STATE OF NEW MEXICO

ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION

AZTEC DISTRICT OFFICE

BRUCE KING
GOVERNOR

ANITA LOCKWOOD
CABINET SECRETARY

1000 RIO BRAZOS ROAD
AZTEC, NEW MEXICO 87410
(505) 334-6178

Date: 1/19/93

Oil Conservation Division
P.O. Box 2088
Santa Fe, NM 87504-2088

RE: Proposed MC_____
Proposed NSL_____
Proposed WFX_____
Proposed NSP_____
Proposed DHC X
Proposed SWD_____
Proposed PMX_____
Proposed DD_____

Gentlemen:

I have examined the application received on 12/22/92

for the Sexco Keys Com #1
OPERATOR LEASE & WELL NO.

N-32 29N-10W and my recommendations are as follows:
UL-S-T-R

Approve

Yours truly,

Texaco Exploration and Production Inc
3300 N Butler
Farmington NM 87401

December 3, 1992

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT
OIL CONSERVATION DIVISION
PO BOX 2088
STATE LAND OFFICE BUILDING
SANTA FE, NEW MEXICO 87504

Attention: Michael E. Stogner
Chief Hearing Officer/Engineer

RE: **Application for exception to NMOCD Rule 303-A:Downhole Commingle State of New Mexico Keys Unit No. 1:1120' FSL & 1680' FWL (Unit N) Sec. 32-T29N-R10W, NMPM, San Juan County, New Mexico**

Dear Mr. Stogner:

Texaco respectfully requests administrative approval to downhole commingle the Armenta Gallup Oil Pool and Basin Dakota Gas Pool within the referenced well. Approval of this application would require an exception to NMOCD Rule 303-A. Texaco has notified all offset operators to the referenced spacing unit. Please find attached, the return receipt cards signed by each operator.

Production methods are limited due to the 4-1/2" production casing the well is completed with. This size of casing does not offer sufficient room to run adequately sized tubing strings to each formation. The downhole commingling of these zones will offer an economical method of production without reservoir damage, waste of reserves, or violation of correlative rights.

If you have any questions concerning this matter please contact Mr. Darren Segrest at (505) 325-4397. Your attention to this matter is greatly appreciated.

Sincerely,

Rachael Heineli/THT

Ted A. Tipton
AREA MANAGER

RECEIVED
DEC 22 1992
OIL CON. DIV.
DIST. 3

DBS/s

Attachments
NMOCD - Aztec
file

Application for Exception to Rule 303-SEGREGATION OF PRODUCTION FROM POOLS

D. REQUIREMENTS

(1) Name and address of the operator.

Texaco Exploration and Production Inc.
3300 N. Butler Suite 100
Farmington, NM. 87401

(2) Lease name, well number, well location, name of the pools to be commingled.

Lease name: State of New Mexico Keys Unit
Well number: 1
Well location: 1120' FSL & 1680' FWL, Unit "N"
Sec. 32. T29N-R10W, NMPM
San Juan County, New Mexico
Pools commingled: Armenta, Gallup
Basin, Dakota

(3) A plat of the area showing the acreage dedicated to the well and the ownership of all offsetting leases.

Attached. **(attachment I)**

(4) A current (within 30 days) 24-hour productivity test on Division Form C-116 showing the amount of oil, gas, and water produced from each zone.

Attached. **(attachment II)**

(5) A production decline curve for both zones showing that for a period of at least one year a steady rate of decline has been established for each zone which will permit a reasonable allocation of the commingled production to each zone for statistical purposes. (This requirement may be dispensed with in the case of a newly completed or recently completed well which gas little of no production history. However, a complete resume of the well's completion history including description of treating, testing, etc., of each zone, and a prognostication of future production from each zone shall be submitted.)

Dakota completion: Decline curve attached, well has effective annual decline of 11.5% and a calculated GOR of 125,000 $^{SCF}/_{STB}$. **(attachment III)**

Gallup completion: New completion, no production history available. The Armenta Gallup formation was perforated and stimulated in two stages. On September 11, 1992 the lower Gallup was perforated from 5680'-5705' using 4 JSPF. The fluid was swabbed off the perforated interval and the lower Gallup was flow tested through a 1/4" orifice plate. The gas volume was too small to measure. The interval was acidized using 16.6 BBL of 15% HCl. The interval was again swabbed dry and flow tested through a 1/4" orifice plate. The completion was measured at five pounds differential (21 MCFD) to atmosphere. This rate declined to 2.5 pounds differential (5 MCFD). The well was then fractured treated using 46,000 gallons of cross linked gel and 41,600 pounds of 20/40 Brady sand. A retrievable bridge plug was set above the lower Gallup perforations and the Gallup was perforated from 5440'-5460' using 4 JSPF. This interval was acidized using 23 BBLS of 15% HCl. Following the acid treatment the interval was fractured treated using 53,900 gallons of cross linked gel and 87,700 pounds of 20/40 Brady sand. The

retrievable bridge plug set above the lower Gallup interval was removed from the well and both intervals were flow tested together at 170 MCFD/10 BOPD/6 BWPD. The well is currently shut-in awaiting final production equipment and regulatory approvals.

(6) Estimated bottomhole pressure for each artificially lifted zone. A current (within 30 days) measured bottom hole pressure for each zone capable of flowing.

Dakota completion: 502 psi **(attachment IV)**
Gallup completion: 1225 psi **(attachment V)**

The Gallup P_{BH} was obtained using a bottomhole pressure recording device. The Dakota P_{BH} was calculated using a seven day shut-in pressure, read at the surface. Because of the rapid drawdown the Armenta Gallup will exhibit following the initial production, the pressure differential between the zones will not present a crossflow problem. The proposed production method is to run a standing valve, tailpipe and packer between the Dakota and Gallup formations, with a profile nipple and sliding sleeve located above the packer. This will keep all Gallup fluids off the Dakota formation. In addition this completion will allow a blanking plug to be installed between the zones in the case of any extended shut-in periods.

