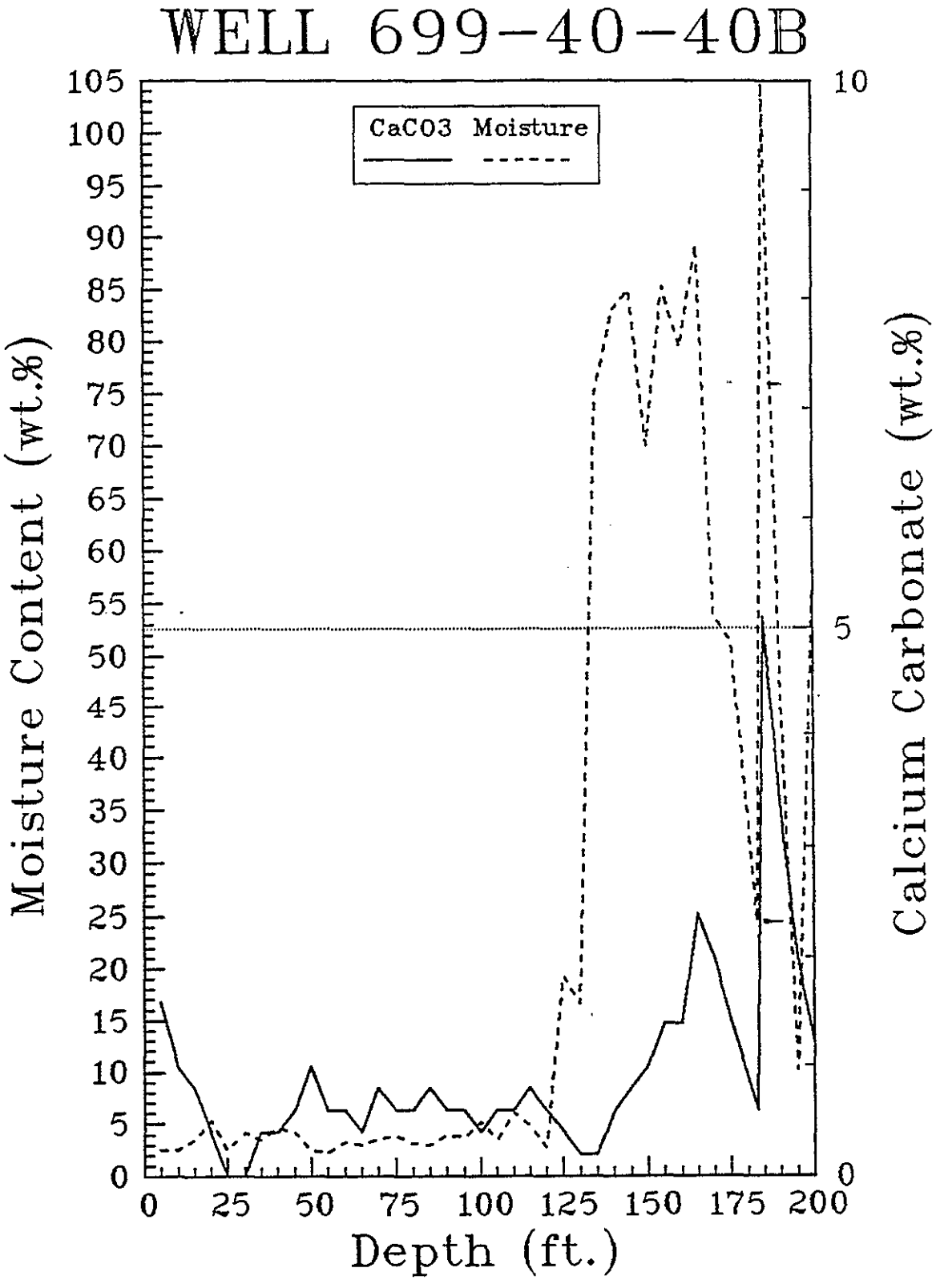
Date Year 91 (Mo/Day)	Hydraulic Conductivity (cm/sec)	Hydraulic Gradient (cm/cm)	Effluent Analysis		Effluent Description	Operator Initials
			Specimen Number	Lab. Notebook Location		
9-27	START	TEST	—	—	—	RGA
9-27	1.0×10^{-5}	27.23	—	—	CLEAR	RGA
9-27	9.5×10^{-6}	12.60	—	—	"	RGA
9-27	9.7×10^{-6}	12.60	—	—	"	RGA
9-30	8.9×10^{-6}	12.60	—	—	"	RGA
9-30	9.2×10^{-6}	12.60	—	—	"	RGA
9-30	STOP	TEST	9.2 +/- 0.3 X	10^{-6} CM/SEC	—	RGA

All required data are accurately and completely recorded. The test operator was appropriately trained and utilized calibrated test instruments as indicated above. Approved test procedures were followed to produce the above data.

Check by W. G. Daniels Date 10-9-91

A-6000-405.3 (07/89)

9 3 1 2 7 3 9 0 5 3 4


WELL 699-40-40B
CaCO3 Moisture
Moisture Content (wt.%)
Calcium Carbonate (wt.%)
Depth (ft.)
0
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
105
0
25
50
75
100
125
150
175
200
0
5
10

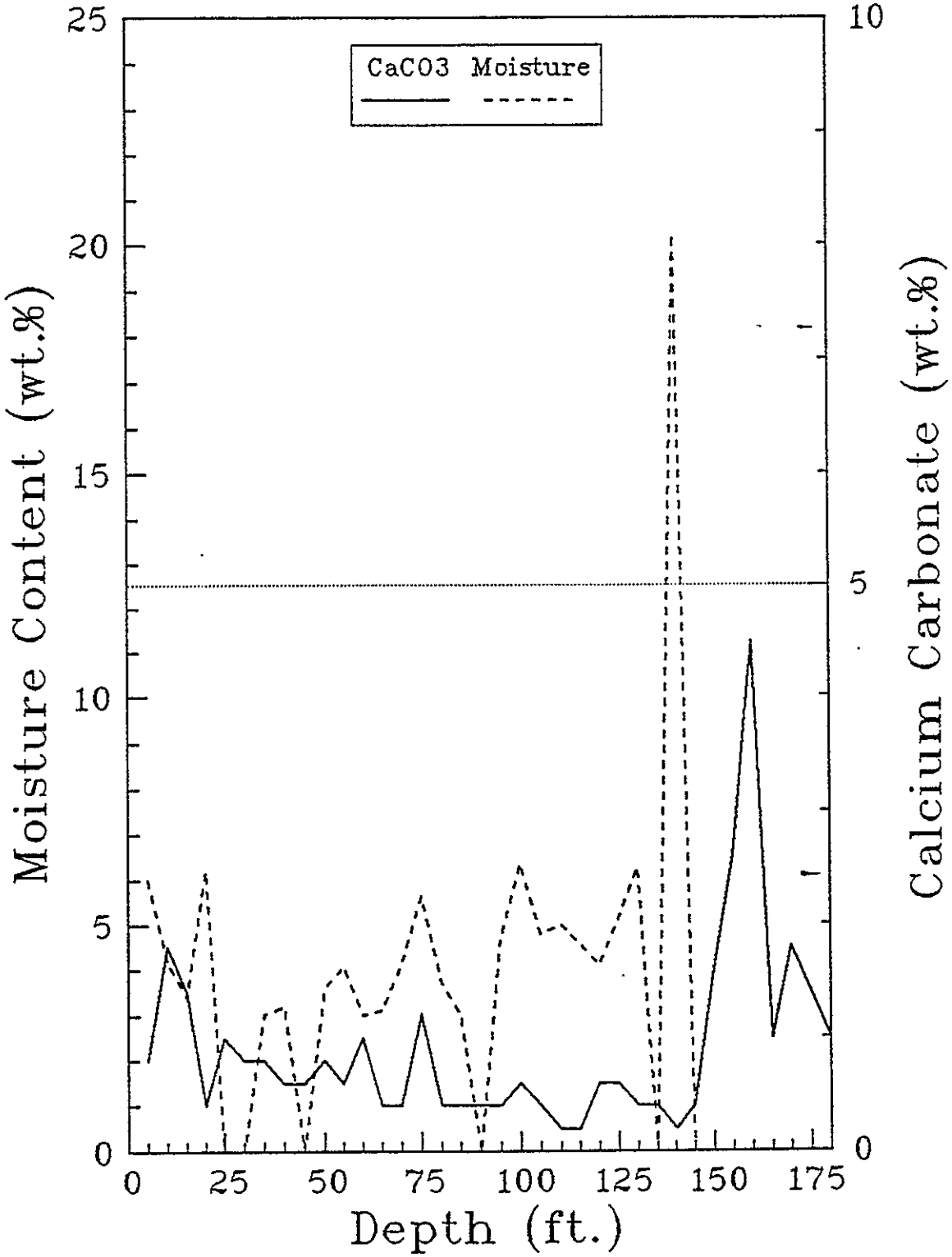
	A	B	C
1	WELL 699-42-41		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	1.6	2.51
7	10	1	2.53
8	15	0.8	3.46
9	20	0.4	5.33
10	25	0	2.52
11	30	0	4.11
12	35	0.4	3.47
13	40	0.4	4.64
14	45	0.6	4.15
15	50	0.1	2.44
16	55	0.6	2.21
17	60	0.6	3.28
18	65	0.4	2.92
19	70	0.8	3.46
20	75	0.6	3.88
21	80	0.6	3.11
22	85	0.8	2.99
23	90	0.6	3.84
24	95	0.6	3.71
25	100	0.4	5.12
26	105	0.6	3.53
27	110	0.6	6.06
28	115	0.8	4.73
29	120	0.6	2.76
30	125	0.4	19.19
31	130	0.2	16.56
32	135	0.2	74.99
33	140	0.6	82.97
34	145	0.8	84.98
35	150	1	69.93
36	155	1.4	85.32
37	160	1.4	79.37
38	165	2.4	89.25
39	170	2	53.87
40	175	1.4	51.27
41	182-184	0.6	24.42
42	185	5.1	104.7
43	190	3.3	45.6
44	195	2	10.1
45	200	1.2	57.7

9 3 1 2 7 3 9 0 5 8 6

VALIDATED
SIGNATURE/DATE

'82

WELL 699-BP91-2



9 3 1 2 7 0 5 8 7

272

	A	B	C
1	WELL 699-BP91-2		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	0.8	5.99
7	10	1.8	4.17
8	15	1.4	3.40
9	20	0.4	6.22
10	25	1	
11	30	0.8	
12	35	0.8	3.02
13	40	0.6	3.17
14	45	0.6	
15	50	0.8	3.58
16	55	0.6	4.06
17	60	1	2.98
18	65	0.4	3.10
19	70	0.4	4.09
20	75	1.2	5.61
21	80	0.4	3.69
22	85	0.4	2.98
23	90	0.4	
24	95	0.4	4.70
25	100	0.6	6.34
26	105	0.4	4.79
27	110	0.2	4.99
28	115	0.2	4.56
29	120	0.6	4.08
30	125	0.6	5.12
31	130	0.4	6.26
32	135	0.4	
33	140	0.2	20.23
34	145	0.4	
35	150	1.6	
36	155	2.6	
37	160	4.5	
38	165	1	
39	170	1.8	
40	180	1	

9 3 1 2 7 5 9 0 5 8 8

SIEVE ANALYSIS DATA SHEET

Sample No. 1-1900 Page 1 of 1

Tested By: JERRY L. ENGLAND Date 8-14-91
Procedure No: ETAL-07 Rev. 1 Date Issued 11-15-89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: GEL- 3310 Calibration Due Date 9-21-91
Thermometer: GEL- 0006 Calibration Due Date 4-1-92
N/A : GEL- N/A Calibration Due Date N/A
N/A : GEL- N/A Calibration Due Date N/A
N/A : GEL- N/A Calibration Due Date N/A
N/A : GEL- N/A Calibration Due Date N/A

Sample Description SANDY CLAY Sieve Time 10 (min)
Reduced by (X) Splitting ( ) Quartering ( ) Stockpile

Sieve Size	Sample Weight	Cumulative Wt. Retained	Cumulative % Retained	Cumulative % Passed
3/8	352.7	0	0	100
4		11.9	3.4	96.6
10		68.9	19.5	80.5
40		158.8	45.0	55.0
60		178.8	50.7	49.3
100		214.4	60.8	39.2
200		253.7	71.9	28.1
N/A	N/A	N/A	N/A	N/A

Finess Modules (FM) N/A (See ASTM C 136-83, Section 6.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING

C = Percentage of material passing a 200 Sieve N/A %
D = Original Dry Weight of Sample N/A g
E = Dry Weight of Sample After Washing/Sieve N/A g
C = <(D-E)/D>*100

Remarks
WASHED GRADING

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By: RG ALEXANDER Date 8-14-91

A-6400-204(2-87)

9 3 1 2 7 0 5 3 9

GRAIN SIZE ANALYSIS PLOT

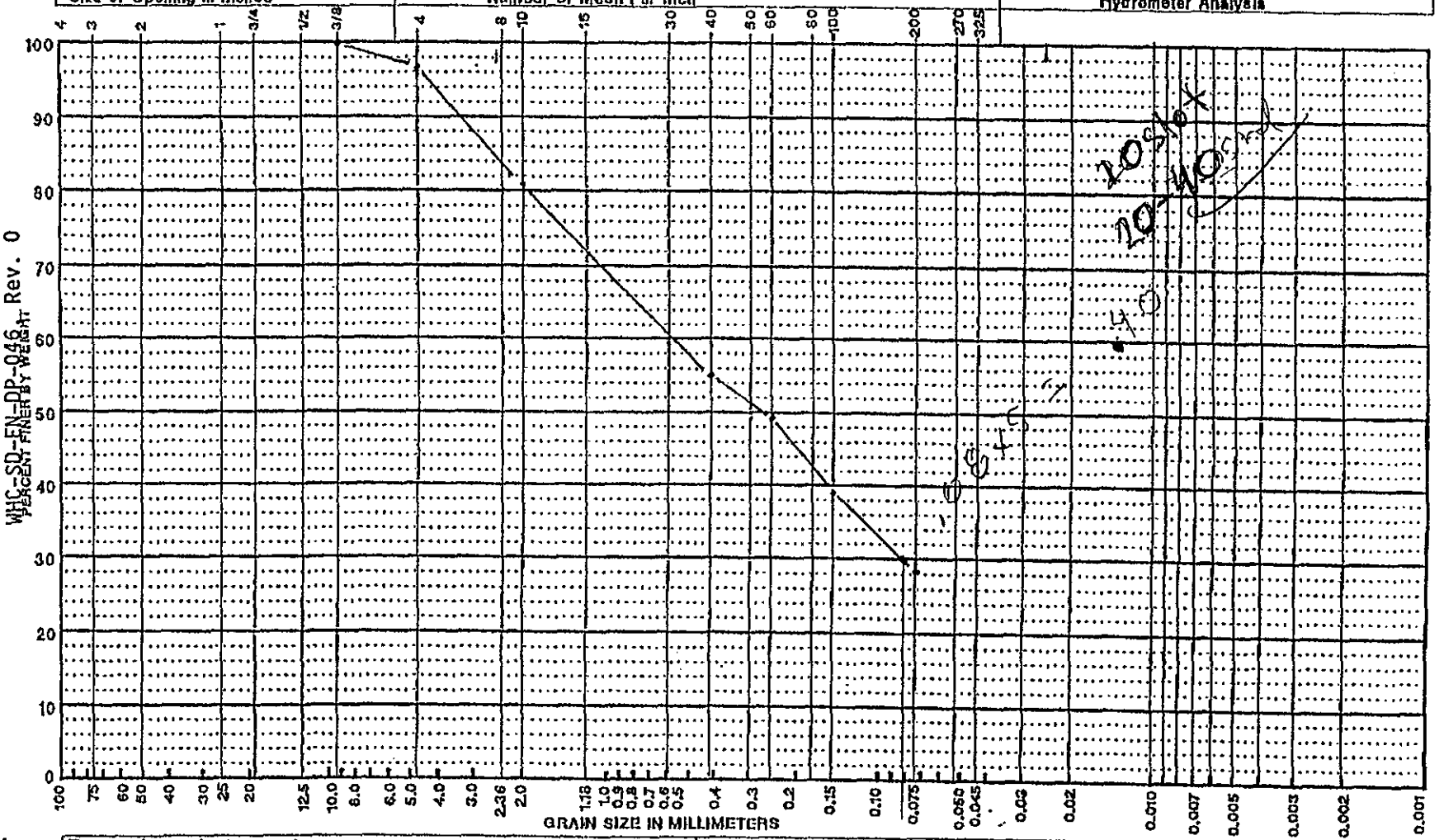
Sample No. 1-1900 Page 1 of 1

Procedure No. ETAL-07 Rev. 1 Date Issued 11-16-89

Test Plan No. N/A Rev. N/A Date Issued N/A

Plotted By JERRY L. ENGLAND

Date 8-14-91



Remarks SANDY CLAY

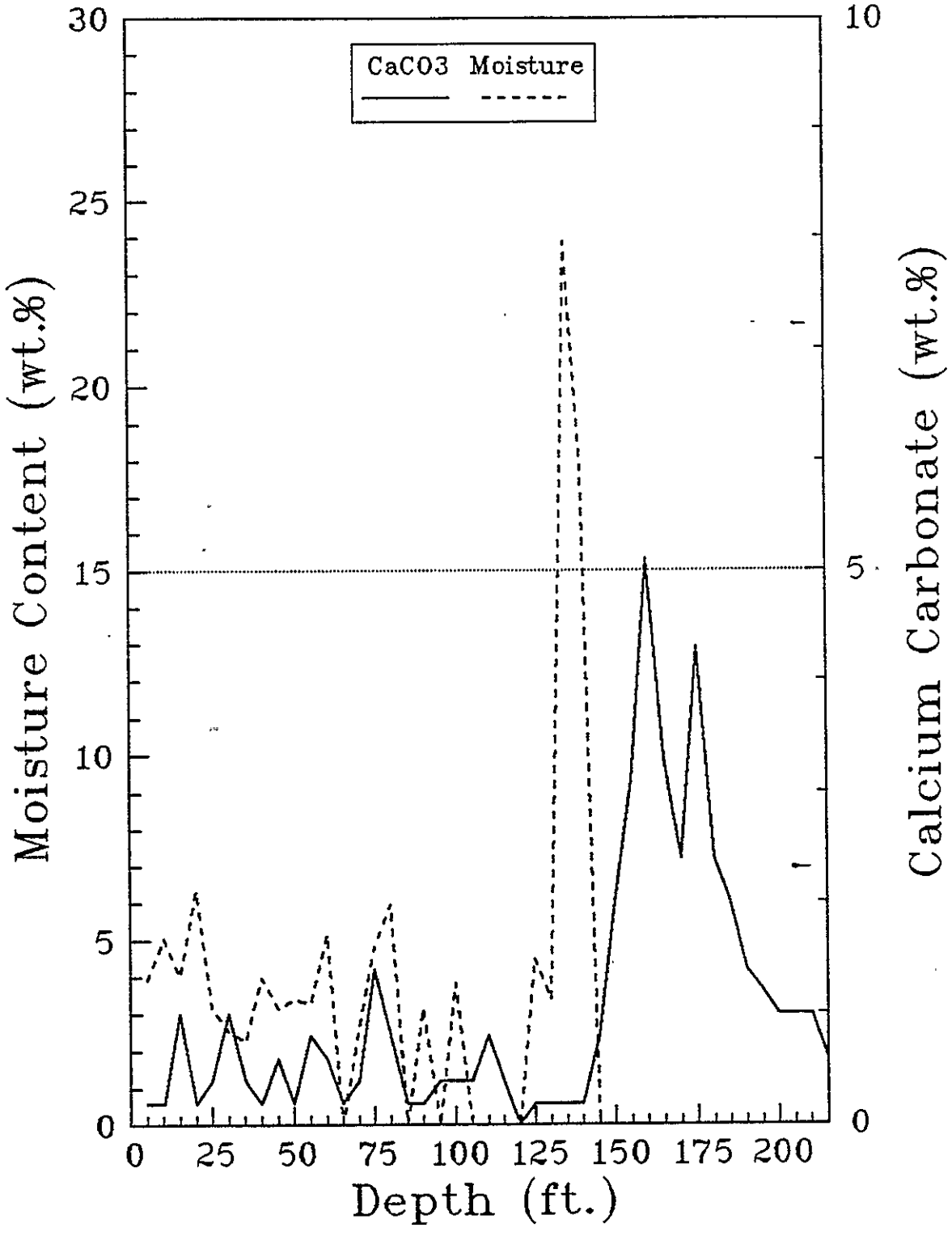
699-BP91-2 175'

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.

Checked By: RG ALEXANDER Date 8-14-91

WHC-SD-EN-DP-046 Rev. 0

9312759059 0


WELL 699-BP91-3
CaCO3
Moisture
Moisture Content (wt.%)
Calcium Carbonate (wt.%)
Depth (ft.)
0
5
10
15
20
25
30
0
5
10
0
25
50
75
100
125
150
175
200

293

	A	B	C
1	WELL 699-BP91-3		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	0.2	3.92
7	10	0.2	5.05
8	15	1	4.02
9	20	0.2	6.33
10	25	0.4	3.18
11	30	1	2.53
12	35	0.4	2.26
13	40	0.2	3.97
14	45	0.6	3.16
15	50	0.2	3.38
16	55	0.8	3.27
17	60	0.6	5.14
18	65	0.2	
19	70	0.4	2.64
20	75	1.4	4.81
21	80	0.8	5.95
22	85	0.2	
23	90	0.2	3.14
24	95	0.4	
25	100	0.4	3.82
26	105	0.4	
27	110	0.8	
28	115	0.4	
29	120	0	
30	125	0.2	4.49
31	130	0.2	3.37
32	135	0.2	23.87
33	140	0.2	17.79
34	145	0.8	
35	150	2	
36	155	3.1	
37	160	5.1	
38	165	3.3	
39	170	2.4	
40	175	4.3	
41	180	2.4	
42	185	2	
43	190	1.4	
44	195	1.2	
45	200	1	
46	205	1	
47	210	1	

9 3 1 2 7 5 9 0 5 9 2

3 of 3

	A	B	C
48	215	0.6	

9 3 1 2 7 0 5 9 3

9 3 1 2 7 3 9 0 5 9 4

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SIEVE ANALYSIS DATA SHEET

Sample No. 1-2240 Page 1 of 1

Tested By: R.G. ALEXANDER Date 9-30-91
Procedure No: GEL-07 Rev. 1 Date Issued 11-15-89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: ETAL- 3304 Calibration Due Date 12-25-91
Thermometer: ETAL- 0006 Calibration Due Date 4-1-92
N/A : ETAL- N/A Calibration Due Date N/A
: ETAL- Calibration Due Date
: ETAL- Calibration Due Date
: ETAL- Calibration Due Date

Sample Description SILT Sieve Time 10 (min)

Reduced by (X) Splitting ( ) Quartering ( ) Stockpile

Sieve Size	Sample Weight	Cumulative Wt. Retained	Cumulative % Retained	Cumulative % Passed
#10	109.60	Ø	Ø	100
#40		14.8	13.5	86.5
#60		35.1	32.0	68.0
#100		51.2	46.7	53.3
#200		68.4	62.4	37.6

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING		Remarks
C = Percentage of material passing a 200 Sieve	N/A %	
D = Original Dry Weight of Sample	N/A g	WASH GRADING
E = Dry Weight of Sample After Washing/Sieve	N/A g	
C = <(D-E)/D>*100		

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By: [signature] Date 9-30-91

A-6400-204(2-87)

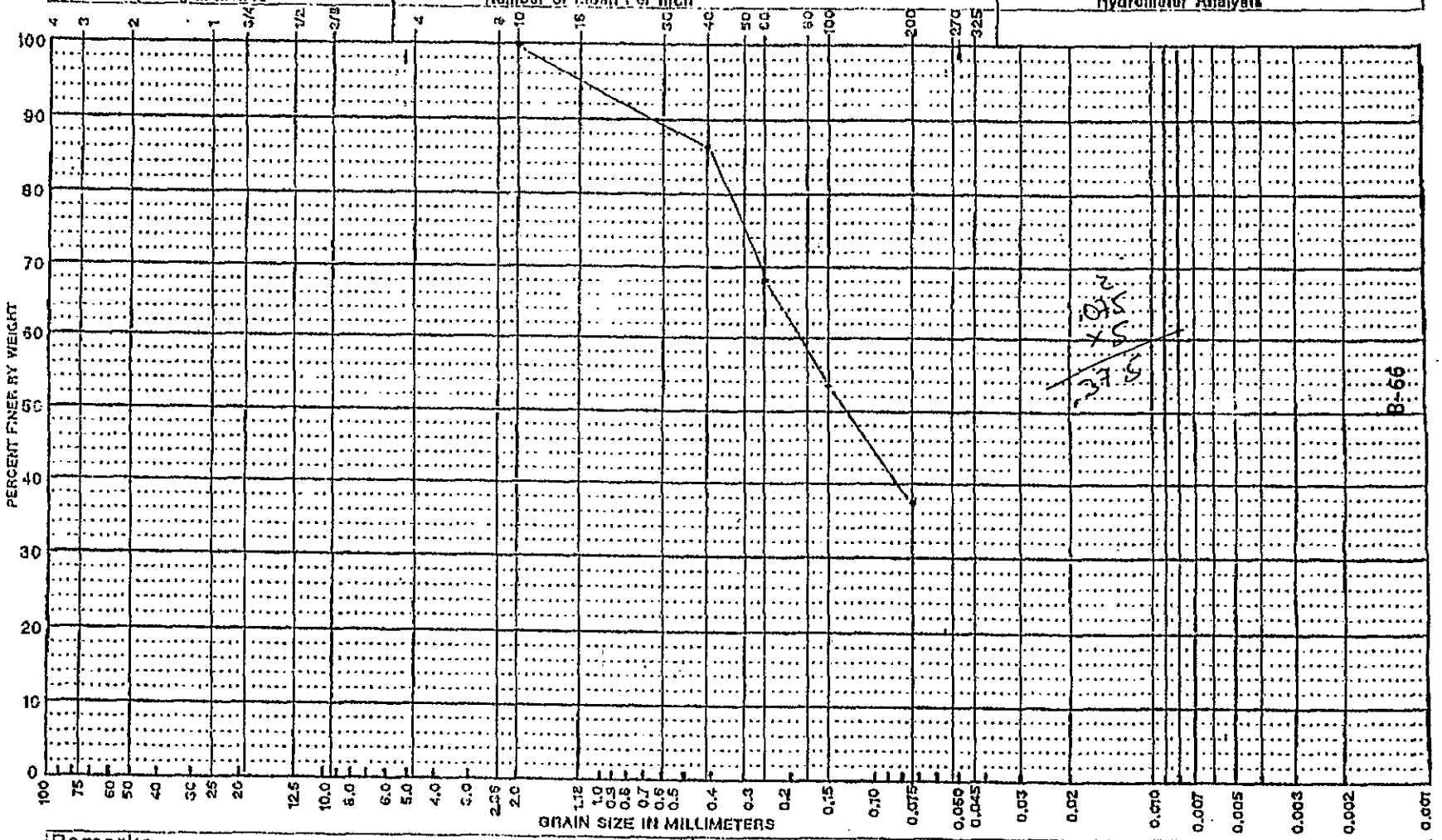
9 3 1 2 7 9 0 5 9 5

GRAIN SIZE ANALYSIS PLOT

Sample No. 1-2240 Page 1 of 1

Procedure No. GEL-07 Rev. 1 Date Issued 11-15-89 Plotted By R.G. ALEXANDER

Test Plan No. N/A Rev. N/A Date Issued N/A Date 9-30-91



Remarks 699-BP91-3 215-216'

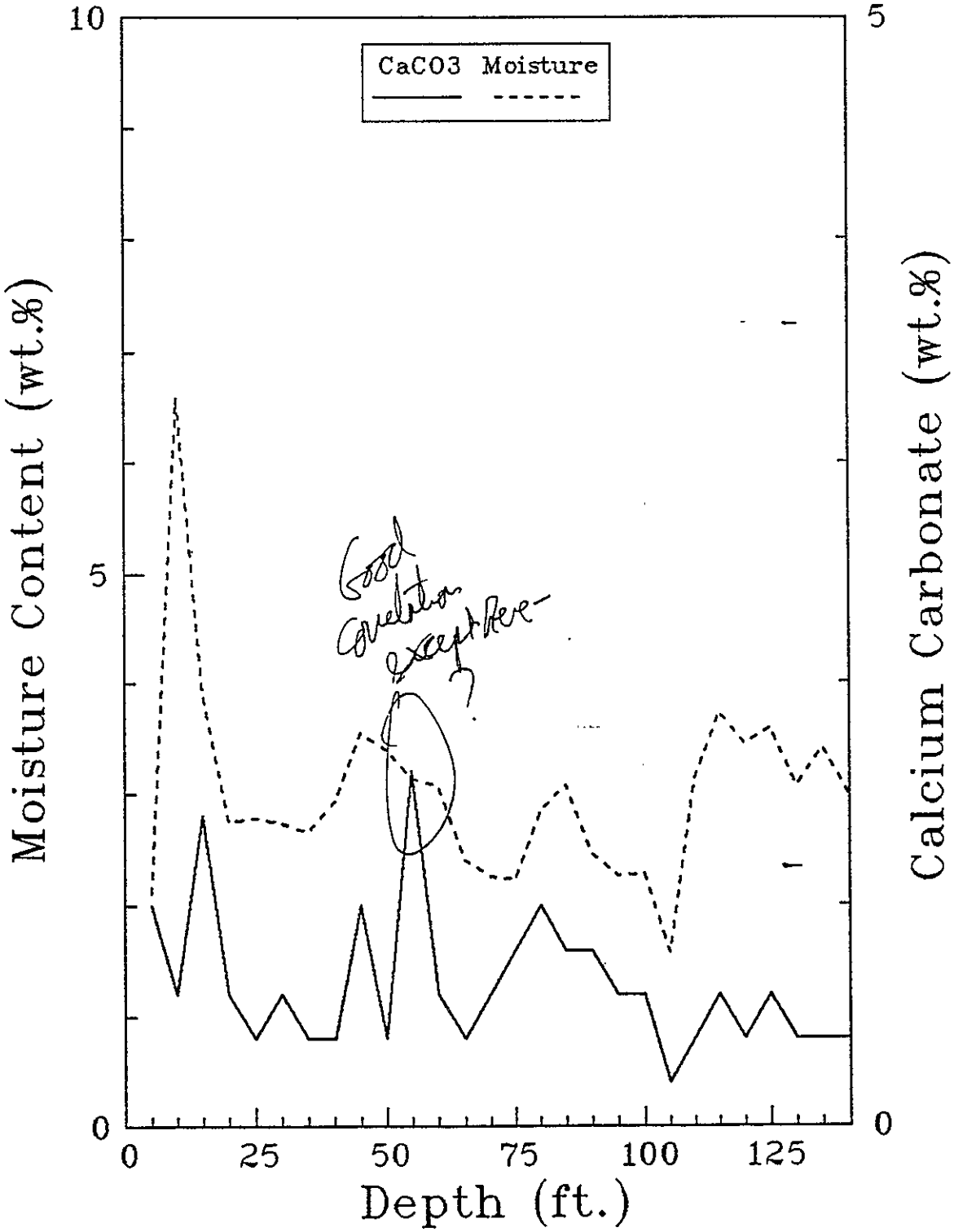
All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.

Checked By: [signature] Date 9-30-91

9 3 1 2 7 5 9 0 5 9 6

182

WELL 699-42-41



9 3 1 2 7 9 0 5 9 7

292

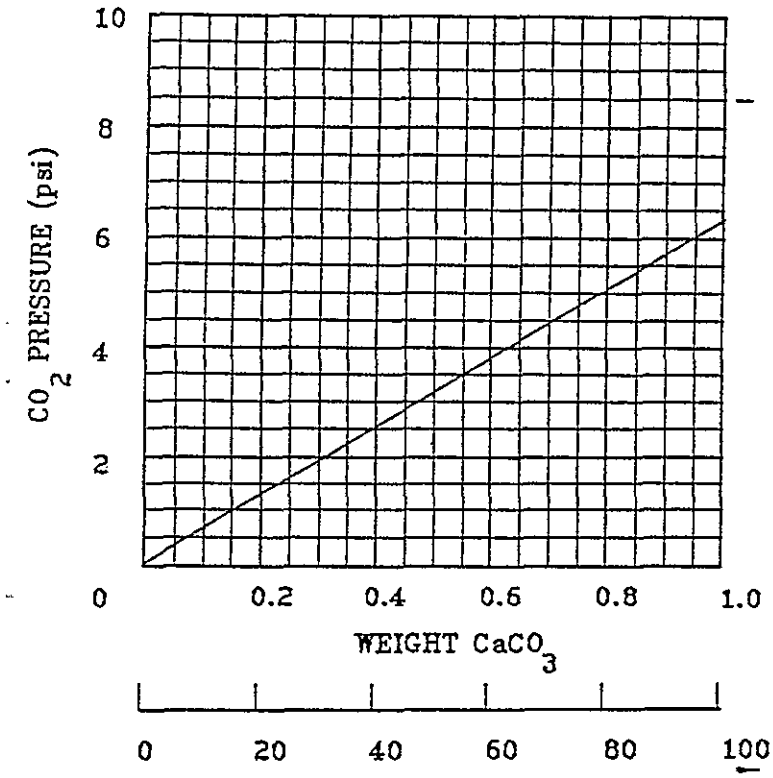
	A	B	C
1	WELL 699-42-41		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	1	2.11
7	10	0.6	6.59
8	15	1.4	3.9
9	20	0.6	2.75
10	25	0.4	2.77
11	30	0.6	2.73
12	35	0.4	2.65
13	40	0.4	2.93
14	45	1	3.55
15	50	0.4	3.4
16	55	1.6	3.13
17	60	0.6	3.06
18	65	0.4	2.4
19	70	0.6	2.25
20	75	0.8	2.23
21	80	1	2.84
22	85	0.8	3.07
23	90	0.8	2.46
24	95	0.6	2.26
25	100	0.6	2.28
26	105	0.2	1.58
27	110	0.4	3.13
28	115	0.6	3.73
29	120	0.4	3.45
30	125	0.6	3.59
31	130	0.4	3.06
32	135	0.4	3.41
33	140	0.4	2.97

9 3 1 2 7 5 9 0 5 9 8

CALCIUM CARBONATE DATA SHEET

SAMPLE NO.	1-1896	PAGE 1 OF 1	
TESTED BY	JERRY L. ENGLAND	DATE	8-16-91
PROCEDURE	ETAL-19 REV 0	DATE ISSUED	9-7-90
BALANCE NUMBER	3304	DATE DUE	9-21-91

ANALYZER NO. 5642



GRAMS $CaCO_3$	PRESSURE*
0	0
0.2	1.25
0.4	2.55
0.6	3.80
0.8	5.05
1.0	6.15

*AVG. OF TWO SAMPLES

SAMPLE WEIGHT 8.0 (g)

SAMPLE PRESSURE 0.5 (psi) % $CaCO_3$ 1.0 PER GRAM

CHECKED BY R.G. ALEXANDER DATE 8-21-91

9 3 1 2 7 0 9 0 5 9 9

SPECIFIC GRAVITY OF SOILS DATA SHEET

Sample No. 1-1896 Page 1 of 1

Tested By:	JERRY L. ENGLAND	Date	8-1991
Procedure No:	ETAL-10	Rev. 0 Date Issued	11-15-89
Test Plan No:	N/A	Rev. N/A Date Issued	N/A
Balance: ETAL-	3304	Calibration Due Date	9-21-91
Oven Thermometer: ETAL-	0006	Calibration Due Date	4-1-92
Thermometer: ETAL-	0002	Calibration Due Date	2-12-92
Pycnometer: ETAL-	2554	Calibration Due Date	N/A
N/A : ETAL-	N/A	Calibration Due Date	N/A
N/A : ETAL-	N/A	Calibration Due Date	N/A

Wetting Agent "D" WATER

	DETERMINATION NO.	1	2	3
W_o	Wt. Oven Dry Soil, g	65.00	N/A	N/A
	Pycnometer No.	2554		
	Wt. Pycnometer, g	135.22		
W_a	Wt. Pycnometer+Wetting Agent, g	387.09 ~~65 421 .28~~		
W_b	Wt. Pycnometer+Wetting Agent + Soil, g	421.28		
	Temperature, T_x at W_b, °C	25.0		
G_w	Specific Gravity of Wetting Agent at T_x	1.00		
G_t	Specific Gravity of Soil at T_x	2.64		
G_s	Specific Gravity of Soil at 20°C	2.64		

$$G_t = \frac{G_w \times Y_w \times W_o}{W_o + W_a - W_b}$$

Y_W = Unit Weight of Water (g/cm³)

*$G_s = K * G_t$

Average Specific Gravity at 20 °C

2.64 g/cm³

K Values found in ASTM D854-58, Table 1

* NOTE $G_s = G_t$ When Test Run at 20 °C

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.

Checked By: RG ALEXANDER Date 8-21-91

A-6400-235(2-87)

9312759090

SPECIFIC GRAVITY COARSE AGGREGATES DATA SHEET

Page 1 Of 2

Specimen/Sample No. 1-1996 Test Operator JERRY L. ENGLAND

EQUIPMENT ITEM	NO.	DATE DUE
Balance	3310	9-21-91
Oven Thermometer	0006	4-1-92
N/A	N/A	N/A

	DETERMINATION NO.	1	2	3	4
	Size Fraction	2 - 4	N/A	N/A	N/A
	Size fraction, wt % total, g	523			
B	Weight sample (SSD), g	807.70	.—	.—	.—
	Weight sample + container in H_2O at 23 ± 1.7 °C, g	N/A .—	.—	.—	.—
	Weight container, g	N/A .—	.—	.—	.—
C	Weight sample in H_2O, g	500.20	.—	.—	.—
	Weight of dry sample + drying container, g	N/A .—	.—	.—	.—
	Weight of drying container, g	N/A .—	.—	.—	.—
A	Weight of oven dry sample, g	793.50	.—	.—	.—

GENERAL NOTES:

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By RG Alexander Date 8-21-91

9 3 1 2 7 3 0 6 0 1

Specimen/Sample No. 1-1896 Test Operator JERRY L. ENGLAND

Bulk Specific Gravity, 23/23°C = A/(B-C) = 2.58

A = wt. oven dry sample in air, g

B = wt. SSD sample in air, g

C = wt. saturated sample in H_2O, g

Bulk Specific Gravity SSD, 23/23°C = B/(B-C) = 2.63

Apparent Specific Gravity, 23/23°C = A/A-C) = 2.71

*Average Specific Gravity Values, 23/23°C $\overline{G}$ = 2.61

$$\overline{G} = \frac{1}{\frac{P_1}{100G_1} + \frac{P_2}{100G_2} + \frac{P_n}{100G_n}}$$

$\overline{G}$ = Ave. Specific Gravity for all forms of Specific Gravity i.e. formula applicable to Bulk, Bulk SSD and apparent Specific Gravity.

$G_1, G_2, \ldots G_n$ = appropriate Specific Gravity values for each size fraction depending on the type of Specific Gravity being averaged.

$P_1, P_2, \ldots P_n$ = wt. percentages of each size fraction present in the original sample.

*State type of Specific Gravity Reported i.e. either Bulk, Bulk SSD or Apparent.

Absorption, % = [(B-A)/A] X 100 = N/A (%)

Average Absorption Values, $\overline{A}$ = N/A (%)

$\overline{A} = (P_1 A_1/100) + (P_2 A_2/100) + \ldots (P_n A_N/100)$

$A_1, A_2, \ldots A_n$ = absorption percentages for each size fraction

$P_1, P_2, \ldots P_n$ = weight percentages of each size fraction present in the original sample.

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By R.G. ALEXANDER Date 8-21-91

9 3 1 2 7 3 9 0 6 0 2

SIEVE ANALYSIS DATA SHEET

Sample No. 1-1896 Page 1 of 1

Tested By: JERRY L. ENGLAND Date 8.16.91
Procedure No: ETAL-07 Rev. 1 Date Issued 11.15.89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: GEL- 3310 Calibration Due Date 9-21-91
Thermometer: GEL- 0006 Calibration Due Date 4.1.91
N/A : GEL- N/A Calibration Due Date N/A
N/A : GEL- N/A Calibration Due Date N/A
N/A : GEL- N/A Calibration Due Date N/A
N/A : GEL- N/A Calibration Due Date N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)
Reduced by (X) Splitting ( ) Quartering ( ) Stockpile

Sieve Size	Sample Weight	Cumulative Wt. Retained	Cumulative % Retained	Cumulative % Passed
2	2564.4	0	0	100
1½		135.2	5.3	94.7
1		449.7	17.5	82.5
¾		623.6	24.3	75.7
½		832.1	32.5	67.5
⅜		1004.2	39.2	60.8
4		1340.6	52.3	47.7
10	143.0	24.1	16.9	39.6
40		55.9	39.1	29.0
60		74.2	51.9	22.9
100		86.9	60.8	18.7
200		100.9	70.6	14.0

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING		Remarks
C = Percemtage of material passing a 200 Sieve	N/A %	
D = Original Dry Weight of Sample	N/A g	WASHED FINE GRADING
E = Dry Weight of Sample After Washing/Sieve	N/A g	
C = <(D-E)/D>*100		

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By; M.A. Daechler Date 8-19-91

A-6400-204(2-87)

9 3 1 2 7 0 6 0 3

HYDROMETER ANALYSIS DATA SHEET

Sample No. 1-1896 Page 1 of 1

Tested By: RG. ALEXANDER Date 8-14-91
Procedure No: ETAL-07 Rev. 1 Date Issued 11-15-89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: GEL- 3304 Calibration Due Date 9-21-91
Thermometer: GEL- 0006 Calibration Due Date 4-1-92
Hydrometer: GEL- 1007 Calibration Due Date 1-25-92
THERMO : GEL- 0002 Calibration Due Date 2-12-92
N/A : GEL- N/A Calibration Due Date N/A

Specific Gravity of Sample 2.64
% Passing No. 10 Sieve 39.6 (%)
Hygroscopic Correction Factor N/A

HYGROSCOPIC MOISTURE CONTENT
Wt. Container + Air Dry Soil N/A (g)
Wt. Container + Oven Dry Soil N/A (g)
Wt. Container N/A (g)
Water Content N/A (%)

WEIGHT OF SAMPLE
Wt. Container + Soil N/A (g)
Wt. Container N/A (g)
Wt. Soil 123.39 (g)

REMARKS
a = 1.00 W = 311.59 K = 0.01268

COMPOSITE CORRECTION
1st Reading 6 at 26.7 °C
2nd Reading 6 at 26.0 °C

TUBE "B"

Date	Clock Time	Elapsed time (min)	Hydrometer Reading	Hydrometer with Composite Correction	Temperature (oC)	Soil in Suspension (%)	Particle Diameter (mm)
8-20-91	0822	2.0	42	36	26.7	16.6	0.027
	0825	5.0	35	29	26.7	9.3	0.018
	0835	15.0	30	24	26.7	7.7	0.011
	0850	30.0	25	19	26.7	6.1	0.008
	0920	60.0	22	16	26.7	5.1	0.006
	1232	250.0	17	11	26.7	3.5	0.003
8-21-91	0820	1440.0	13	7	26.0	2.3	0.001

Formulas and Tables used to calculate percent soil in suspension, particle diameter and hygroscopic correction factor are found in ASTM D422

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By: [signature] Date 8-21-91

9 3 1 2 7 3 9 0 6 0 4

GRAIN SIZE ANALYSIS PLOT

Sample No. 1-1896

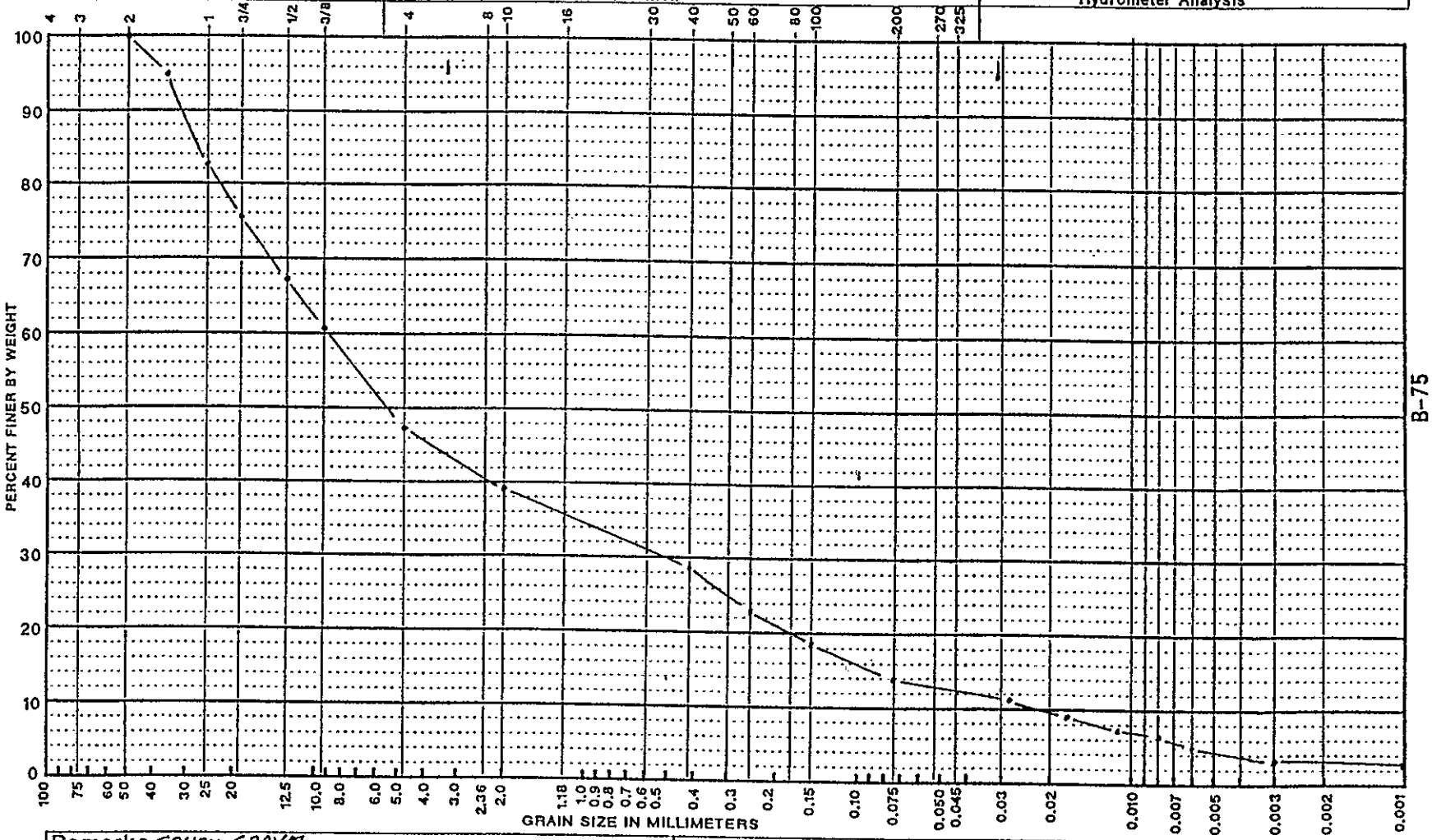
Page 1 of 1

Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Test Plan No. Rev. Date Issued

Plotted By JERRY L. ENGLAND

Date 8-16-91



Remarks SANDY GRAVEL

BP699-42-41 154.72 - 166.72

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.

Checked By: M. A. Zachlin Date 8-19-91

WHC-SD-EN-DP-046, Rev. 0

B-75

9 3 1 2 7 0 6 0 5

HYDRAULIC CONDUCTIVITY DATA SHEET

Specimen ID 1-1896

Tested By R.G. ALEXANDER Date 8-14-91

Procedure ETAL-09 Rev. 1 Date Issued 10-1-89

Test Plan N/A Rev. N/A

EQUIPMENT	NO.	CALIBRATION DUE DATE
Balance	3310/3304	9-21-91
Thermometer	0006	4-1-92
Thermocouple	N/A	N/A
Thermocouple		
Pressure Gauge		
Pressure Gauge		
Pressure Transducer		
Pressure Transducer		
Calipers	5624	5-22-92
Oven	N/A	N/A
Permeameter	N/A	N/A

Specimen Diameter (D) 9.53 cm

Specimen Length (L) 10.95 cm

$$A = \left(\frac{D}{2}\right)^2 \times 3.1415$$

Specimen Area (A) 71.33 cm

Darcy's Law $K = \frac{QL}{AH}$

K = Hydraulic Conductivity (cm/sec)
Q = Flow (cm^3/sec) = Vol. g/Time (sec)
A = Area (cm^2)
H = Hydraulic Head = $\frac{\text{Pressure (psi)}}{14.5 \text{ psi/bar}} \times 1020$ cm/bar
L = Length (cm)

Remarks √= 781-33

All required data are accurately and completely recorded. The test operator was appropriately trained and utalized calibrated test instruments as indicated above. Approved test procedures were followed to produce the above data.

Checked by [signature] Date 8-21-91

A-6000-405.1 (07/89

9312759006

Sample No. 1-1896

SAMPLE COMPACTION

Compaction Method Static ☒ N/A Tamping ☒ N/A

STATIC or TAMPING	Load Applied, g/ Layer length, cm	Layer 1	N/A	11	N/A
		2		12	
	No. Tamps per Layer/ Layer Length, cm	3		13	
		4		14	
		5		15	
		6		16	
Total No. of Layers N/A		7		17	
INTACT SAMPLE		8		18	
		9		19	
		10		20	

Tamper Foot Diameter cm	N/A
Tamper Applied Load, g	N/A
Sample Diameter, (d), cm	9.53
Sample Length, (L), cm	10.95
Sample Mold or Permeameter Weight & Compacted Sample, g	1965.75
Sample Mold or Permeameter Weight, g	128.57
Weight of Compacted Sample, (E), g	1837.18
Weight of Container & Uncompacted Wet Sample, (A), g	2822.90
Weight of Container & Uncompacted Dry Sample, (B), g	2639.30
Weight of Water, g	183.60
Weight of Container, (C), g	74.96
Weight of Dry Soil, (WS), g	2564.34
Water Content, %	7.16
Compacted Bulk Density of Sample, (γm), g/cc	2.35
Compacted Sample Dry Density, (γd), g/cc	2.19

$$\gamma m = \frac{E}{(\pi)\,(d/2)^2 (L)}$$

$$\gamma d = \left(\frac{\gamma m}{W + 100}\right) 100$$

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked By Jeanne [illegible] Date 8.21.91

9 3 1 2 7 0 9 0 6 0 7

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID 1-1896 Page 3 of 4

Procedure No. ETAC-09 Date Issued 12-1-89

Date Year (Mo/Day)	TIME System Down (Hr:Min)	TIME System Up (Hr:Min)	TIME Time Change (Hr:Min)	VOLUME DETERMINANTS Effluent Temp (°C)	Effluent Weight (±0.1g)	Container Tare (±0.1g)	Container ~~Tare & Effluent~~ (±0.1g)	System Temp (°C)	Pressure Pore H_2O ~~(psi)~~ cm	Pressure Back H_2O (psi)	Operator Initials
8-15	—	0908	—	25	—	53.87		25	405.1	N/A	RGA
8-15	1228	1230	2:20	26	74.94	53.87	21.07	25	405.1	N/A	RGA
8-15	1435	1435	2:15	26	67.45	53.87	13.58	26	405.1	N/A	RGA
8-16	0850	0850	18:15	25	263.46	152.57	110.89	25	405.1	N/A	RGA
8-16	1400	STOP	5:10	26	183.96	152.57	31.41	26	405.1	N/A	RGA
8-16	STOP	TESTING		—	—	—	—	—	—	—	RGA

All required data are accurately and completely recorded. The test operator was appropriately trained and utilized calibrated test instruments as indicated above. Approved test procedures were followed to produce the above data.

