ENCLOSURE

TVA CALCULATION SCG1S361

(B87 900822 007)

TVA 10697 (DNE-6-86) ORIGINAL DNE CALCULATIONS SHEET ____ OF ____

TITLE FOUNDATION INVESTIGATION OF ERCW PUMPING STATION FOUNDATION CELLS | PLANT/UNIT SQN/0

PREPARING ORGANIZATION CEB/SQN/C1 | KEY NOUNS (Consult RIMS DESCRIPTORS LIST) ERCW, CONCRETE, FOUNDATION, DRILL, GROUT

QA Record

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Prepared	A. D. Soderberg 8/16/90			
Checked	L. A. Taylor 8/21/90			
Reviewed	M. G. Manuse 8/21/90			
Approved	D. A. Kuh			
Date	8/21/90			
See Form TVA 10534 when page required. List all pages added by this revision.				
List all pages deleted by this revision.				
List all pages changed by this revision.				
These calculations contain an assumption(s) that must be verified later Yes[ ] No[X]		Yes [ ] No [ ]	Yes [ ] No [ ]	Yes [ ] No [ ]

Safety-related? Yes[X] No[ ]

Statement of Problem

THE PURPOSE OF THIS CALCULATION IS TO DOCUMENT THE LIMITED EXPLORATION PROGRAM THAT HAS BEEN CONDUCTED FOR THE INVESTIGATION OF THE ERCW PUMPING STATION FOUNDATION CELLS. THE SPECIFIC PURPOSE OF THE PROGRAM WAS TO RE-CONFIRM THE ADEQUACY OF THE CONCRETE FOR ELEMENTS D & B OF THE ERCW PUMPING STATION FOUNDATION CELLS.

Abstract

THIS INVESTIGATION VALIDATES THE ASSUMPTIONS THAT WERE UTILIZED FOR ELEMENTS D & B IN THE PRE-RESTART EVALUATION OF THE FOUNDATION AND RE-CONFIRMS THE STRUCTURAL INTEGRITY OF THE PUMPING STATION FOUNDATION CELLS, THE CELLS WILL PERFORM THEIR INTENDED FUNCTION UNDER ALL DESIGN CONDITIONS AND NO ADDITIONAL INVESTIGATION IS NECESSARY OR REQUIRED.

[ ] Microfilm and store calculations in RIMS Service Center. Microfilm and Destroy [ ]

[X] Microfilm and return calculations to: John Dennis Address: Trailer-K, SQN

cc: RIMS, SL26 C-K

TVA

SHEET ___ OF ___

FOUNDATION INVESTIGATION EVALUATION OF ERCW
Title: PUMPING STATION FOUNDATION CELLS

REVISION LOG

SCG1S361

Revision No.	DESCRIPTION OF REVISION	Date Approved
R0	INITIAL ISSUE CONTAINS 213 PAGES Legibility evaluated and accepted for issue. Signature 8/21/90 Date	

TVA 10534 (EN DES 4-78)

SHEET ____ OF ____

CALCULATION DESIGN VERIFICATION (INDEPENDENT REVIEW) FORM

SCG1 361 - 0
Calculation No. Revision

Method of design verification (independent review) used (check method used):

1. Design Review ✓
2. Alternate Calculation
3. Qualification Test

Justification (explain below):

Method 1: In the design review method, justify the technical adequacy of the calculation and explain how the adequacy was verified (calculation is similar to another, based on accepted handbook methods, appropriate sensitivity studies included for confidence, etc.).

Method 2: In the alternate calculation method, identify the pages where the alternate calculation has been included in the calculation package and explain why this method is adequate.

Method 3: In the qualification test method, identify the QA documented source(s) where testing adequately demonstrates the adequacy of this calculation and explain.

This calculation was verified by consultant review. This calculation was reviewed by L.G. Hash - Chief Structural Engr. Bechtel Corp., Los Angeles; ~~E.D. Graf~~ B. Gerwick on 8/21/90 - Foundation and Structural Engineering; and E.O. Graf - industry specialist in field of grouting.

Fred A. Boyle 8/21/90
Design Verifier (Independent Reviewer) Date

Calculation Format Note: This calculation is divided into two parts: (1) a report detailing the limited exploration program for the foundation investigation of Elements D and B of the ERCW pumping station foundation and (2) supporting documentation for drilling and grouting that was completed for the program under procedure SMI-0-400-6.

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SHEET 1 OF ____

NUCLEAR ENGINEERING

CIVIL ENGINEERING

SEQUOYAH NUCLEAR PLANT

FOUNDATION INVESTIGATION AND EVALUATION ESSENTIAL RAW COOLING WATER (ERCW) PUMPING STATION ELEMENTS D AND B

Prepared:	A. D. Soderberg	A D Soderberg Jr.
Checked:	F. S. Taylor	F. S. Taylor
Reviewed:	M. G. Maxwell	M. G. Maxwell
Approved:	D. L. Lundy	D L Lundy
	J. K. McCall	J. K. McCall

Concurrence By Consultants:

L. G. Hersh	L G Hersh
E. D. Graf	E. D. Graf/LGH
B. Gerwick, Jr.	Ben C Gerwick Jr.

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August 1990
SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION AND EVALUATION OF
ERCW PUMPING STATION
ELEMENTS D AND B

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SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION AND EVALUATION OF
ERCW PUMPING STATION
ELEMENTS D AND B

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1.0 PURPOSE

The purpose of this investigation was to conduct a limited exploration program for the ERCW foundation cells, elements D and B to re-confirm the adequacy of the concrete, and to validate the assumptions regarding the character, extent and size of aggregate zones that were used in the pre-restart evaluation.

2.0 BACKGROUND

As a condition of restart for the Sequoyah Nuclear Plant, TVA committed in a letter to the NRC dated March 3, 1988, (Reference 5) to perform the following:

> "Perform a further assessment of the as-built conditions of the concrete foundation (placed by the tremie technique) with special emphasis on determining the extent and size of "cavities" and gravel pockets. An evaluation program plan will be submitted to the NRC for review and concurrence."

Once the as-built condition is confirmed, TVA also committed to;

> "Review the seismic qualification of the ERCW pumping station equipment for continued acceptability."
>
> "Evaluate the ERCW pumping station deflections to confirm no adverse interaction with ERCW piping."
>
> "Confirm that the design requirements for the OBE concurrent with water level at Elevation 704 are satisfied."

TVA submitted to NRC on October 20, 1988, (Reference 2) an evaluation of the ERCW foundation and roadway access cells performed by Bechtel North American Power Company (BNA). BNA's evaluation concluded that the ERCW foundation and roadway access cells are structurally adequate and will function as intended under their design loads but recommended a limited investigation of the ERCW pumping station to verify the structural adequacy.

In a letter to the NRC dated December 28, 1989, (Reference 3) TVA committed to perform a limited exploration program for the foundations. This program included drilling eight new exploration holes through the concrete and into rock in the ERCW pumphouse foundation cell (six in element D and two in element B), evaluating the core and grouting the holes. The following commitments were established to track the completion of the program:

> "TVA will perform a limited exploration program for the ERCW pumphouse foundation."
>
> "TVA will inform NRC of the results of the exploration."
>
> "Any changes of the action plan for the exploration program for the ERCW pumphouse foundation will be submitted to NRC for approval."

2.0 **BACKGROUND** (continued)

TVA later revised the program plan for Element D to place another hole near the perimeter of the foundation to increase the effectiveness of grouting on the perimeter. TVA also placed a hole to intersect Hole 39 from the original investigation program to further verify that cavities do not exist. TVA also revised the program to drill only one hole in Element B based on the satisfactory results of that hole. (Reference 9)

3.0 **INVESTIGATION**

3.1 **General**

The investigation consisted of drilling three-inch-diameter core holes in elements D & B starting at floor slab elevation 688 of the ERCW pumping station extending through the foundation cells and continuing approximately 15 feet into bedrock. Drilling and grouting instructions are documented in SMI-0-400-6 and DCN M01312.

Six holes were positioned in order to investigate the concrete between the horizontal intake liners. The holes were spaced in Element D from near the edge of the foundation cell to the back of the traveling screen liner (Figures 1, 2, 3 and 5). Element B required one hole drilled near the edge of the foundation cell (Figures 1, 4 and 5). Holes were located to facilitate access of the drill equipment and resulted in drilling both vertical holes and holes at a slight angle from vertical.

In order to prevent the accidental penetration of pipes or conduits, an electric drill equipped with a ground fault interruption device was used for the first 3 to 4 feet. Each hole was completed utilizing a wireline core drill to a minimum depth of 15 feet below the concrete/rock interface.

Because the concrete contained zones of densely packed and/or partially cemented aggregate, drilling was accomplished in steps. Drilling progressed until sand caused the drill to stall and stop advancement. At this point the drill rod was removed and the hole was visually examined (down hole video) to investigate the physical characteristic of the material in these zones. The holes were then grouted to seal the aggregate zone and after the grout was set, drilling continued. Grouting from the floor level down to Elevation 640 was accomplished under static head using Type I Portland cement while grouting between Elevation 640 and the top of rock was done under 15 psi pressure utilizing Microfine MC-500 grout. Details of these operations are discussed further in Section 4.1.4 and 4.2.4. After completion of the holes to a depth of 15 feet into the bedrock, the entire length of the hole was backfilled with a low water-cement ratio, Type I Portland Cement grout.

3.2 **Examination Data**

A drill log record was maintained as each hole was drilled. Each drilled section of core, or "pull", was recorded. Any loss or gain of drill water, and any unexpetted conditions encountered during drilling were noted (Attachments 1 and 2 and Appendix A)

The cores were placed in divided boxes in 5-foot lengths for evaluation. After the completion of each hole, Nuclear Engineering (NE) representatives logged the core and noted the condition of the concrete, concrete/rock

3.0 INVESTIGATION (continued)

3.2 Examination Data (continued)

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interface and rock (Attachments 3 and 4). A photograph was taken of each box of core for a visual record (Attachments 5 and 6).

Where only sand or coarse aggregate was recovered, a bore-hole TV camera was used to further evaluate these zones. This investigation took place prior to sealing the zones with grout. A video tape was made of these zones for future reference. (Tapes are stored in the SQN vault.)

Upon completion of data collection and evaluation, the holes were back-filled with cement grout or pressure grouted with Microfine grout, and the volume of grout recorded.

3.3 Detailed Data Results

A tabulation of the data obtained for each hole follows (elevation in feet): (See Attachment 1 and Appendix A)

3.3.1 Element D

PSD-1 drilled in 1989/90 - 4.75° angle from vertical

Concrete : - 688.? - 617.9 sound concrete alternating with densely packed and/or partially cemented aggregate zones 670.2 to 669.6, 669.4 to 667.3, 667.0 to 665.4, 663.8 to 658.2, 655.6 to 653.5, 645.9 to 641.0, 635.0 to 634.6, 634.2 to 632.4, 631.9 to 631.8, 631.5 to 623.7; cement seam 647.4 to 647.0, 646.4 to 645.9
- core recovery 61.8%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - piece of burlap bag between concrete and rock, otherwise interface was solid and in contact

Limestone/shale : - top of rock 617.9
- slightly weathered parting 615.5
- slightly weathered shale 612.0 - 611.6
- no drill water loss
- core recovery 100%
- bottom of hole 602.3

Grouting : - top of hole to elevation 640 backfilled with 12.5 ft^3 (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 3.8 ft^3 (net) of Microfine grout; rock zone backfilled with 1.2 ft^3 (gross) of Type I cement grout

3.3 **Detailed Data Results** (continued)

3.3.1 **Element D** (continued)

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PSD-2 drilled in 1989/90 - vertical hole

Concrete : - 688.3 - 617.6 sound concrete alternating with densely packed and/or partially cemented aggregate zones 669.9 to 664.7, 663.4 to 660.4, 660.2 to 659.7, 659.5 to 657.4, 655.2 to 653.7, 653.4 to 653.3, 646.1 to 645.9, 645.7 to 640.2, 633.9 to 633.1, 632.8 to 631.7, 631.4 to 630.9 630.7 to 626.7, 626.4 to 626.3, 626.1 to 625.6, 625.5 to 623.7, 623.4 to 622.8, 622.5 to 622.2; cement seam 646.3 to 646.1; weak concrete 660.4 to 660.2, 659.7 to 659.5, 645.9 to 645.7, 625.6 to 625.5
- core recovery 60.7%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - solid but separated slightly at interface

Limestone/shale : - top of rock 617.6
- core loss 614.5 to 614.1
- weathered near vertical joint 616.7 to 616.2
- core recovery 97.4%
- bottom of hole 602.0

Grouting : - top of hole to elevation 640 backfilled with 5 ft^3 (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 2 ft^3 (net) of Microfine grout; rock zone backfilled with 5.5 ft^3 (gross) of Type I cement grout

PSD-5 drilled in 1989/90 - 4.75° angle from vertical

Concrete : - 688.0 - 615.7 sound concrete alternating with densely packed and/or partially cemented aggregate zones 627.7 to 627.2, 626.4 to 626.2, 625.9 to 625.7, 624.9 to 624.6; cement seam 644.1 to 643.9, 643.7 to 643.3, 643.0 to 642.2, 641.9 to 641.0, 640.4 to 639.9; cement with sand 666.5 to 666.1, 627.2 to 627.0, 626.2 to 625.9; cement with aggregate 627.0 to 626.4; weak concrete 658.9 to 658.5, 628.1 to 627.7
- core recovery 98.3%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - solid but separated slightly at interface

3.3 **Detailed Data Results** (continued)

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3.3.1 **Element D** (continued)

PSD-5 drilled in 1989/90 - 4.75° angle from vertical (continued)

Limestone/shale : - top of rock 615.7
- slightly weathered parting 615.5
- slightly weathered shale 612.0 -611.6
- 100% drill water loss at 609.0
- core recovery 100%
- bottom of hole 599.3

Grouting - top of hole to elevation 640 backfilled with 0.4 ft^3 (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 0.2 ft^3 (net) of Microfine grout; rock zone backfilled with 2.0 ft^3 (gross) of Type I cement grout

PSD-6 drilled in 1989/90 - vertical hole

Concrete : - 688.0 - 615.5 sound concrete alternating with densely packed and/or partially cemented aggregate zones 644.3 to 643.8, 642.9 to 642.5, 642.2 to 642.0, 632.9 to 632.6, 632.3 to 631.9, 631.8 to 631.5, 630.2 to 626.9; cement seam 643.7 to 643.5, 641.3 to 640.7, 625.1 to 624.0; weak concrete 643.3 to 642.9, 631.9 to 631.8, 626.7 to 626.4; cement with sand 642.0 to 641.3, 621.6 to 620.7
- core recovery 92.6%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - core loss due to driller not latching inner barrel

Limestone/shale : - top of rock 615.5
- open highly weathered joint 598.6 to 598.5
- 100% drill water loss at 598.5
- core recovery 74.3%
- bottom of hole 597.8

Grouting : - top of hole to elevation 640 backfilled with 0.4 ft^3 (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 4.2 ft^3 (net) of Microfine grout; rock zone backfilled with 2.5 ft^3 (gross) of Type I cement grout

PSD-7 drilled in 1990 - 2.4° angle from vertical

Concrete : - 688.3 - 617.6 sound concrete alternating with densely packed and/or partially cemented aggregate zones 670.1 to 667.5, 667.1 to 666.2, 666.0 to 665.0, 663.5 to 660.2, 660.1 to 659.9, 659.3 to 657.9, 655.6 to 653.7, 646.2 to 642.5, 642.0 to 640.7, 634.9 to 634.3, 633.6 to 632.8, 632.6 to 624.3, 624.1 to 623.4; cement seam 647.4 to 647.2, 646.6 to 646.2; weak concrete 642.5 to 642.0

3.3 **Detailed Data Results** (continued)

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3.3.1 **Element D** (continued)

PSD-7 drilled in 1990 - 2.4° angle from vertical (continued)

Concrete : (continued)
- core recovery 68.9%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - solid but separated slightly at interface

Limestone/shale : - top of rock 617.6
- slightly weathered parting 617.0, 616.4, 614.4
- highly weathered parting 610.6
- drill water loss at 616.4, 614.4, 610.0
- core recovery 100%
- bottom of hole 602.1

Grouting : - top of hole to elevation 640 backfilled with 3.2 ft^3 (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 0.8 ft^3 (net) of Microfine grout; rock zone backfilled with 1.5 ft^3 (cement) of Type I cement grout

PSD-8 drilled in 1990 - 4.75° angle from vertical

Concrete : - 688.3 - 617.9 sound concrete alternating with densely packed and/or partially cemented aggregate zones 670.2 to 669.6, 669.4 to 667.3, 667.0 to 665.4, 663.8 to 658.2, 655.6 to 653.5, 645.9 to 641.0, 635.0 to 634.6, 634.2 to 632.4, 631.9 to 631.8, 631.5 to 623.7; cement seam 647.4 to 647.0, 646.4 to 645.9
- core recovery 61.8%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - piece of burlap bag between concrete and rock, otherwise solid contact

Limestone/shale : - top of rock 617.9
- slightly weathered parting 615.5
- slightly weathered shale 612.0 - 611.6
- no drill water loss
- core recovery 100%
- bottom of hole 602.3

Grouting : - top of hole to elevation 640 backfilled with 12.5 ft^3 (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 3.8 ft^3 (net) of Microfine grout; rock zone backfilled with 1.2 ft^3 (gross) of Type I cement grout

3.3 **Detailed Data Results** (continued)

3.3.1 **Element D** (continued)

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Hole 39 drilled in 1977 - vertical hole located 22' north and 20' east of the center of the pumping station

Concrete : - 685.2 - 618.2 sound concrete alternating with densely packed and/or partially cemented aggregate zones* 671.6 to 671.0, 670.0 to 667.0, 665.2 to 663.3, 662.4 to 660.6, 656.9 to 655.3, 646.5 to 644.9, 634.3 to 634.3, 630.8 to 627.1, 625.6 to 623.9; cement seam 676.4 to 676.3, 659.6 to 659.5, 649.2 to 649.1, 647.5 to 647.4, 643.6 to 643.5
- core recovery 73.3%

*Note: These zones were defined as cavities, soft seams or soft concrete during 1977 investigation.

Concrete/rock interface : - sound concrete with weathered rock at interface

Limestone/shale : - top of rock 618.2
- weathered rock 618.2 to 617.3
- core recovery 100%
- bottom of hole 599.4

Grouting : - No information is available to define whether grouting was completed or not.

3.3.2 **Element B**

PSB-1 drilled in 1990 - 4.75° angle from vertical

Concrete : - 688.2 - 619.8 sound concrete alternating with densely packed and/or partially cemented zones 663.0 to 662.6, 662.1 to 660.9, 660.6 to 656.5, 655.6 to 653.2, 653.1 to 651.3, 643.7 to 643.2, 642.8 to 641.4, 624.9 to 623.9; cement seam 646.6 to 646.5; weak concrete 639.0 to 638.9; open seam 619.9 to 619.8
- core recovery 81.3%

The TV camera showed that the aggregate zones were intact with no voids and these zones did not slump but remained vertical over their full height.

Concrete/rock interface : - 0.1' open seam and core loss in rock at the interface

Limestone/shale : - top of rock 619.8
- slightly weathered parting 615.5
- slightly weathered shale 612.0 - 611.6
- no drill water loss
- core recovery 97.5%
- bottom of hole 604.1

3.3 **Detailed Data Results** (continued)

3.3.2 **Element B** (continued)

PSB-1 drilled in 1990 - 4.75° angle from vertical (continued)

Grouting : - top of hole to elevation 640 backfilled with 2.3 ft³ (gross) of Type I cement grout; elevation 640 to top of rock pressure injected 0.5 ft³ (net) of Microfine grout; rock zone backfilled with 1.5 ft³ (gross) of Type I cement grout

Hole 41 drilled in 1977 - vertical hole located 22' south and 20' east of the center of the pumping station

Concrete : - 685.2 - 618.2 sound concrete alternating with densely packed and/or partially cemented aggregate zones* 671.6 to 671.0, 670.0 to 667.0, 665.2 to 663.3, 662.4 to 660.6, 656.9 to 655.3, 646.5 to 644.9, 634.3 to 634.3, 630.8 to 627.1, 625.6 to 623.9; cement seam 676.4 to 676.3, 659.6 to 659.5, 649.2 to 649.1, 647.5 to 647.4, 643.6 to 643.5
- core recovery 73.3%
*Note: These zones were defined as cavities, soft seams or soft concrete during 1977 investigation.

Concrete/rock interface : - sound concrete with weathered rock at interface

Limestone/shale : - top of rock 618.2
- weathered rock 618.2 to 617.3
- core recovery 100%
- bottom of hole 599.4

Grouting : - No information is available to define whether grouting was completed or not.

4.0 ASSESSMENT OF DATA

4.1 Element D

4.1.1 Concrete

Six new holes (1, 2, 5, 6, 7, 8) were drilled in Element D in addition to Hole 39 which was drilled in 1987. New holes 3 and 4 were started but not drilled below elevation 680'. The results of the drilling are shown graphically on Figure 6.

The concrete for Element D consists of sound concrete with lenses of densely packed and/or partially cemented aggregate. Inspection with a down-hole TV camera showed that the aggregate in each lense was self-supporting and did not slough into the hole. The strength of the material could not be determined since a core could not be recovered.

Three predominant aggregate lenses that are intermixed with sound concrete are evident from the graphic log for Element D. The first occurs between approximately elevation 655 and 670; the second from approximately elevation 640 to 645; and the third from approximately elevation 624 to 634.

4.0 **ASSESSMENT OF DATA** (continued)

4.1 **Element D** (continued)

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4.1.1 **Concrete** (continued)

The three lenses are seen in holes PSD-1, 7, 2 and Hole 39. The graphic logs for holes PSD-5, 6, and 8 indicate that for all three elevations, the aggregate lenses either partially or completely dissipate before reaching the locations of holes 5, 6, and 8 (Approximately 12 feet from hole 39). It should be noted that the 6 new holes indicate conditions that are equivalent too or better than the original hole 39. Thus, the new holes validate the condition of the original hole 39 and do not identify any differences with the exception that they define the presence of partially cemented and/or densely packed material in these areas previously identified as "cavities".

4.1.2 **Concrete/Rock Interface**

The concrete/rock interface as observed in the core samples contained sound, unweathered rock at the contact in all of the holes. The bond between the concrete and rock was generally tight with a few places showing slight separation. In hole PSD-1 a piece of burlap was recovered at the interface and hole PSD-8 had 0.2' of partially cemented sand and aggregate at the interface. The core loss occurring at the interface and into the rock for hole PSD-6 was due to the driller not latching the inner core barrel. The TV camera showed this zone to be sound concrete and rock.

Based upon the core and viewing with the TV camera, the rock surface was judged to have been thoroughly cleaned and weathered rock removed before the placement of concrete.

4.1.3 **Rock**

The rock beneath element D is a sound, unweathered, steeply dipping, interbedded limestone and shale with only a very few slightly weathered partings occurring randomly in the rock. When the side of the holes are viewed with a down-hole TV camera, rock is visible over the entire length of the holes. The rock core observed from element D is consistent with that previously encountered at this site and is consistent with the original calculation of rock modulus and bearing capacity (Reference 6).

4.1.4 **Grouting**

To facilitate drilling in the aggregate zones, it was necessary to seal the zones as drilling progressed. Between the floor slab and elevation 640, cement grout with a 1:1 water-cement ratio was placed under static head through a pipe to the temporary bottom of the hole. Sufficient grout was placed to seal the aggregate zones.

Between elevation 640 and the top of rock these aggregate zones were grouted with MC-500 Microfine cement using 15 psi pressure. Grout take, minus the theoretical volume of the hole, varied from 0.2 ft^3 to 4.2 ft^3 and averaged 2.0 ft^3 for this zone. The volume of grout was recorded. Thus, the grout "take" into the aggregate zones was

4.0 ASSESSMENT OF DATA (continued)

4.1 Element D (continued)

SCG1S361

4.1.4 Grouting (continued)

minimal and attests to the presence and density of material in the zones.

The rock zones were backfilled under static head using Type I cement with a 1:1 water-cement ratio and the remainder of the hole was also backfilled to the surface using the same grout.

4.2 Element B

4.2.1 Concrete

One new hole (PSB-1) was drilled in Element B in addition to Hole 41 drilled in 1977. The results of the drilling are shown on Figure 7.

The concrete for Element B consists of sound concrete with one significant lense of aggregate and two small lenses. Inspection with a down-hole TV camera showed that the aggregate in each lense was self-supporting and did not slough into the hole. The strength of the material could not be determined since a core could not be recovered.

The first lense occurs between approximately elevation 651 and 663; the second between approximately elevation 641 to 643; and the third between approximately elevation 624 to 625.

As can be seen in Figure 7, the new hole validates the original hole 41 as to the location and extent of sound concrete and zones other than sound concrete.

4.2.2 Concrete/Rock Interface

The concrete/rock interface as observed in the core sample contained a 0.1' seam at the interface.

4.2.3 Rock

The rock beneath Element B is a sound, generally unweathered steeply dipping, interbedded limestone and shale with only a very few slightly weathered partings occurring randomly in the rock. When the side of the hole is viewed with a bore-hole TV camera, rock is visible over the entire length of the hole. The rock core observed from Element B is consistent with that previously encountered at this site and is consistent with the original calculation of rock modulus and bearing capacity (Reference 6).

4.2.4 Grouting

To facilitate drilling in the aggregate zones it was necessary to seal the zones as drilling progressed. Between the floor slab and elevation 640, cement grout with a 1:1 water-cement ratio was placed through a pipe to the temporary bottom of the hole. Sufficient grout was placed to seal the aggregate zones.

4.0 ASSESSMENT OF DATA (continued)

4.2 Element B (continued)

4.2.4 Grouting (continued)

Between elevation 640 and the top of rock, the 1 foot aggregate zone was grouted with MC-500 Microfine cement using 15 psi pressure. Grout take was 0.5 ft^3 for this zone which is very minimal and attests to the presence and density of material in the zone. The rock zone was backfilled under static head using Type I cement with a 1:1 water-cement ratio and the remainder of the hole was also backfilled to the surface using the same grout.

5.0 ENGINEERING EVALUATION OF RESULTS OF LIMITED EXPLORATION PROGRAM

5.1 General

Sections 5.2 and 5.3 discuss the condition of Elements B & D between the intake liners (Elevation 624 to 634). The determination of the condition of the concrete in Elements B and D between these elevations was the original concern of the drilling program. These sections are critical for structural integrity and stability because of reduced cross section due to the horizontal intake liners and because they are at the location of highest seismic overturning moments. Section 5.4 discusses the aggregate lenses which were identified at higher elevations (generally between El 650 and 670).

Element D
The exploratory drilling/grouting of Element D was initiated to determine the extent of "cavities" and gravel seams between the intake liners and to validate the assumptions that were used in the pre-restart analysis. Interpretation of the drilling performed in 1977 indicated the existence of "cavities". As an adjunct to the exploration, the program was also intended to enhance the load carrying capability of concrete in Element D by grouting the aggregate zones to the extent possible and backfilling the exploratory holes with grout.

Element B
Exploratory drilling/grouting of Element B was initiated to verify the existence of sound concrete between the intake liners. The 1977 drilling indicated the existence of sound concrete and this was the basis used in the pre-restart analyses.

5.2 Elements D and B Between Intake Liners (Aggregate Lenses Between Approximately El 634 to 624)

5.2.1 Element D

A total of 6 new core holes were drilled in Element D. The drilling and down-hole camera inspections showed that no "cavities" exist in Element D between the intake liners. However, aggregate lenses were encountered between approximately elevations 634 to 624.

5.0 ENGINEERING EVALUATION OF RESULTS OF LIMITED EXPLORATION PROGRAM (continued)

5.2 Elements D and B Between Intake Liners (Aggregate Lenses Between Approximately El 634 to 624) (continued)

SCGIS361

5.2.1 Element D (continued)

5.2.1.1 Aggregate Lenses

The video record of the aggregate lenses shows a dense matrix of coarse and fine aggregate. The aggregate is cemented to some degree since the material does not slough into the hole. However, the cementing of the material was not great enough to resist the drilling forces and thus a core could not be retrieved.

5.2.1.2 Grouting

The grouting of the aggregate lenses was performed using microfine grout due to its capability of penetrating very small voids. The grouting of the aggregate lenses between the intake liners (Elevation 624 to 634) enhanced the strength of the material between the liners to the extent possible. However, since the material in the aggregate lenses was very dense and pressures were limited by liner stresses, the effects of grouting were limited. To maximize the effects of grouting, 3 holes on the perimeter of the cell were drilled/grouted. Grouting of these 3 holes forms "columns" of sound material near the edge which provides the greatest structural benefit and enhancement of the strength of the cell.

5.2.1.3 Effects on Structural Evaluations

The actual capacity of the aggregate lenses in Element D was not quantified as no material was recovered. However, the aggregate has the capability to transfer loads.

Confinement of the aggregate lenses is provided by intermingling with zones of sound concrete, by the stiffened steel liners on the sides, and by the sheet piles. Additionally, the aggregate is confined by the grout columns which resulted from the drilling and grouting of the 6 holes in Element D. The confinement by the grout columns is most effective on the edge of the Element D adjacent to the sheet piles since three parallel holes were drilled and grouted along the perimeter of the element.

The structural evaluation of the pumping station performed for restart conservatively assumed that zones identified as "cavities" or gravel in Element D in the original drilling program (1977) would be considered as having no load carrying capability. Thus, the Element D area between the intake liners was neglected. However, the drilling and downhole camera inspection of Element D has shown that a cavity does not exist, that material is present and has load transfer capability. In addition, the grouting of the 6 holes in Element D has provided some enhancement of the

5.0 ENGINEERING EVALUATION OF RESULTS OF LIMITED EXPLORATION PROGRAM (continued)

5.2 Elements D and B Between Intake Liners (Aggregate Lenses Between Approximately El 634 to 624) (continued)

5.2.1 Element D (continued)

5.2.1.3 Effects on Structural Evaluations (continued)

transfer capability. In addition, the grouting of the 6 holes in Element D has provided some enhancement of the strength of the foundation. Therefore, because the structural capacity of Element D of the pumping station foundation is greater than assumed in the pre-restart calculation, the capacity to resist seismic overturning moments is significantly greater.

5.2.2 Element B

One new core hole was drilled in Element B. The drilling was intended to show that the concrete between the intake liners was sound concrete as shown in the 1977 drilling of Hole 41.

The drilling results showed that the material between the liners for Element B was sound concrete except for a one-foot thick aggregate lense between elevations 624 and 625. Due to the small thickness of this aggregate lense and the fact that the lense was not detected in hole 41, which is approximately 15 ft away, this lense would have no significance with respect to the structural capacity of the foundation. Thus, the assumption of sound concrete in Element B that was utilized in the pre-restart analysis has been validated.

5.3 Aggregate Lenses at Higher Elevations of the Foundation (Between Approximately El 650 and 670)

The new core holes and the original core holes indicate the presence of aggregate lenses between approximately elevations 650 and 670. From a structural standpoint, these lenses are not as critical as the lower sections for the following reasons: 1) The cross-section of the foundation is much greater at this elevation since the cross section of the openings for the travelling screen is much smaller than the openings for the intake liners. Also the openings for the travelling screens are nearer to the neutral axis thus minimizing their impact on capacity of the foundation. 2) The overturning seismic forces are less at these higher elevations.

To assess the lateral extent of aggregate lenses between approximately Elevation 650 and 670, plans were drawn at a discrete number of elevations. These plans demonstrate that the spatial distribution of the aggregate lenses between Elevations 650 and 670 are sporadic in nature, are of limited dimension in both plan and elevation and are not continuous from one elevation to the next. No continuous horizontal aggregate lense was found and at no elevation does an area of aggregate lense exceed 25% of the total plan area of the foundation. This review is documented in Reference 7. In order to assess the stresses in the foundation at this location, an analysis has been completed and documented (Reference 7). This analysis categorized the material as sound or soft concrete or gravel. Areas identified as gravel were conservatively neglected as having any load

5.0 ENGINEERING EVALUATION OF RESULTS OF LIMITED EXPLORATION PROGRAM (continued)

5.3 Aggregate Lenses at Higher Elevations of the Foundation (Between Approximately El 650 and 670) (continued)

carrying capability. The results of this analysis for the SSE load condition are as follows:

Concrete Type	Compressive Stress, psi		Shear Stress, psi		Stress Ratio	
	Calculated	Allowable	Calculated*	Allowable	Compressive Calculated / Allowable	Shear Calculated / Allowable
Sound	536	2600	45	126	0.21	0.36
Soft	722	1105	28	82	0.65	0.34

*Very conservatively utilized total shear at base of foundation. Actual stresses would be much less.

Based on the results of this analysis, the structural integrity of the pumping station foundation at the aggregate lenses between approximately El 650 and 670 has been demonstrated to meet design requirements for the postulated design basis loads.