(7) A description of the fluid characteristics of each zone showing that the fluids will not be incompatible in the wellbore.

The fluids have no abnormal components that would prohibit commingling, or promote the creation of emulsions or scale (see attached produced water analysis).

(8) A computation showing that the value of the commingled production will not be less than the sum of the values of the individual streams.

Dakota Production		Gallup Production	
Oil, BOPD	1	Oil, BOPD	10
Gas, MCFD	125	Gas, MCFD	170
Water, BWPD	2	Water, BWPD	6

The combined production from the Gallup-Dakota formations will be approximately 285 MCFD/11 BOPD/8 BWPD. The calculated incremental pressure drop throughout the tubing string is 17 psi, or an increase of 5 %. This increase in pressure will not offer a significant restriction in production.

(9) A formula for the allocation of production to each of the commingled zones and a description of the factors or data used in determining such formula.

Monthly production from the Basin Dakota Gas Pool is proposed to be calculated using the following formula:

$Q_2=Q_1(1-D)^n$ MCFD **equation (I)**

Where: Q_2= future production rate MCFD
Q_1= current production rate MCFD
D = effective in %/yr, from decline curve
n = years into the future to Q_2 from Q_1

Oil and water production will be calculated using the existing GLR

and GOR of the Dakota formation.

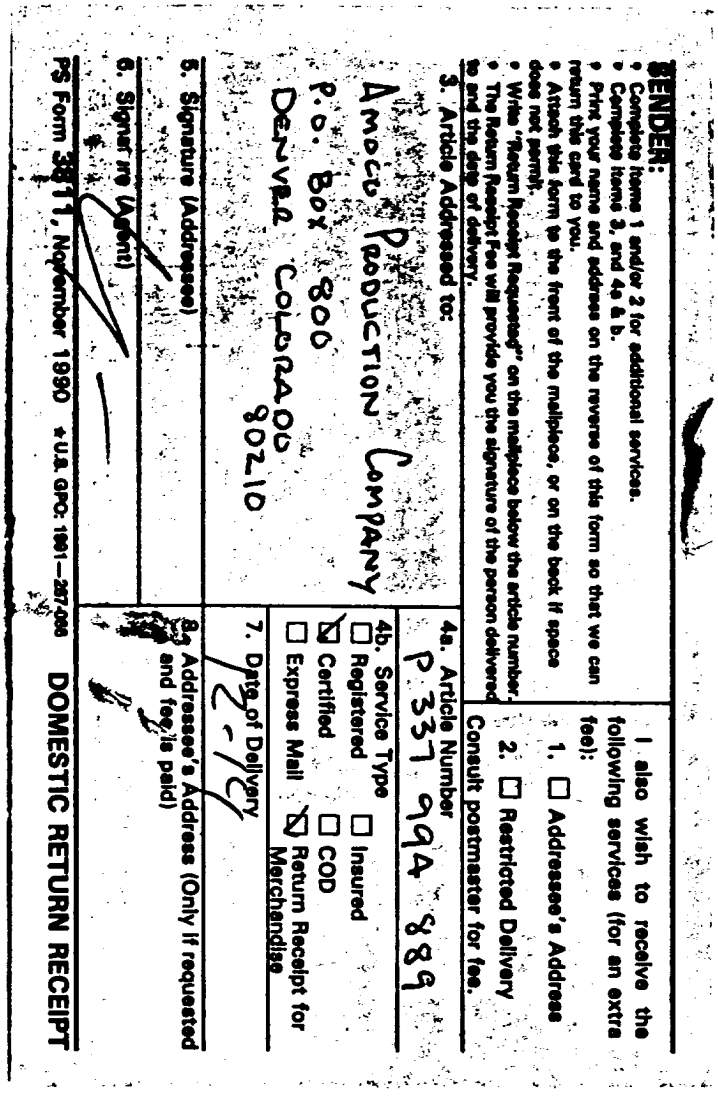
Any oil, gas and water production above what is calculated by equation (I) shall be attributed to the Armenta Gallup Oil Pool.

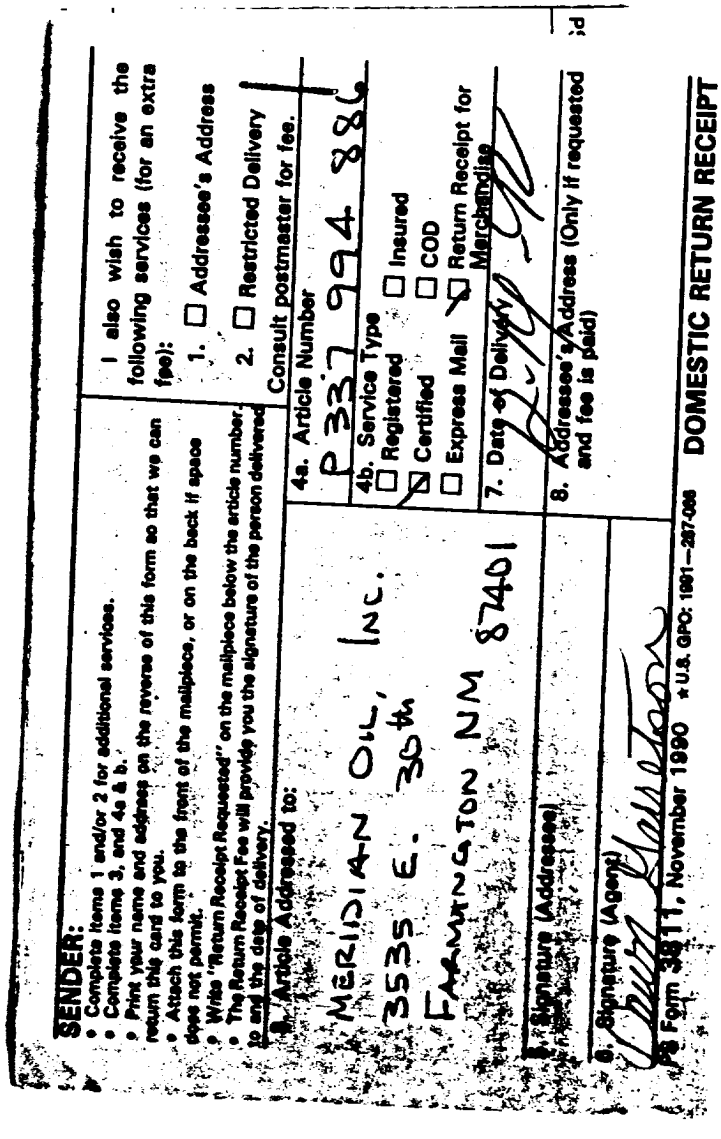
(10) A statement that all offset operators and, in the case of a well on federal land, the United States Bureau of Land Management, have been notified in writing of the proposed commingling.

