2655

G-000-711.9

FEDERAL FACILITIES COMPLIANCE AGREEMENT MONTHLY TECHNICAL PROGRESS REPORT

11/01/87

23
ENCLOSURE

[redacted]

2655

REMEDIAL INVESTIGATION
AND
FEASIBILITY STUDY

FEED MATERIALS PRODUCTION CENTER

FERNALD, OHIO

FEDERAL FACILITIES COMPLIANCE AGREEMENT

MONTHLY TECHNICAL PROGRESS REPORT

NOVEMBER 1987

[redacted]

FMPC SITEWIDE RI/FS
NOVEMBER 1987
MONTHLY TECHNICAL PROGRESS REPORTS

STATUS

General

Progressive actions have continued on the FMPC sitewide RI/FS. Eight additional monitoring well were completed during November for a total of 26. Fall sampling for the biological resources program was completed. Comment responses and change pages to the Task 1 Description of Current Situation Report were issued to U.S. EPA on November 20,1987

Task 1 - Description of Current Situation

The final version of the U.S. EPA Comment Responses and Change Pages to the Task 1 Report- "Description of Current Situation" was submitted to the U.S. EPA on November 20, 1987.

Percent Complete:
- Original Deliverable - Complete
- Comment Response - Complete
- Revised Deliverable - Complete

Task 2 - RI Work Plan Requirements

Revision of the RI Work Plan and supporting documentation continued during November. Final completion is scheduled 45 days following receipt and resolution of U.S. EPA comments on the revised Work Plan and change pages submitted August 24, 1987. Receipt of EPA comments on the revised work plan is expected prior to a planned December 10/11, 1987 comment resolution meeting.

Percent Complete:
- Original Deliverable - Complete
- Comment Response - Complete
- Revised Deliverable - 60 %

Task 3 - Site Investigation

Groundwater and Subsurface Soils - Drilling was completed at well locations 152, 252, 184, 284, 384, 251, 351, and 311 during November. Additionally, 40 feet of drilling was completed at well location 367. A summary of the wells and their boring depths appears in the following table:

RI/FS WELL Location	Boring Depth (ft)	
152	32.5	
252	61.5	
184	33.0	
284	77.0	
384	127.0	
251	105.0	
351	151.5	
311	151.5	
367	40.0	(In Progress)
111	0.0	(In Progress)
181	0.0	(In Progress)
Total	779.0	

When added to the previously reported total boring depth of 697.6 feet, total footage through November 30, 1987 is 1476.6 feet.

The casing and screen section of wells 152, 252, 184, 284, 384, and 251 were installed as specified in the Work Plan. At well locations 351 and 311 the boring was advanced to a depth of 151.5 feet in an effort to contact the "blue clay" layer. Contact with the blue clay was not confirmed despite the fact that drilling operations continued to approximately 7 and 30 feet below the expected contact depths, respectively.

Following the installation of well 252, the surface of the ground water, which was originally contacted at approximately 53 feet below ground surface, began to fall and continued to fall below the bottom of the well screen. A subsequent level measurement indicated that water had failed to return to an above the screen level. This well will be monitored and evaluated to determine if further action is required.

Transit Survey - Survey layout of 100 foot girds within the production area continued during the month of November. Six more 1000 foot grid points were added along the north boundary of the FMPC, on the west side of the north access road. The layout of additional 100 foot sampling grids in the 300 foot perimeter area outside the production area

continued during November. Grid surveys are approximately 70% complete on the 300 foot perimeter area at the boundary of the production area. A vertical and horizontal survey control program to locate recently installed monitoring wells was initiated during November.

Radiation Measurement Survey - Surface radiological surveys were conducted immediately north of the production area within the security buffer zone and in the perimeter area southeast of the production area. Several areas north of the production area were found to exhibit above background levels of direct surface radiation with both the FIDLER probe and the large-volume scintillation detector (SPA-3). The areas with elevated radiation levels were along a gravel roadway leading from the production area.

Efforts to correlate direct radiation measurements from FIDLER and large volume scintillation detectors (SPA-3) continued during November. Correlation curves for each of the FIDLER and SPA-3 systems in use at the FMPC are being developed based upon field measurements and laboratory soil analyses. The correlation curves will be further refined as the field radiation measurements program progresses.

As of November 30, 1987, walkover surveys were completed on 136-100 foot grids. In addition, approximately 25 grid blocks were partially surveyed during November.

Surface Soil Sampling - Systemmatic surface soil sampling was initiated during November on the 1000 foot grid system outside the production area, but within the FMPC boundary. In addition, the collection of biased soil samples (as determined by the radiation measurements program) and correlation soil samples continued during the period. A total of 135 surface soil samples have been collected to date.

Biological Resources - Fall sampling was completed during the first week of November and the specimens sent to IT Analytical Lab in Oak Ridge, TN. Due to the abundance of natural forage, trapping efforts for cottontail rabbit and squirrel resulted in no captures. These species are anticipated to be more easily captured in the late winter when forage is reduced. An opossum was caught and submitted for tissue analysis. Small mammals captured along the perimeter of Waste Pit 5 were composited for tissue analysis.

Percent Complete: 25 %

Task 4 - Site Investigation Analysis

Data Base - Data files for the Flow Gemini data management system were structured to permit data entry from the Visual Classification of Soils form. Data entry from sample collection forms for biological sampling, subsurface sampling and groundwater monitoring is approximately 70% complete.

A program was prepared to automatically link State Planar Survey Coordinates to each data element obtained in the surface radiological measurements effort. This will permit the creation of coordinate files once data entry is complete. Surface Radiological data can now be read into customized command files which have been written in the Contour Plotting System to generate floating contour, 2-D contour and fishnet plots on the plotters. Capability to read these files into Autocad and to plot at remote work stations is now operational.

Ground Water Modeling - A strategy was developed for SWIFT III model code verification. The model grid and well locations were tied together by the State Planar Coordinate system.

Percent complete: 10 %

Tasks 5 and 6

No significant progress.

Task 7 - Program Management and Reports

Health and Safety - A Health and Safety Audit was performed on November 12, 1987. The overall program was found to be satisfactory.

Percent complete: Not applicable (apportioned effort).

Task 8 - Community Relations Support

No significant actions during this reporting period.

Percent complete: Not applicable (apportioned effort).

CHARACTERIZATION INVESTIGATION STUDY

Volume 1 of the Characterization Investigation Study (CIS) final report was issued October 26, 1987. Volume 1 provides an indepth report of the findings of the geophysical surveys performed in the waste storage area during the CIS. Volume 2 of the CIS final report was issued on November 30, 1987.

Volume 2 covers the radiological and chemical analysis of samples collected from the waste storage facilities. Volume 3 of the CIS final report is currently in final printing and is anticipated to be issued in December, 1987. Volume 3 provides the detailed results of the surface radiological survey performed in the waste storage area.

DIFFICULTIES ENCOUNTERED

None.

ACTIONS TAKEN TO RECTIFY PROBLEMS

None Required.

CHANGES IN PERSONNEL

No personnel changes this reporting period.

RESULTS OF SAMPLING

Initial radiological laboratory results from the RI field sampling are now available. As data becomes available, it will be reported in Technical Information Exchange (TIE) meetings as was done in the November TIE meeting.

Attachment 1 to this report provides well completion logs for monitoring wells 184, 284, 252, 152, 111, 311, 384, 251, 351, and 181.

PLANNED ACTIVITIES NEXT MONTH

- Place a second Drilling rig in the waste pit area.
- Conduct a demonstration of the US RADS system.
- Complete the survey layout within the production area.
- Complete capability to electronically transfer data from the Characterization Investigation Study TIMS system to the Flow Gemini data base.
- Begin system design for electronically transferring laboratory results to the Flow Gemini system.

