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REPORTS

DATE:

1/96

Free Phase Hydrocarbon
Recovery System
Installation Report
South Four Lakes Unit
Lea County, New Mexico

PHILLIPS 66

Phillips Petroleum Company
North America Production
Permian Profit Center
4001 Penbrook
Odessa, Texas 79762

January, 1996

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PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT
LEA COUNTY, NEW MEXICO

Free Phase Hydrocarbon Recovery System Installation Report

Prepared for:

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January 30, 1996

TABLE OF CONTENTS

1.0 INTRODUCTION ____ 1

2.0 RECOVERY WELL RW-2 ____ 1

3.0 DATA EVALUATION ____ 2

3.1 Well Performance Test ____ 2

3.2 Recovery Well Zone of Influence ____ 3

3.3 Conclusions ____ 3

4.0 SYSTEM INSTALLATION ____ 4

4.1 Windmill & Pumps ____ 4

4.2 System Piping ____ 6

5.0 SYSTEM START UP & OPERATION ____ 6

5.1 Start Up & Testing ____ 6

5.2 Operating Procedure ____ 6

APPENDIX A

FIGURES

Figure 1 Project Plan
Figure 2 RW-2 Well Installation Details
Figure 3 Calculated Drawdown - Pumping 1 GPM
Figure 4 RW-2 Equipment Installation Details
Figure 5 Piping & Instrument Diagram
Figure 6 Hydrocarbon Recovery System Logic

TABLES

Table 1 Well Performance Test Data, January 15, 1996

PHOTOGRAPHS

INSTALLATION SCHEDULE

1.0 Introduction

Two recovery well clusters, RW-1 and RW-2, were installed at the Phillips Petroleum Company's South Four Lakes Unit at the locations indicated on the Project Plan, Figure 1. The well clusters are located in areas with thickest accumulations of subsurface free phase hydrocarbon (FPH), as determined by site monitoring and documented in the report titled "Soil And Groundwater Assessment", dated March 13, 1995[1].

In accordance with Section 2.2 of the Remedial Action Plan[2], mass removal of FPH is to be accomplished via a total fluids removal system. The system consists of dual pumps operating at each of the recovery well clusters RW-1 and RW-2. The project will be completed in stages, with the first recovery system being installed at RW-2. After evaluation of the system's operation at RW-2, a second system is planned for RW-1.

Wind was selected as the power source for the dual pump system. The energy necessary to operate the system pumps will be generated by a conventional 8-foot diameter windmill placed on a 27-foot high tower. This type of power source has been utilized to pump groundwater for over 100 years, and is commonplace in the area near the South Four Lakes Unit. Windmill power offers the advantage of low maintenance, and provides a reliable power source, with natural cycling of the pump system, which is considered important to the optimum operation of the recovery system.

2.0 Recovery Well RW-2

The recovery well system at RW-2 consists of two 4 inch diameter flush-coupled/square-threaded, Schedule 40 polyvinyl chloride (PVC) casings. The well cluster (Figure 2) was installed within the same borehole, which was drilled with a 12 1/4 inch hollow stem auger. The wells are spaced at approximately 8 inches from center to center, and are designated as RW-2D (deep) and RW-2S (shallow).

Well RW-2D is completed to a depth of 39.5 feet below ground surface (bgs), with 5 feet of 0.010-inch slotted screen from 34.5 to 39.5 feet bgs. This well is intended for gradient control, and is designed for extraction of water only to produce a gradient toward the well cluster which will facilitate removal of FPH at the water table.

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[1] <u>SOIL AND GROUNDWATER ASSESSMENT</u>, Phillips Petroleum Company, South Four Lakes Unit, Lea County, New Mexico, SECOR Project No. B0106-001-01, March 13, 1995.

[2] <u>Remedial Action Plan, South Four Lakes Unit, Lea County, New Mexico,</u> Phillips Petroleum Company, North American Production, Permian Profit Center, 4001 Penbrook, Odessa, Texas 79762, July 1995.

Well RW-2S is completed to a depth of 33.0 feet bgs, with 0.020-inch slotted screen from 18.0 feet to 33.0 feet bgs (across and through the water/FPH interface). This well is considered an "interceptor well" and is utilized for extraction of FPH that accumulates in the vicinity of the well.

3.0 DATA EVALUATION

3.1 Well Performance Test

A 100-minute well performance test was conducted to determine characteristics of the well RW-2, and promote development of the well on January 15, 1996. The test was accomplished using a Grundfos® 2-inch submersible "Redi-Flow" pump with adjustable flow controller. The pump was placed in RW-2D to a depth of approximately 38 feet, and stepped from 1.0 gpm to 1.8 gpm. Levels in both RW-2D and RW-2S were measured immediately before and during pumping at selected time intervals. Photos 1 through 4 show the test setup, the storage tank used for pumped fluids, and the oil/water interface and water level gages used during the test.

Data from the well performance test are shown in Appendix A, Table 1. Data was collected from Well Nos. RW-2D and RW-2S. Since RW-2D is constructed with the screen section below the water table, no FPH accumulations were noted during the test. The data indicates that at 1 gallon per minute (gpm), the drawdown in RW-2D is about 2.4 feet. The resulting specific capacity, or pumping rate divided by drawdown, is 0.42 gpm/ft of drawdown. After the pumping rate was increased to about 1.8 gpm, the drawdown increased to 3.98 feet, translating to a specific capacity of 0.45 gpm/ft of drawdown. Utilizing this information, the expected maximum pumping rate from RW-2D is about 5 gpm. This was calculated by taking an average specific capacity (0.44 gpm/ft) and multiplying by the total available pumping head in the well (13 feet).

It should be noted that a longer-duration test, termed a pump test or aquifer test (typically at least 24-hours in length), is optimal for determining aquifer characteristics in a water table aquifer. However, the information derived from the 100-minute well performance test does provide useful information on the expected well performance. The optimal pumping rate from this particular size windmill-powered pump is typically in the range of 2 gpm; therefore, the well performance test indicates the windmill-powered pump will produce approximately 4 to 5 feet of drawdown at the pumped well. As discussed in Section 3.2, the area of influence resulting from this pumping level should be in the range of 50 to 75 feet from the pumped well.

3.2 Recovery Well Zone of Influence

The "Soil and Groundwater Assessment" report prepared by SECOR presented information on hydraulic conductivity and porosity based on samples submitted to a soils laboratory. The report indicates the hydraulic conductivity ranges from 1.88×10^{-4} centimeters per second (cm/s) to 9.98×10^{-4} cm/s and porosity ranges from 39.2% to 42.8%. Estimates of the expected drawdown at varying distances from the pumped well were made using the Theis non-equilibrium well formula[3] and the following:

- an average hydraulic conductivity of 6×10^{-4} cm/s,
- an assumed storage coefficient of 30%,
- a saturated thickness of 16 feet,
- a flow rate of 1 gpm, and
- a time period of 30 days.

The results of this analysis are presented on Figure 3. The analysis demonstrates that at a distance of 20 feet, the expected drawdown from a well pumping 1 gpm is about 1.5 feet. Similarly, at a distance of 50 feet, the drawdown will be about 0.6 feet. At a distance of 100 feet, the drawdown is minimal (about 0.1 feet). This analysis demonstrates that the present spacing of the recovery well clusters is adequate to capture and recover the FPH from the subsurface. The recovery wells are approximately 60 feet apart; therefore the combined drawdown from two wells each pumping 1 gpm at a radius of 30 feet (the midpoint) will be in excess of 2 feet.