Check by Jerry Boyd Date 8-21-91

A-6000-405.2 (07/89)

9312759608

HYDRAULIC CONDUCTIVITY DATA SHEET

Sample ID 1-1896 Page 4 of 4

Procedure No. ETAL-09 Date Issued 12-1-89

Date Year __ (Mo/Day)	Hydraulic Conductivity (cm/sec)	Hydraulic Gradient (cm/cm)	Effluent Analysis		Effluent Description	Operator Initials
			Specimen Number	Lab. Notebook Location		
8-15	START	TEST	—	—	—	RGA
8-15	9.5×10^{-7}	37.00	—	—	CLEAR	RGA
8-15	6.4×10^{-7}	37.00	—	—	"	RGA
8-16	6.4×10^{-7}	37.00	—	—	"	RGA
8-16	6.4×10^{-7}	37.00	—	—	"	RGA
8-16	STOP	TESTING	6.4 +/- 0.2 X	10^{-7} CM/SEC	—	RGA

All required data are accurately and completely recorded. The test operator was appropriately trained and utilized calibrated test instruments as indicated above. Approved test procedures were followed to produce the above data.

Check by Joseph [illegible] Date 8-21-91

A-6000-405.3 (07/89)

9312790609

COMPACTION TEST DATA SHEET

Specimen/Sample No. 1-1896

Test Operator R.G. ALEXANDER Date 8-14-91

Procedure No. ETAL-16 Rev. No. Ø Date Issued 2-28-90

Test Plan No. N/A Rev. No. N/A Date Issued N/A

EQUIPMENT ITEM	NO.	DATE DUE
Rammer	N/A	N/A
Balance	3310	9-21-91
Oven Thermometer	0006	4-1-92
Mold	N/A	N/A
N/A	N/A	N/A
N/A	N/A	N/A

Compaction Effort:

Number of Tamps per Layer N/A

Tamping Force N/A

Method Used N/A

Mass + No. 4 Material Not Used in Test, g. N/A

Rammer Type N/A

Number of Layers N/A

Mold Diameter N/A

Sample Description: BULK DENSITY / POROSITY CALCULATION

MIXING WATER WITH DRY SAMPLE

Mixing Container No.								
Wt. Container & Dry Soil, g								
Tare Wt. of Container, g								
Wt. Dry Soil, g								
% Water to Add								
Time								
Date								

COMPACTION DATA

DETERMINATION NO.	1	2	3	4	5	6	7	8
Mold No.	N/A					—		
Mold Vol. = Sample Void, V, cc	781.33							
Wt. of Sample & Mold, g	1965.75							
Wt. of Mold, g	128.57							
Wet Wt. of Sample, g	1837.18							
Wet Density of Sample, γ_m, g/cc	2.35							
Water Content % Dry Weight	7.16							
Dry Density, g/cc	2.19							
*Void Ratio, e	0.1896 ~~0.2037~~							
**Porosity, n, %	15.93 ~~16.89~~							
Time	—							
Date	—							

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. THE TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

Checked by: [signature] B-80 Date 8-21-91

9 3 1 2 7 3 9 0 6 1 0

COMPACTION TEST DATA SHEET

Specimen/Sample No. 1-1896

Test Operator	R.G ALEXANDER			Date	8-14-91
Procedure No.	ETAL-1C	Rev. No.	Ø	Date Issued	2-28-90
Test Plan No.	N/A	Rev. No.	N/A	Date Issued	N/A

WATER CONTENT DATA

DETERMINATION NO.	1	2	3	4	5	6	7	8
Container No.	N/A							
Wt. Container & Wet Soil (A), g	2822.90							
Wt. Container & Dry Soil (B), g	2639.30							
Wt. of Water, g	183.60							
Wt. of Container (C), g	2564.34							
Wt. of Dry Soil, W_s, g	74.96							
Water Content (W), %	7.16							

$$W\% = \left(\frac{A-B}{B-C}\right) 100 \quad \text{W at Zero Air Voids, \%} = \left(\frac{1}{\gamma_d} - \frac{1}{G_s}\right) 100$$

$$\gamma_d = \left(\frac{\gamma_m}{W+100}\right) 100$$

$$^{*}\text{Void Ratio} \quad e = \left(\frac{G_s \gamma_w V}{W_s}\right) - 1$$

Where
- $^{1}G_s$ = Specific Gravity of Solids, Unitless
- γ_w = Unit weight of Water, g/cc
- V = Sample Volume, cc
- W_s = Dry Weight of Sample, g
- γ_d = Dry Density of Compacted Soil, g/cc
- γ_m = Wet Density of Compacted Soil, g/cc
- W = Water Content, % Dry Weight

SUMMARY TABLE

Optimum Water Content, %	N/A
Maximum Dry Density, g/cc	N/A
Water Content of Zero Air Voids, %	N/A
*Void Ratio, e, Unitless	0.1696
**Porosity, n, %	12.93
[1]Specific Gravity, G_s, Unitless	2.61

$$^{**}\text{Porosity } n, \% = \left(1 - \frac{W_s}{G_s \gamma_w V}\right) 100 = \left(\frac{e}{1+e}\right) 100$$

ALL REQUIRED DATA ARE ACCURATELY AND COMPLETELY RECORDED. TEST OPERATOR WAS APPROPRIATELY TRAINED AND UTILIZED CALIBRATED TEST INSTRUMENTS AS INDICATED ABOVE. APPROVED TEST PROCEDURES WERE FOLLOWED TO PRODUCE THE ABOVE DATA.

☐ Additional Pages Attached ☐ Calibrated Data Attached ☐ _____ Attached

Checked by: [signature] Date 8-21-91

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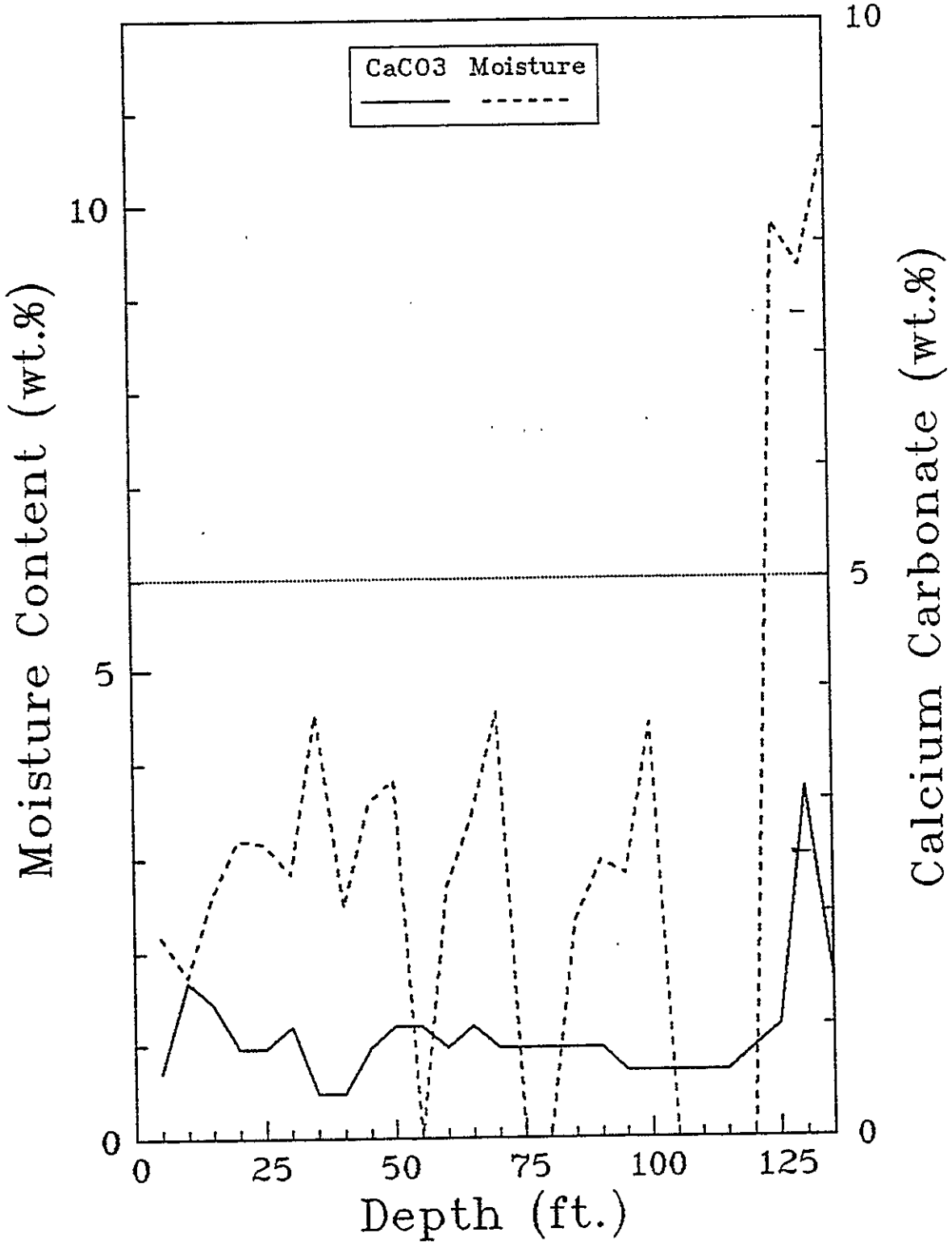
192

WELL BP 699-43-40



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272

	A	B	C
1	WELL BP 699-43-40		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	0.6	2.16
7	10	1.4	1.74
8	15	1.2	2.59
9	20	0.8	3.19
10	25	0.8	3.15
11	30	1	2.83
12	35	0.4	4.53
13	40	0.4	2.48
14	45	0.8	3.58
15	50	1	3.83
16	55	1	
17	60	0.8	2.69
18	65	1	3.44
19	70	0.8	4.54
20	75	0.8	
21	80	0.8	
22	85	0.8	2.32
23	90	0.8	2.97
24	95	0.6	2.82
25	100	0.6	4.42
26	105	0.6	
27	110	0.6	
28	115	0.6	
29	120	0.8	
30	125	1	9.8
31	130	3.1	9.34
32	135	1.4	10.66

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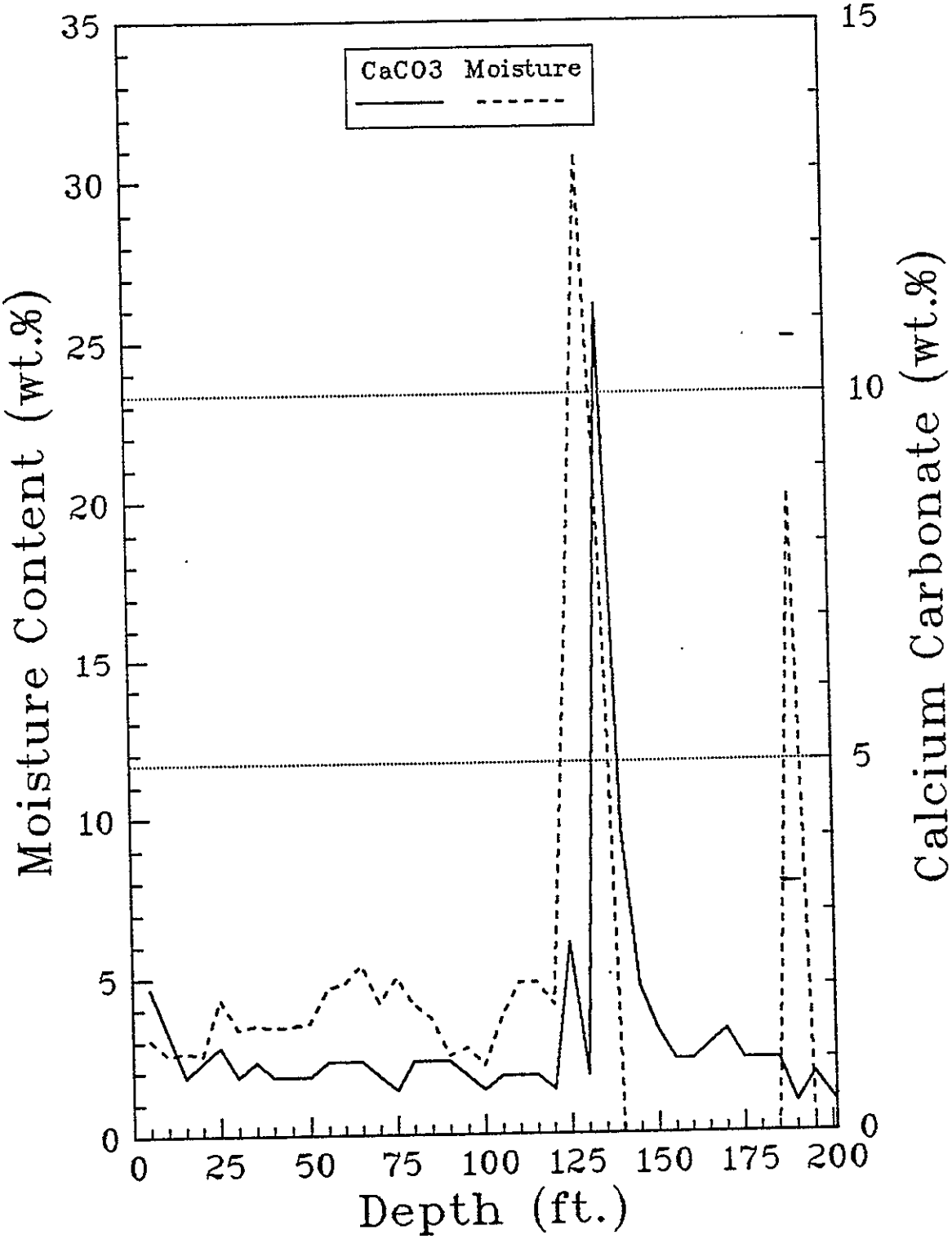
VALIDATED
SIGNATURE DATE

WELL 699-43-41G



9 3 1 2 7 0 0 6 1 5

	A	B	C
1	WELL 699-43-41G		
2			
3	Depth	CaCO3	Moisture
4	ft.	Wt. %	Wt. %
5			
6	5	2	3.06
7	10	1.4	2.54
8	15	0.8	2.66
9	20	1	2.55
10	25	1.2	4.34
11	30	0.8	3.37
12	35	1	3.51
13	40	0.8	3.42
14	45	0.8	3.46
15	50	0.8	3.56
16	55	1	4.66
17	60	1	4.81
18	65	1	5.39
19	70	0.8	4.19
20	75	0.6	4.98
21	80	1	4.13
22	85	1	3.68
23	90	1	2.50
24	95	0.8	2.75
25	100	0.6	2.18
26	105	0.8	3.72
27	110	0.8	4.80
28	115	0.8	4.81
29	120	0.6	4.11
30	125	2.6	16.35
31	130	0.8	30.85
32	135	11.2	18.12
33	140	4.1	
34	145	2	
35	150	1.4	
36	155	1	
37	160	1	
38	165	1.2	
39	170	1.4	
40	175	1	
41	180	1	
42	185	1	
43	189-191	0.4	20.23
44	195	0.8	
45	201	0.4	

9 3 1 2 7 3 9 0 6 1 6

SIEVE ANALYSIS DATA SHEET

Sample No. 1-2091 Page 1 of 1

Tested By: JERRY L. ENGLAND Date 9.9.91
Procedure No: ETAL-07 Rev. 1 Date Issued 11.15.89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: ETAL- 3310 Calibration Due Date 9.21.91
Thermometer: ETAL- 0006 Calibration Due Date 4.1.91
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A

Sample Description SANDY GRAVEL Sieve Time 10 (min)

Reduced by ( ) Splitting ( ) Quartering ( ) Stockpile

Sieve Size	Sample Weight	Cumulative Wt. Retained	Cumulative % Retained	Cumulative % Passed
2	1034.9	0	0	100
1½		365.1	35.3	64.7
1		365.1	35.3	64.7
3/4		437.1	42.2	57.8
½		522.3	50.5	49.5
3/8		574.6	55.5	44.5
4		657.6	63.5	36.5
10	95.4	12.1	12.7	31.9
40		37.5	39.3	22.2
60		57.1	59.9	14.6
100		65.7	68.9	11.4
200		72.7	76.2	8.7

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING		Remarks
C = Percemtage of material passing a 200 Sieve	N/A %	
D = Original Dry Weight of Sample	N/A g	WASHED FINE GRADING
E = Dry Weight of Sample After Washing/Sieve	N/A g	
C = <(D-E)/D>*100		

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By; RG ALEXANDER Date 9-9-91

A-6400-204(2-87)

9312706017

GRAIN SIZE ANALYSIS PLOT

Sample No. 1-2091

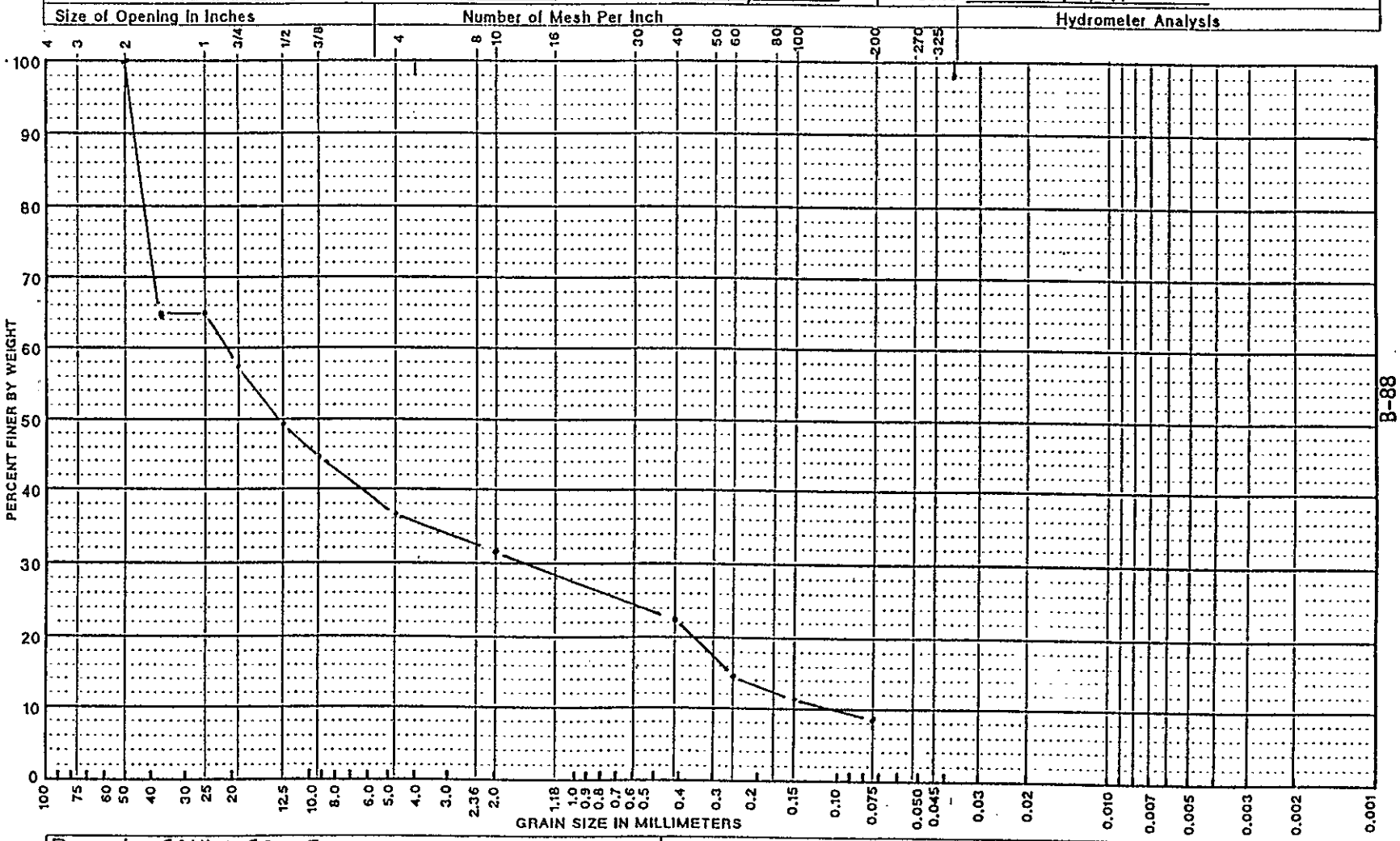
Page 1 of 1

Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Plotted By JERRY L. ENGLAND

Test Plan No. N/A Rev. N/A Date Issued N/A

Date 9-9-91



Remarks SANDY GRAVEL

699-43-41G 188.95-190.95

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.

Checked By: RG ALEXANDER Date 9-9-91

WHC-SD-EN-DP-046, Rev. 0

B-88

93127590618

SIEVE ANALYSIS DATA SHEET

Sample No. 1-2091 Page 1 of 1

Tested By: JERRY L. ENGLAND Date 9.9.91
Procedure No: ETAL-07 Rev. 1 Date Issued 11.15.89
Test Plan No: N/A Rev. N/A Date Issued N/A
Balance: ETAL- 3310 Calibration Due Date 9.21.91
Thermometer: ETAL- 0006 Calibration Due Date 4.1.92
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A
N/A : ETAL- N/A Calibration Due Date N/A

Sample Description SAND Sieve Time 10 (min)

Reduced by (x) Splitting ( ) Quartering ( ) Stockpile

Sieve Size	Sample Weight	Cumulative Wt. Retained	Cumulative % Retained	Cumulative % Passed
4	96.4	0	0	100
10		12.1	12.7	87.3
40		37.5	39.3	60.7
60		57.1	59.9	40.1
100		66.7	68.9	31.1
200		72.7	76.2	23.8
N/A	N/A	N/A	N/A	N/A

Finess Modules (FM) N/A (See ASTM C 136-83, Section 8.2)

MATERIALS FINER THAN NO. 200 SIEVE BY WASHING		Remarks
C = Percemtage of material passing a 200 Sieve	N/A %	
D = Original Dry Weight of Sample	N/A g	WASHED GRADING
E = Dry Weight of Sample After Washing/Sieve	N/A g	
C = <(D-E)/D>*100		

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.
Checked By; R.G. ALEXANDER Date 9-9-91

A-6400-204(2-87)

9 3 1 2 7 0 6 1 9

GRAIN SIZE ANALYSIS PLOT

Sample No. 1-2091

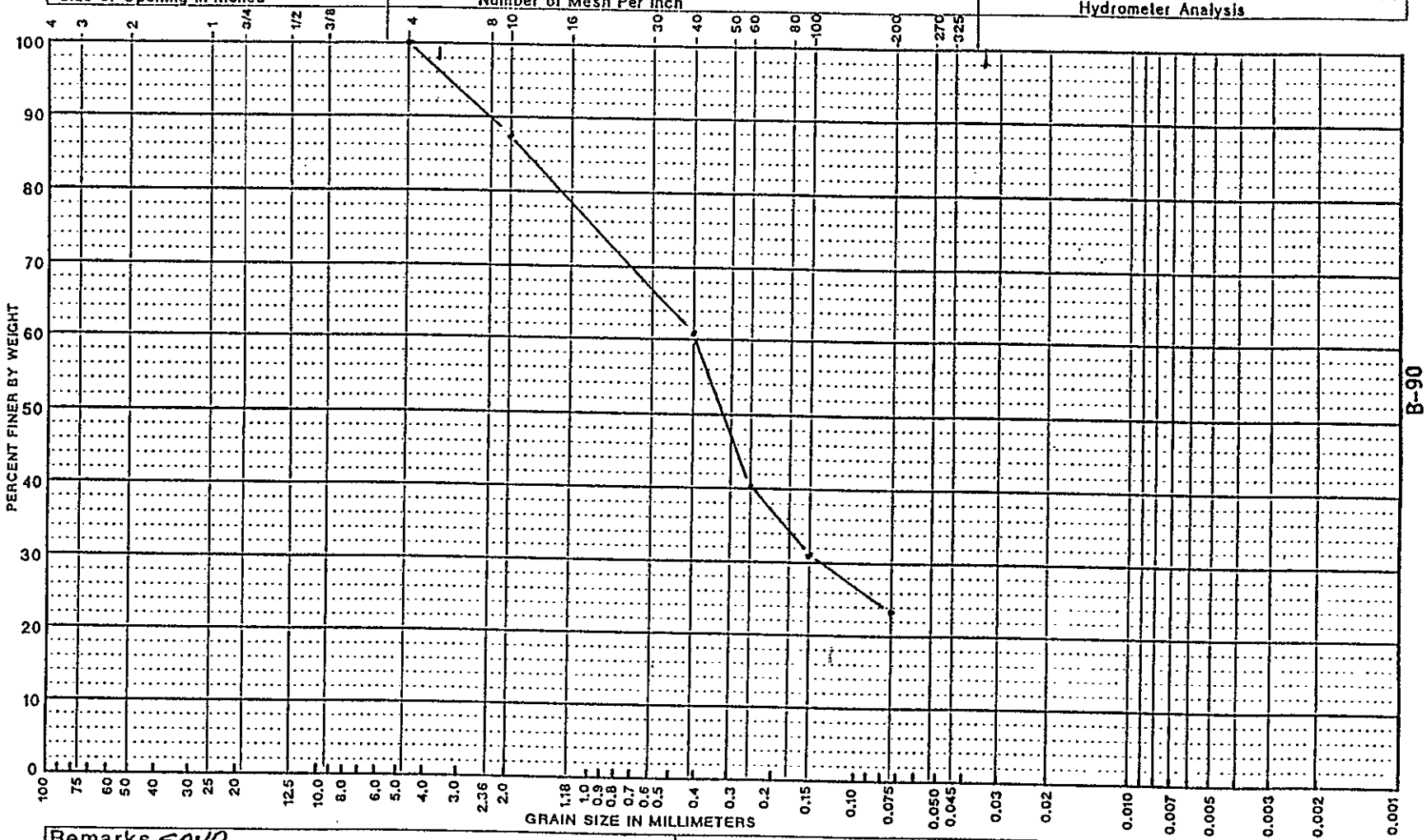
Page 1 of 1

Procedure No. ETAL-07 Rev. 1 Date Issued 11-15-89

Test Plan No. N/A Rev. N/A Date Issued N/A

Plotted By JERRY L. ENGLAND

Date 9-9-91



Remarks SAND

699-43-416 188.95-190.95'

All data are accurately and completely recorded. The test operator was trained and used calibrated instruments.

Checked By: R.G. ALEXANDER Date 9-9-91

WHC-SD-EN-DP-046, Rev. 0

B-90

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APPENDIX C

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

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 699-40-40A Well Depth 229.48' BTOC

Screened Interval 229.48'-218.78' BTOC Date Well Development is Performed 11-21-91/11-22-91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 228.26' Pump Start Time 0915/1042/1052

Flow Rate 11 gpm/10.5 gpm/3.85 gpm Accumulated Flow 1200 gal Pump Stop Time 0915/1052/1640

Turbidity 7100 NTU, 89 NTU, 80 NTU, 58 NTU, 80 NTU, 35 NTU, 38 NTU, 28 NTU

10 NTU, 8.3 NTU, 6.6 NTU, 5.5 NTU, 4.7 NTU, -, -, -

Comments Pumping took place on 11/21/91

Signature of Recorder JAMES A. COATES JAMES A. COATES Date 12-2-91

Sign and Print Name

A-6000-393 (03/90)

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation 699-40-40A Date 11/21/91

Well Depth 229.48' BTOC Screened Interval 229.48' - 218.78' BTOC

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E-TAPE / TRANSDUCER S. N. ET-1 / 2303 Calibration Due 1-24-92 / 5-9-92

Equipment Used to Measure Flow — NA — S. N. — NA — Calibration Due — NA —

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time ① 0915 / ② 1042 Pump Stop Time ① 0925 / ② 1640

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				① 5 gal / 26.4 = 11 GPM
				② 10.5 gal / min
				② 5 gal / 78 sec = 3.85 GPM
		SEE		
		ATTACHED		

Signature of Recorder JAMES A. COATES JAMES A. COATES Date 12-2-91

Sign and Print Name

A-6000-402 (03/90)

9312706625

WELL NO. 600-40-40A BASELINE PAGE 2 OF 7

SE2000
Environmental Logger
11/25 08:16

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	129.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/20 09:04:48

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	129.525	-129.525
1.0000	0.0167	129.525	-129.525
2.0000	0.0333	129.525	-129.525
3.0000	0.0500	129.541	-129.541
4.0000	0.0667	129.557	-129.557
5.0000	0.0833	129.573	-129.573
6.0000	0.1000	129.589	-129.589
7.0000	0.1167	129.589	-129.589
8.0000	0.1333	129.605	-129.605
9.0000	0.1500	129.605	-129.605
10.0000	0.1667	129.620	-129.620
11.0000	0.1833	129.636	-129.636
12.0000	0.2000	129.636	-129.636
13.0000	0.2167	129.636	-129.636
14.0000	0.2333	129.652	-129.652

9 3 1 2 7 3 9 0 6 2 6

WELL NO. 699-40-40A DRAWDOWN PAGE 3 OF 7

SE2000
Environmental Logger
11/25 08:14

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	129.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/20 09:21:13

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	130.017	-130.017
0.0083	0.0001	129.652	-129.652
0.0166	0.0003	129.969	-129.969
0.0250	0.0004	130.112	-130.112
0.0333	0.0006	130.127	-130.127
0.0416	0.0007	130.175	-130.175
0.0500	0.0008	130.698	-130.698
0.0583	0.0010	131.363	-131.363
0.0666	0.0011	130.175	-130.175
0.0750	0.0013	131.839	-131.839
0.0833	0.0014	131.870	-131.870
0.1000	0.0017	131.427	-131.427
0.1166	0.0019	131.680	-131.680
0.1333	0.0022	131.966	-131.966
0.1500	0.0025	132.314	-132.314
0.1666	0.0028	132.583	-132.583
0.1833	0.0031	132.900	-132.900
0.2000	0.0033	133.233	-133.233
0.2166	0.0036	133.518	-133.518
0.2333	0.0039	133.819	-133.819
0.2500	0.0042	134.105	-134.105
0.2666	0.0044	134.422	-134.422
0.2833	0.0047	134.754	-134.754
0.3000	0.0050	135.024	-135.024
0.3166	0.0053	135.325	-135.325
0.3333	0.0056	135.562	-135.562
0.4166	0.0069	136.925	-136.925
0.5000	0.0083	137.892	-137.892
0.5833	0.0097	138.272	-138.272
0.6666	0.0111	138.304	-138.304
0.7500	0.0125	138.367	-138.367
0.8333	0.0139	138.462	-138.462

9 3 1 2 7 3 0 6 2 7

WELL NO. 699-40-40A DRAWDOWN PAGE 4 OF 7

0.9166	0.0153	138.621	-138.621
1.0000	0.0167	138.652	-138.652
1.0833	0.0181	138.684	-138.684
1.1666	0.0194	139.017	-139.017
1.2500	0.0208	138.890	-138.890
1.3333	0.0222	139.223	-139.223
1.4166	0.0236	139.112	-139.112
1.5000	0.0250	139.302	-139.302
1.5833	0.0264	139.460	-139.460
1.6666	0.0278	139.397	-139.397
1.7500	0.0292	139.429	-139.429
1.8333	0.0306	139.651	-139.651
1.9166	0.0319	139.761	-139.761
2.0000	0.0333	139.825	-139.825
2.5000	0.0417	140.284	-140.284
3.0000	0.0500	140.807	-140.807
3.5000	0.0583	141.283	-141.283
4.0000	0.0667	141.092	-141.092
4.5000	0.0750	141.932	-141.932
5.0000	0.0833	148.920	-148.920
5.5000	0.0917	155.353	-155.353
6.0000	0.1000	161.897	-161.897
6.5000	0.1083	168.093	-168.093
7.0000	0.1167	173.924	-173.924
7.5000	0.1250	179.692	-179.692
8.0000	0.1333	184.968	-184.968
8.5000	0.1417	190.149	-190.149
9.0000	0.1500	195.062	-195.062
9.5000	0.1583	199.831	-199.831
10.0000	0.1667	204.489	-204.489

9 3 1 2 7 3 9 0 6 2 8

WELL NO. 699-40-40A RECOVERY PAGE 5 OF 7

SE2000
Environmental Logger
11/25 08:12

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	129.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/20 09:31:54

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
	0.0000	210.321	-210.321
0.0083	0.0001	210.653	-210.653
0.0166	0.0003	210.495	-210.495
0.0250	0.0004	210.400	-210.400
0.0333	0.0006	210.273	-210.273
0.0416	0.0007	210.146	-210.146
0.0500	0.0008	210.035	-210.035
0.0583	0.0010	209.924	-209.924
0.0666	0.0011	209.798	-209.798
0.0750	0.0013	209.687	-209.687
0.0833	0.0014	209.576	-209.576
0.1000	0.0017	209.322	-209.322
0.1166	0.0019	209.085	-209.085
0.1333	0.0022	208.863	-208.863
0.1500	0.0025	208.625	-208.625
0.1666	0.0028	208.419	-208.419
0.1833	0.0031	208.181	-208.181
0.2000	0.0033	207.960	-207.960
0.2166	0.0036	207.738	-207.738
0.2333	0.0039	207.516	-207.516
0.2500	0.0042	207.294	-207.294
0.2666	0.0044	207.072	-207.072
0.2833	0.0047	206.850	-206.850
0.3000	0.0050	206.644	-206.644
0.3166	0.0053	206.438	-206.438
0.3333	0.0056	206.232	-206.232
0.4166	0.0069	205.298	-205.298
0.5000	0.0083	204.299	-204.299
0.5833	0.0097	203.317	-203.317
0.6666	0.0111	202.398	-202.398
0.7500	0.0125	201.495	-201.495
0.8333	0.0139	200.623	-200.623

9 3 1 2 7 0 6 2 9

WELL NO. 699-40-40A RECOVERY PAGE 6 OF 7

0.9166	0.0153	199.799	-199.799
1.0000	0.0167	199.007	-199.007
1.0833	0.0181	198.215	-198.215
1.1666	0.0194	197.470	-197.470
1.2500	0.0208	196.757	-196.757
1.3333	0.0222	196.091	-196.091
1.4166	0.0236	195.442	-195.442
1.5000	0.0250	194.840	-194.840
1.5833	0.0264	194.269	-194.269
1.6666	0.0278	193.715	-193.715
1.7500	0.0292	193.192	-193.192
1.8333	0.0306	192.716	-192.716
1.9166	0.0319	192.257	-192.257
2.0000	0.0333	191.829	-191.829
2.5000	0.0417	189.833	-189.833
3.0000	0.0500	188.074	-188.074
3.5000	0.0583	186.362	-186.362
4.0000	0.0667	184.699	-184.699
4.5000	0.0750	183.067	-183.067
5.0000	0.0833	181.498	-181.498
5.5000	0.0917	179.961	-179.961
6.0000	0.1000	178.456	-178.456
6.5000	0.1083	176.982	-176.982
7.0000	0.1167	175.588	-175.588
7.5000	0.1250	174.209	-174.209
8.0000	0.1333	172.878	-172.878
8.5000	0.1417	171.579	-171.579
9.0000	0.1500	170.311	-170.311
9.5000	0.1583	169.091	-169.091
10.0000	0.1667	167.919	-167.919
12.0000	0.2000	163.482	-163.482
14.0000	0.2333	159.457	-159.457
16.0000	0.2667	155.860	-155.860
18.0000	0.3000	152.691	-152.691
20.0000	0.3333	149.871	-149.871
22.0000	0.3667	147.367	-147.367
24.0000	0.4000	145.149	-145.149
26.0000	0.4333	143.168	-143.168
28.0000	0.4667	141.425	-141.425
30.0000	0.5000	139.888	-139.888
32.0000	0.5333	138.494	-138.494
34.0000	0.5667	137.321	-137.321
36.0000	0.6000	136.291	-136.291
38.0000	0.6333	135.388	-135.388
40.0000	0.6667	134.612	-134.612
42.0000	0.7000	133.915	-133.915
44.0000	0.7333	133.312	-133.312
46.0000	0.7667	132.805	-132.805
48.0000	0.8000	132.362	-132.362
50.0000	0.8333	131.966	-131.966
52.0000	0.8667	131.633	-131.633
54.0000	0.9000	131.348	-131.348

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WELL NO. 699-40-40A RECOVERY PAGE 7 OF 7

56.0000	0.9333	131.094	-131.094
58.0000	0.9667	130.888	-130.888
60.0000	1.0000	130.698	-130.698
62.0000	1.0333	130.539	-130.539
64.0000	1.0667	130.397	-130.397
66.0000	1.1000	130.286	-130.286
68.0000	1.1333	130.175	-130.175
70.0000	1.1667	130.112	-130.112
72.0000	1.2000	130.032	-130.032

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SAMPLING PUMP INSTALLATION FORM

181

Project: W017 / B POND

Well Number 699-40-40A

Pump Type HYDROSTAR

Pump Model 8001

Date Installed: 11/22/91

Installed by: B. STRODE / M. MUNSON

Depth to water: 129.51' BTOC

Depth to Bottom 229.48'

Reported Depth to water:

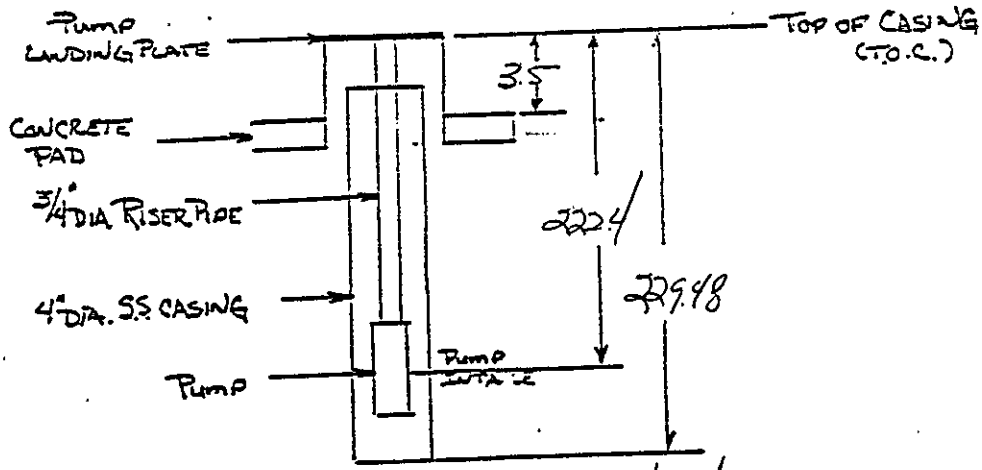
Screened Interval: 229.48' - 218.78' BTOC

Pump/Riser Pipe Description:
- pipe: 3/4" S.S.
- pump length: 4.9
- pump screen length 2.0
- material cleaning: MANUFACTURER

Comments:

PUMP INSTALLATION SKETCH

Total material length 224.4
Loc. of pump intake: 222.4



Completed By: J.A. GATES

Date: 11/22/91

222.48

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 699-40-40B Well Depth 201.19' BTOC

Screened Interval 201.19'-190.37' Date Well Development is Performed 10-19/10-20/10-22-91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 200.0' Pump Start Time 0805/1245 - 10/22/91 1200 - 10/19/91

Flow Rate 1.2 gpm/0.51 gpm 0.6 GPM Accumulated Flow ~~35~~ 1014 gal Pump Stop Time 1045/1800 - 10/22/91 1915 - 11/19/91

Turbidity 102 NTU, 7100 NTU, 86 NTU, 53 NTU, 45 NTU, 41 NTU, 37 NTU, 71 NTU

8.7 NTU, 7.1 NTU, 5.6 NTU, 4.8 NTU, -, -, -, -

Comments _____

Signature of Recorder James A. Gates James A. Gates Date 12-1-91

Sign and Print Name

A-6000-393 (03/90)

9312706635

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation 699-40-40R Date 11-19-91 / 11-20-91 10/28/91

Well Depth 201.19' BTOC Screened Interval 201.19'-190.37'

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E.TAPE / TRANSDUCER S.N E7-5 / 2430 Calibration Due 1-24-92 / 5-9-92

Equipment Used to Measure Flow —NA— S.N. —NA— Calibration Due —NA—

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time 0805-1045 / 1200 Pump Stop Time 1045-1400 / 1915 10/28/91 11/19/91

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				5 gal/4min 12sec = 1.2 GPM } 10/28/91
				10/31sec = 0.51 GPM }
				0.6 GPM - 11/19/91
		SEE		
		ATTACHED		

Signature of Recorder James A. Coates JAMES A. COATES Date 11-11-91

Sign and Print Name

A-6000-402 (03/90)

9312706337

WELL NO. 699-40-40B BASELINE PAGE 2 OF 8

SE2000
Environmental Logger
10/29 10:17

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	133.800
SG	1.000
Linearity	0.000
Scale factor	50.140
Offset	0.000
Delay mSEC	50.000

Step 0 10/28 08:53:58

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	133.800	-133.800
1.0000	0.0167	133.784	-133.784
2.0000	0.0333	133.784	-133.784
3.0000	0.0500	133.784	-133.784
4.0000	0.0667	133.784	-133.784
5.0000	0.0833	133.784	-133.784
6.0000	0.1000	133.784	-133.784
7.0000	0.1167	133.784	-133.784
8.0000	0.1333	133.784	-133.784
9.0000	0.1500	133.784	-133.784
10.0000	0.1667	133.784	-133.784
11.0000	0.1833	133.784	-133.784
12.0000	0.2000	133.784	-133.784
13.0000	0.2167	133.784	-133.784
14.0000	0.2333	133.784	-133.784
15.0000	0.2500	133.784	-133.784
16.0000	0.2667	133.784	-133.784
17.0000	0.2833	133.784	-133.784

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WELL NO. 699-40-40B DRAWDOWN PAGE 3 OF 8

SE2000
Environmental Logger
10/29 10:14

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	133.800
SG	1.000
Linearity	0.000
Scale factor	50.140
Offset	0.000
Delay mSEC	50.000

Step 0 10/28 09:13:05

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	139.706	-139.706
0.0083	0.0001	133.863	-133.863
0.0166	0.0003	134.243	-134.243
0.0250	0.0004	134.259	-134.259
0.0333	0.0006	134.496	-134.496
0.0416	0.0007	134.639	-134.639
0.0500	0.0008	134.908	-134.908
0.0583	0.0010	134.940	-134.940
0.0666	0.0011	135.098	-135.098
0.0750	0.0013	135.304	-135.304
0.0833	0.0014	135.446	-135.446
0.1000	0.0017	135.747	-135.747
0.1166	0.0019	136.096	-136.096
0.1333	0.0022	136.381	-136.381
0.1500	0.0025	136.682	-136.682
0.1666	0.0028	137.014	-137.014
0.1833	0.0031	137.315	-137.315
0.2000	0.0033	137.632	-137.632
0.2166	0.0036	137.933	-137.933
0.2333	0.0039	138.218	-138.218
0.2500	0.0042	138.503	-138.503
0.2666	0.0044	138.819	-138.819
0.2833	0.0047	139.120	-139.120
0.3000	0.0050	139.390	-139.390
0.3166	0.0053	139.675	-139.675
0.3333	0.0056	139.975	-139.975
0.4166	0.0069	141.258	-141.258
0.5000	0.0083	141.337	-141.337
0.5833	0.0097	142.604	-142.604
0.6666	0.0111	142.668	-142.668
0.7500	0.0125	142.668	-142.668
0.8333	0.0139	142.858	-142.858

9 3 1 2 7 5 0 6 3 9

WELL NO. 699-40-40B DRAWDOWN PAGE 4 OF 8

0.9166	0.0153	142.921	-142.921
1.0000	0.0167	143.000	-143.000
1.0833	0.0181	143.507	-143.507
1.1666	0.0194	144.093	-144.093
1.2500	0.0208	144.584	-144.584
1.3333	0.0222	145.170	-145.170
1.4166	0.0236	145.645	-145.645
1.5000	0.0250	146.231	-146.231
1.5833	0.0264	146.532	-146.532
1.6666	0.0278	146.864	-146.864
1.7500	0.0292	146.896	-146.896
1.8333	0.0306	147.181	-147.181
1.9166	0.0319	147.339	-147.339
2.0000	0.0333	147.450	-147.450
2.5000	0.0417	148.226	-148.226
3.0000	0.0500	148.907	-148.907
3.5000	0.0583	150.538	-150.538
4.0000	0.0667	151.678	-151.678
4.5000	0.0750	152.913	-152.913
5.0000	0.0833	153.816	-153.816
5.5000	0.0917	154.750	-154.750
6.0000	0.1000	155.479	-155.479
6.5000	0.1083	156.239	-156.239
7.0000	0.1167	156.825	-156.825
7.5000	0.1250	157.411	-157.411
8.0000	0.1333	158.060	-158.060
8.5000	0.1417	158.709	-158.709
9.0000	0.1500	159.343	-159.343
9.5000	0.1583	159.881	-159.881
10.0000	0.1667	160.388	-160.388
12.0000	0.2000	162.605	-162.605
14.0000	0.2333	164.474	-164.474
16.0000	0.2667	166.136	-166.136
18.0000	0.3000	167.767	-167.767
20.0000	0.3333	169.272	-169.272
22.0000	0.3667	170.681	-170.681
24.0000	0.4000	171.996	-171.996
26.0000	0.4333	173.199	-173.199
28.0000	0.4667	174.498	-174.498
30.0000	0.5000	175.574	-175.574
32.0000	0.5333	176.556	-176.556
34.0000	0.5667	177.459	-177.459
36.0000	0.6000	178.330	-178.330
38.0000	0.6333	179.233	-179.233
40.0000	0.6667	180.072	-180.072
42.0000	0.7000	180.848	-180.848
44.0000	0.7333	181.671	-181.671
46.0000	0.7667	182.416	-182.416
48.0000	0.8000	183.081	-183.081
50.0000	0.8333	183.777	-183.777
52.0000	0.8667	184.474	-184.474
54.0000	0.9000	185.155	-185.155

9 3 1 2 7 3 9 0 6 4 0

WELL NO. 699-40-40B DRAWDOWN PAGE 5 OF 8

56.0000	0.9333	185.757	-185.757
58.0000	0.9667	186.359	-186.359
60.0000	1.0000	186.945	-186.945
62.0000	1.0333	187.530	-187.530
64.0000	1.0667	188.069	-188.069
66.0000	1.1000	188.607	-188.607
68.0000	1.1333	189.098	-189.098
70.0000	1.1667	189.652	-189.652
72.0000	1.2000	190.112	-190.112
74.0000	1.2333	190.571	-190.571
76.0000	1.2667	190.999	-190.999
78.0000	1.3000	191.394	-191.394
80.0000	1.3333	191.822	-191.822
82.0000	1.3667	192.234	-192.234
84.0000	1.4000	192.566	-192.566
86.0000	1.4333	192.931	-192.931
88.0000	1.4667	193.263	-193.263
90.0000	1.5000	193.390	-193.390
92.0000	1.5333	193.421	-193.421
94.0000	1.5667	193.437	-193.437
96.0000	1.6000	193.469	-193.469
98.0000	1.6333	193.469	-193.469
100.0000	1.6667	193.516	-193.516
105.0000	1.7500	193.643	-193.643
110.0000	1.8333	193.722	-193.722
115.0000	1.9167	193.754	-193.754
120.0000	2.0000	193.738	-193.738
125.0000	2.0833	193.754	-193.754
130.0000	2.1667	193.801	-193.801
135.0000	2.2500	194.023	-194.023
140.0000	2.3333	194.118	-194.118
145.0000	2.4167	194.102	-194.102
150.0000	2.5000	194.118	-194.118
155.0000	2.5833	194.118	-194.118
160.0000	2.6667	194.118	-194.118

9 3 1 2 7 0 6 1 1

SE2000
Environmental Logger
10/29 10:03

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	133.800
SG	1.000
Linearity	0.000
Scale factor	50.140
Offset	0.000
Delay mSEC	50.000

Step 0 10/28 11:57:17

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	193.643	-193.643
0.0083	0.0001	193.564	-193.564
0.0166	0.0003	193.469	-193.469
0.0250	0.0004	193.374	-193.374
0.0333	0.0006	193.279	-193.279
0.0416	0.0007	193.184	-193.184
0.0500	0.0008	193.105	-193.105
0.0583	0.0010	193.041	-193.041
0.0666	0.0011	192.962	-192.962
0.0750	0.0013	192.883	-192.883
0.0833	0.0014	192.804	-192.804
0.1000	0.0017	192.661	-192.661
0.1166	0.0019	192.519	-192.519
0.1333	0.0022	192.360	-192.360
0.1500	0.0025	192.218	-192.218
0.1666	0.0028	192.075	-192.075
0.1833	0.0031	191.933	-191.933
0.2000	0.0033	191.790	-191.790
0.2166	0.0036	191.648	-191.648
0.2333	0.0039	191.505	-191.505
0.2500	0.0042	191.347	-191.347
0.2666	0.0044	191.204	-191.204
0.2833	0.0047	191.078	-191.078
0.3000	0.0050	190.935	-190.935
0.3166	0.0053	190.793	-190.793
0.3333	0.0056	190.666	-190.666
0.4166	0.0069	190.048	-190.048
0.5000	0.0083	189.383	-189.383
0.5833	0.0097	188.734	-188.734
0.6666	0.0111	188.132	-188.132
0.7500	0.0125	187.530	-187.530
0.8333	0.0139	186.960	-186.960