5.4 Assessment of Effect of As-Built Condition of Foundation on Structural Behavior, Seismic Equipment Qualification and ERCW Piping

As previously discussed in Section 4.C, the results of the drilling of 7 new holes in Elements D and B did not identify any differences in the foundation condition than those determined by the original investigation program performed immediately after construction of the cells. Thus, the conclusion as addressed in TVA's March 2, 1988 letter to NRC (Reference 10), that the as-built condition of the foundation does not significantly affect the dynamic behavior of the pumping station is still valid. As also noted in that letter, the effect of the foundation condition on seismic equipment qualification is not significant and thus, the qualification of the equipment is still valid.

To address the effect of the as-built condition of the foundation on the deflection of the structure and its effect on piping, the information in the March 2, 1988 submittal should be utilized. It demonstrates that when the weak zones are considered, the deflection of the structure under SSE load increases a maximum of 5.5% with a total maximum deflection of 0.029 inches. This additional deflection of the structure is insignificant and would have no impact on the qualification of the ERCW piping since the piping is encased in a 2" thick fiberglass shell and 1" thick insulation as it enters the pump station.

5.5 Evaluation of Foundation for Operating Basis Earthquake (OBE) + Water Level at Elevation 704.0

To evaluate this design condition, TVA has developed a calculation to assess the stresses in the foundation at the critical section of the horizontal intake liners (Reference 8). This calculation reflects the following:

5.0 ENGINEERING EVALUATION OF RESULTS OF LIMITED EXPLORATION PROGRAM (continued)

5.5 Evaluation of Foundation for Operating Basis Earthquake (OBE) + Water Level at Elevation 704.0 (continued)

Concrete Type	Compressive Stress, psi		Stress Ratio
	Calculated	Allowable	Calculated / Allowable
Sound	935	2600	0.36
Soft	585	1105	0.53

As can be seen from the above, the ERCW Pumping Station is qualified for the design condition of OBE + water level at Elevation 704.0.

6.0 CONCLUSION

The drilling, video inspections, and grouting of the Elements D and B have shown that no cavities exist in the elements. The aggregate zones in Element D have load carrying capability which were conservatively excluded in the design evaluation. The concrete in Element B has been demonstrated to be sound and confirms the evaluation assumptions.

Additionally, evaluations have been completed for the foundation for the aggregate lenses which were identified at higher elevations in the structure. These evaluations demonstrate the adequacy of the foundation to meet design requirements under the design loads.

The observed condition of the concrete/rock interface for the holes indicate that the cells were adequately cleaned prior to concrete placement. The rock observed in the cores is consistent with that previously encountered at the site and is consistent with the original calculation of rock modulus and bearing capacity.

Therefore, TVA concludes that these investigations re-confirm the structural integrity of the pumping station foundation cells and that these cells will perform their intended function under all design basis conditions and no additional investigation is necessary or required.

7.0 REFERENCES

1. NRC Inspection Report 50-327, 328/88-12, June 29, 1988 (A02 880629 010)

2. TVA Letter, R. Gridley to NRC, October 20, 1988 (L44 881020 800)

3. TVA Letter, R. Gridley to NRC, December 28, 1988 (L44 881228 807)

4. TVA Procedure, Special Maintenance Instruction SMI-0-400-6, ERCW Pumping Station and Roadway Access Foundation Cells Evaluation, June 14, 1989

5. TVA Letter, R. Gridley to NRC, March 3, 1988 (L44 880307 808)

6. TVA Calculation, Determination Of Dynamic Rock Properties (Elastic Modulus and Bearing Capacity) For ERCW Access Cell Foundation, (B41 871208 001)

7.0 **REFERENCES** (continued)

7. TVA Calculation, Evaluation of Stresses in ERCW Pumping Station Foundation Between Elevations 650.0 and 670.0 (B87 900809 001)

8. TVA Calculation, Evaluation of ERCW Pumping Station Foundation for OBE + Water Level at Elevation 704.0 (B87 900808 022)

9. TVA Letter, E. G. Wallace to NRC, April 13, 1990 (L44 900413 800)

10. TVA Letter, M. J. Ray to NRC, March 2, 1988 (L44 880302 811)

FIGURE 1 (SHEET 19 OF ____)

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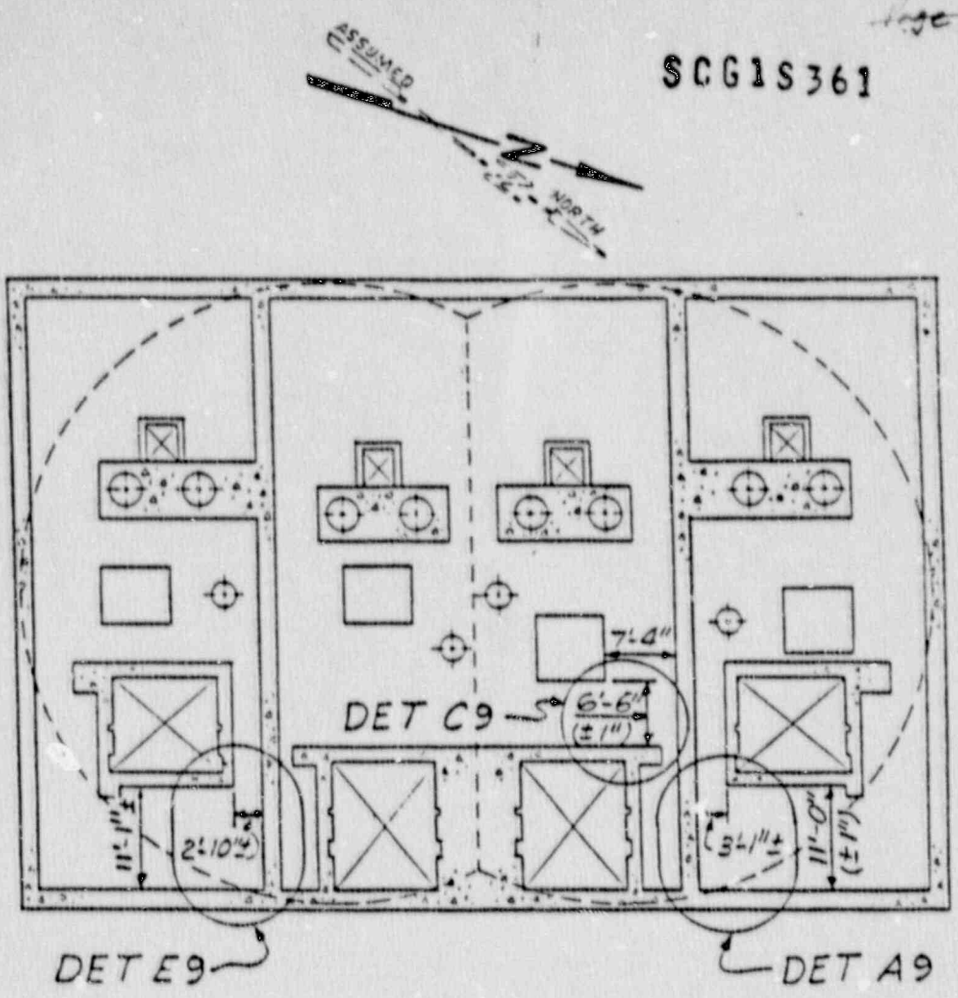
Page 58 of ____

SCG1S361



PLAN - EL 690.5

AFFECTED DWG 3IW211-9

SYSTEM CONDENSER WATER SUPPLY

UNITS 1&2 CATEGORY 2

TITLE CONCRETE ERCW PUMPING STATION OUTLINE

CONTRACT NO. NA

Prerequisites NA

ANTICIPATED ccd 12-31W211-9

DCA Number

SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

Q

DCA -M01312A-01

REVISION	RESP ENGR	LEAD ENGR	DESIGN VERIFIED	CHANGE REFERENCE
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FIGURE 2 (SHEET 20 OF ___)

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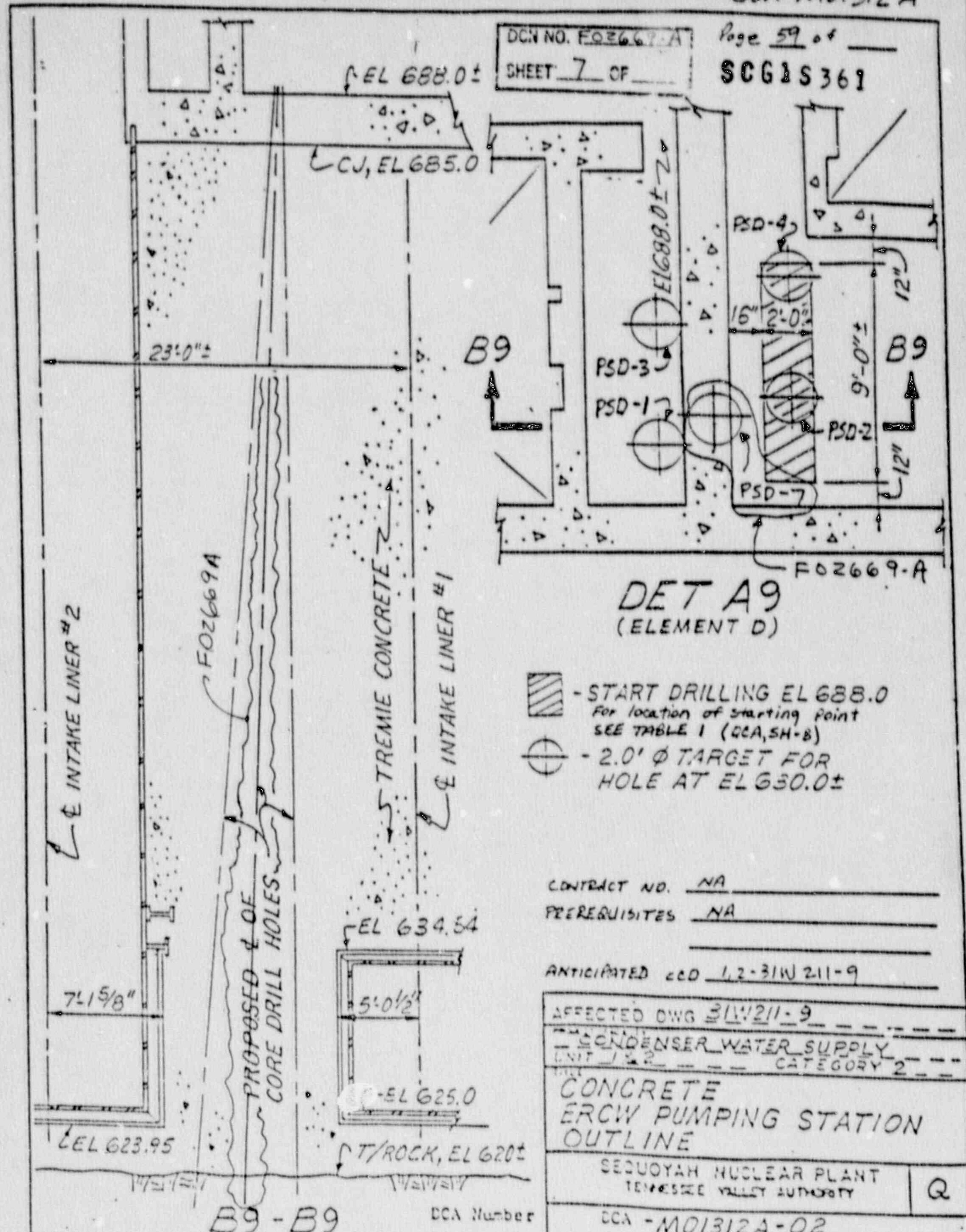

DCN NO. F02669-A
SHEET 7 OF ___
Page 59 of ___
SCG1S361
EL 688.0±
CJ, EL 685.0
EL 688.0±
23'-0"±
B9
B9
PSD-4
PSD-3
PSD-1
PSD-2
PSD-7
16"
2'-0"
9'-0"±
12"
12"
F02669-A
DET A9
(ELEMENT D)
- START DRILLING EL 688.0
For location of starting point
SEE TABLE 1 (DCA, SH-8)
- 2.0' Ø TARGET FOR
HOLE AT EL 630.0±
℄ INTAKE LINER #2
F02669A
TREMIE CONCRETE
℄ INTAKE LINER #1
PROPOSED ℄ OF
CORE DRILL HOLES
EL 634.54
7'-1 5/8"
5'-0 1/2"
EL 625.0
EL 623.95
T/ROCK, EL 620±
B9 - B9
CONTRACT NO. NA
PREREQUISITES NA
ANTICIPATED CCD 1,2-31W211-9
AFFECTED DWG 31W211-9
CONDENSER WATER SUPPLY
UNIT 1&2
CATEGORY 2
CONCRETE
ERCW PUMPING STATION
OUTLINE
SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
Q
DCA Number
DCA - M01312A-02

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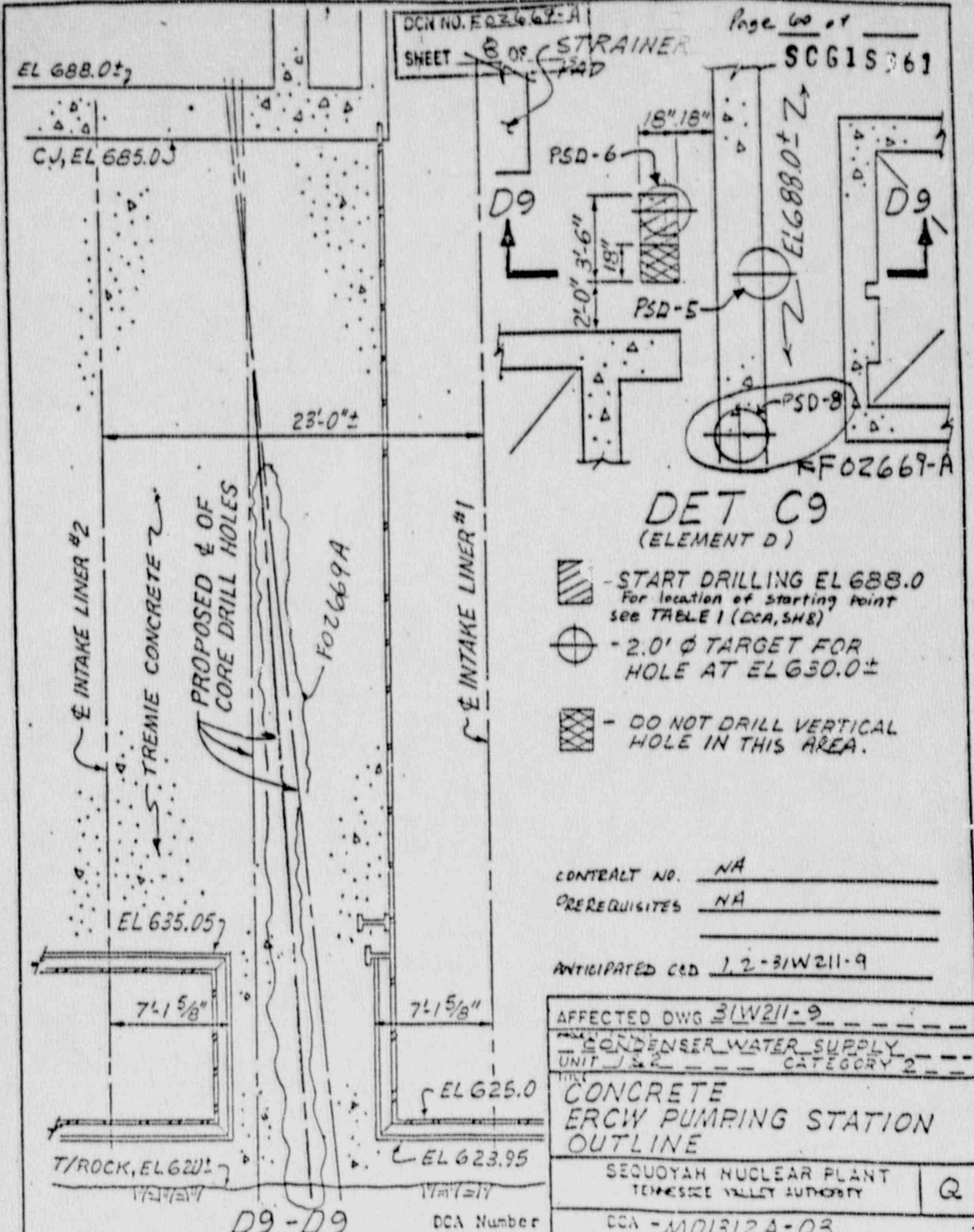
FIGURE 3 Sheet 21 of ___ DCN M01312A


DCN NO. F02669-A
SHEET 8 OF ___
STRAINER PAD
Page 60 of ___
SCG1S361
EL 688.0±
CJ, EL 685.05
23'-0"±
℄ INTAKE LINER #2
TREMIE CONCRETE
PROPOSED ℄ OF CORE DRILL HOLES
F02669A
℄ INTAKE LINER #1
EL 635.05
7'-1 5/8"
7'-1 5/8"
EL 625.0
EL 623.95
T/ROCK, EL 620±
D9 - D9
D9
D9
18" 18"
PSD-6
3'-6"
19"
2'-0"
PSD-5
EL 688.0± Z
PSD-8
F02669-A
DET C9
(ELEMENT D)
- START DRILLING EL 688.0
For location of starting point see TABLE I (DCA, SH8)
- 2.0' Ø TARGET FOR HOLE AT EL 630.0±
- DO NOT DRILL VERTICAL HOLE IN THIS AREA.
CONTRACT NO. NA
PREREQUISITES NA
ANTICIPATED CCD 1, 2-31W211-9
AFFECTED DWG 31W211-9
CONDENSER WATER SUPPLY
UNIT 1 & 2
CATEGORY 2
CONCRETE
ERCW PUMPING STATION
OUTLINE
SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY
Q
DCA Number
DCA - M01312A-03

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1	[signature]	[signature]	[signature]	F02669-A

FIGURE 4 — 22 — DCN M01312A

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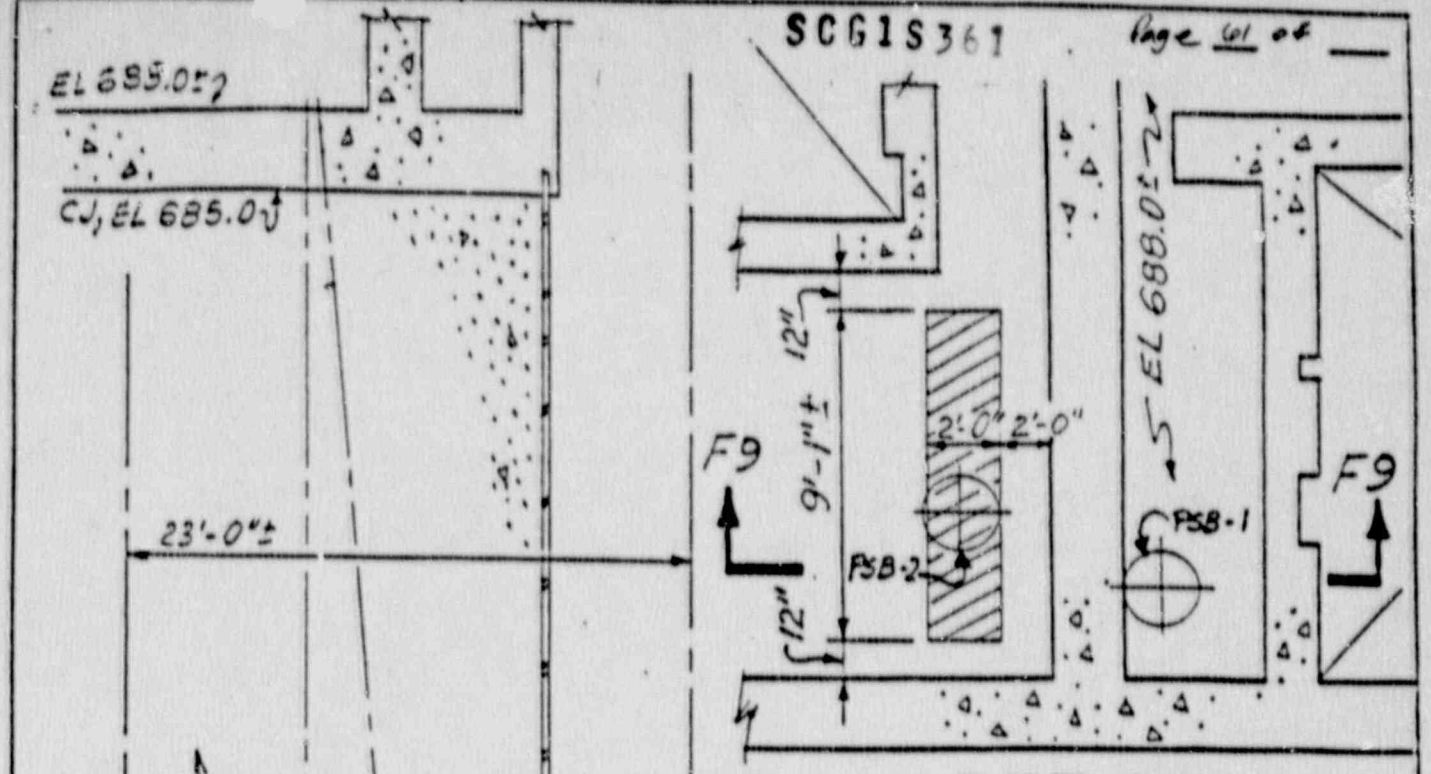
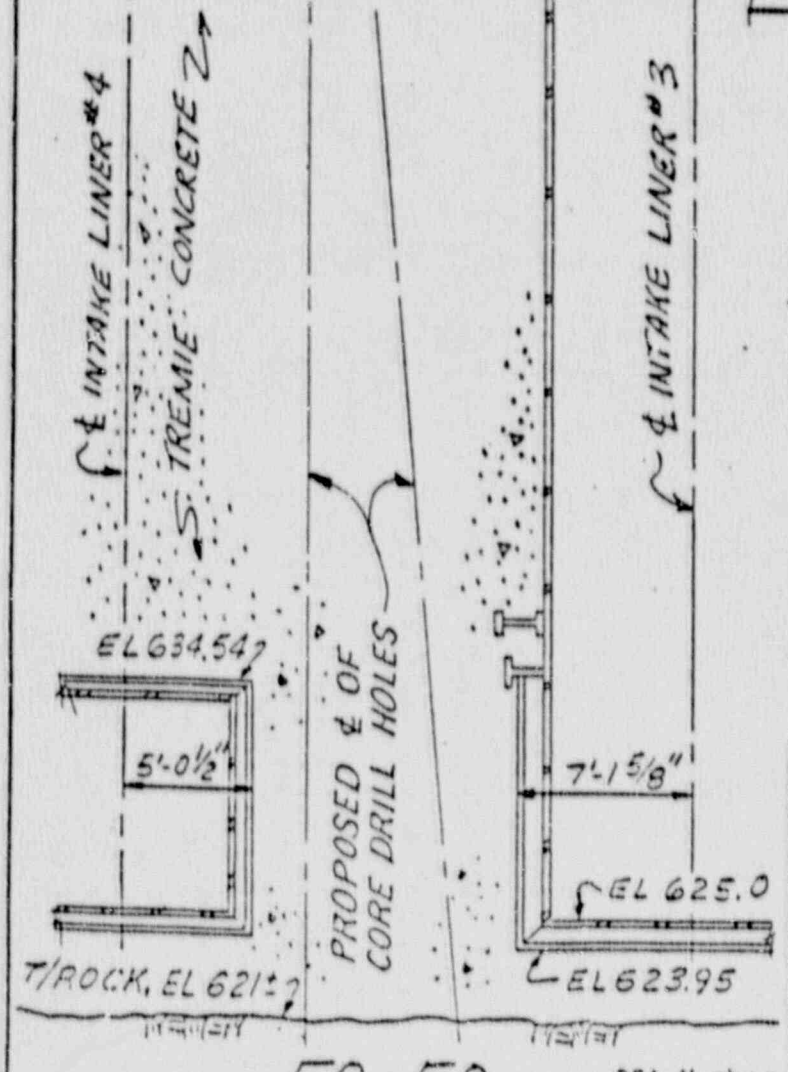


DET E9
(ELEMENT B)

- START DRILLING EL 688.0
For location of starting point see TABLE 1 (DCA, SN 8)

- 2.0' Ø TARGET FOR HOLE AT EL 630.0±



F9-F9

CONTRACT NO. NA

PREREQUISITES NA

ANTICIPATED CCD 1, 2-3IW211-9

AFFECTED DWG 3IW211-9

CONDENSER WATER SUPPLY

UNIT 1 & 2 CATEGORY 2

CONCRETE ERCW PUMPING STATION OUTLINE

SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

Q

DCA Number

DCA - M01312A-04

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FIGURE 5 SHEET 22 OF ____

DCN M01312A

F-DCN F01571-A, SCG1S361 Page 25 of ____

Sheet 7

DCN NO. F02669-A
SHEET 9 OF ____

TABLE 1

DRILL HOLE LOCATION AND SLOPE

Pumping Station Elements D and B

ID No.	Location from center of p. s.	Slope	Direction	Approx. Start el.	Approx. Bottom el
PSD-1	25'N, 29'E, ± 9"	1H:12V	S12E	688'	615'
PSD-2	25.5'N, 27'E, ± 9"	Vertical		688'	615'
PSD-3	25N', 24'E, ± 9"	1H:12V	S12E	688'	~~615'~~ 600'
PSD-4	25.5'N, 22'E, ± 9"	Vertical		688'	~~615'~~ 600'
PSD-5	18'N, 13.5'E, ± 9"	1H:12V	N12W	688'	615'
PSD-6	19'N, 11'E, ± 9"	Vertical		688'	615'
PSB-1	25'S, 29'E, ± 9"	1H:12V	N12W	688'	615'
PSB-2	25.5'S, 27'E ± 9"	Vertical		688'	615'

F01571-A

F02669-A

PSD-7	25.3'N, 28.0'E ± 9"	1H:24V	S12E	688'	600'
PSD-8	18.4' N, 11.9'E ± 9"	1H:6.66V	N54E	688'	600'

F02669-A

AFFECTED DWG 2-W-211-9

CONDENSER WATER SUPPLY
UNITS 1 & 2 CATEGORY I

CONCRETE
ERCW PUMPING STATION
OUTLINE

SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

DCA - M01312A-08

CONTRACT NO. NA

Prerequisites NA

ANTICIPATED CCD 1,2-W-211-9 DCA Number

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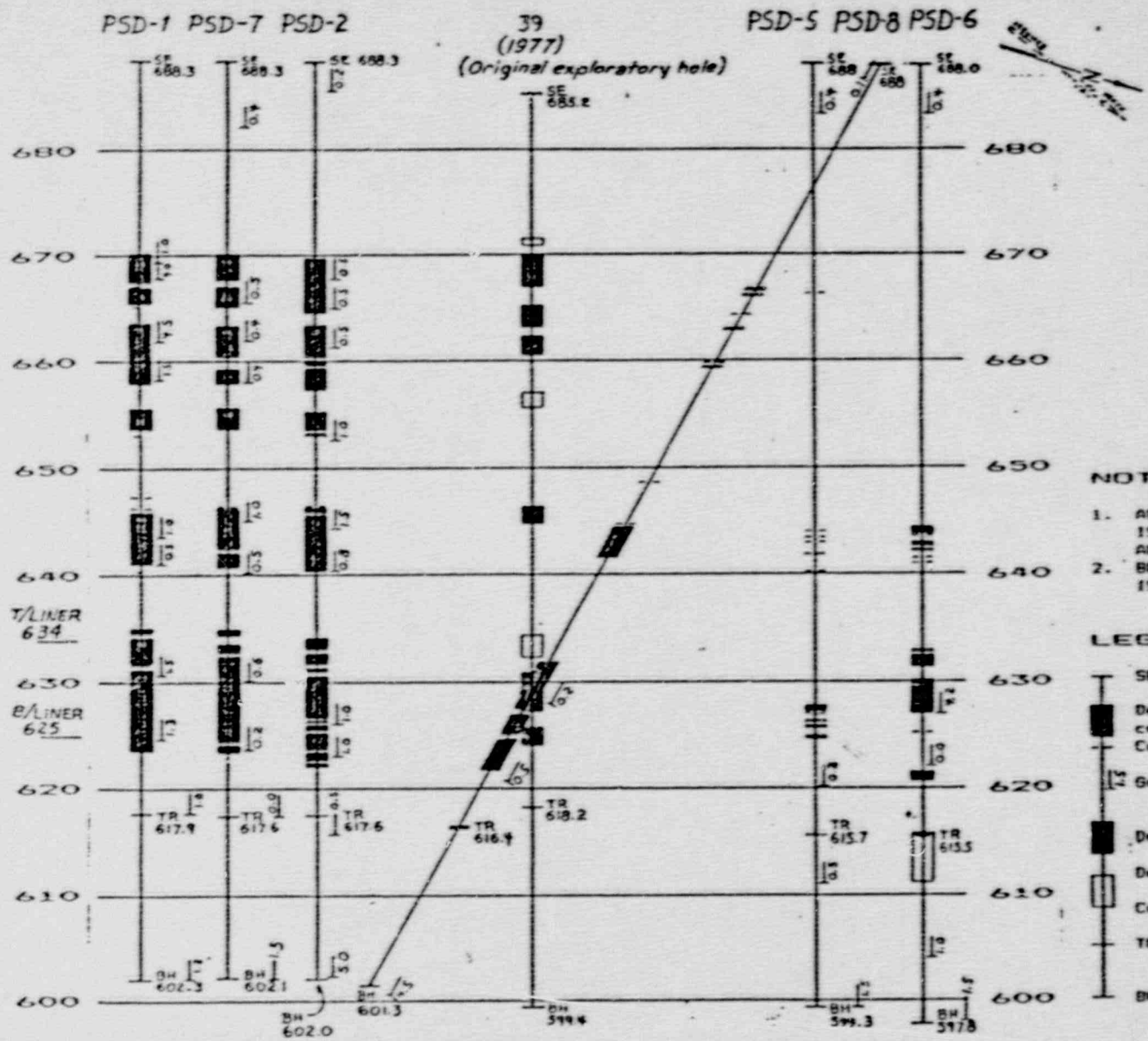
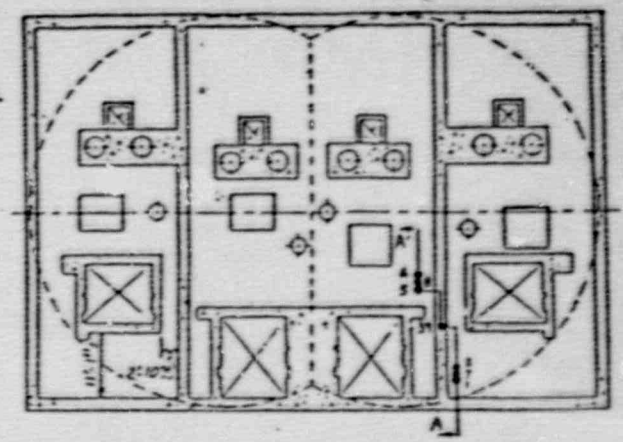


SECTION A'— A'



KEY PLAN - EL 690.5

NOTES:

1. ABOVE EL 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED TO SEAL AGGREGATE AND ROCK ZONES AND/OR BACKFILL HOLE.
2. BETWEEN EL 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO AGGREGATE ZONES.