3.3 Conclusions

It is recommended that the pump in well RW-2D be operated at a flow rate of 1.0 to 2.0 gpm. Intermittent pumping or cycling of the water pump, which naturally occurs with a windmill driven pump, will prevent over-pumping of the well and lowering of the FPH level below recoverable depths (see Section 4 for details). The level of the FPH in RW-2S was estimated to fluctuate at approximately 24 to 25.5 feet, based on the well performance test. This level is estimated to be optimum for setting the FPH recovery sump intake in RW-2S.

[3] GROUND WATER AND WELLS, Johnson Division, UOP Inc., Fourth Printing, 1975, pp. 108-109.

4.0 System Installation

4.1 Windmill & Pumps

The schedule in Appendix A details the history of the installation of the wind powered recovery system. Various tasks consisted of procurement of materials, pump well head fabrication, foundation installation, windmill installation, pump installation, connection of the power "pumper rod" to the pump bracket, and start-up testing of the system. After preliminary testing, the system piping, flow meters, and valves were installed in line from the pumps to the lease battery storage tanks. The formal start-up, along with a three day test, are scheduled to begin February 5, 1996.

On January 15, 1996, the contractor mobilized for installation of the system. Representatives from Phillips Petroleum Company (PPCO) and BASCOR Environmental, Inc. (BEI) were present the entire duration of the installation process for the purpose of providing a Health & Safety representative and Quality Control activities. A site health & safety meeting was held identifying the site, potential hazards, emergency procedures, personal protective equipment, and other related safety issues.

The footings for the foundation were located and marked (photo 5) and the excavation contractor excavated the footings with a combination backhoe/loader. The footing excavations were dug (photo 6) to a depth of 4.5 feet at RW-2. The footings were also completed for RW-1, in anticipation of installation of the second system at a later date (photo 7). The footing at RW-1 could not be completed to 4.5 feet due to difficult excavation conditions (caliche). Photo 8 shows the completed footings to a depth of approximately 2 feet. Additional concrete was placed in these footings to compensate for the shallow depths of the footings.

The lower tower sections were assembled for both RW-2 and RW-1. Photo 9 shows placement and leveling of the tower section in the excavated footing at RW-2. After the lower sections were set, the concrete footings were placed in the excavated areas (photo 10) with the tower bases in place. The footings were allowed to cure a minimum of 10 hours, reaching approximately 70% of design strength and providing a stable base for access to the upper tower sections.

On January 16, 1996, the upper tower assembly for RW-2 recovery system was erected. Photos 11 through 14 show segments of the tower erection process. The system motor consists of a standard windmill motor with reciprocal action activated by a pitman device (photo 15). Once installed, the windmill was tied off to permit completion of the system installation without windmill rotation.

Figure 4 shows the as-built of the RW-2 well cluster. Each 4 inch casing (RW-2D & RW-2S) contains a brass cylinder, 1 3/8 inch diameter, 10 inch stroke, positive displacement pump, connected to the windmill "pumper" rod with a modified pump bracket allowing simultaneous pumping action in each well while the windmill rotates. Photo 16 & 17 show the pump cylinder and portions of the installation process, and photo 18 shows the modified pump power bracket which is attached to both pumps. Each casing well head was pre-fabricated to include a 1 inch riser with stuffing box, and a 1 inch pressure relief valve to prevent damage to the pumps if the discharge piping becomes restricted. A 4 inch well cap is also included with penetrations installed to allow the pump rod, pressure relief valve, and hydrocarbon sump adjustment cable to penetrate. Photo 19 shows the completed wellhead with the modified pump power bracket attached. The pump rod is braced from lateral movement with a weatherproof wood plank (photo 20).

The Pump cylinder intake in casing RW-2D is set at 37 feet - 3 inches, connected to seven 5 foot sections of 1 inch diameter galvanized discharge pipe with the pump actuating rods inside the pipe.

The pump in casing RW-2S operates in suction, and has its intake at 30 feet - 3 inches bgs (the actual pump cylinder is placed at 17 feet bgs with a 13 foot section of 1 inch diameter PVC intake pipe attached). This FPH recovery casing contains an inner sump consisting of a 10 foot section of 2 inch diameter PVC casing, sealed on the bottom (photo 21). Six 1/4 inch diameter holes are drilled 6 feet- 6 inches from the bottom of the casing to allow FPH to enter the holes for recovery by the pump intake. The 1 inch pump intake sits inside the 2 inch diameter sump, restricting this pump to hydrocarbon fluids only. The sump is attached to a 1/8 inch aircraft cable which feeds through the well head and is tied off above ground. The cable is marked in 6 inch increments to show the intake hole settings which can be adjusted via the cable system. When the product in the sump is completely removed, and the FPH in the well is below the inlet holes in the sump, the pump will continue to operate with wind movement, and pump only air until the hydrocarbon level raises to the inlet holes. This cycle is intended to prevent over pumping of the FPH recovery well, making recovery more efficient.

A removal winch and cable system was installed on the windmill tower to allow removal of the pump and inner sump in RW-2S. This also facilitates adjustment of the inner sump with the cable arrangement attached to the winch cable. Photo 22 shows removal of the pump with the winch system.

The system was initially tested by Phillips Petroleum Company personnel on January 16, 1996, and run for several minutes to check operation (photo 23). The water discharge from RW-2D and hydrocarbon discharge from RW-2S were checked for flow to verify operation of each pump. Photo 24 shows the discharge of FPH during the test.

4.2 System Piping

Figure 5 is the system Piping & Instrument diagram (P&ID), which depicts the layout of the water and hydrocarbon discharge piping for the system. Each discharge line has a flow element to quantify discharge from the pumps. The water from RW-2D will be pumped directly into existing saltwater tanks at the lease tank battery for injection in the Class II saltwater disposal well. FPH recovered by RW-2S will be pumped directly into a dedicated 750 gallon fiberglass tank adjacent to the windmill for storage. The liquid level in the fiberglass tank will be monitored weekly, and liquids will be pumped out as required and sold as product.

All underground piping for collection of fluids from the recovery system will be pressure tested for integrity prior to final system startup. Underground piping will be pressured to 3 pounds per square inch (psi) above the operating pressure and shall maintain pressure for four hours.

The schedule in Appendix A shows the project activities.

5.0 System Start Up & Operation

The system at RW-2 is scheduled for start up on February 6, 1996.

5.1 Start Up & Testing

Start Up of the windmill will include measurement of fluid levels in RW-2S prior to activation of the windmill. The flow rates and quantities recovered from each well will be measured over an extended period of 2 days (minimum), and operation of the FPH sump system will be evaluated for the optimum setting for the intake of the sump.

5.2 Operating Procedure

The system is designed to be operated with little maintenance. The procedure will include the following:

- periodic checks of the FPH storage tank for fluid recovery volume;
- removal and transfer of liquids in the FPH storage tank as necessary;
- checking and recording of the flow elements readings on a regularly scheduled basis;
- visual verification of system operation (i.e., windmill, pumper rods, pumps above grade, etc.);
- periodic walkdowns to verify integrity of system piping; and
- changing of oil in windmill motor section on an annual basis.