All offset operators have been notified. Please find attached, signed return receipt cards from each operator. The offsetting operators are:

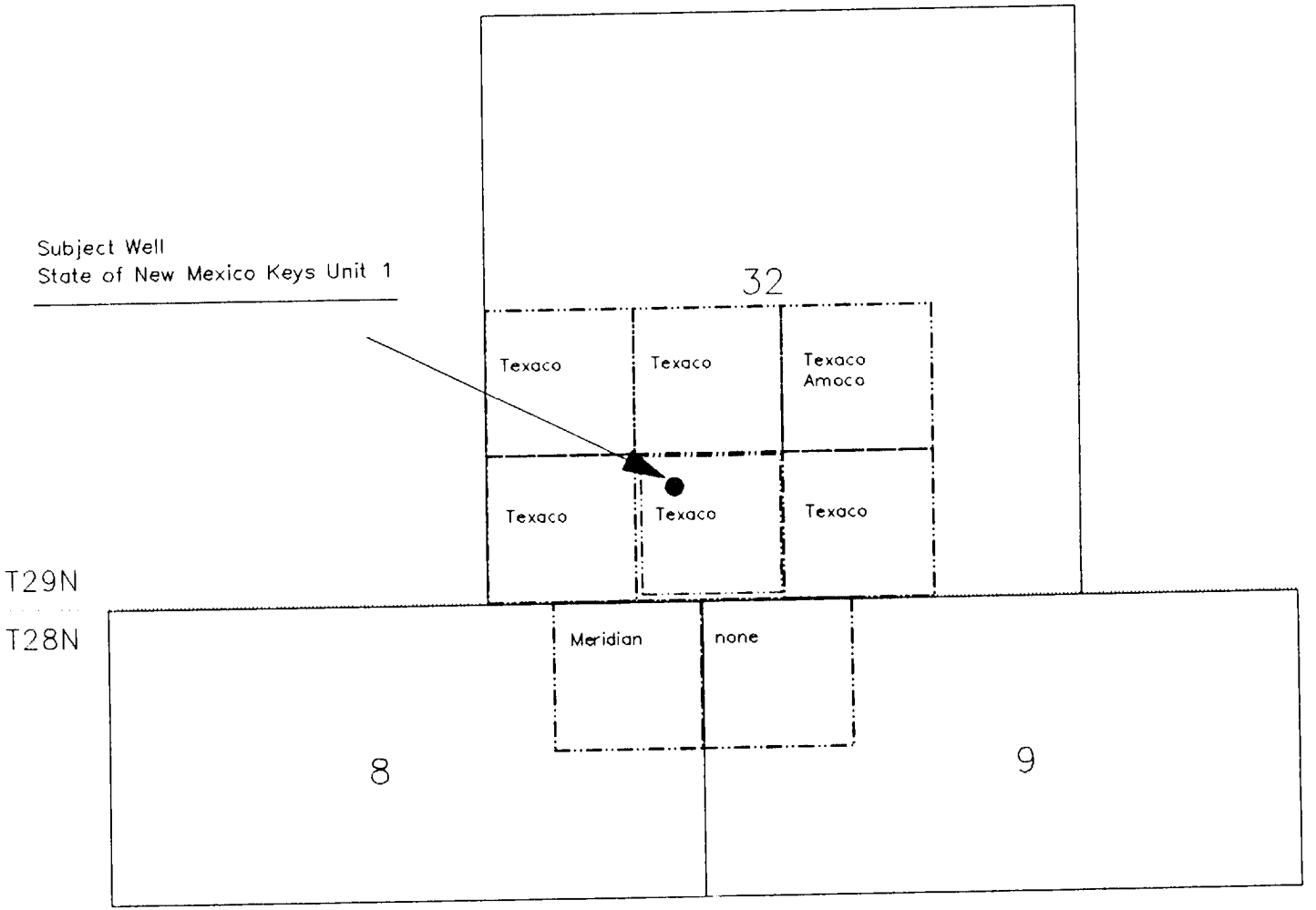
Amoco Production Company
P. O. Box 800
Denver, Colorado 80201

Meridian Oil, Inc.
3435 E. 30th
Farmington, New Mexico 87401





Offset Operators
State of New Mexico Keys Unit 1
Sec 32-T29N-R10W



T28N-R10W is a non-standard Township-Range

mit 2 copies to Appropriate
trict Office.
STRICT I
). Box 1980, Hobbs, NM 88240
STRICT II
). Drawer DD, Artesia, NM 88210
STRICT III
)0 Rio Brazos Rd., Aztec, NM 87410

State of New Mexico
Energy, Minerals and Natural Resources Department

OIL CONSERVATION DIVISION

P.O. Box 2088
Santa Fe, New Mexico 87504-2088

Form C-116
Revised 1/1/89

Attachment II

GAS - OIL RATIO TEST

rator: exaco Exploration and Production Inc.
ress: 300 N. Butler Ste. 100 Farmington, NM 87401