9 3 1 2 7 5 9 0 6 4 2

WELL NO. 699-40-40B RECOVERY PAGE 7 OF 8

0.9166	0.0153	186.422	-186.422
1.0000	0.0167	185.899	-185.899
1.0833	0.0181	185.440	-185.440
1.1666	0.0194	184.997	-184.997
1.2500	0.0208	184.601	-184.601
1.3333	0.0222	184.252	-184.252
1.4166	0.0236	183.936	-183.936
1.5000	0.0250	183.651	-183.651
1.5833	0.0264	183.381	-183.381
1.6666	0.0278	183.160	-183.160
1.7500	0.0292	182.970	-182.970
1.8333	0.0306	182.796	-182.796
1.9166	0.0319	182.669	-182.669
2.0000	0.0333	182.558	-182.558
2.5000	0.0417	182.115	-182.115
3.0000	0.0500	181.735	-181.735
3.5000	0.0583	181.355	-181.355
4.0000	0.0667	180.990	-180.990
4.5000	0.0750	180.610	-180.610
5.0000	0.0833	180.246	-180.246
5.5000	0.0917	179.882	-179.882
6.0000	0.1000	179.518	-179.518
6.5000	0.1083	179.169	-179.169
7.0000	0.1167	178.805	-178.805
7.5000	0.1250	178.472	-178.472
8.0000	0.1333	178.124	-178.124
8.5000	0.1417	177.776	-177.776
9.0000	0.1500	177.427	-177.427
9.5000	0.1583	177.095	-177.095
10.0000	0.1667	176.762	-176.762
12.0000	0.2000	175.448	-175.448
14.0000	0.2333	174.181	-174.181
16.0000	0.2667	172.882	-172.882
18.0000	0.3000	171.679	-171.679
20.0000	0.3333	170.507	-170.507
22.0000	0.3667	169.383	-169.383
24.0000	0.4000	168.290	-168.290
26.0000	0.4333	167.229	-167.229
28.0000	0.4667	166.200	-166.200
30.0000	0.5000	165.202	-165.202
32.0000	0.5333	164.220	-164.220
34.0000	0.5667	163.286	-163.286
36.0000	0.6000	162.367	-162.367
38.0000	0.6333	161.481	-161.481
40.0000	0.6667	160.625	-160.625
42.0000	0.7000	159.802	-159.802
44.0000	0.7333	158.978	-158.978
46.0000	0.7667	158.203	-158.203
48.0000	0.8000	157.442	-157.442
50.0000	0.8333	156.698	-156.698
52.0000	0.8667	156.001	-156.001
54.0000	0.9000	155.305	-155.305

9 3 1 2 7 0 6 1 3

WELL NO. 699-40-40B RECOVERY PAGE 8 OF 8

56.0000	0.9333	154.624	-154.624
58.0000	0.9667	153.959	-153.959
60.0000	1.0000	153.293	-153.293
62.0000	1.0333	152.676	-152.676
64.0000	1.0667	152.090	-152.090
66.0000	1.1000	151.520	-151.520
68.0000	1.1333	150.966	-150.966
70.0000	1.1667	150.411	-150.411
72.0000	1.2000	149.905	-149.905
74.0000	1.2333	149.398	-149.398
76.0000	1.2667	148.907	-148.907
78.0000	1.3000	148.432	-148.432
80.0000	1.3333	147.973	-147.973
82.0000	1.3667	147.545	-147.545
84.0000	1.4000	147.102	-147.102
86.0000	1.4333	146.690	-146.690
88.0000	1.4667	146.278	-146.278
90.0000	1.5000	145.898	-145.898
92.0000	1.5333	145.518	-145.518
94.0000	1.5667	145.154	-145.154
96.0000	1.6000	144.790	-144.790
98.0000	1.6333	144.457	-144.457
100.0000	1.6667	144.124	-144.124
105.0000	1.7500	143.349	-143.349
110.0000	1.8333	142.620	-142.620

9 3 1 2 7 5 9 0 6 1 4

SAMPLING PUMP INSTALLATION FORM

191

VALIDATED 2/4/92 SIGNATURE/DATE

Project: W017 / B-POND

Well Number 699-40-40B

Pump Type HYDROSTAR

Pump Model 8001

Date Installed: 11/20/91

Installed by: B. STRODE / M. MUNSON KEH

Depth to water: 131.6

Depth to Bottom 201.19

Reported Depth to water: _____

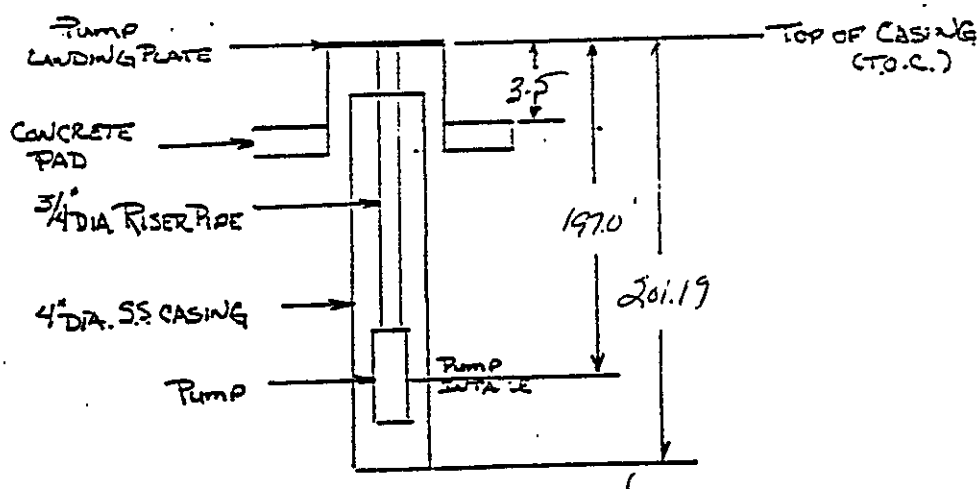
Screened Interval: 201.19 - 190.37' (10.82

Pump/Riser Pipe Description:
- pipe: 3/4' S.S.
- pump length: 4.3
- pump screen length 1.9
- material cleaning: MANUFACTURER

Comments:

PUMP INSTALLATION SKETCH

Total material length 199.3'
Loc. of pump intake: 197.0



Completed By: J.A. COATES

Date: 11/20/91

201.19
4/23
1967

232 4/23

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 699-8P91-2 Well Depth 183.96' BTOC

Screened Interval 183.96'-163.26' BTOC Date Well Development is Performed 10/21/91/10/22/91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 181.~~76~~ 5' BAC Pump Start Time 0805/0845

Flow Rate 10.3gpm/1.36gpm Accumulated Flow 5.72 gal Pump Stop Time 0811/1500

Turbidity 99 NTU, 66 NTU, 30 NTU, 24 NTU, 18 NTU, 8.6 NTU, 8.2 NTU, 15 NTU

6.0 NTU, 4.2 NTU, –, –, –, –, –, –

Comments _____

Signature of Recorder James A. Cassos James A. Cassos Date 10/21/91

Sign and Print Name C-25

A-6000-393 (03/90)

9312706047

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation 699-BP91-2 Date 10-21-91

Well Depth 183.96' BTOC Screened Interval ~~183~~ 183.96'-163.26' BTOC

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E-TAPE/TRANSDUCER S.N ET-5/350976 Calibration Due 1-24-92/5-9-92

Equipment Used to Measure Flow —NA— S.N. —NA— Calibration Due —NA—

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time 0805/0845 Pump Stop Time 0811/1500

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				5 gal/29 sec = 10.3 GPM
				1000 ml/11.69 sec = 1.36 GPM
		SEE		
		ATTACHED		

Signature of Recorder James A. Coates JAMES A. COATES Date 10/31/91

Sign and Print Name

A-6000-402 (03/90)

9312750649

WELL NO. 699-BP1-2 BASELINE

SE2000
Environmental Logger
10/21 16:37

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/21 07:44:44

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0	0.0000	138.873	-138.873
1	0.0167	138.876	-138.876
2	0.0333	138.873	-138.873
3	0.0500	138.867	-138.867
4	0.0667	138.864	-138.864
5	0.0833	138.870	-138.870
6	0.1000	138.864	-138.864
7	0.1167	138.861	-138.861
8	0.1333	138.864	-138.864
9	0.1500	138.861	-138.861
10	0.1667	138.857	-138.857
11	0.1833	138.857	-138.857
12	0.2000	138.861	-138.861
13	0.2167	138.864	-138.864
14	0.2333	138.864	-138.864
15	0.2500	138.857	-138.857
16	0.2667	138.864	-138.864
17	0.2833	138.861	-138.861
18	0.3000	138.864	-138.864
19	0.3167	138.864	-138.864
20	0.3333	138.861	-138.861
21	0.3500	138.864	-138.864

9 3 1 2 7 5 9 0 6 5 0

WELL NO. 699-BP1-2 DRAWDOWN

SE2000
Environmental Logger
10/21 16:35

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/21 08:48:51

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	139.510	-139.510
0.0083	0.0001	139.656	-139.656
0.0166	0.0003	139.836	-139.836
0.0250	0.0004	139.998	-139.998
0.0333	0.0006	140.143	-140.143
0.0416	0.0007	140.295	-140.295
0.0500	0.0008	140.451	-140.451
0.0583	0.0010	140.609	-140.609
0.0666	0.0011	140.755	-140.755
0.0750	0.0013	140.907	-140.907
0.0833	0.0014	141.052	-141.052
0.1000	0.0017	141.331	-141.331
0.1166	0.0019	141.619	-141.619
0.1333	0.0022	141.901	-141.901
0.1500	0.0025	142.167	-142.167
0.1666	0.0028	142.446	-142.446
0.1833	0.0031	142.703	-142.703
0.2000	0.0033	142.978	-142.978
0.2166	0.0036	143.260	-143.260
0.2333	0.0039	143.466	-143.466
0.2500	0.0042	143.751	-143.751
0.2666	0.0044	144.011	-144.011
0.2833	0.0047	144.290	-144.290
0.3000	0.0050	144.527	-144.527
0.3166	0.0053	144.774	-144.774
0.3333	0.0056	145.028	-145.028
0.4166	0.0069	145.319	-145.319
0.5000	0.0083	145.496	-145.496
0.5833	0.0097	145.781	-145.781
0.6666	0.0111	146.193	-146.193
0.7500	0.0125	146.618	-146.618
0.8333	0.0139	147.045	-147.045

9 3 1 2 7 0 6 5 1

WELL NO. 699-BP1-2 DRAWDOWN

0.9166	0.0153	147.397	-147.397
1.0000	0.0167	147.793	-147.793
1.0833	0.0181	148.224	-148.224
1.1666	0.0194	148.471	-148.471
1.2500	0.0208	148.518	-148.518
1.3333	0.0222	148.585	-148.585
1.4166	0.0236	148.746	-148.746
1.5000	0.0250	148.540	-148.540
1.5833	0.0264	148.699	-148.699
1.6666	0.0278	148.680	-148.680
1.7500	0.0292	148.692	-148.692
1.8333	0.0306	148.547	-148.547
1.9166	0.0319	148.645	-148.645
2.0000	0.0333	148.540	-148.540
2.5000	0.0417	148.889	-148.889
3.0000	0.0500	148.911	-148.911
3.5000	0.0583	148.829	-148.829
4.0000	0.0667	148.534	-148.534
4.5000	0.0750	148.939	-148.939
5.0000	0.0833	149.136	-149.136
5.5000	0.0917	149.405	-149.405
6.0000	0.1000	149.481	-149.481
6.5000	0.1083	149.503	-149.503
7.0000	0.1167	149.472	-149.472
7.5000	0.1250	149.456	-149.456
8.0000	0.1333	149.383	-149.383
8.5000	0.1417	149.421	-149.421
9.0000	0.1500	149.358	-149.358
9.5000	0.1583	149.389	-149.389
10.0000	0.1667	149.240	-149.240
12.0000	0.2000	149.285	-149.285
14.0000	0.2333	149.424	-149.424
16.0000	0.2667	149.291	-149.291
18.0000	0.3000	149.161	-149.161
20.0000	0.3333	149.041	-149.041
22.0000	0.3667	148.936	-148.936
24.0000	0.4000	148.819	-148.819
26.0000	0.4333	148.724	-148.724
28.0000	0.4667	148.724	-148.724
30.0000	0.5000	148.810	-148.810
32.0000	0.5333	148.778	-148.778
34.0000	0.5667	148.756	-148.756
36.0000	0.6000	148.746	-148.746
38.0000	0.6333	148.756	-148.756
40.0000	0.6667	148.768	-148.768
42.0000	0.7000	148.759	-148.759
44.0000	0.7333	148.791	-148.791
46.0000	0.7667	148.797	-148.797
48.0000	0.8000	148.832	-148.832
50.0000	0.8333	148.822	-148.822
52.0000	0.8667	148.844	-148.844
54.0000	0.9000	148.895	-148.895

9 3 1 2 7 3 9 0 6 5 2

WELL NO. 699-BP1-2 DRAWDOWN

56.0000	0.9333	148.895	-148.895
58.0000	0.9667	148.930	-148.930
60.0000	1.0000	148.958	-148.958
62.0000	1.0333	148.993	-148.993
64.0000	1.0667	149.003	-149.003
66.0000	1.1000	149.053	-149.053
68.0000	1.1333	149.076	-149.076
70.0000	1.1667	149.104	-149.104
72.0000	1.2000	149.126	-149.126
74.0000	1.2333	149.155	-149.155
76.0000	1.2667	149.180	-149.180
78.0000	1.3000	149.272	-149.272
80.0000	1.3333	149.256	-149.256
82.0000	1.3667	149.244	-149.244
84.0000	1.4000	149.177	-149.177
86.0000	1.4333	149.180	-149.180
88.0000	1.4667	149.183	-149.183
90.0000	1.5000	149.247	-149.247
92.0000	1.5333	149.237	-149.237
94.0000	1.5667	149.259	-149.259
96.0000	1.6000	149.282	-149.282
98.0000	1.6333	149.266	-149.266
100.0000	1.6667	149.278	-149.278
105.0000	1.7500	149.342	-149.342
110.0000	1.8333	149.367	-149.367
115.0000	1.9167	149.396	-149.396
120.0000	2.0000	149.377	-149.377
125.0000	2.0833	149.472	-149.472
130.0000	2.1667	149.446	-149.446
135.0000	2.2500	149.487	-149.487
140.0000	2.3333	149.472	-149.472
145.0000	2.4167	149.576	-149.576
150.0000	2.5000	149.573	-149.573
155.0000	2.5833	149.592	-149.592
160.0000	2.6667	149.636	-149.636
165.0000	2.7500	149.633	-149.633
170.0000	2.8333	149.620	-149.620
175.0000	2.9167	149.633	-149.633
180.0000	3.0000	149.741	-149.741
185.0000	3.0833	149.776	-149.776
190.0000	3.1667	149.728	-149.728
195.0000	3.2500	149.700	-149.700
200.0000	3.3333	149.681	-149.681
205.0000	3.4167	149.709	-149.709
210.0000	3.5000	149.763	-149.763
215.0000	3.5833	149.750	-149.750
220.0000	3.6667	149.829	-149.829
225.0000	3.7500	149.880	-149.880
230.0000	3.8333	149.804	-149.804
235.0000	3.9167	149.782	-149.782
240.0000	4.0000	149.791	-149.791

9 3 1 2 7 0 0 6 5 3

245.0000 4.0833 149.744 -149.744

WELL NO. 699-BP1-2 DRAWDOWN

250.0000	4.1667	149.209	-149.209
255.0000	4.2500	149.012	-149.012
260.0000	4.3333	148.816	-148.816
265.0000	4.4167	148.806	-148.806
270.0000	4.5000	148.867	-148.867
275.0000	4.5833	148.838	-148.838
280.0000	4.6667	148.813	-148.813
285.0000	4.7500	148.825	-148.825
290.0000	4.8333	148.870	-148.870
295.0000	4.9167	148.689	-148.689
300.0000	5.0000	148.448	-148.448
305.0000	5.0833	148.296	-148.296
310.0000	5.1667	148.322	-148.322
315.0000	5.2500	150.137	-150.137
320.0000	5.3333	152.516	-152.516
325.0000	5.4167	153.301	-153.301
330.0000	5.5000	153.535	-153.535
335.0000	5.5833	153.684	-153.684
340.0000	5.6667	153.668	-153.668
345.0000	5.7500	153.757	-153.757
350.0000	5.8333	153.700	-153.700
355.0000	5.9167	153.716	-153.716
360.0000	6.0000	153.741	-153.741
365.0000	6.0833	153.558	-153.558
370.0000	6.1667	152.826	-152.826

9 3 1 2 7 5 9 0 6 5 4

WELL NO. 699-BP1-2 RECOVERY

7 of 8

SE2000
Environmental Logger
10/21 16:33

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/21 15:02:42

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	138.689	-138.689
0.0083	0.0001	138.746	-138.746
0.0166	0.0003	138.689	-138.689
0.0250	0.0004	138.601	-138.601
0.0333	0.0006	138.528	-138.528
0.0416	0.0007	138.423	-138.423
0.0500	0.0008	138.344	-138.344
0.0583	0.0010	138.297	-138.297
0.0666	0.0011	138.176	-138.176
0.0750	0.0013	138.103	-138.103
0.0833	0.0014	138.015	-138.015
0.1000	0.0017	137.875	-137.875
0.1166	0.0019	137.717	-137.717
0.1333	0.0022	137.565	-137.565
0.1500	0.0025	137.403	-137.403
0.1666	0.0028	137.223	-137.223
0.1833	0.0031	137.046	-137.046
0.2000	0.0033	136.919	-136.919
0.2166	0.0036	136.808	-136.808
0.2333	0.0039	136.624	-136.624
0.2500	0.0042	136.453	-136.453
0.2666	0.0044	136.314	-136.314
0.2833	0.0047	136.184	-136.184
0.3000	0.0050	136.029	-136.029
0.3166	0.0053	135.877	-135.877
0.3333	0.0056	135.725	-135.725
0.4166	0.0069	135.101	-135.101
0.5000	0.0083	134.464	-134.464
0.5833	0.0097	133.802	-133.802
0.6666	0.0111	133.226	-133.226
0.7500	0.0125	132.671	-132.671
0.8333	0.0139	132.190	-132.190

9 3 1 2 7 0 6 5 5

WELL NO. 699-BP1-2 RECOVERY

0.9166	0.0153	131.765	-131.765
1.0000	0.0167	131.360	-131.360
1.0833	0.0181	131.005	-131.005
1.1666	0.0194	130.695	-130.695
1.2500	0.0208	130.403	-130.403
1.3333	0.0222	130.172	-130.172
1.4166	0.0236	129.973	-129.973
1.5000	0.0250	129.830	-129.830
1.5833	0.0264	129.681	-129.681
1.6666	0.0278	129.602	-129.602
1.7500	0.0292	129.513	-129.513
1.8333	0.0306	129.466	-129.466
1.9166	0.0319	129.402	-129.402
2.0000	0.0333	129.352	-129.352
2.5000	0.0417	129.029	-129.029
3.0000	0.0500	128.709	-128.709
3.5000	0.0583	128.481	-128.481
4.0000	0.0667	128.265	-128.265
4.5000	0.0750	128.031	-128.031
5.0000	0.0833	127.822	-127.822
5.5000	0.0917	127.629	-127.629
6.0000	0.1000	127.470	-127.470
6.5000	0.1083	127.287	-127.287
7.0000	0.1167	127.166	-127.166
7.5000	0.1250	127.008	-127.008
8.0000	0.1333	126.910	-126.910
8.5000	0.1417	126.802	-126.802
9.0000	0.1500	126.710	-126.710
9.5000	0.1583	126.574	-126.574
10.0000	0.1667	126.517	-126.517
12.0000	0.2000	126.241	-126.241
14.0000	0.2333	126.032	-126.032
16.0000	0.2667	125.871	-125.871
18.0000	0.3000	125.779	-125.779
20.0000	0.3333	125.684	-125.684

9 3 1 2 7 3 9 0 6 5 6

SAMPLING PUMP INSTALLATION FORM

181

VALIDATED 2/4/92

Project: B-POND W-017 Well Number 699-BP1-2

Pump Type HYDROSTAR Pump Model 8001

Date Installed: 10/22/91 Installed by: B. STRADE/M. MUNSON

Depth to water: 138.88' BTOC Depth to Bottom 183.96

Reported Depth to water: 1

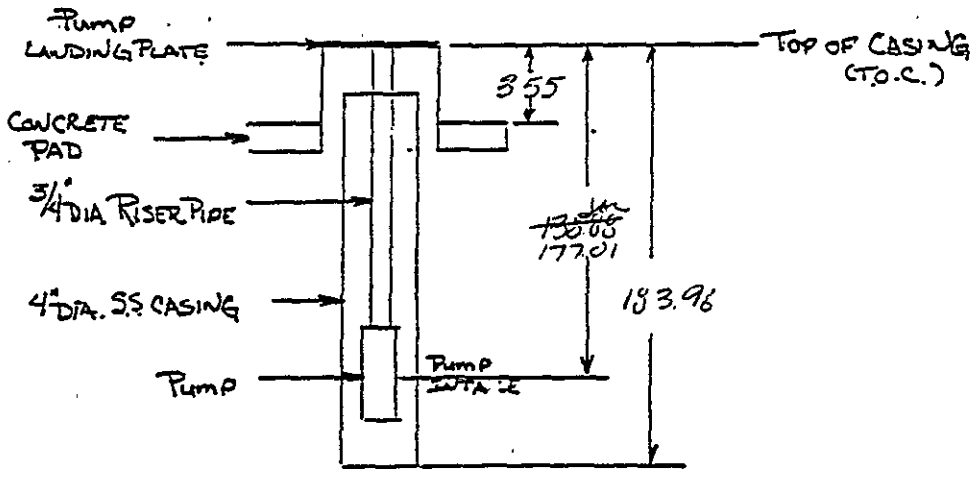
Screened Interval:

Pump/Riser Pipe Description:
pipe: 3/4" S.S. 10 FT LENGTHS
pump length: 4.32
pump screen length 1.92
material cleaning: MANUFACTURER.

Comments:

PUMP INSTALLATION SKETCH

Total material length 179.32' BTOC
Loc. of pump intake: 177.01' BTOC



Completed By: J.A. COATES Date: 10/22/91

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 299-BP41-3 Well Depth 218.01' BTOC

Screened Interval 218.01' - 207.22' Date Well Development is Performed 10-22-91 / 10-23-91 / 10/24/91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 217.5' Pump Start Time 1252 - 10/22/91, 0740 - 10/23/91

Flow Rate 2.2 GPM Accumulated Flow 975 gal Pump Stop Time 1615 - 10/22/91, 1140 - 10/23/91

Turbidity 412 NTU, 40 NTU, 27.3 NTU, 84 NTU, 67 NTU, 64 NTU, 41 NTU, 48 NTU

29 NTU, 13 NTU, 8.8 NTU, 5.2 NTU, 3.1 NTU, 3.0 NTU, —, —

Comments _____

Signature of Recorder James A. Gates Date 11/22/91

Sign and Print Name

A-6000-393 (03/90)

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation ~~699-BP91-2~~ JAC 699-BP91-3 Date 10-22-91/10-23-91

Well Depth 218.01 BTOC Screened Interval 218.01' - 207.22'

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E.TAPE/TRANSDUCER S.N. ET-5/350976 Calibration Due 1-9-92/5-24-92

Equipment Used to Measure Flow —NA— S.N. —NA— Calibration Due —NA—

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time 1252-10/22/91 0940-10/23/91 Pump Stop Time 1615-10/22/91 1140-10/23/91

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				JAC 5 gal /2.3 min = 2.2 gpm
				5 gal /2.30 min = 2.2 gpm
		SEE		
		ATTACHED		

Signature of Recorder James A. Coates James A. Coates Date 11/22/91.

Sign and Print Name

A-6000-402 (03/90)

9312706661

WELL NO. 699-BP1-3 BASELINE

PAGE 2 OF 7

SE2000
Environmental Logger
10/22 17:58

Unit# 192 Test 3

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/22 10:06:53

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0	0.0000	138.889	-138.889
1	0.0167	138.924	-138.924
2	0.0333	138.946	-138.946
3	0.0500	138.978	-138.978
4	0.0667	139.000	-139.000
5	0.0833	139.019	-139.019
6	0.1000	139.038	-139.038
7	0.1167	139.051	-139.051
8	0.1333	139.063	-139.063
9	0.1500	139.085	-139.085
10	0.1667	139.092	-139.092
11	0.1833	139.101	-139.101
12	0.2000	139.111	-139.111
13	0.2167	139.120	-139.120
14	0.2333	139.127	-139.127
15	0.2500	139.133	-139.133
16	0.2667	139.136	-139.136
17	0.2833	139.142	-139.142
18	0.3000	139.149	-139.149
19	0.3167	139.158	-139.158
20	0.3333	139.158	-139.158
21	0.3500	139.158	-139.158
22	0.3667	139.161	-139.161
23	0.3833	139.165	-139.165
24	0.4000	139.171	-139.171
25	0.4167	139.171	-139.171
26	0.4333	139.177	-139.177
27	0.4500	139.184	-139.184

9 3 1 2 7 5 9 0 6 6 2

WELL NO. 699-BP1-3 DRAWDOWN

SE2000
Environmental Logger
10/22 17:55

Unit# 192 Test 4

INPUT 1: Level (F) TOC

Reference	139.600
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/22 12:58:23

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	140.414	-140.414
0.0083	0.0001	140.607	-140.607
0.0166	0.0003	140.771	-140.771
0.0250	0.0004	140.930	-140.930
0.0333	0.0006	141.101	-141.101
0.0416	0.0007	141.262	-141.262
0.0500	0.0008	141.405	-141.405
0.0583	0.0010	141.570	-141.570
0.0666	0.0011	141.728	-141.728
0.0750	0.0013	141.893	-141.893
0.0833	0.0014	142.042	-142.042
0.1000	0.0017	142.368	-142.368
0.1166	0.0019	142.694	-142.694
0.1333	0.0022	142.998	-142.998
0.1500	0.0025	143.299	-143.299
0.1666	0.0028	143.616	-143.616
0.1833	0.0031	143.898	-143.898
0.2000	0.0033	144.189	-144.189
0.2166	0.0036	144.496	-144.496
0.2333	0.0039	144.785	-144.785
0.2500	0.0042	145.082	-145.082
0.2666	0.0044	145.345	-145.345
0.2833	0.0047	145.640	-145.640
0.3000	0.0050	145.922	-145.922
0.3166	0.0053	146.201	-146.201
0.3333	0.0056	146.467	-146.467
0.4166	0.0069	147.718	-147.718
0.5000	0.0083	149.536	-149.536
0.5833	0.0097	149.314	-149.314
0.6666	0.0111	149.590	-149.590
0.7500	0.0125	149.830	-149.830
0.8333	0.0139	150.334	-150.334

9 3 1 2 7 0 6 6 3

WELL NO. 699-BP1-3 DRAWDOWN

0.9166	0.0153	150.448	-150.448
1.0000	0.0167	150.749	-150.749
1.0833	0.0181	151.018	-151.018
1.1666	0.0194	151.341	-151.341
1.2500	0.0208	151.614	-151.614
1.3333	0.0222	151.823	-151.823
1.4166	0.0236	152.048	-152.048
1.5000	0.0250	152.108	-152.108
1.5833	0.0264	152.257	-152.257
1.6666	0.0278	152.352	-152.352
1.7500	0.0292	152.374	-152.374
1.8333	0.0306	152.399	-152.399
1.9166	0.0319	152.447	-152.447
2.0000	0.0333	152.466	-152.466
2.5000	0.0417	152.751	-152.751
3.0000	0.0500	152.893	-152.893
3.5000	0.0583	152.941	-152.941
4.0000	0.0667	153.508	-153.508
4.5000	0.0750	154.537	-154.537
5.0000	0.0833	155.028	-155.028
5.5000	0.0917	155.253	-155.253
6.0000	0.1000	155.456	-155.456
6.5000	0.1083	155.614	-155.614
7.0000	0.1167	155.880	-155.880
7.5000	0.1250	156.007	-156.007
8.0000	0.1333	155.931	-155.931
8.5000	0.1417	155.817	-155.817
9.0000	0.1500	155.789	-155.789
9.5000	0.1583	155.719	-155.719
10.0000	0.1667	155.697	-155.697
12.0000	0.2000	155.446	-155.446
14.0000	0.2333	155.038	-155.038
16.0000	0.2667	154.715	-154.715
18.0000	0.3000	154.468	-154.468
20.0000	0.3333	154.331	-154.331
22.0000	0.3667	154.610	-154.610
24.0000	0.4000	154.664	-154.664
26.0000	0.4333	154.731	-154.731
28.0000	0.4667	154.629	-154.629
30.0000	0.5000	154.560	-154.560
32.0000	0.5333	154.461	-154.461
34.0000	0.5667	154.341	-154.341
36.0000	0.6000	154.278	-154.278
38.0000	0.6333	154.255	-154.255
40.0000	0.6667	154.189	-154.189
42.0000	0.7000	154.151	-154.151
44.0000	0.7333	154.116	-154.116
46.0000	0.7667	154.012	-154.012
48.0000	0.8000	153.964	-153.964
50.0000	0.8333	153.885	-153.885
52.0000	0.8667	153.860	-153.860
54.0000	0.9000	153.841	-153.841

9 3 1 2 7 5 9 0 6 4

WELL NO. 699-BP1-3 DRAWDOWN

56.0000	0.9333	153.783	-153.783
58.0000	0.9667	153.796	-153.796
60.0000	1.0000	153.720	-153.720
62.0000	1.0333	153.502	-153.502
64.0000	1.0667	153.283	-153.283
66.0000	1.1000	153.121	-153.121
68.0000	1.1333	152.985	-152.985
70.0000	1.1667	152.912	-152.912
72.0000	1.2000	152.836	-152.836
74.0000	1.2333	152.767	-152.767
76.0000	1.2667	152.738	-152.738
78.0000	1.3000	152.767	-152.767
80.0000	1.3333	152.672	-152.672
82.0000	1.3667	152.675	-152.675
84.0000	1.4000	152.694	-152.694
86.0000	1.4333	152.637	-152.637
88.0000	1.4667	152.646	-152.646
90.0000	1.5000	152.722	-152.722
92.0000	1.5333	152.757	-152.757
94.0000	1.5667	152.726	-152.726
96.0000	1.6000	152.681	-152.681
98.0000	1.6333	152.653	-152.653
100.0000	1.6667	152.608	-152.608
105.0000	1.7500	152.583	-152.583
110.0000	1.8333	152.516	-152.516
115.0000	1.9167	152.482	-152.482
120.0000	2.0000	152.409	-152.409
125.0000	2.0833	152.387	-152.387
130.0000	2.1667	152.307	-152.307
135.0000	2.2500	151.747	-151.747
140.0000	2.3333	151.411	-151.411
145.0000	2.4167	151.186	-151.186
150.0000	2.5000	151.078	-151.078
155.0000	2.5833	151.021	-151.021
160.0000	2.6667	150.936	-150.936
165.0000	2.7500	150.968	-150.968
170.0000	2.8333	150.980	-150.980
175.0000	2.9167	150.911	-150.911
180.0000	3.0000	150.939	-150.939
185.0000	3.0833	151.189	-151.189
190.0000	3.1667	151.386	-151.386
195.0000	3.2500	151.614	-151.614

9 3 1 2 7 0 0 6 6 5

WELL NO. 699-BP1-3 RECOVERY

SE2000
Environmental Logger
10/22 17:48

Unit# 192 Test 5

INPUT 1: Level (F) TOC

Reference	139.600
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/22 16:18:41

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	139.403	-139.403
0.0083	0.0001	139.333	-139.333
0.0166	0.0003	139.261	-139.261
0.0250	0.0004	139.191	-139.191
0.0333	0.0006	139.112	-139.112
0.0416	0.0007	139.045	-139.045
0.0500	0.0008	138.969	-138.969
0.0583	0.0010	138.903	-138.903
0.0666	0.0011	138.830	-138.830
0.0750	0.0013	138.763	-138.763
0.0833	0.0014	138.694	-138.694
0.1000	0.0017	138.554	-138.554
0.1166	0.0019	138.421	-138.421
0.1333	0.0022	138.285	-138.285
0.1500	0.0025	138.152	-138.152
0.1666	0.0028	138.022	-138.022
0.1833	0.0031	137.889	-137.889
0.2000	0.0033	137.756	-137.756
0.2166	0.0036	137.632	-137.632
0.2333	0.0039	137.503	-137.503
0.2500	0.0042	137.376	-137.376
0.2666	0.0044	137.249	-137.249
0.2833	0.0047	137.126	-137.126
0.3000	0.0050	137.002	-137.002
0.3166	0.0053	136.882	-136.882
0.3333	0.0056	136.761	-136.761
0.4166	0.0069	136.232	-136.232
0.5000	0.0083	135.656	-135.656
0.5833	0.0097	135.102	-135.102
0.6666	0.0111	134.611	-134.611
0.7500	0.0125	134.155	-134.155
0.8333	0.0139	133.724	-133.724

9 3 1 2 7 5 9 0 6 6 6

WELL NO. 699-BP1-3 RECOVERY

0.9166	0.0153	133.325	-133.325
1.0000	0.0167	132.960	-132.960
1.0833	0.0181	132.631	-132.631
1.1666	0.0194	132.330	-132.330
1.2500	0.0208	132.067	-132.067
1.3333	0.0222	131.830	-131.830
1.4166	0.0236	131.627	-131.627
1.5000	0.0250	131.456	-131.456
1.5833	0.0264	131.313	-131.313
1.6666	0.0278	131.199	-131.199
1.7500	0.0292	131.117	-131.117
1.8333	0.0306	131.054	-131.054
1.9166	0.0319	131.016	-131.016
2.0000	0.0333	130.987	-130.987
2.5000	0.0417	130.810	-130.810
3.0000	0.0500	130.648	-130.648
3.5000	0.0583	130.499	-130.499
4.0000	0.0667	130.360	-130.360
4.5000	0.0750	130.230	-130.230
5.0000	0.0833	130.103	-130.103
5.5000	0.0917	129.983	-129.983
6.0000	0.1000	129.875	-129.875
6.5000	0.1083	129.771	-129.771
7.0000	0.1167	129.669	-129.669
7.5000	0.1250	129.578	-129.578
8.0000	0.1333	129.492	-129.492
8.5000	0.1417	129.407	-129.407
9.0000	0.1500	129.331	-129.331
9.5000	0.1583	129.258	-129.258
10.0000	0.1667	129.185	-129.185
12.0000	0.2000	128.935	-128.935
14.0000	0.2333	128.745	-128.745
16.0000	0.2667	128.593	-128.593
18.0000	0.3000	128.475	-128.475
20.0000	0.3333	128.368	-128.368
22.0000	0.3667	128.292	-128.292
24.0000	0.4000	128.231	-128.231
26.0000	0.4333	128.178	-128.178
28.0000	0.4667	128.136	-128.136
30.0000	0.5000	128.108	-128.108

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WHC-SD-EN-DP-046, Rev. 0
SAMPLING PUMP INSTALLATION FORM

1 of 1

VALIDATED
2/4/92
SIGNATURE DATE

Project: W 017/B. Pond

Well Number 699-B-99-3

Pump Type HYDROSTAR

Pump Model 800

Date Installed: 10/24/91

Installed by: B. STRODE, M. MUNSON

Depth to water: 189.6 BTOC

Depth to Bottom 218.01 BTOC

Reported Depth to water: 218.01 -

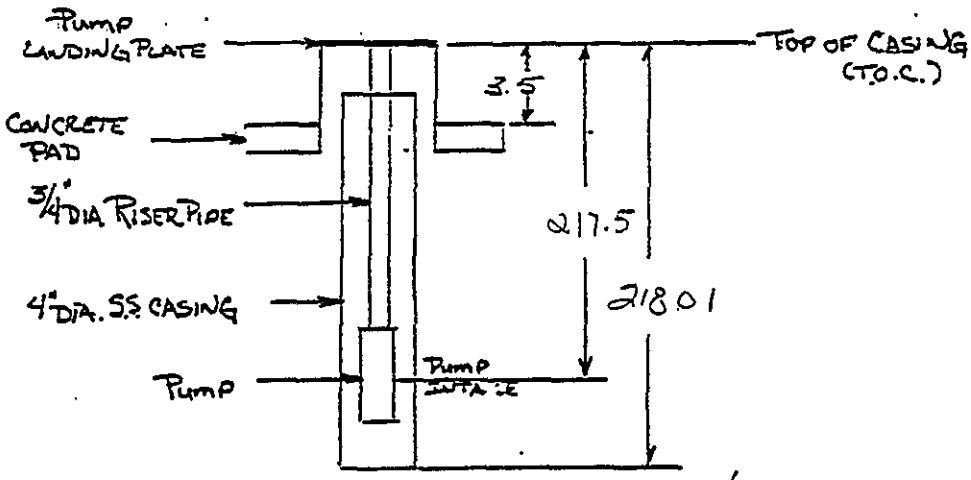
Screened Interval: 218.01 - 207.22

Pump/Riser Pipe Description:
pipe: 3/4" S.S. IN 10' LENGTHS
pump length: 4.3
pump screen length 1.7
material cleaning: MANUFACTURER

Comments:

PUMP INSTALLATION SKETCH

Total material length
Loc. of pump intake: 217.5



Completed By: J A. COATES

Date: 10/24/91

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 699-42-41 Well Depth 159.04'

Screened Interval 159.04'-138.04' Date Well Development is Performed 10/16/91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 157.8' BTOC Pump Start Time 0820

Flow Rate 5gal/29sec = 10.3 GPM Accumulated Flow 875 gal Pump Stop Time 0945

Turbidity 416 NTU, 21 NTU, 9.8 NTU, 6.7 NTU, 6.0 NTU, 3.5 NTU, -, -

-, -, -, -, -, -, -, -

Comments _____

Signature of Recorder James A. Coates James A. Coates Date 12-2-91

Sign and Print Name

A-6000-393 (03/90)

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation 699-42-41 Date 10/16/91

Well Depth 159.04' Screened Interval 159.04' - 138.04'

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E-TAPE/TRANSDUCER S. N ET-5/350976 Calibration Due 1-24-92/5-9-92

Equipment Used to Measure Flow —NA— S. N. —NA— Calibration Due —NA—

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time 0820 Pump Stop Time 0945

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				5 gal/29 sec = 10.3 GPM
		SEE		
		ATTACHED		

Signature of Recorder JAMES A. COATES JAMES A. COATES Date 12-2-91

Sign and Print Name

A-6000-402 (03/90)

9312706 73

WELL NO 699-42-41 BASELINE

SE2000
Environmental Logger
10/17 09:28

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	146.940
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/16 08:03:34

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	146.946	-146.946
1.0000	0.0167	146.949	-146.949
2.0000	0.0333	146.946	-146.946
3.0000	0.0500	146.943	-146.943
4.0000	0.0667	146.946	-146.946
5.0000	0.0833	146.943	-146.943
6.0000	0.1000	146.943	-146.943
7.0000	0.1167	146.949	-146.949
8.0000	0.1333	146.946	-146.946
9.0000	0.1500	146.943	-146.943
10.0000	0.1667	146.946	-146.946
11.0000	0.1833	146.949	-146.949
12.0000	0.2000	146.952	-146.952
13.0000	0.2167	146.949	-146.949
14.0000	0.2333	146.952	-146.952
15.0000	0.2500	146.962	-146.962
16.0000	0.2667	146.962	-146.962
17.0000	0.2833	146.955	-146.955

9 3 1 2 7 3 9 0 6 7 4

WELL NO. 699-42-41 DRAWDOWN

SE2000
Environmental Logger
10/17 09:25

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	146.940
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/16 08:21:45

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	147.377	-147.377
0.0083	0.0001	147.009	-147.009
0.0166	0.0003	147.063	-147.063
0.0250	0.0004	147.076	-147.076
0.0333	0.0006	147.082	-147.082
0.0416	0.0007	147.088	-147.088
0.0500	0.0008	147.088	-147.088
0.0583	0.0010	147.092	-147.092
0.0666	0.0011	147.095	-147.095
0.0750	0.0013	147.092	-147.092
0.0833	0.0014	147.098	-147.098
0.1000	0.0017	147.095	-147.095
0.1166	0.0019	147.092	-147.092
0.1333	0.0022	147.092	-147.092
0.1500	0.0025	147.088	-147.088
0.1666	0.0028	147.092	-147.092
0.1833	0.0031	147.092	-147.092
0.2000	0.0033	147.088	-147.088
0.2166	0.0036	147.088	-147.088
0.2333	0.0039	147.088	-147.088
0.2500	0.0042	147.088	-147.088
0.2666	0.0044	147.088	-147.088
0.2833	0.0047	147.088	-147.088
0.3000	0.0050	147.082	-147.082
0.3166	0.0053	147.082	-147.082
0.3333	0.0056	147.085	-147.085
0.4166	0.0069	147.079	-147.079
0.5000	0.0083	147.085	-147.085
0.5833	0.0097	147.073	-147.073
0.6666	0.0111	147.073	-147.073
0.7500	0.0125	147.073	-147.073
0.8333	0.0139	147.073	-147.073

9 3 1 2 7 0 6 7 5

WELL NO. 699-42-41 DRAWDOWN

0.9166	0.0153	147.073	-147.073
1.0000	0.0167	147.069	-147.069
1.0833	0.0181	147.073	-147.073
1.1666	0.0194	147.076	-147.076
1.2500	0.0208	147.073	-147.073
1.3333	0.0222	147.076	-147.076
1.4166	0.0236	147.069	-147.069
1.5000	0.0250	147.076	-147.076
1.5833	0.0264	147.082	-147.082
1.6666	0.0278	147.073	-147.073
1.7500	0.0292	147.079	-147.079
1.8333	0.0306	147.073	-147.073
1.9166	0.0319	147.079	-147.079
2.0000	0.0333	147.076	-147.076
2.5000	0.0417	147.082	-147.082
3.0000	0.0500	147.079	-147.079
3.5000	0.0583	147.082	-147.082
4.0000	0.0667	147.082	-147.082
4.5000	0.0750	147.079	-147.079
5.0000	0.0833	147.088	-147.088
5.5000	0.0917	147.085	-147.085
6.0000	0.1000	147.085	-147.085
6.5000	0.1083	147.079	-147.079
7.0000	0.1167	147.082	-147.082
7.5000	0.1250	147.088	-147.088
8.0000	0.1333	147.085	-147.085
8.5000	0.1417	147.085	-147.085
9.0000	0.1500	147.085	-147.085
9.5000	0.1583	147.092	-147.092
10.0000	0.1667	147.085	-147.085
12.0000	0.2000	147.082	-147.082
14.0000	0.2333	147.088	-147.088
16.0000	0.2667	147.092	-147.092
18.0000	0.3000	147.076	-147.076
20.0000	0.3333	147.079	-147.079
22.0000	0.3667	147.082	-147.082
24.0000	0.4000	147.079	-147.079
26.0000	0.4333	147.085	-147.085
28.0000	0.4667	147.073	-147.073
30.0000	0.5000	147.085	-147.085
32.0000	0.5333	147.076	-147.076
34.0000	0.5667	147.082	-147.082
36.0000	0.6000	147.079	-147.079
38.0000	0.6333	147.079	-147.079
40.0000	0.6667	147.073	-147.073
42.0000	0.7000	147.076	-147.076
44.0000	0.7333	147.066	-147.066
46.0000	0.7667	147.076	-147.076
48.0000	0.8000	147.069	-147.069
50.0000	0.8333	147.069	-147.069
52.0000	0.8667	147.073	-147.073
54.0000	0.9000	147.073	-147.073

9 3 1 2 7 5 9 0 6 7 6

WELL NO. 699-42-41 DRAWDOWN

56.0000	0.9333	147.073	-147.073
58.0000	0.9667	147.066	-147.066
60.0000	1.0000	147.066	-147.066
62.0000	1.0333	147.073	-147.073
64.0000	1.0667	147.069	-147.069
66.0000	1.1000	147.060	-147.060
68.0000	1.1333	147.066	-147.066
70.0000	1.1667	147.063	-147.063
72.0000	1.2000	147.063	-147.063
74.0000	1.2333	147.063	-147.063
76.0000	1.2667	147.066	-147.066
78.0000	1.3000	147.063	-147.063
80.0000	1.3333	147.060	-147.060
82.0000	1.3667	147.060	-147.060
84.0000	1.4000	147.060	-147.060

9 3 1 2 7 0 9 6 7 7

WELL NO. 699-42-41 RECOVERY

SE2000
Environmental Logger
10/17 09:22

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	146.940
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/16 09:48:01

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	146.762	-146.762
0.0083	0.0001	146.978	-146.978
0.0166	0.0003	146.940	-146.940
0.0250	0.0004	146.917	-146.917
0.0333	0.0006	146.914	-146.914
0.0416	0.0007	146.924	-146.924
0.0500	0.0008	146.924	-146.924
0.0583	0.0010	146.921	-146.921
0.0666	0.0011	146.921	-146.921
0.0750	0.0013	146.924	-146.924
0.0833	0.0014	146.921	-146.921
0.1000	0.0017	146.924	-146.924
0.1166	0.0019	146.924	-146.924
0.1333	0.0022	146.924	-146.924
0.1500	0.0025	146.924	-146.924
0.1666	0.0028	146.924	-146.924
0.1833	0.0031	146.924	-146.924
0.2000	0.0033	146.924	-146.924
0.2166	0.0036	146.924	-146.924
0.2333	0.0039	146.924	-146.924
0.2500	0.0042	146.927	-146.927
0.2666	0.0044	146.927	-146.927
0.2833	0.0047	146.927	-146.927
0.3000	0.0050	146.927	-146.927
0.3166	0.0053	146.924	-146.924
0.3333	0.0056	146.930	-146.930
0.4166	0.0069	146.930	-146.930
0.5000	0.0083	146.933	-146.933
0.5833	0.0097	146.933	-146.933
0.6666	0.0111	146.940	-146.940
0.7500	0.0125	146.940	-146.940
0.8333	0.0139	146.943	-146.943

9 3 1 2 7 5 9 0 6 7 8

WELL NO. 699-42-41 RECOVERY

0.9166	0.0153	146.943	-146.943
1.0000	0.0167	146.946	-146.946
1.0833	0.0181	146.946	-146.946
1.1666	0.0194	146.949	-146.949
1.2500	0.0208	146.952	-146.952
1.3333	0.0222	146.955	-146.955
1.4166	0.0236	146.955	-146.955
1.5000	0.0250	146.959	-146.959
1.5833	0.0264	146.962	-146.962
1.6666	0.0278	146.962	-146.962
1.7500	0.0292	146.965	-146.965
1.8333	0.0306	146.965	-146.965
1.9166	0.0319	146.965	-146.965
2.0000	0.0333	146.968	-146.968
2.5000	0.0417	146.965	-146.965
3.0000	0.0500	146.962	-146.962
3.5000	0.0583	146.962	-146.962
4.0000	0.0667	146.959	-146.959
4.5000	0.0750	146.959	-146.959
5.0000	0.0833	146.962	-146.962
5.5000	0.0917	146.959	-146.959
6.0000	0.1000	146.959	-146.959
6.5000	0.1083	146.959	-146.959
7.0000	0.1167	146.959	-146.959
7.5000	0.1250	146.962	-146.962
8.0000	0.1333	146.965	-146.965
8.5000	0.1417	146.962	-146.962
9.0000	0.1500	146.962	-146.962
9.5000	0.1583	146.962	-146.962
10.0000	0.1667	146.962	-146.962
12.0000	0.2000	146.962	-146.962
14.0000	0.2333	146.962	-146.962
16.0000	0.2667	146.959	-146.959
18.0000	0.3000	146.962	-146.962
20.0000	0.3333	146.959	-146.959

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SAMPLING PUMP INSTALLATION FORM

1 of 1

VALIDATED 2/4/92 SIGNATURE/DATE

Project: W-017 - B POND

Well Number 699-42-41

Pump Type HYDROSTAR

Pump Model 8001

Date Installed: 10/16/91

Installed by: B. STRODE / M. MUNSON

Depth to water: 146.94' BTOC

Depth to Bottom 159.04' BTOC

Reported Depth to water: 142.0 BLS

Screened Interval: (21.0') 159.04' - 138.04'

Pump/Riser Pipe Description:

pipe: 10' x 3/4" S.S.

pump length: ~~[illegible]~~ 4.32'

pump screen length 1.92'

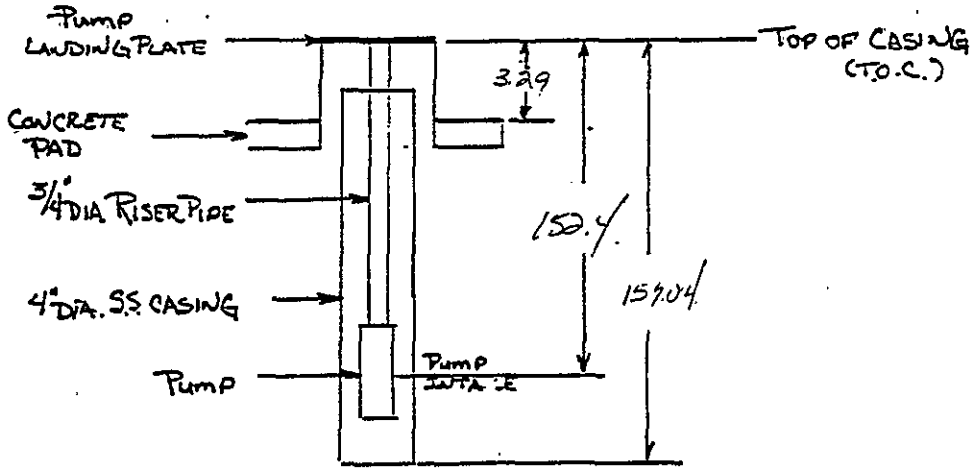
material cleaning: MANUFACTURER

Comments:

PUMP INSTALLATION SKETCH

Total material length 154.32

Loc. of pump intake: 151.4



Completed By: J.A. COATES

Date: 10/16/91

93127 90681

85 10. 850 884

2 84 .4 340 90

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 699-43-40 Well Depth 138.94' BTOC

Screened Interval 138.94'-119.9' BTOC Date Well Development is Performed 11/26/91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 137.7' BTOC Pump Start Time 0850

Flow Rate 1.9 GPM Accumulated Flow 114 gal Pump Stop Time 0930

Turbidity 51 NTU, 25 NTU, 6.1 NTU, 4.8 NTU, -, -, -, -

-, -, -, -, -, -, -, -

Comments _____

Signature of Recorder James A. Gates James A. Gates Date 12-11-91

Sign and Print Name

A-6000-393 (03/90)

9312709633

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation 699-43-40 Date 11/26/91

Well Depth 138.94' BTOC Screened Interval 138.94' - 119.9' BTOC

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E.TAPE / TRANSDUCER S.N ET-1/2303 Calibation Due 1-24-92 / 7-19-92

Equipment Used to Measure Flow — NA — S.N. — NA — Calibation Due — NA —

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time 0830 Pump Stop Time 0930

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				5 gal / 2 min 40 sec = 1.9 GPM
		SEE		
		ATTACHED		

Signature of Recorder JAMES A. COATES JAMES A. COATES Date 12-1-91

Sign and Print Name

A-6000-402 (03/90)

9312709685

SE2000
Environmental Logger
11/27 07:08

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	122.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/26 08:19:49

