N.M. OIL CONS. COMMISSION
P.O. BOX 1980
HOBBS, NEW MEXICO 88240

[redacted], NM 88210

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
Budget Bureau No. 1004-0135
Expires: March 31, 1993

SUNDRY NOTICES AND REPORTS ON WELLS

Do not use this form for proposals to drill or to deepen or reentry to a different reservoir.
Use "APPLICATION FOR PERMIT—" for such proposals

SUBMIT IN TRIPLICATE

5. Lease Designation and Serial No.
NM ~~55962~~ 77074

6. If Indian, Allottee or Tribe Name
N/A

7. If Unit or CA, Agreement Designation
N/A

1. Type of Well
[X] Oil Well [ ] Gas Well [ ] Other

8. Well Name and No.
Anasazi "4" Fed. No. 6

2. Name of Operator
Mitchell Energy Corporation

9. API Well No.
30-025-32252

3. Address and Telephone No.
P. O. Box 4000, The Woodlands, Texas 77387-4000, (713) 377-5855

10. Field and Pool, or Exploratory Area
West Teas (Yates/7 Rivers

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
660' FEL and 2,150' FNL (SE/NE)
Sec. 4, T20S, R33E

4-20-33

11. County or Parish, State
Lea County, NM

12. CHECK APPROPRIATE BOX(s) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION	
[X] Notice of Intent	[ ] Abandonment	[ ] Change of Plans
[ ] Subsequent Report	[ ] Recompletion	[ ] New Construction
[ ] Final Abandonment Notice	[ ] Plugging Back	[ ] Non-Routine Fracturing
	[ ] Casing Repair	[ ] Water Shut-Off
	[ ] Altering Casing	[ ] Conversion to Injection
	[X] Other Amend Permit to Drill	[ ] Dispose Water
		(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Mitchell requests that our Permit to Drill be amended to reflect that this well will now be drilled to test the Yates/Seven Rivers formation. Attached you will find a new DRILLING PROGRAM and SURFACE USE PROGRAM setting forth the changed casing and cementing programs.

RECEIVED
NOV 11 02 AM '93

R-10122

14. I hereby certify that the foregoing is true and correct

Signed George Mullen Title Regulatory Affairs Specialist Date 10/28/93

(This space for Federal or State office use)

Approved by Ron Dunton Title for: AREA MANAGER CARLSBAD RESOURCE AREA Date 7/1/94

Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations, and reports of such operations when completed, as indicated, on Federal and Indian lands pursuant to applicable Federal law and regulations, and, if approved or accepted by any State, on all lands in such State, pursuant to applicable State law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area, or regional procedures and practices, either are shown below or will be issued by, or may be obtained from, the local Federal and/or State office.

SPECIFIC INSTRUCTIONS

Item 4—If there are no applicable State requirements, locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local State or Federal office for specific instructions.

Item 13—Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by local Federal and/or State offices. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones, or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to top of any left in the hole; method of closing top of well; and date well site conditioned for final inspection looking to approval of the abandonment.

NOTICE

The Privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et. seq., 351 et. seq., 25 U.S.C. et. seq.; 43 CFR 3160.

PRINCIPAL PURPOSE — The information is to be used to evaluate, when appropriate, approve applications, and report completion of secondary well operations, on a Federal or Indian lease.

ROUTINE USES:

(1) Evaluate the equipment and procedures used during the proposed or completed subsequent well operations.

(2) Request and grant approval to perform those actions covered by 43 CFR 3162.3-2(2).

(3) Analyze future applications to drill or modify operations in light of data obtained and methods used.

(4)(5) Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions.

EFFECT OF NOT PROVIDING INFORMATION — Filing of this notice and report and disclosure of the information is mandatory once an oil or gas well is drilled.

The Paperwork Reduction Act of 1980 (44 U.S.C. 3501, et. seq.) requires us to inform you that:

This information is being collected in order to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.

This information will be used to report subsequent operations once work is completed and when requested, to obtain approval for subsequent operations not previously authorized.

Response to this request is mandatory for the specific types of activities specified in 43 CFR Part 3160.

BURDEN HOURS STATEMENT

Public reporting burden for this form is estimated to average 25 minutes per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect of this form to U.S. Department of the Interior, Bureau of Land Management, (Alternate) Bureau Clearance Officer, (WO-771), 18 and C Streets, N.W., Washington, D.C. 20240, and the Office of Management and Budget, Paperwork Reduction Project (1004-0135), Washington, D.C. 20503.

*U.S. GPO: 1990-773-016/26019

N.M. OIL CONS. OMMISSION
P.O. BOX 1980
HOBBS, NEW MEXICO 88240

RECEIVED
JUN 13 11 46 AM '94
CARLSBAD AREA

Form 3160-5
(June 1990)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
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NM-~~55961~~ 77074 (575)

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7. If Unit or CA, Agreement Designation
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1. Type of Well
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Anasazi "4" Fed #6

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(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)

13. Describe Proposed or Completed Operations (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work. If well is directionally drilled, give subsurface locations and measured and true vertical depths for all markers and zones pertinent to this work.)*

Mitchell Energy requests that our permit to drill be amended to comply with NMOCD Order No. 10122 concerning waiver of salt protection string as follows:

1. Change 8⅝" surface csg setting depth from 550' to 1350' and cmt to surface with 860 sx Premium.

2. Change cmt on 4½" production csg to 2-stage cmt job with combination DV/ECP tool set at 2950'. Cmt first stage with 150 sx premium and second stage above DV/ECP to surface with 720 sx Lite and 80 sx Premium.

NMOCD Order attached.