Pool: Armenta (Gallup) / Basin (Dakota)
County: San Juan
TYPE OF TEST - (X): Scheduled [ ] Completion [ ] Special [X]

LEASE NAME	WELL NO.	LOCATION U	S	T	R	DATE OF TEST	STATUS	CHOKE SIZE	TBG. PRESS.	DAILY ALLOW-ABLE	LENGTH OF TEST HOURS	PROD. DURING TEST WATER BBLS.	GRAV. OIL	OIL BBLS.	GAS M.C.F.	GAS - OIL RATIO CU.FT/BBL.
Keys Com (Gallup)	1	N	32	29	10	9/15/92		1/2"			72	6	48	10	170	17000
(Dakota)												2	58	1	125	125000

structions:

During gas-oil ratio test, each well shall be produced at a rate not exceeding the top unit allowable for the pool in ich well is located by more than 25 percent. Operator is encouraged to take advantage of this 25 percent tolerance in ler that well can be assigned increased allowables when authorized by the Division.

Gas volumes must be reported in MCF measured at a pressure base of 15.025 psia and a temperature of 60° F. ecific gravity base will be 0.60.

Report casing pressure in lieu of tubing pressure for any well producing through casing.

See Rule 301, Rule 1116 & appropriate pool rules.)

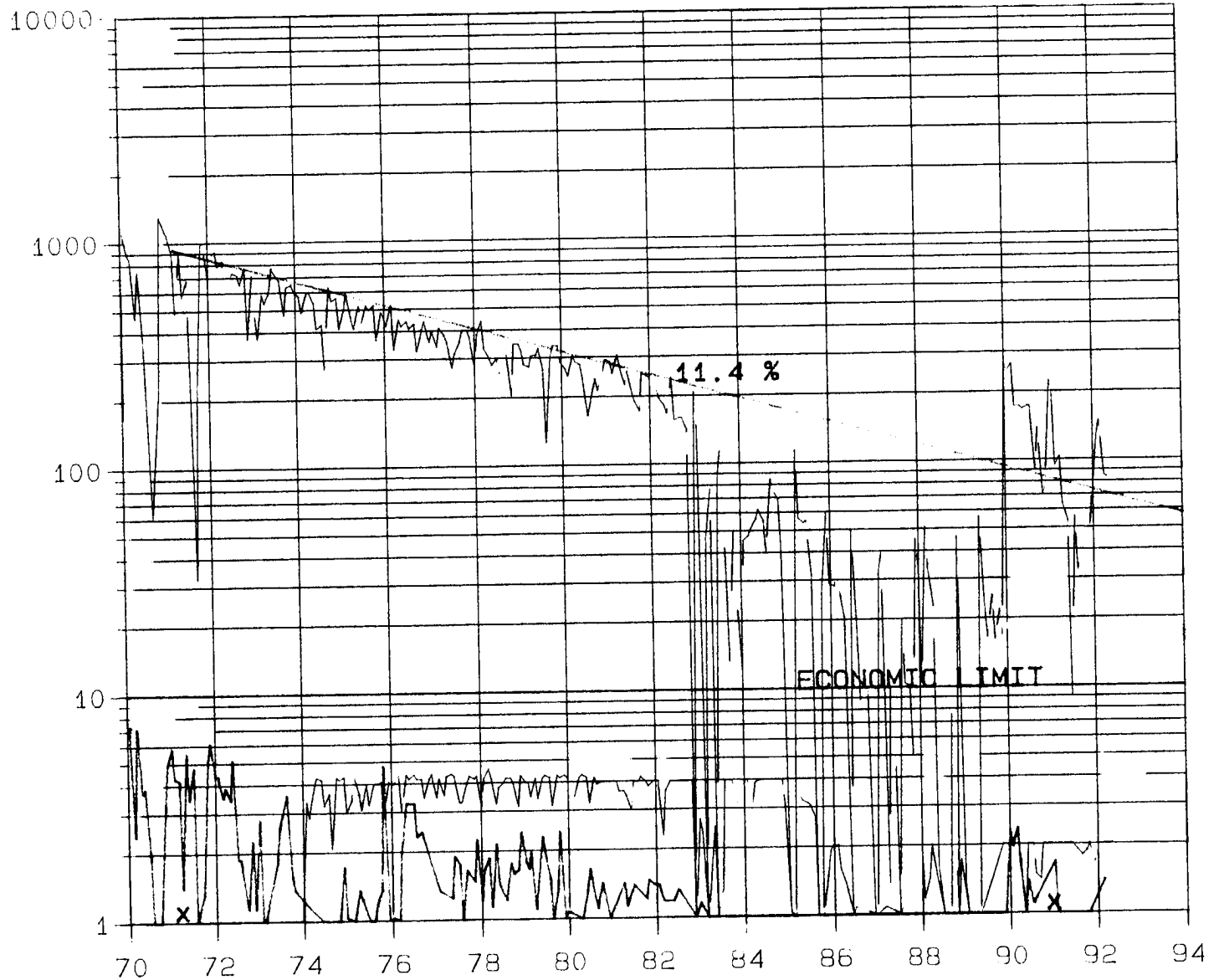
I hereby certify that the above information is true and complete to the best of my knowledge and belief.

Signature

Printed name and title

Date Telephone No.