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	122.510	-122.510
1.0000	0.0167	122.525	-122.525
2.0000	0.0333	122.525	-122.525
3.0000	0.0500	122.541	-122.541
4.0000	0.0667	122.541	-122.541
5.0000	0.0833	122.541	-122.541
6.0000	0.1000	122.541	-122.541
7.0000	0.1167	122.541	-122.541
8.0000	0.1333	122.541	-122.541
9.0000	0.1500	122.541	-122.541
10.0000	0.1667	122.541	-122.541
11.0000	0.1833	122.541	-122.541
12.0000	0.2000	122.541	-122.541
13.0000	0.2167	122.541	-122.541
14.0000	0.2333	122.541	-122.541

9 3 1 2 7 3 9 0 6 8 6

SE2000
Environmental Logger
11/27 07:07

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	122.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/26 08:35:52

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	123.587	-123.587
0.0083	0.0001	122.842	-122.842
0.0166	0.0003	122.890	-122.890
0.0250	0.0004	123.017	-123.017
0.0333	0.0006	123.207	-123.207
0.0416	0.0007	123.365	-123.365
0.0500	0.0008	123.555	-123.555
0.0583	0.0010	123.698	-123.698
0.0666	0.0011	123.872	-123.872
0.0750	0.0013	124.015	-124.015
0.0833	0.0014	124.173	-124.173
0.1000	0.0017	124.458	-124.458
0.1166	0.0019	124.744	-124.744
0.1333	0.0022	125.029	-125.029
0.1500	0.0025	125.314	-125.314
0.1666	0.0028	125.583	-125.583
0.1833	0.0031	125.869	-125.869
0.2000	0.0033	126.138	-126.138
0.2166	0.0036	126.423	-126.423
0.2333	0.0039	126.677	-126.677
0.2500	0.0042	126.946	-126.946
0.2666	0.0044	127.216	-127.216
0.2833	0.0047	127.469	-127.469
0.3000	0.0050	127.738	-127.738
0.3166	0.0053	127.992	-127.992
0.3333	0.0056	128.230	-128.230
0.4166	0.0069	129.371	-129.371
0.5000	0.0083	129.355	-129.355
0.5833	0.0097	129.307	-129.307
0.6666	0.0111	129.260	-129.260
0.7500	0.0125	129.212	-129.212
0.8333	0.0139	129.196	-129.196

9 3 1 2 7 0 9 0 6 3 7

WELL NO. 699-43-40 DRAWDOWN PAGE 4 OF 7

0.9166	0.0153	129.133	-129.133
1.0000	0.0167	129.101	-129.101
1.0833	0.0181	129.069	-129.069
1.1666	0.0194	129.022	-129.022
1.2500	0.0208	128.990	-128.990
1.3333	0.0222	128.990	-128.990
1.4166	0.0236	128.959	-128.959
1.5000	0.0250	128.927	-128.927
1.5833	0.0264	128.911	-128.911
1.6666	0.0278	128.895	-128.895
1.7500	0.0292	128.879	-128.879
1.8333	0.0306	128.863	-128.863
1.9166	0.0319	128.848	-128.848
2.0000	0.0333	128.832	-128.832
2.5000	0.0417	128.689	-128.689
3.0000	0.0500	128.531	-128.531
3.5000	0.0583	128.309	-128.309
4.0000	0.0667	128.135	-128.135
4.5000	0.0750	128.024	-128.024
5.0000	0.0833	127.929	-127.929
5.5000	0.0917	128.008	-128.008
6.0000	0.1000	127.944	-127.944
6.5000	0.1083	127.944	-127.944
7.0000	0.1167	127.944	-127.944
7.5000	0.1250	127.944	-127.944
8.0000	0.1333	127.976	-127.976
8.5000	0.1417	128.008	-128.008
9.0000	0.1500	128.103	-128.103
9.5000	0.1583	128.166	-128.166
10.0000	0.1667	128.214	-128.214
12.0000	0.2000	128.420	-128.420
14.0000	0.2333	128.610	-128.610
16.0000	0.2667	128.753	-128.753
18.0000	0.3000	128.879	-128.879
20.0000	0.3333	129.117	-129.117
22.0000	0.3667	129.291	-129.291
24.0000	0.4000	129.450	-129.450
26.0000	0.4333	129.608	-129.608
28.0000	0.4667	129.672	-129.672
30.0000	0.5000	129.719	-129.719
32.0000	0.5333	129.767	-129.767
34.0000	0.5667	129.798	-129.798
36.0000	0.6000	129.814	-129.814
38.0000	0.6333	129.846	-129.846
40.0000	0.6667	129.893	-129.893
42.0000	0.7000	129.925	-129.925
44.0000	0.7333	129.973	-129.973
46.0000	0.7667	130.004	-130.004
48.0000	0.8000	130.115	-130.115
50.0000	0.8333	130.131	-130.131
52.0000	0.8667	130.147	-130.147
54.0000	0.9000	130.194	-130.194

9 3 1 2 7 3 9 0 6 3 8

WELL NO. 699-43-40 DRAWDOWN PAGE 5 OF 7

56.0000	0.9333	130.226	-130.226
58.0000	0.9667	130.242	-130.242
60.0000	1.0000	130.290	-130.290
62.0000	1.0333	130.337	-130.337
64.0000	1.0667	130.369	-130.369

9312790639

SE2000
Environmental Logger
11/27 07:05

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	122.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/26 09:41:31

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	130.210	-130.210
0.0083	0.0001	130.131	-130.131
0.0166	0.0003	130.052	-130.052
0.0250	0.0004	129.988	-129.988
0.0333	0.0006	129.925	-129.925
0.0416	0.0007	129.846	-129.846
0.0500	0.0008	129.798	-129.798
0.0583	0.0010	129.719	-129.719
0.0666	0.0011	129.656	-129.656
0.0750	0.0013	129.608	-129.608
0.0833	0.0014	129.545	-129.545
0.1000	0.0017	129.434	-129.434
0.1166	0.0019	129.323	-129.323
0.1333	0.0022	129.212	-129.212
0.1500	0.0025	129.117	-129.117
0.1666	0.0028	129.038	-129.038
0.1833	0.0031	128.943	-128.943
0.2000	0.0033	128.848	-128.848
0.2166	0.0036	128.753	-128.753
0.2333	0.0039	128.673	-128.673
0.2500	0.0042	128.578	-128.578
0.2666	0.0044	128.499	-128.499
0.2833	0.0047	128.404	-128.404
0.3000	0.0050	128.309	-128.309
0.3166	0.0053	128.230	-128.230
0.3333	0.0056	128.150	-128.150
0.4166	0.0069	127.834	-127.834
0.5000	0.0083	127.532	-127.532
0.5833	0.0097	127.247	-127.247
0.6666	0.0111	126.994	-126.994
0.7500	0.0125	126.724	-126.724
0.8333	0.0139	126.487	-126.487

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WELL NO. 699-43-40 RECOVERY PAGE 7 OF 7

0.9166	0.0153	126.281	-126.281
1.0000	0.0167	126.091	-126.091
1.0833	0.0181	125.916	-125.916
1.1666	0.0194	125.774	-125.774
1.2500	0.0208	125.647	-125.647
1.3333	0.0222	125.536	-125.536
1.4166	0.0236	125.441	-125.441
1.5000	0.0250	125.378	-125.378
1.5833	0.0264	125.314	-125.314
1.6666	0.0278	125.282	-125.282
1.7500	0.0292	125.251	-125.251
1.8333	0.0306	125.235	-125.235
1.9166	0.0319	125.203	-125.203
2.0000	0.0333	125.172	-125.172
2.5000	0.0417	124.997	-124.997
3.0000	0.0500	124.823	-124.823
3.5000	0.0583	124.680	-124.680
4.0000	0.0667	124.538	-124.538
4.5000	0.0750	124.411	-124.411
5.0000	0.0833	124.300	-124.300
5.5000	0.0917	124.189	-124.189
6.0000	0.1000	124.094	-124.094
6.5000	0.1083	123.999	-123.999
7.0000	0.1167	123.920	-123.920
7.5000	0.1250	123.841	-123.841
8.0000	0.1333	123.761	-123.761
8.5000	0.1417	123.698	-123.698
9.0000	0.1500	123.635	-123.635
9.5000	0.1583	123.571	-123.571
10.0000	0.1667	123.524	-123.524
12.0000	0.2000	123.365	-123.365
14.0000	0.2333	123.238	-123.238
16.0000	0.2667	123.143	-123.143
18.0000	0.3000	123.048	-123.048
20.0000	0.3333	123.017	-123.017
22.0000	0.3667	122.969	-122.969
24.0000	0.4000	122.921	-122.921
26.0000	0.4333	122.890	-122.890
28.0000	0.4667	122.858	-122.858
30.0000	0.5000	122.826	-122.826
32.0000	0.5333	122.811	-122.811
34.0000	0.5667	122.779	-122.779
36.0000	0.6000	122.763	-122.763
38.0000	0.6333	122.747	-122.747
40.0000	0.6667	122.731	-122.731
42.0000	0.7000	122.731	-122.731
44.0000	0.7333	122.715	-122.715
46.0000	0.7667	122.715	-122.715
48.0000	0.8000	122.700	-122.700

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181

VALIDATED 2/4/92 SIGNATURE DATE

SAMPLING PUMP INSTALLATION FORM

Project: W017 / B-Pond

Well Number 199-B-40

Pump Type HYDROSTAR

Pump Model 8001

Date Installed: 11/26/91

Installed by: B. STRODE / M. MUNSON

Depth to water: 122.51

Depth to Bottom 138.94

Reported Depth to water (21.04) 138.94 - 119.9'

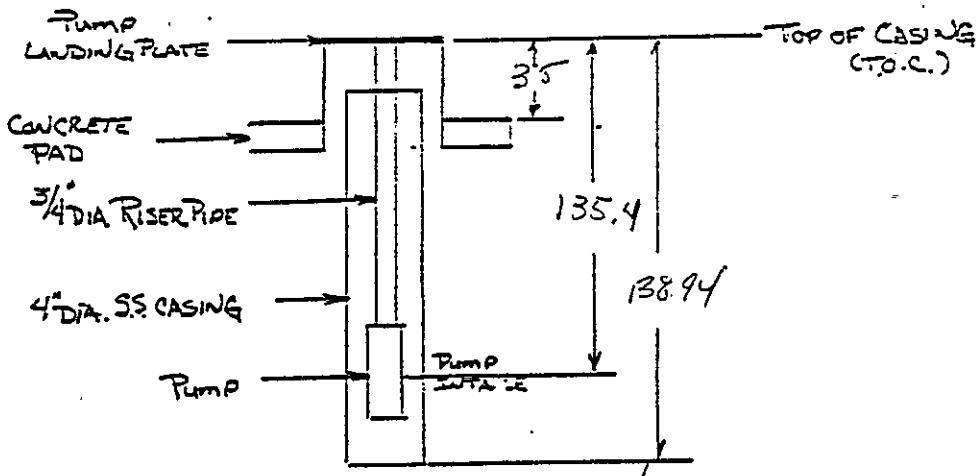
Screened Interval: _____

Pump/Riser Pipe Description:
- pipe: 3/4" S.S.
- pump length: 4.3
- pump screen length 1.9
- material cleaning: MANUFACTURER

Comments:

PUMP INSTALLATION SKETCH

Total material length 137.3'
Loc. of pump intake: 135.4'



Completed By: J.A. Coates

Date: 11/26/91

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WELL DEVELOPMENT FORM

Page 1 of 1

Well Designation 699-43-41G Well Depth 202.58' BTOC

Screened Interval 202.58' – 192.22' BTOC Date Well Development is Performed 11-22/11-23/11-25-91

BAILING

Water Level Prior to Bailing _____ Time of Measurement _____

Volume of Bailer _____ Number of Bails Removed _____ Gallons _____

Summary Description of Water Removed _____

Water Level After Bailing _____ Time of Measurement _____

SURGE BLOCK

Type of Surge Block _____ Dimension of Surge Block _____

TD BEFORE	STROKE LENGTH	STROKE FREQUENCY	SURGE INTERVAL	SURGE TIME	TD AFTER	TD DIFFERENCE

AIRLIFT

Depth of Eductor Pipe _____ Airlift Start Time _____

Flow Rate _____ Accumulated Flow _____ Airlift Stop Time _____

Turbidity _____, _____, _____, _____, _____, _____, _____, _____

_____, _____, _____, _____, _____, _____, _____, _____

MECHANICAL PUMPING

Pumping Technique Constant Discharge Pump Depth 201.38' BTOC Pump Start Time 1250 – 11/22/91; 0630 – 11/23/91; 0815 – 11/25/91

Flow Rate 2.05 GPM – 11/22/91; 1.6 GPM – 11/22/91; 2.4 GPM – 11/25/91 Accumulated Flow 994 gal – 11/22/91; 660 gal – 11/23/91; 294 gal – 11/25/91; Total ≈ 1948 Pump Stop Time 1545 – 11/22/91; 1300 – 11/23/91; 1100 – 11/25/91

Turbidity >100 – 11/22/91 / 98 NTU, 78 NTU, 58 NTU, 21 NTU 11/25/91 / 32 NTU, 26 NTU, 21 NTU

30 NTU, 6.3 NTU, 4.7 NTU, –, –, –, –, –

Comments Note: on 11/22/91 – flow rate decreased from 1.6 GPM @ 1250 to 2.05 @ 1254. on 11/25/91, flow rate decreased from 2.4 GPM @ 0815 to ~~0845~~ 1.65 GPM @ 0830 and then ~~increased~~ returned to 2.4 GPM @ 0845.

Signature of Recorder James A Gates James A. Gates Date 12-2-91

Sign and Print Name

A-6000-393 (03/90)

9312706965

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WHC-SD-EN-DP-046, Rev. 0

DRAWDOWN/RECOVERY

Well Designation 699-43-41G

Date 11/22/91, 11/23/91, 11/25/91

Well Depth 202.58' BTOC

Screened Interval 202.58'-192.22' BTOC

Pumping Method CONSTANT DISCHARGE

Equipment Used to Measure Water Level E-TAPE/TRANSDUCER S.N ET-1/2303 Calibration Due 12-4-92/7-19-92

Equipment Used to Measure Flow —NA— S.N. —NA— Calibration Due —NA—

Measuring Point TOP OF CASING 6" (T.O.C. 6") Pump Start Time 1250 - 11/22, 0630 - 11/23, 0815 - 11/25 Pump Stop Time 1545 - 11/22, 1300 - 11/23, 1100 - 11/25

Time		Water Level		Discharge
Date	Time	Reading Unit:	Water Level Unit:	Reading Unit:
				BUCKET METHOD.
				11/22 - 5 gal / 25.2 = 1.6 GPM
				- 5 gal / 146 sec = 2.05 GPM
				11/23 - 5 gal / 184 sec = 1.6 GPM
				11/25 - 5 gal / 125 sec = 2.4 GPM
				- 5 gal / 180 sec = 1.65 GPM
		SEE		
		ATTACHED		

Signature of Recorder JAMES A. COATES JAMES A. COATES Date 12-2-91

Sign and Print Name

A-6000-402 (03/90)

9312790697

WELL NO. 699-43-41G BASELINE PAGE 2 OF 8

SE2000
Environmental Logger
11/25 08:04

Unit# 192 Test 6

INPUT 1: Level (F) TOC

Reference	134.790
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/22 12:21:18

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	134.774	-134.774
1.0000	0.0167	134.821	-134.821
2.0000	0.0333	134.853	-134.853
3.0000	0.0500	134.853	-134.853
4.0000	0.0667	134.869	-134.869
5.0000	0.0833	134.885	-134.885
6.0000	0.1000	134.900	-134.900
7.0000	0.1167	134.916	-134.916
8.0000	0.1333	134.916	-134.916
9.0000	0.1500	134.916	-134.916
10.0000	0.1667	134.932	-134.932
11.0000	0.1833	134.948	-134.948
12.0000	0.2000	134.948	-134.948
13.0000	0.2167	134.964	-134.964
14.0000	0.2333	134.964	-134.964
15.0000	0.2500	134.980	-134.980
16.0000	0.2667	134.980	-134.980
17.0000	0.2833	134.995	-134.995
18.0000	0.3000	134.995	-134.995
19.0000	0.3167	135.011	-135.011
20.0000	0.3333	135.011	-135.011
21.0000	0.3500	135.011	-135.011
22.0000	0.3667	135.027	-135.027
23.0000	0.3833	135.027	-135.027
24.0000	0.4000	135.043	-135.043
25.0000	0.4167	135.043	-135.043
26.0000	0.4333	135.043	-135.043
27.0000	0.4500	135.059	-135.059
28.0000	0.4667	135.059	-135.059
29.0000	0.4833	135.075	-135.075
30.0000	0.5000	135.075	-135.075
31.0000	0.5167	135.091	-135.091

9 3 1 2 7 3 9 0 6 9 8

WELL NO. 699-43-41G BASELINE PAGE 3 OF 8

32.0000	0.5333	135.091	-135.091
33.0000	0.5500	135.091	-135.091
34.0000	0.5667	135.091	-135.091
35.0000	0.5833	135.106	-135.106

9312706699

SE2000
Environmental Logger
11/25 08:00

Unit# 192 Test 7

INPUT 1: Level (F) TOC

Reference	134.790
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/22 12:57:30

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	135.154	-135.154
0.0083	0.0001	135.059	-135.059
0.0166	0.0003	135.217	-135.217
0.0250	0.0004	135.360	-135.360
0.0333	0.0006	135.471	-135.471
0.0416	0.0007	135.693	-135.693
0.0500	0.0008	135.804	-135.804
0.0583	0.0010	135.946	-135.946
0.0666	0.0011	136.105	-136.105
0.0750	0.0013	136.216	-136.216
0.0833	0.0014	136.358	-136.358
0.1000	0.0017	136.675	-136.675
0.1166	0.0019	136.976	-136.976
0.1333	0.0022	137.309	-137.309
0.1500	0.0025	137.578	-137.578
0.1666	0.0028	137.911	-137.911
0.1833	0.0031	138.228	-138.228
0.2000	0.0033	138.529	-138.529
0.2166	0.0036	138.830	-138.830
0.2333	0.0039	139.131	-139.131
0.2500	0.0042	139.432	-139.432
0.2666	0.0044	139.749	-139.749
0.2833	0.0047	140.018	-140.018
0.3000	0.0050	140.351	-140.351
0.3166	0.0053	140.652	-140.652
0.3333	0.0056	140.922	-140.922
0.4166	0.0069	142.189	-142.189
0.5000	0.0083	143.552	-143.552
0.5833	0.0097	144.820	-144.820
0.6666	0.0111	145.992	-145.992
0.7500	0.0125	147.276	-147.276
0.8333	0.0139	148.464	-148.464

9 3 1 2 7 5 9 0 7 0 0

WELL NO. 699-43-41G DRAWDOWN PAGE 5 OF 8

0.9166	0.0153	149.716	-149.716
1.0000	0.0167	150.936	-150.936
1.0833	0.0181	152.140	-152.140
1.1666	0.0194	153.376	-153.376
1.2500	0.0208	154.644	-154.644
1.3333	0.0222	155.864	-155.864
1.4166	0.0236	157.084	-157.084
1.5000	0.0250	158.320	-158.320
1.5833	0.0264	159.556	-159.556
1.6666	0.0278	160.728	-160.728
1.7500	0.0292	161.964	-161.964
1.8333	0.0306	163.105	-163.105
1.9166	0.0319	164.293	-164.293
2.0000	0.0333	165.450	-165.450
2.5000	0.0417	172.375	-172.375
3.0000	0.0500	178.808	-178.808
3.5000	0.0583	185.003	-185.003
4.0000	0.0667	190.898	-190.898
4.5000	0.0750	193.544	-193.544
5.0000	0.0833	193.528	-193.528
5.5000	0.0917	193.560	-193.560
6.0000	0.1000	193.322	-193.322
6.5000	0.1083	193.021	-193.021
7.0000	0.1167	192.688	-192.688
7.5000	0.1250	192.086	-192.086
8.0000	0.1333	191.595	-191.595
8.5000	0.1417	191.024	-191.024
9.0000	0.1500	190.391	-190.391
9.5000	0.1583	189.757	-189.757
10.0000	0.1667	189.171	-189.171
12.0000	0.2000	187.428	-187.428
14.0000	0.2333	185.051	-185.051
16.0000	0.2667	183.070	-183.070
18.0000	0.3000	181.391	-181.391
20.0000	0.3333	179.980	-179.980
22.0000	0.3667	178.760	-178.760
24.0000	0.4000	177.572	-177.572
26.0000	0.4333	176.621	-176.621
28.0000	0.4667	175.686	-175.686
30.0000	0.5000	175.100	-175.100
32.0000	0.5333	174.656	-174.656
34.0000	0.5667	174.244	-174.244
36.0000	0.6000	173.943	-173.943
38.0000	0.6333	173.563	-173.563
40.0000	0.6667	173.309	-173.309
42.0000	0.7000	173.183	-173.183
44.0000	0.7333	172.739	-172.739
46.0000	0.7667	172.438	-172.438
48.0000	0.8000	172.169	-172.169
50.0000	0.8333	171.931	-171.931
52.0000	0.8667	171.772	-171.772
54.0000	0.9000	171.646	-171.646

9 3 1 2 7 0 9 0 7 0 1

WELL NO. 699-43-41G DRAWDOWN PAGE 6 OF 8

56.0000	0.9333	171.471	-171.471
58.0000	0.9667	171.376	-171.376
60.0000	1.0000	171.297	-171.297
62.0000	1.0333	171.329	-171.329
64.0000	1.0667	171.376	-171.376
66.0000	1.1000	171.551	-171.551
68.0000	1.1333	171.757	-171.757
70.0000	1.1667	171.915	-171.915
72.0000	1.2000	172.058	-172.058
74.0000	1.2333	172.169	-172.169
76.0000	1.2667	172.279	-172.279
78.0000	1.3000	172.422	-172.422
80.0000	1.3333	172.454	-172.454
82.0000	1.3667	172.533	-172.533
84.0000	1.4000	172.644	-172.644
86.0000	1.4333	172.739	-172.739
88.0000	1.4667	172.707	-172.707
90.0000	1.5000	172.771	-172.771
92.0000	1.5333	172.787	-172.787
94.0000	1.5667	172.834	-172.834
96.0000	1.6000	172.866	-172.866
98.0000	1.6333	172.913	-172.913
100.0000	1.6667	172.961	-172.961
105.0000	1.7500	172.993	-172.993
110.0000	1.8333	173.103	-173.103
115.0000	1.9167	173.135	-173.135
120.0000	2.0000	173.167	-173.167
125.0000	2.0833	173.135	-173.135
130.0000	2.1667	173.500	-173.500
135.0000	2.2500	173.420	-173.420
140.0000	2.3333	173.278	-173.278
145.0000	2.4167	173.230	-173.230
150.0000	2.5000	173.199	-173.199
155.0000	2.5833	173.214	-173.214
160.0000	2.6667	173.246	-173.246
165.0000	2.7500	173.183	-173.183
170.0000	2.8333	173.183	-173.183
175.0000	2.9167	173.230	-173.230

9 3 1 2 7 5 9 0 7 0 2

WELL NO. 699-43-41G RECOVERY PAGE 7 OF 8

SE2000
Environmental Logger
11/25 07:54

Unit# 192 Test 8

INPUT 1: Level (F) TOC

Reference	134.790
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/22 15:53:28

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	172.549	-172.549
0.0083	0.0001	172.977	-172.977
0.0166	0.0003	173.230	-173.230
0.0250	0.0004	173.119	-173.119
0.0333	0.0006	173.024	-173.024
0.0416	0.0007	172.945	-172.945
0.0500	0.0008	172.882	-172.882
0.0583	0.0010	172.771	-172.771
0.0666	0.0011	172.691	-172.691
0.0750	0.0013	172.612	-172.612
0.0833	0.0014	172.533	-172.533
0.1000	0.0017	172.375	-172.375
0.1166	0.0019	172.200	-172.200
0.1333	0.0022	172.042	-172.042
0.1500	0.0025	171.883	-171.883
0.1666	0.0028	171.725	-171.725
0.1833	0.0031	171.566	-171.566
0.2000	0.0033	171.408	-171.408
0.2166	0.0036	171.250	-171.250
0.2333	0.0039	171.091	-171.091
0.2500	0.0042	170.948	-170.948
0.2666	0.0044	170.790	-170.790
0.2833	0.0047	170.632	-170.632
0.3000	0.0050	170.489	-170.489
0.3166	0.0053	170.346	-170.346
0.3333	0.0056	170.204	-170.204
0.4166	0.0069	169.538	-169.538
0.5000	0.0083	168.857	-168.857
0.5833	0.0097	168.191	-168.191
0.6666	0.0111	167.558	-167.558
0.7500	0.0125	166.955	-166.955
0.8333	0.0139	166.385	-166.385

9 3 1 2 7 0 9 0 7 0 3

WELL NO. 699-43-41G RECOVERY PAGE 8 OF 8

0.9166	0.0153	165.846	-165.846
1.0000	0.0167	165.323	-165.323
1.0833	0.0181	164.848	-164.848
1.1666	0.0194	164.389	-164.389
1.2500	0.0208	163.961	-163.961
1.3333	0.0222	163.565	-163.565
1.4166	0.0236	163.200	-163.200
1.5000	0.0250	162.883	-162.883
1.5833	0.0264	162.582	-162.582
1.6666	0.0278	162.297	-162.297
1.7500	0.0292	162.075	-162.075
1.8333	0.0306	161.869	-161.869
1.9166	0.0319	161.679	-161.679
2.0000	0.0333	161.536	-161.536
2.5000	0.0417	160.760	-160.760
3.0000	0.0500	160.047	-160.047
3.5000	0.0583	159.350	-159.350
4.0000	0.0667	158.668	-158.668
4.5000	0.0750	158.019	-158.019
5.0000	0.0833	157.369	-157.369
5.5000	0.0917	156.735	-156.735
6.0000	0.1000	156.117	-156.117
6.5000	0.1083	155.531	-155.531
7.0000	0.1167	154.945	-154.945
7.5000	0.1250	154.374	-154.374
8.0000	0.1333	153.788	-153.788
8.5000	0.1417	153.233	-153.233
9.0000	0.1500	152.726	-152.726
9.5000	0.1583	152.219	-152.219
10.0000	0.1667	151.744	-151.744
12.0000	0.2000	149.906	-149.906
14.0000	0.2333	148.290	-148.290
16.0000	0.2667	146.832	-146.832
18.0000	0.3000	145.548	-145.548
20.0000	0.3333	144.408	-144.408
22.0000	0.3667	143.394	-143.394
24.0000	0.4000	142.490	-142.490
26.0000	0.4333	141.698	-141.698
28.0000	0.4667	141.017	-141.017
30.0000	0.5000	140.399	-140.399
32.0000	0.5333	139.876	-139.876
34.0000	0.5667	138.624	-138.624
36.0000	0.6000	138.371	-138.371
38.0000	0.6333	138.165	-138.165
40.0000	0.6667	137.990	-137.990
42.0000	0.7000	137.832	-137.832
44.0000	0.7333	137.689	-137.689
46.0000	0.7667	137.594	-137.594

9 3 1 2 7 5 9 0 7 0 4

1 of 1

SAMPLING PUMP INSTALLATION FORM

Project: W017/B.POND

Well Number: 699-43-41G

Pump Type: HYDROSTAR

Pump Model: 8001

Date Installed: 11/25/91

Installed by: B STRODE/M. MUNSON KEY

Depth to water: 134.79

Depth to Bottom: 202.58

Reported Depth to water: 1

Screened Interval: 202.58-192.22 (10.36)'

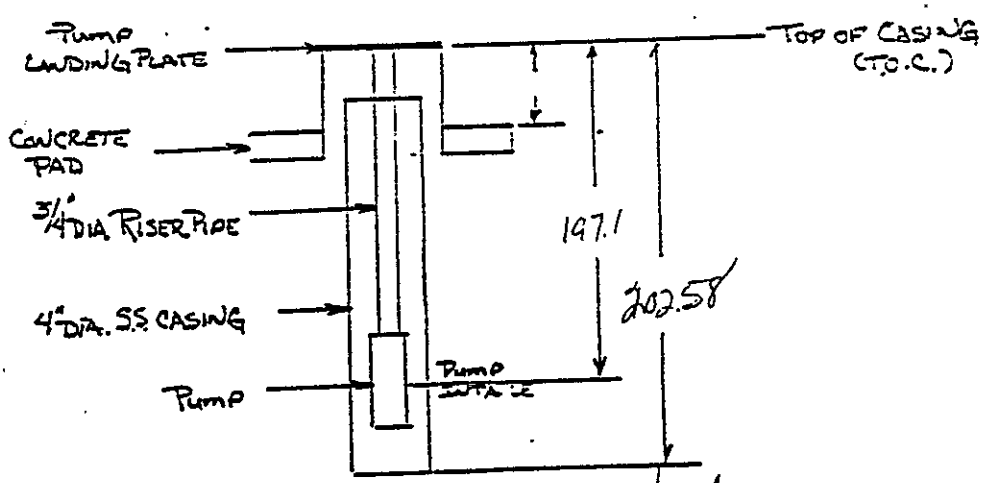
Pump/Riser Pipe Description:
- pipe: 3/4" S.S.
- pump length: 4.3
- pump screen length: 1.9
- material cleaning: MANUFACTURER

Comments:

PUMP INSTALLATION SKETCH

Total material length: 199.3'

Loc. of pump intake: 197.1'



Completed By: J.A. Carter

Date: 11/25/91

9312790705

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9 3 1 2 7 5 9 0 7 0 6

WATER ADDED AND REMOVED FROM 216-B-3 POND BOREHOLES
(in Gallons)

Well Number	Total Drilling Water Added	Drilling Water Added Below Water Table	Removed to Develop Sand Pack	Water Removed During Well Development
699-40-40A	235	185	30	1200
699-40-40B	230	165	35	614
699-42-39A	221	108	35	510
699-42-39B	564	510	40	925
699-42-41	12	0	35	884
699-43-40	189	35	30	215
699-43-41G	186	186	30	1948

9 3 1 2 7 0 9 0 7 0 7

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9 3 1 2 7 5 9 0 7 0 8

APPENDIX D

AQUIFER TEST RESULTS

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AQUIFER TEST RESULTS

Seven RCRA groundwater monitoring wells were drilled at 216-B-3 Pond in FY91. Slug injection/withdrawal tests were conducted in each of these wells to determine hydraulic conductivity and transmissivity values of the uppermost aquifer beneath the B Pond system. All tests were conducted in the fluvial gravel A unit. This unit is partially confined by the lower mud sequence in the eastern portion of the B Pond system. In the western portion of the B Pond system, the saturated unit A is unconfined and is overlain by the Hanford gravels.

The tests are considered opportunistic in that the wells were not designed specifically for aquifer testing. Therefore, the results obtained must be used with caution. In additon, the hydraulic values determined are representative of only the area immediately surrounding the well, i.e. it is a point value. The estimated values of hydraulic conductivity ranged from 1.4 x 10^{-1} to 7 ft/day. Transmissivity values ranged from 2 to 73 ft^2/day (Table D.1). Because of occurring interbedded silts and clays in and above the Ringold Unit A, these ranges may be a result of lateral and vertical lithologic variability or violation of one or more of the analytical assumptions used to evaluate the data.

Methods used to analyze the slug test data include Bouwer and Rice (1976) for unconfined aquifer conditions and Cooper et al. (1967) for confined aquifer conditions. Assumptions inherent to Bouwer and Rice include 1) drawdown of the water table surface is negligable, 2) vadose flow/contribution is negligible, 3) head losses due to the well are negligible, 4) the aquifer is homogeneous and isotropic in the area influenced by the test. Although the method assumes a water table aquifer, the method is applicable to situations where the upper boundary of the aquifer is an impermeable or semipermeable confining layer.

Assumptions inherent to Cooper et al include 1) confined aquifer which is not free-flowing, 2) aquifer is homogeneous, isotropic, areally extensive, and of uniform thickness, 3) head is initially uniform and constant. Although the method assumes a fully penetrating well, the method may be used successfully on partially penetrating wells, provided that no vertical flow occurs and the transmissivity determined for the test is only representative of the aquifer's screened section (Cooper et al. 1967). This method may also be used successfully in unconfined systems provided that the saturated thickness remains nearly constant (Walter and Thompson 1982). Bouwer and Rice (1976) state that under some conditions the results of their method are comparable to the results of the Cooper et al. analysis.

9 3 1 2 7 0 9 0 7 1 1

REFERENCES

Bouwer, H. 1989. "The Bouwer and Rice Slug Test -- An Update." Ground Water 27(3):304-309.

Bouwer, H., and R. C. Rice. 1976. "A Slug Test for Determining Hydraulic Conductivity of the Unconfined Aquifers with Completely or Partially Penetrating Wells." Water Resources Research 12:423-428.

Cooper, H. H., Jr., J. D. Bredehoeft, and I.S. Papdopulos. 1967. "Response of a Finite-Diameter Well to an Instantaneous Charge of Water." Water Resources Research 3(1):263-269.

Walter, G. R., and G. M. Thompson. 1982. "A Repeated Pulse Technique for Determining the Hydraulic Properties of Tight Formation." Ground Water 20(2):186-193.

9 3 1 2 7 5 9 0 7 1 2

TABLE D.1

Well Number	Confined/ Unconfined	Litho-logy	Type of test	Date of Test	Analysis Method	Test Interval	K ft/day	T ft^2/ day
699-40-40A	confined	sandy gravel	slug withdrawal	11/25/91	Bouwer and Rice	215.1-225.9	$8.7x10^{-1}$	10
699-40-40B	confined	sandy gravel	slug injection	11/22/91	Cooper et al	190.37-210.19		4
699-40-40B	confined	sandy gravel	slug injection	11/22/91	Bouwer and Rice	190.37-210.19	$1.9x10^{-1}$	2
699-40-40B	confined	sandy gravel	slug withdrawal	11/22/91	Bouwer and Rice	190.37-210.19	$1.4x10^{-1}$*	2*
699-42-39A	confined	sandy gravel	slug injection	10/22/91	Bouwer and Rice	169.4-180.1	6.8	73
699-42-39B	confined	silty sandy gravel	slug withdrawal	10/24/91	Cooper et al	203-213.8		35*
699-42-39B	confined	silty sandy gravel	slug withdrawal	10/24/91	Bouwer and Rice	203-213.8	1.5	16
699-43-40	unconfined	sandy gravel	slug withdrawal	11/26/91	Bouwer and Rice	124.3-135.3	5.4	60
699-42-41	unconfined	silty sandy gravel	slug injection	10/17/91	Bouwer and Rice	146.94-159.04	not analyzed	---
699-43-41G	confined	silty sandy gravel	slug withdrawal	8/23/91	Cooper et al	145-155		32*
699-43-41G	confined	silty sandy gravel	slug withdrawal	8/23/91	Bouwer and Rice	145-155	7	68
699-43-41G	confined	silty sandy gravel	slug withdrawal	8/28/91	Cooper et al	163-173		51*
699-43-41G	confined	silty sandy gravel	slug withdrawal	8/28/91	Bouwer and Rice	163-173	1	11
699-43-41G	confined	clayey sandy gravel	slug withdrawal	11/26/91	Cooper et al	188.3-198.6		23*
699-43-41G	confined	clayey sandy gravel	slug withdrawal	11/26/91	Bouwer and Rice	188.3-198.6	2	21

*Most reliable analysis

Notes:

1) Correction made for filter pack influence
2) Conversion from K to T is for screened interval
3) All tests were conducted in the Ringold Unit A

Well Number: 699-40-40A

Dimensions in ft unless otherwise specified

Project: RCRA 216-B-3 Pond

Date of Test: 11/25/91

Type of Test: Slug withdrawal

Slugging Rod Dimensions, L: 6.0 U = .1309 ft3

D: .167

Theoretical head displacement in 4 inch casing: 1.57

Location of Field Records and Data: RCRA Records File

Head change within screened interval: NO

Depth below land surface/top of 6" of tested zone: 215.10

Top of open interval

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 96.36

Length of saturated screen interval, Le: 10.77 225.87-215.1

Thickness of aquifer, H: 108 129.51

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min): 0

Intial Head change, Yo: 2nd line .165

Arbitrary time value on straight line, Tc (min): 8

Head at Tc, Yt: .05

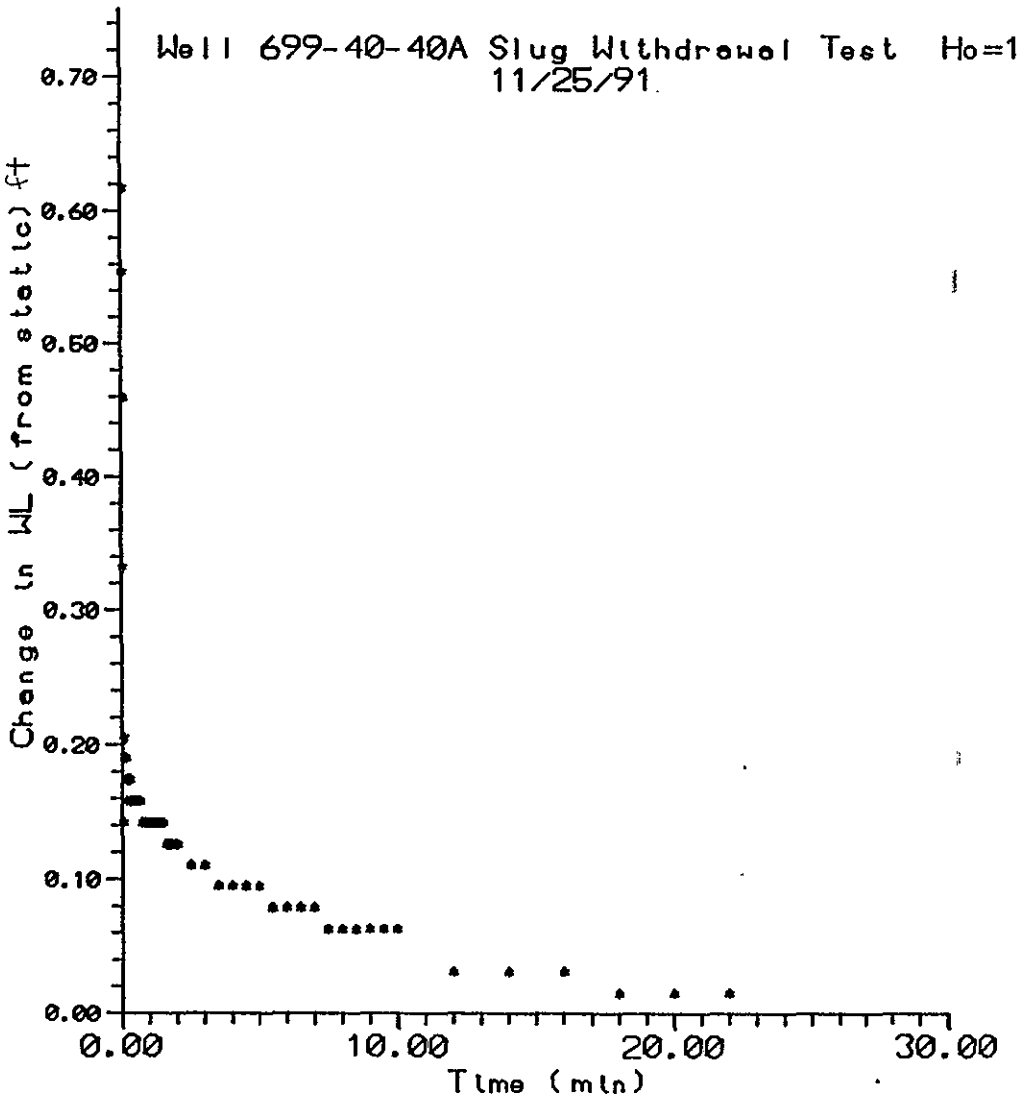
Comments: Cooper curves could not be matched. Theoretical Ho did not match actual Ho. HoA = 4.19 ft, HoT = 1.57.

Bouwer and Rice method was used. Calc were based on calculated line approach.

Injection data not usable.

Name (print): C.D Delaney Signature: C.D. Delaney Date: 4/23/92

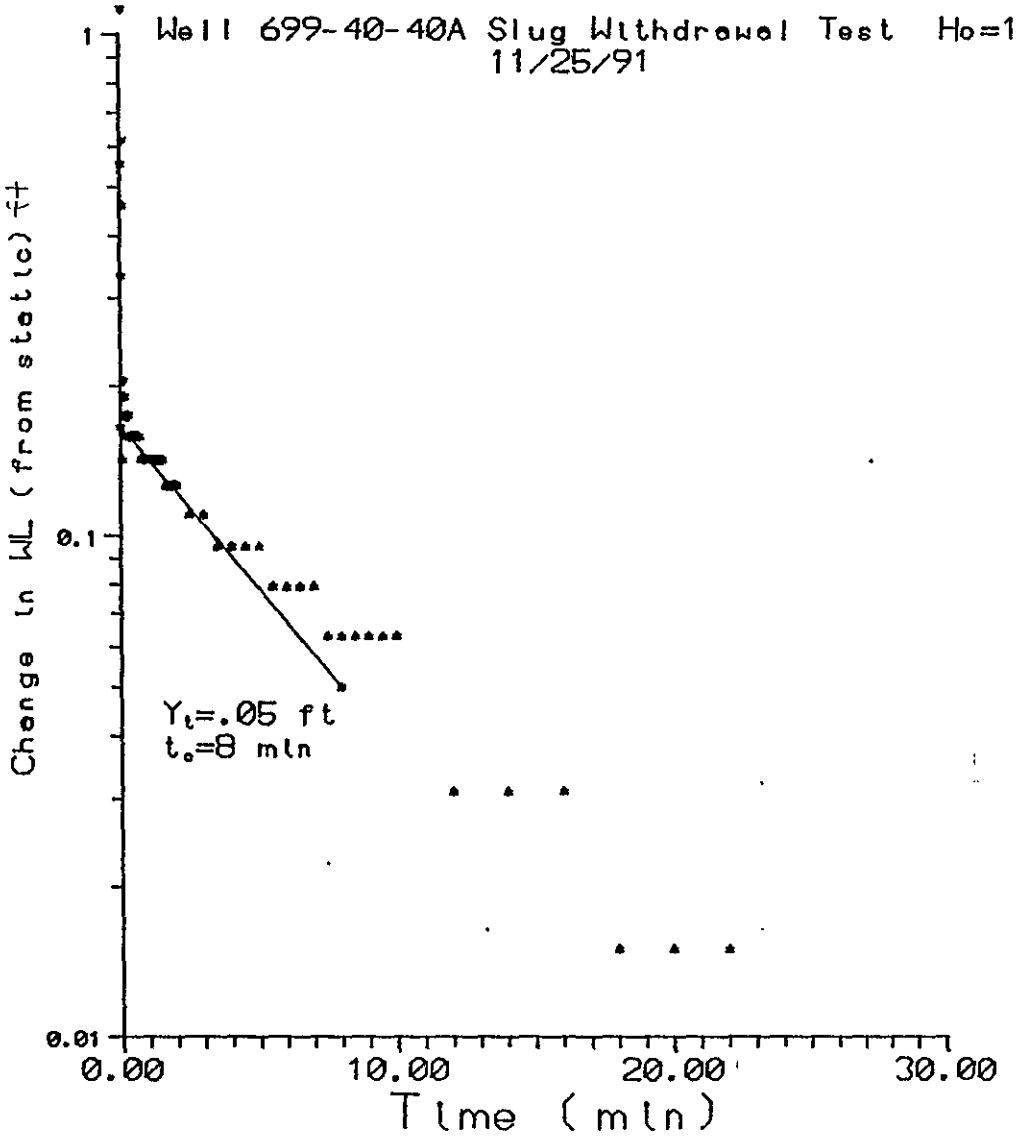
9312739071 4


Well 699-40-40A Slug Withdrawal Test Ho=1.57 ft
11/25/91
Change in WL (from static) ft
0.00
0.10
0.20
0.30
0.40
0.50
0.60
0.70
0.00
10.00
20.00
30.00
Time (min)

9 3 1 2 7 9 0 7 1 5

699-40-40A

```
*****************************************************
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.
***********************************************
Rc (ft)    Rw (ft)   Le (ft)    Lw (ft)    H (ft)
-----------------------------------------------
  .1670     .3330   10.7700     96.3600    108.0000
***********************************************
Le/Rw =          32.3423400
A=          2.5795940
B=  3.941699E-001
C=          2.1857810
t (min)=          8.0000000
1/t=  1.250000E-001
Yo= (ft)  1.650000E-001
Yt= (ft)  5.000000E-002
1/t ln(Yo/Yt)=  1.492403E-001
ln[(H-Lw)/Rw]=          3.5540600
ln(Re/Rw)=          3.1530230
***********************************************
K (ft/day) =  8.773299E-001
***********************************************
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)=          9.4488430
***********************************************
```


Well 699-40-40A Slug Withdrawal Test Ho=1.57 ft
11/25/91
Change in WL (from static) ft
1
0.1
0.01
Yt=.05 ft
to=8 min
0.00
10.00
20.00
30.00
Time (min)

9 3 1 2 7 9 0 7 1 7

Well Number: 699-40-40 B

Dimensions in ft unless otherwise specified

Project: RCRA 216-B-3 Pond

Date of Test: 11/22/91

Type of Test: Slug Injection

Slugging Rod Dimensions, L: 4.0 V=.1309 ft³

D: .167

Theoretical head displacement in 4 inch casing: 1.57

Location of Field Records and Data: RCRA records [illegible]

Head change within screened interval: no

Depth below land surface/top of 6" of tested zone: 190.37-201.19

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 70.19

Length of saturated screen interval, Le: 10.82

Thickness of aquifer, H: 108

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min): 0

Intial Head change, Yo: 2.0

Arbitrary time value on straight line, Tc (min): 19.6

Head at Tc, Yt: 1

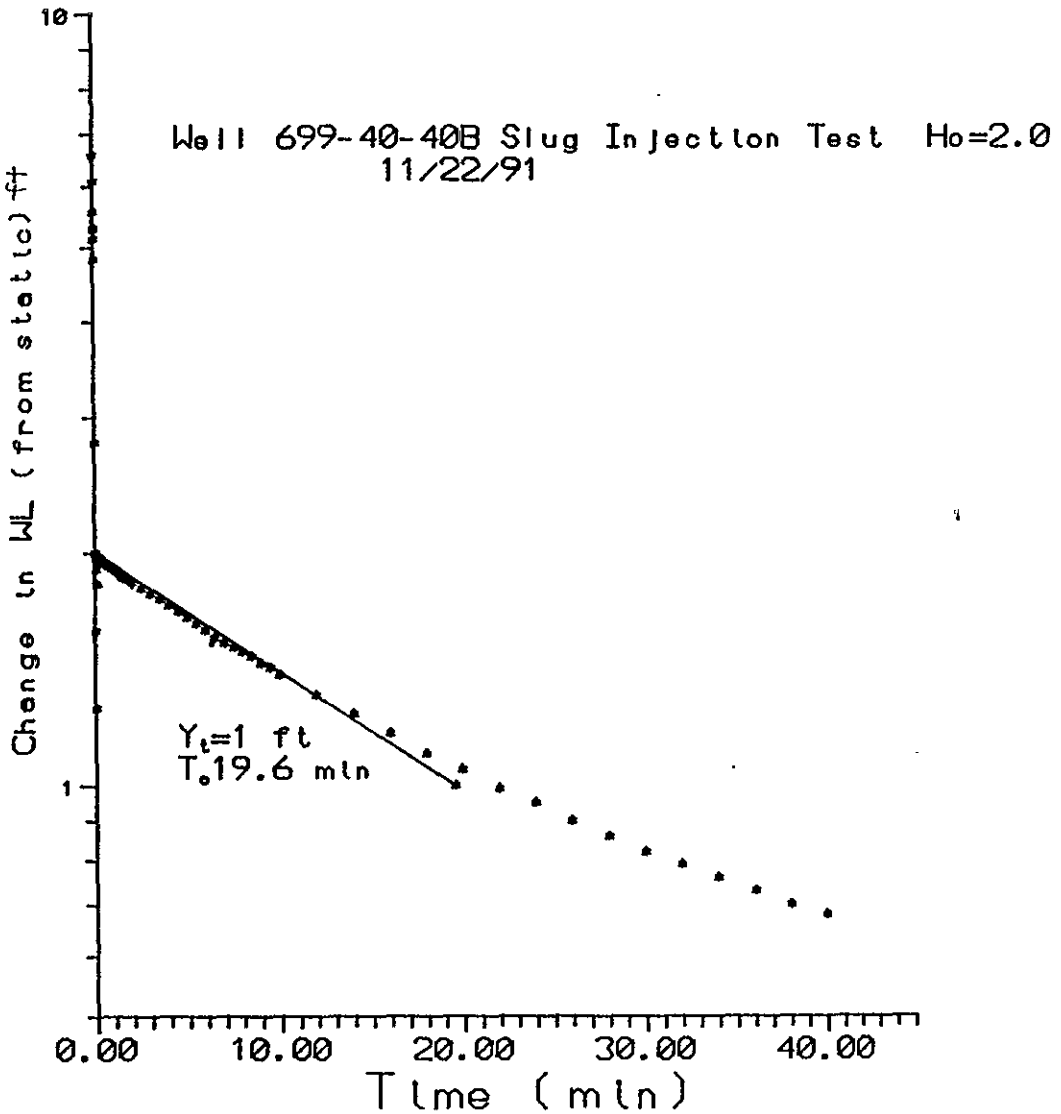
Comments: Cooper et al [illegible]

Name (print): Signature: Date:

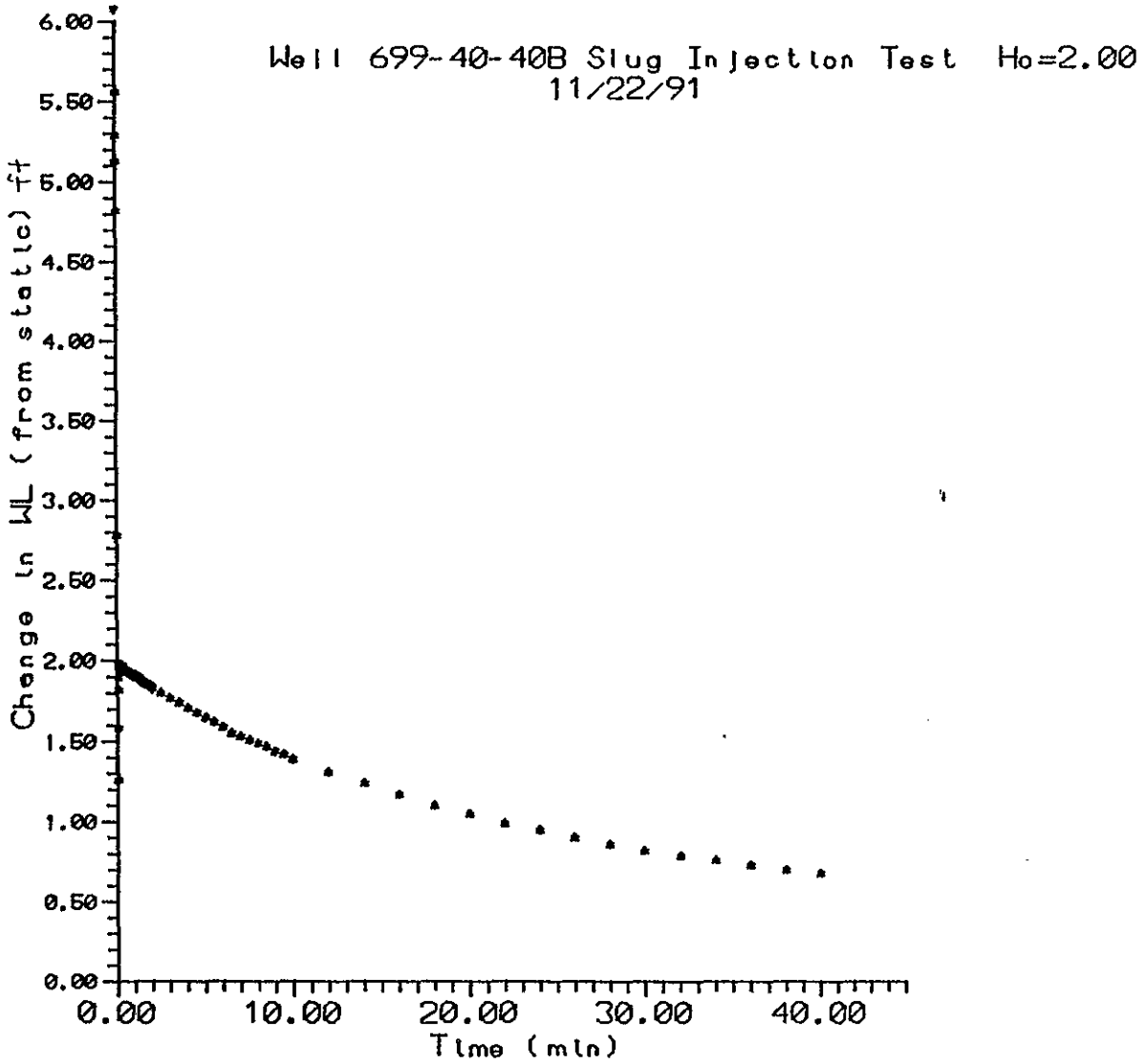
9 3 1 2 7 5 9 0 7 1 8

699-40-40B

```
**************************************************
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.
**********************************************
Rc (ft)    Rw (ft)   Le (ft)    Lw (ft)    H (ft)
-------------------------------------------------
  .1670     .3330   10.8200     70.1900    108.0000
**********************************************
Le/Rw =          32.4924900
A=          2.5932320
B=  3.941699E-001
C=          2.2089310
t (min)=         19.6000000
1/t=  5.102041E-002
Yo= (ft)          2.0000000
Yt= (ft)          1.0000000
1/t ln(Yo/Yt)=  3.536465E-002
ln[(H-Lw)/Rw]=          4.7321860
ln(Re/Rw)=          2.9172130
**********************************************
K (ft/day) =  1.914590E-001
**********************************************
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)=          2.0715860
**********************************************
```

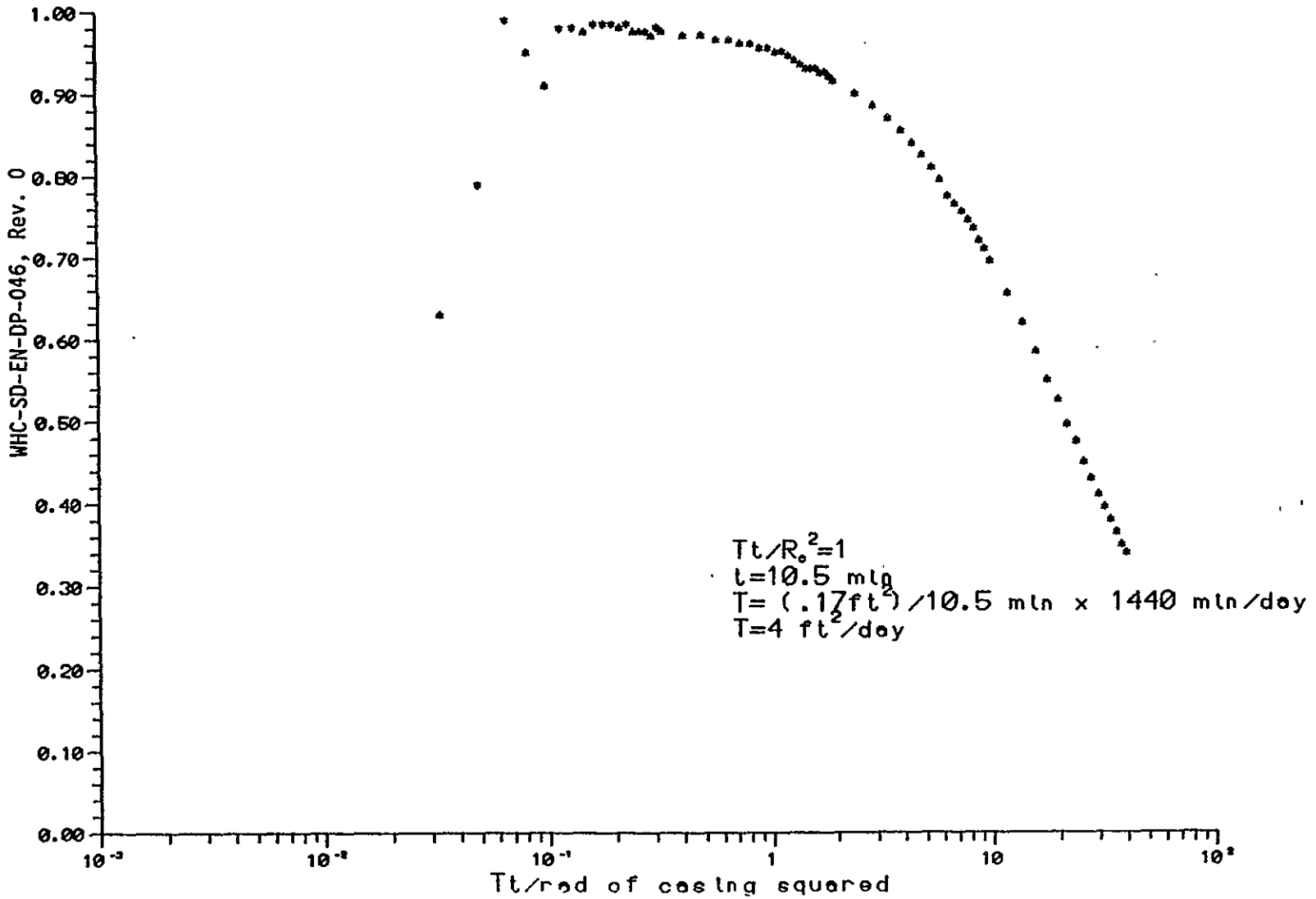


9 3 1 2 7 5 9 0 7 2 0


Well 699-40-40B Slug Injection Test Ho=2.00
11/22/91
Change in WL (from static) ft
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
0.00
10.00
20.00
30.00
40.00
Time (min)

9 3 1 2 7 9 0 7 2 1

Well 699-40-40B Slug Injection Test
11/22/91



9 3 1 2 7 5 9 0 7 2 2

Well Number: 699-40-40B

Dimensions in ft unless otherwise specified

Project: RCRA 216-B-3 Pond

Date of Test: 11/22/91

Type of Test: Slug withdrawal

Slugging Rod Dimensions, L: 6.0 V=.1309 ft³

D: .167

Theoretical head displacement in 4 inch casing: 1.57 (Vol. 1373 ~~ft³~~) 2.17

Location of Field Records and Data: RCRA Records File

Head change within screened interval: no

Depth below land surface/top of 6" of tested zone: 190.37-201.19

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 70.19

Length of saturated screen interval, Le: 10.82

Thickness of aquifer, H: 108

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min): 0

Intial Head change, Yo: 2.00

Arbitrary time value on straight line, Tc (min): 27

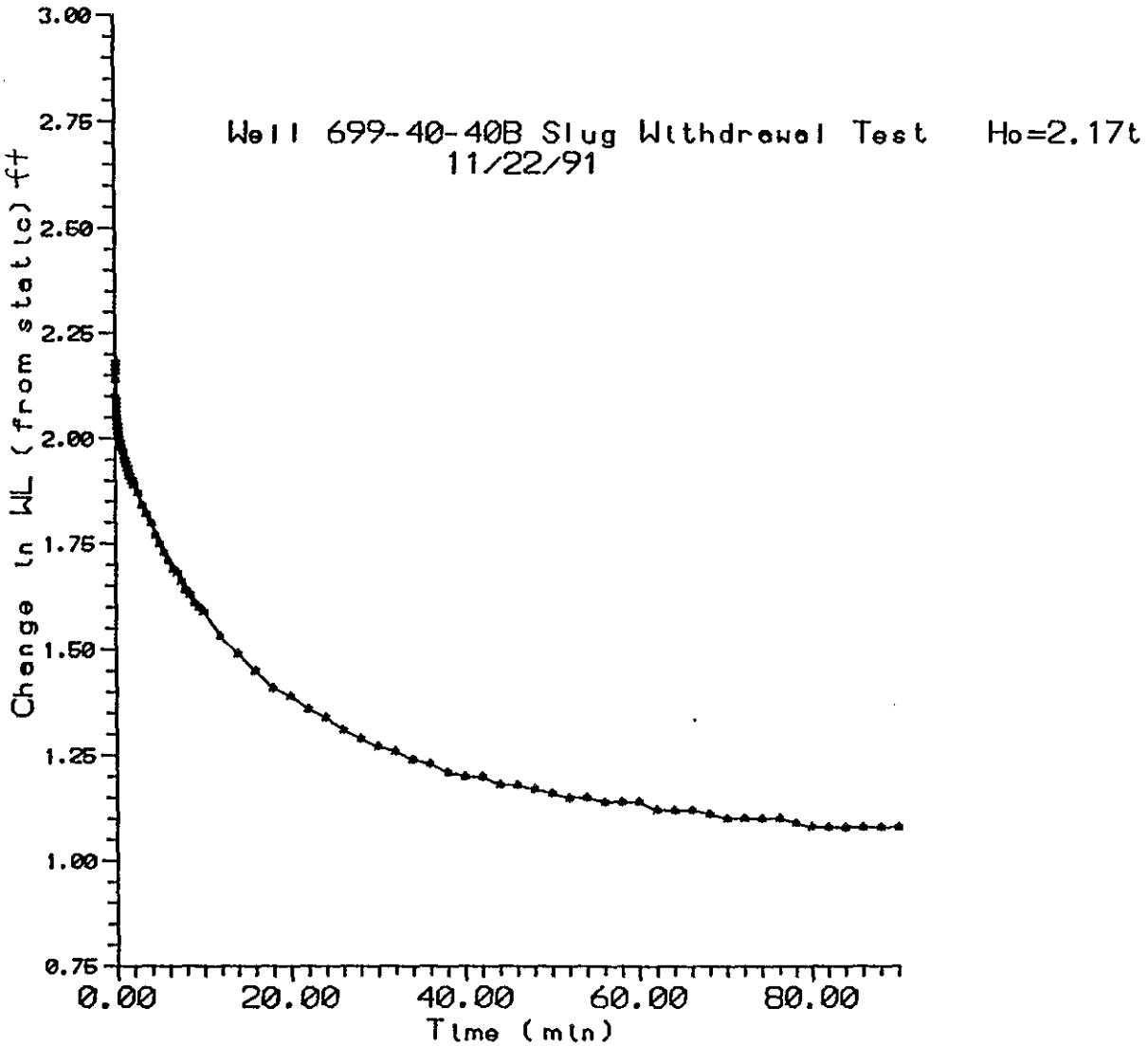
Head at Tc, Yt: 1

Comments: aquifer thickness is based on saturated thickness of FSA unit below Low. Mud. The system is [illegible].

Normalized data did not fit Cooper et al. analysis is based on Bouwer and Rice. Second straight line was used.
Theoretical head displacement was lower that actual head displacement by .6 ft. Complete recovery did not occur after injection before beginning withdrawal.

Name (print): Signature: Date:

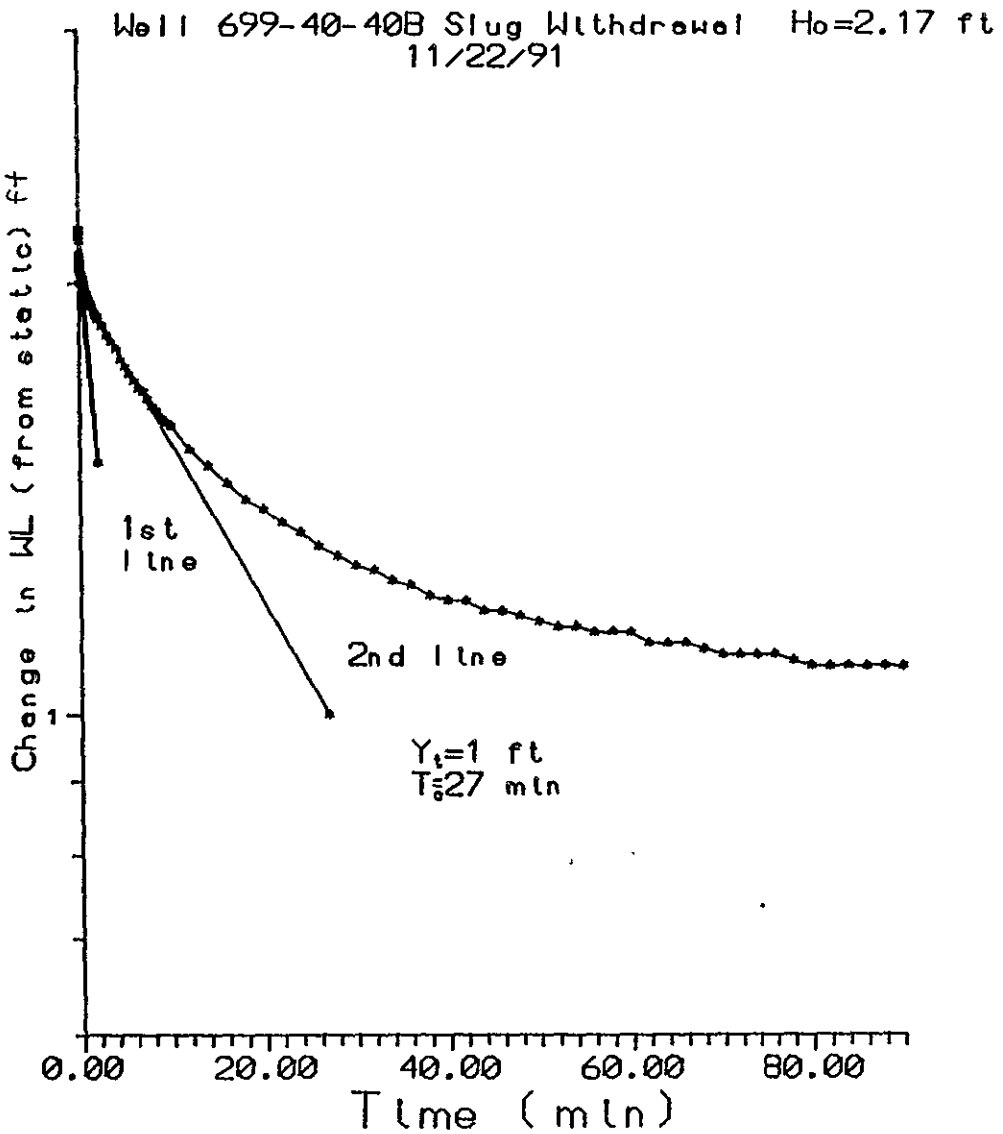
9312790723



9 3 1 2 7 5 9 0 7 2 4

699-40-40B

```
**************************************************
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.
**********************************************
Rc (ft)    Rw (ft)   Le (ft)    Lw (ft)    H (ft)
-------------------------------------------------
  .1670     .3330   10.8200     70.1900    108.0000
**********************************************
Le/Rw =          32.4924900
A=          2.5932320
B=  3.941699E-001
C=          2.2089310
t (min)=         27.0000000
1/t=  3.703704E-002
Yo= (ft)          2.0000000
Yt= (ft)          1.0000000
1/t ln(Yo/Yt)=  2.567212E-002
ln[(H-Lw)/Rw]=          4.7321860
ln(Re/Rw)=          2.9172130
**********************************************
K (ft/day) =  1.389850E-001
**********************************************
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)=          1.5038180
**********************************************
```



9 3 1 2 7 5 9 0 7 2 6

Well Number: 699-42-39A (BP91-2)

Dimensions in ft unless otherwise specified

130.1 - 169.4
138.88

Project: 216-B-3 Pond

Date of Test: 10/22/91

Type of Test: Slug Injection

Slugging Rod Dimensions, L: 6.0 v = .1309 ft3

D: .167

Theoretical head displacement in 4 inch casing: 1.57

Location of Field Records and Data: RCRA Records File

Head change within screened interval: NO

Depth below land surface/top of 6" of tested zone: 169.4

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 41.2

Length of saturated screen interval, Le: 10.7

Thickness of aquifer, H: 88

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min):

Intial Head change, Yo: 2.21 18 .98

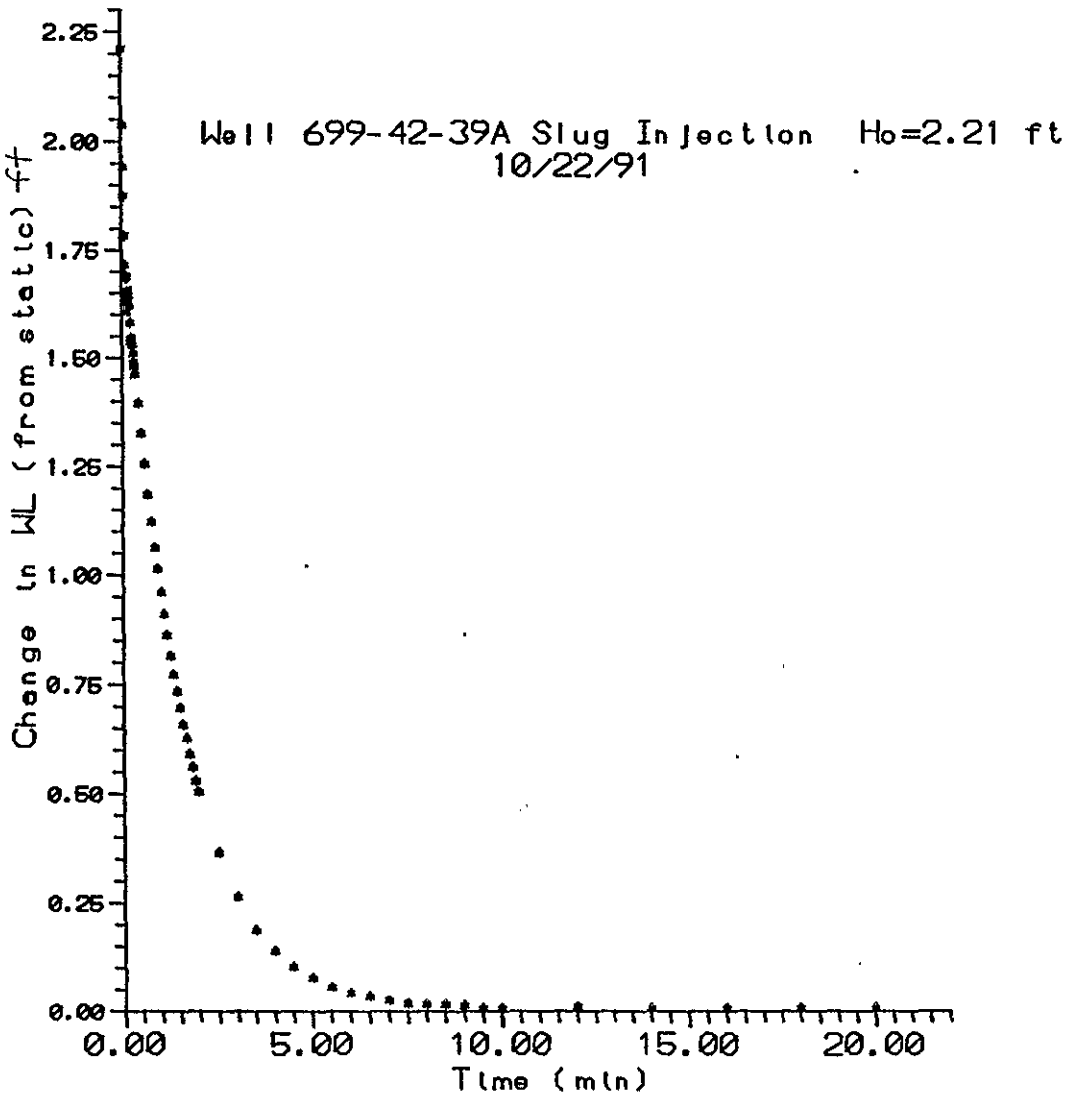
Arbitrary time value on straight line, Tc (min): .2833

Head at Tc, Yt: 1.511

Comments: Analysis based on slug injection, slug withdrawal data was questionable. [illegible] curve [illegible] not [illegible]. Analysis is based on Bouwer and Rice.

Name (print): Signature: Date:

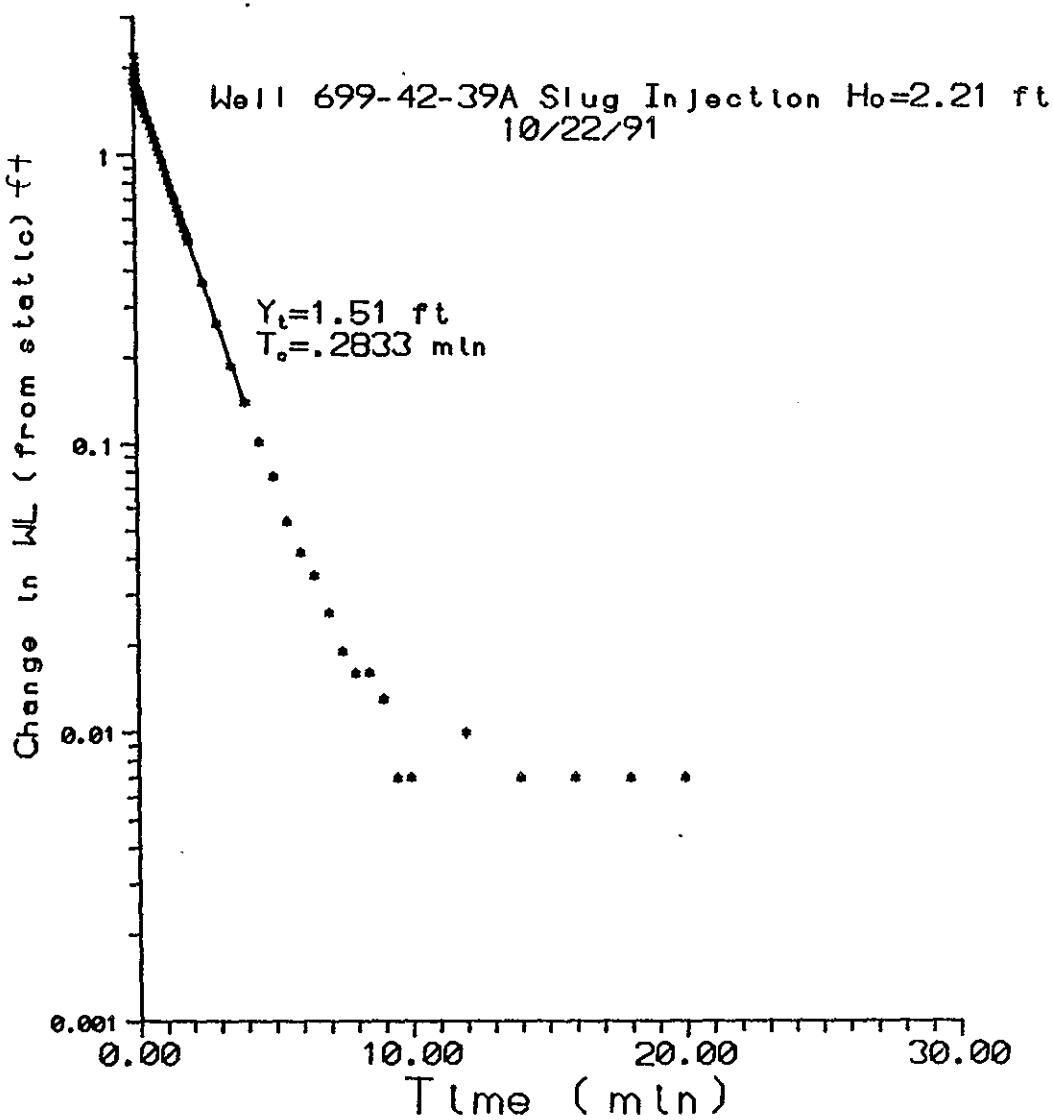
9 3 1 2 7 9 0 7 2 7



9 3 1 2 7 5 9 0 7 2 8

699-42-39A Slug Injection Test

```
**************************************************
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.
**************************************************
Rc (ft)    Rw (ft)   Le (ft)    Lw (ft)    H (ft)
--------------------------------------------------
  .1670     .3330   10.7000     41.2000     88.0000
**************************************************
Le/Rw =          32.1321300
A=          2.5795940
B=  3.941699E-001
C=          2.1857810
t (min)=  2.833000E-001
1/t=          3.5298270
Yo= (ft)          2.2100000
Yt= (ft)          1.5110000
1/t ln(Yo/Yt)=          1.3421140
ln[(H-Lw)/Rw]=          4.9454960
ln(Re/Rw)=          2.7081480
**************************************************
K (ft/day) =          6.8209250
**************************************************
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)=          72.9838900
**************************************************
```



9 3 1 2 7 5 9 0 7 3 0

Well Number: 699-42-39B (BP91-3)

Dimensions in ft unless otherwise specified

139.6 SWL
213.8-203
Screened interval

Project: 216-B-3 Pond

Date of Test: 10/24/91

Type of Test: Slug Withdrawal

Slugging Rod Dimensions, L: 6.0 V = .1309 ft³

D: .167

Theoretical head displacement in 4 inch casing: 1.57

Location of Field Records and Data: RCRA Records File

Head change within screened interval: NO

Depth below land surface/top of 6" of tested zone: 203

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 74.2

Length of saturated screen interval, Le: 10.8

Thickness of aquifer, H: 88

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min):

Intial Head change, Yo: 1.93

Arbitrary time value on straight line, Tc (min): .2

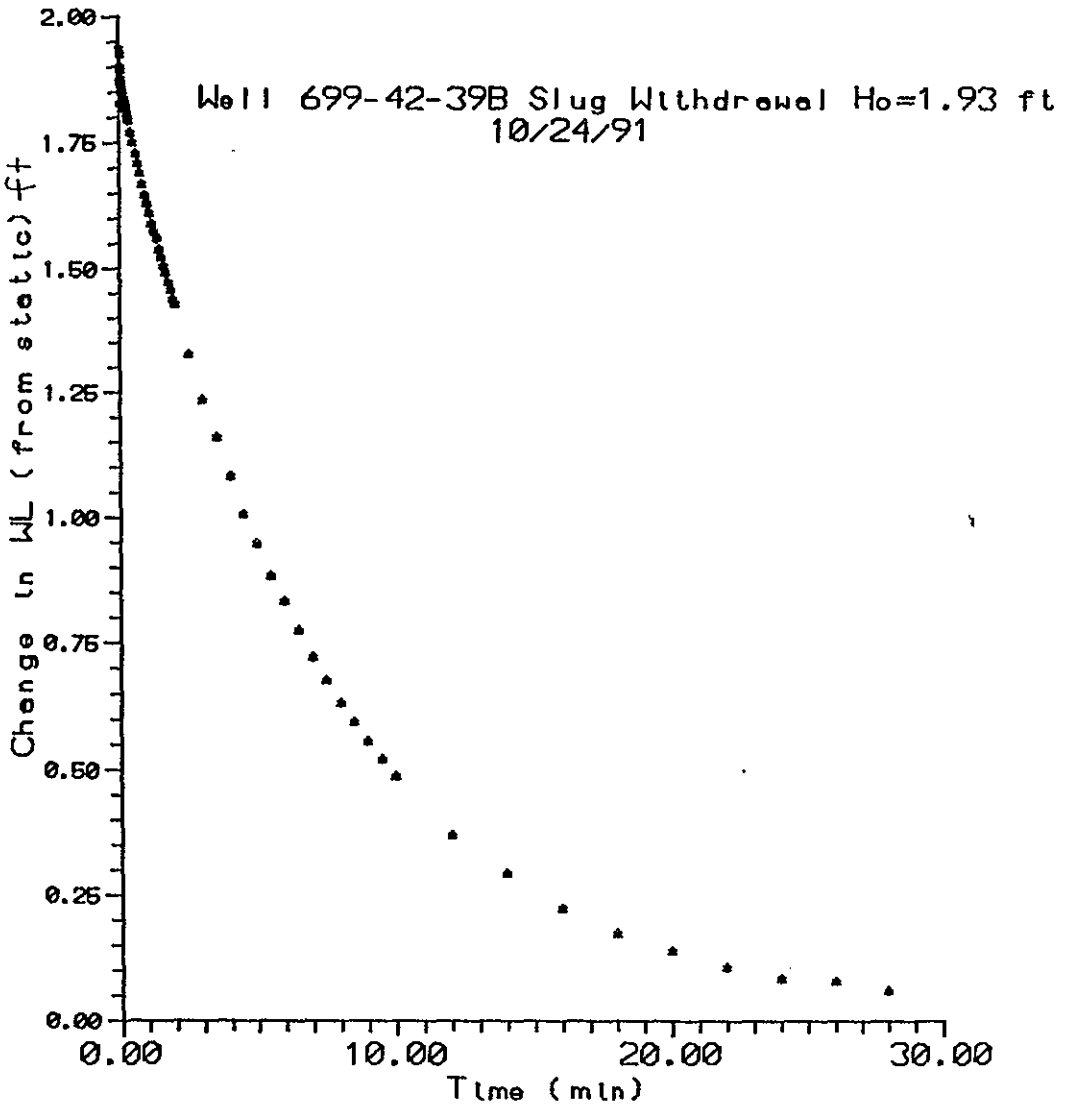
Head at Tc, Yt: 1.83

Comments: analysis is based on slug withdrawal. .98
[illegible]

Cooper analysis T = 35 ft²/day, Bouwer + Rice, T = 16 ft²/day
Results differ by an order of magnitude.
[illegible] coefficient is .98 (B+R)

Name (print): Signature: Date:

93127 90731



9 3 1 2 7 5 9 0 7 3 2

699-42-39B Slug Withdrawal Test

****

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.

****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.1670	.3330	10.8000	74.2000	88.0000

****

Le/Rw = 32.4324300
A= 2.5795940
B= 3.941699E-001
C= 2.2089310
t (min)= 2.000000E-001
1/t= 5.0000000
Yo= (ft) 1.9300000
Yt= (ft) 1.8300000
1/t ln(Yo/Yt)= 2.660197E-001
ln[(H-Lw)/Rw]= 3.7242820
ln(Re/Rw)= 3.0463260

****

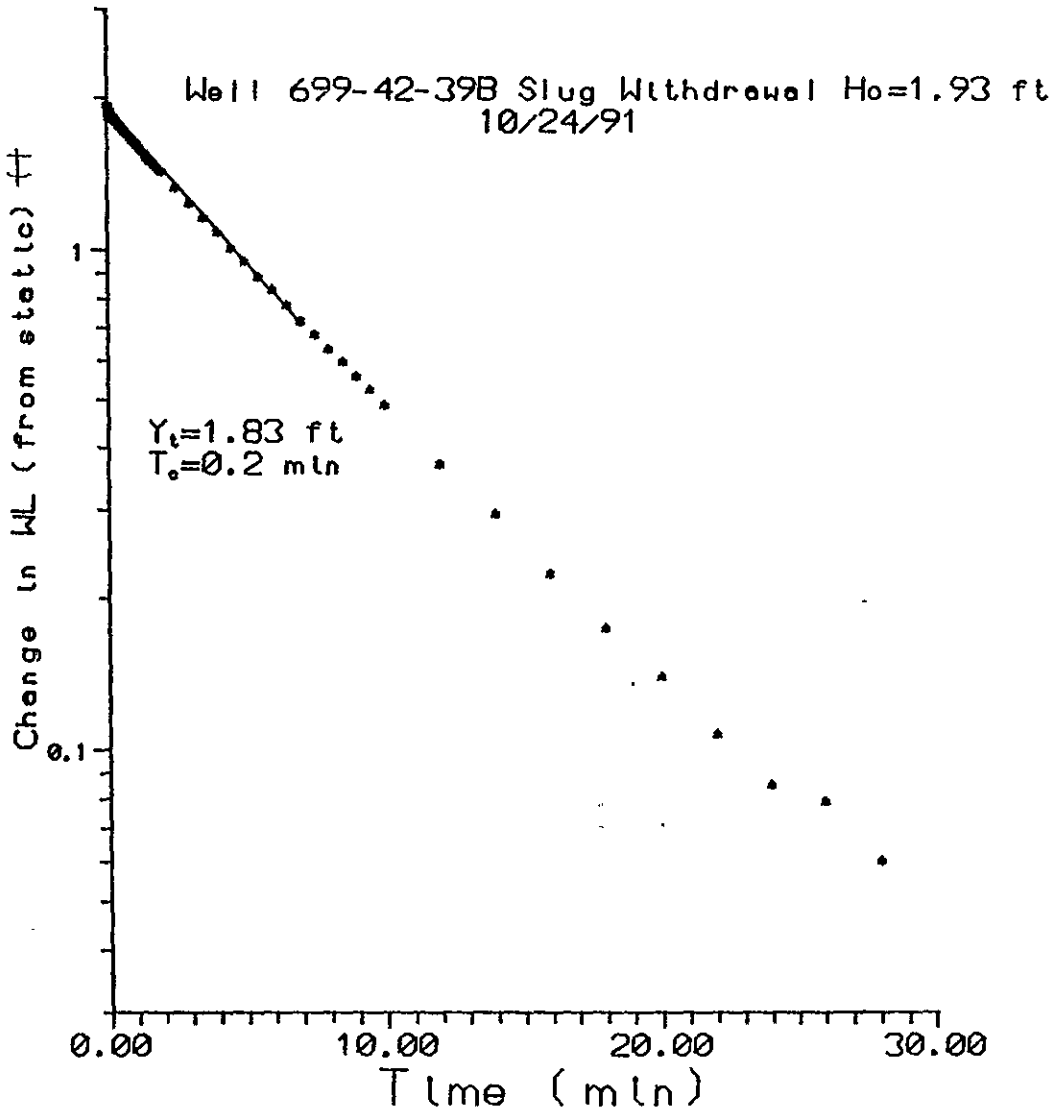
K (ft/day) = 1.5067170

****

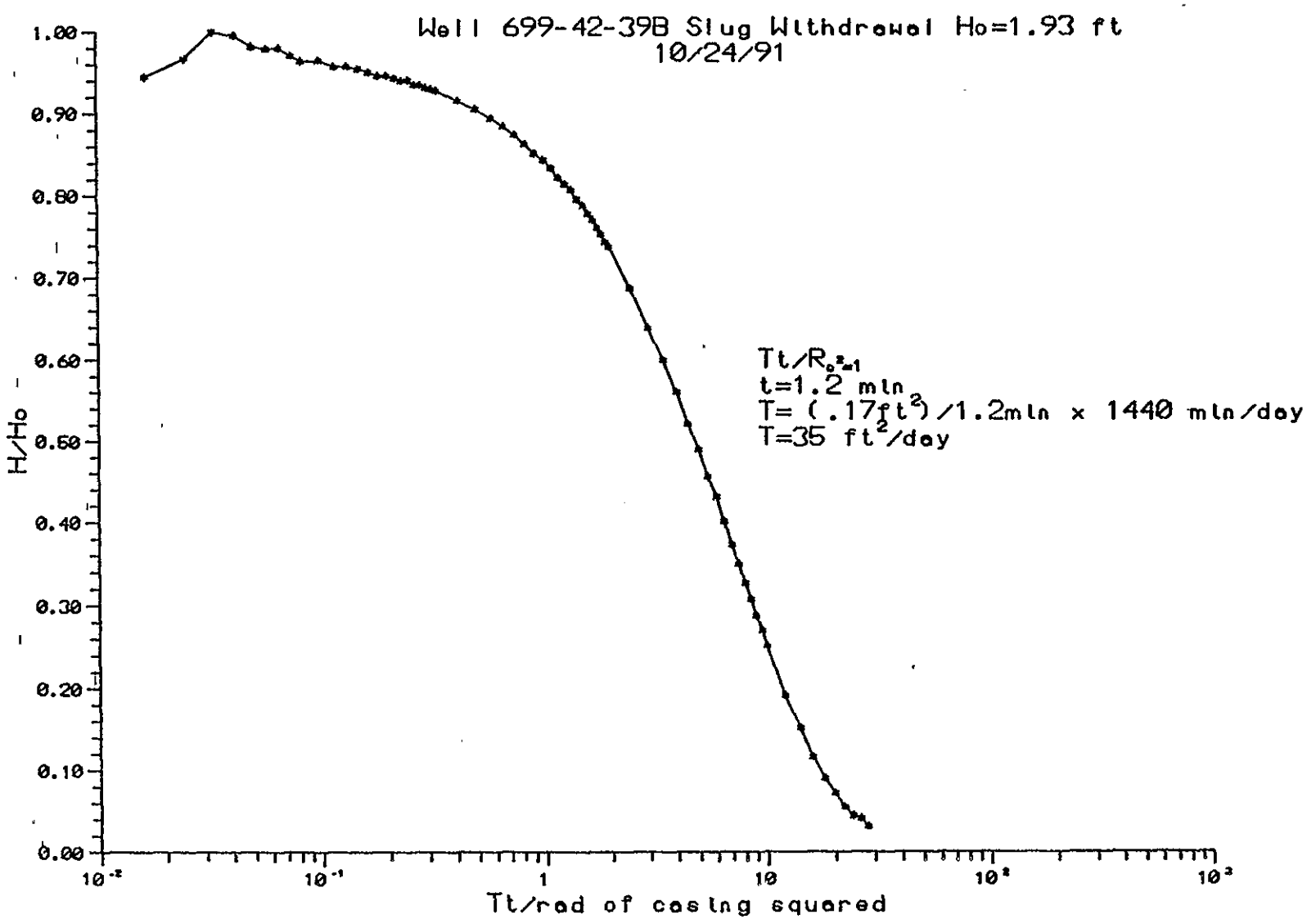
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 16.2725500

****

9 3 1 2 7 0 9 0 7 3 3



9 3 1 2 7 5 9 0 7 3 4


Well 699-42-39B Slug Withdrawal Ho=1.93 ft
10/24/91
Tt/R$_{o}^{2}$=1
t=1.2 min
T= (.17ft^2)/1.2min x 1440 min/day
T=35 ft^2/day
H/Ho
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10^{-2}
10^{-1}
1
10
10^{2}
10^{3}
Tt/rad of casing squared

Well Number: 699-42-41

Dimensions in ft unless otherwise specified

Project: RCRA 216-B-3 Pond

Date of Test: 10/17/91

Type of Test: Slug Injection

Slugging Rod Dimensions, L: 6.0 U = .1309 ft3

D: .167

Theoretical head displacement in 4 inch casing: 1.57 (Vol. 1373 ft3)

Location of Field Records and Data: RCRA Records file

Head change within screened interval: yes

Depth below land surface/top of 6" of tested zone: 146.940-159.04

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 12.100

Length of saturated screen interval, Le: 12.100

Thickness of aquifer, H: 168

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min): .0083

Intial Head change, Yo: 1.52

Arbitrary time value on straight line, Tc (min): .1

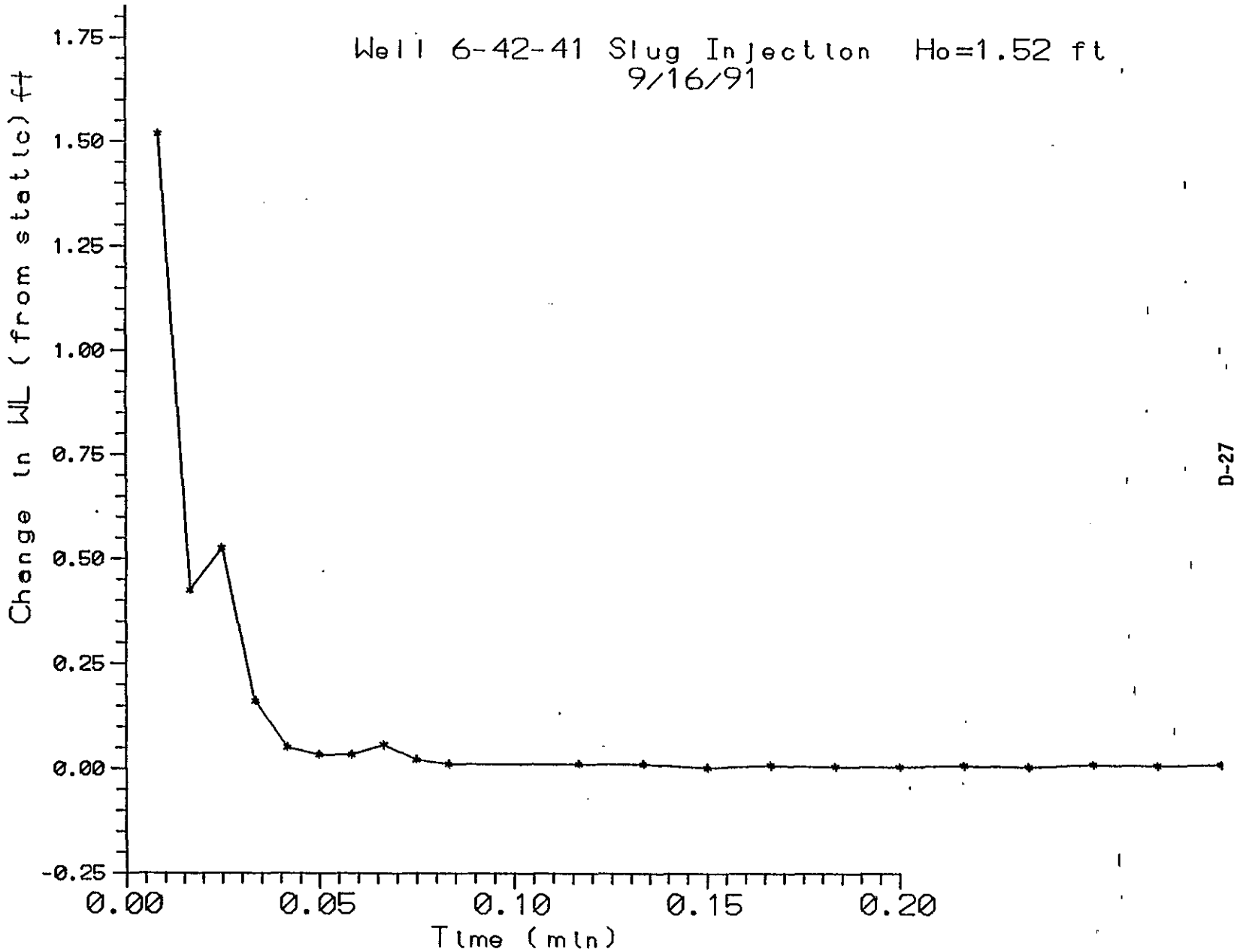
Head at Tc, Yt: .02

Comments: The slug injection test for this well is not analyzable. Recovery occurred in approx .3 min. Overdamping [illegible] [illegible] T from the data.

Cooper et al analysis could not be done. Bouwer and Rice analysis could not be done

Name (print): C.D Delaney Signature: C.D. Delaney Date: 3/26/92

9312759073 6


Well 6-42-41 Slug Injection Ho=1.52 ft
9/16/91
Change in WL (from static) ft
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
-0.25
0.00
0.05
0.10
0.15
0.20
Time (min)

9 3 1 2 7 9 0 7 3 7

Well Number: 699-43-40 $A_0 = 2.10$

Dimensions in ft unless otherwise specified

Project: 216-B-3 Pond

Date of Test: 11/26/91

Type of Test: Slug Withdrawal

Slugging Rod Dimensions, L: 60 $V = .1309\ ft^3$

D: .167

Theoretical head displacement in 4 inch casing: 1.57

Location of Field Records and Data: RCRA Records File

Head change within screened interval: yes

Depth below land surface/top of 6" of tested zone: 124.3 124.3-135

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 12.79 122.51

Length of saturated screen interval, Le: 11.00

Thickness of aquifer, H: 70

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min): 0

Intial Head change, Yo: 2.1

Arbitrary time value on straight line, Tc (min): .2666

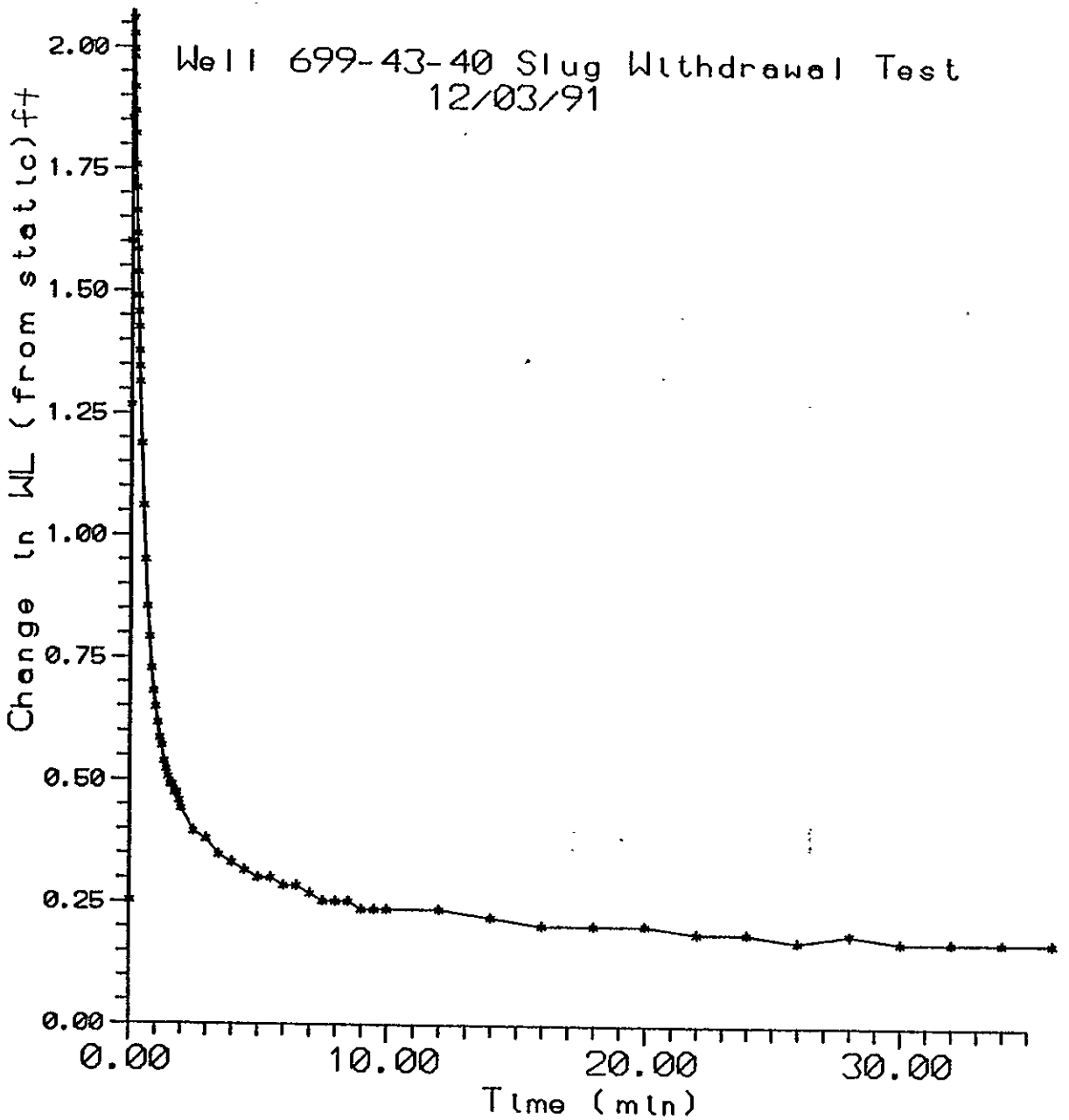
Head at Tc, Yt: 1.478

Comments: Normalized data did not fit [illegible] [illegible] Bouwer and Rice, using [illegible] [illegible] coefficient was .984.

actual head displacement is .5 ft greater than theoretical displacement

Name (print): Signature: Date:

9312759073 8


Well 699-43-40 Slug Withdrawal Test
12/03/91
Change in WL (from static) ft
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.00
10.00
20.00
30.00
Time (min)

9 3 1 2 7 9 0 7 3 9

699-43-40 Slug Withdrawal Test

****

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.