LEGEND:

- SE - Surface Elevation
- Densely packed and/or partially cemented sand and coarse aggregate
- Cement Seam (1989-90)
- Grout take (ft^3)
- Designated as cavity (1977)
- Designated as soft material (1977)
- Core loss in rock (1989-90)
- TR - Top of Rock
- BH - Bottom of Hole

SCALE:

Not to Scale

Horizontal 5'

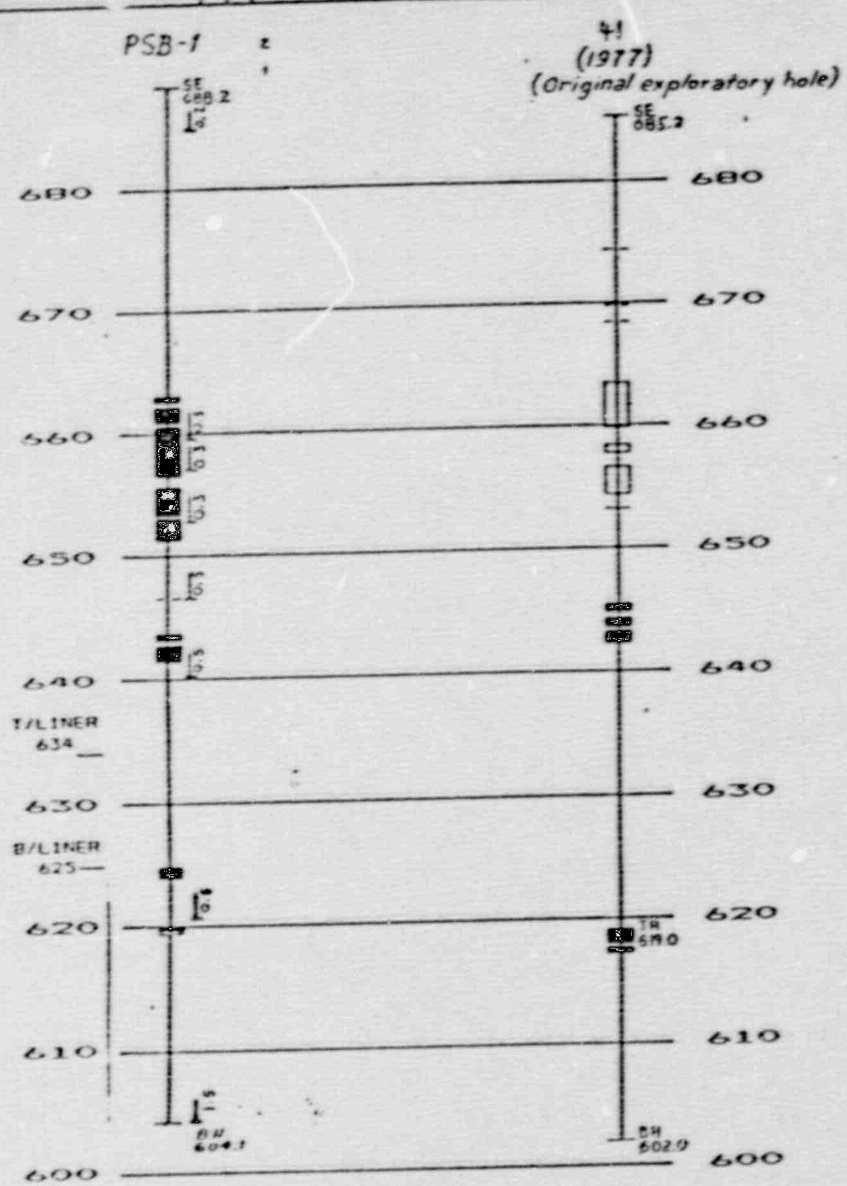
Vertical 10'

ERCW PUMPING STA.
FOUNDATION INVESTIGATION-GRAPHIC LOGS
SEQUOYAH NUCLEAR PLANT
TENNESSEE VALLEY AUTHORITY

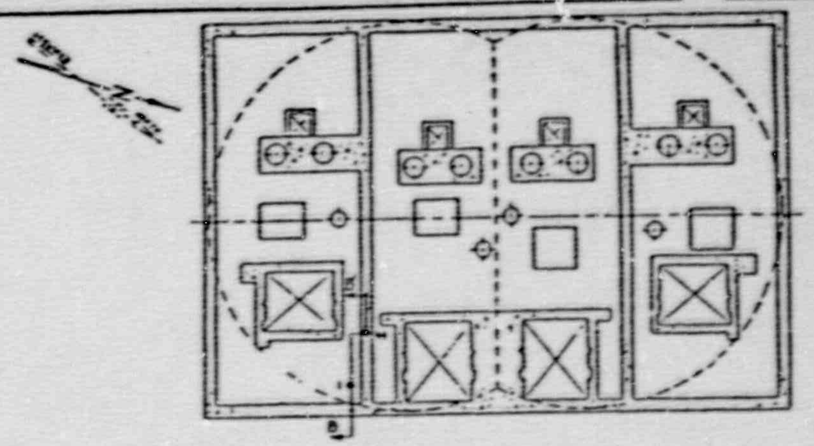
FIGURE 6

SCG1S361

SHEET 24



SECTION B – B'



KEY PLAN – EL 690.5

NOTES:

1. ABOVE EL 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED TO SEAL AGGREGATE AND ROCK ZONES AND/OR BACKFILL HOLE.
2. BETWEEN EL 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO AGGREGATE ZONES.

LEGEND:

- SE – Surface Elevation
- Densely packed and/or partially cemented sand and coarse aggregate (1989-90)
- Cement Seam
- Grout take (ft³)
- Designated as cavity (1977)
- Designated as soft material (1977)
- Core loss in rock (1989-90)
- TR – Top of Rock
- BH – Bottom of Hole

SCALE:

Horizontal: 1' 2' 3'

Vertical: 5' 10'

ERCW PUMPING STATION

FOUNDATION INVESTI-GATION-GRAPHIC LOGS

SEQUOYAH NUCLEAR PLANT

TENNESSEE VALLEY AUTHORITY

FIGURE-7

SHEET 25 OF

SCG1S361

ATTACHMENT 1

SCG 1 26 361

SEQUOYAH NUCLEAR PLANT

HOLE PSD-1 4.75° ANGLE HOLE

COMPUTED a to 8 DATE 8/16/90
CHECKED PULLS DATE
DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	DATE	PULLS	DATE
CONCRETE	0.0	18.2	688.3				1.6	9/22/89
GRAVEL	18.2	0.6 *	670.2				3.1	9/25/89
CONCRETE	18.8	0.2	669.6				4.1	9/25/89
GRAVEL	19.0	2.1 *	669.4	1.0	669.3	11/14/89	6.0	10/19/89
CONCRETE	21.1	0.3	667.3				10.9	10/19/89
GRAVEL	21.4	1.6 *	667.0	4.0	667.8	11/17/89	16.0	10/20/89
CONCRETE	23.0	1.6	665.4				19.0	10/20/89
GRAVEL	24.6	5.6 *	663.8	4.5	661.9	11/21/89	20.5	11/16/89
CONCRETE	30.2	2.6	658.2	1.5	657.9	11/30/89	21.3	11/20/89
GRAVEL	32.8	2.1 *	655.6				24.8	11/20/89
CONCRETE	34.9	6.1	653.5				25.3	11/27/89
CEMENT SEAM	41.0	0.4	647.4				29.7	
CONCRETE	41.4	0.6	647.0				30.4	11/27/89
CEMENT SEAM	42.0	0.5	646.4				31.3	11/30/89
GRAVEL	42.5	5.0 *	645.9	1.0	643.6	12/7/89	34.9	12/4/89
CONCRETE	47.5	6.0	641.0	0.5	641.1	12/9/89	36.2	12/4/89
GRAVEL	53.5	0.4 *	635.0				41.2	12/5/89
CONCRETE	53.9	0.4	634.6				43.0	
GRAVEL	54.3	1.8 *	634.2				44.7	12/5/89
CONCRETE	56.1	0.5	632.4				45.8	12/9/89
GRAVEL	56.6	0.1	631.9				46.8	
CONCRETE	56.7	0.3	631.8				47.2	12/9/89
GRAVEL	57.0	7.8 *	631.5	1.5	630.7	12/12/89	51.3	12/11/89
CONCRETE	64.8	5.8	623.7	1.3	624.6	12/18/89	55.9	
ROCK	70.6	15.7	617.9	1.0	616.3	1/8/90	57.8	12/11/89
BOTTOM OF HOLE	86.3		602.3	1.2	602.3	1/4/90	64.3	12/14/89
							66.3	1/2/90
	TOTAL =	86.3					70.6	
							73.1	
							75.3	
							77.3	
							79.7	
							81.4	1/2/90
							86.3	1/3/90

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE
CONCRETE SECTION CONTAINS 38.2 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED
TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE
(EXCLUDING VOLUME REQUIRED TO FILL HOLE)
GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 3.8 CUBIC FEET

ATTACHMENT 1

27

SCG1S361

SEQUOYAH NUCLEAR PLANT

HOLE PED-2 VERTICAL HOLE

COMPUTED QWB DATE 8/10/90

CHECKED bt DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	DATE	PULLS,	DATE
CONCRETE	0.0	18.4	688.3	0.2	685.5	5/2/90	0.4	9/20/89
GRAVEL	18.4	5.2 *	669.9	0.5	667.8	1/12/90	0.5	9/21/89
CONCRETE	23.6	1.3	664.7	0.5	665.0	1/17/90	0.9	10/11/89
GRAVEL	24.9	3.0 *	663.4	0.5	661.3	1/19/90	2.5	10/12/89
WEAK CONCRETE	27.9	0.2	660.4				3.0	
GRAVEL	28.1	0.5 *	660.2				4.1	10/12/89
WEAK CONCRETE	28.6	0.2	659.7				6.1	1/8/90
GRAVEL	28.8	2.1 *	659.5				11.1	1/8/90
CONCRETE	30.9	2.2	657.4				12.0	1/9/90
GRAVEL	33.1	1.5 *	655.2				16.5	
CONCRETE	34.6	0.3	653.7				21.1	1/9/90
GRAVEL	34.9	0.1 *	653.4				23.3	1/17/90
CONCRETE	35.0	7.0	653.3	1.0	652.7	1/23/90	23.7	1/17/90
CEMENT SEAM	42.0	0.2	646.3				26.3	1/19/90
GRAVEL	42.2	0.2 *	646.1				27.3	1/22/90
WEAK CONCRETE	42.4	0.2	645.9				28.6	
GRAVEL	42.6	5.5 *	645.7	1.5	644.3	1/25/90	31.7	
CONCRETE	48.1	6.3	640.2	0.8	640.4	2/7/90	34.0	
GRAVEL	54.4	0.8 *	633.9				36.7	1/22/90
CONCRETE	55.2	0.3	633.1				38.9	1/24/90
GRAVEL	55.5	1.1 *	632.8				41.3	
CONCRETE	56.6	0.3	631.7				43.6	1/24/90
GRAVEL	56.9	0.5 *	631.4				46.7	2/1/90
CONCRETE	57.4	0.2	630.9				48.0	2/1/90
GRAVEL	57.6	4.0 *	630.7				51.3	2/13/90
CONCRETE	61.6	0.3	626.7				54.2	2/14/90
GRAVEL	61.9	0.1 *	626.4				55.0	
CONCRETE	62.0	0.2	626.3	1.0	626.0	2/23/90	55.5	2/14/90
GRAVEL	62.2	0.5 *	626.1				56.4	2/15/90
WEAK CONCRETE	62.7	0.1	625.6				58.0	
GRAVEL	62.8	1.8 *	625.5				60.0	2/15/90
CONCRETE	64.6	0.3	623.7				61.3	2/20/90
GRAVEL	64.9	0.6 *	623.4				61.6	
CONCRETE	65.5	0.3	622.8	1.0	623.0	3/5/90	62.0	2/20/90
GRAVEL	65.8	0.3 *	622.5				63.3	2/28/90
CONCRETE	66.1	4.6	622.2				64.9	
ROCK	70.7	3.1	617.6				65.5	
CORE LOSS	73.8	0.4	614.5	0.5	615.8	3/1/90	65.8	
ROCK	74.2	12.1	614.1				71.0	2/28/90
BOTTOM OF HOLE	86.3		602.0	5.0	602.3	3/12/90	71.8	3/1/90
							72.8	
							73.8	3/1/90
							75.0	3/8/90
							76.3	3/9/90
	TOTAL =	86.3					79.3	
							81.3	
							84.9	
							86.3	3/9/90

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE

CONCRETE SECTION CONTAINS 39.3 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE (EXCLUDING VOLUME REQUIRED TO FILL HOLE)

GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 2.0 CUBIC FEET

ATTACHMENT 1

28

SCG 1 s 361

SEQUOYAH NUCLEAR PLANT

HOLE PSD-5 4.750 ANGLE HOLE

COMPUTED awd DATE 8/10/90

CHECKED fat DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	DATE	PULLS	DATE
CONCRETE	0.0	21.6	688.0	0.4	683.3	3/8/90	1.9	10/25/89
CEMENT SEAM	21.6	0.4	666.5				2.7	9/25/89
CONCRETE	22.0	7.2	666.1				2.8	10/26/89
WEAK CONCRETE	29.2	0.4	658.9				4.1	10/26/89
CONCRETE	29.6	14.5	658.5				5.8	10/27/89
CEMENT SEAM	44.1	0.2	644.1				10.8	2/6/90
CONCRETE	44.3	0.2	643.9				15.9	
CEMENT SEAM	44.5	0.4	643.7				20.9	
CONCRETE	44.9	0.3	643.3				25.9	2/6/90
CEMENT SEAM	45.2	0.8	643.0				31.0	2/7/90
CONCRETE	46.0	0.3	642.2				36.0	
CEMENT SEAM	46.3	0.9	641.9				41.1	
CONCRETE	47.2	0.6	641.0				46.1	
CEMENT SEAM	47.8	0.5	640.4				48.1	
CONCRETE	48.3	11.8	639.9				51.8	2/7/90
WEAK CONCRETE	60.1	0.4	628.1				56.8	
GRAVEL	60.5	0.5 *	627.7				61.8	
CEMENT W/ SAND	61.0	0.2	627.2				62.3	
CEMENT W/ GRAVEL	61.2	0.6	627.0				62.8	
GRAVEL	61.8	0.2 *	626.4				64.2	
CEMENT SEAM	62.0	0.3	626.2				67.1	
GRAVEL	62.3	0.2 *	625.9				68.0	
CONCRETE	62.5	0.8	625.7				71.0	2/8/90
GRAVEL	63.3	0.3 *	624.9				73.0	2/9/90
CONCRETE	63.6	4.4	624.6				73.6	
CEMENT SEAM	68.0	0.2	620.2				77.0	
CONCRETE	68.2	4.4	620.0	0.2	620.1	3/6/90	77.3	
ROCK	72.6	6.7	615.7				78.3	
WATER LOSS	79.3	0.1	609.0	0.5	611.0	2/27/90	79.3	2/9/90
ROCK	79.4	9.6	608.9				82.0	2/12/90
BOTTOM OF HOLE	89.0		599.3	1.5	599.3	2/26/90	87.0	
							89.0	2/12/90
	TOTAL =	89.0						

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE
CONCRETE SECTION CONTAINS 1.7 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED
TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE
(EXCLUDING VOLUME REQUIRED TO FILL HOLE)
GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 0.2 CUBIC FEET

ATTACHMENT 1

SCG1S361

SEQUOYAH NUCLEAR PLANT

HOLE PSD-6 VERTICAL HOLE

COMPUTED 2-28 DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	DATE		
CONCRETE	0.0	43.7	688.0	0.4	683.4	3/8/90	2.0	10/24/89
GRAVEL	43.7	0.5 *	644.3				4.1	10/24/89
CONCRETE	44.2	0.1	643.8				6.1	10/30/89
CEMENT SEAM	44.3	0.2	643.7				11.3	12/18/89
CONCRETE	44.5	0.2	643.5				16.2	12/18/89
WEAK CONCRETE	44.7	0.4	643.3				21.2	12/19/89
GRAVEL	45.1	0.4 *	642.9				26.0	12/19/89
CONCRETE	45.5	0.3	642.5				31.0	12/20/89
GRAVEL	45.8	0.2 *	642.2				36.0	
CEMENT W/ SAND	46.0	0.7	642.0				41.0	
CEMENT SEAM	46.7	0.6	641.3				45.8	12/20/89
CONCRETE	47.3	7.8	640.7				48.5	1/4/90
GRAVEL	55.1	0.3 *	632.9				48.9	1/5/90
CONCRETE	55.4	0.3	632.6				50.0	
GRAVEL	55.7	0.4 *	632.3				55.0	
WEAK CONCRETE	56.1	0.1	631.9				57.0	
GRAVEL	56.2	0.3 *	631.8				61.1	1/5/90
CONCRETE	56.5	1.3	631.5				64.6	1/23/90
GRAVEL	57.8	3.3 *	630.2				65.0	
CONCRETE	61.1	0.2	626.9	4.2	627.0	1/16/90	70.0	1/23/90
WEAK CONCRETE	61.3	0.3	626.7				74.0	1/24/90
CONCRETE	61.6	1.3	626.4				76.8	
CEMENT SEAM	62.9	1.1	625.1				80.5	
CONCRETE	64.0	2.4	624.0				82.0	
CEMENT W/ SAND	66.4	0.9	621.6	0.0	622.0	3/6/90	87.0	1/24/90
CONCRETE	67.3	5.0	620.7				90.2	1/25/90
CORE LOSS	72.3	4.5	615.7					
ROCK	76.8	12.6	611.2	1.0	604.0	2/27/90		
WATER LOSS	89.4	0.1	598.6					
ROCK	89.5	0.7	598.5					
BOTTOM OF HOLE	90.2		597.8	1.5	598.0	2/26/90		
	TOTAL =	90.2						
TOP OF ROCK	72.5		615.5					

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE
CONCRETE SECTION CONTAINS 7.4 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED
TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE
(EXCLUDING VOLUME REQUIRED TO FILL HOLE)
GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 4.2 CUBIC FEET

ATTACHMENT 1

SCG1S361

SEQUOYAH NUCLEAR PLANT

HOLE PSD-7 2.4° ANGLE HOLE

COMPILED 223 DATE 8/10/90

CHECKED bt DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	DATE	PULLS	DATE
CONCRETE	0.0	18.2	688.3	0.4	682.1	5/2/90	1.5	3/19/90
GRAVEL	18.2	2.6 *	670.1				2.9	3/19/90
CONCRETE	20.8	0.4	667.5				4.0	3/20/90
GRAVEL	21.2	0.9 *	667.1				6.1	3/20/90
CONCRETE	22.1	0.2	666.2				11.2	3/21/90
GRAVEL	22.3	1.0 *	666.0	0.5	665.5	3/23/90	16.3	
CONCRETE	23.3	1.5	665.0				19.8	
GRAVEL	24.8	3.3 *	663.5				20.2	3/21/90
CONCRETE	28.1	0.1	660.2	0.4	662.0	3/28/90	21.3	3/22/90
GRAVEL	28.2	0.2 *	660.1				22.9	3/22/90
CONCRETE	28.4	0.6	659.9				26.3	3/27/90
GRAVEL	29.0	1.4 *	659.3				28.1	3/30/90
CONCRETE	30.4	2.3	657.9	0.4	658.0	3/30/90	29.7	
GRAVEL	32.7	1.9 *	655.6				30.2	3/30/90
CONCRETE	34.6	6.3	653.7				31.3	4/3/90
CEMENT SEAM	40.9	0.2	647.4				34.4	
CONCRETE	41.1	0.6	647.2				36.3	
CEMENT SEAM	41.7	0.4	646.6				41.3	
GRAVEL	42.1	3.7 *	646.2	1.0	645.0	4/3/90	43.2	4/3/90
WEAK CONCRETE	45.8	0.5	642.5				46.3	4/6/90
GRAVEL	46.3	1.3 *	642.0				47.8	
CONCRETE	47.6	5.8	640.7	0.5	640.0	4/9/90	48.5	4/6/90
GRAVEL	53.4	0.6 *	634.9				51.3	4/11/90
CONCRETE	54.0	0.7	634.3				55.3	
GRAVEL	54.7	0.8 *	633.6				56.3	
CONCRETE	55.5	0.2	632.8				58.4	4/11/90
GRAVEL	55.7	8.4 *	632.6	0.6	630.0	4/12/90	58.9	4/17/90
CONCRETE	64.1	0.2	624.3				61.3	
GRAVEL	64.3	0.7 *	624.1				62.5	
CONCRETE	65.0	5.8	623.4	0.2	623.6	4/19/90	64.3	4/17/90
ROCK	70.8		617.6	0.0	617.4	5/1/90	66.3	4/25/90
BOTTOM OF HOLE				1.5	602.0	4/30/90	71.3	
	71.0		617.4				71.7	
	TOTAL =	70.8					73.0	4/25/90
							76.3	4/27/90
							79.3	
							81.2	
							83.9	
							86.3	4/27/90

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE

CONCRETE SECTION CONTAINS 37.9 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE (EXCLUDING VOLUME REQUIRED TO FILL HOLE)

GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 0.8 CUBIC FEET

ATTACHMENT 1

SCG1C361

SEQUOYAH NUCLEAR PLANT

HOLE PSD-8 8.5° ANGLE HOLE

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	DATE	PULLS	DATE
CONCRETE	0.0	21.5	688.0	0.1	686.2	3/12/90	1.7	3/15/90
CEMENT SEAM	21.5	0.1	666.7				3.2	3/15/90
GRAVEL	21.6	0.1 *	666.6				4.3	
CONCRETE	21.7	0.3	666.5				6.0	3/15/90
GRAVEL	22.0	0.2 *	666.2				10.7	3/26/90
CONCRETE	22.2	1.8	666.0				15.8	
CEMENT SEAM	24.0	0.2	664.3				20.8	
CONCRETE	24.2	1.1	664.1				25.8	
GRAVEL	25.3	0.1 *	663.0				30.7	3/26/90
CONCRETE	25.4	1.2	662.9				35.8	3/27/90
CEMENT SEAM	26.6	0.3	661.7				40.8	
CONCRETE	26.9	1.5	661.4				45.8	
CEMENT SEAM	28.4	0.4	659.9				50.8	3/27/90
GRAVEL	28.8	0.2 *	659.5				55.8	3/28/90
CONCRETE	29.0	10.8	659.3				60.2	3/28/90
CEMENT SEAM	39.8	0.4	648.6				60.8	4/5/90
CONCRETE	40.2	3.6	648.2				61.7	
CEMENT SEAM	43.8	0.3	644.7				63.7	
GRAVEL	44.1	2.9 *	644.4				65.0	4/5/90
WEAK CONCRETE	47.0	0.5	641.5				66.1	4/9/90
CONCRETE	47.5	9.3	641.0				67.1	4/9/90
GRAVEL	56.8	3.1 *	631.8				70.8	4/23/90
CONCRETE	59.9	0.4	628.8				72.7	
GRAVEL	60.3	1.1 *	628.4	0.2	628.3	3/29/90	75.3	
CONCRETE	61.4	0.3	627.3				80.3	
GRAVEL	61.7	1.8 *	627.0				82.9	
CONCRETE	63.5	0.7	625.2				83.2	
GRAVEL	64.2	2.8 *	624.5				85.3	
CONCRETE	67.0	5.2	621.7				87.7	4/23/90
GRAVEL	72.2	0.2 *	616.6	0.5	621.6	4/13/90		
ROCK	72.4	15.3	616.4					
BOTTOM OF HOLE	87.7		601.3	4.5	601.0	4.24/90		

TOTAL = 87.7

HIT SUPPORT STEEL FOR LINER AT 65.1' AND 66.1' (EL. 623.6 AND EL. 622.6)

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE

CONCRETE SECTION CONTAINS 14.3 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE (EXCLUDING VOLUME REQUIRED TO FILL HOLE)

GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 0.7 CUBIC FEET

ATTACHMENT 1

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED ADS DATE 8/10/90

CHECKED bf DATE 8/10/90

4" PERCUSSION HOLE 39 DRILLED IN 1977

DESCRIPTION	DEPTH	THICKNESS	ELEVATION
CONCRETE	0.0	8.8	685.2
CEMENT SEAM	8.8	0.1	676.4
CONCRETE	8.9	4.7	676.3
SOFT MATERIAL	13.6	0.6 **	671.6
CONCRETE	14.2	1.0	671.0
CAVITY	15.2	3.0 *	670.0
CONCRETE	18.2	1.8	667.0
CAVITY	20.0	1.9 *	665.2
CONCRETE	21.9	0.9	663.3
CAVITY	22.8	1.8 *	662.4
CONCRETE	24.6	1.0	660.6
CEMENT SEAM	25.6	0.1	659.6
CONCRETE	25.7	2.6	659.5
SOFT MATERIAL	28.3	1.6 **	656.9
CONCRETE	29.9	6.1	655.3
CEMENT SEAM	36.0	0.1	649.2
CONCRETE	36.1	1.6	649.1
CEMENT SEAM	37.7	0.1	647.5
CONCRETE	37.8	0.9	647.4
CAVITY	38.7	1.6 *	646.5
CONCRETE	40.3	1.3	644.9
CEMENT SEAM	41.6	0.1	643.6
CONCRETE	41.7	9.2	643.5
SOFT MATERIAL	50.9	2.0 **	634.3
CONCRETE	52.9	1.5	632.3
CAVITY	54.4	3.7 *	630.8
CONCRETE	58.1	1.5	627.1
CAVITY	59.6	1.7 *	625.6
CONCRETE	61.3	5.7	623.9
WEATHERED ROCK	67.0	0.9	618.2
ROCK	67.9	17.9	617.3
BOTTOM OF HOLE	85.8		599.4
Total		85.8	

CAVITY AND SOFT MATERIAL WERE DEFINED USING GEOPHYSICAL LOGS
THEY WOULD BE EQUIVALENT TO THE GRAVEL ZONE DEFINED AS
DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE
CONCRETE SECTION CONTAINS 25.3 % GRAVEL

ATTACHMENT 2

SCGIS361

SEQUOYAH NUCLEAR PLANT

HOLE PSB-1 4.75° ANGLE HOLE

COMPUTED PULL & DATE [illegible] DATE 8/10/90

CHECKED tjt DATE 8/10/90

DESCRIPTION	DEPTH	THICKNESS	ELEVATION	GROUT TAKE	ELEVATION	COMPUTED PULL & DATE
CONCRETE	0.0	25.3	688.2	0.2	685.7 6/1/90	2.8 11/1/89
GRAVEL	25.3	0.4 *	663.0			3.0 11/1/89
CONCRETE	25.7	0.5	662.6			4.0 11/3/89
GRAVEL	26.2	1.2 *	662.1			6.1 11/3/89
CONCRETE	27.4	0.3	660.9			11.1 5/10/90
GRAVEL	27.7	4.1 *	660.6			16.3
CONCRETE	31.8	0.9	656.5	0.5	659.6 5/11/90	21.3
GRAVEL	32.7	2.4 *	655.6	0.3	657.0 5/14/90	26.3
CONCRETE	35.1	0.1	653.2	0.3	652.8 5/16/90	28.1
GRAVEL	35.2	1.8 *	653.1			28.4 5/10/90
CONCRETE	37.0	4.7	651.3			30.0 5/14/90
CEMENT SEAM	41.7	0.1	646.6	0.5	646.5 5/22/90	31.3 5/14/90
CONCRETE	41.8	2.9	646.5			32.7 5/16/90
GRAVEL	44.7	0.5 *	643.7			34.3
CONCRETE	45.2	0.4	643.2			35.2 5/16/90
GRAVEL	45.6	1.4 *	642.8			36.2 5/22/90
CONCRETE	47.0	2.4	641.4			36.7
WEAK CONCRETE	49.4	0.1	639.0	0.5	640.2 5/25/90	39.0 5/22/90
CONCRETE	49.5	14.0	638.9			40.8 5/24/90
GRAVEL	63.5	1.0 *	624.9			45.8 5/24/90
CONCRETE	64.5	4.0	623.9	0.5	620.6 6/4/90	47.6 5/25/90
OPEN SEAM	68.5	0.1	619.9			48.3 5/25/90
ROCK	68.6	0.0	619.8			51.3 5/29/90
CORE LOSS	68.6	0.4	619.8			56.3
ROCK	69.0	15.4	619.4			61.3
BOTTOM OF HOLE	84.4		604.1	1.5	604.0 5/31/90	64.3
						64.5
TOTAL =		84.4				67.4
						68.6
						69.3 5/29/90
						70.3 5/30/90
						70.8
						73.9
						77.4
						78.9
						79.8
						82.0
						82.7
						84.4 5/30/90

100% WATER LOSS AT ELEV. 619.9

* = GRAVEL = DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE

CONCRETE SECTION CONTAINS 18.7 % GRAVEL

ABOVE EL. 640 AND BELOW TOP OF ROCK, GROUT QUANTITY IS TOTAL USED TO SEAL GRAVEL/ROCK ZONE AND/OR BACKFILL HOLE

BETWEEN EL. 640 AND TOP OF ROCK, GROUT QUANTITY IS TOTAL INJECTED INTO GRAVEL ZONE (EXCLUDING VOLUME REQUIRED TO FILL HOLE)

GROUT TAKE FOR GRAVEL ZONES BETWEEN EL. 640 AND TOP OF ROCK IS 0.5 CUBIC FEET

ATTACHMENT Z

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED bt DATE 8/10/90

3" CORE HOLE HOLE 41 DRILLED IN 1977

DESCRIPTION	DEPTH	THICKNESS	ELEVATION
CONCRETE	0.0	11.0	685.2
CEMENT SEAM	11.0	0.1	674.2
CONCRETE	11.1	4.3	674.1
CEMENT SEAM	15.4	0.1	669.8
CONCRETE	15.5	1.4	669.7
CEMENT SEAM	16.9	0.1	668.3
CONCRETE	17.0	4.7	668.2
SOFT MATERIAL	21.7	3.6 **	663.5
CONCRETE	25.3	1.4	659.9
SOFT MATERIAL	26.7	0.8 **	658.5
CONCRETE	27.5	1.2	657.7
SOFT MATERIAL	28.7	2.2 **	656.5
CONCRETE	30.9	1.2	654.3
CEMENT SEAM	32.1	0.1	653.1
CONCRETE	32.2	7.7	653.0
SOFT MATERIAL	39.9	0.6 **	645.3
CONCRETE	40.5	0.3	644.7
CAVITY	40.8	0.7 *	644.4
CONCRETE	41.5	0.3	643.7
CAVITY	41.8	1.1 *	643.4
CONCRETE	42.9	23.3	642.3
TOP OF ROCK	66.2	0.0	619.0
CAVITY	66.2	0.8	619.0
ROCK	67.0	0.5	618.2
CAVITY	67.5	0.4	617.7
ROCK	67.9	24.6	617.3
BOTTOM OF HOLE	92.5		592.7
Total		92.5	

CAVITY AND SOFT MATERIAL WERE DEFINED USING GEOPHYSICAL LOGS
THEY WOULD BE EQUIVALENT TO THE GRAVEL ZONE DEFINED AS
DENSELY PACKED AND/OR PARTIALLY CEMENTED SAND AND/OR AGGREGATE
CONCRETE SECTION CONTAINS 19.9 % GRAVEL

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ATTACHMENT 3

WATTS BAR NUCLEAR PLANT

Attachment 6
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COMPUTED [illegible] DATE 8/10/90

CHECKED bt DATE 8/10/90

RECORD OF DRILL HOLE

PROJECT SQN

SHEET 1 OF 1

Hole Number PSD-1 Angle hole	Location ERCW PUMPING STATION 25.5' N, 28.9' E of centerline of P. S.	Geologic Formation Conasauga	
Elev. of surface 688.3		Elev. of Water Loss None	
Elev. Top of Rock 617.9	Thickness of Concrete 70.4'	Elev. of Water Gain None	
Elev. Bottom of Hole 602.3	Size of Core NWX	Driller J. B. Payne	
	Bottom of Weathering 611.6	Date Start 9/22/90	Date End 1/3/90

Material	Elev. of Stratum	Angle Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.3	0.0	70.4		Solid concrete with densely
					packed and/or partially
					cemented sand and/or aggregate
					670.2 to 669.6, 669.4 to 667.3,
					667.0 to 665.4, 663.8 to 658.2,
					655.6 to 653.5, 645.9 to 641.0,
					635.0 to 634.6, 634.2 to 632.4,
					631.9 to 631.8, 631.5 to 623.7;
					cement seam 647.4 to 647.0,
					646.4 to 645.9
Limestone	617.9	70.6	15.6	70°	Fine grained, medium grey
					limestone with shale stringers;
					slightly weathered parting
					615.5; slightly weathered shale
					612.0 to 611.6
Bottom of Hole	602.3	86.3			

Remarks:

Hole drilled 4.75° from vertical at S 11° 52' E
Hole located 4' from east edge of cell
Piece of burlap bag at concrete/rock interface, otherwise good bond

Logged By A. D. Soderberg
NE Representative

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SEQUOYAH NUCLEAR PLANT

ATTACHMENT 3

COMPUTED GDK DATE 8/10/90 RECORD OF DRILL HOLE

CHECKED bt DATE 8/10/90 PROJECT SQN

SHEET 2 OF 2

Hole Number PSD-2	Location ERCW PUMPING STATION 25.2' N, 27.2' E of centerline of P. S.		Geologic Formation Conasauga
Elev. of surface 688.3			Elev. of Water Loss None
Elev. Top of Rock 617.9	Thickness of Concrete 70.7'		Elev. of Water Gain None
Elev. Bottom of Hole 602.0	Size of Core NWX		Driller J. B. Payne
	Bottom of Weathering 616.2	Date Start 9/20/89	Date End 3/9/90

Material	Elev. of Stratum	Depth from Surface	Thickness of Stratum	Dip	Description
Limestone/Shale	617.6	70.7	15.6	70°	Fine grained, medium grey
					limestone with interbedded
					lenses of shale; slightly
					weathered near vertical joint
					616.7 to 616.2; core loss 614.5
					to 614.
Bottom of Hole	602.0	86.3			

Remarks:

Logged By A. D. Soderberg
NE Representative

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ATTACHMENT 3

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SEQUOYAH NUCLEAR PLANT — RECORD OF DRILL HOLE

COMPU. CWS DATE 8/10/90 PROJECT SQN

CHECKED LT DATE 8/10/90

SHEET 1 OF 2

Hole Number PSD-2	Location ERCW PUMPING STATION 25.2' N, 27.2' E of centerline of P. S.	Geologic Formation Conasauga
Elev. of surface 688.3		Elev. of Water Loss None
Elev. Top of Rock 617.9	Thickness of Concrete 70.7'	Elev. of Water Gain None
Elev. Bottom of Hole 602.0	Size of Core NWX	Driller J. B. Payne
	Bottom of Weathering 616.2	Date Start 9/20/89 / Date End 3/9/90

Material	Elev. of Stratum	Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.3	0.0	70.7		Solid concrete with densely
					packed and/or partially
					cemented sand and/or aggregate
					669.9 to 664.7, 663.4 to 660.4,
					660.2 to 659.7, 659.5 to 657.4,
					655.2 to 653.7, 653.4 to 653.3,
					646.1 to 645.9, 645.7 to 640.2,
					633.9 to 633.1, 632.8 to 631.7,
					631.4 to 630.9, 630.7 to 626.7,
					626.4 to 626.3, 626.1 to 625.6,
					625.5 to 623.7, 623.4 to 622.8,
					622.5 to 622.2; cement seam
					646.3 to 646.1; weak concrete
					660.4 to 660.2, 659.5 to 657.4,
					645.9 to 645.7, 625.6 to 625.5

Remarks:

Hole drilled vertical
Hole located 4' from east edge of cell
Sloping top of rock with very good bond
and no separation at concrete/rock contact

Logged By A. D. Soderberg
NE Representative

ATTACHMENT 3

SEQUOYAH NUCLEAR PLANT
COMPUTED adf DATE 8/10/90
CHECKED fst DATE 8/10/90

Attachment 6
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RECORD OF DRILL HOLE
PROJECT SQN

SHEET 1 OF 2

Hole Number PSD-5 Angle hole	Location ERCW PUMPING STATION 18.5' N, 13.0' E of centerline of P. S.	Geologic Formation Conasauga	
Elev. of surface 688.0		Elev. of Water Loss 100 % @ 609.0	
Elev. Top of Rock 615.7	Thickness of Concrete 72.3'	Elev. of Water Gain None	
Elev. Bottom of Hole 599.3	Size of Core NWX	Driller C. Grosshein	
	Bottom of Weathering 608.9	Date Start 10/25/89	Date End 2/12/90

Material	Elev. of Stratum	Angle Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.0	0.0	72.3		Solid concrete with densely
					packed and/or partially
					cemented sand and/or aggregate
					627.7 to 627.2, 626.4 to 626.2,
					625.9 to 625.7, 624.9 to 624.6,
					cement with sand 627.2 to 627.0
					cement with aggregate 627.0 to
					626.4; cement seam 666.5 to
					666.1, 644.1 to 643.9, 643.7 to
					643.3, 643.0 to 642.2, 641.9 to
					641.0, 640.4 to 639.9, 626.2 to
					625.9, 620.2 to 620.0

Remarks:
Hole drilled 4.75° from vertical at N 11° 52' W
Hole located 21.5' from east edge of cell
Slight opening/separation around hole at concrete/rock interface

Logged By A. D. Soderberg
NE Representative

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ATTACHMENT 3

SEQUOYAH NUCLEAR PLANT

COMPUTED GDS DATE 8/10/90

CHECKED bt DATE 8/10/90

RECORD OF DRILL HOLE

PROJECT SQN

SHEET 2 OF 2

Hole Number PSD-5 Angle hole		Location ERCW PUMPING STATION 18.5' N, 13.0' E of centerline of P. S.			Geologic Formation Conasauga
Elev. of surface 688.0					Elev. of Water Loss 100 % @ 609.0
Elev. Top of Rock 615.7		Thickness of Concrete 72.3'			Elev. of Water Gain None
Elev. Bottom of Hole 599.3		Size of Core NWX			Driller C. Grosshein
		Bottom of Weathering 608.9			Date Start 10/25/89 / Date End 2/12/90
Material	Elev. of Stratum	Angle Depth from Surface	Thickness of Stratum	Dip	Description
		Rock			
Limestone/shale	615.7	72.6	16.4	70°	Fine grained, medium grey
					limestone with interbedded
					lenses of shale; slightly
					weathered parting 617.6, 617.2;
					highly weathered parting 609.0
					to 608.9
Bottom of Hole	599.3	89.0			

Remarks:

Hole drilled 4.75° from vertical at N 11° 52' W
Hole located 21.5' from east edge of cell
Slight opening/separation around hole at concrete/rock interface

Logged By A. D. Soderberg
NE Representative

SHEET 40

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SEQUOYAH NUCLEAR PLANT

COMPUTED [initials] DATE 8/10/90

CHECKED [initials] DATE 8/10/90

RECORD OF DRILL HOLE
PROJECT SQN

SHEET 1 OF 2

Hole Number PSD-6	Location ERCW PUMPING STATION 18.8' N, 11.1' E of centerline of P. S.	Geologic Formation Conasauga
Elev. of surface 688.0		Elev. of Water Loss 100 % @ 598.5
Elev. Top of Rock 615.5	Thickness of Concrete 72.5'	Elev. of Water Gain None
Elev. Bottom of Hole 597.8	Size of Core NWX	Driller J. B. Payne
	Bottom of Weathering 598.5	Date Start 10/24/89 / Date End 1/25/90

Material	Elev. of Stratum	Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.0	0.0	72.5		Solid concrete with densely
					packed and/or partially cement-
					ed sand and/or aggregate zones
					644.3 to 643.8, 642.9 to 642.5,
					642.2 to 642.0, 632.9 to 632.6,
					632.3 to 631.9, 631.8 to 631.5,
					630.2 to 626.9; weak concrete
					643.3 to 642.9, 626.7 to 626.4;
					cement seam 643.7 to 643.5,
					625.1 to 624.0; cement with
					sand 642.0 to 641.3, 621.6 to
					620.7
Core Loss	615.7	72.3	4.5		Core ground by driller
Limestone	611.2	76.8	13.4	60°	Fine grained, medium grey
					limestone with shale stringers;

Remarks:
Hole drilled vertical
Hole located 17.5' from east edge of cell
Tight bond with some separation on one side of hole

Logged By A. D. Soderberg
NE Representative

SCG1S361

ATTACHMENT 3

SEQUOYAH NUCLEAR PLANT

COMPUTED GDS DATE 8/10/90 RECORD OF DRILL HOLE

CHECKED bt DATE 8/10/90 PROJECT SQN

Hole Number PSD-6	Location ERCW PUMPING STATION 18.8' N, 11.1' E of centerline of P. S.	Geologic Formation Conasauga	
Elev. of surface 688.0		Elev. of Water Loss 100 % @ 598.5	
Elev. Top of Rock 615.5	Thickness of Concrete 72.5'	Elev. of Water Gain None	
Elev. Bottom of Hole 597.8	Size of Core NWX	Driller J. B. Payne	
	Bottom of Weathering 598.5	Date Start 10/24/89	Date End 1/25/90

Material	Elev. of Stratum	Depth from Surface	Thickness of Stratum	Dip	Description
					0.5' thick interbedded lime-
					stone and shale bands separated
					along bedding 607.5 to 606.0;
					open highly weathered joint
					598.6 to 598.5
Bottom of Hole	597.8	90.2			

Remarks:

Logged By A. D. Soderberg
NE Representative

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SEQUOYAH NUCLEAR PLANT

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ATTACHMENT 3

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COMPUTED QW B DATE 8/10/90 RECORD OF DRILL HOLE PROJECT SQN SHEET 1 OF 1

CHECKED fst DATE 8/10/90

Hole Number PSD-7 2.4° Angle hole	Location ERCW PUMPING STATION 25.3' N, 28.0' E of centerline of P. S.		Geologic Formation Conasauga
Elev. of surface 688.3			Elev. of Water Loss 616.4, 614.4, 610.0
Elev. Top of Rock 617.6	Thickness of Concrete 70.7'		Elev. of Water Gain None
Elev. Bottom of Hole 602.1	Size of Core NWX		Driller J. B. Payne
	Bottom of Weathering 610.6	Date Start 3/19/90	Date End 4/27/90

Material	Elev. of Stratum	Angle Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.3	0.0	70.7		Solid concrete with zones of
					densely packed and/or partially
					cemented sand and/or aggregate
					670.1 to 667.5, 667.1 to 666.2,
					666.0 to 665.0, 663.5 to 660.2,
					660.1 to 659.9, 659.3 to 657.9,
					655.6 to 653.7, 646.2 to 642.5,
					642.0 to 640.7, 634.9 to 634.3,
					633.6 to 632.8, 632.6 to 624.3,
					624.1 to 623.4; cement seam
					647.4 to 641.2, 646.6 to 646.2;
		ROCK			weak concrete 642.5 to 642.0
Limestone	617.6	70.8	15.5	70°	Fine grained, medium grey
					limestone with interbedded
					lenses of shale; slightly
					weathered parting 617.0, 616.4,
					614.4; highly weathered parting
Bottom of Hole	602.1	86.3			610.6

Remarks: Tight contact at concrete/rock interface
Hole drilled 2.4° from vertical at S 12° E
Hole located 5' from east edge of cell

Logged By A. D. Soderberg
NE Representative

SEQUOYAH NUCLEAR PLANT

RECORD OF DRILL HOLE

COMPUTED WDS DATE 8/10/90 PROJECT SQN SHEET 1 OF 1

CHECKED [illegible] DATE 8/10/90

Hole Number PSD-8 8.5° Angle hole	Location ERCW PUMPING STATION 18.4' N, 11.9' E of centerline of P. S.		Geologic Formation Conasauga
Elev. of surface 688.0			Elev. of Water Loss None
Elev. Top of Rock 616.4	Thickness of Concrete 71.6'		Elev. of Water Gain None
Elev. Bottom of Hole 601.3	Size of Core NWX		Driller J. B. Payne
	Bottom of Weathering -	Date Start 3/13/90	Date End 4/23/90

Material	Elev. of Stratum	Angle Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.0	0.0	71.6		Solid concrete with zones of
					densely packed and/or partially
					cemented sand and/or aggregate
					666.6 to 666.5, 666.2 to 666.0,
					663.0 to 662.9, 659.5 to 659.3,
					644.4 to 641.5, 631.8 to 628.8,
					628.4 to 627.3, 627.0 to 625.2,
					624.5 to 621.7, 616.5 to 616.4;
					cement seam 666.7 to 666.6,
					664.3 to 664.1, 661.7 to 661.4,
					659.9 to 659.5, 648.6 to 648.2,
					644.7 to 644.4; weak concrete
	ROCK				641.5 to 641.0
Limestone	616.4	72.4	15.1	70°	Fine grained, medium grey
					limestone with interbedded
					shale lenses
Bottom of Hole	601.3	87.7			

Remarks:
Hole drilled 8.5° from vertical at S 12° E
Hole drilled in area of hole 39 at el. 629'
0.2' aggregate zone at concrete/rock interface, not bonded

Logged By A. D. Soderberg
NE Representative

SEQUOYAH NUCLEAR PLANT — RECORD OF DRILL HOLE — PROJECT SQN

COMPUTED ADS DATE 8/10/90
CHECKED FSH DATE 8/10/90

SHEET 1 OF 1

Hole Number PSB-1 Angle hole	Location ERCW PUMPING STATION 24.8' S, 29.7' E of centerline of P. S.	Geologic Formation Conasauga
Elev. of surface 688.2		Elev. of Water Loss 100% at 619.9
Elev. Top of Rock 619.8	Thickness of Concrete 68.4'	Elev. of Water Gain None
Elev. Bottom of Hole 604.1	Size of Core NWX	Driller J. B. Payne
	Bottom of Weathering 618.3	Date Start 11/1/90 / Date End 5/30/90

Material	Elev. of Stratum	Angle Depth from Surface	Thickness of Stratum	Dip	Description
Concrete	688.2	0.0	68.4		Solid concrete with densely
					packed and/or partially
					cemented sand and/or aggregate
					663.0 to 662.6, 662.1 to 660.9,
					660.6 to 656.5, 655.6 to 653.2,
					653.1 to 651.3, 643.7 to 643.2,
					642.8 to 641.4, 624.9 to 623.9;
					weak concrete 639.0 to 638.9;
					cement seam 646.6 to 646.5;
					mud seam 619.9 to 619.8;
Limestone/shale	619.8	68.6	15.7	70°	Fine grained, medium grey
					limestone with interbedded sh.;
					moderately weathered parting
					618.4; moderately weathered 45°
					joint 618.3
Bottom of Hole	604.1	84.4			

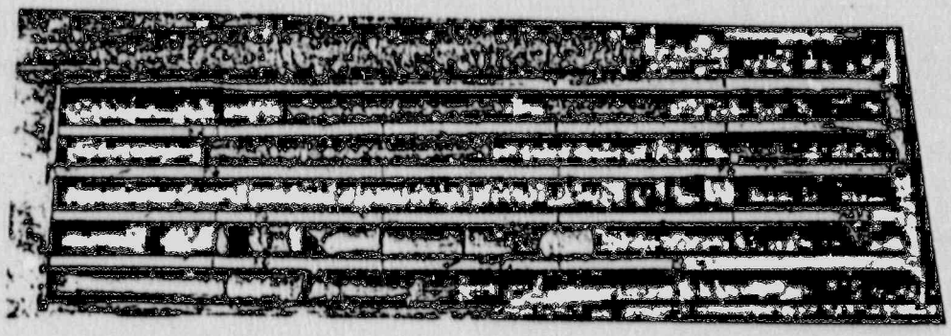
Remarks:
Hole drilled 4.75° from vertical at N 11° 52' W
Hole located 4' from east edge of cell
Mud seam at concrete/rock interface

Logged By A. D. Soderberg
NE Representative

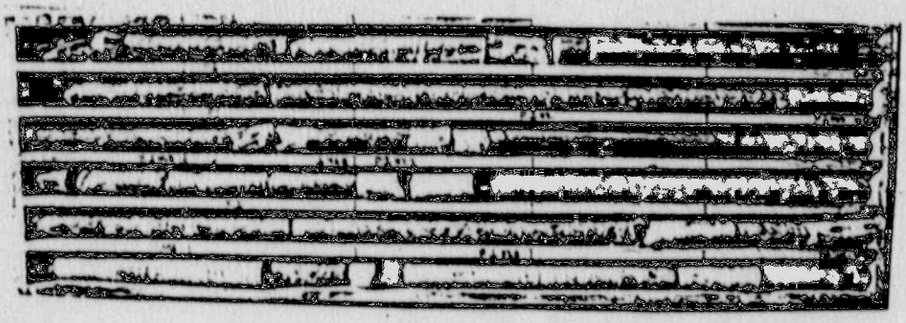
ATTACHMENT 5

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT D

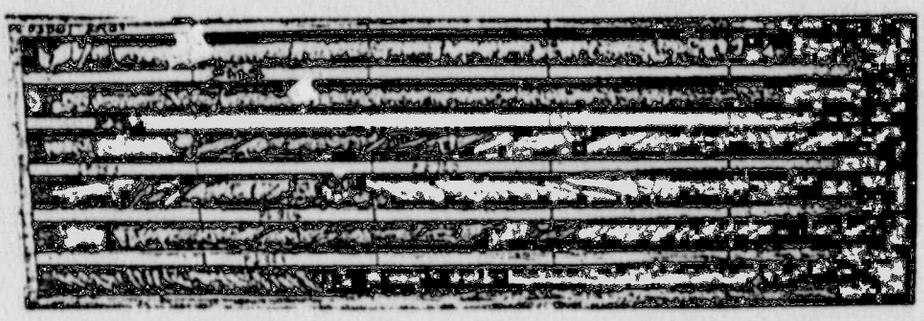
HOLE PSD-1
Surface El. 688.3 (0.0')
Top of Rock 617.9 (70.6')
Bottom of Hole 602.3 (86.3')



BOX 1 0' - 30'



BOX 2 30' - 60'



BOX 3 60' - 90'

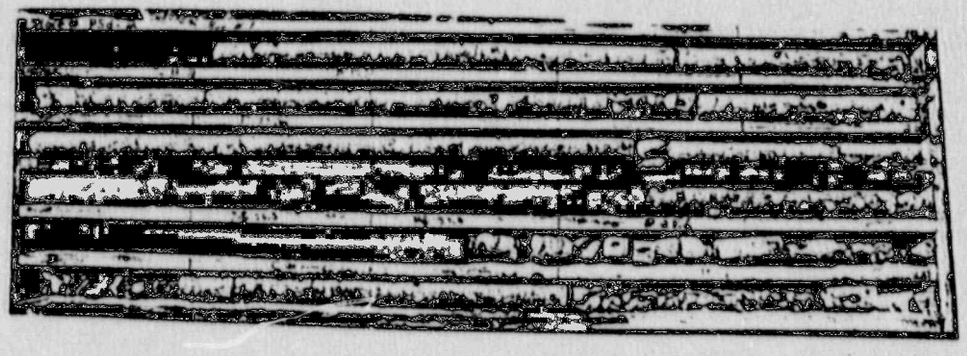
FOR INFORMATION ONLY

ATTACHMENT 5

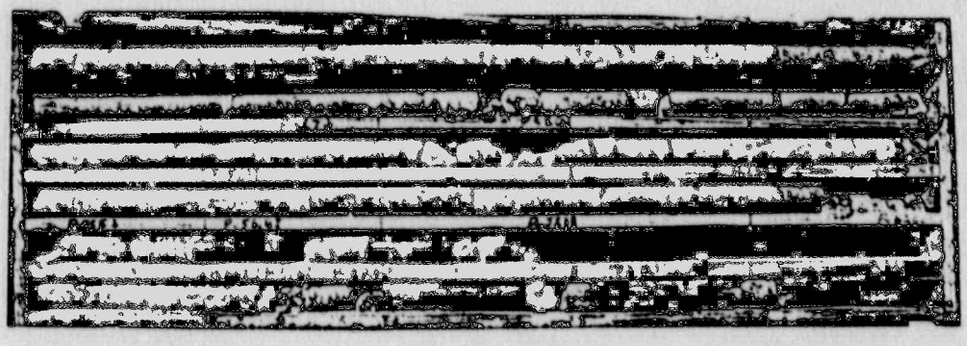
SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT D

HOLE PSD-2
Surface El. 688.3 (0.0')
Top of Rock 617.6 (70.7')
Bottom of Hole 602.0 (86.3')



BOX 1 6.1' - 35'



BOX 2 35' - 65'

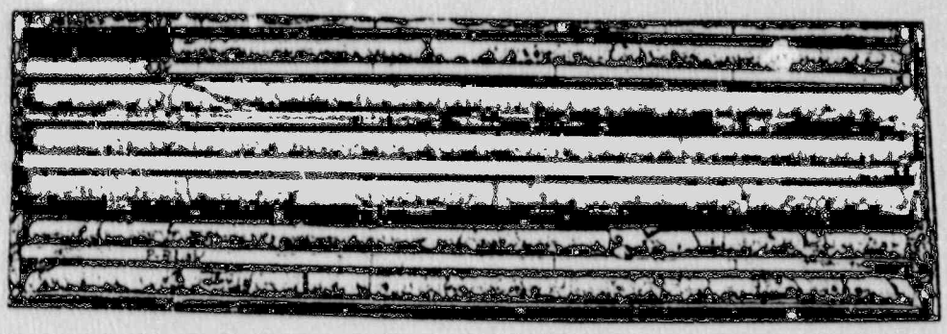
BOX 3 65' - 95'

FOR INFORMATION ONLY

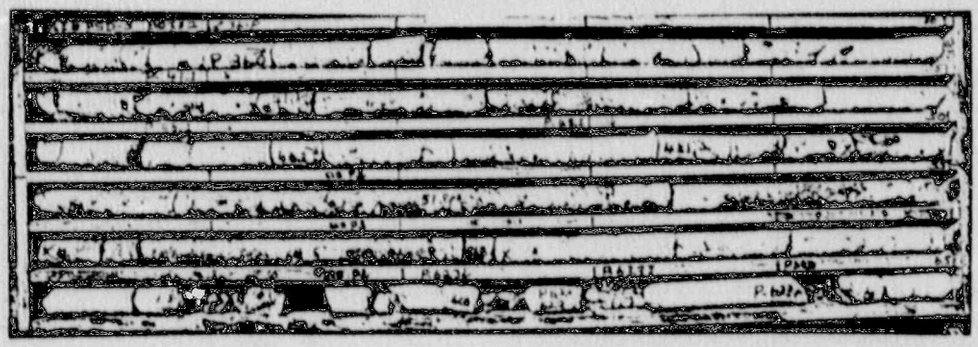
ATTACHMENT 5

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT D

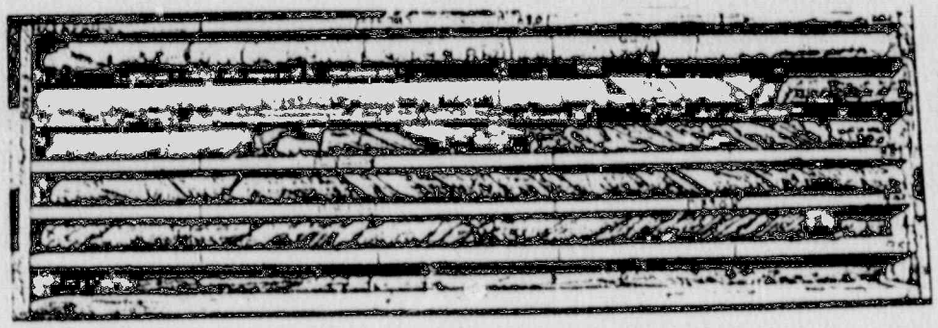
HOLE PSD-5
Surface El. 688.0 (0.0')
Top of Rock 615.7 (70.6')
Bottom of Hole 599.3 (89.0')



BOX 1 5.8' - 35'



BOX 2 35' - 65'



BOX 3 65' - 95'

FOR INFORMATION ONLY

SCG1S361 -

SEQUOYAH NUCLEAR PLANT

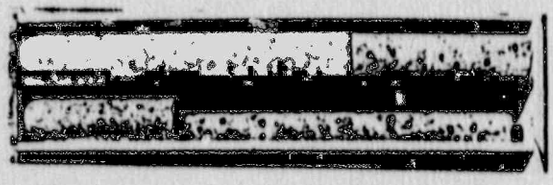
COMPUTED QDL DATE 8/10/90

CHECKED fst DATE 8/10/90

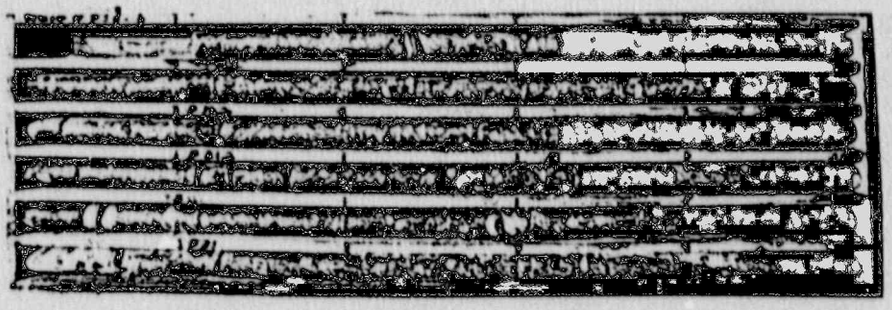
ATTACHMENT 5

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT D

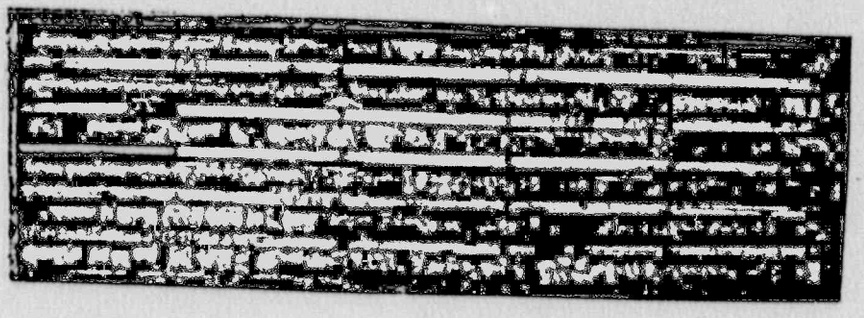
HOLE PSD-6
Surface El. 688.0 (0.0')
Top of Rock 615.5 (72.5')
Bottom of Hole 597.8 (90.2')



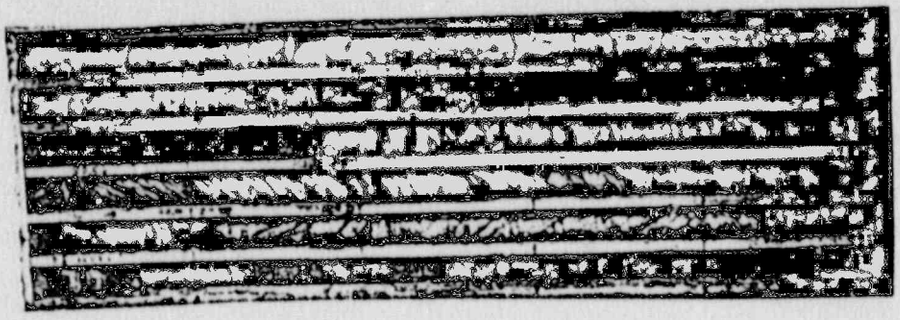
BOX 1 0' - 6.1'



BOX 2 6.1' - 35'



BOX 3 35' - 65'



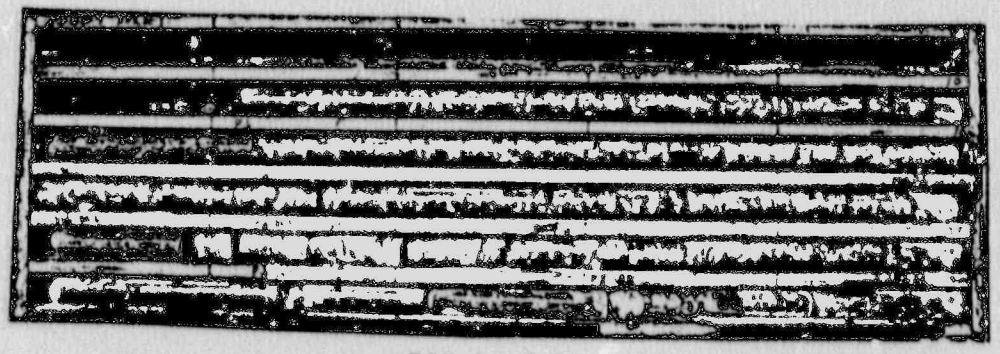
BOX 4 65' - 95'

FOR INFORMATION ONLY

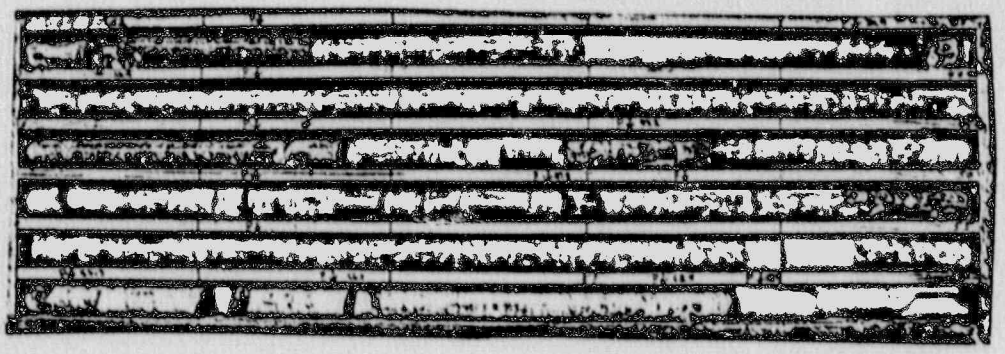
ATTACHMENT 5

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT D

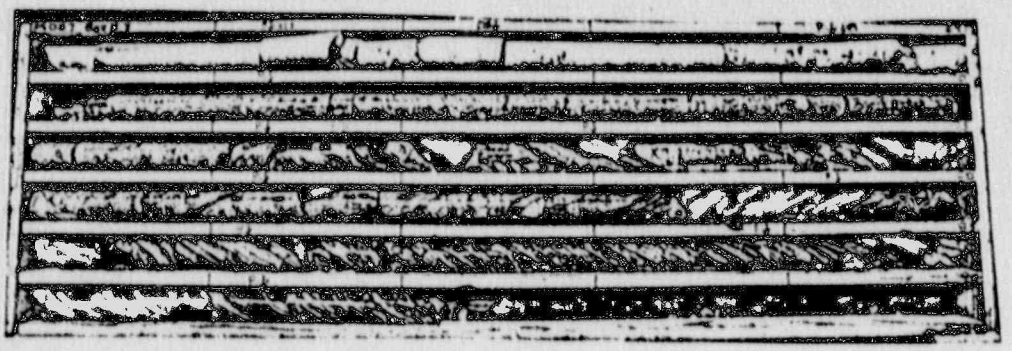
HOLE PSD-7
Surface El. 688.3 (0.0')
Top of Rock 617.6 (70.8')
Bottom of Hole 602.1 (86.3')



BOX 1 6.1' - 30'



BOX 2 30' - 60'



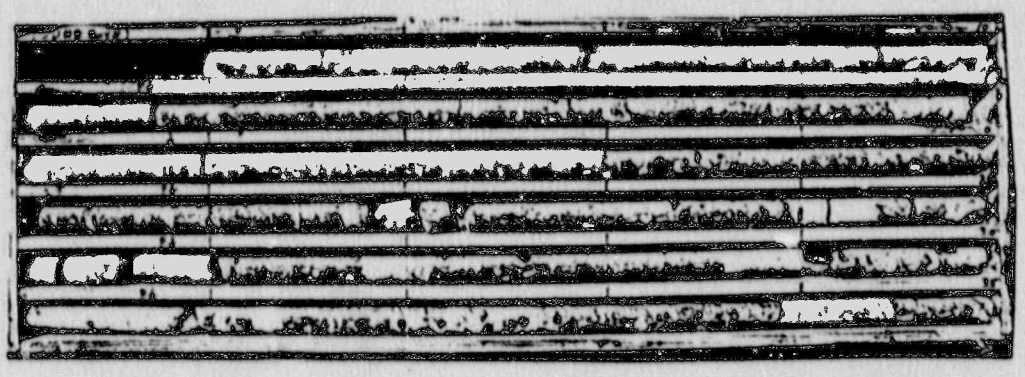
BOX 3 60' - 90'

FOR INFORMATION ONLY

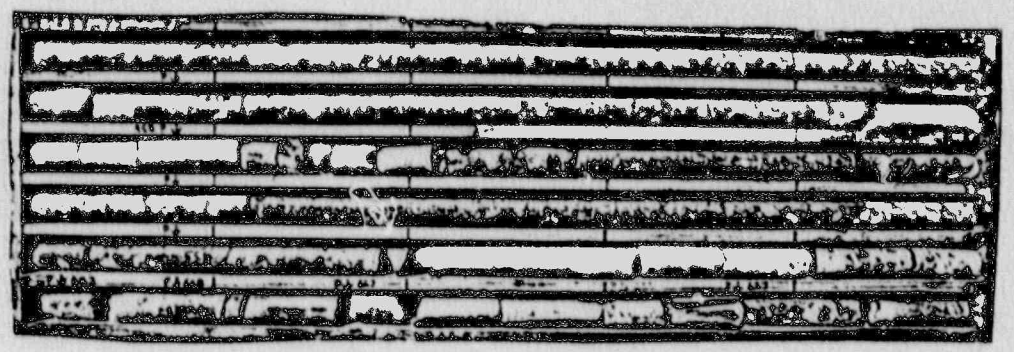
ATTACHMENT 5

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT D

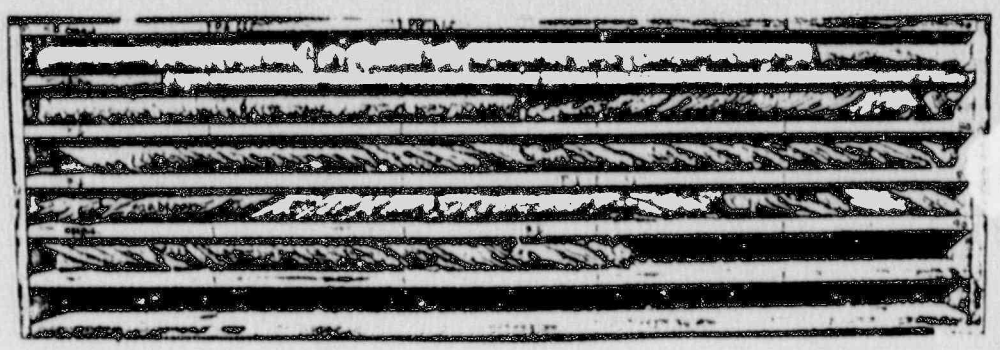
HOLE PSD-8
Surface El. 688.0 (0.0')
Top of Rock 616.4 (72.4')
Bottom of Hole 601.3 (87.7')



BOX 1 6.0' - 35'



BOX 2 35' - 65'



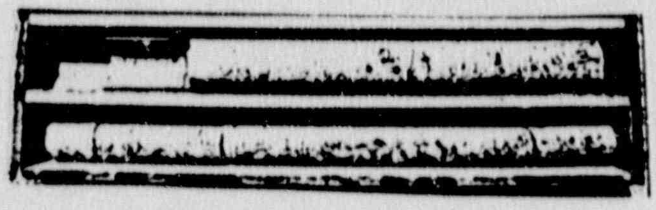
BOX 3 65' - 95'

FOR INFORMATION ONLY

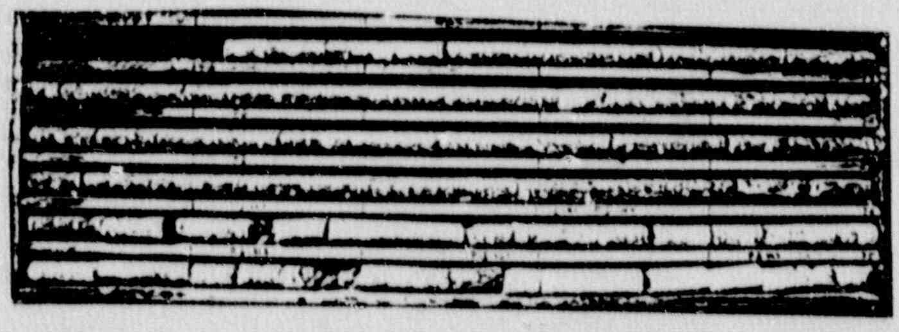
ATTACHMENT 6

SEQUOYAH NUCLEAR PLANT
FOUNDATION INVESTIGATION EVALUATION
ERCW PUMPING STATION
ELEMENT B

HOLE PSB-1
Surface El. 688.2 (0.0')
Top of Rock 619.8 (68.6')
Bottom of Hole 604.1 (84.4')

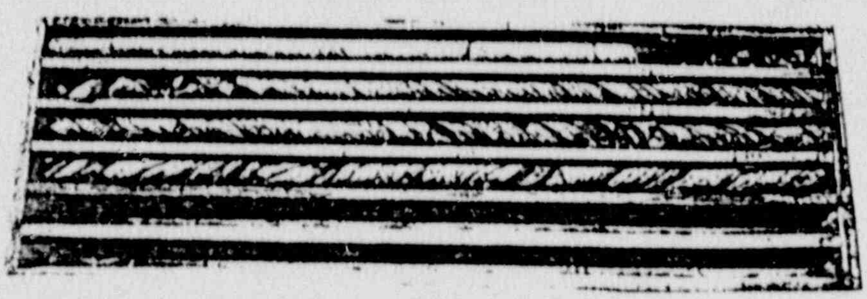


BOX 1 0' - 6.1'



BOX 2 6.1' - 35'

BOX 3 35' - 65'



BOX 4 65' - 95'

SHEET 52 OF _____ APPENDIX A

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90 ATTACHMENT 3 Page 1 of 2

CHECKED TST DATE 8/10/90

DRILLING LOG

SQN
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Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill ____ or Pressure Grout ____
NE. Rep. _____

Hole No. PSD-1 Date 9-22-89 Sheet 1 of 5
Type of Hole Core Size 4"ø NWX
Hole begun 9-22-89 Hole completed 1-3-90
Pumping Station:
Grout above el. 640; Yes X No ____.
NE Rep. A D Lodekens
Lake el _____ ft

Location of Hole:
Angle of Hole:
688.3 Concrete Elev. ft.
617.9 Elev. Top-of-rock ft.
602.3 Bottom of hole Elev. ft.