KEYS COM - 001



LEASE DATA
LSE 389500
FLD 4100
OPER 93322
ZONE 602
29N-10W-32
COUNTY 045
STATE 30

STATUS 1-92
CO 20 MBO
CG 3723 MMCF
BOPD 1
BWPD 2
MCFPD 83
WELLS 1
CI 0 MBWI
BWIPD 0

RATE TIME
OIL 1 MBO
GAS 239 MMCF
IP 90 MCFPD
EL 10 MCFPD
D 0.115
YIELD 5
R/P 8 YEARS
RD 1991.00

P/Z GAS WELL RESERVES WORKSHEET INPUT2

(ALL DATA PRECEDED BY AN * IS TO BE INPUTED BY THE AREA)

GENERAL DATA

*LEASE & WELL NUMBER KEYS COM # 1

*FIELD/RESERVOIR BASIN DAKOTA

*RRC DISTRICT 3 *RRC NUMBER E 3149

*BEGIN. DATE SI TEST 4-3-92 * END. DATE SHUT-IN TEST 4-10-92

* SHUT-IN HOURS 168 MAJOR FIELD X MINOR FIELD

* CSG PRESS BEFORE SI 402 PSIA * SHUT-IN CSG PRESS 487 PSIA

INPUT DATA

1. PRESENT CUM. GAS PRODUCTION (MMCF)
   MCF

*2. CURRENT FLOW RATES PRIOR TO SHUT-IN TEST
   130 MCF/DAY 0.6 BBLS COND/DAY 2 BW/DAY

3. GAS FLOW RATE AT ECONOMIC LIMIT (MMCF/DAY)
   MCF/DAY

*4. SHUT-IN WELLHEAD PRESSURE (PSIA)
   487 PSIA

*5. FLOWING WELLHEAD PRESSURE (PSIA) PRIOR TO SHUT-IN TEST
   350 PSIA

*6. WELLHEAD PRESSURE AT ECONOMIC LIMIT (PSIA)
   337 PSIA

7. TEMPERATURE GRADIENT IN DEGREES F/100 FEET
   DEGREES F/100 FEET

*8. TUBING I. D. (IN) FOR 1ST STRING (TOP STRING)
   1.995 INCHES

*9. TUBING LENGTH FOR 1ST STRING. (TOP STRING)
   6368 FEET

*18. MID-PERF DEPTH (FEET)
   6376 FEET

*19. GAS-OIL RATIO (SCF/STB)
   216,000 SCF/STB

*20. GAS GRAVITY (AIR=1.0)
   0.681

*21. CONDENSATE GRAV. (API)
   '58 @ 60 DEGREES API

CALCULATED OUTPUT

BHP (SHUT-IN)

Z FACTOR (SHUT-IN)

ABANDONMENT RESERVOIR PRESSURE/ECON. LMT Z FACTOR

SWL/8-22-86

(REMEMBER; PSIA = PSIG + 12.0)

1. If well is on compression use compressor suction pressure rather than sales line pressure. Also, indicate on the form that the well is on compression.

HALLIBURTON RESERVOIR SERVICES
WELL TEST REPORT DISTRIBUTION LIST

COMPANY: TEXACO PROD. INC.

WELL: KEYS UNIT #1

AREA: SAN JUAN COUNTY, N.M.

TEST: FLOW/BUILD-UP TEST

DATE: SEPTEMBER 18 - 25 1992

Date: 18-SEP-92 Ticket No: 005230 Page No: 1.2

TEST PERIOD SUMMARY

Gauge No.: 76827 Depth: 5697.00 ft Blanked off: No

ID	PERIOD	DESCRIPTION	PRESSURE (psi)	DURATION (min)
A	1	Start Build-up	161.23	
B		End Build-up	1225.34	9557.47

NOTE: for Pressure vs. Time Plot, see next page.

Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: MEX FED K1 (OFFSET)
Lab #: 1	Formation: DAKOTA
Date: 11/12/92	Depth: 5200

Unichem Intl. Water Analysis Report

Sum +	mg/L	meq/L	Sum -	mg/L	meq/L
Potassium	0.0	0.00	Sulfate	0.0	0.00
Sodium	557.0	24.23	Chloride	520.0	14.67
Calcium	9.0	0.45	Carbonate	0.0	0.00
Magnesium	0.0	0.00	Bicarbonate	610.0	10.00
Iron	0.9	0.05	Hydroxide	0.0	0.00
Barium	0.1	0.00	-	0.0	0.00
Strontium	0.0	0.00	-	0.0	0.00
CATIONS	567.0	24.73	ANIONS	1,130.0	24.67

Solids

Total Dissolved Solids @180C	1,696 mg/L
Total Solids, calculated less carbonate	1,392 mg/L
Total Solids, calculated	1,697 mg/L
Total Solids, NaCl equivalents	1,300 mg/L

System Conditions

System Operation	Normal
Sample Temperature, 'F	90 F
Sample pH, standard units	7 Units

Dissolved Gases

Dissolved Oxygen	0.0 ppm
Carbon Dioxide	0.0 mg/L
Total Sulfide, (TS)	0.0 mg/L
Sulfide Ion, (S)	0 mg/L
Dissolved Hydrogen Sulfide, (TS-S)	0 mg/L

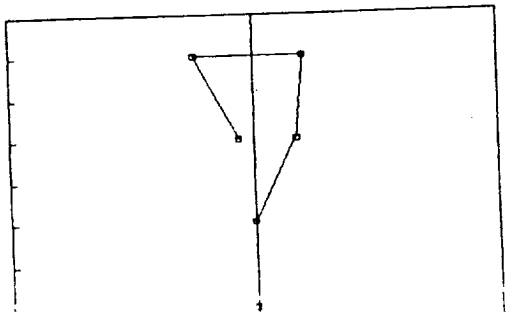
Other Properties

Specific Gravity, measured	1.0010
Specific Gravity, calculated	1.0013
Resistivity, measured	0 ohm/m^3
Ionic strength	0.025