14. I hereby certify that the foregoing is true and correct
Signed George Mullen Title Regulatory Affairs Specialist Date 6-10-94

(This space for Federal or State office use)
Approved by Ron Dunton Title for: AREA MANAGER CARLSBAD RESOURCE AREA Date 7/1/94
Conditions of approval, if any:

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

*See Instruction on Reverse Side

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********** DECISION RATIONALE **********

Regarding Omission of Salt Protection Casing String in Teas Yates-Seven Rivers Pool in NMOCD's Designated R-111-P Area

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BACKGROUND

(1) Mitchell Energy Corporation (MEC) submitted for and received approval on Applications for Permit to Drill their Anasazi "4" Federal Nos. 5 & 6 wells located in unit letters K & H, respectively, of Sec. 4, T.20S.,R.33E. to test the Wolfcamp Formation at approximately 12,000 feet below the surface. Subsequent to their original application, MEC filed with BLM on Sundry Notice their intent to revise their APD with respect to total depth (TD) and target formation. Their new plans called for drilling their wells to a shallower TD of 3,600 feet to test the West Teas Yates-Seven Rivers pool. Included in their revised plans for the wells were provisions for a non-standard casing program which omitted the R-111-P mandated potash protection casing string.

(2) BLM postponed approval of MEC's amended applications pending the outcome of an NMOCD hearing to determine the proposed plan's viability. The original hearing date was scheduled for December 1993. Several continuances were obtained by MEC, and the case was heard in April 1994. NMOCD rendered their decision in May 1994, under Order No. R-10122 [Enclosed]. The Order supported MEC's proposed plans.

FINDINGS

(1) The proposed wells are outside of all LMR & associated buffer-zone boundaries.

(2) The proposed wells are located in an area which has been determined to be barren of economically recoverable potash reserves.

(3) The proposed wells are located just north of an area where extensive oil and gas exploration has occurred since the early 1960's.

(4) Nine out of the ten existing wells which have been drilled immediately south of the proposed wells to the West Teas Yates-Seven Rivers pool have been completed without the salt protection casing string.

(5) The deletion of a salt protection string from the proposed wells will not unduly diminish the total quantity of commercial potash deposits which may be reasonably recovered, nor will it interfere with the orderly extraction/development of surrounding potash reserves.

(6) The omission of a salt protection string from these wells will not present any additional risk to the health and safety of potash miners.

Recommended For Approval: Shannon J. Shaw

Date: 7/1/94

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION

IN THE MATTER OF THE HEARING
CALLED BY THE OIL CONSERVATION
DIVISION FOR THE PURPOSE OF
CONSIDERING:

CASE NO. 10858
ORDER NO. R-10122

APPLICATION OF MITCHELL ENERGY CORPORATION FOR A WAIVER OF THE SALT PROTECTION STRING REQUIREMENTS OF ORDER NO. R-111-P FOR CERTAIN WELLS IN THE OIL/POTASH AREA, LEA COUNTY, NEW MEXICO

ORDER OF THE DIVISION

BY THE DIVISION

This cause came on for hearing at 8:15 a.m. on April 28, 1994, at Santa Fe, New Mexico, before Examiner Jim Morrow.

NOW, on this 31st day of May, 1994, the Division Director, having considered the testimony, the record and the recommendations of the Examiner, and being fully advised in the premisses,

FINDS THAT:

(1) Due public notice having been given as required by law and in accordance with New Mexico Oil Conservation Division/Commission Order No. R-111-P, the Division has jurisdiction of this cause, the parties and the subject matter herein.

(2) Mitchell Energy Corporation ("Mitchell") has the right to develop the oil and gas minerals underlying all of Section 4, Township 20 South, Range 33 East, NMPM, Lea County, New Mexico, and proposes to test for production in the Yates formation of the West Teas Yates-Seven Rivers Pool by drilling nine oil wells, each to an anticipated depth of approximately 3,600 feet and all located on separate 40-acre spacing and proration units within said Section 4.

(3) Mitchell has filed its application in this case seeking Division approval to delete the "salt protection string" requirements of Order R-111-P from the well program for each of these shallow oil wells which are identified on Exhibit "A" attached hereto.

(4) Prior to the Commission's adoption of Order R-111-P effective April 21, 1988, Section 4 was outside the boundaries of the "Potash Area" as described in Order R-111, as amended, and these wells would not have been subject to the casing and cementing requirements of that order.

(5) Order R-111-P expanded the Potash Area as described in Order R-111-O but further provided:

> "Finding (22). Expansion of the R-111 area to coincide with the KPLA (Known Potash Leasing Area, established by the BLM) will bring under the purview of this order areas where potash is either absent or noncommercial and such areas should be granted less stringent casing, cementing and plugging requirements, at the discretion of the OCD district supervisor.", and
>
> "Decretory Paragraph C. (4) provides that "the Division's District Supervisor may waive the requirements of Section D and F (dealing with drilling, casing and plugging) which are more rigorous than the general rules upon satisfactory showing that a location is outside the Life of the Mine Reserves (LMR) and surrounding buffer zone as defined hereinbelow and that no commercial potash reserves will be unduly diminished."

(6) In accordance with Order R-111-P, Mitchell has notified the proper parties and the only timely filed objection was made by Mississippi Potash, Inc. on November 2, 1993, but was subsequently withdrawn on November 8, 1993. The applicant was the only party to appear at the hearing and there is no opposition to the granting of this application from any party in this matter.

(7) On September 20, 1993, the District Supervisor of the Division's Hobbs office advised Mitchell that he was referring Mitchell's request to the Division Director for hearing.

(8) Mitchell has taken the necessary action to amend its applications for permits to drill ("APD") to conform to the well plan submitted at hearing as Mitchell Exhibit (10) and except for the issue of waiving the "salt protection string," Mitchell believes that its APDs are ready for approval by the respective regulatory agency with the authority to grant those APDs.

(9) All of Section 4 (except for approximately 20 acres in the NE/4 NE/4) is identified as "Barren" of commercial potash on both the 1984 and 1993 Bureau of Land Management Potash Resources Map.

(10) Section 4 is not located within an "LMR" or a buffer zone as defined by Order R-111-P.

(11) The nearest potash mine (New Mexico Potash) is approximately five miles southwest of Section 4.

(12) Of the ten wells which have been drilled in Section 9, Township 20 South, Range 33 East, NMPM, to the West Teas Yates-Seven Rivers Pool, nine of those wells have been authorized to be drilled without the salt protection string. Two of those wells, the Stevens & Tull, Inc. Federal "9" Well Nos. 3 and 5, are located only 330 feet from the southern boundary of Section 4.