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description. The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	1.6	1.6	100	—	0	1.6	Start 9-22-89 drill 1.0' in concrete End 9-22-89 4" bit
2	1.5	1.5	100	—	0	3.1	Start 9-25-89 conc drill 0.6' concrete, hit rebar at 3.1'
3	1.0	1.0	100	—	0	4.1	cut rebar in conc. constr. joint at 3.5', End 9-25-89
4	1.9	1.9	100	—	0	6.0	Start 10-19-89, 3" bit conc, ~~encnt~~
5	4.9	4.9	100	—	0	10.9	Nwx bit, conc. end 10-19-89
6	5.7	5.7	100	—	0	16.0	Start 10-20-89, conc conc. to 18.2, sand and coarse aggregate 18.2 to 18.8
7	3.0	2.4	80	—	All	19.0	Hard water return but collect to river.

add 10-25-89

QDS 10-20-89

W H Lo
Cognizant Engineer

L B Ray
Drill Foreman

D E Nall ZIPC8910510 10-13-89
QC Inspector

Verify location ~~Angle~~ of hole (Ref. 2.11, 3.2, 4.2)
And Accuracy of template (of Attachment 1)

89-064

Inclinometer ID No. _____

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-1 Date 11-16-89 Sheet 2 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
							conc. 18.8 to 19.0 end 10-20-89 11-14-89 grout hole w/ 2:1 < red dye Drill on 11-16-89: red grout 18.2 to 18.8, concrete 18.8' to 19.0, sand & gravel 19.0 to 20.5 (no recovery of gravel) end 11-16-89
8	1.5	0	0	—	To river	20.5'	
9	0.8	0.2 25% 25% 0.0 11-17-89	25%	—	to river	21.3	Grout with MC-500 And red dye on 11-17-89, redrill grout to 20.5 drill on 11-20-89 gravel 20.5 to 20.6 gravel with grout 20.6 to 21.0, gravel 21.0 to 21.1 weak concrete 21.1 to 21.3
10	3.5	1.7	49%	—	0	24.8	concrete 21.3 to 21.4, gravel 21.4 to 23.0, concrete 23.0 to 24.6, gravel 24.6 to 24.8 (no recovery of gravel) end 11-20-89
11	1.5	0.9	27%	—	0	26.3	Grout with MC-500 on 11-21-89 start drilling 11-27-89, grout 24.6 to 25.9, grout with gravel 25.9 to 26.3'
12	2.4	—	10%	—	to river	28.7	continue drill in gravel with limited recovery, pieces of Aggregate

W. H. Lee
Cognizant Engineer

L. B. Bass
Drill Foreman

9020/dar

SHEET 54 OF _____

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED bt DATE 8/10/90

APPENDIX A
ATTACHMENT 3
Page 2 of 2

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. RSD-1 Date 11-27-89 Sheet 3 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
13	1.7	0.1	10%±	—	to river	30.4	continue drilling in gravel, weak concrete 30.2 to 30.3 end 11-27-89
14	0.9	0.9	100%	—	—	31.3	11-30-89 drill to 31.3 All conc. end 11-30-89, grout bottom of hole
15	3.6	1.5		—	to river	34.9	12-4-89, drill out grout 21.3 to 30.5, conc. 31.3 to 32.8, gravel 32.8 to 34.9
16	1.3	1.3	100%	—	—	36.2	conc. 34.9 to 36.2 end 12-4-89
17	5.0	4.0 5.0	100%	—	—	41.2	12-5-89, conc. 36.2 to 41.0, cement seam 41.0 to 41.2 end 12-5-89
18	1.8	1.3	72	—	to river	43.0	cement seam 41.2 to 41.4, conc. 41.4 to 42.0; cement seam 42.0 to 42.5, gravel 42.5 to 43.0
19	1.7	0	0	—	to river	44.7	gravel - no recovery end 12-5-89
20	1.1	0	0	—	to river	45.8	gravel 3 pieces recovered 12-9-89
21	1.0	—	0	—	to river	46.8	gravel - some recovery

W. H. Lee
Cognizant Engineer

J. B. Bay
Drill Foreman

09020/dar

SHEET 55 OF ______

SCG1S361 -

APPENDIX A I

SEQUOYAH NUCLEAR PLANT

ATTACHMENT 3
Page 2 of 2

COMPUTED QDS DATE 8/10/90

CHECKED Bt. DATE 8/10/90

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-1 Date 12-9-89 Sheet 4 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
22	0.4	0	0	—	to river	47.2	cont. 12-9-89, gravel no recovery grout end 12-9-89
23	4.1	3.8	93	—	to river	51.3	12-11-89; gravel 47.2 to 47.5, conc. 47.5 to 51.3
24	4.6	2.6	56	—	to river	55.9	conc. 51.3' to 53.5', gravel 53.5 to 53.9' conc. 53.9' to 54.3', gravel 54.3 to 55.9'
25	1.9	0.8	42	—	to river	57.8	gravel 55.9 to 56.1, conc. 56.1 to 56.6, gravel 56.6 to 56.7, ~~gravel~~ conc. 56.7 to 57.0, gravel 57.0 to 57.8; grouted end 12/11/89 (QDS 12/11/89)
26	6.5	0.1	1	—	to river	64.3	12/14/89 gravel 57.8 to 61.7 conc. 61.7 to 61.8, gravel 61.8 to 64.3 end 12/15/89
27	2.6	1.5	75	-	to river	66.3	start 1-2-90, gravel to 64.8, conc 64.8 to 66.3
28	4.3	4.3	100	—	to river	70.6	conc. to 70.6, burlap bag 70.6, Top of rock 70.6
29	2.5	2.5	100	—	to river	73.1	Rock to 73.1
30	2.2	2.2	100	—	to river	75.3	Rock to 75.3

W. H. Lee
Cognizant Engineer

L. B. Payne
Drill Foreman

SHEET 56 OF 1

SCG1S861

SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90

CHECKED bt DATE 8/10/90

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DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. BSR-1 Date 1-2-90 Sheet 5 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
31	2.0	2.0	100	—	to river	77.3	Rock to 77.3
32	2.4	2.4	100	—	to river	79.7	Rock to 79.7
33	1.7	1.7	100	—	to river	81.4	Rock to 81.4, end 1-2-90
34	4.9	4.9	100	—	to river	86.3	Rock to 86.3 on 1-3-90 end 1-3-90

W H Lee
Cognizant Engineer

J. B. Bayne
Drill Foreman

09020/dir

SHEET 57 OF _____

SCG1S361

SEQUOYAH NUCLEAR PLANT

APPENDIX A

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COMPUTED QDS DATE 8/10/90 ATTACHMENT 3
CHECKED fst DATE 8/10/90 Page 1 of 2

DRILLING LOG

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill ____ or Pressure Grout ____
NE. Rep. _____

Hole No. PSD-2 Date 9-20-89 Sheet 1 of 6
Type of Hole Core Size 4" & NWX
Hole begun 9-20-89 Hole completed 3-9-90
Pumping Station:
Grout above el. 640: Yes X No ____
NE Rep. Art Soderberg
Lake el _____ ft

Location of Hole:
Angle of Hole:
688.3 Concrete Elev. ft.
617.6 Elev. Top-of-rock ft.
602.0 Bottom of hole Elev. ft.

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	0.4	0.4	100	—	0	0.4	started 9-20-89, 4" bit hit rebar, End 9-20-89
2	0.1	0.1	100	—	0	0.5	start 9-21-89, cut rebar End 9-21-89
3	0.4	0.4	100	—	0	0.9	start 10-11-89, core 3" bit End 10-11-89
4	1.6	1.6	100	—	0	2.5	start 10-12-89, conc.
5	0.5	0.5	100	—	0	3.0	conc, hit rebar at 3.0
6	1.1	1.1	100	—	0	4.1	conc, contact at 3.3 - uneven. End 10-12-89
7	2.0	2.0	100	—	0	6.1	start 1-8-90 conc.

W H Lee
Cognizant Engineer

L. B. Ray
Drill Foreman

D E Hall
QC Inspector

I.R. C890510 10-13-89
Verify location ~~Angle~~ of hole (Ref. 2.11, 3.2, 4.2)
And Accuracy of template (of Attachment 1)

89-0641

Inclinometer ID No. 78023

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. RSD-2 Date 1-8-90 Sheet 2 of 6

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
8	5.0	5.0	100	—	0	11.1	conc., end 1-8-90
9	0.9	0.9	100	—	0	12.0	start 1-9-90, conc.
10	4.5	4.5	100	—	0	16.5	conc.
11	4.6	1.9	41	—		21.1	conc 16.5 to 18.4, gravel 18.4 to 21.1; end 1-9-90
12	2.2	0.0	0	—		23.3	start 1-17-90, gravel 21.1 to 23.3
13	0.4	0.1	25	—		23.7	gravel 23.3 to 23.6, conc. 23.6 to 23.7, end 1-17-90
14	2.6	1.2	46	—		26.3	start 1-19-90, conc. 23.7 to 24.9, gravel 24.9 to 26.3 end 1-19-9
15	1.0	0.0	0	—		27.3	start 1-22-90, gravel 26.3 to 27.3
16	1.3	0.2	15	—		28.6	gravel 27.3 to 27.9, conc. 27.9 to 28.1, gravel 28.1 to 28.6
17	3.1	1.0	32	—		31.7	conc. 28.6 to 28.8, gravel 28.8 to 30.9, conc. 30.9 to 31.7

C W Lee
Cognizant Engineer

Ellis Blanch
Drill Foreman

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-2 Date 1-22-90 Sheet 3 of 6

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
18	2.3	1.9	61	-		34.0	conc. 31.7 to 33.1, gravel 33.1 to 34.0
19	2.7	2.0	74	-		36.7	gravel 34.0 to 34.6, conc. 34.6 to 34.9, gravel 34.9 to 35.0, conc. 35.0 to 36.7 end 1-22-90
20	2.2	2.2	100	-		38.9	start 1-24-90, conc 36.7 to 38.9
21	2.4	2.4	100	-		41.3	conc. 38.9 to 41.3
22	2.3	1.1	48	-	to river	43.6	conc. 41.3 to 42.0, cement seam 42.0 to 42.2, gravel 42.2 to 42.4, wear conc. 42.4 to 42.6, gravel 42.6 to 43.6, end 1-24-90
23	3.1	0.0	0	-	to river	46.7	start 1-29-90, gravel 43.6 to 46.7, end 1-29-90
24	1.3	0.0	0	-	to river	48.0	start 2-1-90, gravel 46.7 to 48.0, end 2-1-90 2-7-90, TV camera not working : grouted hole w/out video

C H Lee
Cognizant Engineer

Drill Foreman

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Ce

Hole No. PSD-2 Date 2-13- Sheet 4 of 6

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
25	3.3	3.2	97	–	to river	51.3	start 2-13-90, gravel 48.0 to 48.1, conc. 48.1 to 51.3 end 2-13-90
26	2.9	2.9	100	–	0	54.2	start 2-14-90, conc. 51.3 to 54.2.
27	0.8	0.2	25	–	to river	55.0	conc. 54.2 to 54.4, gravel 54.4 to 55.0
28	0.5	0.3	60	–	to river	55.5	gravel 55.0 to 55.2, conc. 55.2 to 55.5 end 2-14-90
29	0.9	0.0	0	–	to river	56.4	start 2-15-90, gravel 55.5 to 56.4
30	1.6	0.4	25	–	to river	58.0	gravel 56.4 to 56.7, conc. 56.7 to 56.8, gravel 56.8 to 57.3, conc. 57.3 to 57.6, gravel 57.6 to 58.0
31	2.0	0.0	0	–	to river	60.0	gravel 58.0 to 60.0, end 2-15-90
32	1.3	0.0	0	–	to river	61.3	start 2-20-90, gravel 60.0 to 61.3
33	0.3	0.0	0	–	to river	61.6	gravel 61.3 to 61.6
34	0.9	0.3	75	–	to river	62.0	conc. 61.6 to 61.9, gravel 61.9 to 62.0, end 2-20-90

W H Lan
Cognizant Engineer

L. B Bayer
Drill Foreman

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SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90

CHECKED fst DATE 8/10/90

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DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-2 Date 3-9-90 Sheet 6 of 6

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
44	1.3	1.3	100	—	0	76.3	rock 75.0 to 76.3, start 3-9-90
45	3.0	3.0	100	—	70% loss	79.3	rock 76.3 to 79.3 lost some water to 79.3
46	2.0	2.0	100	—	0	81.3	rock 79.3 to 81.3
47	3.6	3.6	100	—	0	84.9	rock 81.3 to 84.9
48	1.4	1.4	100	—	0	86.3	rock 84.9 to 86.3 end 3-9-90, Bot. of hole

W H Lee
Cognizant Engineer

J. B. Payne
Drill Foreman

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SEQUOYAH NUCLEAR PLANT
COMPUTED GDB DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

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DRILLING LOG

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill ____ or Pressure Grout ____
NE. Rep. ________

Hole No. PSD-5 Date 10-25-89 Sheet 1 of 4
Type of Hole Core Size 4"& NWX
Hole begun 10-25-89 Hole completed 2-12-90
Pumping Station:
Grout above el. 640: Yes ____ No X
NE Rep. [illegible]
Lake el — ft

Location of Hole: 18.7'N, 13.1'E
Angle of Hole: 1H:12V
638.0 Concrete Elev. ft.
615.7 Elev. Top-of-rock ft.
599.3 Bottom of hole Elev. ft.

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description: The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	1.9	1.9	100	-	0	1.9	start 10-25-89, conc., 4" bit
2	0.8	0.8	100	—	0	2.7	conc., hit rebar end 10-25-89
3	0.1	0.1	100	—	0	2.8	start 10-26-89 cut rebar, end @ 2.8 10-26-89
4	1.3	1.3	100	—	0	4.1	conc., 3" bit, end 10-26-89 bonded contact at 3.2'
5	1.7	1.7	100	—	0	5.8	start 10-27-89, conc., 3" bit end 10-27-89
6	5.0	5.0	100	—	0	10.8	start 2-6-90 conc.
7	5.1	5.1	100	—	0	15.9	conc., 60° j w/ effeseance

W. H. Lee
Cognizant Engineer

[signature]
Drill Foreman

D E Hall I.R. NO. C890527
QC Inspector
Verify location/~~angle~~ of hole (Ref. 2.11, 3.2, 4.2) And Accuracy of template (of Attachment 1)

Inclinometer ID No. 78023

189-0641

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. RSP5 Date 2-6-90 Sheet 2 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
8	5.0	5.0	100	—	0	20.9	conc.
9	5.0	5.0	100	—	0	25.9	conc. 20.9 to 21.6, cement w/ seam 21.6 to 22.0, con. 22.0 to 25.9, end 2-6-90
10	5.1	5.1	100	—	0	31.0	start 2-7-90, conc. 25.9 to 29.2, weak conc. 29.2 to 29.6, conc. 29.6 to 31.0
11	5.0	5.0	100	—	0	36.0	conc. 31.0 to 36.0
12	5.1	5.1	100	—	0	41.1	conc. 36.0 to 41.1
13	5.0	5.0	100	—	0	46.1	conc. 41.1 to 44.1, conc 44.3 to 44.5, cement seam 44.1 to 44.3, conc. 44.3 to 44.5, cement seam 44.5 to 44.9, conc. 44.9 to 45.2, cement seam 45.2 to 46.0, conc. 46.0 to 46.1
14	2.0	2.0	100	—	0	48.1	conc. 46.1 to 46.3, cement seam 46.3 to 47.2, conc. 47.2 to 47.3, cement seam 47.3 to 48.1, end 2-7-90

W H Lee
Cognizant Engineer

Drill Foreman

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. P52-5 Date 2/8/90 Sheet 3 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
15	3.7	3.7	100	—	0	51.8	start 2-8-90, cement seam 48.1 to 48.3, conc. 48.3 to 51.8
16	5.0	5.0	100	—	0	56.8	conc. 51.8 to 56.8
17	5.0	4.5	90	—	to river	61.8	conc. 56.8 to 60.1, weak conc. 60.1 to 60.5, gravel 60.5 to 61.0, cement w/ sand 61.0 to 61.2, cement w/ gravel 61.2 to 61.8
18	0.5	0.3	60	—	to river	62.3	gravel 61.8 to 62.0, cement w/ sand 62.0 to 62.3
19	0.5	0.3	60	—	to river	62.8	gravel 62.3 to 62.5, conc. 62.5 to 62.8
20	1.4	1.1	79	—	to river	64.2	conc. 62.8 to 63.3, gravel 63.3 to 63.6, conc. 63.6 to 64.2
21	2.9	2.9	100	—	0	67.1	conc. 64.2 to 67.1
22	0.9	0.9	100	-	0	68.0	conc. 67.1 to 68.0
23	3.0	3.0	100	-	0	71.0	conc. 68.0 to 71.0, end 2-8 90 71.0 RDS 2-9-90
24	2.0	2.0	100	—	0	73.0	start 2-9-90, conc. ~~73.0~~ to 73.6, rock 73.6 to 73.0

W H Lee
Cognizant Engineer

L B Bynum
Drill Foreman

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-5 Date 2/9/90 Sheet 4 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
25	0.6	0.6	100	–	0	73.6	rock 73.0 to 73.6
26	3.4	3.4	100	–	0	77.0	rock 73.6 to 77.0
27	0.3	0.3	100	–	0	77.3	rock 77.0 to 77.3
28	1.0	1.0	100	–	0	78.3	rock 77.3 to 78.3
29	1.0	1.0	100	–	to 100% return	79.3	rock 78.3 to 79.3, lost water end 2/9/90
30	2.7	2.6	96	–	to return 100%	82.0	start 2/12/90, lost water 79.3 to 79.4, rock 79.4 to 82.0
31	5.0	5.0	100	–	0	87.0	rock 82.0 to 87.0
32	2.0	2.0	100	–	0	89.0	rock 87.0 to 89.0 bottom of hole end 2/13/90

W H Lee
Cognizant Engineer

T. B. Bayne
Drill Foreman

SHL 66 OF
SCG1S361

SEQUOYAH NUCLEAR PLANT
COMPUTED GDL DATE 8/10/90
CHECKED bt DATE 8/10/90

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Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill ____ or Pressure Grout ____
NE. Rep. _____

Hole No. PSP-6 Date 10-24-89 Sheet 1 of 4
Type of Hole Core Size 4" EXWX
Hole begun 10-24-89 Hole completed 11-25-90
Pumping Station:
Grout above el. 640: Yes ____ No ✓
NE Rep. G D Lazenby
Lake el _____ ft

Location of Hole: 18.8'N, 11.1'E
Angle of Hole: Vertical
688.0 Concrete Elev. ft.
615.5 Elev. Top-of-rock ft.
597.8 Bottom of hole Elev. ft.

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description. The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	2.0	2.0	100	—	0	2.0	START 10-24-89, conc. 4" bit
2	2.1	2.1	100	—	0	4.1	conc., bottom of core slab 3.2' End core banded, broken on handling 10-2
3	2.0	2.0	100	—	0	6.1	START 10-30-89, 3" bit, conc.
4	5.2	5.2	100	—	0	11.3	END 10-30-89 START 12-19-89, conc.
5	4.9	4.9	100	—	0	16.2	conc., end 12-19-89
6	5.0	5.0	100	—	0	21.2	START 12-19-89, conc.
7	4.8	4.8	100	—	0	26.0	conc., end 12-19-89

W. H. Lee
Cognizant Engineer

L. B. Bamm
Drill Foreman

QE Hall FRC890527
QC Inspector Verify location ~~angle~~ of hole (Ref. 2.11, 3.2, 4.2)
And Accuracy of template (of Attachment 1)

89-0641

Inclinometer ID No. 78023

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-6 Date 12-20-89 Sheet 2 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
8	5.0	5.0	100	–	0	31.0	start 12-20-89, conc.
9	5.0	5.0	100	–	0	36.0	conc.
10	5.0	5.0	100	–	0	41.0	conc.
11	4.8	3.9	81	–	w/ River	45.8	conc. 41.0 to 43.7; gravel 43.7 to 44.2; cement sand 44.2 to 44.5; conc. 44.2 to 44.3, 44.5 to 44.7 weak conc. 44.7 to 45.1, gravel 45.1 to 45.5, conc. 45.5 to 45.8 end 12-20-89
12	2.7	2.5	93	–	to river	48.5	start 1-4-90, gravel 45.8 to 46.0, cement w/ sand 46.0 to 46.7, cement sand 46.7 to 47.3, conc. 47.3 to 48.5 end 1-4-90
13	0.4	0.4	100	–	0	48.9	start 1-5-90, conc. 48.5 to 48.9
14	1.1	1.1	100	–	0	50.0	conc. 48.9 to 50.0
15	5.0	5.0	100	–	0	55.0	conc 50.0 to 55.0

W H Lee
Cognizant Engineer

Ellie Shanks
Drill Foreman

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-6 Date 1-5-90 Sheet 3 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
16	2.0	1.0	50	—	to river	57.0	conc. 55.0 to 55.1, gravel 55.1 to 55.4, conc. 55.4 to 55.7, gravel 55.7 to 56.1, conc. 56.1 to 56.2, gravel 56.2 to 56.5, conc. 56.5 to 57.0
17	4.1	0.8	20	—	to river	61.1	conc. 57.0 to 57.8, gravel 57.8 to 61.1, end 1-5-90 start 1-23-90, conc. 61.1 to 61.2, weak conc. 61.3 to 61.6, conc. 61.6 to 62.9, cement seam 62.9 to 64.0, conc. 64.0 to 64.6
18	3.5	3.5	100	—	0	64.6	
19	0.4	0.4	100	—	0	65.0	conc. 64.6 to 65.0
20	5.0	5.0	100	—	0	70.0	conc. 65.0 to 66.4, cement with sand 66.4 to 67.3, conc. 67.3 to 70.0 end 1-23-90
21	4.6	2.3	57	—	0	74.0	conc. 70.0 to 72.3, core loss 72.3 to 74.0 driller ground core start 1-24-90

W H Lee
Cognizant Engineer

J. B. Payne
Drill Foreman

SHEET 69 OF 1

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SEQUOYAH NUCLEAR PLANT

COMPUTED QDR DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

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Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-6 Date 1-24-90 Sheet 4 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
22	2.8	0.0	0	—	0	76.8	core loss 74.0 to 76.8, driller ground core
23	3.7	3.7	100	-	0	80.5	rock 76.8 to 80.5
24	1.5	1.5	100	—	0	82.0	rock 80.5 to 82.0
25	5.0	5.0	100	—	0	87.0	rock 82.0 to 87.0 end 1-24-90
26	3.2	3.1	97	-	100 loss	90.2	start 1-25-90, rock 87.0 to 89.4, water loss (100%) 89.4 to 89.5, rock 89.5 to 90.2 end 1-25-90 Bottom of hole

W H Lee
Cognizant Engineer

J. B. Payne
Drill Foreman

09020/dsr

SHEET 70 OF ________

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SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90 ATTACHMENT 3
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CHECKED bf DATE 8/10/90

DRILLING LOG

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill — or Pressure Grout — Hole No. PSD-7 Date 3/19/90 Sheet 1 of 4
NE. Rep. — Type of Hole Core Size NWX
Hole begun 3-19-90 Hole completed ____

Location of Hole:
Angle of Hole: 1H:24V
688.3 Concrete Elev. ft.
Elev. Top-of-rock ft.
Bottom of hole Elev. ft.

Pumping Station:
Grout above el. 640: Yes X No ____
NE Rep. QD Soderberg
Lake el — ft

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	1.5	1.5	100	—	0	1.5	start 3-19-90, 3" bit, conc 0.0 to 1.5
2	1.4	1.4	100	—	0	2.9	conc. 1.5 to 2.9, hit steel rebar end 3-19-90
3	1.1	1.1	100	—	0	4.0	start 3-20-90, conc. 2.9 to 4.0, 1" rebar N-S, 1" rebar E-W
4	2.1	2.1	100	—	0	6.1	conc. 4.0 to 6.1 end 3-20-90
5	5.1	5.1	100	—	0	11.2	start 3-21-90, conc 6.1 to 11.2
6	5.1	5.1	100	—	0	16.3	conc. 11.2 to 16.3
7	3.5	1.9	54	—	to river	19.8	conc. 16.3 to 18.2, gravel 18.2 to 19.8

W H Lee
Cognizant Engineer

J B Payne
Drill Foreman

D E Hall IRC 900216 4
QC Inspector

Verify location ~~angle~~ of hole (Ref. 2.11, 3.2, 4.2) And Accuracy of template (of Attachment 1)

Inclinometer ID No. —

89-0641

COMPUTED [illegible] DATE 3/10/90

CHECKED [illegible] DATE 8/10/90

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DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-7 Date 3-21-90 Sheet 2 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
8	0.4	90	0	—	to river	20.2	gravel 19.8 to 20.2, end @ 3/21/90
9	1.1	0.4	36	—	to river	21.3	start 3-22-90, gravel 20.2 to 20.8, conc. 20.8 to 21.2, gravel 21.2 to 21.3
10	1.6	0.2	13	—	to river	22.9	gravel 21.3 to 22.1, gravel w/ black grout 22.1 to 22.3, gravel 22.3 to 22.9, end 3-22-90
11	3.4	1.5	44	—	to river	26.3	start 3-27-90, gravel 22.9 to 23.3, conc. 23.3 to 24.8, gravel 24.8 to 26.3, end 3-27-90
12	1.8	0	0	—	to river	28.1	start 3-30-90, gravel 26.3 to 28.1
13	1.6	0.7	44	—	to river	29.7	conc. 28.1 to 28.2, gravel 28.2 to 28.4, conc. 28.4 to 29.0, gravel 29.0 to 29.7
14	0.5	0	0	—	to river	30.2	gravel 29.7 to 30.2, end 3-30-90
15	1.1	0.9	82	—	to river	31.3	start 4-3-90, gravel 30.2 to 30.4, conc. 30.4 to 31.3
16	3.1	0.9	13	—	to river	34.4	conc. 31.3 to 32.7, gravel 32.7 to 34.4

W H Lee
Cognizant Engineer

[signature]
Drill Foreman

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSP-7 Date 4-3-90 Sheet 3 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is, jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
17	1.9	1.7	89	–	to river	36.3	gravel 34.4 to 34.6, conc. 34.6 to 36.3
18	5.0	5.0	100	–	–	41.3	conc. 36.3 to 40.9, cement seam 40.4 to 41.1, conc. 41.1 to 41.3
19	1.9	0.^	42	–	to river	43.2	conc. 41.3 to 41.7, cement seam 41.7 to 42.1, gravel 42.1 to 43.2, end 4-3-90
20	3.1	0.5	16	–	to river	46.3	start 4-6-90, gravel 43.2 to 45.8, weak conc. 45.8 to 46.3
21	1.5	0.2	13	–	to river	47.8	gravel 46.3 to 47.6, conc. 47.6 to 47.8
22	0.7	0.7	100	–	–	48.5	conc. 47.8 to 48.5, end 4-6-90
23	2.8	2.8	100	–	–	51.3	start 4-11-90, conc. 48.5 to 51.3
24	4.0	2.8	70	–	to river	55.3	conc. 51.3 to 53.4, gravel 53.4 to 54.0, conc. 54.0 to 54.7, gravel 54.7 to 55.3
25	1.0	0.2	20	–	to river	56.3	gravel 55.3 to 55.5, conc. 55.5 to 55.7, gravel 55.7 to 56.3
26	2.1	0	0	–	to river	58.4	gravel 56.3 to 58.4, end 4-11-90

C W H Lee
Cognizant Engineer

L B Bayne
Drill Foreman

09020/dar

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-7 Date 4/17/90 Sheet 4 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
27	0.5	0	0	–	to river	58.9	start 4-17-90, gravel 58.4 to 58.9
28	2.4	0	0	–	to river	61.3	gravel 58.9 to 61.3
29	1.2	0	0	–	to river	62.5	gravel 61.3 to 62.5
30	1.8	0.2	11	–	to river	64.3	gravel 62.5 to 64.1, conc. 64.1 to 64.3, end 4-17-90
add 4-25-90 31	~~1.2~~ 2.0	1.3	65	–	to river	66.3	start 4-25-90, gravel 64.3 to 65.0, conc. 65.0 to 66.3
32	5.0	5.0	100	–	–	71.3	conc. 66.3 to 70.8, rock 70.8 to 71.3
33	0.4	0.4	100	–	–	71.7	rock 71.3 to 71.7
34	1.3	1.3	100	–	30%	73.0	rock 71.7 to 73.0, end 4-25-90 lost water 72.0
35	3.3	3.3	100	–	30%	76.3	start 4-27-90, rock 73.0 to 76.3 L.W. 74.0
36	3.0	3.0	100	–	30%	79.3	rock 76.3 to 79.3
37	1.9	1.9	100	–	–	81.2	lost water 77.8
38	2.7	2.7	100	–	–	83.9	rock 79.3 to 81.2
39	2.4	2.4	100	–	–	86.3	rock 83.9 to 86.3, end 4-27-90

W H Lee
Cognizant Engineer

L B Bayes
Drill Foreman

09020/dar

ICF 89-0641 Sheet 9 of 11

SHEET 74 OF _____

SCG1S361 APPENDIX A

SEQUOYAH NUCLEAR PLANT

COMPUTED CDS DATE 8/10/90 ATTACHMENT 3 Page 1 of 2

CHECKED [illegible] DATE 8/10/90

DRILLING LOG

SQN
SMI-0-400-6
Page 14
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Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill — or Pressure Grout —
NE. Rep. —

Hole No. PSD-8 Date 3-13-90 Sheet 1 of 4
Type of Hole Core Size NWX
Hole begun 3-13-90 Hole completed 4-23-90
Pumping Station:
Grout above el. 640: Yes ___ No X
NE Rep. C A Pedersen
Lake el — ft

Location of Hole:
Angle of Hole:
Concrete Elev. ft.
Elev. Top-of-rock ft.
Bottom of hole Elev. ft.