Microbiological

Sulfate Reducing Bacteria	nd
Aerobic Bacteria	nd

Water Analysis Pattern



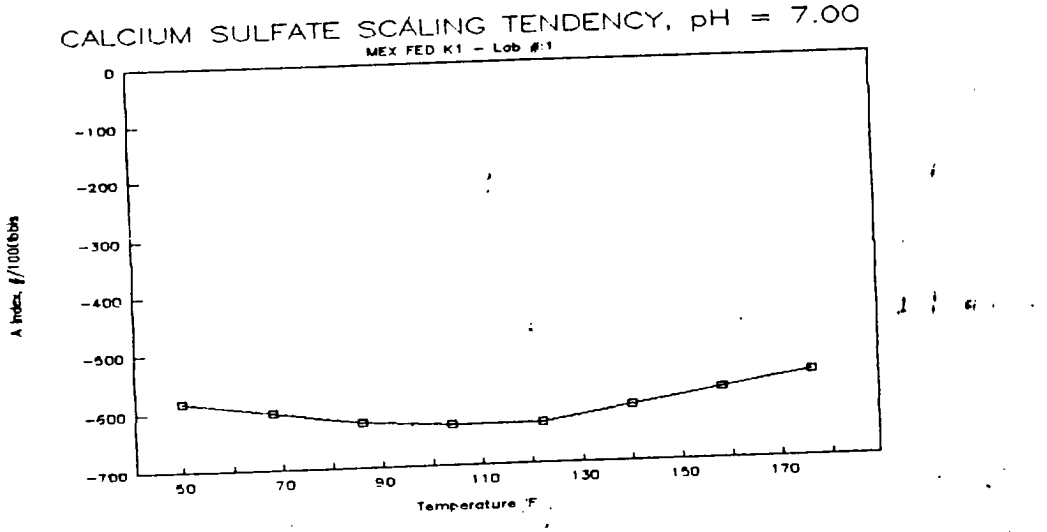
Approved: T.J. MOORE
11/30/92 v2.00

Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: MEX FED K1
Lab #: 1	Formation: DAKOTA
Date: 11/12/92	Depth: 5200

Unichem Intl. Skillman Method

Calcium Sulfate Scale Precipitation Calculations

Temperature C	Temperature F	SOLUBILITY Actual		Calculated		S Index		A Index
10	50	0.00	-	24.46	=	-24.46		-583
20	68	0.00	-	25.26	=	-25.26		-602
30	86	0.00	-	26.03	=	-26.03		-621
40	104	0.00	-	26.39	=	-26.39		-629
50	122	0.00	-	26.34	=	-26.34		-628
60	140	0.00	-	25.33	=	-25.33	*	-604
70	158	0.00	-	24.29	=	-24.29		-579
80	176	0.00	-	23.20	=	-23.20		-553



NOTE: Skillman Method Calcium Sulfate 'S Index'

- indicates undersaturation. Scale formation negative.

0 indicates the water is at saturation point. Scale unlikely.

+ indicates supersaturation. A positive scaling condition exists.

NOTE: A Index; worst possible case. Assumes 100% precipitation.

- Units = pounds of scale produced / 1000 bbls. of water.
- A Index =< 0 Scale formation negative.
- A Index > 0 Scale formation positive.

Approved: T.J. MOORE

11/30/92

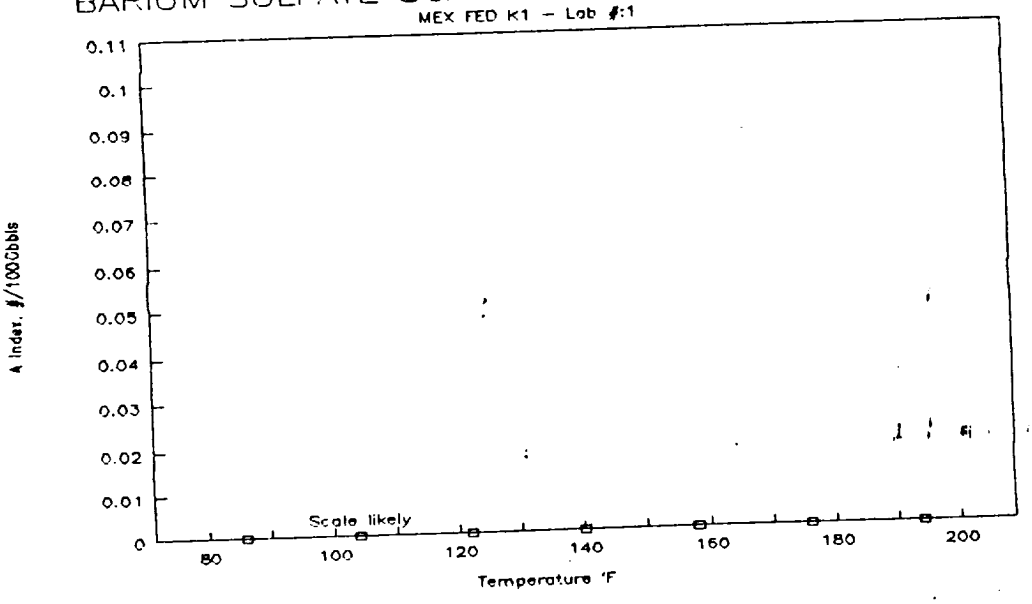
Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: MEX FED K1
Lab #: 1	Formation: DAKOTA
Date: 11/12/92	Depth: 5200

Unichem Intl. Skillman Method

Barium Sulfate Scale Precipitation Calculations

Temperature C	Temperature F	SOLUBILITY Actual		Calculated		S Index		A Index
30	86	0.00000	-	0.09813	=	-0.09813		ND
40	104	0.00000	-	0.10402	=	-0.10402		ND
50	122	0.00000	-	0.10911	=	-0.10911		ND
60	140	0.00000	-	0.11278	=	-0.11278	*	ND
70	158	0.00000	-	0.11593	=	-0.11593		ND
80	176	0.00000	-	0.11862	=	-0.11862		ND
90	194	0.00000	-	0.12040	=	-0.12040		ND

BARIUM SULFATE SCALING TENDENCY, pH = 7.00



NOTE: Skillman Method Barium Sulfate 'S Index'

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- Units = pounds of scale produced / 1000 bbls. of water.
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- A Index > 0 Scale formation positive.