An Operation and Maintenance manual will be issued subsequent to the startup and testing process for formal operating procedures. Figure 6 is included in Appendix A to show a sectional view of the system operation logic.

APPENDIX A

FIGURES
TABLES
PHOTOGRAPHS
INSTALLATION SCHEDULE

FIGURE 1 PROJECT PLAN

FIGURE 2 RW-2 WELL INSTALLATION DETAILS

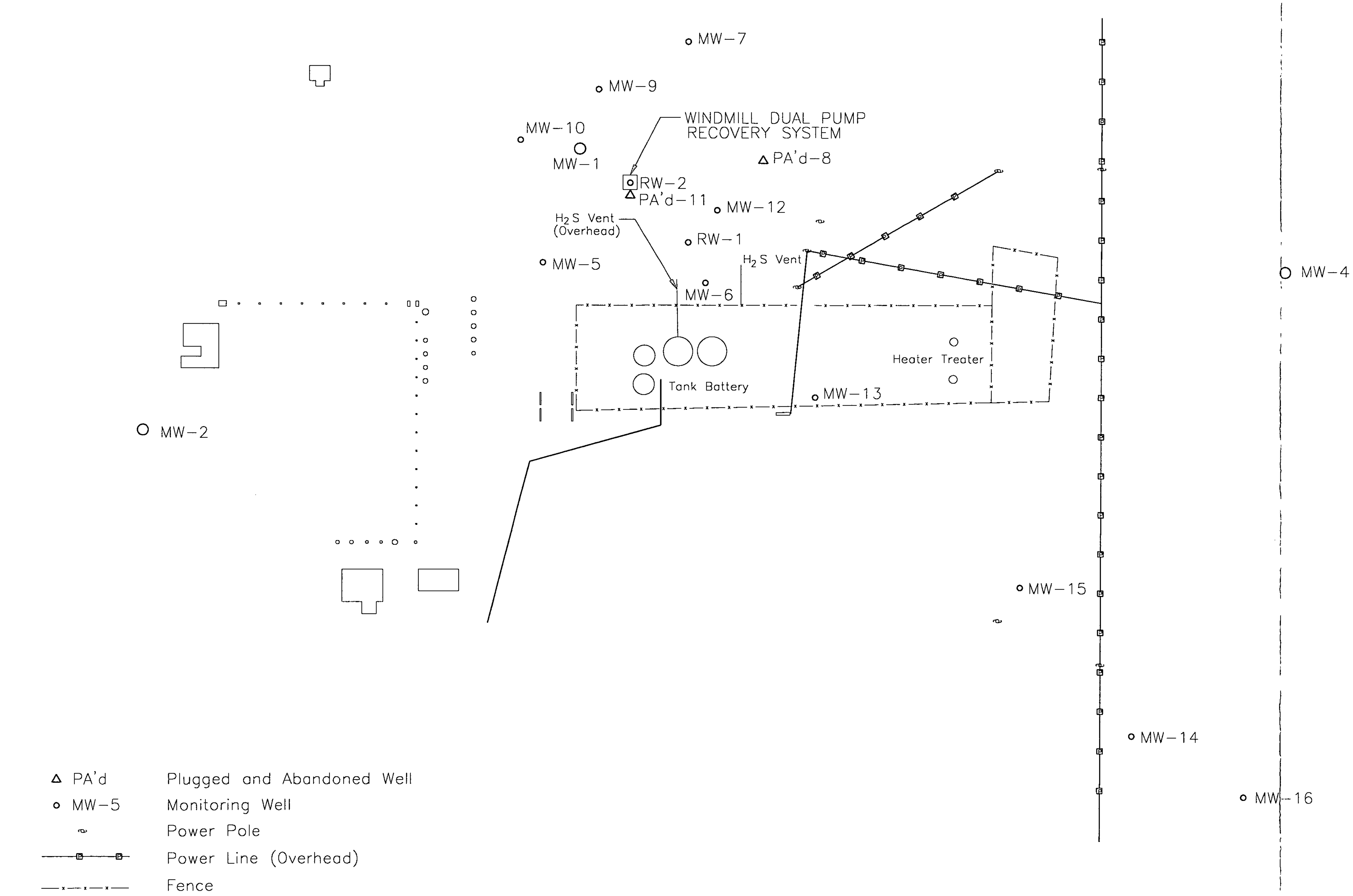
FIGURE 3 CALCULATED DRAWDOWN - PUMPING 1 GPM

FIGURE 4 RW-2 EQUIPMENT INSTALLATION DETAILS

FIGURE 5 PIPING & INSTRUMENT DIAGRAM

FIGURE 6 HYDROCARBON RECOVERY SYSTEM LOGIC

FIGURES



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0 80 160

SCALE: 1"=80'

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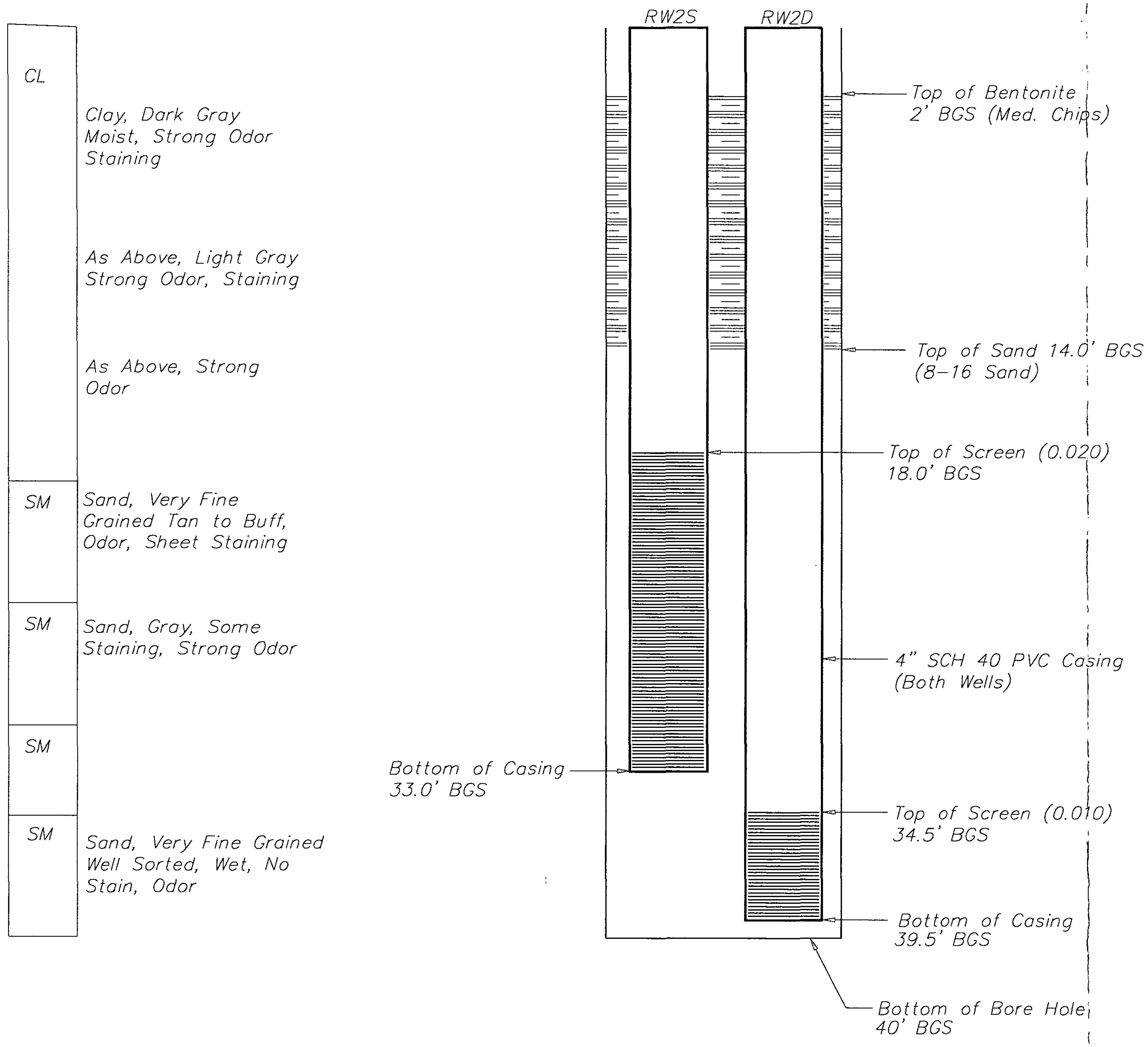
DATE	ISSUE	DATE	ISSUE