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	1.7	1.7	100	—	0	1.7	start 3-13-90, conc. 0.0 to 1.7 end 3-13-90
2	1.5	1.5	100	—	0	3.2	start 3-15-90, conc. 1.7 to 3.2
3	1.1	1.1	100	—	0	4.3	conc. 3.2 to 4.3
4	1.7	1.7	100	—	0	6.0	conc 4.3 to 6.0, end 3-15-90
5	4.7	4.7	100	—	0	10.7	start 3-26-90, conc. 6.0 to 10.7
6	5.1	5.1	100	—	0	15.8	conc. 10.7 to 15.8
7	5.0	5.0	100	—	0	20.8	conc. 15.8 to 20.8

W H Lo
Cognizant Engineer

J B Bayne
Drill Foreman

D E Hall ER C902164
QC Inspector

Verify location ~~Angle~~ of hole (Ref. 2.11, 3.2, 4.2) And Accuracy of template (of Attachment 1)

89-0641

Inclinometer ID No. —

APPENDIX A
ATTACHMENT 3
Page 2 of 2

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-8 Date 3-26-90 Sheet 2 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
8	5.0	4.6	92	—	to river	25.8	conc. 20.8 to 21.5, cement seam 21.5 to 21.6, gravel 21.6 to 21.7, conc. 21.7 to 22.0, gravel 22.0 to 22.2, conc. 22.2 to 24.0, cement seam 24.0 to 24.2, conc. 24.2 to 25.3, gravel 25.3 to 25.4, conc. 25.4 to 25.8
9	4.9	4.7	96	—	to river	30.7	conc. 25.8 to 26.6, cement seam 26.6 to 26.9, conc. 26.9 to 28.4, cement seam 28.4 to 28.8, gravel 28.8 to 29.0, soil 29.0 to 30.7, end 3-26-90 start 3-27-90, conc. 30.7 to 35.8
10	5.1	5.1	100	—	—	35.8	
11	5.0	5.0	100	—	—	40.8	conc. 35.8 to 39.8, cement seam 39.8 to 40.2, conc. 40.2 to 40.8
12	5.0	3.3	66	—	to river	45.8	conc. 40.8 to 43.8, cement seam 43.8 to 44.1, gravel 44.1 to 45.8
13	5.0	3.8	76	—	to river	50.8	gravel 45.8 to 47.0, weak conc. 47.0 to 47.5, conc. 47.5 to 50.8, end 3-27-91

W H Lee
Cognizant Engineer

J. B. Boyd
Drill Foreman

09020/dar

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSD-8 Date 3-28-90 Sheet 3 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, i.e. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
14	5.0	5.0	100	—		55.8	start 3-28-90, conc. 50.8 to 55.8
15	4.4	1.3	30	—	to river	60.2	conc. 55.8 to 56.8, gravel 56.8 to 59.9, conc. 59.9 to 60.2, end 3-28-90
16	0.6	0.1	17	—	to river	60.8	start 4-5-90, conc. 60.2 to 60.3, gravel 60.3 to 60.8
17	0.9	0.3	33	—	to river	61.7	gravel 60.8 to 61.4, conc. 61.4 to 61.7
18	2.0	0.2	10	—	to river	63.7	gravel 61.7 to 63.5, conc. 63.5 to 63.7
19	1.3	0.5	38	—	to river	65.0	conc. 63.7 to 64.2, gravel 64.2 to 65.0, end 4-5-90
20	1.1	0.0	0	—	to river	66.1	start 4-9-90, gravel 65.0 to 66.1
21	1.0	0.1	10	—	to river	67.1	gravel 66.1 to 67.0, conc. 67.0 to 67.1, end 4-9-90
22	3.7	3.7	100	—	—	70.8	conc. 67.1 to 70.8, start 4-23-90
23	1.9	1.7	89	—	to river	72.7	conc. 70.8 to 72.2, gravel 72.2 to 72.4, rock 72.4 to 72.7

W H Lee
Cognizant Engineer

L. B. Payne
Drill Foreman

09020/dar

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Calls

Hole No. PSD-8 Date 4-23-90 Sheet 4 of 4

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, i.e. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
24	2.6	2.6	100	-	-	75.3	rock 72.7 to 75.3
25	5.0	5.0	100	-	-	80.3	rock 75.3 to 80.3
26	2.6	2.6	100	-	-	82.9	rock 80.3 to 82.9
27	0.3	0.3	100	-	-	83.2	rock 82.9 to 83.2
28	2.1	2.1	100	-	-	85.3	rock 83.2 to 85.3
29	2.4	2.4	100	-	-	87.7	rock 85.3 to 87.7, end 4-23-90

W H Lee
Cognizant Engineer

J. B. Bowman
Drill Foreman

09020/dar

ICF 89-0641 Sheet 9 of 11

APPENDIX A

SHEET 78 OF ______

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED ADB DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

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DRILLING LOG

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Access Cells:
Backfill ____ or Pressure Grout ____
NE. Rep. ________

Hole No. RSB-1 Date 11-1-89 Sheet 1 of 5
Type of Hole Core Size 4" ENWX
Hole begun 11-1-89 Hole completed ____
Pumping Station:
Grout above el. 640: Yes X No ____
NE Rep. [signature]
Lake el ________ ft

Location of Hole: 24.8'S, 29.7'E
Angle of Hole: 1H:12V
688.2 Concrete Elev. ft.
619.8 Elev. Top-of-rock ft.
604.1 Bottom of hole Elev. ft.

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
1	2.0	2.0	100	–	0	2.0	Start 11-1-89, start 4" conc.
2	1.0	1.0	100	–	0	3.0	conc., hit rebar, end 11-1-89
3	0.1	0.1	100	–	0	3.1	cut steel w/ 4", start 11-3-89
4	0.9	0.9	100	–	0	4.0	change to 3" bit, conc. contact at 3.3' floor slab
5	2.1	2.1	100	–	0	6.1	conc., end 11-3-89
6	5.0	5.0	100	–	0	11.1	Start 5-10-90, conc.
7	5.2	5.2	100	–	0	16.3	conc.
8	5.0	5.0	100	–	0	21.3	conc.

W.H. Lee
Cognizant Engineer

[signature]
Drill Foreman

I.R. II C890527

DE Hall Verify location ~~Angle~~ of hole (Ref. 2.11, 3.2, 4.2)
QC Inspector And Accuracy of template (of Attachment 1)

89-0641

Inclinometer ID No. ________

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSB-1 Date 5-10-90 Sheet 3 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
9	5.0	4.5	90	-	to river	26.3	conc. 21.3 to 25.3, gravel 25.3 to 25.7, conc. 25.7 to 26.3, gravel 26.3 to 26.3
10	1.8	0.3	17	-	to river	28.1	gravel 26.3 to 27.4 conc. 27.4 to 27.7, gravel 27.7 to 28.1
11	0.3	0	0	-	to river	28.4	gravel 28.1 to 28.4, end 5-10-90
12	1.6	0	0	-	to river	30.0	start 5-14-90, gravel 28.4 to 30.0
13	1.3	0	0	-	to river	31.3	gravel 30.0 to 31.3 end 5-14-90
14	1.4	0.9	64	-	to river	32.7	start 5-16-90, gravel 31.3 to 31.8, conc. 31.8 to 32.7
15	1.6	0	0	-	to river	34.3	gravel 32.7 to 34.3
16	0.9	0.1	11	-	to river	35.2	gravel 34.3 to 35.1, conc. 35.1 to 35.2, end 5-16-90
17	1.0	0	0	-	to river	36.2	start 5-22-90, gravel 35.2 to 36.2
18	0.5	0	0	-	to river	36.7	gravel 36.2 to 36.7

W H Lee
Cognizant Engineer

L. B. Rayon
Drill Foreman

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSB-1 Date 5-22-90 Sheet 3 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
19	2.3	2.0	87	-	to river	39.0	gravel 36.7 to 37.0, conc. 37.0 to 39.0, end 5-22-90
20	1.8	1.8	100	-	0	40.8	start 5-24-90, 39.0 to 40.8
21	5.0	4.3	86	-	to river	45.8	conc. 40.8 to 41.7, cement seal 41.7 to 41.8, conc. 41.8 to 44.7, gravel 44.7 to 45.2, conc. 45.2 to 45.6, gravel 45.6 to 45.8, end 5-24-90
22	1.8	0.6	33	-	to river	47.6	start 5-25-90, gravel 45.8 to 47.0, conc. 47.0 to 47.6
23	0.7	0.7	100	-	0	48.3	conc. 47.6 to 48.3, end 5-25-90
24	3.0	3.0	100	-	0	51.3	start 5-29-90 conc. 48.3 to 49.4, weak conc. 49.4 to 49.5, conc. 49.5 to 51.3
25	5.0	5.0	100	-	0	56.3	conc. 51.3 to 56.3
26	5.0	5.0	100	-	0	61.3	conc. 56.3 to 61.3
27	3.0	2.2	73	-	to river	64.3	conc. 61.3 to 63.5, gravel 63.5 to 64.3

W H Lee
Cognizant Engineer

L. B. Payne
Drill Foreman

09020/dar

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSB-1 Date 5-29-90 Sheet 4 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
28	0.2	0	0	-	to river	64.5	gravel 64.3 to 64.5
29	2.9	2.9	100	-	0	67.4	conc. 64.5 to 67.4
30	1.2	1.1	92	-	All	68.6	conc. 67.4 to 68.5, open seam 68.5 to 68.6, lost All drill water
31	0.7	0.3	43	-		69.3	rock 68.6, core loss 68.6 to 69.0, rock 69.0 to 69.3 end 5-29-90
32	1.0	1.0	100	-		70.3	start 5-30-90, rock 69.3 to 70.3
33	0.5	0.5	100	-		70.8	rock 70.3 to 70.8
34	3.1	3.1	100	-		73.9	rock 70.8 to 73.9
35	3.5	3.5	100	-		77.4	rock 73.9 to 77.4
36	1.5	1.5	100	-		78.9	rock 77.4 to 78.9
37	0.9	0.9	100	-	↓	79.8	rock 78.9 to 79.8

W H Lee
Cognizant Engineer

L. B. Rayner
Drill Foreman

09020/dar

APPENDIX A

SHEET 82 OF ____

SCGIS361

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

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Page 2 of 2

DRILLING LOG
Continuation Sheet

Sequoyah Nuclear Plant
ERCW Pumping Station And Access Roadway Cells

Hole No. PSB-1 Date 5-30-90 Sheet 5 of 5

Pull Number	Length Cored, Ft.	Recovery Ft.	% Recovery	Drilling Time Min.	Depth/Amount of Water Loss/Gain	DEPTH IN FEET	Concrete or Rock Description The presence of discontinuities (cracks or loose zones); elevations of start and end of drilling per shift; location and cause of core loss, such as open joints or cracks, grinding, soft material; water elevation at end of drilling and beginning of each day; drill water connections; action of drill, is. jerky, smooth, rough or steady; times of starting/stopping, changes in water flow rate and color.
38	2.2	2.2	100	—	All	82.0	rock 79.8 to 82.0
39	0.7	0.7	100	—	↓	82.7	rock 82.0 to 82.7
40	1.7	1.7	100	—	↓	84.4	rock 82.7 to 84.4, bottom of hole, end 5-30-90

[signature]
Cognizant Engineer

[signature]
Drill Foreman

0902Q/dar

ATTACHMENT 10
Page 1 of 1

TRAINING DATA SHEET

The NE representative (who is the author if this SMI) for this program does not require training because of his extensive experience over the past 19 years in similar programs at various nuclear and hydro plants. He will train the drill foreman, drill operator, cognizant engineer and QC inspector in their appropriate tasks.

SUBJECT: Training for SMI-0-400-6

Please sign below to acknowledge training in this SMI.

NAME	SIGNATURE	TITLE	DATE
Drill Foreman			
D.E. HALL	D E Hall	QC INSPECTOR	8-7-89
~~Cognizant Engineer~~ QC Inspector	[illegible] 8-7-89		
Harold L. Long QC Inspector	Harold L Long	QC Inspector	8-7-89
Drill Operator			
A.D. Soderberg Instructor	A D Soderberg	Engr. Spec.	8-7-89

ATTACHMENT 10
Page 1 of 1

TRAINING DATA SHEET

The NE representative (who is the author if this SMI) for this program does not require training because of his extensive experience over the past 19 years in similar programs at various nuclear and hydro plants. He will train the drill foreman, drill operator, cognizant engineer and QC inspector in their appropriate tasks.

SUBJECT: Training for SMI-0-400-6

Please sign below to acknowledge training in this SMI.

NAME	SIGNATURE	TITLE	DATE
James B. Payne Drill Foreman	James B Payne	Core Drill Foreman	7/27/89
William H. Lee Cognizant Engineer	William H Lee	COG-ENGR	7-27-89
Barbara M. Mattox QC Inspector	Barbara M. Mattox	QC Shift Coordinator	7-27-89
Roger T Helms Drill Operator	Roger T Helms	Core Drill Opr.	7/27/89
Art Soderberg Instructor	Art Soderberg	Engr. Spec.	7/27/89
VIRGIL F. POWELL Cognizant Engr.	Virgil F. Powell	MECH ENGR	7/27/89

SCG 18361

SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90

CHECKED LF DATE 8/10/90

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SMI-0-400-6
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ATTACHMENT 10
Page 1 of 1

TRAINING DATA SHEET

The NE representative (who is the author if this SMI) for this program does not require training because of his extensive experience over the past 19 years in similar programs at various nuclear and hydro plants. He will train the drill foreman, drill operator, cognizant engineer and QC inspector in their appropriate tasks.

SUBJECT: Training for SMI-0-400-6

Please sign below to acknowledge training in this SMI.

NAME	SIGNATURE	TITLE	DATE
James B. Payne Drill Foreman	James B Payne	Core Drill Foreman	7/27/89
William H. Lee Cognizant Engineer	William H Lee	COG-ENGR	7-27-89
Barbara M. Mather QC Inspector	Barbara M. Mather	QC Shift Coordinator	7-27-89
Roger T Helms Drill Operator	Roger T Helms	Core Drill Opr.	7/27/89
Art Soderberg Instructor	Art Soderberg	Engr. Spec.	7/27/89
VIRGIL F. POWELL Cognizant Engr.	Virgil F. Powell	MECH ENGR	7/27/89

0902Q/jar

ATTACHMENT 10
Page 1 of 1

TRAINING DATA SHEET

The NE representative (who is the author if this SMI) for this program does not require training because of his extensive experience over the past 19 years in similar programs at various nuclear and hydro plants. He will train the drill foreman, drill operator, cognizant engineer and QC inspector in their appropriate tasks.

SUBJECT: Training for SMI-0-400-6

Please sign below to acknowledge training in this SMI.

NAME	SIGNATURE	TITLE	DATE
ERIC PLUNK Drill Foreman	Eric Plunk	CORE DRILL FOREMAN	12/12/89
Cognizant Engineer			
QC Inspector			
Carl E Grossheim Drill Operator	Carl E Grossheim	Core Drill Operator	12/12/89
Art Soderberg Instructor	Art Soderberg	Engr. Spec.	12/12/89

ATTACHMENT 5
Page 1 of 1

Date 11-17-89

Page 1 of 1

DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-1	pipe At 20.5'	MC-500	4*	688	679.5	Use MC-500 1&2:1 mix ratio with red dye. Took grout At first then slowed to no tAKe. Grout thru pipe set At ~~62~~ 20.5' depth, mAintAined grout level At top of floor (el. 688.2) The open hole holds 1 ft³ therefore ApproximAtely 3 ft³ into the grAvel
						* ApproximAte

* OR el top of grout

L. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IRC890534
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment

COMPUTED DATE 11/17/89
CHECKED
DATE 11/17/89

APPENDIX C

SEQUOYAH NUCLEAR PLANT

SHEET 37 OF

SCGIS381

ATTACHMENT 5
Page 1 of 1

Date 11-21-89

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-1	Pipe At 26.4'	MC-500	4.5*	el. 688	678.5	Pipe set in hole to 26.4'. setting on gravel injected 4.5 ft³ of 1.2:1 w:c MC-500 (No dye) into hole. same reaction As 11-11-89 *Hole holds 1.5 ft³ therefore 3 ft³ put into gravel, Approximate.

* OR el top of grout

Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IR C890536
QC Inspector
Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

D C Hall IRC890541
QC Inspector
Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

09040/ceg

APPENDIX C

SEQUOYAH NUCLEAR PLANT
COMPUTED [initials] DATE 8/10/90
CHECKED [initials] DATE 8/10/90
SHEET 88 OF
SCG1S361

ATTACHMENT 5
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Date 11-30-89

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSP-1	~Pipe At 30.4'	Type I Ratio 1:1	1.5	— Top of pipe At 693.1	677.25	Grout poured through ¾" pipe to bottom. At 30.4', object is to seal bottom 5' of hole. Grout pushed water out top of hole.

* OR el top of grout

S. B. Boyer
Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IRC890547
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

APPENDIX C

SHEET 8 OF

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

ATTACHMENT 5
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Date 12-7-89

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Take Elevation Ft.	Remarks
PSD-1	*	Type I/ 1:1 w:c	1	* 688	677.0	*Pipe set At 44.7' Put in 1 ft³ of 1:1 with red dye
						12-8-89 soft grout At 26'

* OR el top of grout

L. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

O. E. Hall IR(890557)
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT
COMPUTER [illegible] DATE 5/10/90
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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth ft.	Type I, MC-5007 Grout Mix W/gal. Cement	Grout Take Cubic feet	* Gauge Pressure P.S.I.	Take Elevation ft.	Remarks
PSD-1	Pipe At 47.2'	Type I / 1:1	1/2	* 688	677.0	Pipe set At 47.2' Poured 1/2 ft³ in At el 688
						12-11-89 Grout set At 41.4'

* Gauge type of grout

F B Pope
Grout Foreman

D E Hall I.R. C890560
I. Inspector

W. H. Lee
Engineering Engineer

Continuation of cement/water quantities (Ref 4.1.3 of Attachment 1)

APPENDIX C

SEQUOYAH NUCLEAR PLANT
COMPUTED DATE 12/12/89
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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation ft.	Remarks
PSD-1	Pipe At 576'	MC-500/	** 4.1	*688	676.7	Pipe set At 57.6' in hole, grout w/ 1.3:1 Mc-500 (no dye) filled hole to top.
						** 4.1 ft³ put in hole, volume of hole = 2.6 ft³ Therefore 1.5 ft³ into gravel zones.

* OR el top of grout

S B Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

D C Hall IR 890567
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment

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SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT

COMPUTED RGB DATE 8/10/90

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-1		MC-500/1.3:1	** 4.4	* 688	676.75	*Pipe set At 63.7' Grout w/ MC-500 w:c 1.3:1, grout to top of hole ** Hole took 4.4 ft³ of grout, volume of hole is 3.1 ft³ therefore grout into gravel is 1.3 ft³

* OR el top of grout

[signature] Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IR C890577 Verification of cement/water quanities (Ref 4.3.3 of Attachment

QC Inspector

0404Q/cen

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SEQUOYAH NUCLEAR PLANT

COMPUTED SDB DATE 8/10/90

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-1	Pipe At 86'	Type I / 1:1	1.2	*. 688	677.5	Grout rock portion of hole PSD-1 with 1:1 type I cement Mixed 1.5 ft^3, Grout in hole is 1.2 ft^3
						1-5-90 Grout At depth of 72.5'

* OR el top of grout

Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall I.R.C900006
QC Inspector

Verification of cement/water quanities (Ref 3.3 of Attachment

0040/ceq

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Take Elevation Ft.	Remarks
PSD-1	Pipe at 72'	MC-500/1.3:1	1	1.688	677.5	Grouted from top of rock to surface (el 688) with MC-500 1.3:1
						Inject 4.8 ft³ of grout into hole. Volume of hole is 3.8 ft³, hole (gravel zone) took 1 ft³

* OR el top of grout

L B Payne
Grout Foreman

W. H. Lea
Cognizant Engineer

D E Hall I.R. C900011
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1

COMPUTED [illegible] DATE 2/10/90
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SEQUOYAH NUCLEAR PLANT

add 1-12-90

Hole No.	Packer Set Depth ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation ft.	~~Pump~~ ~~Plate~~ Remarks
PSD-2	Pipe At 20.5'	Type I / 1:1	1/2	*688	677.75	~~Pump~~ ~~Plate~~ Type I 1:1 w:c, 1/2 ft³ in hole

* OR el top of grout

Grout Foreman

C. H. Lee
Cognizant Engineer

D E Hall IRC900033
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 23.3	Type I / 1:1	1/2 ft³	el. 688	676.5	Pour Type 1, 1:1 cement with black dye and 32 oz of TRIMIX-NCA Accelerator

* OR el top of grout

Grout Foreman

Cognizant Engineer

QC Inspector

I.R. C900062 Verification of cement/water quanities (Ref 4.3.3 of Attachment

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure P.S.I.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 27'	Type I / 1:1	1/2			Pour in 1/2 ft³ of type I to seal gravel zone.

* OR el top of grout

J. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

O E Hall I.R C9 0071
QC Inspector

Version of cement/water quanities Ref 4.3.3 of Attachment 1)

COMPUTED [illegible] DATE 1/16/90
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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 35'6"	Type I / 1:1	1 ft³		678.0	Mix Type I 1:1 1 bag, 7.5 gal water 1 @ 45 oz, And 45 oz of Accelerator.

* OR el top of grout

L. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IRC90-0094
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1) /Admixtures (Ref. 6.8 of Att. 1)

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SEQUOYAH NUCLEAR PLANT
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ICF 87-0855

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SEQUOYAH NUCLEAR PLANT

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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 44'	Type I / 1:1	1 1/2		677.5	Pour 1:1 into hole
						Mix 1 bAg cement, 45 oz Accel. 7.5 gAl - 45 oz H_2O
						Pour 1 1/2 ft^3 into hole
						1-26-90 Grout At 20.5 (soft)

* OR el top of grout

[signature]
Grout Foreman

W. H. Lee
Cognizant Engineer

DE Hall I.R. C90-0105
QC Inspector

Verification of cement/water /Admixtures (Ref. 6.8 Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 97.9'	Type I/1:1	3/4		678	Pour in 3/4 ft³ of type I, 1:1 with 45 oz of Accelerator

* OR el top of grout

F. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall I.R. C90-6175
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1) /Admixtures (Ref 6.8 of Att. 1)

09040/ceg

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SEQUOYAH NUCLEAR PLANT

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	62'	MC-500/12:1	1	el. 688	678	Pump MC-500, 12:1 mix ratio with black dye into hole with pipe at 626'±
						8.8 cu. ft. mix with 5.7 ft³ put into hole. Hole volume is approx. 4.7 ft³ ∴ 1 cu ft in gravel

* OR el top of grout

[signature] Grout Foreman

[signature] I.R. C90-0341 QC Inspector

[signature] Cognizant Engineer

Verification of cement/water/admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8)

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 725	Type I (1:1	1/2	≤ 688	676.5	Pour Type I, 1:1 with Accelerator into pipe set At 72.5"

* OR el top of grout

Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IRC900427
QC Inspector

Verification of cement/water quantities (Ref 4.3.3 of Attachment 1) /Admixtures (Ref. 6.8 of Att. 1)

09040/ceg

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	hose At 65'	MC-500/1.3:1	1.0	el. 688	677.0	pump MC-500, 1.3:1 w/ black dye to bottom of hole
						4.8 ft3 of grout pumped into hole, vol. of hole is approx. 3.8 ft3 ∴ 1 ft3 of grout into gravel

* OR el top of grout

L. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall IRC90-0483
QC Inspector

Verification of cement/water/Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

D0040/ceg

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SEQUOYAH NUCLEAR PLANT
COMPUTED [signature] DATE 8/10/90
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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-2	Pipe At 86'	Type I / 1:1	5	el. 688	el. 677.5	Pour 1:1 thru pipe to bottom of hole Approx 5 ft³

* OR el top of grout

SEQUOYAH NUCLEAR PLANT
COMPUTED R.B.B. DATE 3/10/90
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J. B. Bayne
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall IR C90-056d
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1) /Admixtures (Ref. 6.8)

09040/ceg

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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-4		Type I / 1:1	0.4	el. 688	NA	BAckfill 6.2' of hole
PSD-3		Type I / 1:1	0.4	el 688	NA	BAckfill 5.5' of hole
PSD-2		Type I / 1:1	0.2	el. 688	NA	BAckfill 2.8' of hole
PSD-7		Type I / 1:1	0.4	el. 688	NA	BACK fill 6.3' of hole
PSD-8		Type I / 1:1	0.1	el 688	NA	BAckfill 1.8' of hole

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SEQUOYAH NUCLEAR PLANT
COMPUTED [signature] DATE 8/10/90
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* OR el top of grout

[signature]
Grout Foreman

Harold Long 5-2-90
QC Inspector

IRC9077[illegible]

W H Lee
Cognizant Engineer

/Admixtures (Ref. 6.8 of Att. 1) ICF 89-0[illegible]
Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation ft.	Remarks
PSD-5	Pipe At 46'	Type I, 1:1	0.4 ft³	≈ 1688	—	Pour 1:1, Type I into top 4.6' of hole
PSD-6	Pipe At 47'	Type I, 1:1	0.4 ft³	el. 688	—	Pour Type I, 1:1 into top of 4.6' of hole.

* OR el top of grout

L B Sayre
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall IR C90-0516
QC Inspector

Verification of cement/water/Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-5	Hose At 66'	MC-500 / 1.2:1	< 0.2	el. 688	677.0	Pump MC-500, 1.2:1 to bottom of hole And filled to top.
						Volume of hole is 4.2 ft³
						Volume of grout into hole is Approx. 4 ft³
						∴ Approx. 0.2 ft³ of grout into gravel zone

* OR el top of grout

L. B. Bass
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall IR 90-0487
QC Inspector

Verification of cement/water quantities (Ref 4.3.3 of Attachment 1) / Admixtures (Ref. 6.8 of Att. 1)

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 3/16/90
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SEQUOYAH NUCLEAR PLANT

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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-5	Pipe At 76'	Type I / 1:1	1/2	el. 688	—	Pour 1/2 ft³ of Type I 1:1 mix into hole

* OR el top of grout

Grout Foreman

WE Hall IRC90-0397
QC Inspector

W H Lee
Cognizant Engineer

Verification of cement/water/Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-5	89' pipe	Type I / 1:1	1 1/2	el. 688	677.0	Pour Type I 1:1 grout thru pipe to 89'. Pour 1 1/2 ft³ in hole

* OR el top of grout

[signature]
Grout Foreman

W H Lee
Cognizant Engineer

D E Hill I.R-C90-0384
QC Inspector

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8 of Att. 1)

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSP-5	Pipe At 4.6'	Type I, 1:1	0.4 ft³	≤ 1 688	—	Pour 1:1, Type I into top 4.6' of hole
PSP-6	Pipe At 4.7'	Type I, 1:1	0.4 ft³	el. 688	—	Pour Type I, 1:1 into top 4.6' of hole. 4.7 ad 3-8-90

* OR* el top of grout

L. B. Cayce
Grout Foreman

W. H. Lee
Cognizant Engineer

D. E. Hall IRC90-0516
QC Inspector

Verification of cement/water quantities (Ref 4.3.3 of Attachment 1) /Admixtures (Ref. 6.8 Att. 1)

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 3/10/90
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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-6	Hose At 68'	MC-500/1.2:1	0	el 688	677.0	Pump MC-500, 1.2:1 to bottom of hole And filled to top. Volume of hole is 3.2 ft³; Volume of grout into hole is Approx. 3.2 ft³ ∴ no take

* OR el top of grout

L. B. Payne
Grout Foreman

W. H. Lee
Cognizant Engineer

DE Hall IR C90-0487
QC Inspector

Verification of cement/water/admixtures (Ref. 6.8 of Att. 1)

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SEQUOYAH NUCLEAR PLANT

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-6	Pipe At 84'	Type I (1:1	1	el 688	—	Pour 1 ft³ of Type I, 1:1 mix in hole

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* OR el top of grout

L. B. Bayne
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall IRC90-0397
QC Inspector

Verification of cement/water/Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

090410/ceg

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure P.S.I.	Lake Elevation Ft.	Remarks
PSD-6	Pipe at 61'	MC-500/1.3:1	4.2 ft³	688	676.5	Pump MC-500, 1.3:1 to bottom of hole Pumped 8.4 ft³ of grout, volume of hole is 4.2 ft³. Red dye Added Grout was very thin And could not be maintained At top of hole. This mix Appeared thinner than before, zone of grout take did not Appear Any different than previous zones.

* OR el top of grout

Grout Foreman

W. H. Lee
Cognizant Engineer

D E Hall I.R. C90-0054
QC Inspector

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-4		Type I / 1:1	0.1	el. 688	NA	Backfill 6.2' of hole
PSD-3		Type I / 1:1	0.4	el 688	NA	Backfill 5.5' of hole
PSD-2		Type I / 1:1	0.	el. 688	NA	Backfill 2.8' of hole
PSD-7		Type I / 1:1	0.4	el. 688	NA	Backfill 6.3' of hole
PSD-8		Type I / 1:1	0.1	el 688	NA	Backfill 1.8' of hole

* OR el top of grout

[signature]
Grout Foreman

W H Lee
Cognizant Engineer

/Admixtures (Ref. 6.8 of Att. 1) | ICF 89-08

Harold Lang 5-2-90
QC Inspector

Verification of cement/water/admixtures quanities (Ref 4.3.3 of Attachment 1)

IRC900774

SEQUOYAH NUCLEAR PLANT
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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 71.0	MC500 / 1:1	~~3.5~~ 0 ad 5-1-90	el. 688	683.0	Pump MC-500 to bottom of hole through ~~pipe~~ hose. ad 5-1-90
						Vol. of hole is 3.5 ft^3
						Grout placed in hole is 3.5 ft^3
						∴ No take

* OR el top of grout

J.B. Bayne
Grout Foreman

W H Lee
Cognizant Engineer

Harold Long 5-1-90
QC Inspector

Verification of cement/water /Admixtures (Ref. 6.8) quanities (Ref 4.3.3 of Attachment 1)

IR # C907642

09040/ceg

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SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 86'	Type I / 1:1	1.5	≤ 1688	NA	Pour 1.5, Type I through pipe to bottom of hole. Grout only rock zone

* OR el top of grout

J. B. Bayne
Grout Foreman

W. H. Lee
Cognizant Engineer

DE Hall IR 9007445
QC Inspector

Verification of cement/water/admixtures quantities (Ref 4.3.3 of Attachment 1)

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/16/90
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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 64.8'	MC-500/1:1	0.2	el 688	682.0	Pump MC-500 to bottom of hole through pipe.
						Vol. of hole is 3.8 ft³
						Vol. of grout pumped into hole is 4.0 ft³
						∴ 0.2 ft³ into gravel zone

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* OR el top of grout

[signature]
Grout Foreman

I.R.# C905237
DE Hall
QC Inspector

W H Lee
Cognizant Engineer

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.3 of Att. 1) ICF 89-0855

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 585	MC-500/1:1	0.6	el 688	680.4	Pump MC-500, 1:1 to bottom of hole through pipe. Vol. of grout pumped into hole is 4 ft^3. Vol. of hole is 3.4 ft^3. ∴ 0.6 ft^3 of grout into gravel zones.

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* OR el top of grout

[signature]
Grout Foreman

D E Hall IR # C904353
QC Inspector

W H Lee
Cognizant Engineer

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8 of Att. 1) ICF 89-0855

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure P.S.I.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 48.7	Type I / 1:1	0.5	el 688	NA	Pour Type I, 1:1 grout to bottom of hole through pipe At 48.7' Add 40 oz TRIMIX grout Accelerator

* OR el top of grout

S. B. Payne
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall I.R.#C903915
QC Inspector

Verification of cement/water/Admixtures (Ref. 6.8 of Att. 1)

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

07010/ceg

SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	• Gauge Pressure P.S.I.	Lake Elevation Ft.	Remarks
PSO-7	Pipe At 43.4'	Type I / 1:1	1 ft³	el 688	NA	Pour Type I, 1:1 thru pipe to bottom of hole At 43.4'.

• OR el top of grout

J. B. Payne
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall C90-3300
QC Inspector

Verification of cement/water /Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1) ICF 89-0855

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure P.S.I.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 30'	Type I/1:1	0 4	688	NA	Pour Type I, 1:1 thru pipe to bottom of hole.