Approved: T.J. MOORE

11/30/92

v2.00

Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: KEY COM #1
Lab #: 1	Formation: GALLUP
Date: 10/20/92	Depth: 5200

Unichem Intl. Water Analysis Report

Sum +	mg/L	meq/L	Sum −	mg/L	meq/L
Potassium	0.0	0.00	Sulfate	30.0	0.62
Sodium	8,091.0	351.94	Chloride	14,000.0	394.89
Calcium	780.0	38.92	Carbonate	0.0	0.00
Magnesium	214.0	17.60	Bicarbonate	732.0	12.00
Iron	1.2	0.06	Hydroxide	0.0	0.00
Barium	6.1	0.09	-	0.0	0.00
Strontium	0.0	0.00	-	0.0	0.00
CATIONS	9,092.3	408.61	ANIONS	14,762.0	407.51

Solids

Total Dissolved Solids @180C	23,850 mg/L
Total Solids, calculated less carbonate	23,488 mg/L
Total Solids, calculated	23,854 mg/L
Total Solids, NaCl equivalents	22,592 mg/L

System Conditions

System Operation	Normal
Sample Temperature, 'F	90 F
Sample pH, standard units	6.8 Units

Dissolved Gases

Dissolved Oxygen	0.0 ppm
Carbon Dioxide	0.0 mg/L
Total Sulfide, (TS)	0.0 mg/L
Sulfide Ion, (S)	0 mg/L
Dissolved Hydrogen Sulfide, (TS-S)	0 mg/L

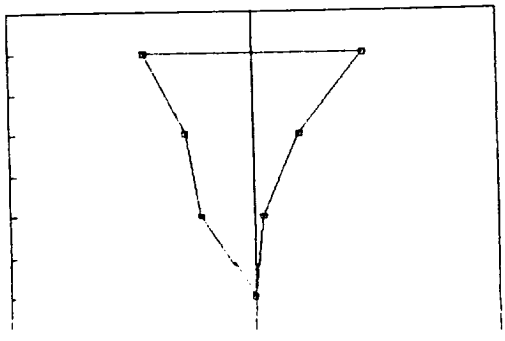
Other Properties

Specific Gravity, measured	1.0170
Specific Gravity, calculated	1.0172
Resistivity, measured	0 ohm/m^3
Ionic strength	0.437

Microbiological

Sulfate Reducing Bacteria	nd
Aerobic Bacteria	nd

Water Analysis Pattern



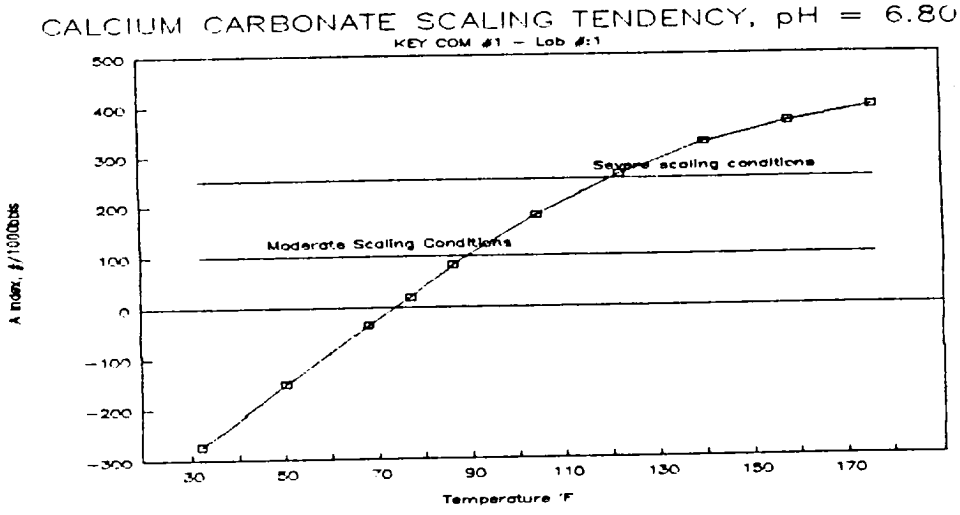
Approved: T.J. MOORE
11/30/92 v2.00

Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: KEY COM #1
Lab #: 1	Formation: GALLUP
Date: 10/20/92	Depth: 5200

Unichem Intl. Stiff–Davis Technique

Calcium Carbonate Scale Precipitation Calculations

Temperature C	Temperature F	Stiff Davis Index	Aggressivity Index
0	32	-0.36	-273
10	50	-0.22	-152
20	68	-0.05	-34
25	77	0.03	19
30	86	0.15	82
40	104	0.37	179
50	122	0.63	260
60	140	0.92 *	324 *
70	158	1.23	366
80	176	1.57	393



NOTE: Stiff Davis Index

- indicates undersaturation. Scale formation negative.

0 indicates the water is at saturation point. Scale unlikely.

+ indicates supersaturation. A positive scaling condition exists.

NOTE: A Index; worst possible case. Assumes 100% precipitation.

- Units = pounds of scale produced / 1000 bbls. of water.
- A Index =< 0 Scale formation negative.
- A Index > 0 Scale formation positive.

Approved: T.J. MOORE

11/30/92

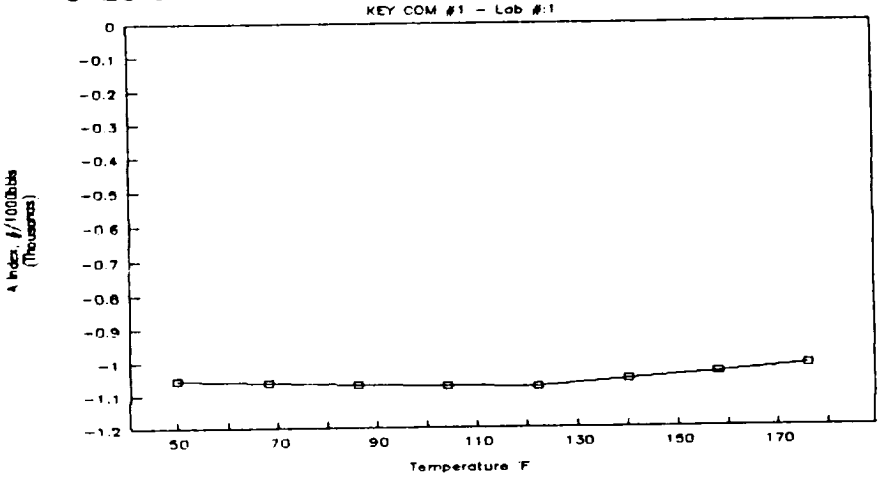
Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: KEY COM #1
Lab #: 1	Formation: GALLUP
Date: 10/20/92	Depth: 5200