PHILLIPS 66

PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT
PROJECT PLAN

DRAWN S.WHITNEY	CHECKED S.SENN	APPROVED S.SENN	DATE 1-29-96
FILENAME: D:\PP124\BBASE.DWG		REFERENCE FILES: NONE	FIGURE 1

Boring Log



Well Installation Details from SECOR Sketch
B0106-001-02, Dated 01/11/96

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NOT TO SCALE

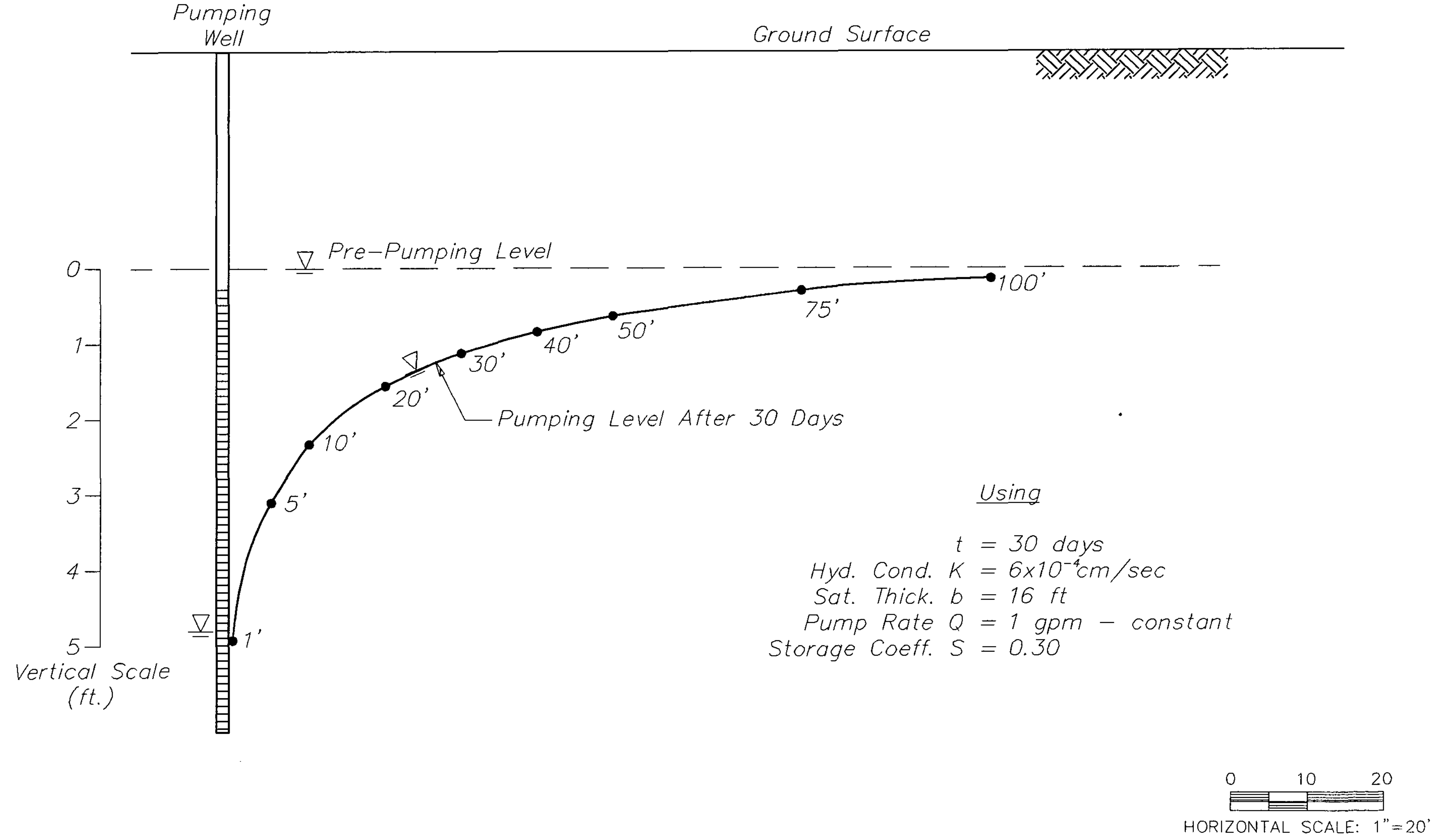
DATE	ISSUE	DATE	ISSUE

PHILLIPS 66

PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT
RW-2 WELL INSTALLATION DETAILS