* OR el top of grout

S. B. Barne
Grout Foreman

D E Hall IR C90 2920
QC Inspector

W H Lee
Cognizant Engineer

Verification of cement/water /Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-7	Pipe At 26.5	Type I / 1:1	0.4	688	NA	Pour Type I 1:1 through pipe to bottom of hole. Added grout Accelerator, 40 oz of TRIMIX.

* OR el top of grout

L B Barger
Grout Foreman

W H Lee
Cognizant Engineer

D C Hall IR C90 2602
QC Inspector

Verification of cement/water quantities (Ref 4.3.3 of Attachment 1) / Admixtures (Ref 6.8 of Att. 1)

0004Q/ceg

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 2/16/90
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SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
FSD-7	Pipe At 228	Type I/1:1	1/2	688	-NA	Pour 1/2 ft³ of 1:1 thru pipe to seal gravel zone

* OR el top of grout

[signature]
Grout Foreman

OC Hall IR C902164
QC Inspector

W/d Lee
Cognizant Engineer

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8 of Att. 1) ICF 89-0855

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-4		Type I / 1:1	0.4	el. 688	NA	BACKfill 6.2' of hole
PSD-3		Type I / 1:1	0.4	el 688	NA	BACKfill 5.5' of hole
PSD-2		Type I / 1:1	0.2	el. 688	NA	BACKfill 2.8' of hole
PSD-7		Type I / 1:1	0.4	el. 688	NA	BACKfill 6.3' of hole
PSD-8		Type I / 1:1	0.1	el 688	NA	BACKfill 1.8' of hole

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* OR el top of grout

[signature]
Grout Foreman

W H Lee
Cognizant Engineer

Harold Long 5-2-90
QC Inspector

/Admixtures (Ref. 6.8 of Att. 1)

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	° Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-8	Pipe At 87.5	Type I / 1:1	~~3.5~~ 4.5	el. 688	NA	Pour Type I, 1:1 grout in pipe to bottom of hole.
			a[illegible]4-24-90			

° OR el top of grout

J. B. Bayne
Grout Foreman

W H Lee
Cognizant Engineer

W E Hall I.R.# C905924
QC Inspector

Verification of cement/water/admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref 6.8 of Att. 1) ICF 89-0855

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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSD-8	Pipe At 67.2	MC-500 1:1	0.5	1.688	680.5	Pump MC-500, 1:1 to bottom of hole through pipe
						Vol. of grout pumped into hole is 4 ft³
						Vol of hole is 3.5 ft³
						∴ 0.5 ft³ of grout into gravel zone

* OR el top of grout

L. B. Payne
Grout Foreman

W E Hall 0904491
QC Inspector

SEQUOYAH NUCLEAR PLANT
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W H Lee
Cognizant Engineer

Verification of cement/water/Admixtures (Ref 6.8 of Att. 1) quantities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure P.S.I.	Lake Elevation Ft.	Remarks
PSD-8	Pipe At 60.4'	MC-500/1.3:1	0.2	<1688	677.5	Pump MC-500, 1.3:1 grout to bottom of hole At 60.4'
						Volume of hole is Approx. 3.2 ft3, pumped 3.4 ft3 of grout ∴ 0.2 ft3 into gravel Approx.

* OR el top of grout

Grout Foreman [signature]

W H Lee
Cognizant Engineer

OE Hall IRC902805
QC Inspector

Verification of cement/water/Admixtures (Ref 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSB-1	Pipe At 89.2'	Type I / 1:1	1.5	el 688	NA	Pour grout thru pipe to bottom of hole. Seal rock zone.

* OR el top of grout

[signature]
Grout Foreman

[signature] IRC 9010732
QC inspector

W H Lee
Cognizant Engineer

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8 of Att. 1) ICF 89-CE

C9040/ceg

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500F Grout Mix Water: Cement	Grout Take Cubic Feet	Gauge Pressure p.s.i.	Lake Elevation ft.	Remarks
PSB-1	NA	Type I, 1:1	0.2	el. 688	NA	Pour grout to bottom of hole At 2.5'
PSB-2	NA	Type I, 1:1	0.7	el 688	NA	Pour grout to bottom of hole At 6.1'

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SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 5/16/90
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* OR el top of grout

L.B. Bayne
Grout Foreman

W H Lee
Cognizant Engineer

DE Hall IR# C90 10835
QC Inspector

/Admixtures (Ref 6.8 of Att. 1) ICF 89-08

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSB-1	Pipe At 98.3'	Type I/1:1	0.5	el 688	NA	Pour grout thru pipe to bottom of hole

* OR el top of grout

[signature] Grout Foreman

[signature] Cognizant Engineer

[signature] 5-25-90 IR# C9010596
QC Inspector

/Admixtures (Ref 6.8 of Att. 1) ICF 89-08
Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSB-1	Hose At 67.8'	MC-500/1:1	0.5	el 688	682.5	Pump MC-500, 1:1 to bottom of hole At 67.8'
						Volume of grout placed is 3.8 ft³
						Volume of hole is 3.3 ft³
						∴ TAKE is 0.5 ft³

* OR el top of grout

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SEQUOYAH NUCLEAR PLANT
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[signature: B. Payne]
Grout Foreman

[signature: W H Lee]
Cognizant Engineer

[signature]
QC Inspector

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8 of Att. 1) ICF 89-08

IR# C9010782

0040Q/ceg

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSB-1	Pipe at 285	Type I/1:1	0.5 ~~5/22/90~~ 0.5	el 688	NA	Pour grout thru pipe to bottom of hole.
						40 oz. of Accelerator

* OR el top of grout

S. B. Payne
Grout Foreman

W H Lee
Cognizant Engineer

DE Hall I.R.# C9010482
QC Inspector

/Admixtures (Ref. 6.8 of Att. 1)

Verification of cement/water quanities (Ref 4.3.3 of Attachment 1)

0004Q/ceg

SKG 1S 861
SEQUOYAH NUCLEAR PLANT
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SEQUOYAH NUCLEAR PLANT
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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSB-1	Pipe At 35.5'	Type I, 1:1	0.3	el. 688	NA	Pour grout thru pipe to bottom of hole

* OR el top of grout

[signature]
Grout Foreman

W H Lee
Cognizant Engineer

D E Hall I.R.# C909870
QC Inspector

Verification of cement/water/Admixtures quanities (Ref 4.3.3 of Attachment 1) (Ref. 6.8 of Att. 1) ICF 89-0E

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DAILY GROUTING REPORT
SEQUOYAH NUCLEAR PLANT

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Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure p.s.i.	Lake Elevation Ft.	Remarks
PSB-1	Pipe At 31.6	Type I / 1:1	0.3	el 688	NA	Pour Type I, 1:1 thru pipe to bottom of hole

* OR el top of grout

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SEQUOYAH NUCLEAR PLANT
COMPUTED [signature] DATE 8/10/90
CHECKED [signature] DATE 8/10/90

SQG19 361

[signature: L. B. Payne]
Grout Foreman

[signature: W H Lee]
Cognizant Engineer

D E Hill C909664
QC Inspector

Verification of cement/water /Admixtures (Ref 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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SEQUOYAH NUCLEAR PLANT

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SEQUOYAH NUCLEAR PLANT

Hole No.	Packer Set Depth Ft.	Type I, MC-500/ Grout Mix Water: Cement	Grout Take Cubic Feet	* Gauge Pressure psi.	Lake Elevation Ft.	Remarks
PSB-1	Pipe At 28.7	Type I / 1:1	0.5	el 688.2	NA	Pour Type I, 1:1 thru pipe to bottom of hole

* OR el top of grout

G. B. Payne
Grout Foreman

W H Lee
Cognizant Engineer

Harold Terry 5-11-90
QC Inspector

12C90915)

Verification of cement/water /Admixtures (Ref. 6.8 of Att. 1) quanities (Ref 4.3.3 of Attachment 1)

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WATER TEST

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SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure 6 psi

Time start pumping water 6:00

Time actual test start (after water flow equalized) 6:10

Time end of test 6:15

Elapsed time of test 5 Min.

Number of gallons 52.8

Gallons/minute 10.6

Water Meter

Starting Meter reading 5040.0 gal.

Ending Meter reading 5092.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR c90 0006
QC Inspector

Remarks: Water in open hole (el. 688.3)
Take of 10.6 gpm for hole

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED DWS DATE 8/10/90
CHECKED bt DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell _____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure .6 psi

Time start pumping water 5:20 PM

Time actual test start (after water flow equalized) 5:30 PM

Time end of test 5:35 PM

Elapsed time of test 5 Min.

Number of gallons 22.8

Gallons/minute 4.6

Water Meter

Starting Meter reading 4961.0 gal.

Ending Meter reading 4983.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR c900006
QC Inspector

Remarks: PACKer At 70', wAter on outside of pipe (el. 688.3)
TAKe of 4.6 gpm in gravel

W. H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED GDS DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure 6 psi

Time start pumping water 4:51 PM

Time actual test start (after water flow equalized) 5:05 PM

Time end of test 5:10 PM

Elapsed time of test 5 Min.

Number of gallons 29.3

Gallons/minute 5.9

Water Meter

Starting Meter reading 4895.0 gal.

Ending Meter reading 4924.3 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall C900006
QC Inspector I.R.

Remarks: PACKER AT 70', WATER IN PIPE (el. 691.7)
TAKE of 5.9 gpm in rock

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SCG1S361 -

SEQUOYAH NUCLEAR PLANT
COMPUTED [signature] DATE 8/10/90
CHECKED [signature] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure 15 psi
(10 psi on gauge)

Time start pumping water 3:58

Time actual test start
(after water flow equalized) 4:15

Time end of test 4:20

Elapsed time of test 5 Min.

Number of gallons 51.5

Gallons/minute 10.3

Water Meter

Starting
Meter reading 4780.0 gal.

Ending
Meter reading 4831.5 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C90 0006
QC Inspector

Remarks: Packer at 60'; water into pipe with 10 psi gauge.
TAke of 10.3 gpm in rock and gravel.

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0903Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED JDB DATE 8/10/90
CHECKED BT DATE 8/6/90

Element D Cell _____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure 15 psi
(10 psi on gauge)

Time start pumping water 3:18

Time actual test start
(after water flow equalized) 3:25

Time end of test 3:30

Elapsed time of test 5 Min.

Number of gallons 41.3

Gallons/minute 8.3

Water Meter

Starting
Meter reading 4720.0 gal.

Ending
Meter reading 4761.3 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hall · IR C900006
QC Inspector

Remarks: PACKER AT 70', WATER INTO PIPE WITH 10 psi ON GAUGE.
TAKE of 8.3 gpm in rock zone.

W. H Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure 6 psi

Time start pumping water 2:50

Time actual test start (after water flow equalized) 2:58

Time end of test 3:03

Elapsed time of test 5 Min.

Number of gallons 25.5

Gallons/minute 5.1

Water Meter

Starting Meter reading 4665.0 gal.

Ending Meter reading 4690.5 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

Q E Hall IR C900006
QC Inspector

Remarks: PACKER AT 70', WATER ON OUTSIDE OF PIPE (el. 688.3) TAKE of 5.1 gpm IN GRAVEL ZONE 64'-65'.

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SCG 1 S 361 -

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell ____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure ~~576~~ psi
OBH 1-4-90

Time start pumping water 2:20

Time actual test start
(after water flow equalized) 2:29

Time end of test 2:34

Elapsed time of test 5 Min.

Number of gallons 28.5

Gallons/minute 5.7

Water Meter

Starting
Meter reading 4612.0 gal.

Ending
Meter reading 4640.5 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall · ZR C90006
QC Inspector

Remarks: PACKER AT 70', WATER ON INSIDE OF PIPE @ 691.5
TAKE of 5.7 gpm in rock zone.

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED WDS DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-1

Date 1-4-90

Elevation bottom of hole 86.3 ft

Elevation Lake 677.5 ft

Water pressure 6 psi

Packer set at 60', water outside of pipe (el. 688.3)

Time pumping water 2102

Time actual test start (after water flow equalized) 2107

Time end of test 2112

Elapsed time of test 5 Min.

Number of gallons 0

Gallons/minute 0

Water Meter

Starting Meter reading 4535 gal.

Ending Meter reading 4535 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

W E Hall IR C900006
QC Inspector

Remarks:
Test from 0' to 60' = 0 gpm

W. H. Lee
Cognizant Engineer

Ellie Blanks
Grout Foreman

09020/ceg

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SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED ODB DATE 8/10/90
CHECKED LH DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 1-10-90

Elevation bottom of hole 667.2 ft

Elevation lake 677.75 ft

Water pressure 4.57 head psi

Time start pumping water 4:30 PM

Time actual test start (after water flow equalized) 4:40

Time end of test 4:45

Elapsed time of test 5 Min.

Number of gallons 5

Gallons/minute 1

Water Meter

Starting Meter reading 5374.0 gal.

Ending Meter reading 5379.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C90020
QC Inspector

Remarks: Water At top of hole
1 gpm At 4.6 psi

W.H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90
CHECKED bt DATE 8/6/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell _____

Hole Number PSD-2

Date 1-10-90

Elevation bottom of hole 667.2 ft

Elevation Lake 677.75 ft

Water pressure 4.96 head psi

Time start pumping water 3:45 PM

Time actual test start (after water flow equalized) 3:55

Time end of test 4:00

Elapsed time of test 5 Min.

Number of gallons 4.2

Gallons/minute 0.84

Water Meter

Starting Meter reading 5363.0 gal.

Ending Meter reading 5367.2 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

W E Hall IRC900020
QC Inspector

Packer at 11'

Remarks: Water in Tunnel (e' 689.2)
0.8 gpm at 5 psi

W H Lee
Cognizant Engineer

Grout Foreman

0902Q'ceg

APPENDIX D

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WATER TEST

SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED QDS DATE 8/10/90
CHECKED bf DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 1-10-90

Elevation bottom of hole ~~21.1~~ 667.2 ft c.d. 1-10-90

Elevation Lake 677.75 ft

Water pressure 4.6 head psi + 5 psi gauge

Time start pumping water 3:00 PM

Time actual test start (after water flow equalized) 3:10

Time end of test 3:15

Elapsed time of test 5 Min.

Number of gallons 4.8

Gallons/minute 0.96

Water Meter

Starting Meter reading 5309.0 gal.

Ending Meter reading 5313.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hall IR C900020
QC Inspector

Remarks: PACKer set AT 11'
∴ 0.96 gpm AT 10 psi

W.H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

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WATER TEST

SCG1S361
SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED QDS DATE 8/10/90
CHECKED pt DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 1-10-90

Elevation bottom of hole 21.1 667.2 ft and 1-10-90 Water

Elevation Lake 677.75 ft

Water pressure 15 psi
5 head + 10 gauge

Time start pumping water 3:27 PM

Time actual test start (after water flow equalized) 3:35

Time end of test 3:40

Elapsed time of test 5 Min.

Number of gallons 13.9

Gallons/minute ~~13.0~~ 2.8 and 1-10-90

Starting Meter reading 5324.0 gal.

Ending Meter reading 5337.9 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hall FR C90-0020
QC Inspector

Remarks: Packer At 11'
2.8 gpm At 15 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED DDS DATE 8/10/90

CHECKED ft DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 1-12-90

Elevation bottom of hole 667.2 ft

Elevation Lake 677.75 ft

Water pressure 4.6 head psi

Time start pumping water 9:02 AM

Time actual test start (after water flow equalized) 9:06

Time end of test 9:11

Elapsed time of test 5 Min.

Number of gallons 5

Gallons/minute 1

Water Meter

Starting Meter reading 5495.0 gal.

Ending Meter reading 5550.6 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IRC900031
QC Inspector

Remarks: Funnel test water at el. 689.1
PACKER AT 10'
1 GPM AT 5 PSI

W. H. Lee
Cognizant Engineer

L. B. Payne
Grout Foreman

09020/ceg

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WATER TEST

SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED AJS DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 1-12-90

Elevation bottom of hole 667.2 ft

Elevation Lake 677.75 ft

Water pressure 545 Gauge psi

Time start pumping water 9:14 AM

Time actual test start (after water flow equalized) 9:17

Time end of test 9:22

Elapsed time of test 5 Min.

Number of gallons 8.2

Gallons/minute 1.6

Water Meter

Starting Meter reading 5503.0 gal.

Ending Meter reading 5511.2 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

W E Hoef IRC900031
QC Inspector

Remarks: Packer at 10'
1.6 gpm at 10 psi

W. H. Lee
Cognizant Engineer

L B. Bayne
Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT

COMPUTED 2D3 DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell _____

Hole Number PSD-2

Date 1-12-90

Elevation bottom of hole 667.2 ft

Elevation Lake 677.75 ft

Water pressure 5+10 gAuge psi

Time start pumping water 9:23 A

Time actual test start (after water flow equalized) 9:25

Time end of test 9:30

Elapsed time of test 5 Min.

Number of gallors 17.3

Gallons/minute 3.5

Water Meter

Starting Meter reading 55220 gal.

Ending Meter reading 5539.3 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C900031
QC Inspector

Remarks: PAcKer At 10'
3.5 gpm A+15 psi

W. H. Lee
Cognizant Engineer

L. S. Payne
Grout Foreman

09020/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED QDS DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element 12 Cell

Hole Number PSD-2

Date 1-12-90

Elevation bottom of hole 667.2 ft

Elevation Lake 677.75 ft

Water pressure 5 head psi

Time start pumping water 9:33 AM

Time actual test start (after water flow equalized) 9:36

Time end of test 9:41

Elapsed time of test 5 Min.

Number of gallons 5

Gal'ons/minute 1

Water Meter

Starting Meter reading 5544.9 gal.

Ending Meter reading 5550.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR 900031
QC Inspector

Re: Funnel test (el. 689.1)
1 gpm at 5 psi
Packer at 10'

W. H. Lee
Cognizant Engineer

J B Payne
Grout Foreman

0902Q/ceg

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WATER TEST

SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED RWS DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 1-12-90

Elevation bottom of hole 667.3 ft

Elevation Lake 677.75 ft

Water pressure 4.6 HEAD psi

Time start pumping water 8:52 AM

Time actual test start (after water flow equalized) 8:55

Time end of test 9:00

Elapsed time of test 5 Min.

Number of gallons 5.8

Gallons/minute 1.2

Water Meter

Starting Meter reading 5486.5 gal.

Ending Meter reading 5492.3 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

WE Hall IR C90C031
QC Inspector

Remarks: WATER AT top of hole (el. 688.3)
1.2 GPM AT 5 psi.

C. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED RDS DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number BD-2

Date 1-12-90

Elevation bottom of hole 667.2 ft

Elevation Lake 677.75 ft

Water pressure 4.6 head psi

Time start pumping water 9:54 A

Time actual test start (after water flow equalized) 9:57

Time end of test 10:02

Elapsed time of test 5 Min.

Number of gallons 7

Gallons/minute 1.4

Water Meter

Starting Meter reading 5563.0 gal.

Ending Meter reading 5570.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C900031
QC Inspector

Remarks: Water at top of hole (el. 688.3)
1.4 gpm at 5 psi

W. H. Lee
Cognizant Engineer

L. B. Barnes
Grout Foreman

0902Q/ceg

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SCG1S361

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED QWS DATE 8/10/90
CHECKED pt DATE 8/10/90

Element D Cell ______

Hole Number PSD-2

Date 1-23-90

Elevation bottom of hole 651.6 ft

Elevation Lake 678.0 ft

Water pressure ______ psi

Time start pumping water 10:52 A

Time actual test start (after water flow equalized) 10:57

Time end of test 11:02

Elapsed time of test 5 Min.

Number of gallons 23.9

Gallons/minute 4.8

Water Meter

Starting Meter reading 5680.0 gal.

Ending Meter reading 5703.9 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IRC90-0094
QC Inspector

Remarks: Packer At 26'
Water in funnel (el. 687 690.57
4.8 gpm At
QWS 1-23-90

W H Lee
Cognizant Engineer

J. B. Payne
Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT
COMPUTED QDJ DATE 8/10/90
CHECKED pt DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ________

Hole Number PSD-2

Date 1-23-90

Elevation bottom of hole 651.6 ft

Elevation Lake 678.0 ft

Water pressure ~~5+5 psi gauge~~ psi

Time start pumping water 11:10 A

Time actual test start (after water flow equalized) 11:13

Time end of test 11:18

Elapsed time of test 5 Min.

Number of gallons 29.5

Gallons/minute 5.9

Water Meter

Starting Meter reading 5757.0 gal.

Ending Meter reading 5785.5 ~~5758~~ gal. adl 1-23-90

ID Number 502063

Calibration Due Date Date 1-26-90

Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hall IRC90-0094
QC Inspector

Remarks: Packer at 26'
5.9 gpm at 10 psi

W. H. Lee
Cognizant Engineer

L B Payne
Grout Foreman

0902Q/ceg

APPENDIX D

AT[illegible]
P[illegible]

WATER TEST

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SCG1S361

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell

Hole Number PSD-2

Date 1-23-90

Elevation bottom of hole 651.6 ft

Elevation Lake 678.0 ft

Water pressure 5+10 ~~psi gauge~~ psi

Time start pumping water 11:21 A

Time actual test start
(after water flow equalized) 11:24

Time end of test 11:29

Elapsed time of test 5 Min.

Number of gallons 39.5

Gallons/minute 7.9

Water Meter

Starting
Meter reading 5820.0 gal.

Ending
Meter reading 5859.5 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IRC90-0094
QC Inspector

Remarks: Packer At 26'
7.9 gpm At 15 psi

G. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCGIS361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED QDS DATE 8/10/90
CHECKED bt DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 2-21-90

Elevation bottom of hole 626.3 ft

Elevation Lake 678.5 ft

Water pressure Head psi

Time start pumping water 1:35 PM

Time actual test start (after water flow equalized) 1137

Time end of test 1:42

Elapsed time of test 5 Min.

Number of gallons 32.2

Gallons/minute 6.4

Water Meter

Starting Meter reading 7850.0 gal.

Ending Meter reading 7882.2 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall T.N. C490317
QC Inspector

Remarks: Maintain water at top of open hole 0 gauge pressure

W. H. Lee
Cognizant Engineer

J. B. Bayne
Grout Foreman

0902Q/ceg

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WATER TEST

SCG 1 C 361
SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCh PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED BDS DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 2-21-90

Elevation bottom of hole 626.3 ft

Elevation Lake 678.5 ft

Water pressure Head psi

Time start pumping water 1:44 P

Time actual test start (after water flow equalized) 1:47

Time end of test 1:52

Elapsed time of test 5 Min.

Number of gallons 15.5

Gallons/minute 3.1

Water Meter

Starting Meter reading 7892.0 gal.

Ending Meter reading 7907.5 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

DE Hall TP C900317
QC Inspector

Remarks: Funnel test
Water el. 6900
Packer At 20'

W. H. Lois
Cognizant Engineer

S. B. Bayne
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1c361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED CDS DATE 8/10/90

CHECKED bt DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 2-21-90

Elevation bottom of hole 626.3 ft

Elevation Lake 678.5 ft

Water pressure 5 gAuge + Head psi

Time start pumping water 1:54 PM

Time actual test start (after water flow equalized) 1:56

Time end of test 2:01

Elapsed time of test 5 Min.

Number of gallons 45

Gallons/minute 8

Water Meter

Starting Meter reading 7930.0 gal.

Ending Meter reading 7975.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall I.R. c90-0317
QC Inspector

Remarks: PAcker At 20'
8 gpM At 10 psi

W. B. Lee
Cognizant Engineer

J. B. Bayne
Grout Foreman

0902Q/ceg

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SCG1S361

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell ______

Hole Number PSD-2

Date 2-21-90

Elevation bottom of hole 626.3 ft

Elevation Lake 678.5 ft

Water pressure 10 gauge + head psi

Time start pumping water 2:02 PM

Time actual test start
(after water flow equalized) 2:04 PM

Time end of test 2:09

Elapsed time of test 5 Min.

Number of gallons 56

Gallons/minute 11.2

Water Meter

Starting
Meter reading 8000.0 gal.

Ending
Meter reading 8056.0 gal.

ID Number 502063

Calibration
Due Date Date 8-6-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

PAcker At 20'
11.2 gpm At 15 psi

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall [illegible] E9w0317
QC Inspector

Remarks:

[signature]
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 3-1-90

Elevation bottom of hole 614.5 ft

Elevation Lake 676.5 ft

Water pressure head psi

Water Meter

Starting Meter reading 8230.8 gal.

Ending Meter reading 8351.8 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Time start pumping water 1:50 P

Time actual test start (after water flow equalized) 1:57

Time end of test 2:03

Elapsed time of test 5 Min.

Number of gallons 121.8

Gallons/minute 24.4

open hole
gauge is showing 23 psi

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall T.R.C90 0426
QC Inspector

Remarks:

W. H. Lee
Cognizant Engineer

L. B. Payne
Grout Foreman

9020/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 3-1-90

Elevation bottom of hole 614.5 ft

Elevation Lake 676.5 ft

Water pressure head psi
gauge = 3psi

Time start pumping water 2:05 P

Time actual test start (after water flow equalized) 2:10

Time end of test 2:15

Elapsed time of test 5 Min.

Number of gallons 50

Gallons/minute 60

Water Meter

Starting Meter reading 8400.0 gal.

Ending Meter reading 8450.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Funnel test
PAcker At 20'

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall I.P.C900426
QC Inspector

Remarks:

W. H. Lee
Cognizant Engineer

L. B. Bane
Grout Foreman

Q/ceg

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SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 3-1-90

Elevation bottom of hole 614.5 ft

Elevation Lake 676.5 ft

Water pressure head + 10 psi

Time start pumping water 2126

Time actual test start (after water flow equalized) 2129

Time end of test 2134

Elapsed time of test 5 Min.

Number of gallons 59

Gallons/minute 11.8

Water Meter

Starting Meter reading 8540.0 gal.

Ending Meter reading 8599.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1119z

PACKER AT 20'
11.8 gpm AT 15 psi

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

DEM 3-1-90 JE Hill IRC9000426
QC Inspector

Remarks:

W. H. Lee
Cognizant Engineer

[illegible]
Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT

COMPUTED ADS DATE 8/10/90

CHECKED ft DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell

Hole Number PSD-2

Date 3-5-90

Elevation bottom of hole 623.0 ft

Elevation Lake 677.0 ft

Water pressure HeAd psi

Time start pumping water 10:10 A

Time actual test start (after water flow equalized) 10:15

Time end of test 10:20

Elapsed time of test 5 Min.

Number of gallons 16.5

Gallons/minute 3.3

Water Meter

Starting Meter reading 8630.0 gal.

Ending Meter reading 8646.5 gal.

ID Number 502063

Calibration Due Date 8-6-90

Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1192

open hole

3.3 gpm 0 gauge

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

OEHall IRC90-0482
QC Inspector

Remarks: Rock/conc. interface ungrouted

WHLee
Cognizant Engineer

G. B. Payne
Grout Foreman

0902Q/ceg

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WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED QDS DATE 8/10/90
CHECKED pt DATE 8/10/90

Element D Cell ____

Hole Number PSD-2

Date 3-5-90

Elevation bottom of hole 623.0 ft

Elevation Lake 677.0 ft

Water pressure Head (el. 698) psi

Time start pumping water 10:20 A

Time actual test start
(after water flow equalized) 10:25

Time end of test 10:30

Elapsed time of test 5 Min.

Number of gallons 10.2

Gallons/minute 2.04

Water Meter

Starting
Meter reading 8656.0 gal.

Ending
Meter reading 8666.2 gal.

ID Number 502063

Calibration
Due Date Date 8-6-90
Pressure Gauge

Calibration
Due Date 6-1-90

ID Number E1119Z

Funnel test
Packer At 20'

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C900482
QC Inspector

Remarks:

[signature]
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED ADS DATE 8/10/90
CHECKED DF DATE 8/10/90

Element D Cell _____

Hole Number PSD-2

Date 3-5-90

Elevation bottom of hole 623.0 ft

Elevation Lake 677.0 ft

Water pressure Head + 5 psi

Time start pumping water 10:33 A

Time actual test start (after water flow equalized) 10:35

Time end of test 10:40

Elapsed time of test 5 Min.

Number of gallons 27

Gallons/minute 5.4

PAcKer At 20'
5.4 gpm At 10 psi

Water Meter

Starting Meter reading 8680.0 gal.

Ending Meter reading 8707.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

DC Hall IR 900482
QC Inspector

Remarks:

WHL
Cognizant Engineer

Grout Foreman

09020/ceg

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SEQUOYAH NUCLEAR PLANT

COMPUTED RDS DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell _____

Hole Number PSD-2

Date 3-5-90

Elevation bottom of hole 623.0 ft

Elevation Lake 677.0 ft

Water pressure head +10 psi

Time start pumping water 10:40 A

Time actual test start (after water flow equalized) 10:44

Time end of test 10:49

Elapsed time of test 5 Min.

Number of gallons 34

Gallons/minute 6.8

Water Meter

Starting Meter reading 8730.0 gal.

Ending Meter reading 8764.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90

Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Packer At 20'
6.8 gpm At 15 psi

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall IS C900482
QC Inspector

Remarks:

[signature]
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED DS DATE 8/10/90
CHECKED DS DATE 8/10/90

Element D Cell ____

Hole Number PSD-5

Date 2-9-90

Elevation bottom of hole 617.0 ft

Elevation Lake 677.0 ft

Water pressure HEAD 688 psi

Time start pumping water 1:25 P

Time actual test start (after water flow equalized) 1:30

Time end of test 1:35

Elapsed time of test 5 Min.

Number of gallons 3

Gallons/minute 0.6

Water Meter

Starting Meter reading 7330.0 gal.

Ending Meter reading 7333.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1119Z

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D.E. Hall 0900 8/9/90
QC Inspector

Remarks: Open hole water at el. 688.0
0.6 gpm. at 5 psi

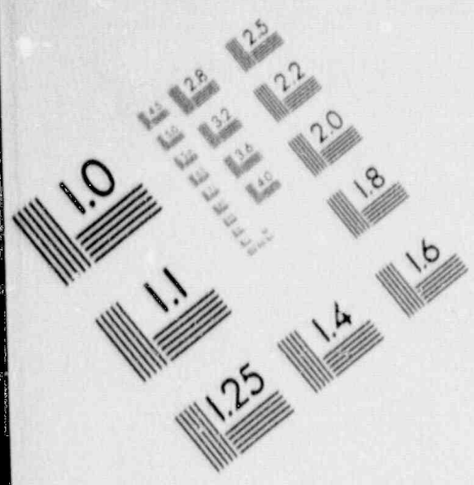
W.H. Lee
Cognizant Engineer

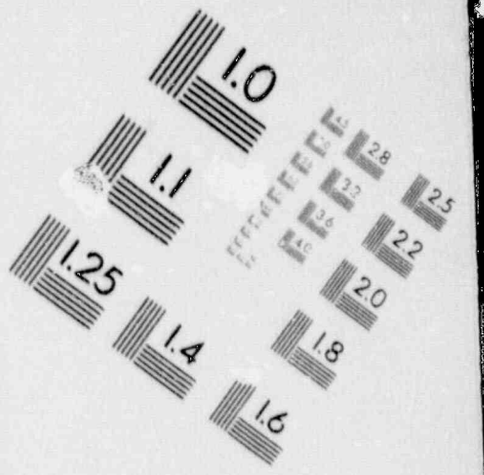
L.B. Seymour
Grout Foreman

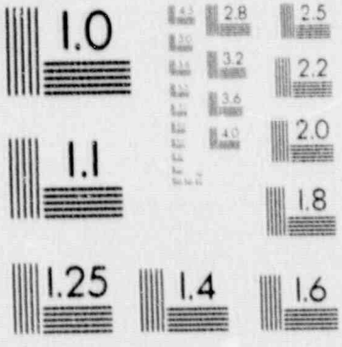
09020/ceg

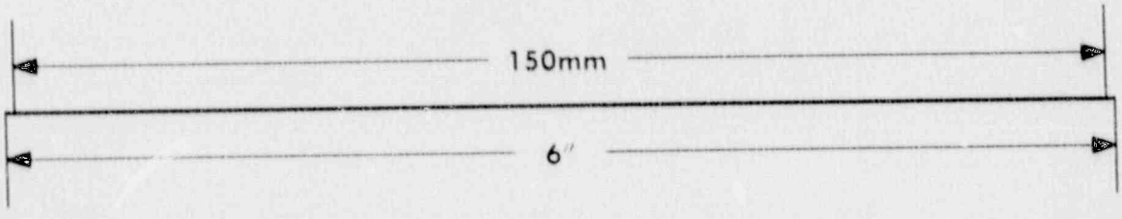
1

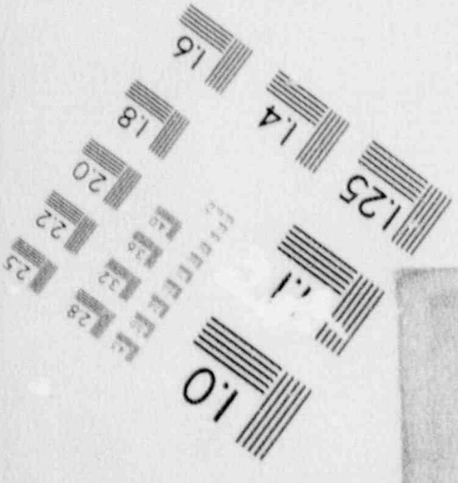
IMAGE EVALUATION TEST TARGET (MT-3)

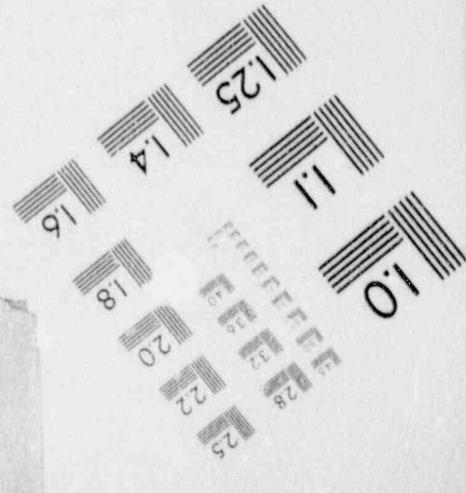












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SCG1S361

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-5

Date 2-9-90

Elevation bottom of hole 617.0 ft

Elevation Lake 677.0 ft

Water pressure Head 5 psi

Time start pumping water 1:40 P

Time actual test start
(after water flow equalized) 1:45

Time end of test 1:50

Elapsed time of test 5 Min.