(13) Mitchell's correlative rights will be impaired because they will be at a competitive disadvantage with other operators in this pool unless they are granted a waiver of the "salt protection string."

(14) Mitchell's geologic and reservoir engineering evidence demonstrated that:

(a) based upon conventional geologic investigation utilizing cross sections, structure map, isopachs, there is a reasonable scientific probability that the proposed well locations are a geologically logical extension of the north end of the Yates formation of the West Teas Yates-Seven Rivers Pool;

(b) the expected average ultimate recovery for all wells which have produced from the Yates formation of the pool is approximately 63,000 barrels of oil;

(c) the total cost of a well with the salt protection string but without the external-casing packer would be $341,000 and with an external-casing packer but without the salt protection string would be $290,500;

(d) the deletion of the salt protection string results in almost doubling the discount profitability index for this project and directly affects the economic viability of this project;

(e) the deletion of the salt protection string significantly improves Mitchell's opportunity to drill these wells and to recover oil that might otherwise be lost or subject to drainage;

(f) deletion of the salt protection string will provide Mitchell with the same opportunity as the offsetting operators who have not been required to pay the costs of salt protection strings in their wells thereby protecting Mitchell's correlative rights;

(g) the expected producing life of these wells is estimated to be approximately 8.5 years.

(15) Mitchell's experts on drilling, completing and producing these wells presented evidence which demonstrated that:

(a) these wells can be drilled, cased, cemented, completed and produced by deleting the "salt protection string" without risk to miner's safety or causing the undue waste of commercial deposits of potash;

(b) each of these wells will have surface casing set in the "Red Bed" section of the basal Rustler formation immediately above the salt section in such a manner as to protect any and all fresh water, and then shall be cemented using a combination DV tool and external casing packer such that there shall be a continuous column of cement from the surface to the total depth of each well isolating all formations including the Salado ("salt") section from the 4-1/2" production casing;

(c) prior to completing each well, a temperature survey or a cement bond log shall be run and any necessary remedial cementing operations shall be conducted in accordance with Division procedures;

(d) each of these wells will be monitored during its productive life for mechanical integrity including detection of casing leaks and any effects of corrosion;

(e) the wellbore integrity of these wells is expected to continue for a longer time than the time required to produce the wells to abandonment.

(16) Mitchell's potash expert presented evidence that:

(a) demonstrated with publicly available potash core data and ore grade information, that all of Section 4 was within an area "barren" of commercial potash and thus validated the BLM's potash maps which had reached the same conclusion;

(b) no commercial potash currently exists in Section 4 or within one-half mile of said Section, nor is it expected to exist in the foreseeable future given the depressed state of the New Mexico potash mining industry;

(c) potash mining activity would not occur within one mile of Section 4 at any time during the life of the wells being produced in the West Teas Yates-Seven Rivers Pool;

(d) by using subsidence calculations, the removal of potash ore from the McNutt member of the Salado formation at a depth of 2,000 feet would have to come to within 1200 feet of any of these wells before any said well would be subject to the effects of potash mining subsidence;

(e) the conductivity data demonstrates that the Salado formation is plastic and virtually impermeable to fluid flow;

(f) Since 1966, mining in the potash area has been on a significant decline and it is highly improbable that mining activity will occur towards Section 4 from any existing mining operation.

(17) The deletion of the salt protection string from these wells will not unduly reduce the total quantity of commercial deposits of potash which may reasonably be recovered in commercial quantities, nor will it interfere unduly with the orderly commercial development of the potash deposits.

(18) A substantial savings in the costs of each of these wells will be realized by deleting the salt protection string.

(19) The deletion of salt protection string from these wells will not constitute a risk to miner's health or safety.

(20) Approval of this application will afford Mitchell the opportunity to produce its just and equitable share of the hydrocarbons in the Yates formation of the West Teas Yates Seven Rivers Pool, will prevent the economic loss caused by drilling of wells with unnecessary salt protection strings and will otherwise prevent waste and protect correlative rights.

IT IS THEREFORE ORDERED THAT:

(1) The application of Mitchell Energy Corporation for approval to delete the "salt protection string" requirements of Order R-111-P is hereby granted for each of the wells identified and described on Exhibit "A" attached hereto and incorporated by reference into this Order;

(a) that each said well shall be drilled, cased, cemented in accordance with the Well Plan introduced at the hearing as Mitchell Exhibit (10) which is hereby incorporated by reference into this order;

(b) that each said well shall be completed, produced and abandoned in accordance with the exhibits and procedures introduced at the hearing as Mitchell's Exhibit (12) which is hereby incorporated by reference into this Order.

(2) Mitchell shall provide the OCD District Supervisor of the Hobbs Office with copies of Exhibits (10) and (12) and shall notify him of the times when casing is to be run and cemented, when bond or temperature logs are to be run, and when remedial cementing operations are to occur.

(3) Except as modified by Decretory Paragraph No. (1) of this order, all of the provisions of Order R-111-P applicable to the casing, actual drilling, cementing and plugging of a shallow well within the "Designated Potash Area" shall be strictly adhered to.

(4) The operator of the subject well and unit shall notify the Director of the Division in writing of the subsequent voluntary agreement of all parties subject to the force-pooling provisions of this order.

(5) Jurisdiction of this cause is retained for the entry of such further orders as the Division may deem necessary.

DONE at Santa Fe, New Mexico, on the day and year hereinabove designated.