DRAWN	CHECKED	APPROVED	DATE
S.WHITNEY	S.SENN	S.SENN	1-29-96

FILENAME:	REFERENCE FILES:	FIGURE
D:\RP124\RW1.DWG	NONE	2



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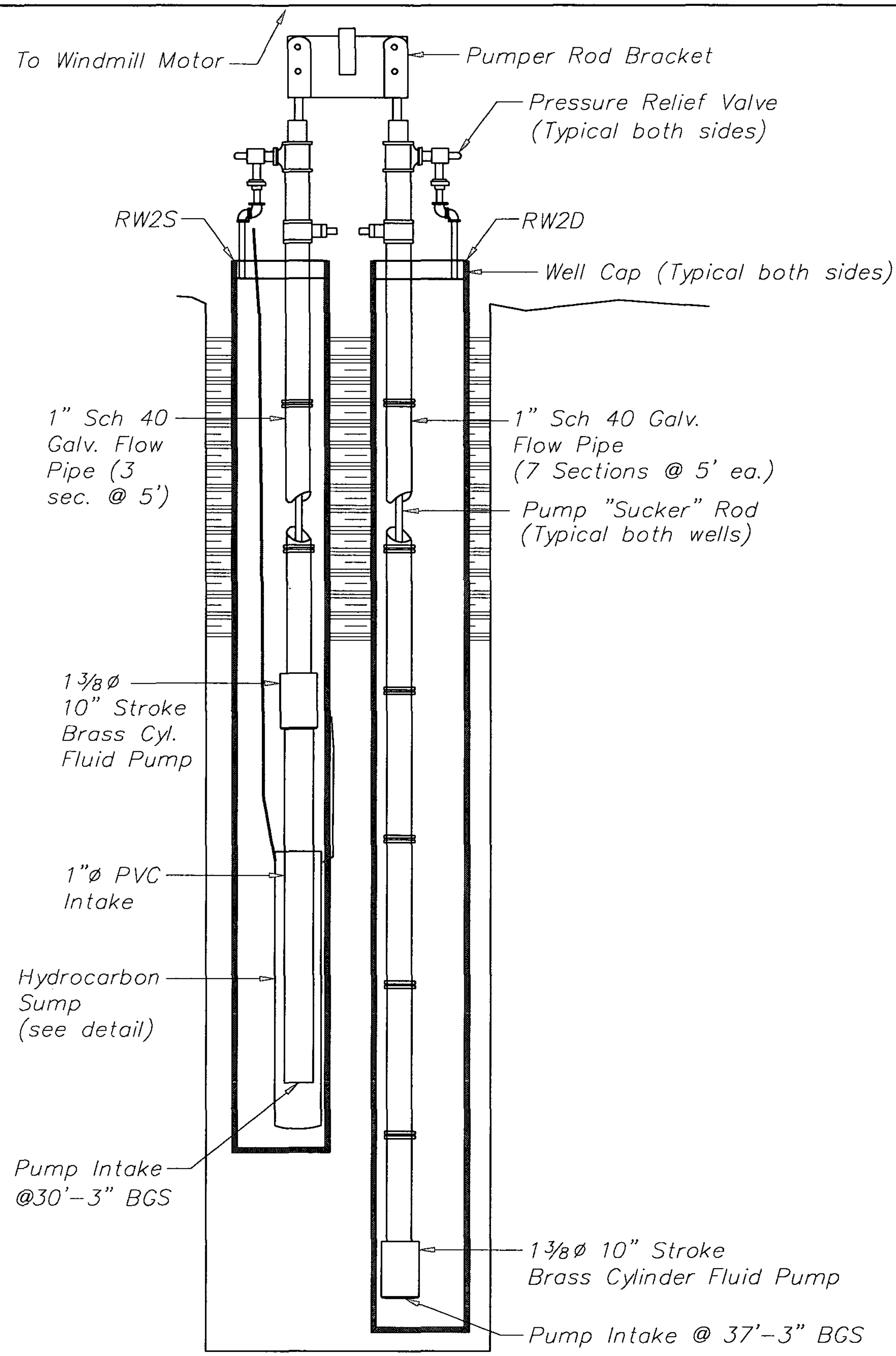
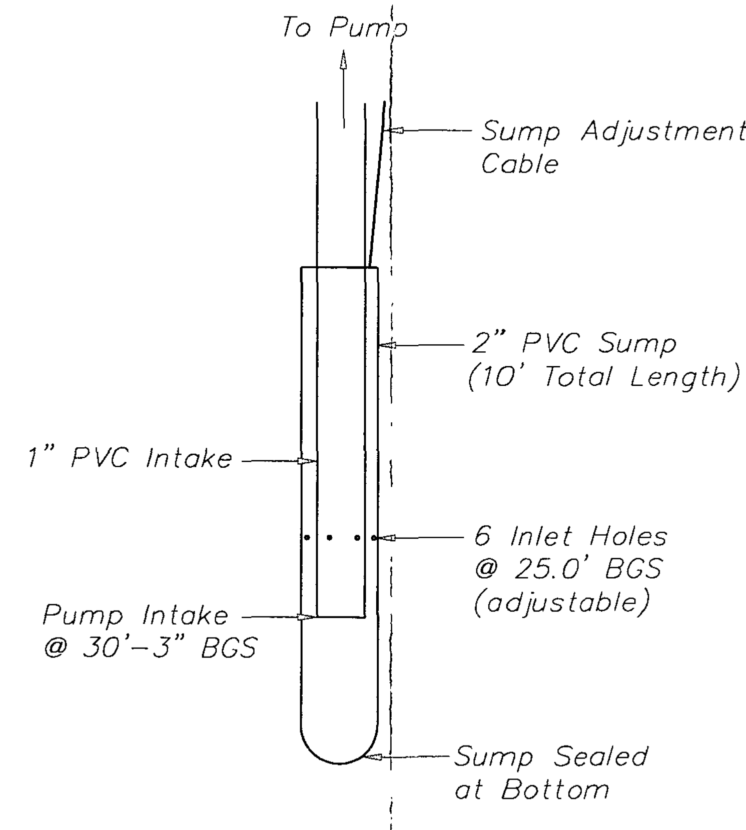
SOUTH FOUR LAKES UNIT

CALCULATED DRAWDOWN – PUMPING 1 GPM

DRAWN S. WHITNEY	CHECKED	APPROVED	DATE 1-29-96
FILENAME: D:\DWGS\PP95124\DRAWDOWN.DWG		REFERENCE FILES: NONE	FIGURE 3





HYDROCARBON SUMP DETAIL

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DATE	ISSUE	DATE	ISSUE

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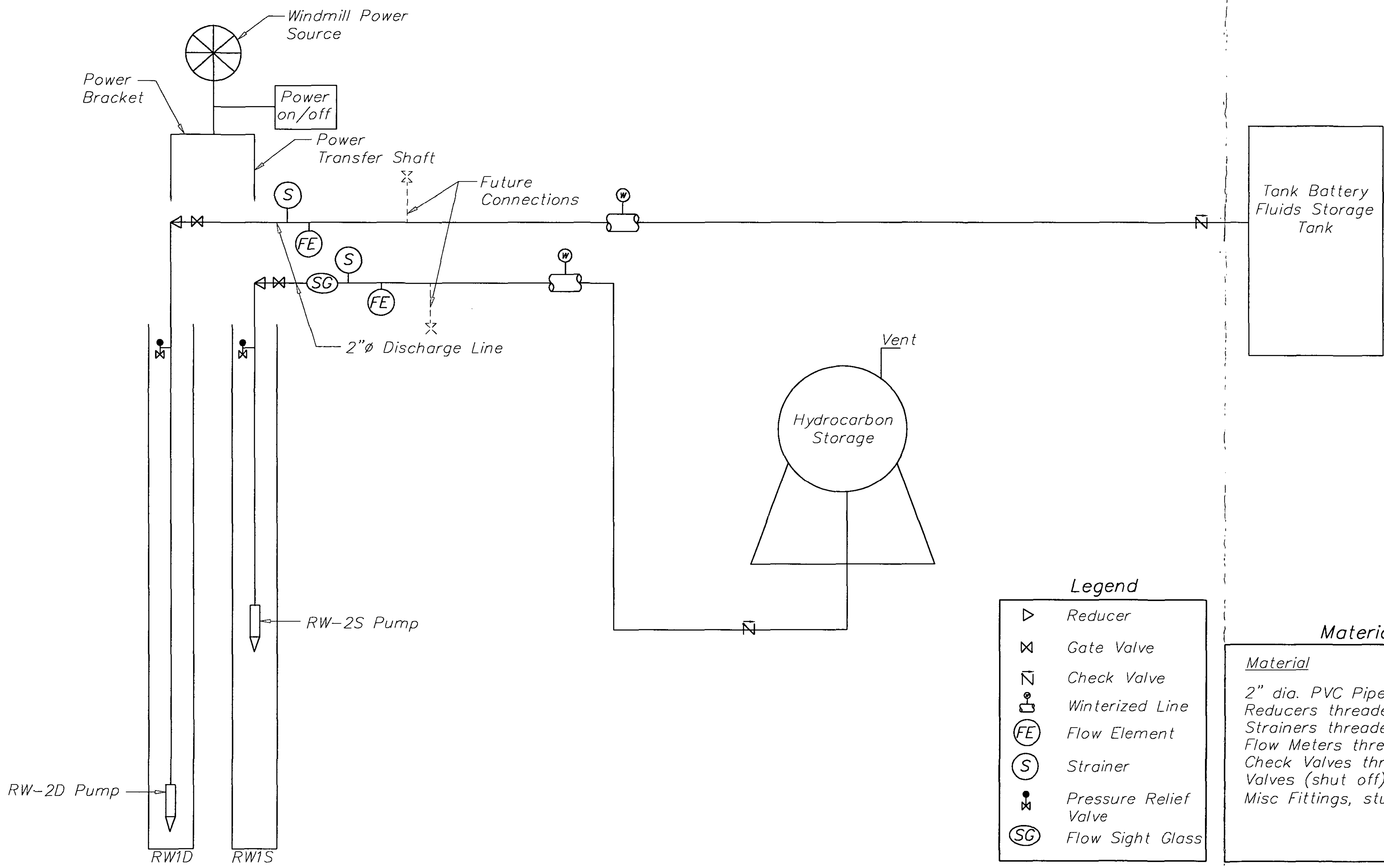
PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT
RW-2 EQUIPMENT INSTALLATION DETAILS