WELL # 184 #27

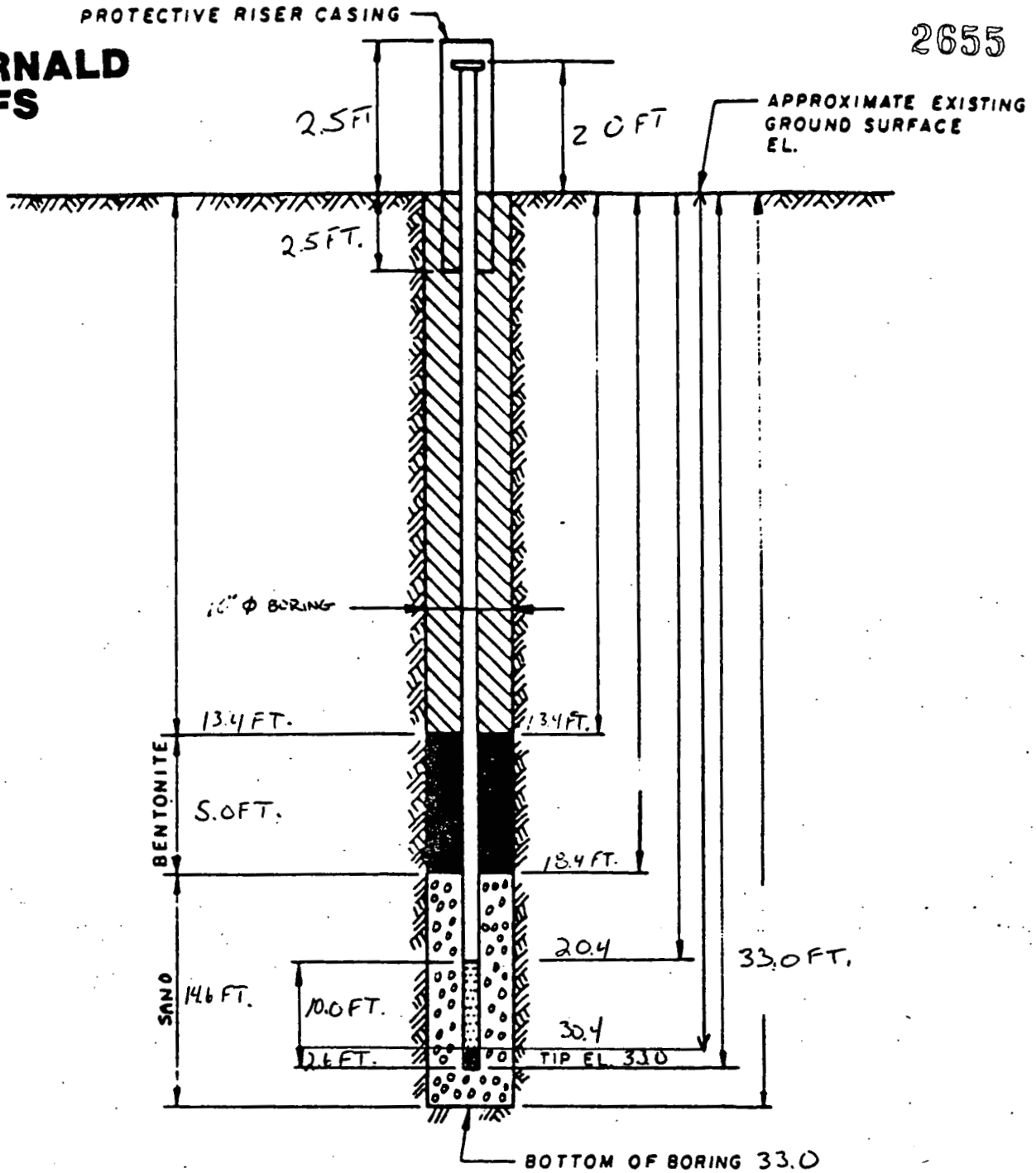
2655

FERNALD RI/FS

DRAWING NUMBER

CHECKED BY / APPROVED BY

DRAWN BY DRC



NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL 184

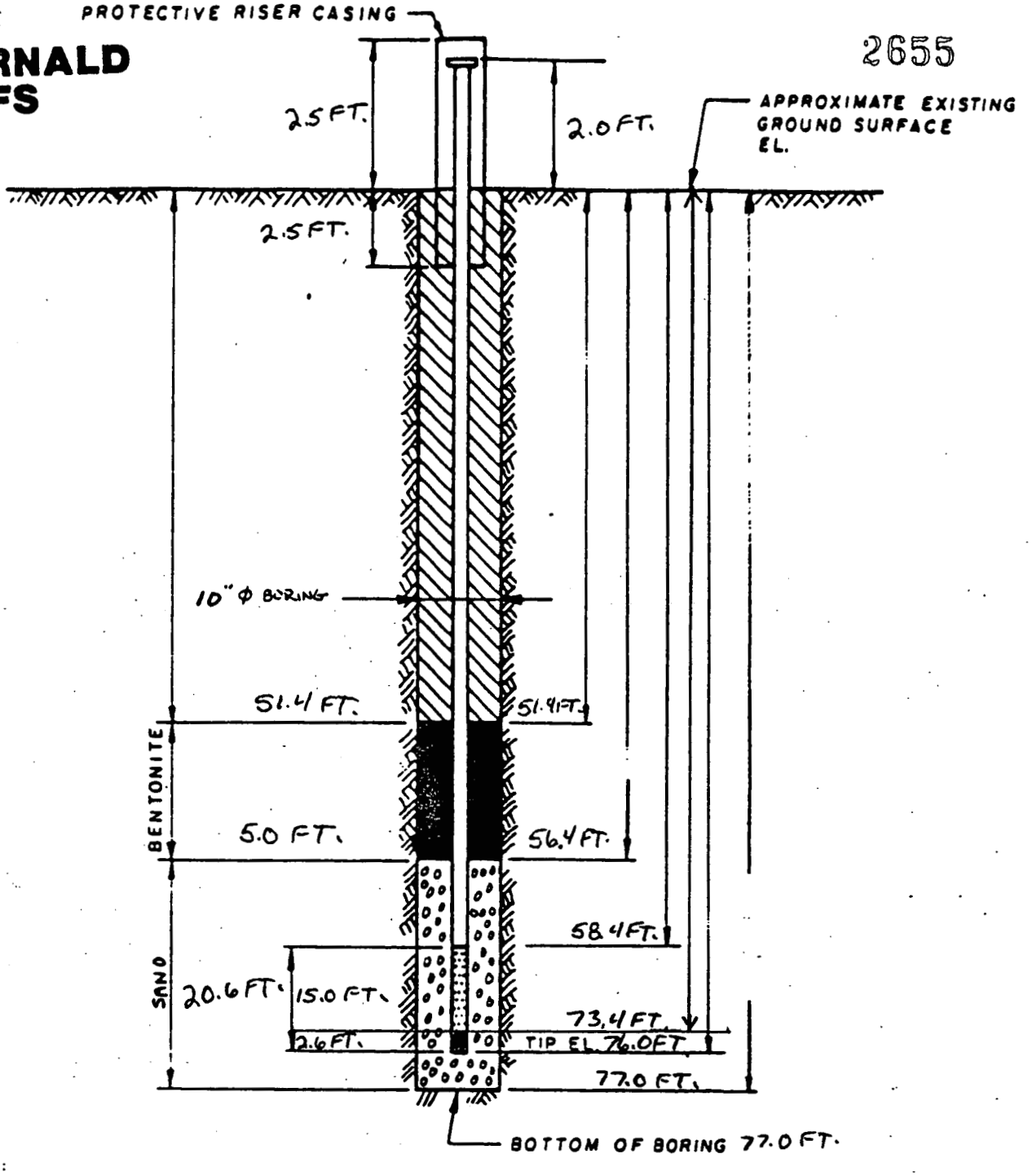
PREPARED FOR

7

WELL #284

FERNALD RI/FS

2655



DRAWING NUMBER

CHECKED BY

APPROVED BY

DRAWN BY 080

NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D. SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL 284