****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.1670	.3330	11.0000	12.7900	70.0000

****

Le/Rw = 33.0330300
A= 2.6162770
B= 3.941699E-001
C= 2.2089310
t (min)= 2.666000E-001
1/t= 3.7509370
Yo= (ft) 2.1000000
Yt= (ft) 1.4780000
1/t ln(Yo/Yt)= 1.3175070
ln[(H-Lw)/Rw]= 5.1463410
ln(Re/Rw)= 2.2618120

****

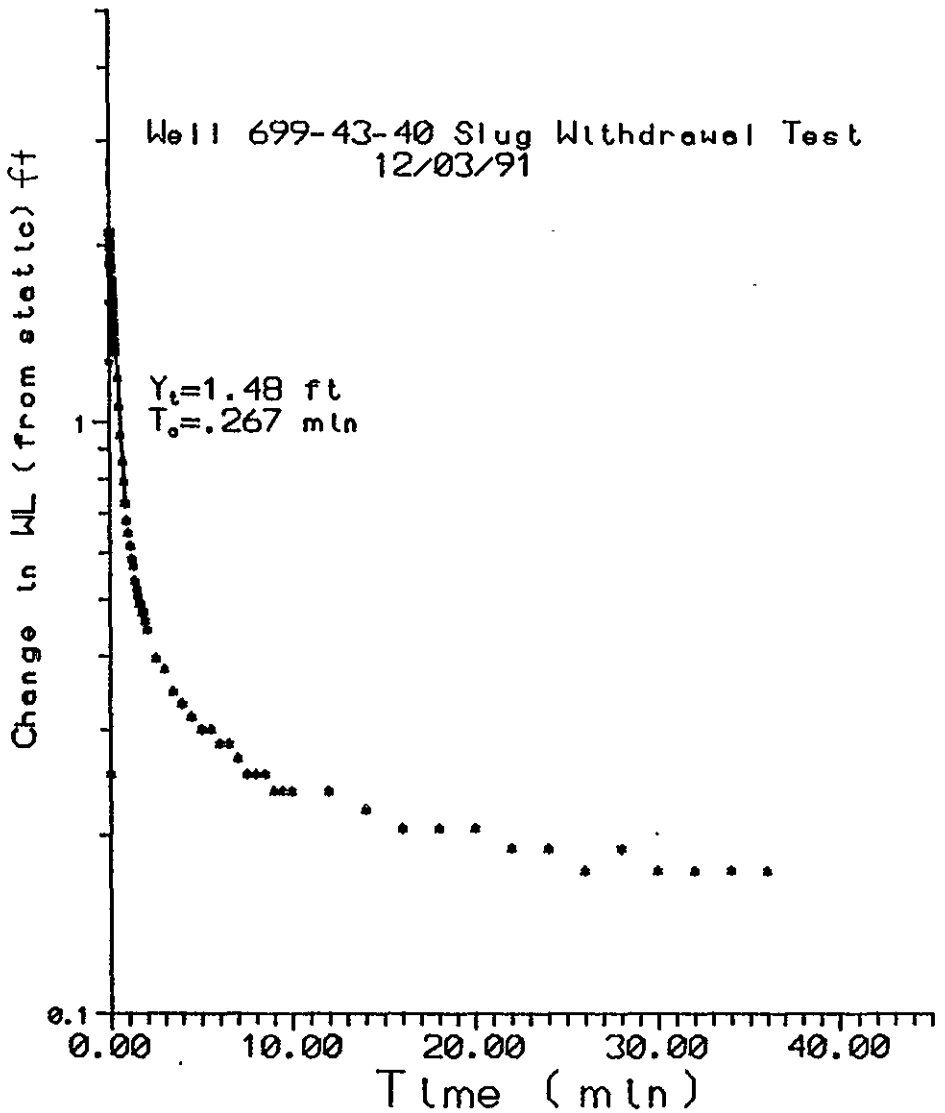
K (ft/day) = 5.4397920

****

T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 59.8377200

****

9312739070


Well 699-43-40 Slug Withdrawal Test
12/03/91
Y_t=1.48 ft
T_o=.267 min
Change in WL (from static) ft
1
0.1
0.00
10.00
20.00
30.00
40.00
Time (min)

9 3 1 2 7 9 0 7 4 1

127.14 SWL

Well Number: 699-43-41G

Dimensions in ft unless otherwise specified

Project: RCRA 216-B-3 Pond

Date of Test: 8/23/91

Type of Test: slug withdrawal

Slugging Rod Dimensions, L: 8.8 V = 1.22 ft³

D: .142

Theoretical head displacement in 10 inch casing: 2.20

Location of Field Records and Data: [illegible]

Head change within screened interval: NO

Depth below land surface/top of 6" of tested zone: 145

Radius of casing, Rc: .46

Radius of well, Rw: .40

Distance from WT to bottom of tested interval, Lw: 23.4

Length of saturated screen interval, Le: 10

Thickness of aquifer, H: 62

Estimated Porosity of Sand Pack: —

For Bouwer and Rice Analysis

Time correction applied to data (min):

Intial Head change, Yo: 2.21

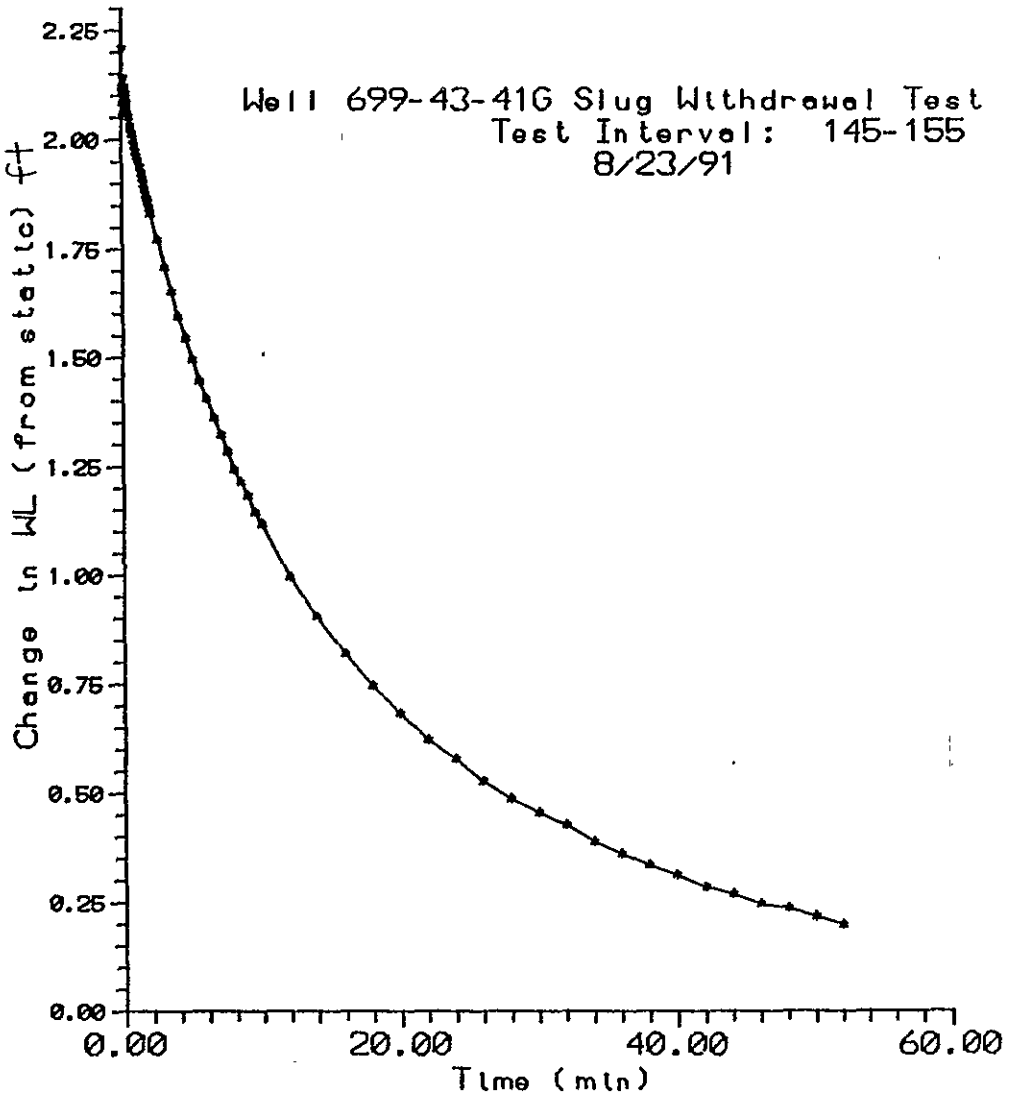
Arbitrary time value on straight line, Tc (min): .233

Head at Tc, Yt: 2.096

Comments: analysis based on [illegible] with [illegible]. This test was conducted in an [illegible] well with an open [illegible] 145-155. 10" casing was from 145' to [illegible]. Both [illegible] [illegible] .98.

Name (print): Signature: Date:

9312759074 2


Well 699-43-41G Slug Withdrawal Test Ho=2.21
Test Interval: 145-155
8/23/91
Change in WL (from static) ft
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.00
20.00
40.00
60.00
Time (min)

9 3 1 2 7 9 0 7 4 3

699-43-41G Slug Withdrawal Test, Test Interval: 145-155'

****

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.

****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.4200	.4200	10.0000	28.4000	66.0000

****

Le/Rw = 23.8095200
A= 2.3445710
B= 3.395377E-001
C= 1.8125020
t (min)= 2.330000E-001
1/t= 4.2918460
Yo= (ft) 2.2100000
Yt= (ft) 2.0960000
1/t ln(Yo/Yt)= 2.273038E-001
ln[(H-Lw)/Rw]= 4.4945040
ln(Re/Rw)= 2.3606750

****

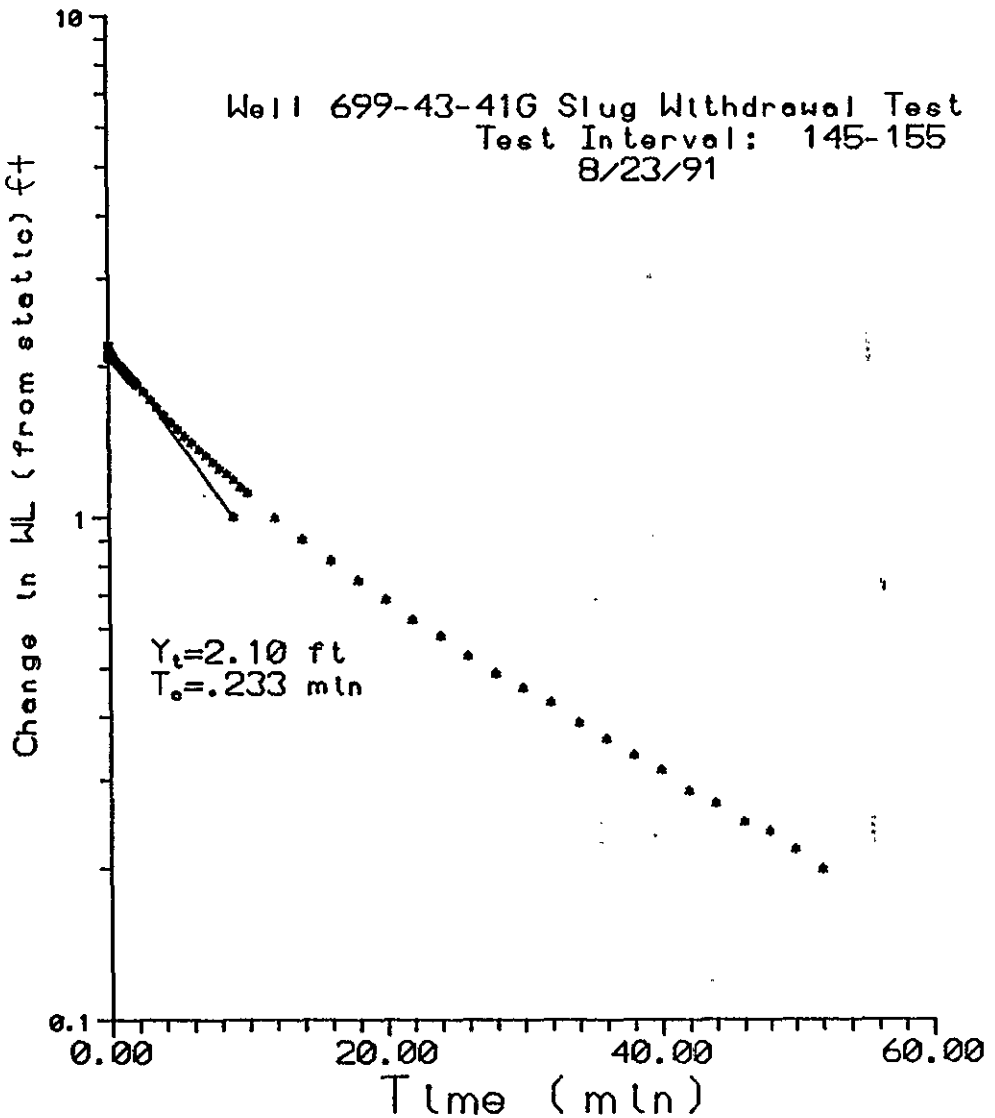
K (ft/day) = 6.8151270

****

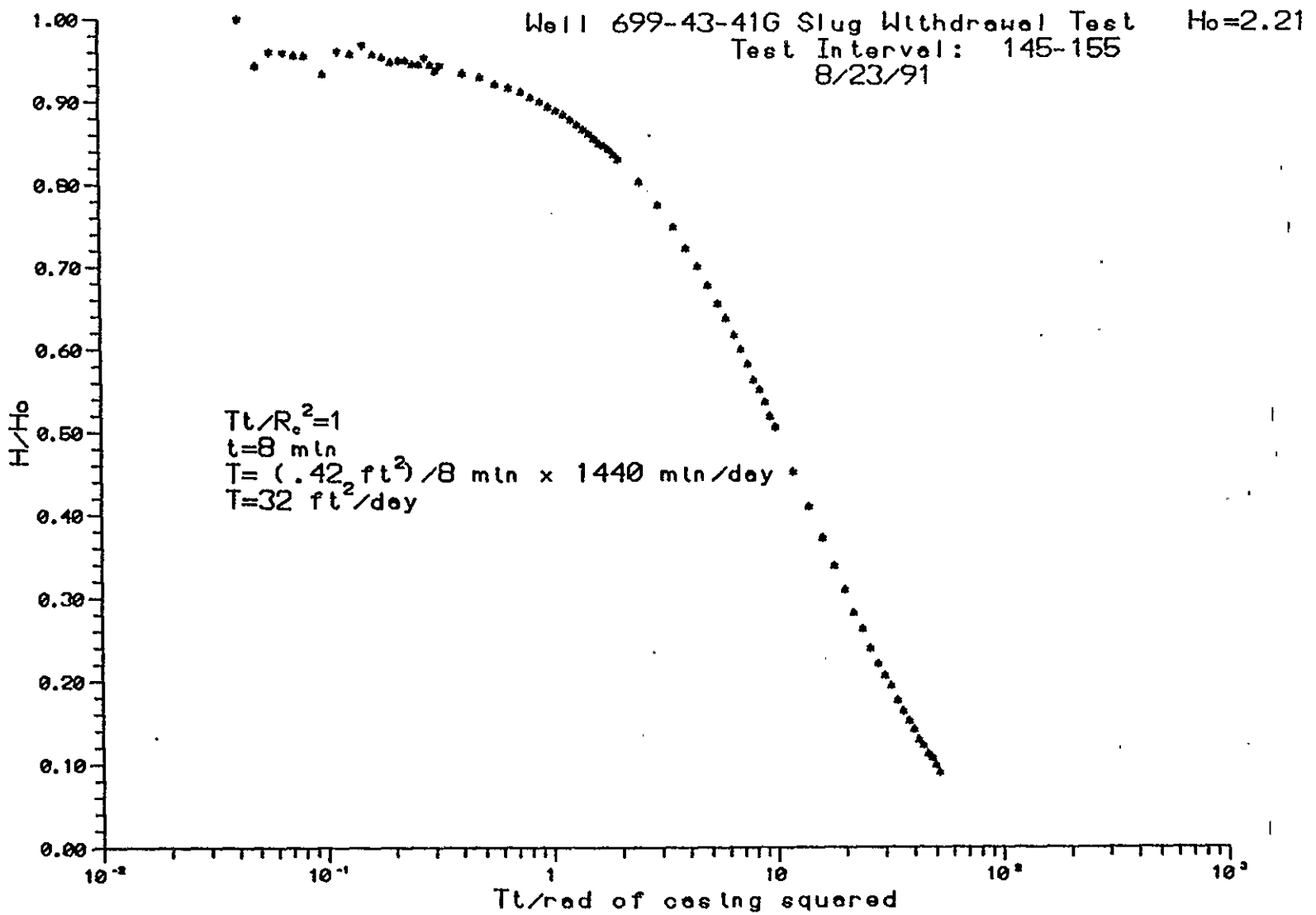
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 68.1512700

****

9 3 1 2 7 3 9 0 7 4 4


Well 699-43-41G Slug Withdrawal Test
Test Interval: 145-155
8/23/91
Ho=2.21
Y_t=2.10 ft
T_o=.233 min
Change in WL (from static) ft
10
1
0.1
0.00
20.00
40.00
60.00
Time (min)

9 3 1 2 7 9 0 7 4 5



9 3 1 2 7 5 9 0 7 4 6

126.6 SWL

163 - 173

Well Number: 699-43-41 G

Dimensions in ft unless otherwise specified

Project: RCRA 216 B-3 Pond

Date of Test: 8/28/91

Type of Test: Slug withdrawal

Slugging Rod Dimensions, L: 8.8 $V = \pi r^2 L$ 1.0

D: .42 $\frac{V_s}{\pi r_c^2} = L(*$

Theoretical head displacement in ~~4~~ 8 inch casing: 3.57

Location of Field Records and Data: RCRA Records File

Head change within screened interval: NO

Depth below land surface/top of 6" of tested zone: 163

Radius of casing, Rc: .333

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 46.4

Length of ~~saturated screen interval~~ open hole tested, Le: 10

Thickness of aquifer, H: 66

Estimated Porosity of Sand Pack: —

For Bouwer and Rice Analysis

Time correction applied to data (min):

Intial Head change, Yo: 2.20

Arbitrary time value on straight line, Tc (min): 1.0

Head at Tc, Yt: 2.09

Comments: [illegible] a well with a temporary screen [illegible] 163-173 8" [illegible] 63 [illegible]. Slug interference test also conducted at this depth; [illegible]

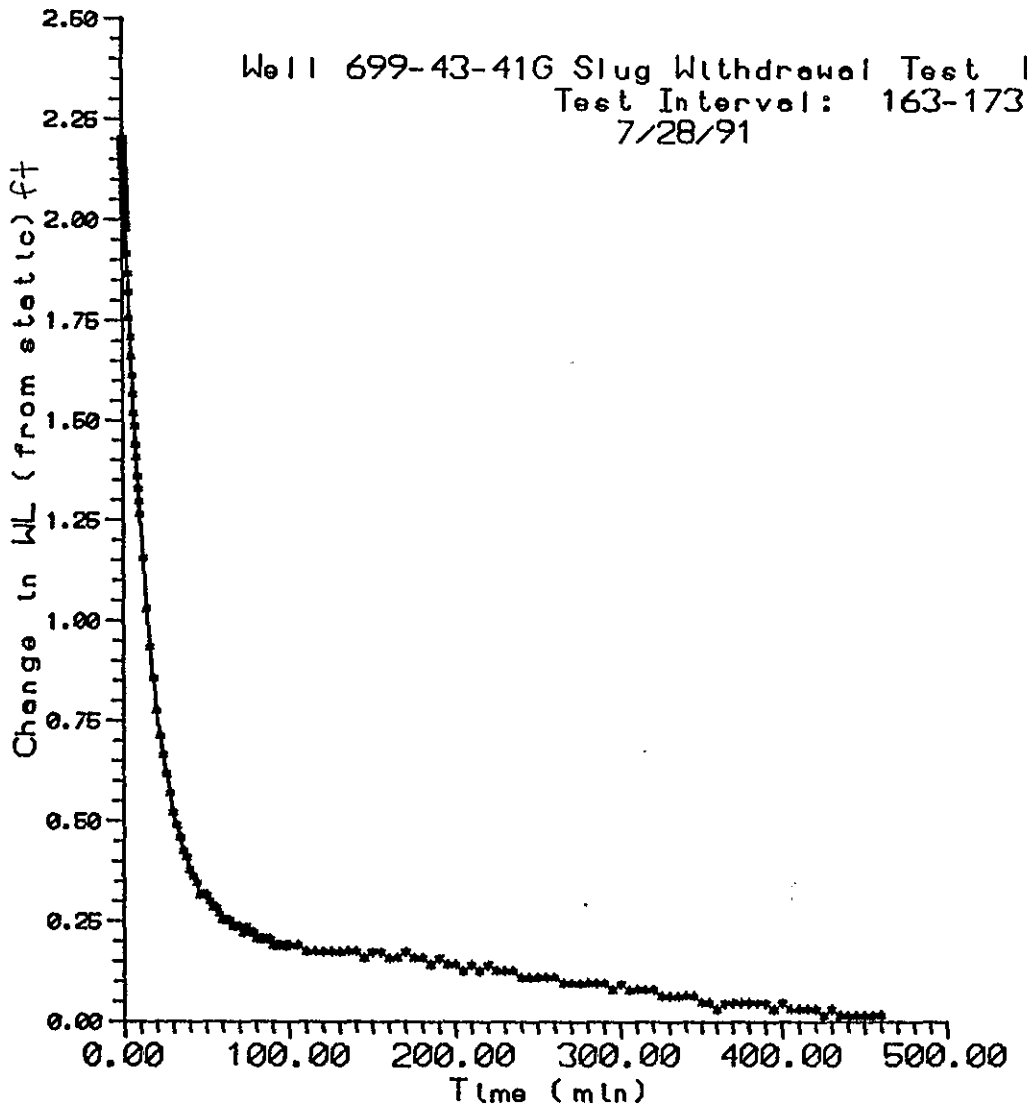
Theoretical head displacement greater than actual head displacement.

Shallow interval 145-155 also tested (open hole)

Correlation coefficient for Bouwer & Rice is .99.

Name (print): Signature: Date:

9312790747



9 3 1 2 7 5 9 0 7 4 8

699-43-41G Slug Withdrawal Test 163-173'

****

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.

****

Rc (ft)	Rw (ft)	Le (ft)	Lw (ft)	H (ft)
.3330	.3330	10.0000	46.4000	66.0000

****

Le/Rw = 30.0300300
A= 2.5262120
B= 3.780580E-001
C= 2.0760190
t (min)= 1.0000000
1/t= 1.0000000
Yo= (ft) 2.2000000
Yt= (ft) 2.0900000
1/t ln(Yo/Yt)= 5.129333E-002
ln[(H-Lw)/Rw]= 4.0751420
ln(Re/Rw)= 2.7914440

****

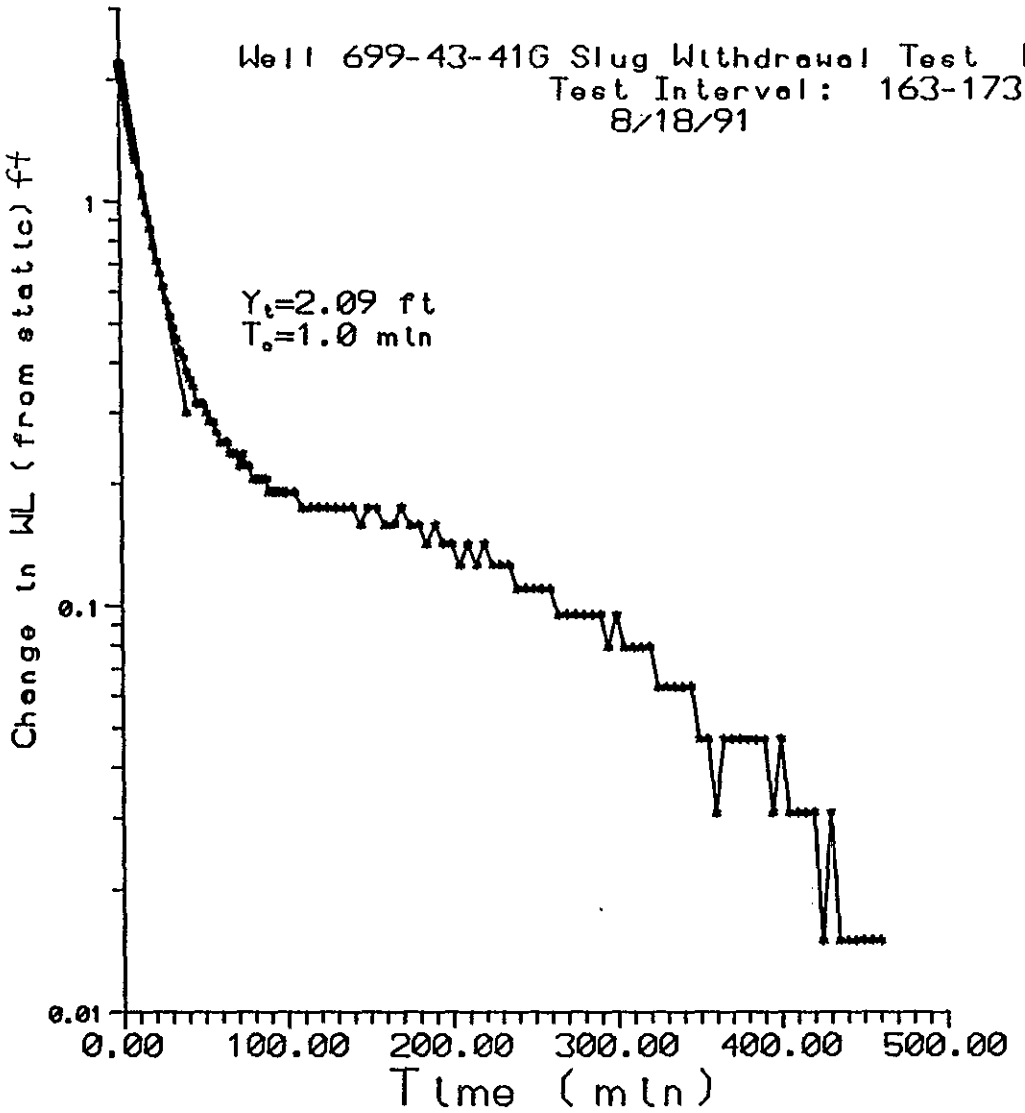
K (ft/day) = 1.1431700

****

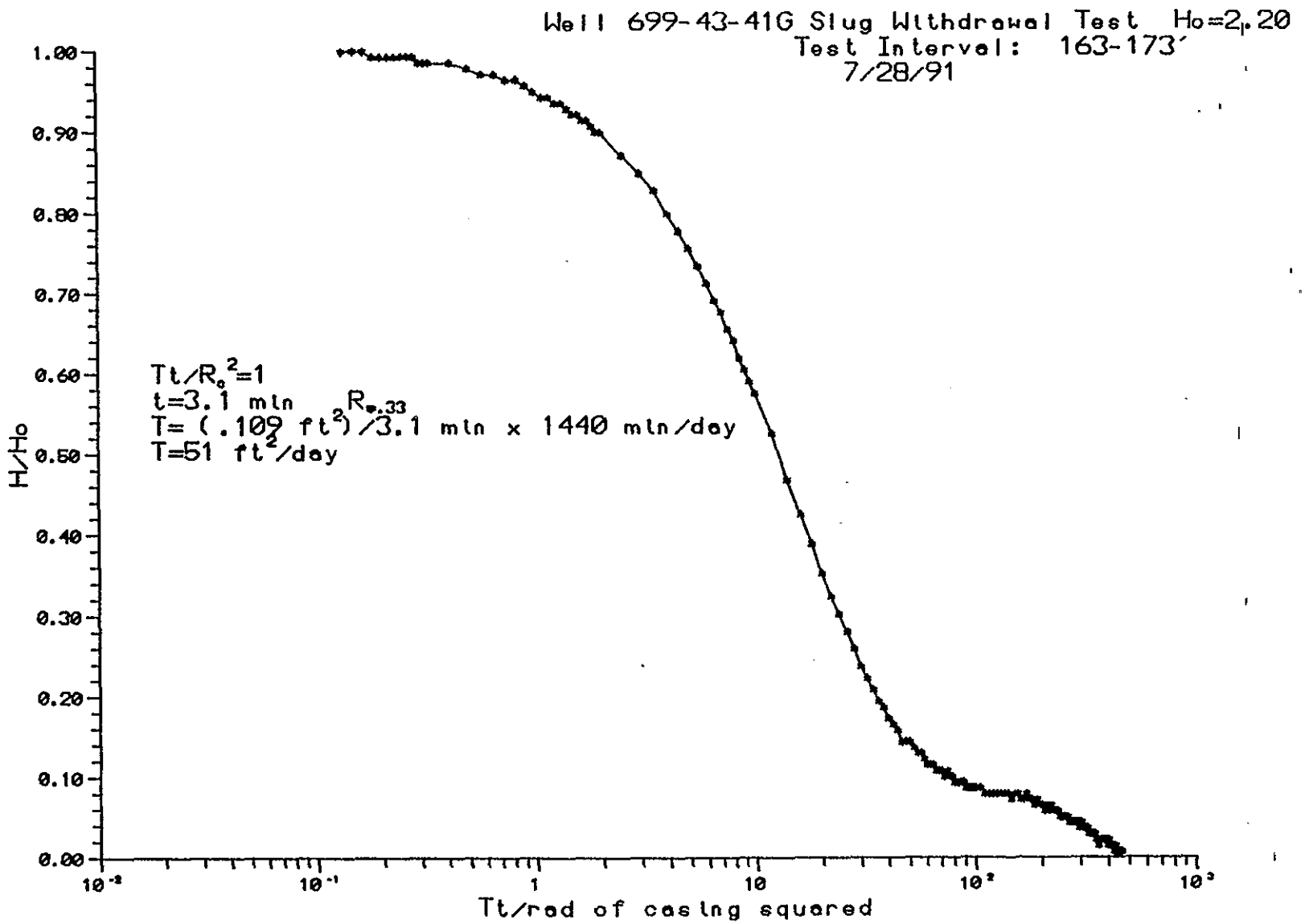
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)= 11.4317000

****

9 3 1 2 7 0 9 0 7 1 9



9 3 1 2 7 5 9 0 7 5 0


Well 699-43-41G Slug Withdrawal Test Ho=2.20
Test Interval: 163-173'
7/28/91
Tt/R$_o$^{2}=1
t=3.1 min
T= (.109 ft^2)/3.1 min x 1440 min/day
T=51 ft^2/day
H/Ho
Tt/rad of casing squared
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.30
0.20
0.10
0.00
10^{-2}
10^{-1}
1
10
10^2
10^3

9 3 1 2 7 9 0 7 5 1

Well Number: 699-43-41G

Dimensions in ft unless otherwise specified

Project: RCRA 216-B-3 Pond

Date of Test: 11/26/91

Type of Test: Slug Withdrawal

Slugging Rod Dimensions, L: 6.0 V = .1309 ft3

D: .167

Theoretical head displacement in 4 inch casing: 1.57

Location of Field Records and Data: RCRA Records File

Head change within screened interval: no

Depth below land surface/top of 6" of tested zone: 188.3

Radius of casing, Rc: .167

Radius of well, Rw: .333

Distance from WT to bottom of tested interval, Lw: 63.80

Length of saturated screen interval, Le: 10.30 198.6 - 188.3 134.80

Thickness of aquifer, H: 66

Estimated Porosity of Sand Pack: .25

For Bouwer and Rice Analysis

Time correction applied to data (min): 0

Intial Head change, Yo: 2.0

Arbitrary time value on straight line, Tc (min): 9.3 min

Head at Tc, Yt: 0.1 ft

Comments: analysis based on [illegible]

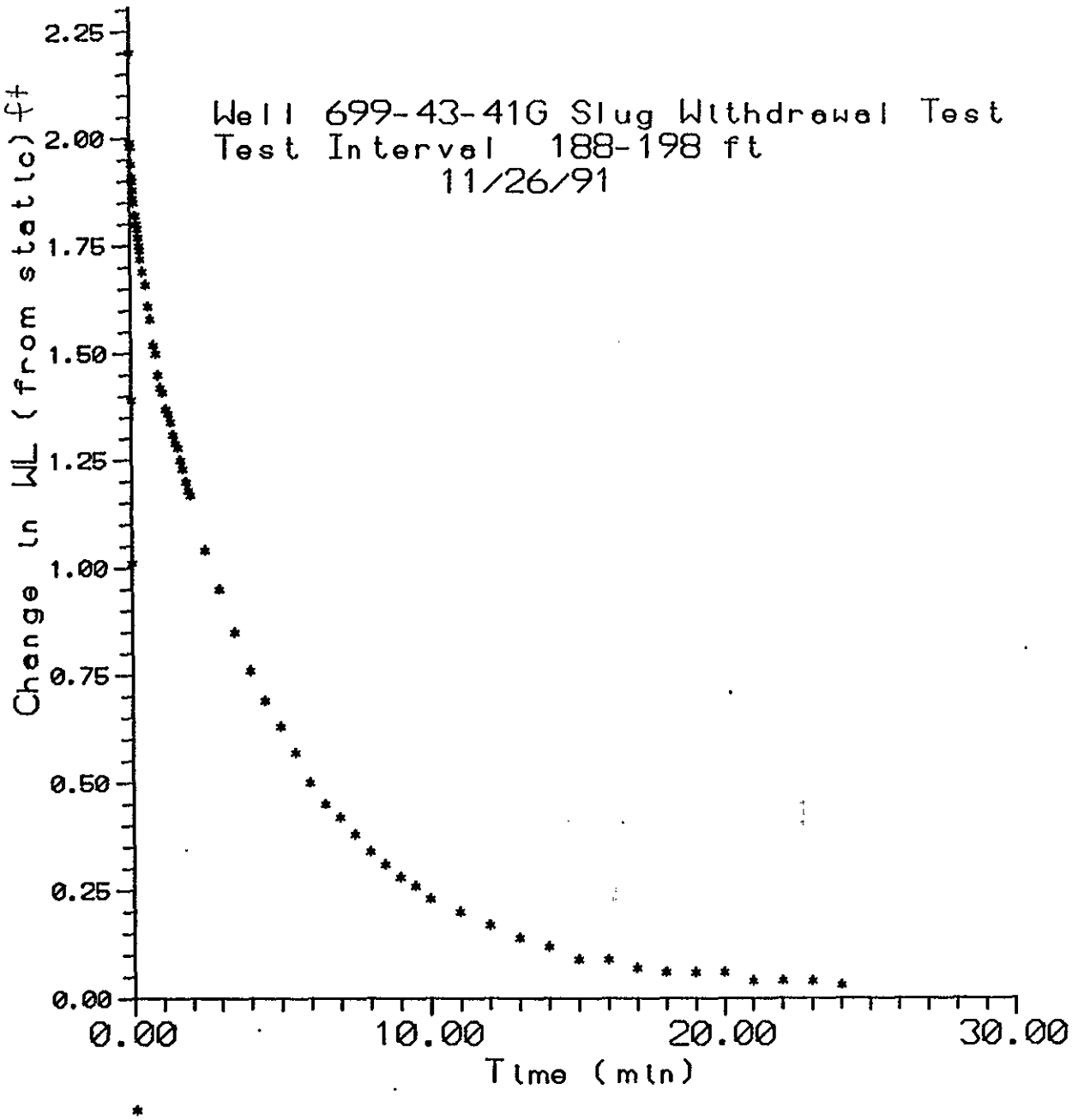
[illegible] 25 min

[illegible] and Bouwer & Rice [illegible]

[illegible] results are similar.

Name (print): Signature: Date:

9312759075 2

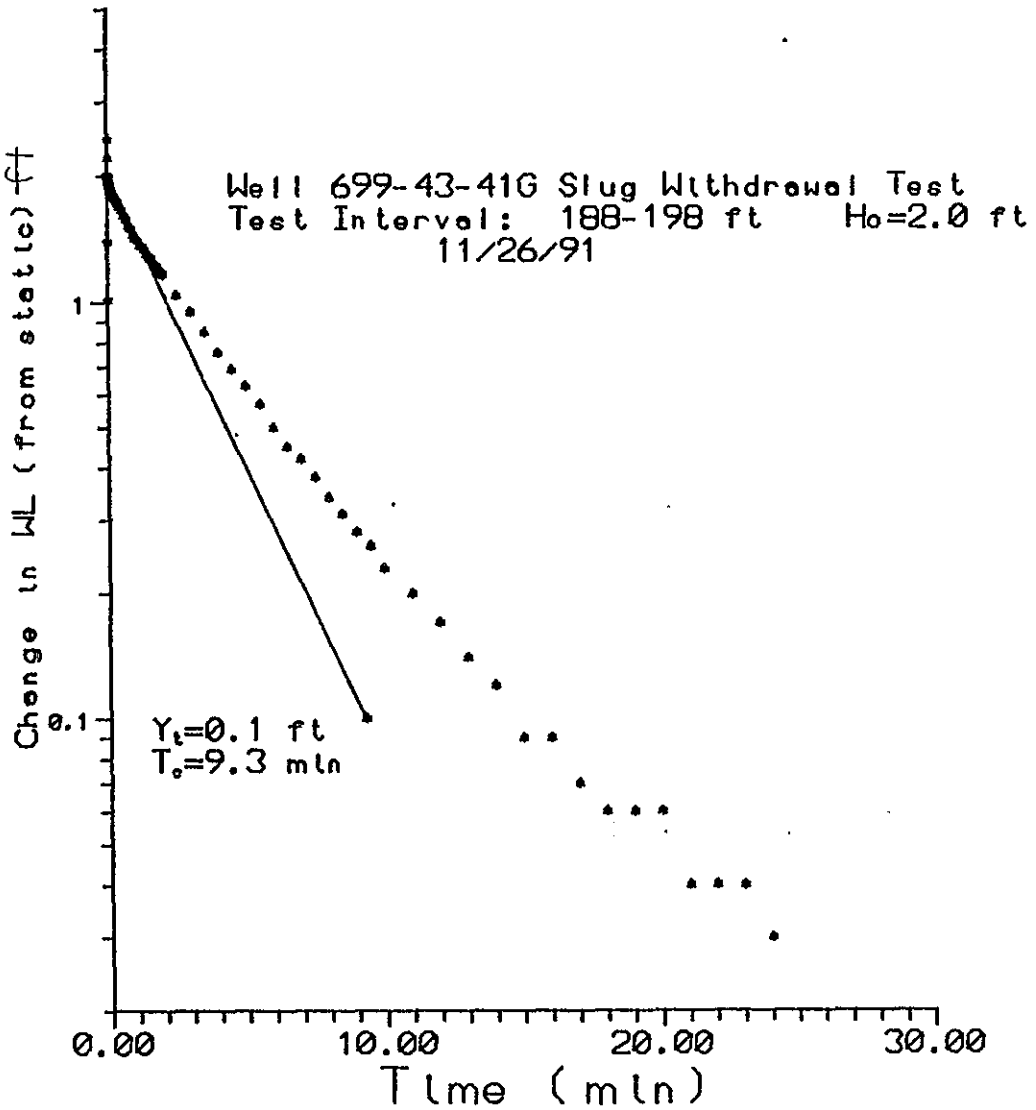

Well 699-43-41G Slug Withdrawal Test
Test Interval 188-198 ft
11/26/91
Change in WL (from static) ft
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
0.00
10.00
20.00
30.00
Time (min)

9 3 1 2 7 9 0 7 5 3

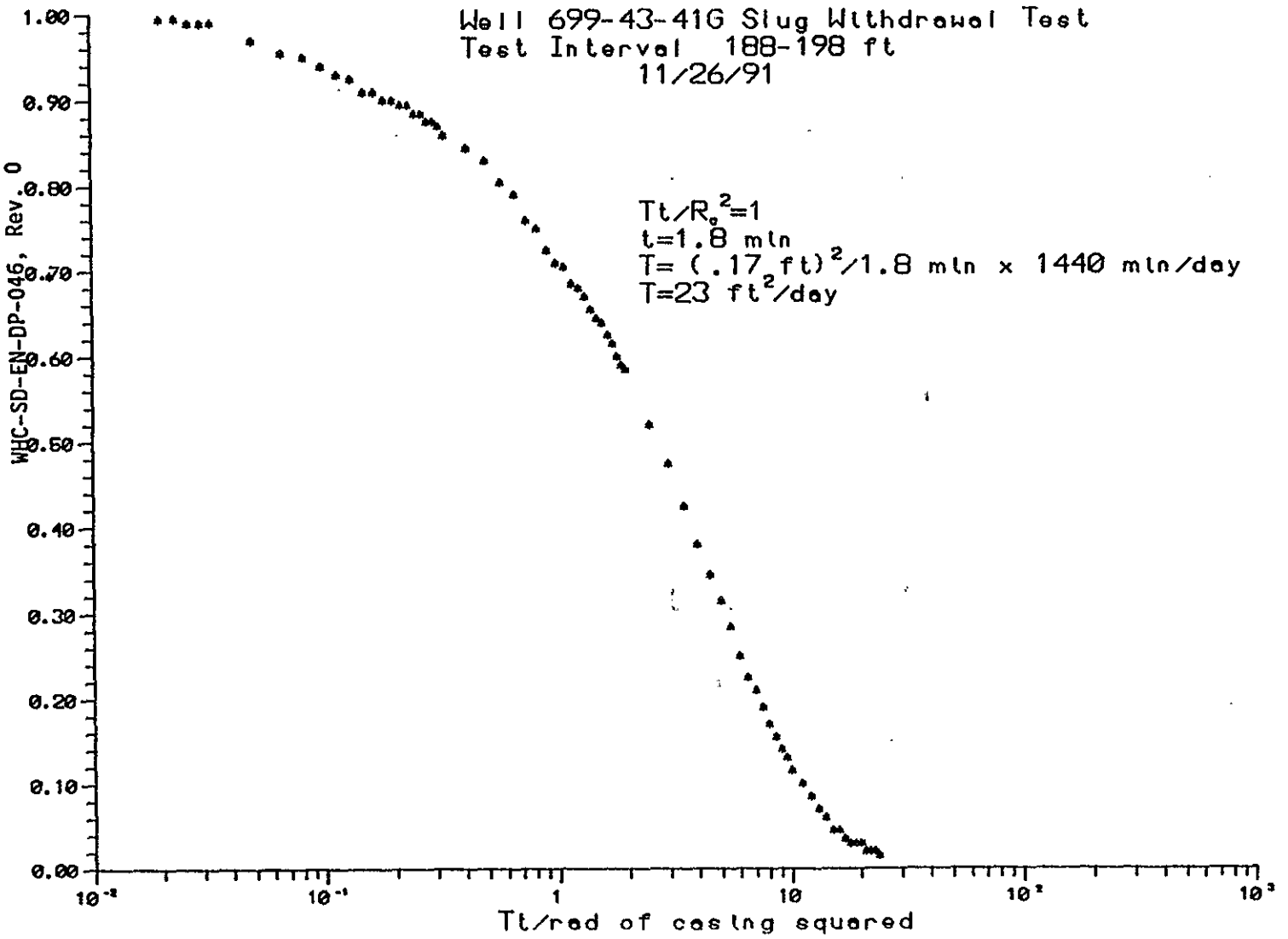
699-43-41G

```
**************************************************
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.
**********************************************
Rc (ft)    Rw (ft)   Le (ft)    Lw (ft)    H (ft)
----------------------------------------------
  .1670     .3330   10.3000     63.8000     66.0000
**********************************************
Le/Rw =          30.9309300
A=          2.5426880
B=  3.823192E-001
C=          2.1450520
t (min)=          9.3000000
1/t=  1.075269E-001
Yo= (ft)          2.0000000
Yt= (ft)  1.000000E-001
1/t ln(Yo/Yt)=  3.221217E-001
ln[(H-Lw)/Rw]=          1.8880700
ln(Re/Rw)=          3.1760900
**********************************************
K (ft/day) =          1.9945320
**********************************************
T OF THE SATURATED SCREEN INTERVAL
(ft2/day)=      20.5436800
**********************************************
```


9 3 1 2 7 3 9 0 7 5 4


Well 699-43-41G Slug Withdrawal Test
Test Interval: 188-198 ft Ho=2.0 ft
11/26/91
Yt=0.1 ft
Tc=9.3 min
Change in WL (from static) ft
1
0.1
0.00
10.00
20.00
30.00
Time (min)

9 3 1 2 7 0 7 5 5



9 3 1 2 7 5 9 0 7 5 6

VALIDATED 4/4/92 SIGNATURE/DATE

P. 1 of 8

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev.

Page 1 of 1

Borehole 699-40-40A Borehole Diameter 4" Hanford Coordinates —NA—

Interval Tested 229.48' - 218.78' BTOC Depth Interval 229.48' - 218.78'

Test Type Instantaneous Slug Test Injection/Withdrawal Borehole Depth 229.48'

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOUNST SN-ET-1
DATA LOGGER.	IN-SITU INC. SN.-2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.- ~~2K3AL~~ 2303
SLUGGING ROD	2.0' x 6.0' 0.13 ft^3
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

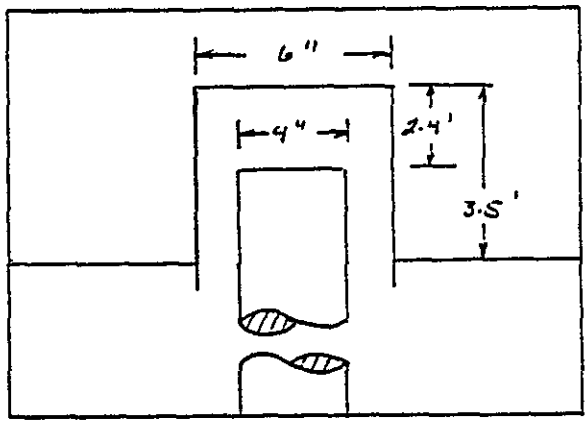
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: JAMES A. COATES JAMES A. COATES. 12-2-91

Sign and Print Name Date

BD-6000-295 (05/89)

9312709757

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

INJECTION

Borehole 699-40-40A

Interval Tested 229.48' BTOC

Depth to Water 129.51' BTOC

Date 11/22/91

Measured by JAMES A. COATES

Slug Volume .13ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 0945-injection baseline, 1000-injection

Transducer Measurement Units FEET

Depth to Transducer 94.08' BTOC

Initial Pressure (P_i) 129.51'

Slug Level or Pressure (P_{max}) 125.897'

Borehole Diameter 4"

Time		Pressure	Time		Pressure	Time		Pressure
Observed	Elapsed	Trans. Measurement	Observed	Elapsed	Trans. Measurement	Observed	Elapsed	Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES JAMES A. COATES (Sign and Print Name) 12-2-91 (Date)

BD-6000-293 (07/90)

9312759075 8

SE2000
Environmental Logger
11/25 08:11

Unit# 192 Test 3

INPUT 1: Level (F) TOC

Reference	129.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/22 09:46:46

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	129.510	-129.510
1.0000	0.0167	129.510	-129.510
2.0000	0.0333	129.510	-129.510
3.0000	0.0500	129.510	-129.510
4.0000	0.0667	129.510	-129.510
5.0000	0.0833	129.510	-129.510
6.0000	0.1000	129.510	-129.510
7.0000	0.1167	129.525	-129.525
8.0000	0.1333	129.510	-129.510
9.0000	0.1500	129.525	-129.525
10.0000	0.1667	129.510	-129.510
11.0000	0.1833	129.525	-129.525
12.0000	0.2000	129.525	-129.525
13.0000	0.2167	129.525	-129.525
14.0000	0.2333	129.525	-129.525
15.0000	0.2500	129.525	-129.525
16.0000	0.2667	129.525	-129.525

9 3 1 2 7 0 9 0 7 5 9

SE2000
Environmental Logger
11/25 08:09

Unit# 192 Test 4

INPUT 1: Level (F) TOC

Reference	129.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/22 10:05:17

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	128.892	-128.892
0.0083	0.0001	125.897	-125.897
0.0166	0.0003	126.420	-126.420
0.0250	0.0004	140.601	-140.601
0.0333	0.0006	128.274	-128.274
0.0416	0.0007	129.700	-129.700
0.0500	0.0008	130.730	-130.730
0.0583	0.0010	129.636	-129.636
0.0666	0.0011	129.652	-129.652
0.0750	0.0013	129.430	-129.430
0.0833	0.0014	129.383	-129.383
0.1000	0.0017	129.367	-129.367
0.1166	0.0019	129.399	-129.399
0.1333	0.0022	129.399	-129.399
0.1500	0.0025	129.414	-129.414
0.1666	0.0028	129.414	-129.414
0.1833	0.0031	129.414	-129.414
0.2000	0.0033	129.414	-129.414
0.2166	0.0036	129.414	-129.414
0.2333	0.0039	129.414	-129.414
0.2500	0.0042	129.414	-129.414
0.2666	0.0044	129.414	-129.414
0.2833	0.0047	129.414	-129.414
0.3000	0.0050	129.414	-129.414
0.3166	0.0053	129.414	-129.414
0.3333	0.0056	129.414	-129.414
0.4166	0.0069	129.414	-129.414
0.5000	0.0083	129.414	-129.414
0.5833	0.0097	129.414	-129.414
0.6666	0.0111	129.414	-129.414
0.7500	0.0125	129.414	-129.414
0.8333	0.0139	129.414	-129.414

9 3 1 2 7 3 9 0 7 6 0

WELL NO. 699-40-40A INJECTION PAGE 4 OF 4

0.9166	0.0153	129.414	-129.414
1.0000	0.0167	129.414	-129.414
1.0833	0.0181	129.414	-129.414
1.1666	0.0194	129.414	-129.414
1.2500	0.0208	129.414	-129.414
1.3333	0.0222	129.430	-129.430
1.4166	0.0236	129.414	-129.414
1.5000	0.0250	129.430	-129.430
1.5833	0.0264	129.430	-129.430
1.6666	0.0278	129.430	-129.430
1.7500	0.0292	129.430	-129.430
1.8333	0.0306	129.430	-129.430
1.9166	0.0319	129.430	-129.430
2.0000	0.0333	129.430	-129.430
2.5000	0.0417	129.430	-129.430
3.0000	0.0500	129.430	-129.430
3.5000	0.0583	129.430	-129.430
4.0000	0.0667	129.430	-129.430
4.5000	0.0750	129.446	-129.446
5.0000	0.0833	129.446	-129.446
5.5000	0.0917	129.446	-129.446
6.0000	0.1000	129.446	-129.446
6.5000	0.1083	129.446	-129.446
7.0000	0.1167	129.446	-129.446
7.5000	0.1250	129.462	-129.462
8.0000	0.1333	129.462	-129.462
8.5000	0.1417	129.462	-129.462
9.0000	0.1500	129.462	-129.462
9.5000	0.1583	129.462	-129.462
10.0000	0.1667	129.462	-129.462
12.0000	0.2000	129.462	-129.462
14.0000	0.2333	129.462	-129.462
16.0000	0.2667	129.462	-129.462
18.0000	0.3000	129.462	-129.462
20.0000	0.3333	129.462	-129.462
22.0000	0.3667	129.462	-129.462
24.0000	0.4000	129.462	-129.462
26.0000	0.4333	129.462	-129.462

9 3 1 2 7 9 0 7 6 1

INSTANTANEOUS SLUG TEST DATA SHEET

WITHDRAWAL

Borehole 699-40-40A

Interval Tested 229.48' BTOC

Depth to Water 129.51' BTOC

Date 11/22/91

Measured by JAMES A. COATES

Slug Volume .1344³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1030

Transducer Measurement Units FEET.