DRAWN	CHECKED	APPROVED	DATE
S.WHITNEY	S.SENN	S.SENN	1-29-96

FILENAME	REFERENCE FILES	FIGURE
D:\PP124\PUMP.DWG	NONE	4



Material Takeoff List

Material	Quantity
2" dia. PVC Pipe	200 lf
Reducers threaded	2
Strainers threaded	2
Flow Meters threaded	2
Check Valves threaded	2
Valves (shut off) threaded	2
Misc Fittings, stubs, etc.	As Req'd

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DATE	ISSUE	DATE	ISSUE

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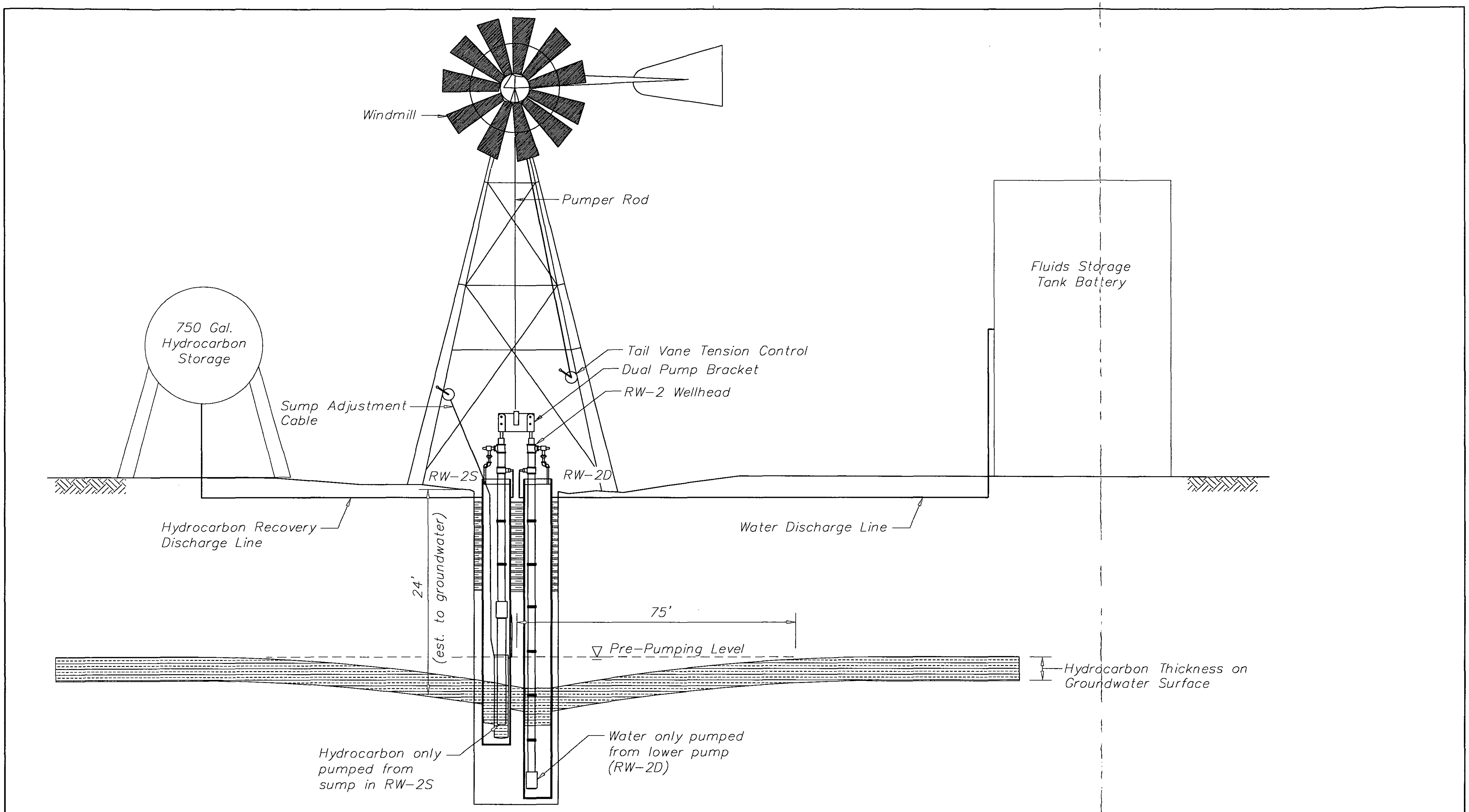
PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT
PIPING & INSTRUMENT DIAGRAM

DRAWN S.WHITNEY	CHECKED S.SENN	APPROVED S.SENN	DATE 1-29-96
FILENAME: D:\PP124\PID.DWG		REFERENCE FILES: NONE	FIGURE 5



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DATE	ISSUE	DATE	ISSUE

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PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT
HYDROCARBON RECOVERY SYSTEM LOGIC

DRAWN	CHECKED	APPROVED	DATE
S.WHITNEY	S.SENN	S.SENN	1-29-96
FILENAME: D:\PP124\CARTOON.DWG		REFERENCE FILES: NONE	FIGURE 6