STATE OF NEW MEXICO
OIL CONSERVATION DIVISION

WILLIAM J. LEMAY
Director

S E A L

EXHIBIT "A"
CASE NO. 10858
DIVISION ORDER R-10122

Mitchell Energy Corporation
Approved Oil Wells

(1) Anasazi 4" State No. 1,
Unit N, 330' FSL & 1980' FWL

(2) Anasazi "4" State No. 2,
Unit I, 660' FEL & 1650' FSL

(3) Anasazi "4" State No. 3,
Unit J, 1980' FEL & 1650' FSL

(4) Anasazi "4" State No. 4,
Unit G, 2310' FNL & 1980' FEL

(5) Anasazi "4" Federal No. 5,
Unit K, 1980' FWL & 1650' FSL

(6) Anasazi "4" Federal No. 6,
Unit H, 2150' FNL & 660' FEL

(7) Anasazi "4" State No. 9,
Unit M, 660' FWL & 330' FSL

(8) Anasazi "4" State No. 10,
Unit L, 660' FWL & 1650' FSL

(9) Scharbauer "4" No. 3,
Unit P, 660' FSL & 660' FEL

(10) Scharbauer "4" No. 2,
Unit O, 330' FSL & 2055' FEL
This well is deleted from this order at the request of the applicant.

MITCHELL ENERGY CORP.

Well Plan

ANASAZI / SCHARBAUER AREA

Lea County. New Mexico

WELL DATA

Company: Mitchell Energy Corporation

Field: West Teas

Objective: Yates

Total Depth: 3600'

TABLE OF CONTENTS

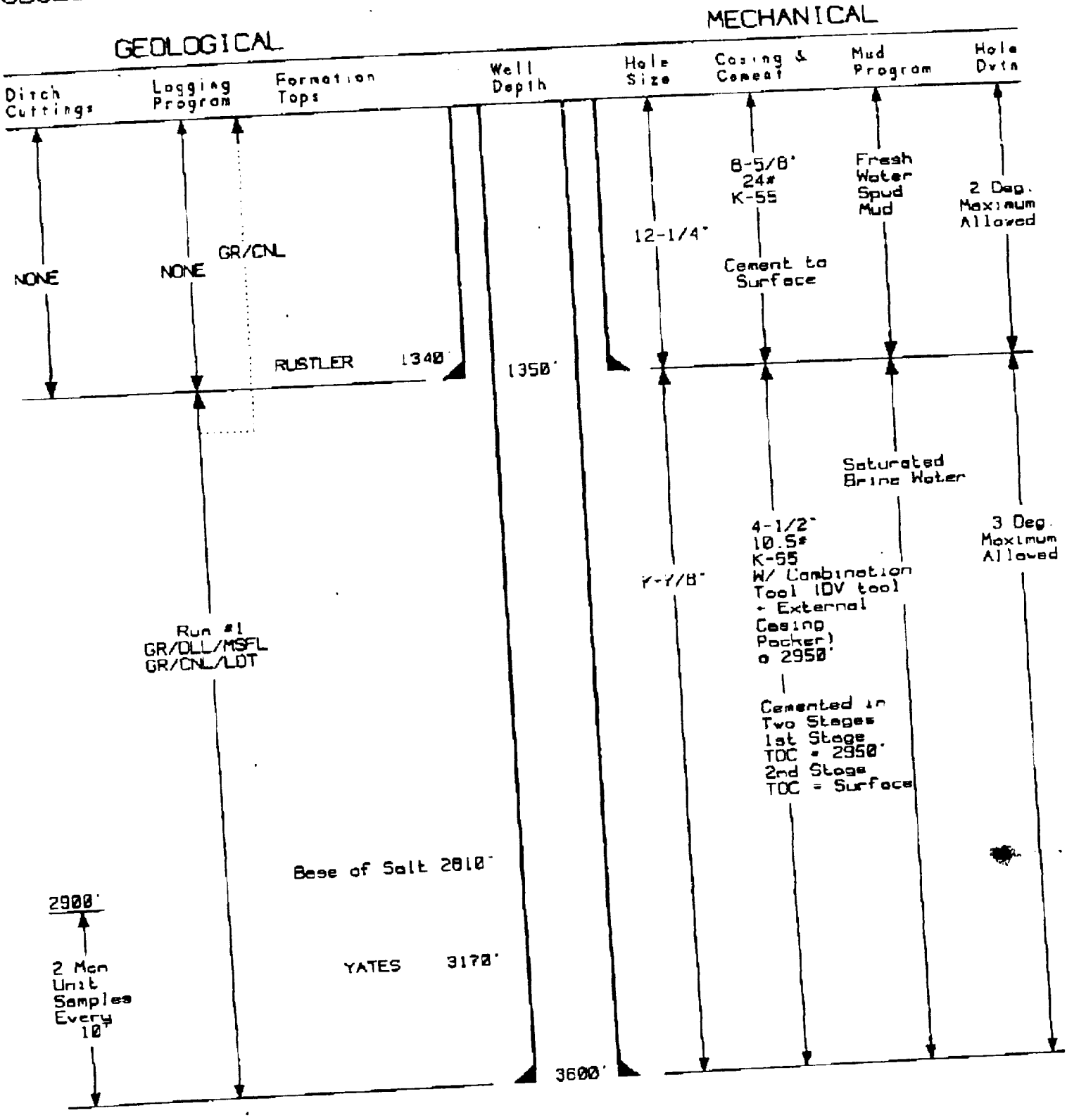
DRILLING PROGNOSIS

FIELD: West Tees

WELL: Anasazi/Scherbauer Area

OBJECTIVE: Yates

ELEVATION:



DRILLING PROGRAM

1.0 Set conductor at +/- 40' with rat hole machine.

2.0 Move in drilling rig and rig up same.

3.0 Drill 12-1/4" hole to +/- 1350'.

4.0 At 1350' circulate and condition hole for casing.

5.0 Run 8-5/8" casing as shown on the appropriate attachment, "Casing String Design".

5.1 Once casing string is made up, circulate a minimum of one entire circulation while reciprocating casing.

6.0 Cement 8-5/8" casing as per attached cement program.

7.0 Cut off conductor and 8-5/8" casing and install 11" x 3MWP head as shown on attachment.

8.0 Nipple up 11" x 3MWP - BOP stack as shown on attachment.

9.0 Test annular BOP to 1000 psi. Test rams, choke manifold and all associated equipment to 1000 psi.

10.0 Drill 7-7/8" hole to +/- 3600'.

10.1 Prior to drilling the float collar, pressure test the casing to 600 psi by closing the annular preventer and pressuring up to 600psi. Hold this pressure for a minimum of 30 minutes and record any pressure fluctuations. Report the results of this test on the morning report.