Depth to Transducer 94.08' BTOC

Initial Pressure (P_i) 129.51'

Slug Level or Pressure (P_{max}) 133.709'

Borehole Diameter 4"

Time		Pressure	Time		Pressure	Time		Pressure
Observed	Elapsed	Trans. Measurement	Observed	Elapsed	Trans. Measurement	Observed	Elapsed	Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) JAMES A. COATES 12-2-91 (Date)

BD-6000-293 (07/90)

9312759062

WELL NO. 699-40-40A WITHDRAWAL PAGE 2 OF 3

SE2000
Environmental Logger
11/25 08:06

Unit# 192 Test 5

INPUT 1: Level (F) TOC

Reference	129.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/22 10:33:23

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	132.282	-132.282
0.0083	0.0001	133.709	-133.709
0.0166	0.0003	133.629	-133.629
0.0250	0.0004	128.876	-128.876
0.0333	0.0006	129.842	-129.842
0.0416	0.0007	130.064	-130.064
0.0500	0.0008	128.495	-128.495
0.0583	0.0010	130.635	-130.635
0.0666	0.0011	129.652	-129.652
0.0750	0.0013	130.127	-130.127
0.0833	0.0014	129.969	-129.969
0.1000	0.0017	129.700	-129.700
0.1166	0.0019	129.715	-129.715
0.1333	0.0022	129.700	-129.700
0.1500	0.0025	129.684	-129.684
0.1666	0.0028	129.684	-129.684
0.1833	0.0031	129.668	-129.668
0.2000	0.0033	129.684	-129.684
0.2166	0.0036	129.684	-129.684
0.2333	0.0039	129.684	-129.684
0.2500	0.0042	129.684	-129.684
0.2666	0.0044	129.684	-129.684
0.2833	0.0047	129.684	-129.684
0.3000	0.0050	129.668	-129.668
0.3166	0.0053	129.668	-129.668
0.3333	0.0056	129.668	-129.668
0.4166	0.0069	129.668	-129.668
0.5000	0.0083	129.668	-129.668
0.5833	0.0097	129.668	-129.668
0.6666	0.0111	129.668	-129.668
0.7500	0.0125	129.652	-129.652
0.8333	0.0139	129.652	-129.652

9 3 1 2 7 0 9 0 7 6 3

WELL NO. 699-40-40A WITHDRAWAL PAGE 3 OF 3

0.9166	0.0153	129.652	-129.652
1.0000	0.0167	129.652	-129.652
1.0833	0.0181	129.652	-129.652
1.1666	0.0194	129.652	-129.652
1.2500	0.0208	129.652	-129.652
1.3333	0.0222	129.652	-129.652
1.4166	0.0236	129.652	-129.652
1.5000	0.0250	129.652	-129.652
1.5833	0.0264	129.636	-129.636
1.6666	0.0278	129.636	-129.636
1.7500	0.0292	129.636	-129.636
1.8333	0.0306	129.636	-129.636
1.9166	0.0319	129.636	-129.636
2.0000	0.0333	129.636	-129.636
2.5000	0.0417	129.620	-129.620
3.0000	0.0500	129.620	-129.620
3.5000	0.0583	129.605	-129.605
4.0000	0.0667	129.605	-129.605
4.5000	0.0750	129.605	-129.605
5.0000	0.0833	129.605	-129.605
5.5000	0.0917	129.589	-129.589
6.0000	0.1000	129.589	-129.589
6.5000	0.1083	129.589	-129.589
7.0000	0.1167	129.589	-129.589
7.5000	0.1250	129.573	-129.573
8.0000	0.1333	129.573	-129.573
8.5000	0.1417	129.573	-129.573
9.0000	0.1500	129.573	-129.573
9.5000	0.1583	129.573	-129.573
10.0000	0.1667	129.573	-129.573
12.0000	0.2000	129.541	-129.541
14.0000	0.2333	129.541	-129.541
16.0000	0.2667	129.541	-129.541
18.0000	0.3000	129.525	-129.525
20.0000	0.3333	129.525	-129.525
22.0000	0.3667	129.525	-129.525

9 3 1 2 7 5 9 0 7 6 4

P. 1 of 7

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev. 0

VALIDATED 2/4/92

Page 1 of 1

Borehole 699-40-40B Borehole Diameter 4" Hanford Coordinates —NA—

Interval Tested 201.19' - 190.37' BTOC Depth Interval 201.19' - 190.37'

Test Type Constant Discharge Borehole Depth 201.19'

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOUNST SN-ET-5
DATA LOGGER.	IN-SITU INC. SN.-2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.-2430
SLUGGING ROD	6.0' x 2.0' 0.13 ft³
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

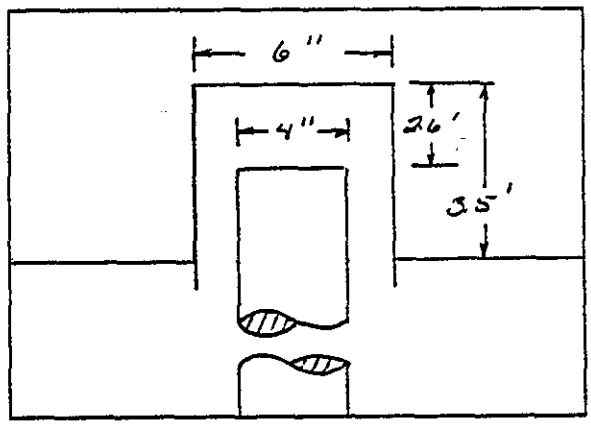
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: James A. Coates JAMES A. COATES 12/11/91

Sign and Print Name Date

BD-6000-295 (05/89)

9312709765

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

INJECTION

Borehole 699-40-40B

Interval Tested 201.19' - 190.37'

Depth to Water 133.8'

Date 11-20-91

Measured by JAMES A. COATES

Slug Volume -13 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 0935-inj. baseline 0950-injection -11/20/91

Transducer Measurement Units FEET.

Depth to Transducer 12.04' BWL

Initial Pressure (P_i) 131.00'

Slug Level or Pressure (P_{max}) 124.4130'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by James A Coates JAMES A. COATES (Sign and Print Name) 12-11-91 (Date)

BD-6000-293 (07/90)

9312739076 6

WELL NO. 699-40-40B BASELINE INJECTION PAGE 2 OF 4

SE1000B
Environmental Logger
11/22 08:50

Unit# 00700 Test# 0

INPUT 1: Level (F) TOC

Reference 131.00
Scale factor 10.03
Offset 0.00

Step# 0 11/20 10:33

Elapsed Time Value

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
3.0000	0.0500	131.010	-131.010
4.0000	0.0667	131.010	-131.010
5.0000	0.0833	131.000	-131.000
6.0000	0.1000	131.010	-131.010
7.0000	0.1167	131.000	-131.000
8.0000	0.1333	131.000	-131.000
9.0000	0.1500	131.000	-131.000
10.0000	0.1667	131.000	-131.000
11.0000	0.1833	131.000	-131.000
12.0000	0.2000	130.990	-130.990

9312707767

SE1000B
Environmental Logger
11/22 08:43

Unit# 00700 Test# 1

INPUT 1: Level (F) TOC

Reference 131.00
Scale factor 10.03
Offset 0.00

Step# 0 11/20 10:47

Elapsed Time Value

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0099	0.0002	124.920	-124.920
0.0133	0.0002	125.870	-125.870
0.0166	0.0003	124.430	-124.430
0.0200	0.0003	125.440	-125.440
0.0233	0.0004	125.710	-125.710
0.0266	0.0004	126.180	-126.180
0.0300	0.0005	128.220	-128.220
0.0333	0.0006	129.740	-129.740
0.0500	0.0008	129.420	-129.420
0.0666	0.0011	129.020	-129.020
0.0833	0.0014	129.100	-129.100
0.1000	0.0017	129.180	-129.180
0.1166	0.0019	129.040	-129.040
0.1333	0.0022	129.040	-129.040
0.1500	0.0025	129.050	-129.050
0.1666	0.0028	129.030	-129.030
0.1833	0.0031	129.030	-129.030
0.2000	0.0033	129.030	-129.030
0.2166	0.0036	129.040	-129.040
0.2333	0.0039	129.030	-129.030
0.2500	0.0042	129.050	-129.050
0.2666	0.0044	129.050	-129.050
0.2833	0.0047	129.050	-129.050
0.3000	0.0050	129.060	-129.060
0.3166	0.0053	129.040	-129.040
0.3333	0.0056	129.050	-129.050
0.4167	0.0069	129.060	-129.060
0.5000	0.0083	129.060	-129.060
0.5833	0.0097	129.070	-129.070
0.6667	0.0111	129.070	-129.070
0.7500	0.0125	129.080	-129.080
0.8333	0.0139	129.080	-129.080

9 3 1 2 7 3 9 0 7 6 8

WELL NO. 699-40-40B INJECTION

0.9167	0.0153	129.090	-129.090
1.0000	0.0167	129.090	-129.090
1.0833	0.0181	129.100	-129.100
1.1667	0.0194	129.100	-129.100
1.2500	0.0208	129.110	-129.110
1.3333	0.0222	129.120	-129.120
1.4166	0.0236	129.130	-129.130
1.5000	0.0250	129.140	-129.140
1.5833	0.0264	129.140	-129.140
1.6667	0.0278	129.140	-129.140
1.7500	0.0292	129.150	-129.150
1.8333	0.0306	129.150	-129.150
1.9167	0.0319	129.160	-129.160
2.0000	0.0333	129.170	-129.170
2.5000	0.0417	129.200	-129.200
3.0000	0.0500	129.230	-129.230
3.5000	0.0583	129.260	-129.260
4.0000	0.0667	129.290	-129.290
4.5000	0.0750	129.320	-129.320
5.0000	0.0833	129.350	-129.350
5.5000	0.0917	129.380	-129.380
6.0000	0.1000	129.410	-129.410
6.5000	0.1083	129.450	-129.450
7.0000	0.1167	129.470	-129.470
7.5000	0.1250	129.490	-129.490
8.0000	0.1333	129.510	-129.510
8.5000	0.1417	129.530	-129.530
9.0000	0.1500	129.560	-129.560
9.5000	0.1583	129.580	-129.580
10.0000	0.1667	129.610	-129.610
12.0000	0.2000	129.690	-129.690
14.0000	0.2333	129.760	-129.760
16.0000	0.2667	129.830	-129.830
18.0000	0.3000	129.900	-129.900
20.0000	0.3333	129.950	-129.950
22.0000	0.3667	130.010	-130.010
24.0000	0.4000	130.050	-130.050
26.0000	0.4333	130.100	-130.100
28.0000	0.4667	130.140	-130.140
30.0000	0.5000	130.180	-130.180
32.0000	0.5333	130.210	-130.210
34.0000	0.5667	130.240	-130.240
36.0000	0.6000	130.270	-130.270
38.0000	0.6333	130.300	-130.300
40.0000	0.6667	130.320	-130.320

9 3 1 2 7 0 7 6 9

INSTANTANEOUS SLUG TEST DATA SHEET

WITHDRAWAL

Borehole 699-40-403

Interval Tested 201.19' - 190.37'

Depth to Water 133.8'

Date 11-20-91

Measured by JAMES A. COATES

Slug Volume .1341³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1035

Transducer Measurement Units FEET.

Depth to Transducer 12.04' BWL

Initial Pressure (P_i) 131.00'

Slug Level or Pressure (P_{max}) 133.410'

Borehole Diameter 4"

Time		Pressure Trans. Measurement	Time		Pressure Trans. Measurement	Time		Pressure Trans. Measurement
Observed	Elapsed		Observed	Elapsed		Observed	Elapsed	
		SEE ATTACHED			SEE ATTACHED			

Recorded by James A. Coates JAMES A. COATES (Sign and Print Name) 12-1-91 (Date)

BD-6000-293 (07/90)

9312790770

WELL NO. 699-40-40B WITHDRAWAL PAGE 2 OF 4

SE1000B
Environmental Logger
11/22 08:35

Unit# 00700 Test# 2

INPUT 1: Level (F) TOC

Reference 131.00
Scale factor 10.03
Offset 0.00

Step# 0 11/20 11:30

Elapsed Time Value

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0099	0.0002	131.610	-131.610
0.0133	0.0002	133.410	-133.410
0.0166	0.0003	133.170	-133.170
0.0200	0.0003	133.180	-133.180
0.0233	0.0004	133.180	-133.180
0.0266	0.0004	133.160	-133.160
0.0300	0.0005	133.160	-133.160
0.0333	0.0006	133.140	-133.140
0.0500	0.0008	133.100	-133.100
0.0666	0.0011	133.090	-133.090
0.0833	0.0014	133.080	-133.080
0.1000	0.0017	133.070	-133.070
0.1166	0.0019	133.060	-133.060
0.1333	0.0022	133.050	-133.050
0.1500	0.0025	133.050	-133.050
0.1666	0.0028	133.040	-133.040
0.1833	0.0031	133.030	-133.030
0.2000	0.0033	133.030	-133.030
0.2166	0.0036	133.030	-133.030
0.2333	0.0039	133.030	-133.030
0.2500	0.0042	133.030	-133.030
0.2666	0.0044	133.030	-133.030
0.2833	0.0047	133.020	-133.020
0.3000	0.0050	133.020	-133.020
0.3166	0.0053	133.020	-133.020
0.3333	0.0056	133.020	-133.020
0.4167	0.0069	133.010	-133.010
0.5000	0.0083	133.000	-133.000
0.5833	0.0097	132.990	-132.990
0.6667	0.0111	132.980	-132.980
0.7500	0.0125	132.970	-132.970
0.8333	0.0139	132.970	-132.970

9 3 1 2 7 0 9 0 7 7 1

WELL NO. 699-40-40B WITHDRAWAL PAGE 3 OF 4

0.9167	0.0153	132.960	-132.960
1.0000	0.0167	132.950	-132.950
1.0833	0.0181	132.950	-132.950
1.1667	0.0194	132.940	-132.940
1.2500	0.0208	132.940	-132.940
1.3333	0.0222	132.930	-132.930
1.4166	0.0236	132.930	-132.930
1.5000	0.0250	132.920	-132.920
1.5833	0.0264	132.910	-132.910
1.6667	0.0278	132.910	-132.910
1.7500	0.0292	132.900	-132.900
1.8333	0.0306	132.900	-132.900
1.9167	0.0319	132.900	-132.900
2.0000	0.0333	132.890	-132.890
2.5000	0.0417	132.870	-132.870
3.0000	0.0500	132.840	-132.840
3.5000	0.0583	132.820	-132.820
4.0000	0.0667	132.800	-132.800
4.5000	0.0750	132.770	-132.770
5.0000	0.0833	132.750	-132.750
5.5000	0.0917	132.730	-132.730
6.0000	0.1000	132.710	-132.710
6.5000	0.1083	132.690	-132.690
7.0000	0.1167	132.680	-132.680
7.5000	0.1250	132.660	-132.660
8.0000	0.1333	132.640	-132.640
8.5000	0.1417	132.630	-132.630
9.0000	0.1500	132.610	-132.610
9.5000	0.1583	132.600	-132.600
10.0000	0.1667	132.590	-132.590
12.0000	0.2000	132.530	-132.530
14.0000	0.2333	132.490	-132.490
16.0000	0.2667	132.450	-132.450
18.0000	0.3000	132.410	-132.410
20.0000	0.3333	132.390	-132.390
22.0000	0.3667	132.360	-132.360
24.0000	0.4000	132.340	-132.340
26.0000	0.4333	132.310	-132.310
28.0000	0.4667	132.290	-132.290
30.0000	0.5000	132.270	-132.270
32.0000	0.5333	132.260	-132.260
34.0000	0.5667	132.240	-132.240
36.0000	0.6000	132.230	-132.230
38.0000	0.6333	132.210	-132.210
40.0000	0.6667	132.200	-132.200
42.0000	0.7000	132.200	-132.200
44.0000	0.7333	132.180	-132.180
46.0000	0.7667	132.180	-132.180
48.0000	0.8000	132.170	-132.170
50.0000	0.8333	132.160	-132.160
52.0000	0.8667	132.150	-132.150
54.0000	0.9000	132.150	-132.150

9 3 1 2 7 5 9 0 7 7 2

WELL NO. 699-40-40B WITHDRAWAL PAGE 4 OF 4

56.0000	0.9333	132.140	-132.140
58.0000	0.9667	132.140	-132.140
60.0000	1.0000	132.140	-132.140
62.0000	1.0333	132.120	-132.120
64.0000	1.0667	132.120	-132.120
66.0000	1.1000	132.120	-132.120
68.0000	1.1333	132.110	-132.110
70.0000	1.1667	132.100	-132.100
72.0000	1.2000	132.100	-132.100
74.0000	1.2333	132.100	-132.100
76.0000	1.2667	132.100	-132.100
78.0000	1.3000	132.090	-132.090
80.0000	1.3333	132.080	-132.080
82.0000	1.3667	132.080	-132.080
84.0000	1.4000	132.080	-132.080
86.0000	1.4333	132.080	-132.080
88.0000	1.4667	132.080	-132.080
90.0000	1.5000	132.080	-132.080

9 3 1 2 7 0 7 7 3

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BOREHOLE TEST INFORMATION
WHC-SD-EN-DP-046, Rev. 0

VALIDATED 2/4/92

Page 1 of 1

Borehole 699-B99-2 Borehole Diameter 4" Hanford Coordinates — NA —

Interval Tested 183.96' - 163.26' BTOC Depth Interval 183.96' - 163.26' BTOC

Test Type Instantaneous Slug Test Injection / Withdrawal Borehole Depth 183.96'

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOLINST SN- ET-5
DATA LOGGER.	IN-SITU INC. SN.- 2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.- 350976
SLUGGING ROD	2.0' x 6.0' 0.18 ft³
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

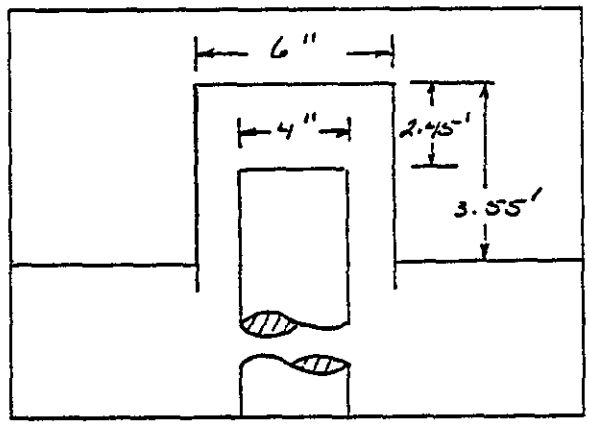
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: James A. Coates JAMES A. COATES, 10/2/91
Sign and Print Name Date

BD-6000-295 (05/89)

9312790775

INSTANTANEOUS SLUG TEST DATA SHEET

INJECTION

Borehole 699-B P91-2

Interval Tested 183.96'-163.26' ~~138.8'~~ BTOC

Depth to Water 138.8' RTOC

Date 10/22/91

Measured by JAMES A. COATES

Slug Volume .13 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 0750-injection baseline, 0807-injection

Transducer Measurement Units FEET.

Depth to Transducer 21.597' BWL

Initial Pressure (P_i) 138.880'

Slug Level or Pressure (P_{max}) 135.921'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by James A. Coates (Sign and Print Name) JAMES A. COATES 10/21/91 (Date)

BD-6000-293 (07/90)

9312759077 6

WELL NO. 699-BP1-2 INJECTION BASELINE PAGE 2 OF 4

SE2000
Environmental Logger
10/22 18:04

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/22 07:50:32

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0	0.0000	138.870	-138.870
1	0.0167	138.864	-138.864
2	0.0333	138.867	-138.867
3	0.0500	138.870	-138.870
4	0.0667	138.873	-138.873
5	0.0833	138.873	-138.873
6	0.1000	138.873	-138.873
7	0.1167	138.873	-138.873
8	0.1333	138.876	-138.876
9	0.1500	138.873	-138.873
10	0.1667	138.867	-138.867
11	0.1833	138.870	-138.870
12	0.2000	138.873	-138.873
13	0.2167	138.873	-138.873
14	0.2333	138.873	-138.873
15	0.2500	138.870	-138.870

9 3 1 2 7 0 9 0 7 7 7

WELL NO. 699-BP1-2 INJECTION

SE2000
Environmental Logger
10/22 18:01

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/22 08:09:37

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	135.921	-135.921
0.0083	0.0001	136.596	-136.596
0.0166	0.0003	136.422	-136.422
0.0250	0.0004	136.669	-136.669
0.0333	0.0006	136.843	-136.843
0.0416	0.0007	136.938	-136.938
0.0500	0.0008	137.096	-137.096
0.0583	0.0010	137.251	-137.251
0.0666	0.0011	137.004	-137.004
0.0750	0.0013	137.163	-137.163
0.0833	0.0014	137.096	-137.096
0.1000	0.0017	137.188	-137.188
0.1166	0.0019	137.274	-137.274
0.1333	0.0022	137.194	-137.194
0.1500	0.0025	137.242	-137.242
0.1666	0.0028	137.223	-137.223
0.1833	0.0031	137.236	-137.236
0.2000	0.0033	137.261	-137.261
0.2166	0.0036	137.299	-137.299
0.2333	0.0039	137.343	-137.343
0.2500	0.0042	137.334	-137.334
0.2666	0.0044	137.350	-137.350
0.2833	0.0047	137.369	-137.369
0.3000	0.0050	137.391	-137.391
0.3166	0.0053	137.400	-137.400
0.3333	0.0056	137.419	-137.419
0.4166	0.0069	137.486	-137.486
0.5000	0.0083	137.555	-137.555
0.5833	0.0097	137.625	-137.625
0.6666	0.0111	137.695	-137.695
0.7500	0.0125	137.758	-137.758
0.8333	0.0139	137.818	-137.818

9 3 1 2 7 3 9 0 7 7 8

WELL NO. 699-BP1-2 INJECTION

0.9166	0.0153	137.866	-137.866
1.0000	0.0167	137.920	-137.920
1.0833	0.0181	137.970	-137.970
1.1666	0.0194	138.018	-138.018
1.2500	0.0208	138.065	-138.065
1.3333	0.0222	138.107	-138.107
1.4166	0.0236	138.145	-138.145
1.5000	0.0250	138.183	-138.183
1.5833	0.0264	138.221	-138.221
1.6666	0.0278	138.252	-138.252
1.7500	0.0292	138.290	-138.290
1.8333	0.0306	138.319	-138.319
1.9166	0.0319	138.351	-138.351
2.0000	0.0333	138.376	-138.376
2.5000	0.0417	138.515	-138.515
3.0000	0.0500	138.617	-138.617
3.5000	0.0583	138.693	-138.693
4.0000	0.0667	138.740	-138.740
4.5000	0.0750	138.778	-138.778
5.0000	0.0833	138.803	-138.803
5.5000	0.0917	138.826	-138.826
6.0000	0.1000	138.838	-138.838
6.5000	0.1083	138.845	-138.845
7.0000	0.1167	138.854	-138.854
7.5000	0.1250	138.861	-138.861
8.0000	0.1333	138.864	-138.864
8.5000	0.1417	138.864	-138.864
9.0000	0.1500	138.867	-138.867
9.5000	0.1583	138.873	-138.873
10.0000	0.1667	138.873	-138.873
12.0000	0.2000	138.870	-138.870
14.0000	0.2333	138.873	-138.873
16.0000	0.2667	138.873	-138.873
18.0000	0.3000	138.873	-138.873
20.0000	0.3333	138.873	-138.873

9 3 1 2 7 0 0 7 7 9

INSTANTANEOUS SLUG TEST DATA SHEET

WITHDRAWAL

Borehole 699-BP91-2

Interval Tested 183.96'-163.26' BTOC

Depth to Water 138.8' BTOC

Date 10/22/91

Measured by James A. Coates

Slug Volume .134 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 0835

Transducer Measurement Units Feet

Depth to Transducer 21.597' BWL

Initial Pressure (P_i) 138.880'

Slug Level or Pressure (P_{max}) 143.618'

Borehole Diameter 4"

Time		Pressure	Time		Pressure	Time		Pressure
Observed	Elapsed	Trans. Measurement	Observed	Elapsed	Trans. Measurement	Observed	Elapsed	Trans. Measurement
		See Attached Data			See Attached Data			

Recorded by James A. Coates (Sign and Print Name) James A. Coates 10/21/91 (Date)

BD-6000-293 (07/90)

9312759730

WELL NO. 699-BP1-2 WITHDRAWAL

SE2000
Environmental Logger
10/22 18:00

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	138.880
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/22 08:30:30

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	141.287	-141.287
0.0083	0.0001	142.503	-142.503
0.0166	0.0003	143.618	-143.618
0.0250	0.0004	143.539	-143.539
0.0333	0.0006	143.510	-143.510
0.0416	0.0007	143.453	-143.453
0.0500	0.0008	143.453	-143.453
0.0583	0.0010	143.434	-143.434
0.0666	0.0011	143.431	-143.431
0.0750	0.0013	143.400	-143.400
0.0833	0.0014	143.384	-143.384
0.1000	0.0017	143.365	-143.365
0.1166	0.0019	143.342	-143.342
0.1333	0.0022	143.320	-143.320
0.1500	0.0025	143.301	-143.301
0.1666	0.0028	143.285	-143.285
0.1833	0.0031	143.263	-143.263
0.2000	0.0033	143.247	-143.247
0.2166	0.0036	143.222	-143.222
0.2333	0.0039	143.206	-143.206
0.2500	0.0042	143.197	-143.197
0.2666	0.0044	143.178	-143.178
0.2833	0.0047	143.162	-143.162
0.3000	0.0050	143.146	-143.146
0.3166	0.0053	143.127	-143.127
0.3333	0.0056	143.111	-143.111
0.4166	0.0069	143.051	-143.051
0.5000	0.0083	142.981	-142.981
0.5833	0.0097	142.918	-142.918
0.6666	0.0111	142.858	-142.858
0.7500	0.0125	142.801	-142.801
0.8333	0.0139	142.744	-142.744

WELL NO. 699-BPI-2 WITHDRAWAL

0.9166	0.0153	142.696	-142.696
1.0000	0.0167	142.649	-142.649
1.0833	0.0181	142.601	-142.601
1.1666	0.0194	142.554	-142.554
1.2500	0.0208	142.516	-142.516
1.3333	0.0222	142.475	-142.475
1.4166	0.0236	142.437	-142.437
1.5000	0.0250	142.399	-142.399
1.5833	0.0264	142.364	-142.364
1.6666	0.0278	142.335	-142.335
1.7500	0.0292	142.300	-142.300
1.8333	0.0306	142.272	-142.272
1.9166	0.0319	142.243	-142.243
2.0000	0.0333	142.215	-142.215
2.5000	0.0417	142.072	-142.072
3.0000	0.0500	141.961	-141.961
3.5000	0.0583	141.879	-141.879
4.0000	0.0667	141.816	-141.816
4.5000	0.0750	141.771	-141.771
5.0000	0.0833	141.733	-141.733
5.5000	0.0917	141.705	-141.705
6.0000	0.1000	141.686	-141.686
6.5000	0.1083	141.670	-141.670
7.0000	0.1167	141.661	-141.661
7.5000	0.1250	141.651	-141.651
8.0000	0.1333	141.638	-141.638
8.5000	0.1417	141.635	-141.635
9.0000	0.1500	141.629	-141.629
9.5000	0.1583	141.623	-141.623
10.0000	0.1667	141.619	-141.619
12.0000	0.2000	141.610	-141.610
14.0000	0.2333	141.610	-141.610
16.0000	0.2667	141.610	-141.610
18.0000	0.3000	141.600	-141.600
20.0000	0.3333	141.607	-141.607
22.0000	0.3667	141.604	-141.604
24.0000	0.4000	141.604	-141.604
26.0000	0.4333	141.604	-141.604

9 3 1 2 7 5 9 0 7 3 2

Page 1 of 4

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev. 0

VALIDATED

Page 1 of 1

Borehole 699-B091-3 Borehole Diameter 4" Hanford Coordinates —NA—

Interval Tested 218.01' -207.22' Depth Interval 218.01' -207.22'

Test Type Instantaneous Slug Test Injection/Withdrawal Borehole Depth 218.01'

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOUNST SN-ET-5
DATA LOGGER.	IN-SITU INC. SN.-2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.-350976
SLUGGING ROD	2.0' x 6.0' 0.13 ft³
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

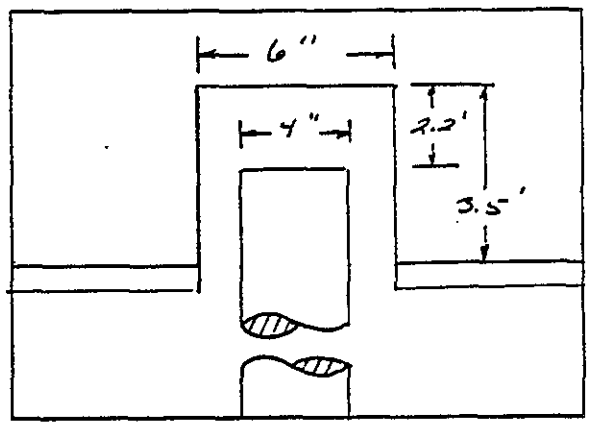
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: James A. Coates James A. Coates, 11/22/91

Sign and Print Name Date

BD-6000-295 (05/89)

9312707733

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

INJECTION

Borehole 699-BP91-3

Interval Tested 218.01' - 207.22'

Depth to Water 139.06'

Date 10/24/91

Measured by JAMES A. COATES

Slug Volume .1354 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1310-injection baseline 1350-injection

Transducer Measurement Units FEET.

Depth to Transducer 24.01' BWL

Initial Pressure (P_i) 139.016'

Slug Level or Pressure (P_{max}) 139.143'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) 11/22/91 (Date)

BD-6000-293 (07/90)

9312739084

SE2000
Environmental Logger
10/25 15:38

Unit# 192 Test 6

INPUT 1: Level (F) TOC

Reference	139.600
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/24 13:04:21

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0	0.0000	139.584	-139.584
1	0.0167	139.542	-139.542
2	0.0333	139.492	-139.492
3	0.0500	139.460	-139.460
4	0.0667	139.428	-139.428
5	0.0833	139.406	-139.406
6	0.1000	139.381	-139.381
7	0.1167	139.352	-139.352
8	0.1333	139.340	-139.340
9	0.1500	139.327	-139.327
10	0.1667	139.311	-139.311
11	0.1833	139.302	-139.302
12	0.2000	139.295	-139.295
13	0.2167	139.289	-139.289
14	0.2333	139.276	-139.276
15	0.2500	139.273	-139.273
16	0.2667	139.267	-139.267
17	0.2833	139.264	-139.264
18	0.3000	139.267	-139.267
19	0.3167	139.257	-139.257
20	0.3333	139.248	-139.248
21	0.3500	139.248	-139.248
22	0.3667	139.251	-139.251
23	0.3833	139.245	-139.245
24	0.4000	139.242	-139.242
25	0.4167	139.242	-139.242
26	0.4333	139.238	-139.238
27	0.4500	139.242	-139.242
28	0.4667	139.232	-139.232
29	0.4833	139.235	-139.235
30	0.5000	139.238	-139.238
31	0.5167	139.238	-139.238

9 3 1 2 7 0 9 0 7 8 5

WELL NO. 699-BP1-3 INJECTION BASELINE PAGE 3 OF 5

32	0.5333	139.232	-139.232
33	0.5500	139.235	-139.235
34	0.5667	139.232	-139.232
35	0.5833	139.238	-139.238
36	0.6000	139.232	-139.232
37	0.6167	139.232	-139.232
38	0.6333	139.235	-139.235
39	0.6500	139.232	-139.232
40	0.6667	139.232	-139.232

9 3 1 2 7 3 9 0 7 8 6

WELL NO. 699-BP1-3 INJECTION

SE2000
Environmental Logger
10/25 15:36

Unit# 192 Test 7

INPUT 1: Level (F) TOC

Reference	139.600
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/24 13:45:30

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	139.143	-139.143
0.0083	0.0001	139.143	-139.143
0.0166	0.0003	139.729	-139.729
0.0250	0.0004	139.143	-139.143
0.0333	0.0006	139.143	-139.143
0.0416	0.0007	139.143	-139.143
0.0500	0.0008	139.143	-139.143
0.0583	0.0010	139.143	-139.143
0.0666	0.0011	139.143	-139.143
0.0750	0.0013	139.143	-139.143
0.0833	0.0014	139.143	-139.143
0.1000	0.0017	139.143	-139.143
0.1166	0.0019	139.143	-139.143
0.1333	0.0022	139.143	-139.143
0.1500	0.0025	139.143	-139.143
0.1666	0.0028	139.143	-139.143
0.1833	0.0031	139.143	-139.143
0.2000	0.0033	139.143	-139.143
0.2166	0.0036	139.143	-139.143
0.2333	0.0039	139.143	-139.143
0.2500	0.0042	139.143	-139.143
0.2666	0.0044	139.143	-139.143
0.2833	0.0047	139.143	-139.143
0.3000	0.0050	139.143	-139.143
0.3166	0.0053	139.143	-139.143
0.3333	0.0056	139.143	-139.143
0.4166	0.0069	139.143	-139.143
0.5000	0.0083	139.143	-139.143
0.5833	0.0097	139.143	-139.143
0.6666	0.0111	139.143	-139.143
0.7500	0.0125	139.143	-139.143
0.8333	0.0139	139.143	-139.143

9 3 1 2 7 0 9 0 7 8 7

WELL NO. 699-BP1-3 INJECTION

0.9166	0.0153	139.143	-139.143
1.0000	0.0167	139.143	-139.143
1.0833	0.0181	139.143	-139.143
1.1666	0.0194	139.143	-139.143
1.2500	0.0208	139.143	-139.143
1.3333	0.0222	139.143	-139.143
1.4166	0.0236	139.143	-139.143
1.5000	0.0250	139.143	-139.143
1.5833	0.0264	139.143	-139.143
1.6666	0.0278	139.143	-139.143
1.7500	0.0292	139.143	-139.143
1.8333	0.0306	139.143	-139.143
1.9166	0.0319	139.143	-139.143
2.0000	0.0333	139.143	-139.143
2.5000	0.0417	139.143	-139.143
3.0000	0.0500	139.143	-139.143
3.5000	0.0583	139.143	-139.143
4.0000	0.0667	139.143	-139.143
4.5000	0.0750	139.143	-139.143
5.0000	0.0833	139.143	-139.143
5.5000	0.0917	139.143	-139.143
6.0000	0.1000	139.143	-139.143
6.5000	0.1083	139.143	-139.143
7.0000	0.1167	139.143	-139.143
7.5000	0.1250	139.143	-139.143
8.0000	0.1333	139.143	-139.143
8.5000	0.1417	139.143	-139.143
9.0000	0.1500	139.143	-139.143
9.5000	0.1583	139.143	-139.143
10.0000	0.1667	139.143	-139.143
12.0000	0.2000	139.254	-139.254
14.0000	0.2333	139.337	-139.337
16.0000	0.2667	139.400	-139.400
18.0000	0.3000	139.444	-139.444
20.0000	0.3333	139.485	-139.485
22.0000	0.3667	139.511	-139.511
24.0000	0.4000	139.530	-139.530
26.0000	0.4333	139.546	-139.546
28.0000	0.4667	139.552	-139.552

9 3 1 2 7 3 9 0 7 9 8

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

WITHDRAWAL

Borehole 699-B91-3

Interval Tested 218.01' - 207.22'

Depth to Water 139.06'

Date 10/24/91

Measured by JAMES A. COATES

Slug Volume .13 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1415

Transducer Measurement Units FEET.

Depth to Transducer 24.01' BWL

Initial Pressure (P_i) 139.600'

Slug Level or Pressure (P_{max}) 141.535'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) JAMES A. COATES 11/22/91 (Date)

BD-6000-293 (07/90)

9312709739

WELL NO. 699-BP1-3 WITHDRAWAL ... PAGE 2 OF 3

.SE2000
Environmental Logger
10/25 15:27

Unit# 192 Test 8

INPUT 1: Level (F) TOC

Reference	139.600
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/24 14:15:46

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	139.172	-139.172
0.0083	0.0001	140.733	-140.733
0.0166	0.0003	141.427	-141.427
0.0250	0.0004	141.471	-141.471
0.0333	0.0006	141.535	-141.535
0.0416	0.0007	141.525	-141.525
0.0500	0.0008	141.500	-141.500
0.0583	0.0010	141.494	-141.494
0.0666	0.0011	141.494	-141.494
0.0750	0.0013	141.478	-141.478
0.0833	0.0014	141.465	-141.465
0.1000	0.0017	141.465	-141.465
0.1166	0.0019	141.452	-141.452
0.1333	0.0022	141.452	-141.452
0.1500	0.0025	141.446	-141.446
0.1666	0.0028	141.437	-141.437
0.1833	0.0031	141.430	-141.430
0.2000	0.0033	141.430	-141.430
0.2166	0.0036	141.424	-141.424
0.2333	0.0039	141.418	-141.418
0.2500	0.0042	141.418	-141.418
0.2666	0.0044	141.408	-141.408
0.2833	0.0047	141.408	-141.408
0.3000	0.0050	141.402	-141.402
0.3166	0.0053	141.399	-141.399
0.3333	0.0056	141.395	-141.395
0.4166	0.0069	141.370	-141.370
0.5000	0.0083	141.351	-141.351
0.5833	0.0097	141.329	-141.329
0.6666	0.0111	141.310	-141.310
0.7500	0.0125	141.291	-141.291
0.8333	0.0139	141.269	-141.269

9 3 1 2 7 5 9 0 7 9 0

WELL NO. 699-BP1-3 WITHDRAWAL PAGE 3OF3

0.9166	0.0153	141.247	-141.247
1.0000	0.0167	141.231	-141.231
1.0833	0.0181	141.212	-141.212
1.1666	0.0194	141.190	-141.190
1.2500	0.0208	141.174	-141.174
1.3333	0.0222	141.161	-141.161
1.4166	0.0236	141.139	-141.139
1.5000	0.0250	141.123	-141.123
1.5833	0.0264	141.104	-141.104
1.6666	0.0278	141.091	-141.091
1.7500	0.0292	141.072	-141.072
1.8333	0.0306	141.057	-141.057
1.9166	0.0319	141.038	-141.038
2.0000	0.0333	141.028	-141.028
2.5000	0.0417	140.927	-140.927
3.0000	0.0500	140.835	-140.835
3.5000	0.0583	140.759	-140.759
4.0000	0.0667	140.683	-140.683
4.5000	0.0750	140.607	-140.607
5.0000	0.0833	140.547	-140.547
5.5000	0.0917	140.483	-140.483
6.0000	0.1000	140.433	-140.433
6.5000	0.1083	140.376	-140.376
7.0000	0.1167	140.322	-140.322
7.5000	0.1250	140.277	-140.277
8.0000	0.1333	140.233	-140.233
8.5000	0.1417	140.195	-140.195
9.0000	0.1500	140.157	-140.157
9.5000	0.1583	140.122	-140.122
10.0000	0.1667	140.087	-140.087
12.0000	0.2000	139.970	-139.970
14.0000	0.2333	139.894	-139.894
16.0000	0.2667	139.824	-139.824
18.0000	0.3000	139.774	-139.774
20.0000	0.3333	139.739	-139.739
22.0000	0.3667	139.707	-139.707
24.0000	0.4000	139.685	-139.685
26.0000	0.4333	139.679	-139.679
28.0000	0.4667	139.660	-139.660

9 3 1 2 7 0 7 9 1

9 3 1 2 7 3 9 0 7 9 2

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P. 1 of 8

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev. 0

VALIDATED 2/4/91 SIGNATURE/DATE

Page 1 of 1

Borehole 699-42-41 Borehole Diameter 4" Hanford Coordinates N/A

Interval Tested 159.04'-138.04' Depth Interval 159.04'-138.04'

Test Type Instantaneous Slug Test Injection/Withdrawal Borehole Depth 159.04'

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOUNST SN-ET-5
DATA LOGGER.	IN-SITU INC. S.N.-2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.-350976
SLUGGING ROD	2.0' x 6.0' 0.13 ft³
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

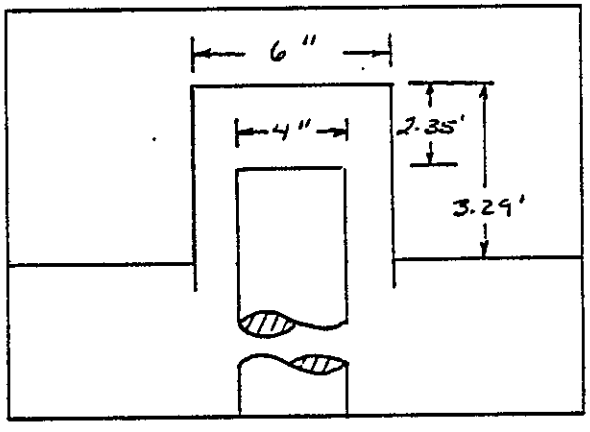
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: JAMES A. COATES JAMES A. COATES 12-2-91

Sign and Print Name Date

BD-6000-295 (05/89)

9 3 1 2 7 9 0 7 9 3

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

INJECTION.

Borehole 699-42-41

Interval Tested 159.04' - 138.04'

Depth to Water 146.94' BTOC

Date 10/16/91

Measured by JAMES A. COATES

Slug Volume .13ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1100

Transducer Measurement Units FEET.

Depth to Transducer 8.975' BWL

Initial Pressure (P_i) 146.940'

Slug Level or Pressure (P_{max}) 145.422'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES JAMES A. COATES (Sign and Print Name) 12-2-91 (Date)

BD-6000-293 (07/90)

9312759794

WELL NO. 699-42-41 INJECTION BASELINE

SE2000
Environmental Logger
10/17 09:21

Unit# 192 Test 3

INPUT 1: Level (F) TOC

Reference	146.940
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/16 10:38:26

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0	0.0000	146.946	-146.946
1	0.0167	146.949	-146.949
2	0.0333	146.949	-146.949
3	0.0500	146.949	-146.949
4	0.0667	146.952	-146.952
5	0.0833	146.949	-146.949
6	0.1000	146.952	-146.952
7	0.1167	146.949	-146.949
8	0.1333	146.952	-146.952
9	0.1500	146.952	-146.952
10	0.1667	146.952	-146.952
11	0.1833	146.952	-146.952
12	0.2000	146.952	-146.952
13	0.2167	146.955	-146.955
14	0.2333	146.955	-146.955
15	0.2500	146.959	-146.959
16	0.2667	146.955	-146.955
17	0.2833	146.959	-146.959
18	0.3000	146.959	-146.959
19	0.3167	146.959	-146.959

9 3 1 2 7 0 9 0 7 9 5

SE2000
Environmental Logger
10/17 09:19

Unit# 192 Test 4

INPUT 1: Level (F) TOC

Reference	146.940
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/16 10:59:03

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	146.477	-146.477
0.0083	0.0001	145.422	-145.422
0.0166	0.0003	146.515	-146.515
0.0250	0.0004	146.414	-146.414
0.0333	0.0006	146.778	-146.778
0.0416	0.0007	146.889	-146.889
0.0500	0.0008	146.974	-146.974
0.0583	0.0010	146.974	-146.974
0.0666	0.0011	146.882	-146.882
0.0750	0.0013	146.962	-146.962
0.0833	0.0014	146.952	-146.952
0.1000	0.0017	146.940	-146.940
0.1166	0.0019	146.952	-146.952
0.1333	0.0022	146.952	-146.952
0.1500	0.0025	146.943	-146.943
0.1666	0.0028	146.949	-146.949
0.1833	0.0031	146.946	-146.946
0.2000	0.0033	146.946	-146.946
0.2166	0.0036	146.949	-146.949
0.2333	0.0039	146.946	-146.946
0.2500	0.0042	146.952	-146.952
0.2666	0.0044	146.949	-146.949
0.2833	0.0047	146.952	-146.952
0.3000	0.0050	146.949	-146.949
0.3166	0.0053	146.952	-146.952
0.3333	0.0056	146.952	-146.952
0.4166	0.0069	146.971	-146.971
0.5000	0.0083	146.943	-146.943
0.5833	0.0097	146.952	-146.952
0.6666	0.0111	146.955	-146.955
0.7500	0.0125	146.952	-146.952
0.8333	0.0139	146.949	-146.949

93127590796

WELL NO. 699-42-41 INJECTION

0.9166	0.0153	146.952	-146.952
1.0000	0.0167	146.955	-146.955
1.0833	0.0181	146.949	-146.949
1.1666	0.0194	146.933	-146.933
1.2500	0.0208	146.952	-146.952
1.3333	0.0222	146.946	-146.946
1.4166	0.0236	146.949	-146.949
1.5000	0.0250	146.949	-146.949
1.5833	0.0264	146.946	-146.946
1.6666	0.0278	146.949	-146.949
1.7500	0.0292	146.949	-146.949
1.8333	0.0306	146.949	-146.949
1.9166	0.0319	146.943	-146.943
2.0000	0.0333	146.946	-146.946
2.5000	0.0417	146.927	-146.927
3.0000	0.0500	146.955	-146.955
3.5000	0.0583	146.949	-146.949
4.0000	0.0667	146.943	-146.943
4.5000	0.0750	146.946	-146.946
5.0000	0.0833	146.949	-146.949
5.5000	0.0917	146.949	-146.949
6.0000	0.1000	146.962	-146.962
6.5000	0.1083	146.955	-146.955
7.0000	0.1167	146.952	-146.952
7.5000	0.1250	146.946	-146.946
8.0000	0.1333	146.946	-146.946
8.5000	0.1417	146.952	-146.952
9.0000	0.1500	146.952	-146.952
9.5000	0.1583	146.955	-146.955
10.0000	0.1667	146.955	-146.955
12.0000	0.2000	146.955	-146.955
14.0000	0.2333	146.949	-146.949
16.0000	0.2667	146.949	-146.949
18.0000	0.3000	146.949	-146.949
20.0000	0.3333	146.968	-146.968
22.0000	0.3667	146.955	-146.955

9 3 1 2 7 0 9 0 7 9 7

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

WITHDRAWAL

Borehole 699-42-41

Interval Tested 159.04' - 138.04'

Depth to Water 146.94' BTOC

Date 10/16/91

Measured by JAMES A. COATES

Slug Volume .13 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1120

Transducer Measurement Units FEET.