PREPARED FOR

WELL 252

2655

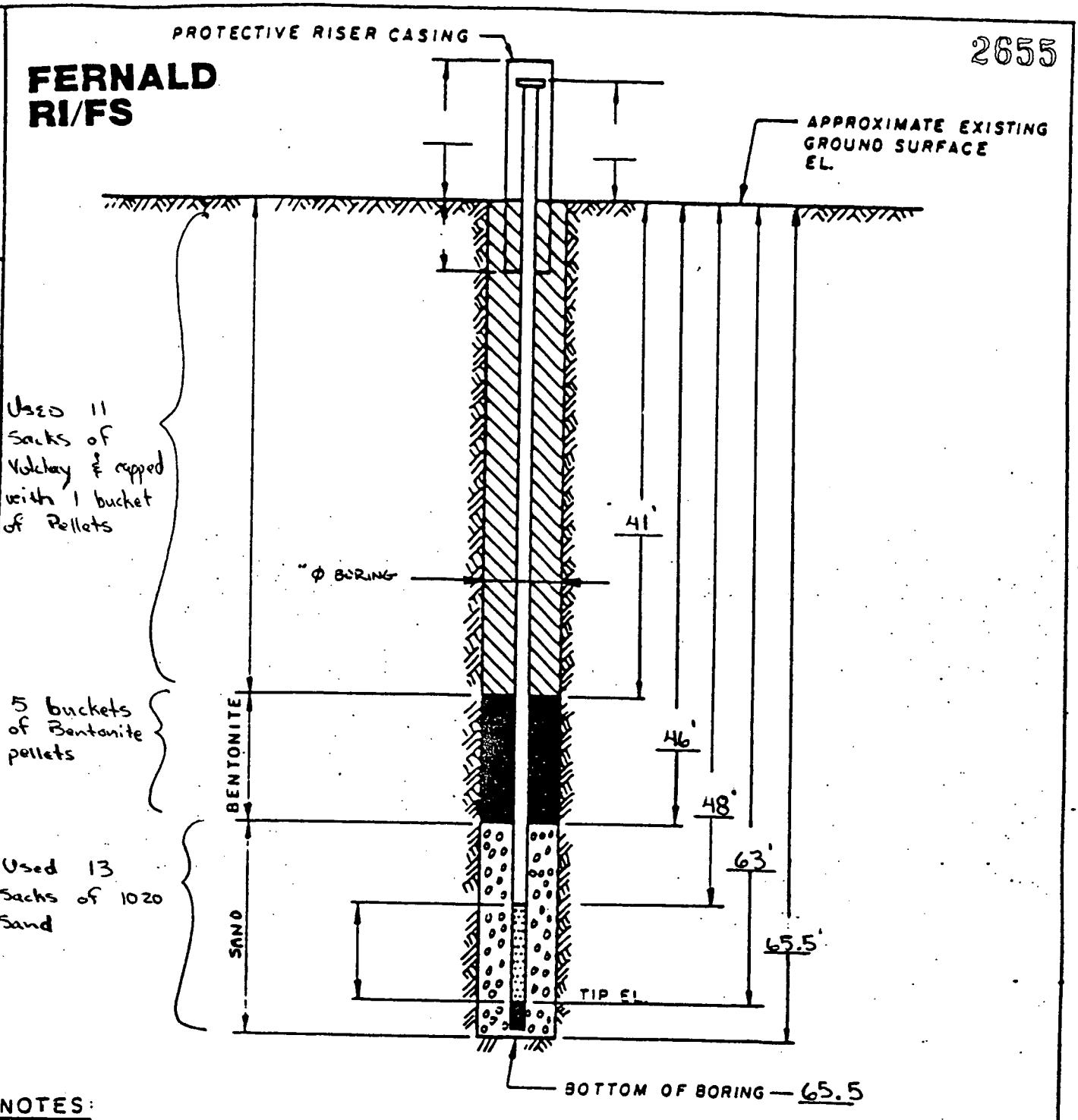
FERNALD RI/FS

DRAWING NUMBER

CHECKED BY

APPROVED BY

DRAWN BY



NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

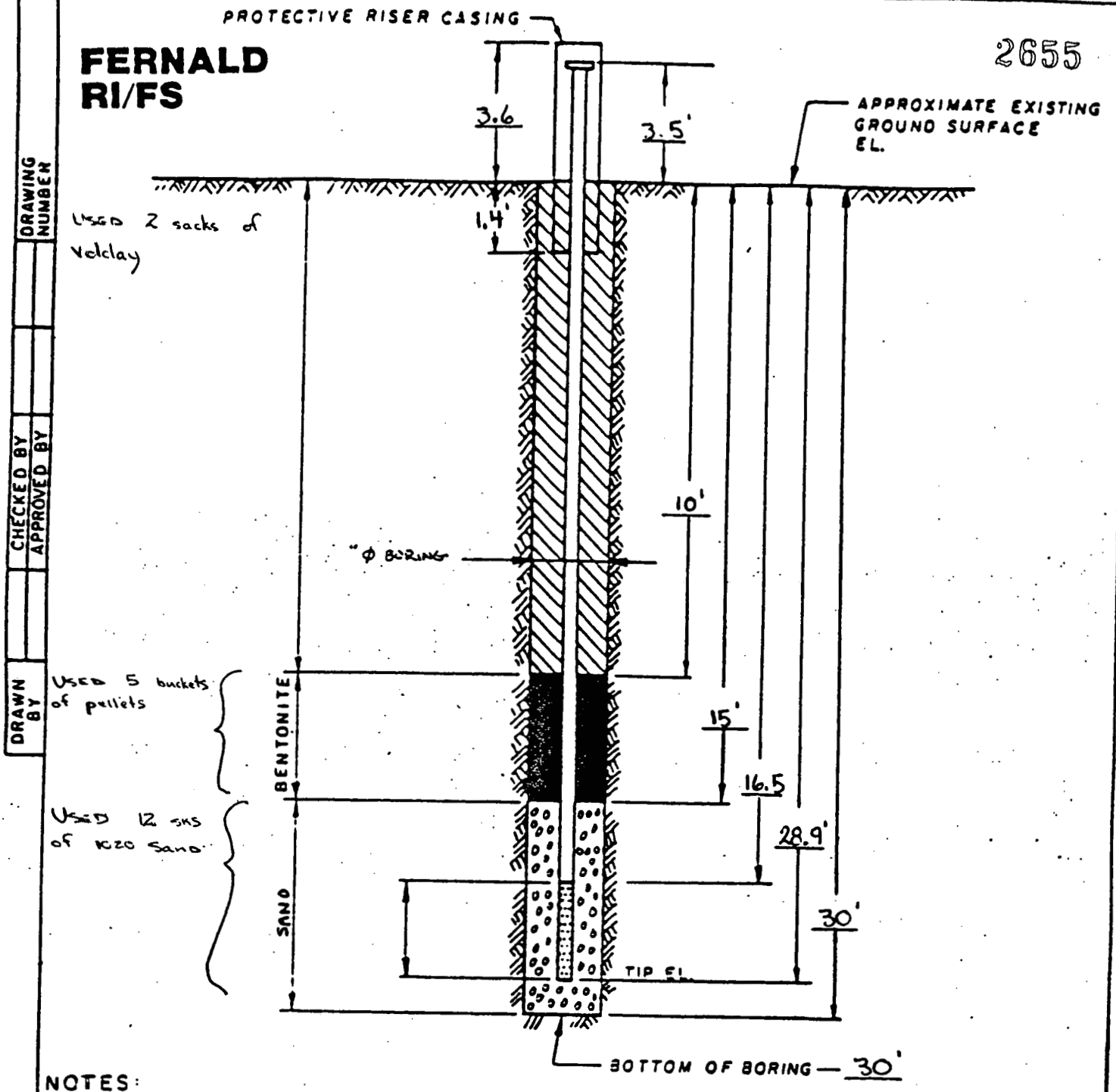
INSTALLATION DETAILS
MONITORING WELL 252

PREPARED FOR

BOREHOLE # 152

FERNALD RI/FS

2655



DRAWING NUMBER

CHECKED BY

APPROVED BY

DRAWN BY

NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D. SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL

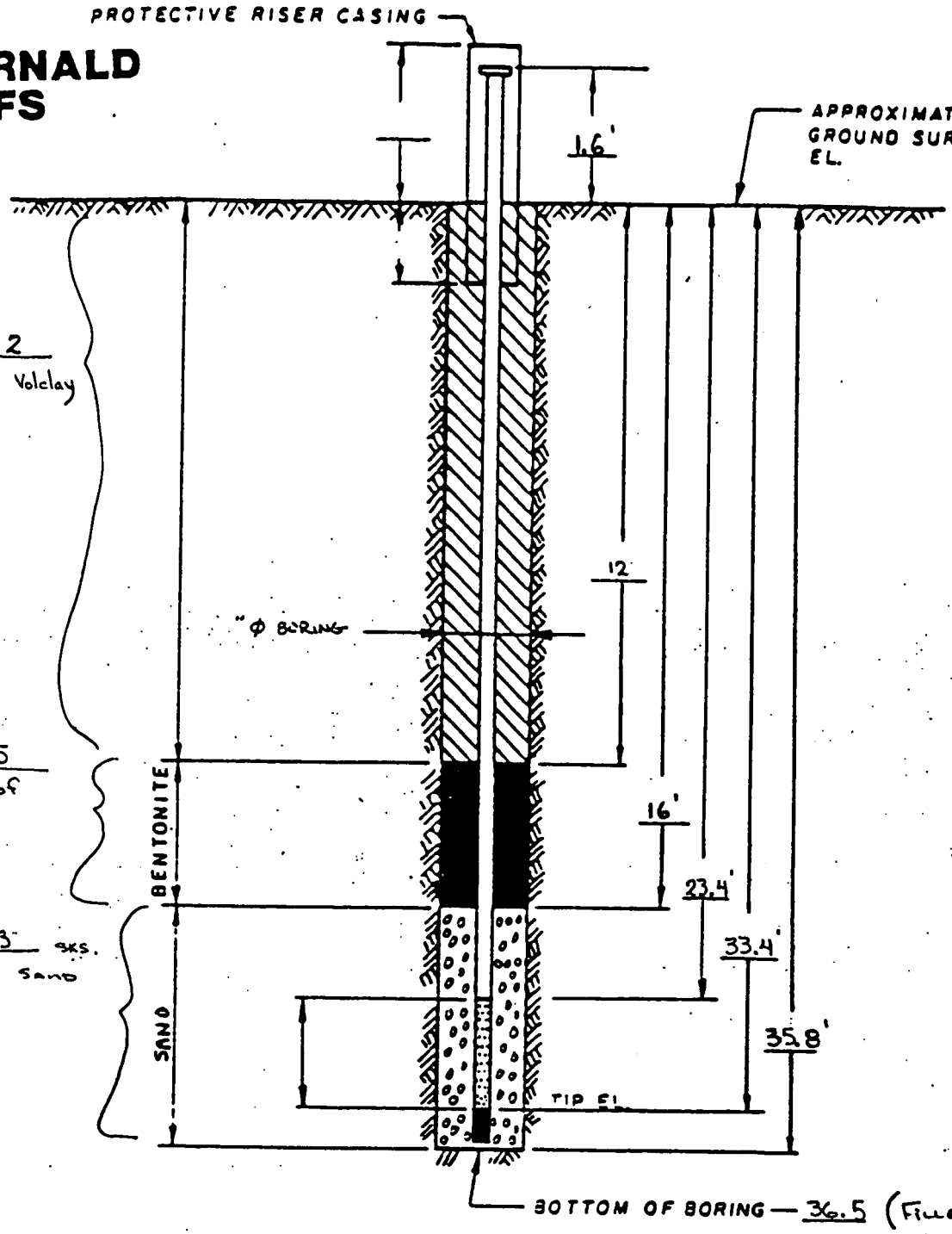
PREPARED FOR

10

BOREHOLE # 111

FERNALD RI/FS

2655



DRAWING NUMBER

CHECKED BY

APPROVED BY

DRAWN BY

NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL

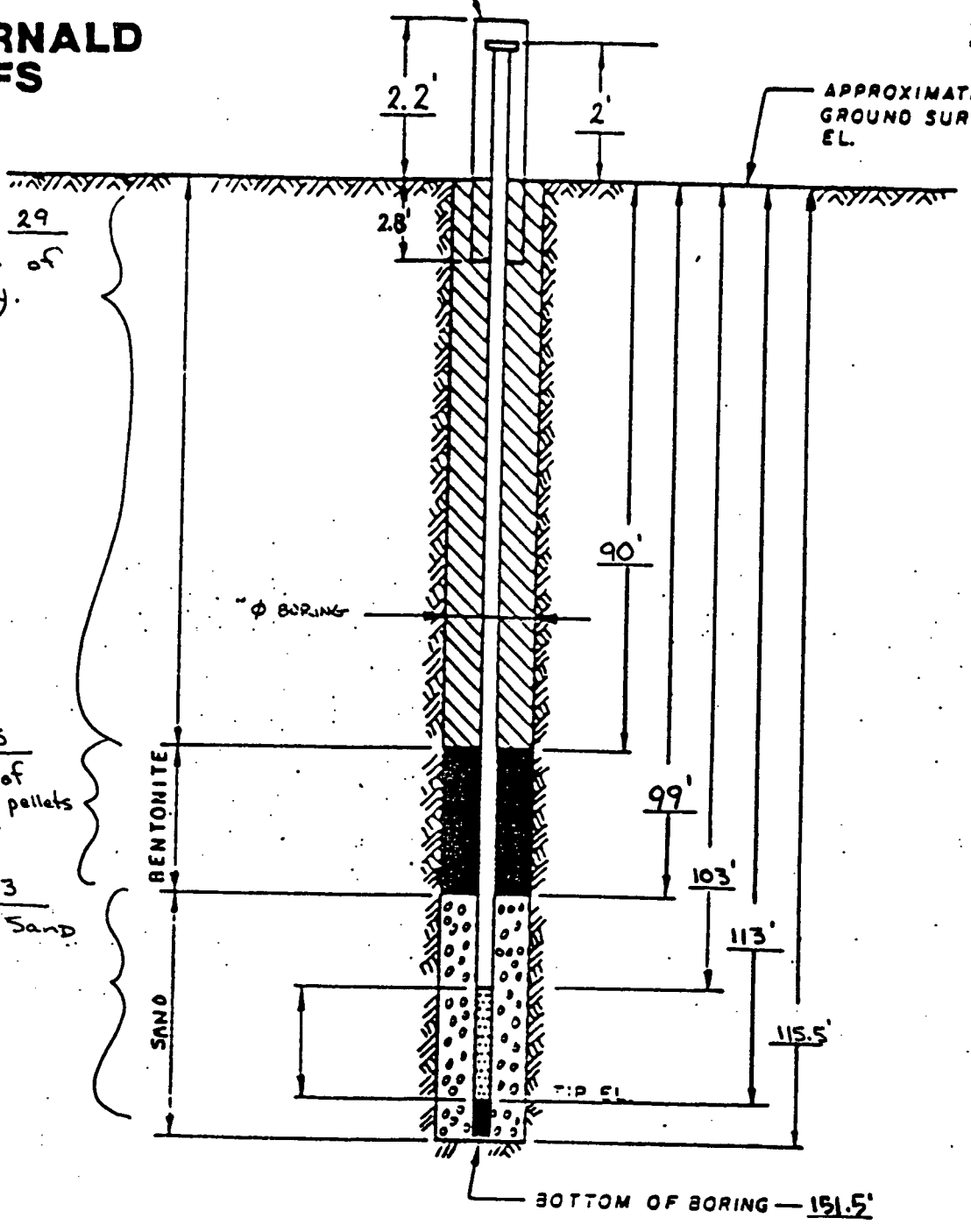
PREPARED FOR

11

BOREHOLE # 311

FERNALD RI/FS

2655



DRAWING NUMBER

CHECKED BY

APPROVED BY

DRAWN BY

NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL

PREPARED FOR

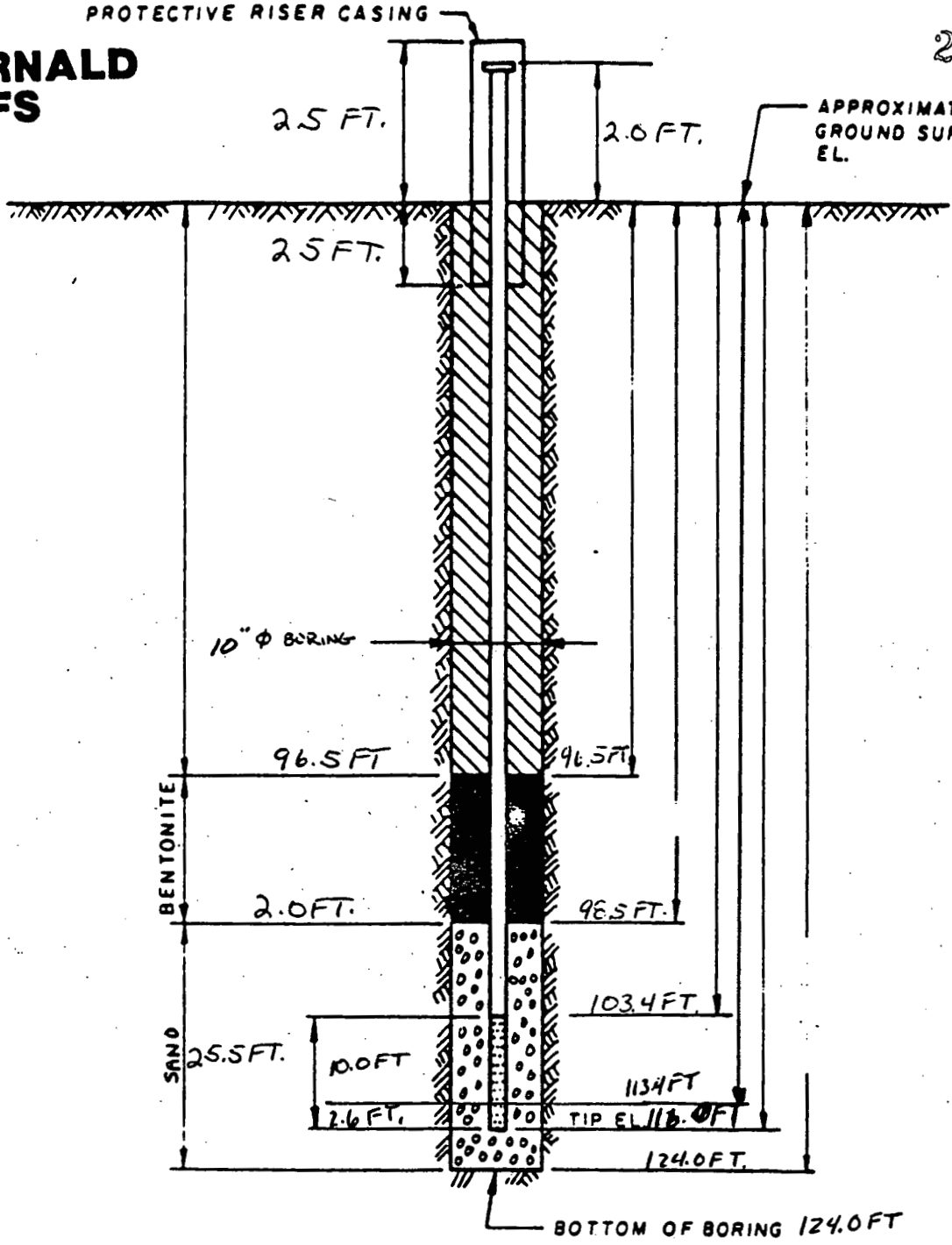
12

WELL #384

#23

2655