11.0 At 3600', condition hole for logs and log well as per attached "Geological Prognosis".

12.0 Following logging operations, trip back in hole and circulate a minimum of one complete circulation. Have the mud engineer perform a full check during this circulation and verify mud - is in condition to run casing.

13.0 Once the order has been given to run pipe and the above conditions have been met, begin the trip out of the hole laying down the drill string to run casing.

14.0 Make up and run 4 1/2" casing as per the following:

A. Clean exposed threads on the guide shoe, first joint of 4 1/2" casing, float collar, and second joint of casing.

B. Apply thread lock to the above listed connections prior to make-up.

C. The bottom assembly of the casing assembly must be made up as follows with the first listed being the first in the hole:

1. Guide shoe
2. First joint of 4 1/2" casing
3. Float collar
4. 4 1/2" casing back to setting depth of 2950' (140' below the salt).
5. Combination Tool (DV Tool with External Casing Packer)
6. 4-1/2" casing back to surface.

D. Install centralizers as follows on the 4-1/2" casing:

1. 10' above the guide shoe by means of a stop collar.
2. Around the first coupling above the float collar.
3. Every third coupling back to the combination tool.
4. Around the coupling immediately below the combination tool.
5. Around the coupling immediately above the combination tool.
6. Every third coupling back to surface.

15. With casing on bottom, circulate mud a minimum of one circulation. Monitor returns to ensure hole is "clean".

16. Cement the 4 1/2" casing string as follows:

A. Reciprocate the casing during the <u>first stage</u> circulation and cementation.

B. Once the first stage cement is in place (Figure 1), drop the ***EXTERNAL CASING PACKER / DV TOOL ACTUATION DEVICE*** (a.k.a. Ball, Bomb, Plug, Dart (Figure 2)).

C. With guidance from the tool manufacturers representative, set the external casing packer and open the DV tool.

D. Circulate one complete circulation through the DV tool to ensure any residual cement from the first stage is removed from the annulus above the combination tool.

E. Pump the second stage cement into position followed by the ***SECOND STAGE FOLLOWING PLUG***. Displace cement and plug with drilling fluid. The ***SECOND STAGE FOLLOWING PLUG*** will close the DV tool ports when the cement is in place (Figure 3).

17. Set the slips on the 4 1/2" casing in the as cemented condition.

18. Install the "Bell Nipple" tubing head, and associated equipment comprising the 8" section.

19. Once all contractual obligations are met, release the rig.

20. !!!!!!!!!! -- **NET THE PITS** -- !!!!!!!!!!!!!!!