TABLE 1 Well Performance Test Data, January 15, 1996

T A B L E 1

TABLE 1
WELL PERFORMANCE TEST DATA
JANUARY 15, 1996
PHILLIPS PETROLEUM COMPANY
SOUTH FOUR LAKES UNIT, NEW MEXICO

Well No.	Time, min.	Depth to FPH, ft	Depth to Water, ft	FPH Thick., ft	Corr. FPH Thick., ft [1]	Corr. Depth to Water, ft [2]	s, ft [3]
RW-2D	0	-- [4]	24.77	--	--	24.77	0
	2	--	27.0	--	--	27.0	2.23
	6.25	--	27.71	--	--	27.71	2.94
	9	--	27.5	--	--	27.5	2.73
	14.25	--	27.17	--	--	27.17	2.40
	15	--	27.17	--	--	27.17	2.40
	19.5	--	27.17	--	--	27.17	2.40
	23.5	--	26.79 [5]	--	--	26.79	2.02
	32	--	27.15	--	--	27.15	2.38
	44	--	27.17	--	--	27.17	2.40
	54.5	--	27.17	--	--	27.17	2.40
	62	--	27.75 [6]	--	--	27.75	2.98
	63	--	27.88	--	--	27.88	3.11
	69	--	27.96	--	--	27.96	3.19
	80	--	27.98	--	--	27.98	3.21
	98	--	28.75	--	--	28.75	3.98
	100	--	28.75	--	--	28.75	3.98
RW-2S	0	24.04	28.08	4.04	1.01	24.85	0
	11	24.21	28.5	4.29	1.07	25.07	0.22
	17	24.25	28.58	4.33	1.08	25.12	0.27
	25.5	24.25 [5]	28.5	4.25	1.06	25.10	0.25
	30	24.27	28.54	4.27	1.07	25.12	0.27
	35	24.27	28.54	4.27	1.07	25.12	0.27
	45	24.29	28.54	4.25	1.06	25.14	0.29
	55	24.29	28.54	4.25	1.06	25.14	0.29
	65	24.33 [6]	28.58	4.25	1.06	25.18	0.33
	86	24.38	28.71	4.33	1.08	25.25	0.40

Notes: Flow rate at 1 gpm for the first hour

1 FPH thickness corrected using the formula FPHc=FPHm[(1-S.G.)/S.G.],
where FPHc=corrected FPH thickness
FPHm=measured FPH thickness
S.G.=FPH specific gravity=0.80

2 Depth to water corrected using the formula DTWc=DTWm-[FPHm-(FPHcxS.G.)]
where DTWc=corrected depth to water
DTWm=measured depth to water

3 s=drawdown

4 -- no FPH detected

5 pumping down for 2 minutes

6 flow rate increased to about 1.8 gpm

Photographs 1 through 24
(See index next sheet)

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H
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R
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P
H
S

System Installation Photographs

Photograph	Description
1	Looking South Showing Grundfos® pump in RW-2D
2	View of Pump Reel, Controller (in background), and Pump Hose in RW-2D
3	Photo of Storage Tank Utilized for Pump Test Fluids Storage
4	Picture of MMC® Oil/Water Interface Probe in RW-2S, and Solonist® Water Level Used in RW-2D & RW-2S During Pump Test
5	Looking South, Showing Layout of RW-2 System Foundation Note 4" Diameter Casings RW-2D (Long Riser) and RW-2S
6	Photo of Backhoe Excavation Process at RW-2
7	View Showing Excavation of RW-1 Footings
8	Close-up of RW-1D and RW-1S Showing Shallow Footings
9	Lower Tower Erection Process at RW-2
10	Placement of Concrete Footings at RW-2
11	Erection of Upper Tower Section at RW-2
12	Placement of "Pumper" Rod Section at Top of Tower RW-2 Note Platform Installed
13	Lifting of Windmill Motor Section with Temporary Hoist
14	Completed Windmill Prior to Pumper Rod Attachment
15	Photo Showing Standard Windmill Motor Used for Power to System Pumps
16	Photo Showing Brass Cylinder Pump Prior to Installation in RW-2D Note 1" Diameter Discharge Pipe Attached to Top of the Pump
17	Installation of Pump Lower Section in RW-2S Note 1" Dia. PVC Intake Pipe Attached to Bottom of Brass Cylinder Pump
18	Modified Pump Power Bracket Attached to Top of Pumps
19	Photo of Completed Wellhead at RW-2 Note Adjustment Cable in RW-2S for Moving 2" PVC Inner Sump Intake Level
20	"Pumper" Rod Brace
21	10' Section of PVC Installed as Inner Hydrocarbon Sump in RW-2S Note Inlet Holes 6.5' from Bottom (Left) and Adjustment Cable Clamp at Top (Right)
22	Photo Showing Removal of RW-2S Pump Components
23	Start Up of System Pumps by Phillips Petroleum Company Personnel
24	Verification of Hydrocarbon Recovery During Initial Testing of System

PHOTO 1

Looking South Showing Grundfos® pump in RW-2D

PHOTO 2

View of Pump Reel, Controller (in background), and Pump Hose in RW-2D

PHOTO 3

Photo of Storage Tank Utilized for Pump Test Fluids Storage

PHOTO 4

Picture of MMC® Oil/ Water Interface Probe in RW-2S, and Solonist® Water Level Used in RW-2D & RW-2S During Pump Test

PHOTO 5

Looking South Showing Layout of RW-2 System Foundation
Note 4" Diameter Casings RW-2D (Long Riser) and RW-2S

PHOTO 6

Photo of Backhoe Excavation Process at RW-2

PHOTO 7

View Showing Excavation of RW-1 Footings

PHOTO 8

Close Up of RW-1D and RW-1S Showing Shallow Footings

PHOTO 9

Lower Tower Erection Process at RW-2

PHOTO 10

Placement of Concrete Footings at RW-2

PHOTO 11

Erection of Upper Tower Section at RW-2

PHOTO 12

Placement of "Pumper" Rod Section at Top of Tower RW-2
Note Platform Installed

PHOTO 13

Lifting of Windmill Motor Section with Temporary Hoist

PHOTO 14

Completed Windmill Prior to Pumper Rod Attachment

PHOTO 15

Photo Showing Standard Windmill Motor Used for Power to System Pumps

PHOTO 16

Photo Showing Brass Cylinder Pump Prior to Installation in RW-2D
Note 1" Diameter Discharge Pipe Attached to Top of the Pump

PHOTO 17

Installation of Pump Lower Section in RW-2S
Note 1" Dia. PVC Intake Pipe Attached to Bottom of Brass Cylinder Pump

PHOTO 18

Modified Pump Power Bracket Attached to Top of Pumps

PHOTO 19

Photo of Completed Wellhead at RW-2
Note Adjustment Cable in RW-2S for Moving the 2" PVC Inner Sump Intake Level

PHOTO 20

"Pumper" Rod Brace

PHOTO 21

10' Section of PVC Installed as Inner Hydrocarbon Sump in RW-2S
Note Inlet Holes 6.5' from Bottom (Left) and Adjustment Cable Clamp at Top (Right)