FERNALD RI/FS



DRAWING NUMBER

CHECKED BY

APPROVED BY

D30

DRAWN BY

NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL 384

PREPARED FOR

13

WELL 251 # 24

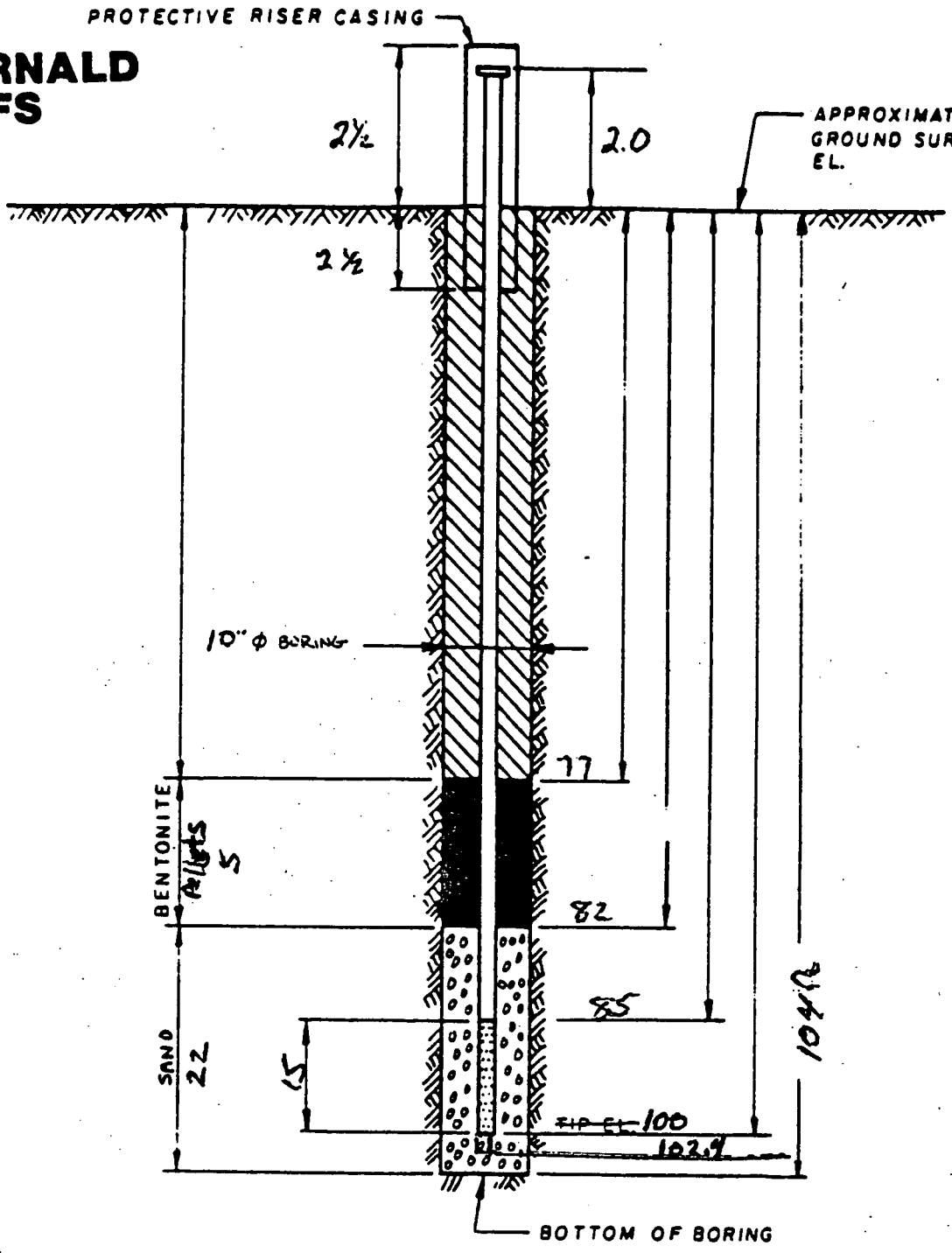
FERNALD RI/FS

2655

DRAWING NUMBER

CHECKED BY / APPROVED BY

DRAWN BY



NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D Stainless steel PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL 91.7 below Stainless steel top of casing
5. WATER LEVEL READING ON Nov 19, 1987