Wellbore Schematic

First Stage Cement In Place

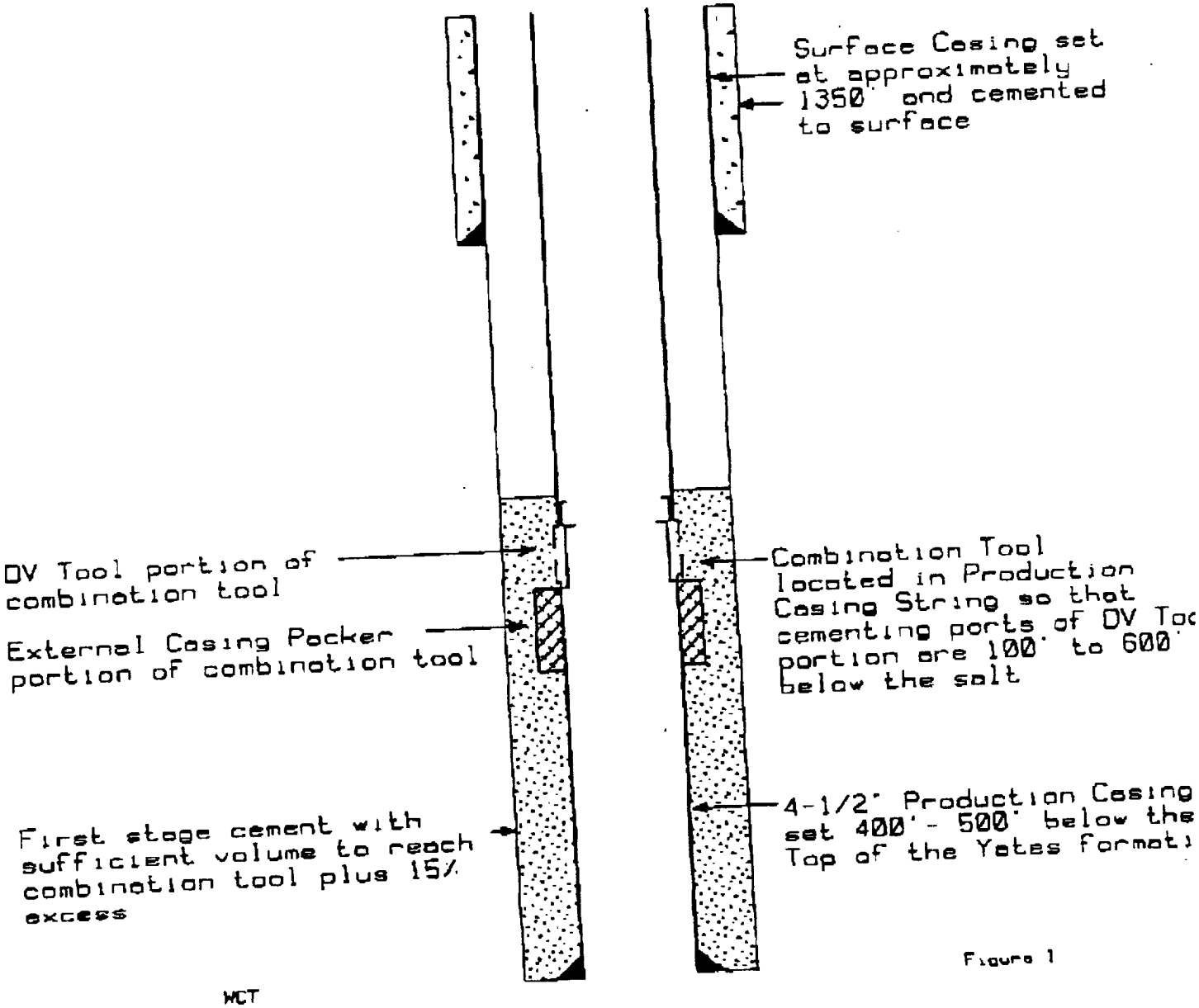


Figure 1

WCT

Wellbore Schematic

DISPLACING SECOND STAGE CEMENT

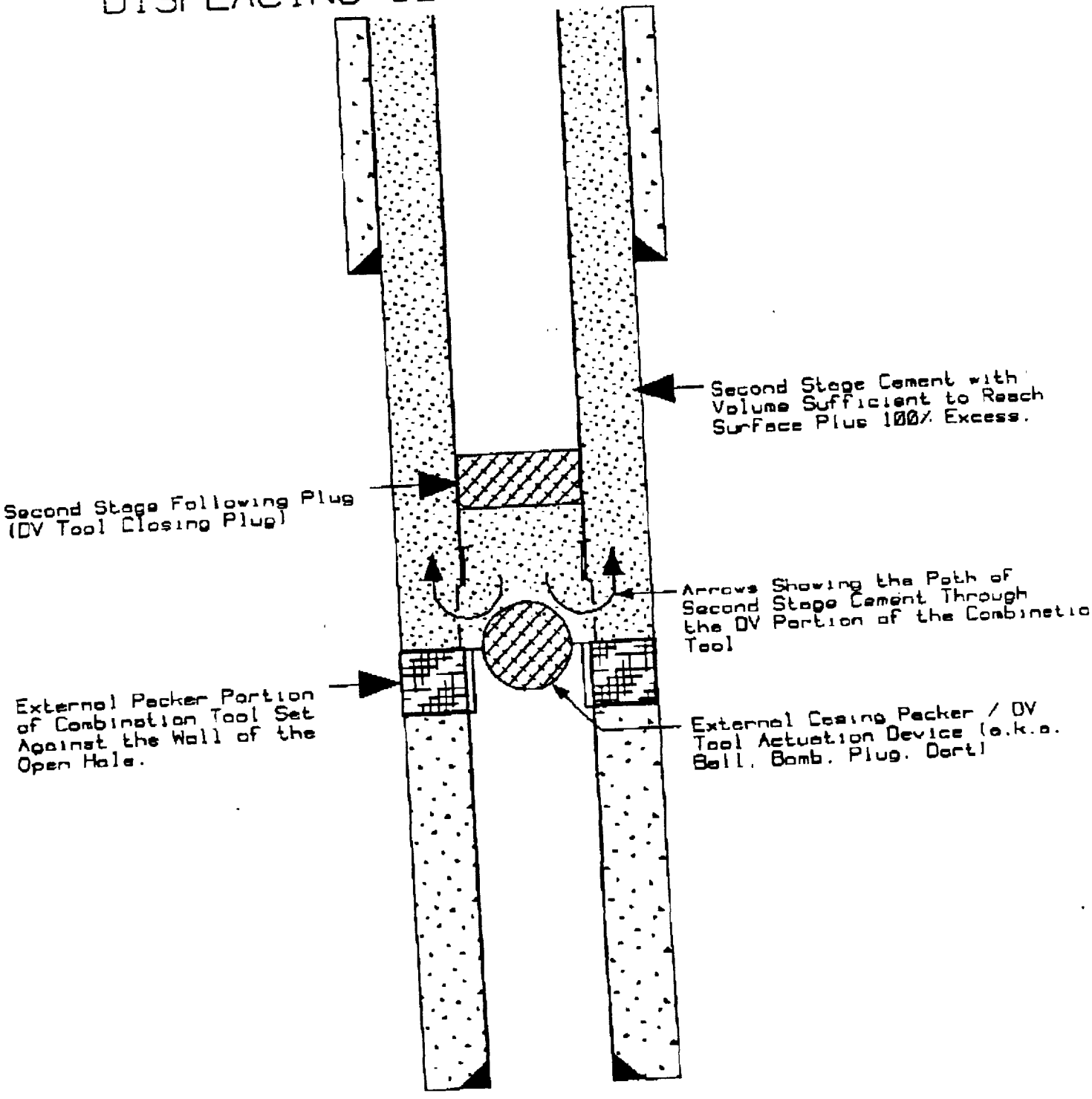
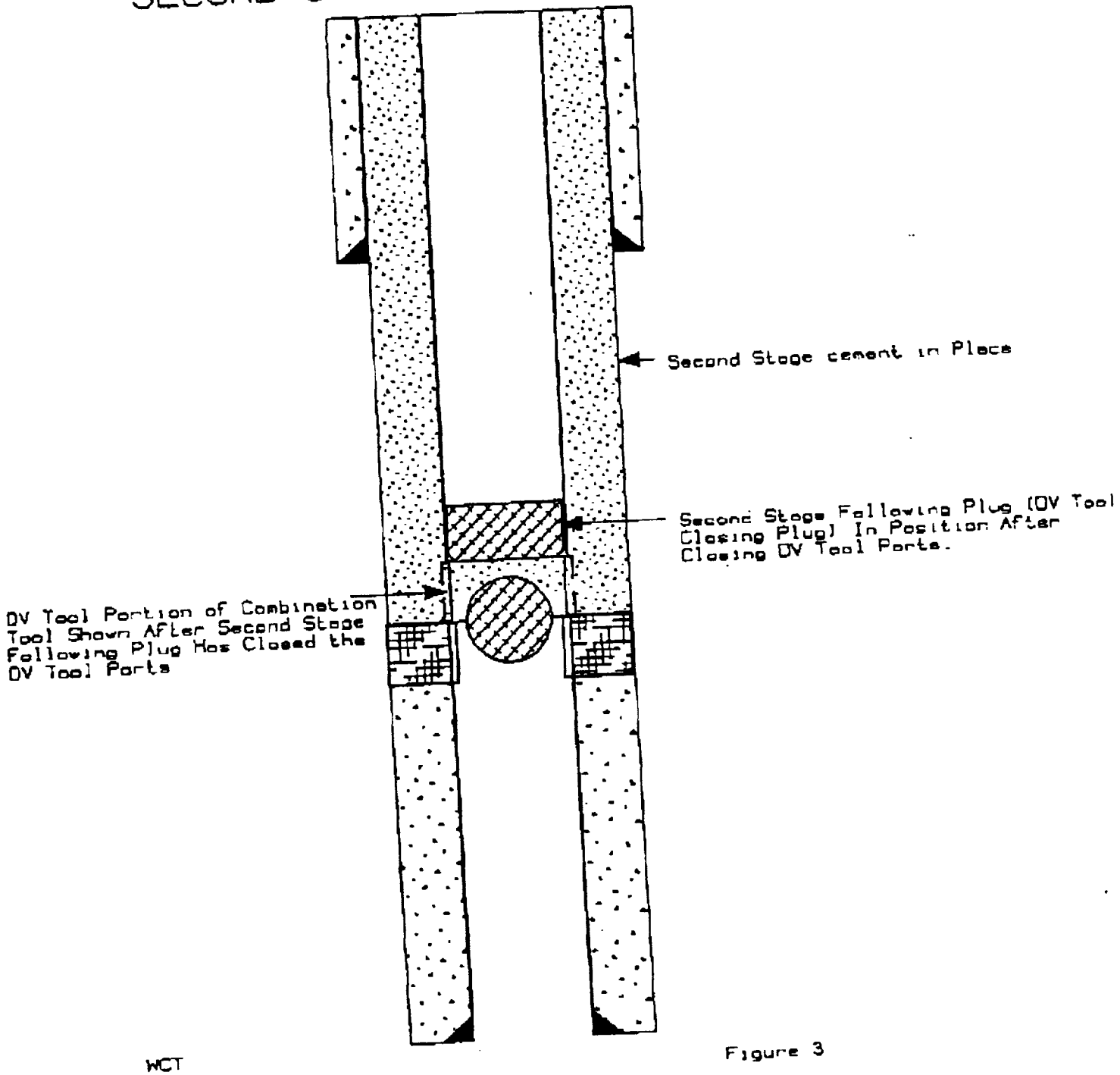