Depth to Transducer ~~14~~ JAC 8.945' BWL

Initial Pressure (P_i) 146.940'

Slug Level or Pressure (P_{max}) 147.522'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) JAMES A. COATES 12-2-91 (Date)

BD-6000-293 (07/90)

9 3 1 2 7 3 9 0 7 9 8

WELL NO. 699-42-41 WITHDRAWAL

SE2000
Environmental Logger
10/17 09:14

Unit# 192 Test 5

INPUT 1: Level (F) TOC

Reference	146.940
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 10/16 11:22:11

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	147.373	-147.373
0.0083	0.0001	147.522	-147.522
0.0166	0.0003	147.152	-147.152
0.0250	0.0004	146.962	-146.962
0.0333	0.0006	146.946	-146.946
0.0416	0.0007	146.949	-146.949
0.0500	0.0008	146.959	-146.959
0.0583	0.0010	146.949	-146.949
0.0666	0.0011	146.946	-146.946
0.0750	0.0013	146.943	-146.943
0.0833	0.0014	146.940	-146.940
0.1000	0.0017	146.930	-146.930
0.1166	0.0019	146.930	-146.930
0.1333	0.0022	146.930	-146.930
0.1500	0.0025	146.930	-146.930
0.1666	0.0028	146.930	-146.930
0.1833	0.0031	146.930	-146.930
0.2000	0.0033	146.930	-146.930
0.2166	0.0036	146.927	-146.927
0.2333	0.0039	146.930	-146.930
0.2500	0.0042	146.930	-146.930
0.2666	0.0044	146.930	-146.930
0.2833	0.0047	146.927	-146.927
0.3000	0.0050	146.930	-146.930
0.3166	0.0053	146.927	-146.927
0.3333	0.0056	146.930	-146.930
0.4166	0.0069	146.930	-146.930
0.5000	0.0083	146.924	-146.924
0.5833	0.0097	146.927	-146.927
0.6666	0.0111	146.927	-146.927
0.7500	0.0125	146.927	-146.927
0.8333	0.0139	146.927	-146.927

9 3 1 2 7 0 9 0 7 9 9

WELL NO. 699-42-41 WITHDRAWAL

0.9166	0.0153	146.927	-146.927
1.0000	0.0167	146.927	-146.927
1.0833	0.0181	146.927	-146.927
1.1666	0.0194	146.930	-146.930
1.2500	0.0208	146.927	-146.927
1.3333	0.0222	146.924	-146.924
1.4166	0.0236	146.927	-146.927
1.5000	0.0250	146.924	-146.924
1.5833	0.0264	146.927	-146.927
1.6666	0.0278	146.927	-146.927
1.7500	0.0292	146.930	-146.930
1.8333	0.0306	146.927	-146.927
1.9166	0.0319	146.927	-146.927
2.0000	0.0333	146.924	-146.924
2.5000	0.0417	146.927	-146.927
3.0000	0.0500	146.924	-146.924
3.5000	0.0583	146.927	-146.927
4.0000	0.0667	146.927	-146.927
4.5000	0.0750	146.927	-146.927
5.0000	0.0833	146.930	-146.930
5.5000	0.0917	146.930	-146.930
6.0000	0.1000	146.930	-146.930
6.5000	0.1083	146.930	-146.930
7.0000	0.1167	146.933	-146.933
7.5000	0.1250	146.933	-146.933
8.0000	0.1333	146.933	-146.933
8.5000	0.1417	146.933	-146.933
9.0000	0.1500	146.933	-146.933
9.5000	0.1583	146.933	-146.933
10.0000	0.1667	146.930	-146.930
12.0000	0.2000	146.933	-146.933
14.0000	0.2333	146.936	-146.936
16.0000	0.2667	146.933	-146.933
18.0000	0.3000	146.936	-146.936
20.0000	0.3333	146.936	-146.936
22.0000	0.3667	146.933	-146.933
24.0000	0.4000	146.924	-146.924

9 3 1 2 7 3 9 0 8 0 0

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev. 0

VALIDATED 12/4/91

Page 1 of 1

Borehole 699-43-40 Borehole Diameter 4" Hanford Coordinates —NA—

Interval Tested 138.94' - 119.9' BTOC Depth Interval 138.94' -119.9' BTOC

Test Type Instantaneous Slug Test - Injection/withdrawal Borehole Depth 138.94' BTOC

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOUNST SN- ET-1
DATA LOGGER.	IN-SITU INC. SN.-2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.-2303
SLUGGING ROD	2.0' x 6.0' ft , 0.13 ft^3
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

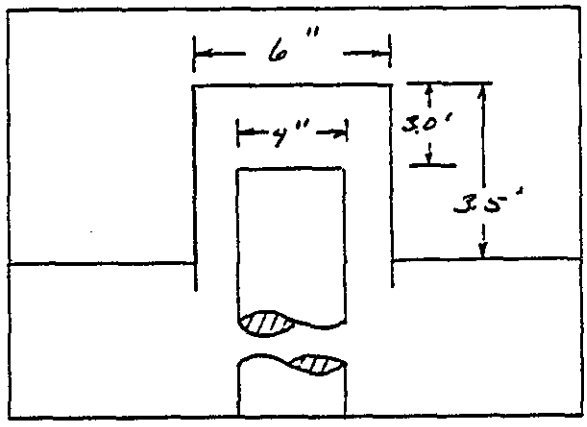
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: James A. Coates James A. Coates 12-4-91

Sign and Print Name Date

BD-6000-295 (05/89)

INSTANTANEOUS SLUG TEST DATA SHEET

WHC-SD-EN-DP-046, Rev. 0 INJECTION

Borehole 699-43-4D

Interval Tested 138.94' - 119.9' BTOC

Depth to Water 122.51' BTOC

Date 11/26/91

Measured by JAMES A. COATES

Slug Volume .134 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1050-inj. baseline, 1100-injection

Transducer Measurement Units FEET

Depth to Transducer 11.337' BWL

Initial Pressure (P_i) 122.51'

Slug Level or Pressure (P_{max}) 118.04'

Borehole Diameter 4"

Time		Pressure Trans. Measurement	Time		Pressure Trans. Measurement	Time		Pressure Trans. Measurement
Observed	Elapsed		Observed	Elapsed		Observed	Elapsed	
		SEE ATTACHED			SEE ATTACHED			

Recorded by James A. Coates JAMES A. COATES (Sign and Print Name) 12-1-91 (Date)

BD-6000-293 (07/90)

9312759030 2

SE2000
Environmental Logger
11/27 07:03

Unit# 192 Test 3

INPUT 1: Level (F) TOC

Reference	122.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/26 10:56:33

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	122.510	-122.510
1.0000	0.0167	122.494	-122.494
2.0000	0.0333	122.494	-122.494
3.0000	0.0500	122.494	-122.494
4.0000	0.0667	122.494	-122.494
5.0000	0.0833	122.494	-122.494
6.0000	0.1000	122.494	-122.494
7.0000	0.1167	122.494	-122.494
8.0000	0.1333	122.494	-122.494
9.0000	0.1500	122.494	-122.494
10.0000	0.1667	122.494	-122.494
11.0000	0.1833	122.478	-122.478

9 3 1 2 7 0 8 0 3

SE2000
Environmental Logger
11/27 07:01

Unit# 192 Test 4

INPUT 1: Level (F) TOC

Reference	122.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/26 11:08:47

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	118.105	-118.105
0.0083	0.0001	122.874	-122.874
0.0166	0.0003	122.399	-122.399
0.0250	0.0004	123.159	-123.159
0.0333	0.0006	123.238	-123.238
0.0416	0.0007	123.159	-123.159
0.0500	0.0008	123.112	-123.112
0.0583	0.0010	123.112	-123.112
0.0666	0.0011	123.112	-123.112
0.0750	0.0013	123.127	-123.127
0.0833	0.0014	123.143	-123.143
0.1000	0.0017	123.143	-123.143
0.1166	0.0019	123.159	-123.159
0.1333	0.0022	123.159	-123.159
0.1500	0.0025	123.175	-123.175
0.1666	0.0028	123.175	-123.175
0.1833	0.0031	123.191	-123.191
0.2000	0.0033	123.191	-123.191
0.2166	0.0036	123.207	-123.207
0.2333	0.0039	123.191	-123.191
0.2500	0.0042	123.207	-123.207
0.2666	0.0044	123.207	-123.207
0.2833	0.0047	123.207	-123.207
0.3000	0.0050	123.207	-123.207
0.3166	0.0053	123.223	-123.223
0.3333	0.0056	123.223	-123.223
0.4166	0.0069	123.223	-123.223
0.5000	0.0083	123.238	-123.238
0.5833	0.0097	123.254	-123.254
0.6666	0.0111	123.254	-123.254
0.7500	0.0125	123.270	-123.270
0.8333	0.0139	123.270	-123.270

9 3 1 2 7 3 9 0 8 0 4

WELL NO. 699-43-40 INJECTION PAGE 4 OF 4

0.9166	0.0153	123.270	-123.270
1.0000	0.0167	123.286	-123.286
1.0833	0.0181	123.286	-123.286
1.1666	0.0194	123.302	-123.302
1.2500	0.0208	123.302	-123.302
1.3333	0.0222	123.302	-123.302
1.4166	0.0236	123.318	-123.318
1.5000	0.0250	123.318	-123.318
1.5833	0.0264	123.318	-123.318
1.6666	0.0278	123.318	-123.318
1.7500	0.0292	123.333	-123.333
1.8333	0.0306	123.333	-123.333
1.9166	0.0319	123.333	-123.333
2.0000	0.0333	123.333	-123.333
2.5000	0.0417	123.365	-123.365
3.0000	0.0500	123.381	-123.381
3.5000	0.0583	123.397	-123.397
4.0000	0.0667	123.397	-123.397
4.5000	0.0750	123.413	-123.413
5.0000	0.0833	123.413	-123.413
5.5000	0.0917	123.429	-123.429
6.0000	0.1000	123.444	-123.444
6.5000	0.1083	123.444	-123.444
7.0000	0.1167	123.460	-123.460
7.5000	0.1250	123.460	-123.460
8.0000	0.1333	123.460	-123.460
8.5000	0.1417	123.476	-123.476
9.0000	0.1500	123.476	-123.476
9.5000	0.1583	123.476	-123.476
10.0000	0.1667	123.476	-123.476
12.0000	0.2000	123.508	-123.508
14.0000	0.2333	123.508	-123.508
16.0000	0.2667	123.524	-123.524
18.0000	0.3000	123.524	-123.524
20.0000	0.3333	123.524	-123.524
22.0000	0.3667	123.524	-123.524
24.0000	0.4000	123.524	-123.524
26.0000	0.4333	123.524	-123.524
28.0000	0.4667	123.539	-123.539
30.0000	0.5000	123.524	-123.524

9312790805

INSTANTANEOUS SLUG TEST DATA SHEET

-WITHDRAWAL-

Borehole 699-43-40

Interval Tested 138.94' - 119.9' BTOC

Depth to Water 122.51' BTOC

Date 11/26/91

Measured by JAMES A. COATES

Slug Volume .1354 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1130

Transducer Measurement Units FEET

Depth to Transducer 11.337' BWL

Initial Pressure (P_i) 122.51'

Slug Level or Pressure (P_{max}) 128.185'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) JAMES A. COATES 12-1-91 (Date)

BD-6000-293 (07/90)

9 3 1 2 7 3 9 0 8 0 6

WELL NO. 699-43-40 WITHDRAWAL PAGE 2 OF 3

SE2000
Environmental Logger
11/27 06:58

Unit# 192 Test 5

INPUT 1: Level (F) TOC

Reference	122.510
SG	1.000
Linearity	0.000
Scale factor	50.170
Offset	0.000
Delay mSEC	50.000

Step 0 11/26 11:41:36

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	128.135	-128.135
0.0083	0.0001	124.110	-124.110
0.0166	0.0003	122.763	-122.763
0.0250	0.0004	123.777	-123.777
0.0333	0.0006	124.363	-124.363
0.0416	0.0007	124.601	-124.601
0.0500	0.0008	124.617	-124.617
0.0583	0.0010	124.569	-124.569
0.0666	0.0011	124.538	-124.538
0.0750	0.0013	124.506	-124.506
0.0833	0.0014	124.490	-124.490
0.1000	0.0017	124.427	-124.427
0.1166	0.0019	124.379	-124.379
0.1333	0.0022	124.332	-124.332
0.1500	0.0025	124.268	-124.268
0.1666	0.0028	124.221	-124.221
0.1833	0.0031	124.173	-124.173
0.2000	0.0033	124.126	-124.126
0.2166	0.0036	124.094	-124.094
0.2333	0.0039	124.047	-124.047
0.2500	0.0042	123.999	-123.999
0.2666	0.0044	123.967	-123.967
0.2833	0.0047	123.936	-123.936
0.3000	0.0050	123.888	-123.888
0.3166	0.0053	123.856	-123.856
0.3333	0.0056	123.825	-123.825
0.4166	0.0069	123.698	-123.698
0.5000	0.0083	123.571	-123.571
0.5833	0.0097	123.460	-123.460
0.6666	0.0111	123.365	-123.365
0.7500	0.0125	123.302	-123.302
0.8333	0.0139	123.238	-123.238

9 3 1 2 7 0 8 0 7

P. 8058

WELL NO. 699-43-40 WITHDRAWAL PAGE 3 OF 3

0.9166	0.0153	123.191	-123.191
1.0000	0.0167	123.159	-123.159
1.0833	0.0181	123.127	-123.127
1.1666	0.0194	123.096	-123.096
1.2500	0.0208	123.080	-123.080
1.3333	0.0222	123.048	-123.048
1.4166	0.0236	123.032	-123.032
1.5000	0.0250	123.017	-123.017
1.5833	0.0264	123.001	-123.001
1.6666	0.0278	123.001	-123.001
1.7500	0.0292	122.985	-122.985
1.8333	0.0306	122.985	-122.985
1.9166	0.0319	122.969	-122.969
2.0000	0.0333	122.953	-122.953
2.5000	0.0417	122.906	-122.906
3.0000	0.0500	122.890	-122.890
3.5000	0.0583	122.858	-122.858
4.0000	0.0667	122.842	-122.842
4.5000	0.0750	122.826	-122.826
5.0000	0.0833	122.811	-122.811
5.5000	0.0917	122.811	-122.811
6.0000	0.1000	122.795	-122.795
6.5000	0.1083	122.795	-122.795
7.0000	0.1167	122.779	-122.779
7.5000	0.1250	122.763	-122.763
8.0000	0.1333	122.763	-122.763
8.5000	0.1417	122.763	-122.763
9.0000	0.1500	122.747	-122.747
9.5000	0.1583	122.747	-122.747
10.0000	0.1667	122.747	-122.747
12.0000	0.2000	122.747	-122.747
14.0000	0.2333	122.731	-122.731
16.0000	0.2667	122.715	-122.715
18.0000	0.3000	122.715	-122.715
20.0000	0.3333	122.715	-122.715
22.0000	0.3667	122.700	-122.700
24.0000	0.4000	122.700	-122.700
26.0000	0.4333	122.684	-122.684
28.0000	0.4667	122.700	-122.700
30.0000	0.5000	122.684	-122.684
32.0000	0.5333	122.684	-122.684
34.0000	0.5667	122.684	-122.684
36.0000	0.6000	122.684	-122.684
38.0000	0.6333	133.300	-133.300

9312739308

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev. 0

VALIDATED 2/4/92

Page 1 of 1

Borehole 699-43-41G

Borehole Diameter 4"

Hanford Coordinates — NA —

Interval Tested 202.58' - 192.22' BTOC

Depth Interval 202.58' - 192.22' BTOC

Test Type Instaneous Slug Test Injection/withdrawal

Borehole Depth 202.58' BTOC

Instruction Used WHC-CM-7-7-EII 10.1

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOUNST SN-ET-1
DATA LOGGER	IN-SITU INC. S.N.-2K192
PRESSURE TRANSDUCER	IN-SITU INC. S.N.-2303
SLUGGING ROD	2.0' x 6.0' 0.13 ft^3
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum TOP OF CASING 6" (T.O.C. 6")

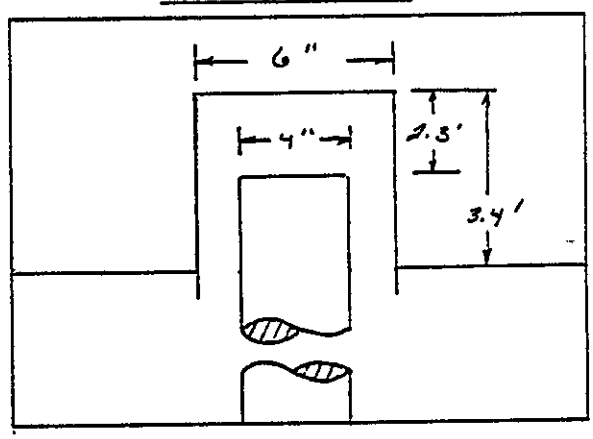
Elevation NA

Electric Sounder T.O.C. 6"

Steel Tape T.O.C. 6"

Pressure Transducer T.O.C. 6"

WELL HEAD DIAGRAM



COMMENTS

Recorded by: JAMES A. COATES JAMES A. COATES
Sign and Print Name

12-2-91
Date

BD-6000-295 (05/89)

9312708009

~~page 2~~

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET -INJECTION-

Borehole 699-43-41G

Interval Tested 202.58' - 192.22' BTOC

Depth to Water 134.79'

Date 11/25/91

Measured by JAMES A. COATES

Slug Volume .1347³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1215 - inj. baseline, 1230 - injection

Transducer Measurement Units FEET.

Depth to Transducer 64.0' BWL

Initial Pressure (P_i) 134.8'

Slug Level or Pressure (P_{max}) 127.540'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) JAMES A. COATES. 12-2-91 (Date)

BD-6000-293 (07/90)

9312759310

WELL NO. 699-43-41G INJECTION BASELINE PAGE 2 OF 4

SE1000B
Environmental Logger
11/26 10:11

Unit# 00700 Test# 0

INPUT 1: Level (F) TOC

Reference 134.80
Scale factor 50.17
Offset 0.00

Step# 0 11/25 11:57

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	134.800	-134.800
1.0000	0.1670	134.780	-134.780
2.0000	0.0333	134.760	-134.760
3.0000	0.0500	134.750	-134.750
4.0000	0.0667	134.730	-134.730
5.0000	0.0833	134.730	-134.730
6.0000	0.1000	134.720	-134.720
7.0000	0.1167	134.720	-134.720
8.0000	0.1333	134.700	-134.700
9.0000	0.1500	134.700	-134.700
10.0000	0.1667	134.680	-134.680
11.0000	0.1833	134.680	-134.680
12.0000	0.2000	134.670	-134.670
13.0000	0.2167	134.670	-134.670
14.0000	0.2333	134.650	-134.650
15.0000	0.2500	134.650	-134.650
16.0000	0.2667	134.650	-134.650
17.0000	0.2833	134.640	-134.640
18.0000	0.3000	134.640	-134.640
19.0000	0.3167	134.640	-134.640
20.0000	0.3333	134.640	-134.640
21.0000	0.3500	134.620	-134.620

WELL NO. 699-43-41G INJECTION PAGE 3 OF 4

SE1000B
Environmental Logger
11/26 07:12

Unit# 00700 Test# 1

INPUT 1: Level (F) TOC

Reference 134.80
Scale factor 50.17
Offset 0.00

Step# 0 11/25 12:20

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	133.450	-133.450
0.0033	0.0001	128.210	-128.210
0.0066	0.0001	127.540	-127.540
0.0099	0.0002	133.720	-133.720
0.0133	0.0002	141.150	-141.150
0.0166	0.0003	133.040	-133.040
0.0200	0.0003	129.500	-129.500
0.0233	0.0004	130.880	-130.880
0.0266	0.0004	134.870	-134.870
0.0300	0.0005	133.100	-133.100
0.0333	0.0006	131.820	-131.820
0.0500	0.0008	132.510	-132.510
0.0666	0.0011	132.960	-132.960
0.0833	0.0014	133.050	-133.050
0.1000	0.0017	133.120	-133.120
0.1166	0.0019	133.100	-133.100
0.1333	0.0022	133.120	-133.120
0.1500	0.0025	133.100	-133.100
0.1666	0.0028	133.100	-133.100
0.1833	0.0031	133.100	-133.100
0.2000	0.0033	133.100	-133.100
0.2166	0.0036	133.120	-133.120
0.2333	0.0039	133.130	-133.130
0.2500	0.0042	133.130	-133.130
0.2666	0.0044	133.150	-133.150
0.2833	0.0047	133.150	-133.150
0.3000	0.0050	133.160	-133.160
0.3166	0.0053	133.180	-133.180
0.3333	0.0056	133.180	-133.180
0.4167	0.0069	133.230	-133.230
0.5000	0.0083	133.260	-133.260
0.5833	0.0097	133.310	-133.310
0.6667	0.0111	133.340	-133.340
0.7500	0.0125	133.370	-133.370
0.8333	0.0139	133.420	-133.420

WELL NO. 699-43-41G INJECTION PAGE 4 OF 4

0.9167	0.0153	133.430	-133.430
1.0000	0.0167	133.480	-133.480
1.0833	0.0181	133.500	-133.500
1.1667	0.0194	133.530	-133.530
1.2500	0.0208	133.560	-133.560
1.3333	0.0222	133.590	-133.590
1.4166	0.0236	133.610	-133.610
1.5000	0.0250	133.640	-133.640
1.5833	0.0264	133.670	-133.670
1.6667	0.0278	133.690	-133.690
1.7500	0.0292	133.720	-133.720
1.8333	0.0306	133.730	-133.730
1.9167	0.0319	133.770	-133.770
2.0000	0.0333	133.780	-133.780
2.5000	0.0417	133.910	-133.910
3.0000	0.0500	134.000	-134.000
3.5000	0.0583	134.100	-134.100
4.0000	0.0667	134.180	-134.180
4.5000	0.0750	134.260	-134.260
5.0000	0.0833	134.300	-134.300
5.5000	0.0917	134.370	-134.370
6.0000	0.1000	134.400	-134.400
6.5000	0.1083	134.450	-134.450
7.0000	0.1167	134.480	-134.480
7.5000	0.1250	134.510	-134.510
8.0000	0.1333	134.540	-134.540
8.5000	0.1417	134.560	-134.560
9.0000	0.1500	134.570	-134.570
9.5000	0.1583	134.610	-134.610
10.0000	0.1667	134.620	-134.620

9 3 1 2 7 0 9 0 3 1 3

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

-WITHDRAWAL-

Borehole 1699-43-416

Interval Tested 202.58' - 192.22' BTOC

Depth to Water 134.79'

Date 11/25/91

Measured by JAMES A. COATES

Slug Volume .134 ft³ Barometer Reading (Beginning) -NA- (End) -NA-

Time 1240

Transducer Measurement Units FEET

Depth to Transducer 64.0' BWL

Initial Pressure (P_i) 134.80'

Slug Level or Pressure (P_{max}) 137.310'

Borehole Diameter 4"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
		SEE ATTACHED			SEE ATTACHED			

Recorded by JAMES A. COATES (Sign and Print Name) JAMES A. COATES 12-2-91 (Date)

BD-6000-293 (07/90)

9312790814

WELL NO. 699-43-41G WITHDRAWAL PAGE 2 OF 3

SE1000B
Environmental Logger
11/26 07:09

Unit# 00700 Test# 2

INPUT 1: Level (F) TOC

Reference 134.80
Scale factor 50.17
Offset 0.00

Step# 0 11/25 12:32

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0000	0.0000	137.310	-137.310
0.0033	0.0001	135.810	-135.810
0.0066	0.0001	136.190	-136.190
0.0099	0.0002	134.540	-134.540
0.0133	0.0002	137.230	-137.230
0.0166	0.0003	137.000	-137.000
0.0200	0.0003	136.790	-136.790
0.0233	0.0004	136.790	-136.790
0.0266	0.0004	136.780	-136.780
0.0300	0.0005	136.780	-136.780
0.0333	0.0006	136.780	-136.780
0.0500	0.0008	136.740	-136.740
0.0666	0.0011	136.710	-136.710
0.0833	0.0014	136.700	-136.700
0.1000	0.0017	136.680	-136.680
0.1166	0.0019	136.660	-136.660
0.1333	0.0022	136.650	-136.650
0.1500	0.0025	136.620	-136.620
0.1666	0.0028	136.620	-136.620
0.1833	0.0031	136.600	-136.600
0.2000	0.0033	136.600	-136.600
0.2166	0.0036	136.590	-136.590
0.2333	0.0039	136.590	-136.590
0.2500	0.0042	136.570	-136.570
0.2666	0.0044	136.570	-136.570
0.2833	0.0047	136.550	-136.550
0.3000	0.0050	136.550	-136.550
0.3166	0.0053	136.540	-136.540
0.3333	0.0056	136.520	-136.520
0.4167	0.0069	136.490	-136.490
0.5000	0.0083	136.460	-136.460
0.5833	0.0097	136.410	-136.410
0.6667	0.0111	136.380	-136.380
0.7500	0.0125	136.320	-136.320
0.8333	0.0139	136.300	-136.300

WELL NO. 699-43-41G WITHDRAWAL PAGE 3 OF 3

0.9167	0.0153	136.250	-136.250
1.0000	0.0167	136.220	-136.220
1.0833	0.0181	136.210	-136.210
1.1667	0.0194	136.170	-136.170
1.2500	0.0208	136.160	-136.160
1.3333	0.0222	136.140	-136.140
1.4166	0.0236	136.110	-136.110
1.5000	0.0250	136.090	-136.090
1.5833	0.0264	136.080	-136.080
1.6667	0.0278	136.050	-136.050
1.7500	0.0292	136.030	-136.030
1.8333	0.0306	136.000	-136.000
1.9167	0.0319	135.980	-135.980
2.0000	0.0333	135.970	-135.970
2.5000	0.0417	135.840	-135.840
3.0000	0.0500	135.750	-135.750
3.5000	0.0583	135.650	-135.650
4.0000	0.0667	135.560	-135.560
4.5000	0.0750	135.490	-135.490
5.0000	0.0833	135.430	-135.430
5.5000	0.0917	135.370	-135.370
6.0000	0.1000	135.300	-135.300
6.5000	0.1083	135.250	-135.250
7.0000	0.1167	135.220	-135.220
7.5000	0.1250	135.180	-135.180
8.0000	0.1333	135.140	-135.140
8.5000	0.1417	135.110	-135.110
9.0000	0.1500	135.080	-135.080
9.5000	0.1583	135.060	-135.060
10.0000	0.1667	135.030	-135.030
11.0000	0.1833	135.000	-135.000
12.0000	0.2000	134.970	-134.970
13.0000	0.2167	134.940	-134.940
14.0000	0.2333	134.920	-134.920
15.0000	0.2500	134.890	-134.890
16.0000	0.2667	134.890	-134.890
17.0000	0.2833	134.870	-134.870
18.0000	0.3000	134.860	-134.860
19.0000	0.3167	134.860	-134.860
20.0000	0.3333	134.860	-134.860
21.0000	0.3500	134.840	-134.840
22.0000	0.3667	134.840	-134.840
23.0000	0.3833	134.840	-134.840
24.0000	0.4000	134.830	-134.830

9 3 1 2 7 3 9 0 3 1 6

BOREHOLE TEST INFORMATION

WHC-SD-EN-DP-046, Rev. 0

VALIDATED 4/4/92 SIGNATURE/DATE

Page 1 of 1

Borehole C-4341G Borehole Diameter _____ Hanford Coordinates - NA -

Interval Tested 145' - 155' Depth Interval 145' - 155'

Test Type INSTANTANEOUS SLUG Borehole Depth ~~10'~~ 155'

Instruction Used WHC-CM-7-7-EII

EQUIPMENT

NAME	DESCRIPTION
ELECTRIC SOUNDER	SOLINST SN-E-5
DATA LOGGER	IN-SITU INC. SN 2K192
PRESSURE TRANSDUCER	IN-SITU SN 350
SLUGGING ROD	8.8' x 0.42'
STEEL MEASURING TAPE	500' GRADUATED STEEL TAPE

MEASUREMENT DATUM

Control Datum LAND SURFACE

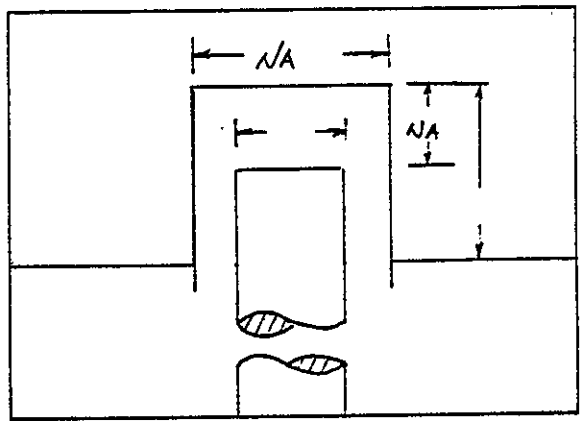
Elevation - NA -

Electric Sounder LAND SURFACE

Steel Tape "

Pressure Transducer "

WELL HEAD DIAGRAM



COMMENTS

UNCOMPLETED WELL

Recorded by: JAMES A. COATES JAMES A. COATES CAL 8-23-91

Sign and Print Name Date

BD-6000-295 (05/89)

9 3 1 2 7 0 8 1 7

WHC-SD-EN-DP-046, Rev. 0

INSTANTANEOUS SLUG TEST DATA SHEET

WITHDRAWAL

Borehole 6-4341G

Interval Tested 155-145 BLS

Depth to Water 127.14 BLS

Date 8-22-91

Measured by JAMES A COATES

Slug Volume 1.22 ft³ (9 Bears) Barometer Reading (Beginning) - NA (End) - NA

Time

Transducer Measurement Units FEET

Depth to Transducer 18.05 BWC

Initial Pressure (P_i) 127.14'

Slug Level or Pressure (P_{max}) 129.35

Borehole Diameter 10"

Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement	Time Observed	Time Elapsed	Pressure Trans. Measurement
					SEE ATTACHED DATA.			

Recorded by JAMES A. COATES JAMES A. COATES cd (Sign and Print Name) 8-23-91 (Date)

BD-6000-293 (07/90)

9312759081 8

Page 2a R.6

6-4341G

WITHDRAWAL (BASELINE)

SE2000
Environmental Logger
08/22 10:47

Unit# 192 Test 2

INPUT 1: Level (F) TOC

Reference	127.140
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 08/22 07:10:25

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.0	0.000	127.130	-127.130
1.0	0.017	127.133	-127.133
2.0	0.033	127.133	-127.133
3.0	0.050	127.130	-127.130
4.0	0.067	127.133	-127.133
5.0	0.083	127.133	-127.133
6.0	0.100	127.133	-127.133
7.0	0.117	127.136	-127.136
8.0	0.133	127.136	-127.136
9.0	0.150	127.133	-127.133
10.0	0.167	127.133	-127.133
11.0	0.183	127.133	-127.133
12.0	0.200	127.133	-127.133

Page 3 of 6

WITHDRAWN

SE2000
Environmental Logger
08/22 10:25

Unit# 192 Test 3

INPUT 1: Level (F) TOC

Reference	127.140
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 08/22 07:37:02

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.0000	126.091	-126.091
0.008	0.0001	128.989	-128.989
0.017	0.0003	129.290	-129.290
0.025	0.0004	128.856	-128.856
0.033	0.0006	129.303	-129.303
0.042	0.0007	129.350	-129.350
0.050	0.0008	129.224	-129.224
0.058	0.0010	129.262	-129.262
0.067	0.0011	129.259	-129.259
0.075	0.0013	129.252	-129.252
0.083	0.0014	129.249	-129.249
0.100	0.0017	129.202	-129.202
0.117	0.0019	129.262	-129.262
0.133	0.0022	129.255	-129.255
0.150	0.0025	129.281	-129.281
0.167	0.0028	129.252	-129.252
0.183	0.0031	129.246	-129.246
0.200	0.0033	129.233	-129.233
0.217	0.0036	129.236	-129.236
0.233	0.0039	129.236	-129.236
0.250	0.0042	129.227	-129.227
0.267	0.0044	129.227	-129.227
0.283	0.0047	129.246	-129.246
0.300	0.0050	129.224	-129.224
0.317	0.0053	129.208	-129.208
0.333	0.0056	129.224	-129.224
0.417	0.0069	129.202	-129.202
0.500	0.0083	129.192	-129.192
0.583	0.0097	129.173	-129.173

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0.667	0.0111	129.164	-129.164
0.750	0.0125	129.154	-129.154
0.833	0.0139	129.138	-129.138
0.917	0.0153	129.126	-129.126
1.000	0.0167	129.113	-129.113
1.083	0.0181	129.103	-129.103
1.167	0.0194	129.091	-129.091
1.250	0.0208	129.078	-129.078
1.333	0.0222	129.065	-129.065
1.417	0.0236	129.053	-129.053
1.500	0.0250	129.040	-129.040
1.583	0.0264	129.027	-129.027
1.667	0.0278	129.015	-129.015
1.750	0.0292	129.008	-129.008
1.833	0.0306	128.999	-128.999
1.917	0.0319	128.986	-128.986
2.000	0.0333	128.973	-128.973
2.500	0.0417	128.913	-128.913
3.000	0.0500	128.850	-128.850
3.500	0.0583	128.793	-128.793
4.000	0.0667	128.736	-128.736
4.500	0.0750	128.685	-128.685
5.000	0.0833	128.635	-128.635
5.500	0.0917	128.587	-128.587
6.000	0.1000	128.546	-128.546
6.500	0.1083	128.502	-128.502
7.000	0.1167	128.464	-128.464
7.500	0.1250	128.426	-128.426
8.000	0.1333	128.384	-128.384
8.500	0.1417	128.356	-128.356
9.000	0.1500	128.324	-128.324
9.500	0.1583	128.286	-128.286
10.000	0.1667	128.258	-128.258
12.000	0.2000	128.137	-128.137
14.000	0.2333	128.045	-128.045
16.000	0.2667	127.960	-127.960
18.000	0.3000	127.887	-127.887
20.000	0.3333	127.824	-127.824
22.000	0.3667	127.763	-127.763
24.000	0.4000	127.719	-127.719
26.000	0.4333	127.668	-127.668
28.000	0.4667	127.627	-127.627
30.000	0.5000	127.596	-127.596
32.000	0.5333	127.567	-127.567
34.000	0.5667	127.529	-127.529
36.000	0.6000	127.501	-127.501
38.000	0.6333	127.475	-127.475
40.000	0.6667	127.453	-127.453
42.000	0.7000	127.425	-127.425
44.000	0.7333	127.409	-127.409

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46.000	0.7667	127.387	-127.387
48.000	0.8000	127.377	-127.377
50.000	0.8333	127.358	-127.358
52.000	0.8667	127.339	-127.339

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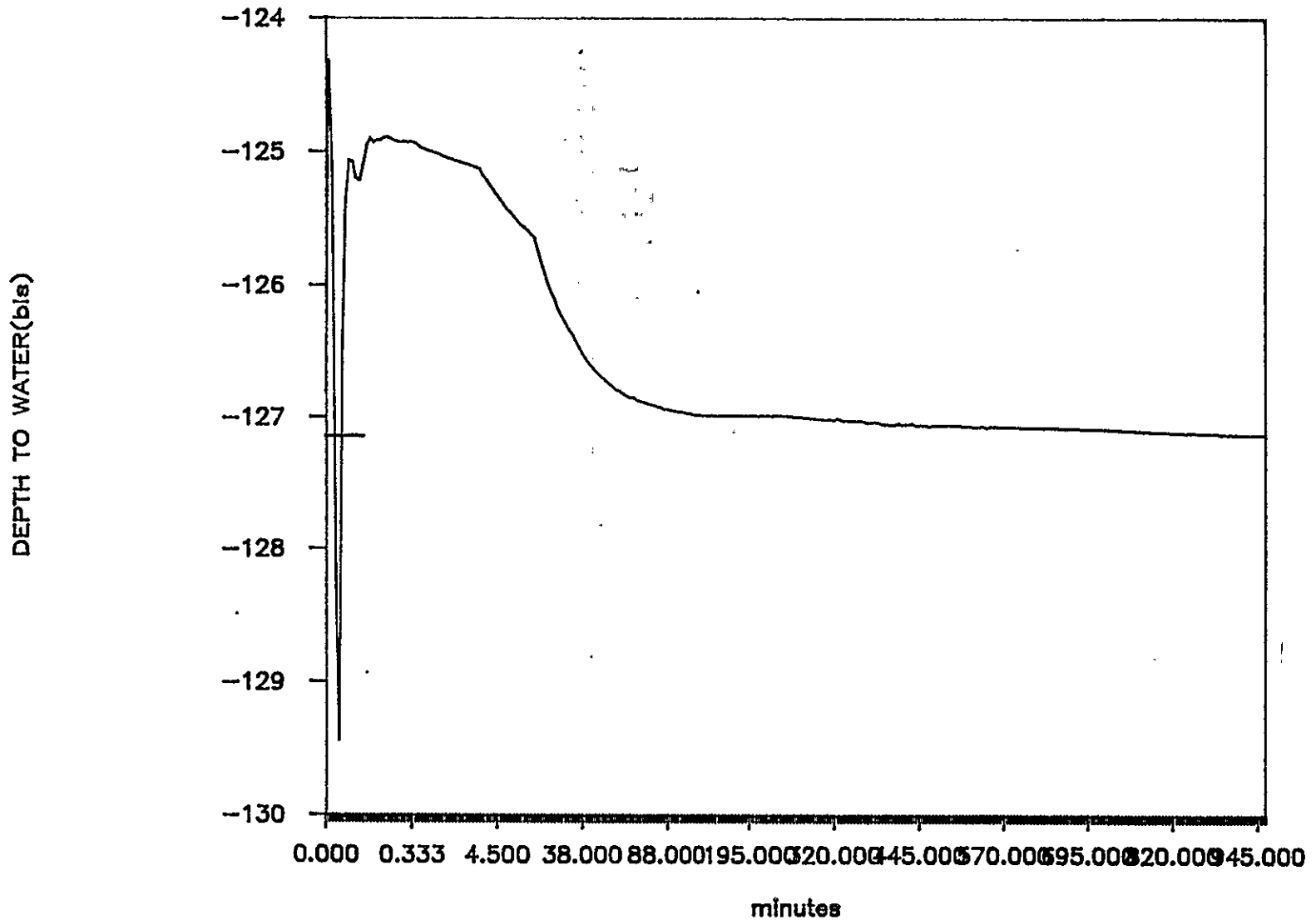
WELL 64341G INJECTION



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INSTANTANEOUS SLUG TEST DATA SHEET

INJECTION

Borehole 6-43416

Interval Tested 155'-145' BLS

Depth to Water 127.14 BLS

Date 8-21-91

Measured by JAMES A. COATES

Slug Volume 1.22 ft³ (9.13 gal) Barometer Reading (Beginning) N/A (End) N/A

Time 1512

Transducer Measurement Units FEET

Depth to Transducer 18.05' BWL

Initial Pressure (P_i) 127.14'

Slug Level or Pressure (P_{max}) 24.31

Borehole Diameter 10"

Time		Pressure Trans. Measurement	Time		Pressure Trans. Measurement	Time		Pressure Trans. Measurement
Observed	Elapsed		Observed	Elapsed		Observed	Elapsed	
				SEE ATTACHED DATA				

Recorded by JAMES A. COATES JAMES A. COATES (Sign and Print Name) 8-23-91 (Date)

BD-6000-293 (07/90)

9312709825

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BASELINE (INJECTION)

SE2000
Environmental Logger
08/22 11:19

Unit# 192 Test 0

INPUT 1: Level (F) TOC

Reference	127.140
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 08/21 14:59:33

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0	0.000	127.145	-127.145
1	0.017	127.142	-127.142
2	0.033	127.142	-127.142
3	0.050	127.145	-127.145
4	0.067	127.148	-127.148
5	0.083	127.145	-127.145
6	0.100	127.145	-127.145
7	0.117	127.142	-127.142
8	0.133	127.142	-127.142
9	0.150	127.142	-127.142
10	0.167	127.149	-127.149
11	0.183	127.145	-127.145

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6-4341G

INJECTION

SE2000
Environmental Logger
08/22 11:05

Unit# 192 Test 1

INPUT 1: Level (F) TOC

Reference	127.140
SG	1.000
Linearity	0.000
Scale factor	10.029
Offset	0.000
Delay mSEC	50.000

Step 0 08/21 15:12:02

Time:min	Time:hrs	D-T-W:Ft	d(WL):Ft
0.000	0.00000	126.810	-126.810
0.008	0.00014	124.314	-124.314
0.017	0.00028	125.090	-125.090
0.025	0.00042	128.045	-128.045
0.033	0.00056	129.439	-129.439
0.042	0.00069	126.487	-126.487
0.050	0.00083	125.356	-125.356
0.058	0.00097	125.062	-125.062
0.067	0.00111	125.077	-125.077
0.075	0.00125	125.198	-125.198
0.083	0.00139	125.217	-125.217
0.100	0.00167	125.106	-125.106
0.117	0.00194	124.954	-124.954
0.133	0.00222	124.894	-124.894
0.150	0.00250	124.932	-124.932
0.167	0.00278	124.910	-124.910
0.183	0.00306	124.910	-124.910
0.200	0.00333	124.891	-124.891
0.217	0.00361	124.887	-124.887
0.233	0.00389	124.900	-124.900
0.250	0.00417	124.919	-124.919
0.267	0.00444	124.925	-124.925
0.283	0.00472	124.932	-124.932
0.300	0.00500	124.922	-124.922
0.317	0.00528	124.932	-124.932
0.333	0.00556	124.925	-124.925
0.417	0.00694	124.935	-124.935
0.500	0.00833	124.954	-124.954
0.583	0.00972	124.973	-124.973
0.667	0.01111	124.982	-124.982
0.750	0.01250	124.992	-124.992
0.833	0.01389	125.001	-125.001
0.917	0.01528	125.011	-125.011
1.000	0.01667	125.017	-125.017
1.083	0.01805	125.030	-125.030

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1.167	0.01944	125.043	-125.043
1.250	0.02083	125.052	-125.052
1.333	0.02222	125.058	-125.058
1.417	0.02361	125.068	-125.068
1.500	0.02500	125.077	-125.077
1.583	0.02639	125.084	-125.084
1.667	0.02778	125.093	-125.093
1.750	0.02917	125.100	-125.100
1.833	0.03056	125.109	-125.109
1.917	0.03194	125.119	-125.119
2.000	0.03333	125.128	-125.128
2.500	0.04167	125.176	-125.176
3.000	0.05000	125.214	-125.214
3.500	0.05833	125.252	-125.252
4.000	0.06667	125.287	-125.287
4.500	0.07500	125.325	-125.325
5.000	0.08333	125.359	-125.359
5.500	0.09167	125.391	-125.391
6.000	0.10000	125.429	-125.429
6.500	0.10833	125.451	-125.451
7.000	0.11667	125.483	-125.483
7.500	0.12500	125.511	-125.511
8.000	0.13333	125.543	-125.543
8.500	0.14167	125.568	-125.568
9.000	0.15000	125.591	-125.591
9.500	0.15833	125.616	-125.616
10.000	0.16667	125.644	-125.644
12.000	0.20000	125.733	-125.733
14.000	0.23333	125.822	-125.822
16.000	0.26667	125.904	-125.904
18.000	0.30000	125.987	-125.987
20.000	0.33333	126.053	-126.053
22.000	0.36667	126.104	-126.104
24.000	0.40000	126.180	-126.180
26.000	0.43333	126.234	-126.234
28.000	0.46667	126.284	-126.284
30.000	0.50000	126.335	-126.335
32.000	0.53333	126.370	-126.370
34.000	0.56667	126.424	-126.424
36.000	0.60000	126.468	-126.468
38.000	0.63333	126.519	-126.519
40.000	0.66667	126.557	-126.557
42.000	0.70000	126.595	-126.595
44.000	0.73333	126.623	-126.623
46.000	0.76667	126.655	-126.655
48.000	0.80000	126.683	-126.683
50.000	0.83333	126.706	-126.706
52.000	0.86667	126.728	-126.728
54.000	0.90000	126.750	-126.750
56.000	0.93333	126.772	-126.772

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58.000	0.96667	126.794	-126.794
60.000	1.00000	126.804	-126.804
62.000	1.03333	126.823	-126.823
64.000	1.06667	126.839	-126.839
66.000	1.10000	126.851	-126.851
68.000	1.13333	126.854	-126.854
70.000	1.16667	126.873	-126.873
72.000	1.20000	126.883	-126.883
74.000	1.23333	126.889	-126.889
76.000	1.26667	126.899	-126.899
78.000	1.30000	126.905	-126.905
80.000	1.33333	126.911	-126.911
82.000	1.36667	126.921	-126.921
84.000	1.40000	126.927	-126.927
86.000	1.43333	126.940	-126.940
88.000	1.46667	126.940	-126.940
90.000	1.50000	126.949	-126.949
92.000	1.53333	126.953	-126.953
94.000	1.56667	126.956	-126.956
96.000	1.60000	126.962	-126.962
98.000	1.63333	126.965	-126.965
100.000	1.66667	126.972	-126.972
105.000	1.75000	126.975	-126.975
110.000	1.83333	126.981	-126.981
115.000	1.91667	126.984	-126.984
120.000	2.00000	126.984	-126.984
125.000	2.08333	126.987	-126.987
130.000	2.16667	126.987	-126.987
135.000	2.25000	126.991	-126.991
140.000	2.33333	126.984	-126.984
145.000	2.41667	126.991	-126.991
150.000	2.50000	126.991	-126.991
155.000	2.58333	126.987	-126.987
160.000	2.66667	126.991	-126.991
165.000	2.75000	126.984	-126.984
170.000	2.83333	126.987	-126.987
175.000	2.91667	126.991	-126.991
180.000	3.00000	126.987	-126.987
185.000	3.08333	126.991	-126.991
190.000	3.16667	126.987	-126.987
195.000	3.25000	126.991	-126.991
200.000	3.33333	126.987	-126.987
205.000	3.41667	126.987	-126.987
210.000	3.50000	126.991	-126.991
215.000	3.58333	126.987	-126.987
220.000	3.66667	126.987	-126.987
225.000	3.75000	126.987	-126.987
230.000	3.83333	126.991	-126.991
235.000	3.91667	126.984	-126.984
240.000	4.00000	126.991	-126.991

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245.000	4.08333	126.991	-126.991
250.000	4.16667	126.991	-126.991
255.000	4.25000	126.991	-126.991
260.000	4.33333	126.997	-126.997
265.000	4.41667	126.997	-126.997
270.000	4.50000	126.994	-126.994
275.000	4.58333	127.003	-127.003
280.000	4.66667	127.003	-127.003
285.000	4.75000	127.006	-127.006
290.000	4.83333	127.006	-127.006
295.000	4.91667	127.013	-127.013
300.000	5.00000	127.013	-127.013
305.000	5.08333	127.016	-127.016
310.000	5.16667	127.019	-127.019
315.000	5.25000	127.016	-127.016
320.000	5.33333	127.022	-127.022
325.000	5.41667	127.006	-127.006
330.000	5.50000	127.019	-127.019
335.000	5.58333	127.025	-127.025
340.000	5.66667	127.022	-127.022
345.000	5.75000	127.025	-127.025
350.000	5.83333	127.029	-127.029
355.000	5.91667	127.025	-127.025
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365.000	6.08333	127.032	-127.032
370.000	6.16667	127.041	-127.041
375.000	6.25000	127.035	-127.035
380.000	6.33333	127.032	-127.032
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395.000	6.58333	127.051	-127.051
400.000	6.66667	127.048	-127.048
405.000	6.75000	127.051	-127.051
410.000	6.83333	127.051	-127.051
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470.000	7.83333	127.057	-127.057
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490.000	8.16667	127.057	-127.057

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495.000	8.25000	127.057	-127.057
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505.000	8.41667	127.060	-127.060
510.000	8.50000	127.067	-127.067
515.000	8.58333	127.067	-127.067
520.000	8.66667	127.063	-127.063
525.000	8.75000	127.070	-127.070
530.000	8.83333	127.073	-127.073
535.000	8.91667	127.067	-127.067
540.000	9.00000	127.063	-127.063
545.000	9.08333	127.076	-127.076
550.000	9.16667	127.067	-127.067
555.000	9.25000	127.067	-127.067
560.000	9.33333	127.067	-127.067
565.000	9.41667	127.070	-127.070
570.000	9.50000	127.070	-127.070
575.000	9.58333	127.070	-127.070
580.000	9.66667	127.073	-127.073
585.000	9.75000	127.070	-127.070
590.000	9.83333	127.070	-127.070
595.000	9.91667	127.073	-127.073
600.000	10.00000	127.076	-127.076
605.000	10.08333	127.076	-127.076
610.000	10.16667	127.073	-127.073
615.000	10.25000	127.076	-127.076
620.000	10.33333	127.076	-127.076
625.000	10.41667	127.076	-127.076
630.000	10.50000	127.076	-127.076
635.000	10.58333	127.073	-127.073
640.000	10.66667	127.076	-127.076
645.000	10.75000	127.076	-127.076
650.000	10.83333	127.076	-127.076
655.000	10.91667	127.082	-127.082
660.000	11.00000	127.079	-127.079
665.000	11.08333	127.082	-127.082
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675.000	11.25000	127.079	-127.079
680.000	11.33333	127.079	-127.079
685.000	11.41667	127.086	-127.086
690.000	11.50000	127.086	-127.086
695.000	11.58333	127.082	-127.082
700.000	11.66667	127.086	-127.086
705.000	11.75000	127.086	-127.086
710.000	11.83333	127.082	-127.082
715.000	11.91667	127.086	-127.086
720.000	12.00000	127.089	-127.089
725.000	12.08333	127.086	-127.086
730.000	12.16667	127.089	-127.089
735.000	12.25000	127.089	-127.089
740.000	12.33333	127.092	-127.092

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745.000	12.41667	127.092	-127.092
750.000	12.50000	127.095	-127.095
755.000	12.58333	127.095	-127.095
760.000	12.66667	127.095	-127.095
765.000	12.75000	127.098	-127.098
770.000	12.83333	127.098	-127.098
775.000	12.91667	127.101	-127.101
780.000	13.00000	127.101	-127.101
785.000	13.08333	127.101	-127.101
790.000	13.16667	127.105	-127.105
795.000	13.25000	127.105	-127.105
800.000	13.33333	127.105	-127.105
805.000	13.41667	127.105	-127.105
810.000	13.50000	127.108	-127.108
815.000	13.58333	127.108	-127.108
820.000	13.66667	127.111	-127.111
825.000	13.75000	127.111	-127.111
830.000	13.83333	127.108	-127.108
835.000	13.91667	127.114	-127.114
840.000	14.00000	127.114	-127.114
845.000	14.08333	127.111	-127.111
850.000	14.16667	127.108	-127.108
855.000	14.25000	127.114	-127.114
860.000	14.33333	127.114	-127.114
865.000	14.41667	127.114	-127.114
870.000	14.50000	127.114	-127.114
875.000	14.58333	127.117	-127.117
880.000	14.66667	127.117	-127.117
885.000	14.75000	127.117	-127.117
890.000	14.83333	127.124	-127.124
895.000	14.91667	127.124	-127.124
900.000	15.00000	127.124	-127.124
905.000	15.08333	127.120	-127.120
910.000	15.16667	127.124	-127.124
915.000	15.25000	127.127	-127.127
920.000	15.33333	127.127	-127.127
925.000	15.41667	127.124	-127.124
930.000	15.50000	127.127	-127.127
935.000	15.58333	127.127	-127.127
940.000	15.66667	127.124	-127.124
945.000	15.75000	127.124	-127.124
950.000	15.83333	127.127	-127.127
955.000	15.91667	127.124	-127.124

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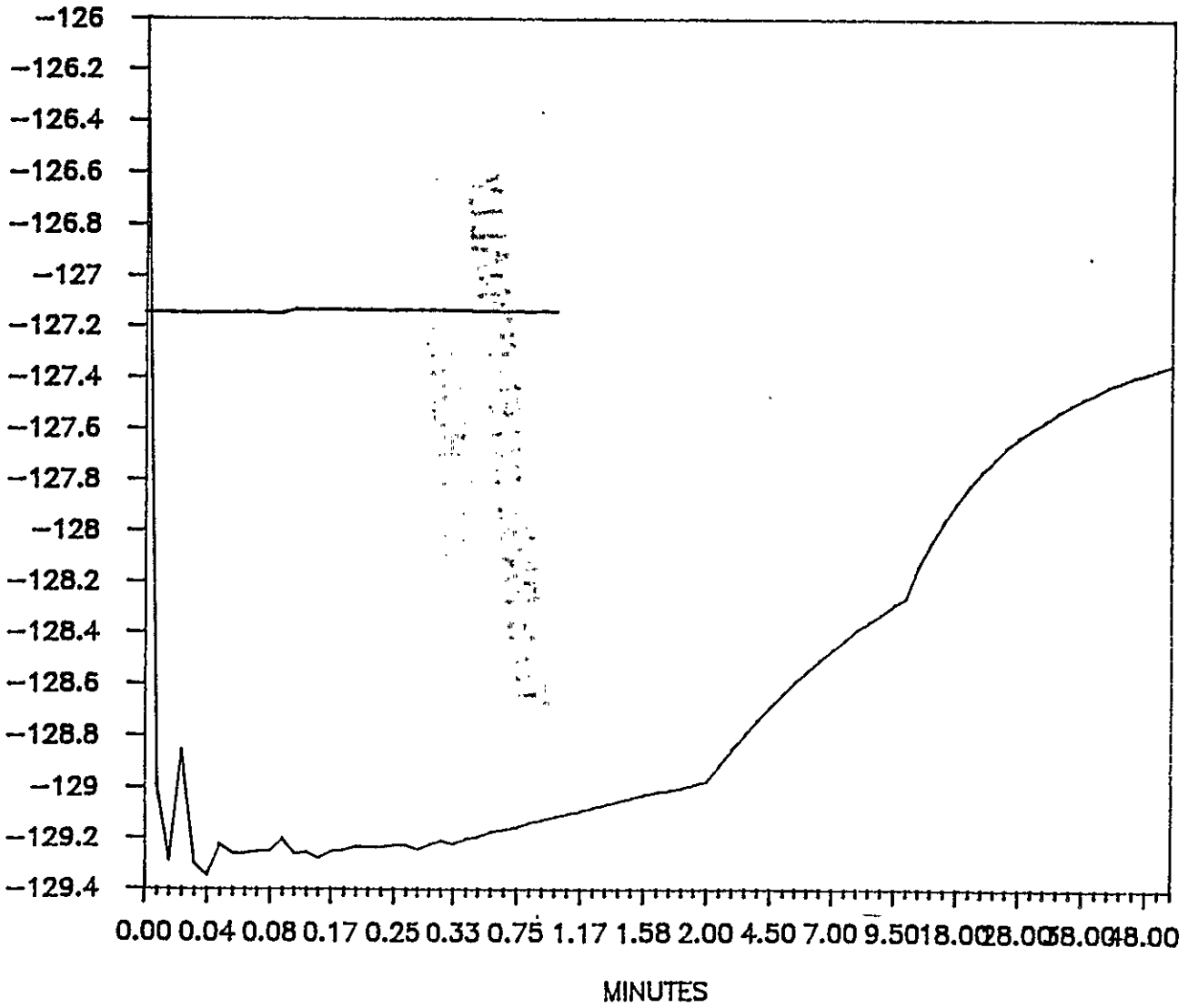
WELL 64341G WITHDRAWAL



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Classification/Unclassified Controlled Nuclear Information	[]	[]			
Patent - General Counsel	[X]	[]	B. D. Williamson		7/27/92
Legal - General Counsel	[X]	[]	B. D. Williamson	BDWilliamson	7/29/92
Applied Technology/Export Controlled Information or International Program	[]	[X]			
WHC Program/Project	[]	[X]			
Communications	[]	[X]			
RL Program/Project	[]	[X]			
Publication Services	[X]	[]	Leslie Brown	Leslie Brown	8/5/92
Other Program/Project	[]	[X]			

Information conforms to all applicable requirements. The above information is certified to be correct.

	Yes	No
References Available to Intended Audience	[X]	[]
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Author/Requestor (Printed/Signature) Date
C. D. Delaney Cynthia Delaney 7/20/92

Intended Audience
[] Internal [] Sponsor [X] External

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K. R. Fecht K. R. Fecht 7/20/92

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