INSTALLATION DETAILS
MONITORING WELL 251

PREPARED FOR

14

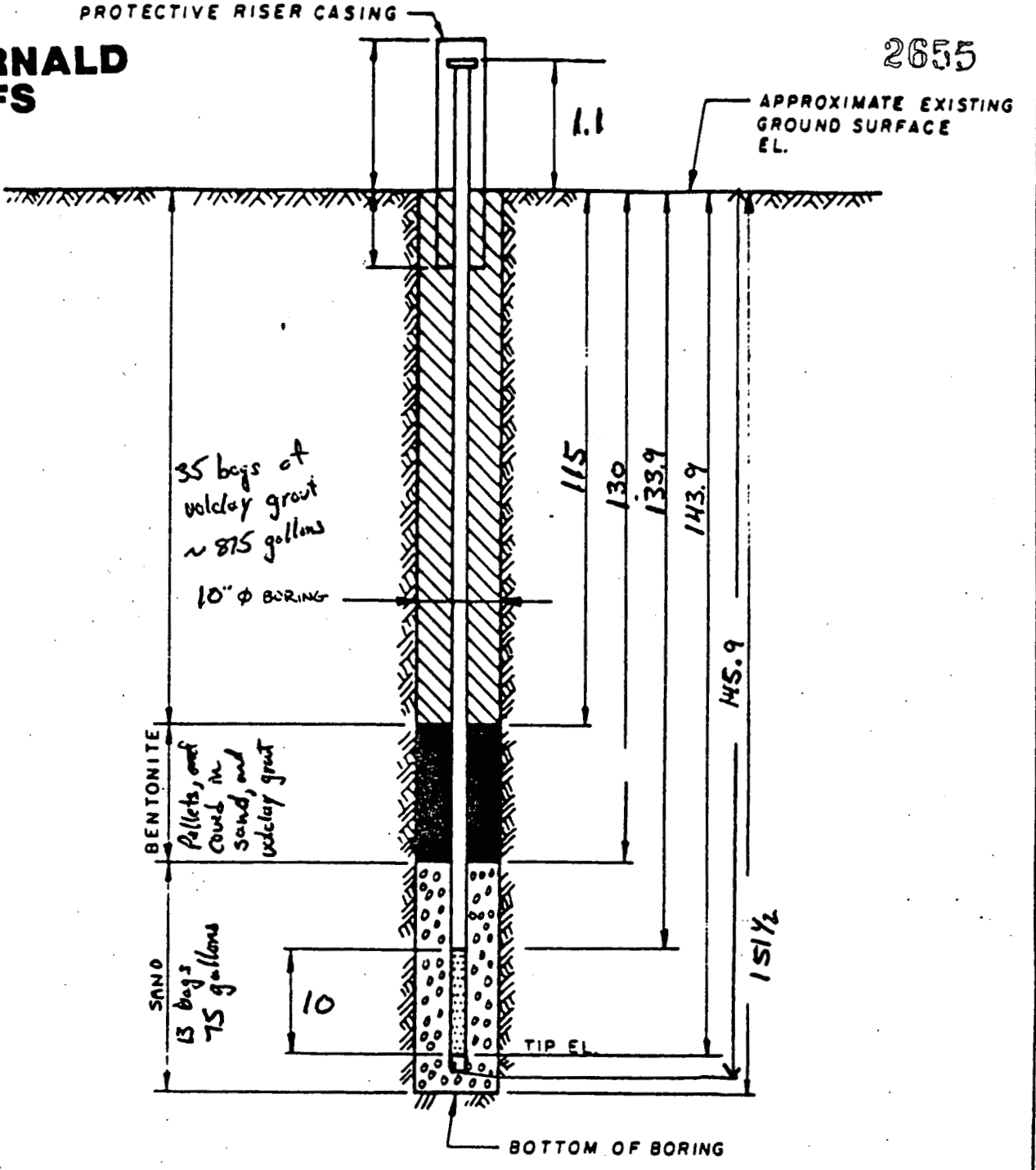
FERNALD
RI/FS

2655

DRAWING NUMBER

CHECKED BY
APPROVED BY

DRAWN BY



NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D Stainless PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL 89.9, [illegible]
5. WATER LEVEL READING ON 11-17-87 @ 0800

INSTALLATION DETAILS
MONITORING WELL 351

PREPARED FOR

15

WELL # 181 #29

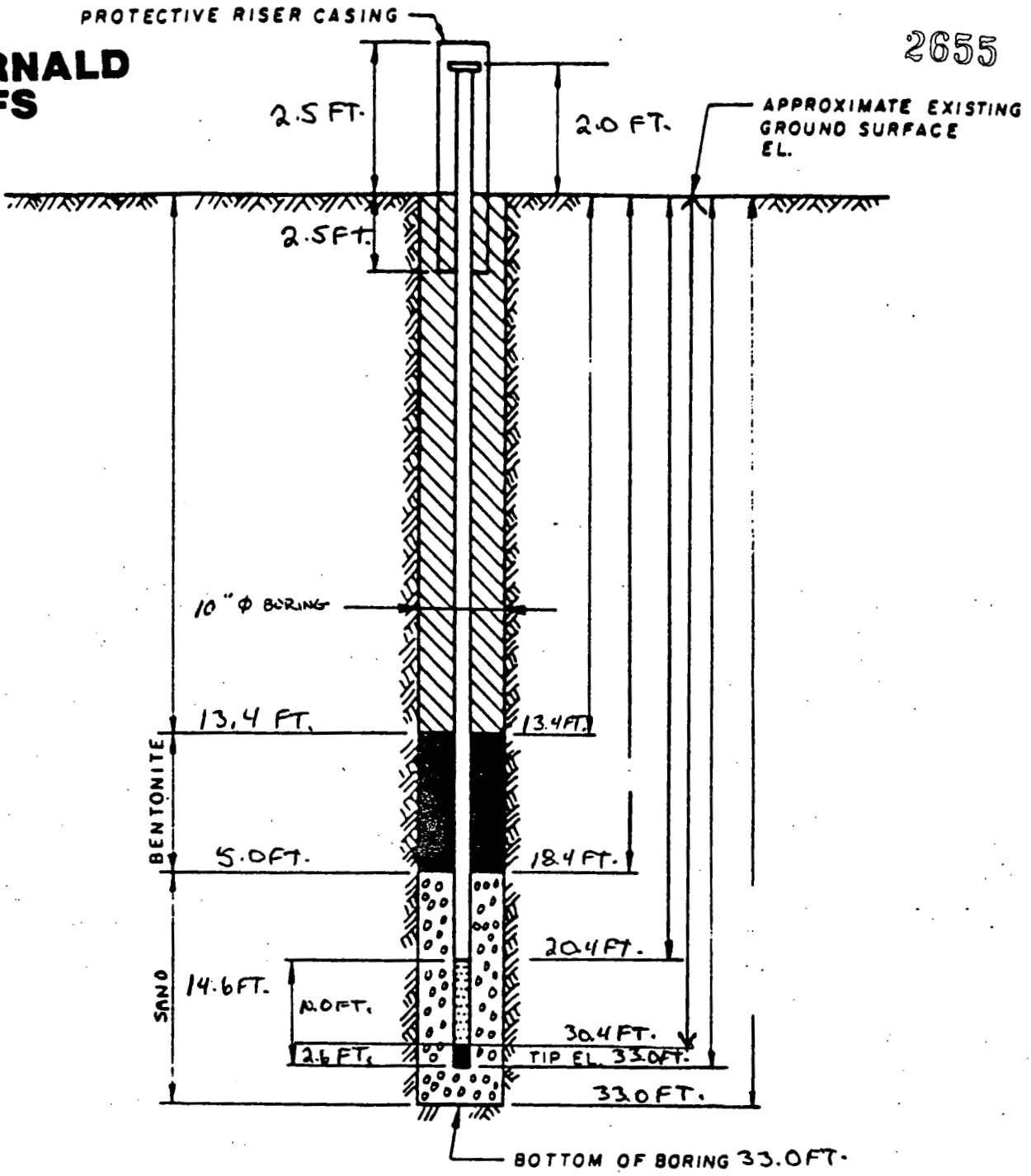
2655

FERNALD
RI/FS

DRAWING NUMBER

CHECKED BY | APPROVED BY

DRAWN BY



NOTES:

1. RISER PIPE IS 4 IN I.D. SCHEDULE PIPE, THREADED. FLUSH-JOINTED.
2. SCREEN IS 4 IN I.D. SS PIPE CONTINUOUS SLOT SCREEN (0.010 IN. SLOT SIZE).
3. LOWER END OF SCREEN IS CAPPED.
4. ELEVATION OF WATER LEVEL
5. WATER LEVEL READING ON

INSTALLATION DETAILS
MONITORING WELL 181

PREPARED FOR

16

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FERNALD RI/FS

2655

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FMPC RI/FS — FIELD ENG./GEO. B. Dunning — DATE 11/10/87
PROJECT NO. 602 — CHECKED BY _____ — DATE _____
BORING NO. 152
PIEZOMETER NO. NA — DATE OF INSTALLATION 11/10/87

BOREHOLE DRILLING

DRILLING METHOD Cable Tool — TYPE OF BIT Hammer
DRILLING FLUID (S) USED: Potable Water
FLUID H_2O FROM 0' TO 30' — CASING SIZE (S) USED:
FLUID NA FROM NA TO NA — SIZE 10" FROM 0 TO 30'
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE Stainless Steel (316) — RISER PIPE MATERIAL Stainless Steel
DIAMETER OF PERFORATED SECTION 4" Inches — RISER PIPE DIAMETERS:
PERFORATION TYPE: — O.D. 4 3/8 Inches I.D. 4" Inches
SLOTS ☐ HOLES ☐ SCREEN ☒ — LENGTH OF PIPE SECTIONS 10'
AVERAGE SIZE OF PERFORATIONS 0.01 Inch. — JOINING METHOD Flush Jointed - threaded.
TOTAL PERFORATED AREA 10'

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5' — OTHER PROTECTION LOCKING CAP
PROTECTIVE PIPE O.D. 10"

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE	3.4'			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	1.4'			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0'	BOTTOM 10'	TOP	BOTTOM
BENTONITE	TOP 10'	BOTTOM 15'	TOP	BOTTOM
SAND	TOP 15'	BOTTOM 30'	TOP	BOTTOM
NO GRAVEL USED	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 16.5'	BOTTOM 28.9'	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	30'			
GWL AFTER INSTALLATION	25.5'			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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REMARKS _____

PAC

FERNALD RI/FS

2655

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FEINALD RI/FS — FIELD ENG./GEO. D CARLEY — DATE 11-21-87
PROJECT NO. 607 — CHECKED BY ____ — DATE ____
BORING NO. 184
PIEZOMETER NO. NA — DATE OF INSTALLATION 11-21-87

BOREHOLE DRILLING

DRILLING METHOD CABLE TOOL	TYPE OF BIT FLAT HEAD
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID WATER FROM 4 TO 33 FT.	SIZE 10 IN FROM 0 TO 33 FT
FLUID - FROM - TO -	SIZE - FROM - TO -

PIEZOMETER DESCRIPTION

TYPE MONITORING - RCRA	RISER PIPE MATERIAL 316 STAINLESS STEEL
DIAMETER OF PERFORATED SECTION 4 IN	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. 4 3/8 IN I.D. 4 IN
SLOTS ☐ HOLES ☐ SCREEN ☒	LENGTH OF PIPE SECTIONS 10 FT.
AVERAGE SIZE OF PERFORATIONS .010 INCH	JOINING METHOD THREAD AND COUPLE
TOTAL PERFORATED AREA 10 FT.	

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5 FT.	OTHER PROTECTION LOCKABLE CAP WITH LOCK
PROTECTIVE PIPE O.D. 10 IN	

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION (FT) MSL	
TOP OF RISER PIPE	2.0 FT.			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5 FT.			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.5 FT.	BOTTOM 13.4 FT	TOP	BOTTOM
BENTONITE	TOP 13.4 FT.	BOTTOM 18.4 FT	TOP	BOTTOM
SAND	TOP 18.4 FT	BOTTOM 33.0 FT	TOP	BOTTOM
~~GRAVEL~~	TOP NA	BOTTOM	TOP	BOTTOM
PERFORATED SECTION	TOP 20.4 FT.	BOTTOM 30.4 FT.	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	33.0 FT.			
GWL AFTER INSTALLATION	NA			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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REMARKS ____

FERNALD RI/FS

2655 PAL

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FERNALD RI/FS — FIELD ENG./GEO. D OAKLEY — DATE 11-19-87
PROJECT NO. 602 — CHECKED BY ____ — DATE ____
BORING NO. ~~FB~~ 284
PIEZOMETER NO. NA — DATE OF INSTALLATION 11-19-87

BOREHOLE DRILLING

DRILLING METHOD CABLE TOOL	TYPE OF BIT FLATHEAD
DRILLING FLUID (S) USED:	CASING SIZE (S) USED:
FLUID WATER FROM 4 TO 77 FT.	SIZE 10 IN FROM 0 TO 77 FT.
FLUID — FROM — TO —	SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE MONITORING	RISER PIPE MATERIAL 316 STAINLESS STEEL
DIAMETER OF PERFORATED SECTION 4 IN	RISER PIPE DIAMETERS:
PERFORATION TYPE:	O.D. 4 3/8" I.D. 4 IN
SLOTS ☐ HOLES ☐ SCREEN ☒	LENGTH OF PIPE SECTIONS 10 FT.
AVERAGE SIZE OF PERFORATIONS .010 INCH	JOINING METHOD THREAD AND COUPLE.
TOTAL PERFORATED AREA 15 FT.	(FLUSH JOINT THREADS)

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5 FT.	OTHER PROTECTION LOCKABLE CAP
PROTECTIVE PIPE O.D. 10 INCH	AND LOCK

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION (FT) MSL	
TOP OF RISER PIPE	2.0 FT.			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5 FT.			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0 FT.	BOTTOM 51.4 FT.	TOP	BOTTOM
BENTONITE	TOP 51.4 FT.	BOTTOM 56.4 FT.	TOP	BOTTOM
SAND	TOP 58.4 FT	BOTTOM ~~77~~ 70.0 FT	TOP	BOTTOM
NO GRAVEL USED	TOP —	BOTTOM —	TOP	BOTTOM
PERFORATED SECTION	TOP 58.4	BOTTOM 73.4	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	77.0 FT			
GWL AFTER INSTALLATION	63.3 FT.			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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REMARKS ____

2655

FERNALD RI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME FERNALD RI/FS — FIELD ENG./GEO. D. CAITLEY — DATE 11-15-87
PRCJECT NO. 6.02 — CHECKED BY ____ — DATE ____
BORING NO. 384
PIEZOMETER NO. NA — DATE OF INSTALLATION 11-14-87, 11-15-87

BOREHOLE DRILLING

DRILLING METHOD CABLE TOOL — TYPE OF BIT FLAT HEAD
DRILLING FLUID (S) USED:
FLUID WATER FROM @ 2 FT. TO 124 FT.
FLUID — FROM — TO —
CASING SIZE (S) USED:
SIZE 10" FROM 0 FT. TO 124 FT.
SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE MONITORING — RISER PIPE MATERIAL 316 STAINLESS STEEL
DIAMETER OF PERFORATED SECTION 4 IN. — RISER PIPE DIAMETERS:
PERFORATION TYPE: — O.D. 4 3/8" IN I.D. 4 IN
SLOTS ☐ HOLES ☐ SCREEN ☒ — LENGTH OF PIPE SECTIONS 10 FT.
AVERAGE SIZE OF PERFORATIONS .010 INCH — JOINING METHOD THREAD AND COUPLE
TOTAL PERFORATED AREA 10 FT.