Figure 2

WCT

Wellbore Schemotic

SECOND STAGE CEMENT IN PLACE



WCT

Figure 3

MUD PROGRAM

Depth Interval (feet)	*Density PPG)*	*Funnel Viscosity (Seconds)*	*Type Mud*	*Filtrate (cc)*
0-1350'	8.5	40-45	Spud Mud	NC
1350'-3600'	10.0	28	Saturated Brine Water	NC

CASING STRING DESIGN

DEPTH: 1350'
TYPE: Surface
SIZE: 8-5/8"
MUD WEIGHT: 8.5

Description	*Interval*	*Length Per Section*	*Weight Per Section*	*Cumm. Weight*	*Min. Strength*	*Tens. S.F.*
24#,ST&C,K-55	0-1350'	1350'	32400#	32400#	263,000	8.12

Collapse Force	**Resist*	*S.F.*	*Burst Force*	*Resist.*	*S.F.*	*Minimum Torque*	*Optimum Torque*	*Maximum Torque*
596	1370	2.29	624	2950	4.72	1970	2630	3290

* Tension effect on collapse resistance included

Procedure:

1. Clean threads on shoe joint , float collar, and guide shoe to bare shiny metal. Apply Thread Lock to connections prior to make-up.

2. The casing assembly will be made up as follows:

Note: Best-o-Life 2000 will be applied to all connections not receiving Thread Lock.

   a. Guide shoe
   b. Shoe Joint
   c. Float collar
   d. Remainder of casing string

3. Centralizers should be applied 10 feet above the guide shoe by means of a stop collar, around the first coupling above the float collar, and every fourth coupling back to surface.

CASING STRING DESIGN

DEPTH:	3600'
TYPE:	Production
SIZE:	4-1/2"
MUD WEIGHT:	10.0

Description	*Interval*	*Length Per Section*	*Weight Per Section*	*Cumm. Weight*	*Min. Strength*	*Tens. S.F.*
10.5#,LT&C,K-55	0-3600'	3600'	37,800#	37,800#	146K	3.86

Collapse Force	*Resist*	*S.F.*	*Burst Force*	*Resist.*	*S.F.*	*Minimum Torque*	*Optimum Torque*	*Maximum Torque*
1872	4010	2.14	1740	4790	2.75	1100	1460	1825

Procedure:

Make up and run 4 1/2" casing as per the following:

A. Clean exposed threads on the guide shoe, first joint of 4 1/2" casing, float collar, and second joint of casing. Apply Thread Lock to these connections prior to make-up.

B. The bottom assembly of the casing assembly must be made up as follows with the first listed being the first in the hole:

Note: Seal Lube will be applied to all conections not receiving Thread Lock.

1. Guide shoe
2. First joint of 4 1/2" casing
3. Float collar
4. 4 1/2" casing back to setting depth of 2950' (140' below the salt).
5. Combination Tool (DV Tool with External Casing Packer)
6. 4-1/2" casing back to surface.

C. Install centralizers as follows on the 4-1/2" casing:

1. 10' above the guide shoe by means of a stop collar.
2. Around the first coupling above the float collar.
3. Every third coupling back to the combination tool.
4. Around the coupling immediately below the combination tool.
5. Around the coupling immediately above the combination tool.
6. Every third coupling back to surface.