PHOTO 22

Photo Showing Removal of RW-2S Pump Components

PHOTO 23

Start Up of System Pumps by Phillips Petroleum Company Personnel

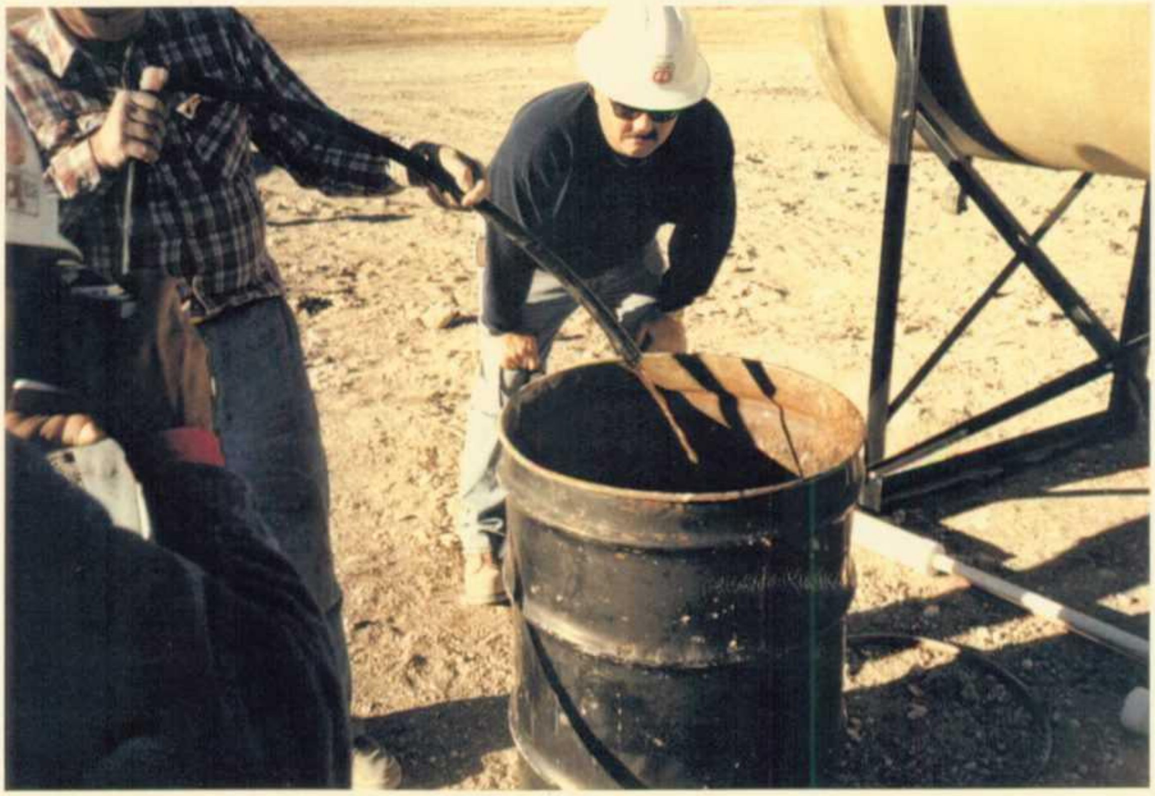


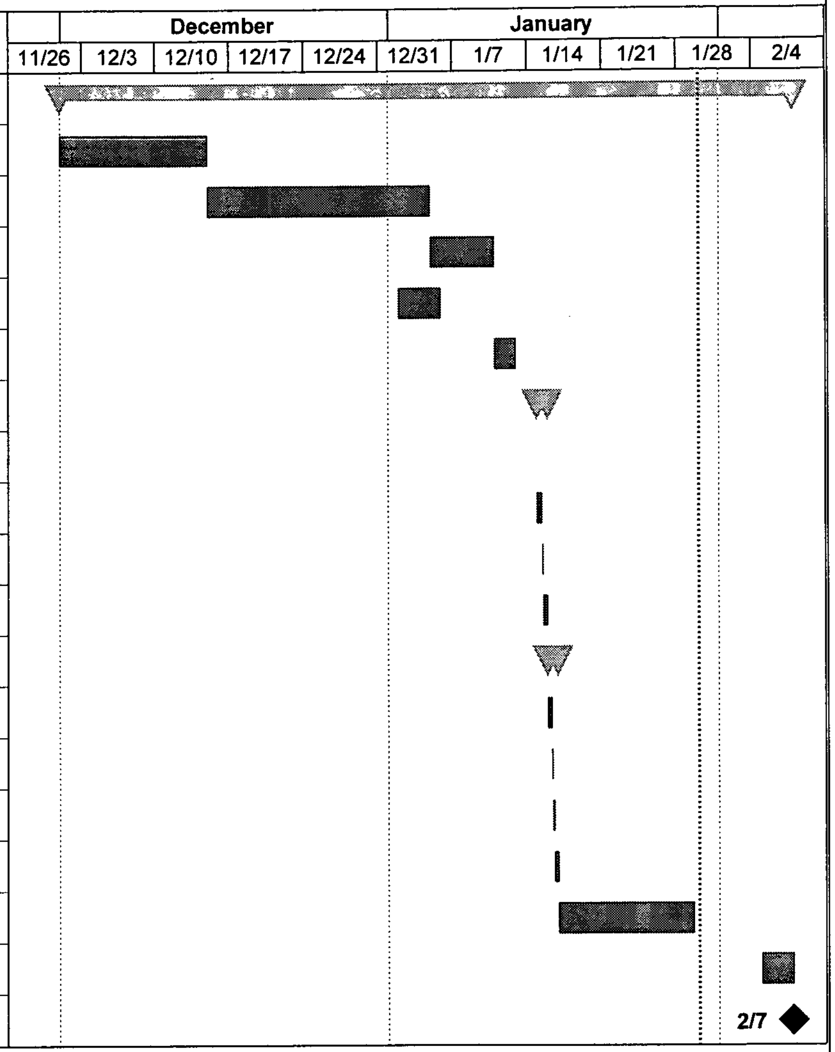
PHOTO 24

Verification of Hydrocarbon Recovery During Initial Testing of System

INSTALLATION SCHEDULE

PPCO South Four Lakes Unit
Hydrocarbon Dual Pump Recovery System
Installation Schedule

ID	Task Name	Duration	Start	Finish
1	**Windmill Dual Pump Hydrocarbon Recovery System**	**50.5d**	**12/1/95**	**2/7/96**
2	Design System	2w	12/1/95	12/14/95
3	Procure Equipment	3w	12/15/95	1/4/96
4	Fabricate Upper Pump Assemblies	4d	1/5/96	1/10/96
5	Install Wells RW-1 & RW-2	4d	1/2/96	1/5/96
6	Mobilize Windmill Contractor	2d	1/11/96	1/12/96
7	**Install Foundations**	**2.13d**	**1/15/96**	**1/16/96**
8	Excavate Footings	2h	1/15/96	1/15/96
9	Fabricate Lower Section of Tower	4h	1/15/96	1/15/96
10	Place Concrete in Footings	1h	1/15/96	1/15/96
11	Concrete Set Up	10h	1/15/96	1/16/96
12	**Install Windmill**	**1.25d**	**1/16/96**	**1/16/96**
13	Erect Tower & Motor	4h	1/16/96	1/16/96
14	Pump Rod	1h	1/16/96	1/16/96
15	Assemble and Set Pumps	3h	1/16/96	1/16/96
16	Initial Start Up & Testing	2h	1/16/96	1/16/96
17	Install System Piping, Flow Elements, & Valves	9d	1/16/96	1/29/96
18	System Start Up & Testing	3d	2/5/96	2/7/96
19	System Turnover	0d	2/7/96	2/7/96



Project: PPCO SFL
Date: 1/30/96

Task | Progress | Milestone | Summary

BASCOR Environmental, Inc.