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5 FT. — OTHER PROTECTION LOCKABLE CAP WITH LOCK
PROTECTIVE PIPE O.D. 10 IN

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION (FT) MSL	
TOP OF RISER PIPE	2.0 FT.			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5 FT.			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0 FT.	BOTTOM 96.5 FT.	TOP	BOTTOM
BENTONITE	TOP 96.5 FT.	BOTTOM 98.5 FT.	TOP	BOTTOM
SAND	TOP 98.5 FT.	BOTTOM 124.0 FT.	TOP	BOTTOM
~~GRAVEL~~	TOP NA	BOTTOM	TOP	BOTTOM
PERFORATED SECTION	TOP 103.4 FT.	BOTTOM 113.4 FT.	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	124.0 FT.			
GWL AFTER INSTALLATION				

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☑
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☑

REMARKS

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FERNALD RI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS — FIELD ENG./GEO. Lovell Wille — DATE Nov 19, 1991
PROJECT NO. 602.3.2 — CHECKED BY _____ — DATE _____
BORING NO. B251
PIEZOMETER NO. 251 — DATE OF INSTALLATION Nov 17, 18 and 19

BOREHOLE DRILLING

DRILLING METHOD cable tool — TYPE OF BIT N/A
DRILLING FLUID (S) USED:
FLUID N/A FROM ____ TO ____
FLUID — FROM — TO —
CASING SIZE (S) USED:
SIZE ~~N/A~~ FROM N/A TO ____
SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE Monitoring well — RISER PIPE MATERIAL Stainless steel
DIAMETER OF PERFORATED SECTION 4 in — RISER PIPE DIAMETERS:
PERFORATION TYPE: — O.D. 4 5/8 in — I.D. 4 in
SLOTS ☐ HOLES ☐ SCREEN ☒ — LENGTH OF PIPE SECTIONS 10 ft
AVERAGE SIZE OF PERFORATIONS 0.010 in — JOINING METHOD Screw FLUSH JOINT
TOTAL PERFORATED AREA ____ — THREADS.

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5 ft — OTHER PROTECTION NA LOCKING CAP
PROTECTIVE PIPE O.D. 10 3/4 in — AND LOCK.

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (ft)		ELEVATION (FT) MSL	
TOP OF RISER PIPE	2.5			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0	BOTTOM 78	TOP	BOTTOM
BENTONITE	TOP 78	BOTTOM 82	TOP	BOTTOM
SAND	TOP 82	BOTTOM 103	TOP	BOTTOM
NO GRAVEL USED.	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 85	BOTTOM 100	TOP	BOTTOM
PIEZOMETER TIP	102.4			
BOTTOM OF BOREHOLE	103.5			
GWL AFTER INSTALLATION	91.7 top of		casing	

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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REMARKS _____

PAK

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FERNALD RI/FS

PIEZOMETER INSTALLATION SHEET

PROJECT NAME Fernald RI/FS — FIELD ENG./GEO. Lowell Wille — DATE Nov 12, 87
PRCJECT NC. 602.3.2 — CHECKED BY _____ — DATE _____
BORING NO. 351
PIEZOMETER NO. 351 — DATE OF INSTALLATION Nov 10, 11, 12, 1987

BOREHOLE DRILLING

DRILLING METHOD cable tool — TYPE OF BIT HAMMER
DRILLING FLUID (S) USED: WATER
FLUID WATER FROM 0 TO 50ft — CASING SIZE (S) USED: TEMPORARY
FLUID NA FROM NA TO NA — SIZE 10 IN FROM 0 TO 150 ft
SIZE NA FROM NA TO NA

PIEZOMETER DESCRIPTION

TYPE Monitoring well — RISER PIPE MATERIAL Stainless steel
DIAMETER OF PERFORATED SECTION 4 in — RISER PIPE DIAMETERS:
PERFORATION TYPE: — O.D. 4 3/8 in I.D. 4 in
SLOTS ☐ HOLES ☐ SCREEN ☒ — LENGTH OF PIPE SECTIONS 10 ft
AVERAGE SIZE OF PERFORATIONS 0.010 in — JOINING METHOD screw
TOTAL PERFORATED AREA _____

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5 ft — OTHER PROTECTION LOCKING CAP
PROTECTIVE PIPE O.D. 10 3/4 in

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION ( )	
TOP OF RISER PIPE				
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE				
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 1	BOTTOM 115	TOP	BOTTOM
BENTONITE Pellets and coved in sand	TOP 115	BOTTOM 130	TOP	BOTTOM
SAND	TOP 130	BOTTOM 146	TOP	BOTTOM
NO GRAVEL USED	TOP NA	BOTTOM NA	TOP	BOTTOM
PERFORATED SECTION	TOP 133.9	BOTTOM 143.9	TOP	BOTTOM
PIEZOMETER TIP	145.9			
BOTTOM OF BOREHOLE	151.5			
GWL AFTER INSTALLATION	89.9			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

REMARKS _____

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FERNALD RI/FS

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PIEZOMETER INSTALLATION SHEET

PROJECT NAME FERNALD | FIELD ENG./GEO. D. OAKLEY | DATE 12-3-87
PROJECT NO. 602 | CHECKED BY | DATE
BORING NO. 181
PIEZOMETER NO. NA | DATE OF INSTALLATION 12-3-87

BOREHOLE DRILLING

DRILLING METHOD CABLE TOOL | TYPE OF BIT FLATHEAD
DRILLING FLUID (S) USED:
FLUID WATER FROM 4 TO 33 FT. | CASING SIZE (S) USED:
FLUID — FROM — TO — | SIZE 10" FROM 0 TO 30 FT.
SIZE — FROM — TO —

PIEZOMETER DESCRIPTION

TYPE MONITORING | RISER PIPE MATERIAL 316 STAINLESS STEEL
DIAMETER OF PERFORATED SECTION 4 INCH | RISER PIPE DIAMETERS:
PERFORATION TYPE: | O.D. 4 3/8 IN. I.D. 4 IN
SLOTS ☐ HOLES ☐ SCREEN ☒ | LENGTH OF PIPE SECTIONS 10.0 FT.
AVERAGE SIZE OF PERFORATIONS .010 INCH | JOINING METHOD THREAD AND COUPLE
TOTAL PERFORATED AREA 10.0 FT. | (FLUSH JOINT THREAD)

PROTECTION SYSTEM

RISER PROTECTIVE PIPE LENGTH 5 FT. | OTHER PROTECTION LOCKING CAP
PROTECTIVE PIPE O.D. 10 INCH | WITH LOCK

ITEM	DISTANCE ABOVE/BELOW GROUND SURFACE (FT)		ELEVATION (FT) MSL	
TOP OF RISER PIPE	2.0 FT.			
GROUND SURFACE	0.0			
BOTTOM OF PROTECTIVE PIPE	2.5 FT.			
BOREHOLE FILL MATERIALS:				
GROUT/SLURRY	TOP 0.0 FT.	BOTTOM 13.4 FT.	TOP	BOTTOM
BENTONITE	TOP 13.4 FT.	BOTTOM 18.4 FT.	TOP	BOTTOM
SAND	TOP 18.4 FT.	BOTTOM 33.0 FT.	TOP	BOTTOM
~~GRAVEL~~	TOP NA	BOTTOM	TOP	BOTTOM
PERFORATED SECTION	TOP 20.4 FT.	BOTTOM 30.4 FT.	TOP	BOTTOM
PIEZOMETER TIP	NA			
BOTTOM OF BOREHOLE	33.0 FT.			
GWL AFTER INSTALLATION	NA			

WAS THE PIEZOMETER FLUSHED AFTER INSTALLATION? YES ☐ NO ☒
WAS A SENSITIVITY TEST PERFORMED ON THE PIEZOMETER? YES ☐ NO ☒

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REMARKS