Cementing Program

8-5/8" Surface Casing

Depth:	1350'
Casing Size:	8-5/8"
Hole Size:	12.25"
Calculated Cement Fill:	1350'
Excess Calculated:	100%
Cementing Company:	Halliburton

Cement Recommendation:

Spacer: 20 Bbls Fresh Water

Slurry: 860 sacks Premium Plus + 2% CaCl2

Slurry Weight:	14.8 ppg
Slurry Yield:	1.34 cu.ft./sack

Procedure:

1. Utilize the two-plug system.
2. Wait on cement a minimum of 8 hours.

NOTE: VOLUME ADJUSTMENTS BASED ON THE CALIPER WILL BE UNATTAINABLE. THE STANDARD PRACTICE FOR SURFACE CASING CEMENT VOLUME DETERMINATIO HAS BEEN CALCULATED (GAUGE HOLE PLUS 100% EXCESS). NO FURTHER CALCULATIONS WILL BE MADE FOR CEMENT VOLUME.

Cementing Program

4-1/2" Production Casing

Depth:	3600'
Casing Size:	4-1/2"
Hole Size:	7-7/8"
Caiculated Cement Fill:	3600' (In Two Stages)
Excess Calculated	
1st Stage:	15% over caliper
2nd Stage:	100%
Cementing Company:	Halliburton

Cement Recommendation:

1st Stage:

Slurry: 150 sacks Premium Plus + 2.5 #/sk Salt (Accelerator) + 0.4% HALAD-322 (Fluid Loss)

Slurry Weight:	14.8 ppg
Slurry Yield:	1.36 cu.ft./sack

2nd Stage:

Lead Slurry: 720 sacks Premium Plus + 1% CaCl2 + 15 #/sk Salt

Slurry Weight:	14.0 ppg
Slurry Yield:	1.75 cu.ft./sack

Tail Slurry: 80 sacks Premium Plus

Slurry Weight:	14.8 ppg
Slurry Yield:	1.32 cu.ft./sack

Procedure:

Cement the 4 1/2" casing string as follows:

A. Reciprocate the casing during the first stage circulation and cementation.

Cementing Program

4-1/2" Production Casing
Continued

B. Once the first stage cement is in place (Figure 1), drop the ***EXTERNAL CASING PACKER / DV TOOL ACTUATION DEVICE*** (a.k.a. Ball, Bomb, Plug, Dart) .

C. With guidance from the tool manufacturers representative, set the external casing packer and open the DV tool.

D. Circulate one complete circulation through the DV tool to ensure any residual cement from the first stage is removed from the annulus above the combination tool.

E. Pump the second stage cement into position followed by the ***SECOND STAGE FOLLOWING PLUG***. Displace cement and plug with drilling fluid. The ***SECOND STAGE FOLLOWING PLUG*** will close the DV tool ports when the cement is in place

MINIMUM BLOWOUT PREVENTER REQUIREMENTS

3,000 psi Working Pressure

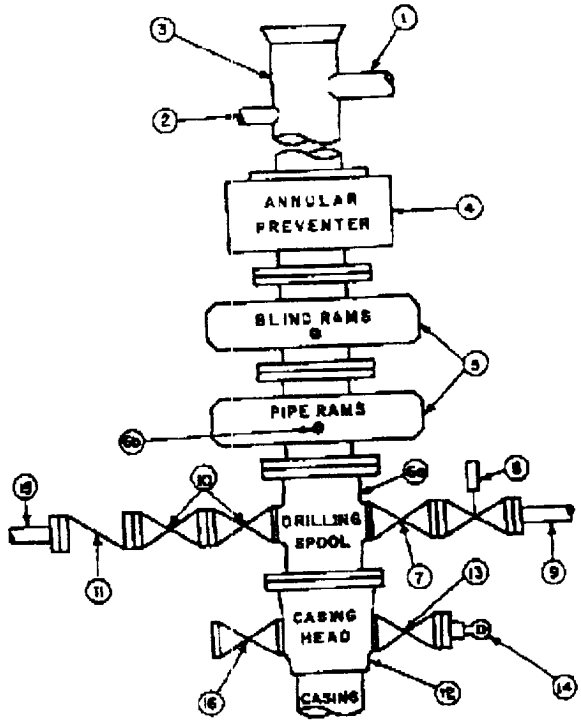
3 MWP

STACK REQUIREMENTS

No.	Item	Min. I.D.	Min. Nominal
1	Flowline		2"
2	Fill up line		
3	Drilling nipple		
4	Annular preventer		
5	Two single or one dual hydraulically operated rams		
6a	Drilling spool with 2" min. kill line and 3" min choke line outlets		
	or		
6b	2" min. kill line and 3" min. choke line outlets in ram. (Alternate to 6a above.)		
7	Valve Gate ☐ Plug ☐	3-1/8"	
8	Gate valve—power operated	3-1/8"	
9	Line to choke manifold		3"
10	Valves Gate ☐ Plug ☐	2-1/16"	
11	Check valve	2-1/16"	
12	Casing head		
13	Valve Gate ☐ Plug ☐	1-13/16"	
14	Pressure gauge with needle valve		
15	Kill line to rig mud pump manifold		2"

OPTIONAL			
16	Flanged valve	1-13/16"	

CONFIGURATION A



CONTRACTOR'S OPTION TO FURNISH:

1. All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 3,000 psi, minimum.
2. Automatic accumulator (80 gallon, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure.
3. BOP controls, to be located near drillers position.
4. Kelly equipped with Kelly cock.
5. Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
6. Kelly saver-sub equipped with rubber casing protector at all times.
7. Plug type blowout preventer tester.
8. Extra set pipe rams to fit drill pipe in use on location at all times.
9. Type RX ring gaskets in place of Type R.

MEC TO FURNISH:

1. Bradenhead or casinghead and side valves.
2. Wear bushing, if required.

GENERAL NOTES:

1. Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager.
2. All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke. Valves must be full opening and suitable for high pressure mud service.
3. Controls to be of standard design and each marked, showing opening and closing position.
4. Chokes will be positioned so as not to hamper or delay changing of choke beans. Replaceable parts for adjustable choke, other bean sizes, retainers, and choke wrenches to be conveniently located for immediate use.
5. All valves to be equipped with handwheels or handles ready for immediate use.
6. Choke lines must be suitably anchored.
7. Handwheels and extensions to be connected and ready for use.
8. Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency.
9. All seamless steel control piping (3000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted.
10. Casinghead connections shall not be used except in case of emergency.
11. Do not use kill line for routine fill-up operations.