Number of gallons 4.1

Gallons/minute 0.8 gpm

Water Meter

Starting
Meter reading 7338.0 gal.

Ending
Meter reading 7342.1 gal.

ID Number 502063

Calibration
Due Date Date 8-6-90

Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E1142

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hall C90-0140
QC Inspector

Remarks: Funnel test water el 690.1
0.8 gpm At 5 psi
Packer At 20'

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

APPENDIX D E

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WATER TEST

SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED QDS DATE 8/10/90
CHECKED DT DATE 8/16/90

Element D Cell _____

Hole Number RSD-5

Date 2-9-90

Elevation bottom of hole 617.0 ft

Elevation Lake 677.0 ft

Water pressure head + 5 psi

Time start pumping water 1:52 P

Time actual test start (after water flow equalized) 1:55

Time end of test 2:00

Elapsed time of test 5 Min.

Number of gallons 7.1

Gallons/minute 1.4

Water Meter

Starting Meter reading 0T345.9 gal.

Ending Meter reading 7352.1 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall C90-0190
QC Inspector

Remarks: Packer at 20'
1.4 gpm at 10 psi

W. H. Lee
Cognizant Engineer

G. B. Payne
Grout Foreman

0902Q/ceg

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SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED 2DS DATE 8/10/90

CHECKED DF DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell _____

Hole Number PSD-5

Date 2-9-90

Elevation bottom of hole 617.0 ft

Elevation Lake 677.0 ft

Water pressure ~~head + 10 gauge~~ psi

Time start pumping water 2:03 P

Time actual test start (after water flow equalized) 2:03

Time end of test 2:08

Elapsed time of test 5 Min.

Number of gallons 9.6

Gallons/minute 1.9

Water Meter

Starting Meter reading 7360.0 gal.

Ending Meter reading 7369.6 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall C90-0140
QC Inspector

Remarks: Packer At 20'
1.9 gpm At 15 psi

W. H. Lee
Cognizant Engineer

L. B. Davis
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

COMPUTED CRB DATE 8/10/90
CHECKED bt DATE 8/10/90

Element D Cell _____

Hole Number PSD-5

Date 2-21-90

Elevation bottom of hole 599.0 ft

Elevation Lake 678.5 ft

Water pressure 0 psi

Time start pumping water 10:20 AM

Time actual test start
(after water flow equalized) 10:27

Time end of test 10:32

Elapsed time of test 5 Min.

Number of gallons 85.5

Gallons/minute 17.1 gpm

Water Meter

Starting
Meter reading 7480.0 gal.

Ending
Meter reading 7565.5 gal.

ID Number 502063

Calibration
Due Date Date 8-6-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall C90 0317
QC Inspector

Remarks: Maintain water at top of hole. Open hole, water in top, gauge reads 23 psi.

W. H. Lee
Cognizant Engineer

S B Bayne
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED BWS DATE 5/10/90

CHECKED DT DATE 5/10/90

Element D Cell _____

Hole Number PSD-5

Date 2-21-90

Elevation bottom of hole 599.0 ft

Elevation Lake 678.5 ft

Water pressure head psi

Time start pumping water 11:26 AM

Time actual test start (after water flow equalized) 11:25

Time end of test 11:30

Elapsed time of test 5 Min.

Number of gallons 56.2

Gallons/minute 11.2

Water Meter

Starting Meter reading 7600.0 gal.

Ending Meter reading 7656.2 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

PACKer AT 20'

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall ER. C90 0317
QC Inspector

Remarks: Funnel test, water At. el. 689.5
gAuge reAds 11 psi
11.2 ~~PSI~~ gpm
2-21-90

W. H. Lei
Cognizant Engineer

L. B. Sayre
Grout Foreman

0902Q/ceg

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SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED DJH DATE 8/10/90
CHECKED pt DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell _____

Hole Number PSD-5

Date 2-21-90

Elevation bottom of hole 599.0 ft

Elevation Lake 678.5 ft

Water pressure 5 gauge psi

Time start pumping water 11:41 AM

Time actual test start (after water flow equalized) 11:42

Time end of test 11:47

Elapsed time of test 5 Min.

Number of gallons 40.5

Gallons/minute 8.1

Water Meter

Starting Meter reading 7680.0 gal.

Ending Meter reading 7720.5 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall TA C900317
QC Inspector

Remarks: Packer at 20'
8 gpm at 10 psi

W. H. Lea
Cognizant Engineer

L. B. Bayne
Grout Foreman

0902Q/ceg

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WATER TEST

SCG 1 c 361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/10/90

CHECKED DT DATE 8/10/90

Element D Cell _____

Hole Number PSD-

Date 2-21-90

Elevation bottom of hole 599.0 ft

Elevation Lake 678.5 ft

Water pressure 10 gauge psi

Time start pumping water 11:48 AM

Time actual test start (after water flow equalized) 11:50

Time end of test 11:55

Elapsed time of test 5 Min.

Number of gallons 51

Gallons/minute 10.2

Water Meter

Starting Meter reading 7750.6 gal.

Ending Meter reading 7801.0 gal.

ID Number 502063

Calibration Due Date Date 8-6-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1119z

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall 7/9/90-0317
QC Inspector

Remarks: PACKER AT 20'
10.2 GPM AT 15 PSI

W. H. Lee
Cognizant Engineer

P B. Payne
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED JDS DATE 3/10/90
CHECKED [illegible] DATE 8/15/90

Element D Cell _____

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 4.6 head psi

Time start pumping water 6:55 PM

Time actual test start (after water flow equalized) 7:05

Time end of test 7:10

Elapsed time of test 5 Min.

Number of gallons 2.5

Gallons/minute 0.5

Water Meter

Starting Meter reading 5364.0 gal.

Ending Meter reading 5366.5 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall FIRC900020
QC Inspector

Remarks: WAter At top of hole
0.5 gpm At 5 psi

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

09020/ceg

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SCG1S361

SEQUOYAH NUCLEAR PLANT
COMPUTED QWS DATE 8/10/90
CHECKED ft DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 head psi

Time start pumping water 9:22 PM

Time actual test start (after water flow equalized) 9:25

Time end of test 9:30

Elapsed time of test 5 Min.

Number of gallons 2.8

Gallons/minute 0.6

Water Meter

Starting Meter reading 5474.0 gal.

Ending Meter reading 5476.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90

Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C900020
QC Inspector

Remarks: water at top of hole el 688.0
0.6 gpm at 5 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361 -

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 Head psi

Time start pumping water 8:53 PM

Time actual test start (after water flow equalized) 8:55

Time end of test 9:00

Elapsed time of test 5 Min.

Number of gallons 3.4

Gallons/minute 0.7

Water Meter

Starting Meter reading 5434.5 gal.

Ending Meter reading 5437.9 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall IRC900020
QC Inspector

Remarks: Funnel test (el. 689.6 water)
Packer at 12.7'
0.7 gpm at 5 psi

W H Lee
Cognizant Engineer

Grout Foreman

09020/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element 0 Cell _____

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 ± 5 gauge psi

Time start pumping water 9:03 PM

Time actual test start (after water flow equalized) 9:05

Time end of test 9:10

Elapsed time of test 5 Min.

Number of gallons 6.7

Gallons/minute 1.3

Water Meter

Starting Meter reading 54420 gal.

Ending Meter reading 5498.7 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

[signature] IRC900020
QC Inspector

Remarks: Packer At 12.7'
1.3 gpm At 10 psi

[signature]
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCG 1S 361 -

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 10 gauge psi

Time start pumping water 9:12 PM

Time actual test start (after water flow equalized) 9:15

Time end of test 9:20

Elapsed time of test 5 Min.

Number of gallons 10.6

Gallons/minute 2.1

Water Meter

Starting Meter reading 5455.0 gal.

Ending Meter reading 5465.6 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1119Z

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

OE Hall IR 0900020
QC Inspector

Remarks: Packer at 12.7'
2.1 gpm at 15 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

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SCG1S361 --

SEQUOYAH NUCLEAR PLANT

COMPUTED ___ DATE 8/10/90
CHECKED ___ DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 4.6 head psi

Time start pumping water 7:20 PM

Time actual test start
(after water flow equalized) 7:25

Time end of test 7:30

Elapsed time of test 5 Min.

Number of gallons 3.1

Gallons/minute 0.6

Water Meter

Starting
Meter reading 5370.0 gal.

Ending
Meter reading 5373.1 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90

Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

DE Hall FRC900020
QC Inspector

Remarks: Funnel test (el 689.3) Packer set at 42.7'
0.6 gpm at 5 psi

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5+5 gauge psi

Time start pumping water 7:35 PM

Time actual test start (after water flow equalized) 7:40

Time end of test 7:45

Elapsed time of test 5 Min.

Number of gallons 7.6

Gallons/minute 1.5

Water Meter

Starting Meter reading 5376.0 gal.

Ending Meter reading 5383.6 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hood FIRC900020
QC Inspector

Remarks: PACKER AT 42.7'
1.5 gpm AT 10 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

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SCG1S 361

SEQUOYAH NUCLEAR PLANT
COMPUTED RDB DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 10 gauge psi

Time start pumping water 7:50 PM

Time actual test start (after water flow equalized) 7:55

Time end of test 8:00

Elapsed time of test 5 Min.

Number of gallons 11.8

Gallons/minute 2.3

Water Meter

Starting Meter reading 5390.0 gal.

Ending Meter reading 5401.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90

Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall FRC900020
QC Inspector

Remarks: Packer At 42.7'
2.3 gpm At 15 psi

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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SCG1S361

SEQUOYAH NUCLEAR PLANT
COMPUTED QDS DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 head psi

Time start pumping water 8:15 PM

Time actual test start
(after water flow equalized) 8:20

Time end of test 8:26

Elapsed time of test 6 Min.

Number of gallons 2.7

Gallons/minute 0.5

Water Meter

Starting
Meter reading 5405.0 gal.

Ending
Meter reading 5407.7 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall TRC900020
QC Inspector

Remarks: Funnel test (el. 689.4 water)
PACKer At 52.7'
0.5 gpm At 5 psi

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED WDS DATE 8/10/90
CHECKED DT DATE 8/10/90

Element D Cell

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5+5 gauge psi

Time start pumping water 8:30 PM

Time actual test start (after water flow equalized) 8:35

Time end of test 8:40

Elapsed time of test 5 Min.

Number of gallons 5.5

Gallons/minute 1.1

Water Meter

Starting Meter reading 5412.0 gal.

Ending Meter reading 5417.5 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

W E Hall 7/9 & 900820
QC Inspector

Remarks: Packer at 52.7'
1.1 gpm at 10 psi

W H Low
Cognizant Engineer

Grout Foreman

0902Q/ceg

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WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLAN

COMPUTED ADS DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-10-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 10 gAuge psi

Time start pumping water 8:42 PM

Time actual test start (after water flow equalized) 8:45

Time end of test 8:50

Elapsed time of test 5 Min.

Number of gallons 8.8

Gallons/minute 1.8

Water Meter

Starting Meter reading 5422.0 gal.

Ending Meter reading 5430.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

LDE Hall FP C900020
QC Inspector

Remarks: PAcker At 52.7'
1.8 gpm At 15 psi

W. H. Lee
Cognizant Engineer

[signature]
Grout Foreman

09020/ceg

APPENDIX D

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SCG1S361

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED QWS DATE 8/10/90
CHECKED pt DATE 8/10/90

Element D Cell

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 4.6 head psi

Time start pumping water 3:42 PM

Time actual test start (after water flow equalized) 3:45

Time end of test 3:50

Elapsed time of test 5 Min.

Number of gallons 1.7

Gallons/minute 0.3

Water Meter

Starting Meter reading 5582.5 gal.

Ending Meter reading 5584.2 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall IRC900036
QC Inspector

Remarks: Water At top of hole (el. 688.0)
0.3 gpm At 5 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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SCG1S361

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED CWS DATE 8/10/90
CHECKED bt DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 4.6 head psi

Water Meter

Starting
Meter reading 5587.0 gal.

Ending
Meter reading 5589.0 gal.

ID Number 502063

Calibration
Due Date Date 1-26-90
Pressure Gauge

Calibration
Due Date 6-19-90

ID Number E11192

Time start pumping water 4:03 P

Time actual test start
(after water flow equalized) 4:05

Time end of test 4:10

Elapsed time of test 5 Min.

Number of gallons 2.0

Gallons/minute 0.4

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

DE Hall IRC900031
QC Inspector

Remarks: Funnel test water at el. 689.7
Packer at 12'
0.4 gpm at 5 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

0902Q/ceg

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WATER TEST

SCG1 361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED QWS DATE 8/10/90
CHECKED [illegible] DATE 8/16/90

Element D Cell _____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 5 gAuge psi

Time start pumping water 4:13 PM

Time actual test start (after water flow equalized) 4:15

Time end of test 4:20

Elapsed time of test 5 Min.

Number of gallons 2.4

Gallons/minute 0.5

Water Meter

Starting Meter reading 5590.0 gal.

Ending Meter reading 5592.4 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

DE Hall IRC900031
QC Inspector

Remarks: Packer At 12'
0.5 gpm At 10 psi

W.H. Lee
Cognizant Engineer

[signature]
Grout Foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED CWS DATE 3/16/90
CHECKED bt DATE 3/16/90

Element D Cell _____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 10 gauge psi

Time start pumping water 4:20 PM

Time actual test start (after water flow equalized) 4:22

Time end of test 4:27

Elapsed time of test 5 Min.

Number of gallons 9.3

Gallons/minute 1.9

Water Meter

Starting Meter reading 5597.0 gal.

Ending Meter reading 5606.3 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8 - 2.9 of Attachment 1)

D E Hall IRC90003
QC Inspector

Remarks: PACKER AT 12'
1.9 gpm AT 15 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

APPENDIX D

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED QDS DATE 8/13/90
CHECKED DT DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 Head psi

Time start pumping water 4:35 PM

Time actual test start (after water flow equalized) 4:38

Time end of test 4:43

Elapsed time of test 5 Min.

Number of gallons 3

Gallons/minute 0.6

Water Meter

Starting Meter reading 5609.0 gal.

Ending Meter reading 5612.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

DE Hall IR.C900031
QC Inspector

Remarks: PAcker set At 42'
Funnel test water el. 689.8
0.6 gpm At 5 psi

W H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

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WATER TES.

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED [illegible] DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number ESD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 5gAuge psi

Time start pumping water 4:45

Time actual test start (after water flow equalized) 4:46

Time end of test 4:51

Elapsed time of test 5 Min.

Number of gallons 5

Gallons/minute 1

Water Meter

Starting Meter reading 5613.6 gal.

Ending Meter reading 5618.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8 2.9 of Attachment 1)

DE Hall FIR C900031
QC Inspector

Remarks: PAcKer At 42'
1 gpm At 10 psi

W. H. Lee
Cognizant Engineer

Ellie Blunk
Grout Foreman

09020/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED a.d.s DATE 8/10/90
CHECKED tf DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 10 gauge psi

Time start pumping water 4:52 PM

Time actual test start (after water flow equalized) 4:53

Time end of test 4:58

Elapsed time of test 5 Min.

Number of gallons 9.8

Gallons/minute 2 ~~2.0~~ a.d.s 1-12-90

Water Meter

Starting Meter reading 5623.0 gal.

Ending Meter reading 5632.8 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E1119Z

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

DE Hael C90 0031 TR
QC Inspector

Remarks: Packer set At 42'
2 gpm At 15 psi

W.H. Loc
Cognizant Engineer

Grout foreman

0902Q/ceg

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WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 HEAD psi

Time start pumping water 5:04 PM

Time actual test start (after water flow equalized) 5:08

Time end of test 5:13

Elapsed time of test 5 Min.

Number of gallons 2.3

Gallons/minute 0.5

Water Meter

Starting Meter reading 5640.0 gal.

Ending Meter reading 56423 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

DE Hall IRC900031
QC Inspector

Remarks: PACKER AT 52'
~~WATER~~ WATER AT EL 689.6 (FUNNEL TEST)
0.5 GPM AT 5 PSI

W. H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

APPENDIX D

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Revision 0

ATTACHMENT 4
Page 1 of 1

SHEET 197 OF ____

WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED CDS DATE 8/10/90
CHECKED FH DATE 8/10/90

Element D Cell ____

Hole Number PSD-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5±5 gauge psi

Time start pumping water 7:00 AM 1-12-90 ~~5:11 PM~~

Time actual test start (after water flow equalized) 7:05

Time end of test 7:10

Elapsed time of test 5 Min.

Number of gallons 1.9 CDS 1-12-90

Gallons/minute 0.4 ✓

Water Meter

Starting Meter reading 5646.5 gal.

Ending Meter reading 5648.4 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11'92

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

DE Hall IR C90CO31
QC Inspector

Remarks: PACKER AT 52'
0.4 GPM AT 10 PSI

W.H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

APPENDIX D

ATTACHMENT 4
Page 1 of 1

SHEET 198 OF _____

WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT

COMPUTED Q.D.S DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number PSR-6

Date 1-12-90

Elevation bottom of hole 626.9 ft

Elevation Lake 677.75 ft

Water pressure 5 + 10 gauge psi

Time start pumping water 7:11

Time actual test start (after water flow equalized) 7:13

Time end of test 7:18

Elapsed time of test 5 Min.

Number of gallons 9

Gallons/minute 1.8

Water Meter

Starting Meter reading 5654.0 gal.

Ending Meter reading 5663.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall TR C900031
QC Inspector

Remarks: Packer At 52'
1.8 gpm At 15 psi

W. H. Loa
Cognizant Engineer

Grout Foreman

0902Q/ceg

APPENDIX D

ATTACHMENT 4
Page 1 of 1

SHEET 199 OF _____

WATER TEST

SCG 1 S 361 - -

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 2/10/96
CHECKED [illegible] DATE 2/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-26-90

Elevation bottom of hole 597.8 ft

Elevation Lake 677.0 ft

Water pressure Head 5 psi

Time start pumping water 1:25 PM

Time actual test start (after water flow equalized) 1:35

Time end of test 1:40

Elapsed time of test 5 Min.

Number of gallons 59.0

Gallons/minute 11.8

Water Meter

Starting Meter reading 5960.0 gal.

Ending Meter reading 6019.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Drill water lost At 89.3' (100%)
Funnel test - 3 Gauge reads 8 psi

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

D E Hall I.R. C90-0107
QC Inspector

Remarks: Packer At 20' 11.8 GPM At 5 psi

W. H. Lee
Cognizant Engineer

L. B. Bayne
Grout Foreman

09020/ceg

APPENDIX D

ATTACHMENT 4
Page 1 of 1

SHEET 200 OF ______

SCG1S361

SEQUOYAH NUCLEAR PLANT
COMPUTED ADR DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-6

Date 1-26-90

Elevation bottom of hole 597.8 ft

Elevation Lake 677.0 ft

Water pressure 5 head to gauge psi

Time start pumping water 2:10

Time actual test start (after water flow equalized) 2:15

Time end of test 2:20

Elapsed time of test 5 Min.

Number of gallons 25

Gallons/minute 5.0

Water Meter

Starting Meter reading ~~6267.0~~ 6285.0 ADR 1-26-90 gal.

Ending Meter reading 6310.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

W E Hall IRC90-0107
QC Inspector

Remarks: 100% Drill water loss At 89.3
Packer At 20'
5.0 gpm At ~~15~~ 5 psi ADR 1-26-90

W. H. Lee
Cognizant Engineer

J. B. Payne
Grout Foreman

0902Q/ceg

APPENDIX D

ATTACHMENT 4
Page 1 of 1

SHEET 201 OF _____

WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED JDS DATE 8/10/90
CHECKED _____ DATE 8/10/90

Element D Cell _____

Hole Number PSD-6

Date 1-26-90

Elevation bottom of hole 597.8 ft
3 Ref 1-26-90

Elevation Lake ~~597.5~~ 677.0 ft

Water pressure 515 gAuge psi

Time start pumping water 1:40 P

Time actual test start (after water flow equalized) 1:45

Time end of test 1:50

Elapsed time of test 5 Min.

Number of gallons 44

Gallons/minute 8.8

Water Meter

Starting Meter reading 6100.0 gal.

Ending Meter reading 6194.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall IR C90-0107
QC Inspector

Remarks: 100% Drill water loss At 39.3'
PACKer At 20'
8.8 gpm At 10 psi

W. H. Lee
Cognizant Engineer

L. S. Bayne
Grout Foreman

09020/ceg

SHEET 202 OF ______

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED QDF DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

WATER TEST

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

Element D Cell ______

Hole Number PSD-6

Date 1-26-90

Elevation bottom of hole 597.8 ft

Elevation Lake 677.0 ft

Water pressure 5+10 gauge psi

Time start pumping water 1:55 P

Time actual test start (after water flow equalized) 2:00

Time end of test 2:05

Elapsed time of test 5 Min.

Number of gallons 107

Gallons/minute 21.4

Water Meter

Starting Meter reading 6170.0 gal.

Ending Meter reading 6277.0 gal.

ID Number 502063

Calibration Due Date Date 1-26-90

Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge.
(Ref. 2.8, 2.9 of Attachment 1)

D E Hall I.T. C90-0107
QC Inspector

100% Drill water loss At 89.3'

Remarks: Packer At 20'
21.4 gpm At 15 psi

W. H. Lee
Cognizant Engineer

J. B. Payne
Grout Foreman

0902Q/ceg

APPENDIX D

ATTACHMENT 4
Page 1 of 1

SHEET 203 OF _____

WATER TEST

SCG1S361

SEQUOYAH NUCLEAR PLANT
ERCW PUMPING STATION
AND ACCESS ROADWAY CELLS

SEQUOYAH NUCLEAR PLANT
COMPUTED [illegible] DATE 8/10/90
CHECKED [illegible] DATE 8/10/90

Element D Cell _____

Hole Number RSD-6

Date 1-26-90

Elevation bottom of hole 597.8 ft

Elevation Lake 677.0 ft

Water pressure Top of hole 688.0 psi

Time start pumping water 2:20

Time actual test start (after water flow equalized) 2:25

Time end of test 2:30

Elapsed time of test 5 Min.

Number of gallons 87

Gallons/minute 17.4

Water Meter

Starting Meter reading 6380.0 gal.

Ending Meter reading 6467.0 gal.

ID Number 502-63

Calibration Due Date Date 1-26-90
Pressure Gauge

Calibration Due Date 6-19-90

ID Number E11192

Verify calibration of meter and gauge. (Ref. 2.8, 2.9 of Attachment 1)

OE Hall IR 90-0107
QC Inspector

Remarks: 100% Drill water loss At 83.9'
Open hole water At 688.0
Gauge is 14.5 psi

W. H. Lee
Cognizant Engineer

Grout Foreman

09020/ceg

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED ADB DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

APPENDIX E

WORK EXPERIENCE FOR JAMES B. PAYNE, 424-56-3652

TITLE: Core drill foreman

CRAFT: Operator

Core drill operator: started with TVA in 1968

Core drill foreman: started in 1986

I have operated a core drill on a continuous bases since 1968. Experience includes operating core drill equipment at all new TVA construction projects and proposed TVA sites since 1968. This has included core drilling for hydro, fossil and nuclear projects.

Specific experience with drilling in concrete at the following TVA projects:

Yellow Creek NP - core drill cooling tower caissons , checking on condition of concrete

Bellefonte NP - core drilled for samples of rolled filled concrete test section

Cumberland SP - core drill cassions to check quality of concrete

Fontana Dam - core drill concrete to verify integrity of concrete structure

Pickwick Lock - Core drill approach walls for condition of concrete

James B. Payne 7/27/89
James B. Payne

The above named individual is acceptable to Nuclear Engineering to perform core drilling for the ERCW pumping station and access roadway cell evaluation.

A D Lockeberg 7-27-89
N. E. Representative

APPENDIX E

WORK EXPERIENCE FOR ROGER HELMS, 412-84-9139

TITLE: Core drill operator

CRAFT: Operator

Core drill operator: started with TVA in 1975

I have operated a core drill on a continuous bases since 1975. Experience includes operating core drill equipment at TVA construction projects and proposed TVA sites since 1975. This has included core drilling for hydro, fossil and nuclear projects and coal exploration.

Specific experience with drilling in concrete at the following TVA projects:

Fontana Dam - core drill concrete to verify integrity of concrete structure

Fort Loudoun Dam - core drill concrete structure

Watts Bar Dam - core drill concrete structure

Wheeler Dam - core drill concrete in gallery of dam

Roger T Helms 7-27-89
Roger Helms

The above named individual is acceptable to Nuclear Engineering to perform core drilling for the ERCW pumping station and access roadway cell evaluation.

A D Lodeberg 7-27-89
N. E. Representative

APPENDIX F

78023 BOREHOLE SURVEY TOOL CALIBRATION DATA 7/18/89

Inclinometer vertical check

VERT AXIS ROTATION	Xm	Ym	Zm	Xi	Yi	*INC	**AZ
0	-432	7	907	0	-2	0.1	91
90	3	435	904'	0	-1	0.1	180
180	430	3	906	0	-1	0.1	269
270	-2	-426	910	0	-2	0.1	0
360	-432	7	907	0	-2	0.1	91

* zero degrees inclination should be indicated
**directional data not valid in this position

Magnetometer Zaxis parallel to Earth's field

	*Xm	*Ym	**Zm	Xi	Yi	INC	AZ
0	-1	3	1004	429	0	25.4	180
90	-1	5	1004	0	-431	25.5	180
180	-1	6	1004	-429	0	25.4	179
270	-1	5	1004	-2	427	25.3	180
360	0	4	1004	429	0	25.4	181

* should incidicate zero in this position
** should be full field value (1000) in this positon

Magnetometer Zaxis orthogonal to Earth's field

	*Xm	*Ym	**Zm	Xi	Yi	INC	AZ
0	-1007	-4	6	-903	0	64.6	359
90	1	1003	-4	0	903	64.6	0
180	1008	0	0	904	0	64.7	0
270	0	-1008	8	0	-904	64.7	0
360	-1007	-2	3	-903	0	64.6	0

* should pass through equal +/- peaks with zero points between
** should indicate zero in this position
(this data very sensitive to test stand position)

The borehole survey tool was supplied by Owl Technical, Inc. and calibrated by their QA controlled laboratory.

APPENDIX G

INCLINOMETER SURVEY

ELEMENT D

Hole PSD-1

Bearing	166.18°
Horizontal Distance	4.24'
Vertical Depth	53.8'

Depth	Angle	Bearing
00.0'	4.9°	189°
10.0'	4.6°	178°
20.0'	4.6°	175°
30.0'	4.6°	163°
40.0'	4.6°	151°
50.0'	4.6°	150°
54.0'	4.4°	147°

Hole PSD-2

Bearing	032.15°
Horizontal Distance	0.20'
Vertical Depth	79.0'

Depth	Angle	Bearing
00.0'	0.2°	239°
10.0'	0.5°	036°
20.0'	0.4°	037°
30.0'	0.4°	012°
40.0'	0.4°	315°
50.0'	0.4°	257°
60.0'	0.4°	129°
70.0'	0.3°	094°
79.0'	0.3°	084°

Hole PSD-5

Bearing	182.22°
Horizontal Distance	4.53'
Vertical Depth	55.8'

Depth	Angle	Bearing
00.0'	4.8°	014°
10.0'	4.7°	019°
20.0'	4.7°	022°
30.0'	4.7°	019°
40.0'	4.7°	018°
50.0'	4.5°	017°
56.0'	4.4°	012°

Hole PSD-6

Bearing	153.95°
Horizontal Distance	0.15'
Vertical Depth	83.0'

Depth	Angle	Bearing
00.0'	0.9°	132°
10.0'	0.2°	169°
20.0'	0.2°	202°
30.0'	0.4°	118°
40.0'	0.4°	084°
50.0'	0.3°	035°
60.0'	0.3°	307°
70.0'	0.4°	234°
80.0'	0.4°	216°
83.0'	0.3°	232°

Note: The bearing is determined with a magnetic compass. This bearing is influenced by the steel sheet pile of the cell boundary and the steel intake liners.

APPENDIX G

INCLINOMETER SURVEY

ELEMENT D

SCG1S361

SEQUOYAH NUCLEAR PLANT

COMPUTED CDB DATE 8/10/90

CHECKED [illegible] DATE 8/10/90

Hole PSD-7

Bearing	177.78°
Horizontal Distance	1.45'
Vertical Depth	41.0'

Depth	Angle	Bearing
00.0'	1.7°	177°
10.0'	1.9°	180°
20.0'	2.2°	188°
30.0'	2.3°	179°
40.0'	2.1°	154°
41.0'	2.2°	157°

Hole PSD-8

Bearing	076.90°
Horizontal Distance	8.59'
Vertical Depth	57.3'

Depth	Angle	Bearing
00.0'	8.5°	069°
10.0'	8.8°	088°
20.0'	8.9°	092°
30.0'	8.8°	082°
40.0'	8.8°	073°
50.0'	8.5°	059°
58.0'	8.5°	058°

SHEET 209
CALC ID SCG1S361

THIS IS THE LAST PAGE OF THIS CALCULATION PACKAGE

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AUG 28 1990

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Gentlemen:

In the Matter of	)	Docket Nos. 50-327
Tennessee Valley Authority	)	50-328

SEQUOYAH NUCLEAR PLANT (SQN) - ESSENTIAL RAW COOLING WATER (ERCW) PUMPHOUSE FOUNDATION AND ERCW PUMPING STATION ACCESS CELLS

References: 1. TVA letter to NRC dated December 28, 1988, "Sequoyah Nuclear Plant (SQN) - Essential Raw Cooling Water (ERCW) Pumphouse Foundation and ERCW Pumping Station Access Cells"

2. TVA letter to NRC dated March 1, 1990, "Sequoyah Nuclear Plant (SQN) - Essential Raw Cooling Water (ERCW) Pumphouse Foundation and ERCW Pumping Station Access Cells"

As committed in References 1 and 2, this letter provides the final report for the limited exploration program of the ERCW pumphouse foundation. Contained within the report is the evaluation of the seismic qualification of the pumphouse equipment, the evaluation of the pumphouse deflections, and the evaluation of the operating basis earthquake concurrent with water level at Elevation 704. The roadway access cells final report was submitted by Reference 2.

The enclosure contains TVA's Calculation SCG1S361, which includes the final report for the foundation investigation of the ERCW pumphouse. The conclusions of the calculation and the final report are that the structural integrity of the pumping station foundation cells is confirmed, the foundation will perform its intended function under design conditions, and no additional investigation is necessary.

No commitments are contained in this submittal. Please direct questions concerning this issue to K. S. Whitaker at (615) 843-7748.

Very truly yours,

TENNESSEE VALLEY AUTHORITY

E. G. Wallace, Manager
Nuclear Licensing and
Regulatory Affairs

Enclosure
cc: See page 2

A001
1/1

U.S. Nuclear Regulatory Commission

AUG 28 1990

Enclosure
cc: Ms. S. C. Black, Deputy Director (w/Enclosure)
Project Directorate II-4
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

Mr. J. N. Donohew, Project Manager (w/Enclosure)
U.S. Nuclear Regulatory Commission
One White Flint, North
11555 Rockville Pike
Rockville, Maryland 20852

NRC Resident Inspector (w/Enclosure)
Sequoyah Nuclear Plant
2600 Igou Ferry Road
Soddy Daisy, Tennessee 37379

Mr. B. A. Wilson, Project Chief (w/Enclosure)
U.S. Nuclear Regulatory Commission
Region II
101 Marietta Street, NW, Suite 2900
Atlanta, Georgia 30323