Unichem Intl. Skillman Method

Calcium Sulfate Scale Precipitation Calculations

Temperature		SOLUBILITY				S		A
C	F	Actual		Calculated		Index		Index
10	50	0.62	-	44.82	=	-44.20		-1054
20	68	0.62	-	45.11	=	-44.49		-1060
30	86	0.62	-	45.40	=	-44.77		-1067
40	104	0.62	-	45.59	=	-44.96		-1072
50	122	0.62	-	45.68	=	-45.06		-1074
60	140	0.62	-	44.79	=	-44.16	*	-1053
70	158	0.62	-	43.88	=	-43.25		-1031
80	176	0.62	-	42.95	=	-42.33		-1009

CALCIUM SULFATE SCALING TENDENCY, pH = 6.80



NOTE: Skillman Method Calcium Sulfate 'S Index'

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0 indicates the water is at saturation point. Scale unlikely.

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NOTE: A Index; worst possible case. Assumes 100% precipitation.

- Units = pounds of scale produced / 1000 bbls. of water.
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Approved: T.J. MOORE

11/30/92

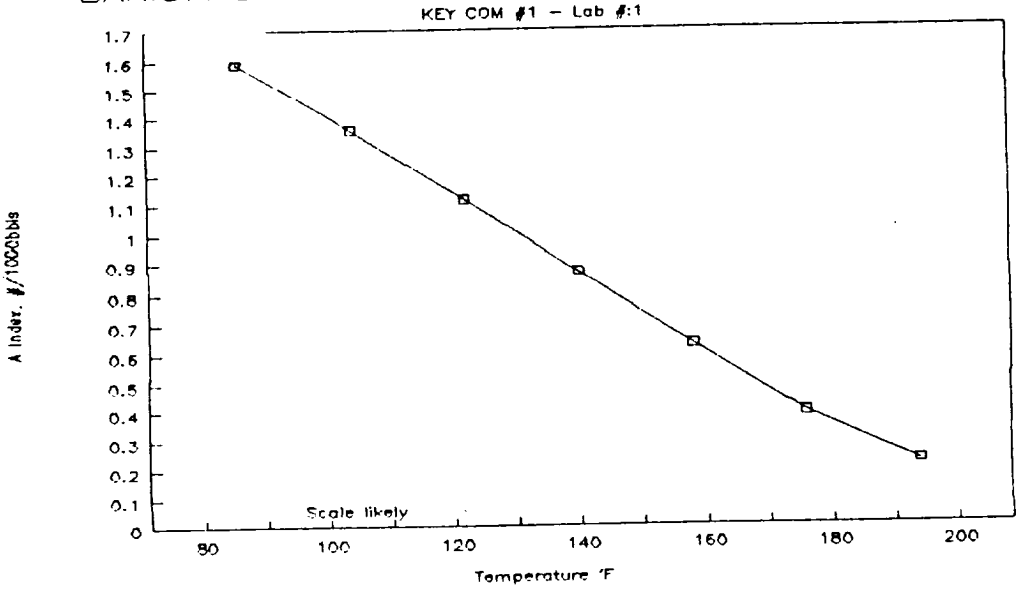
Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: KEY COM #1
Lab #: 1	Formation: GALLUP
Date: 10/20/92	Depth: 5200

Unichem Intl. Skillman Method

Barium Sulfate Scale Precipitation Calculations

Temperature C	Temperature F	SOLUBILITY Actual		Calculated		S Index		A Index
30	86	0.08883	-	0.04999	=	0.03884		1.587
40	104	0.08883	-	0.05562	=	0.03321		1.357
50	122	0.08883	-	0.06156	=	0.02727		1.114
60	140	0.08883	-	0.06755	=	0.02128	*	0.870
70	158	0.08883	-	0.07343	=	0.01541		0.630
80	176	0.08883	-	0.07920	=	0.00963		0.393
90	194	0.08883	-	0.08337	=	0.00546		0.223

BARIUM SULFATE SCALING TENDENCY, pH = 6.80



NOTE: Skillman Method Barium Sulfate 'S Index'

- indicates undersaturation. Scale formation negative.

0 indicates the water is at saturation point. Scale unlikely.

+ indicates supersaturation. A positive scaling condition exists.

NOTE: A Index; worst possible case. Assumes 100% precipitation.

- Units = pounds of scale produced / 1000 bbls. of water.
- A Index =< 0 Scale formation negative.
- A Index > 0 Scale formation positive.

Approved: T.J. MOORE

11/30/92

v2.00

Company: TEXACO EXPL. AND PROD.	
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: KEY COM #1
Lab #: 1	Formation: 25% DAK/ 75% GAL
Date: 10/20/92	Depth: 5200

Unichem Intl. Water Analysis Report

Sum +	mg/L	meq/L	Sum -	mg/L	meq/L
Potassium	0.0	0.00	Sulfate	22.5	0.47
Sodium	6,208.0	270.03	Chloride	10,630.0	299.83
Calcium	587.5	29.32	Carbonate	0.0	0.00
Magnesium	161.0	13.24	Bicarbonate	700.0	11.47
Iron	1.1	0.06	Hydroxide	0.0	0.00
Barium	4.5	0.07	-	0.0	0.00
Strontium	0.0	0.00	-	0.0	0.00
CATIONS	6,962.1	312.72	ANIONS	11,352.5	311.77

Solids

Total Dissolved Solids @180C	18,315	mg/L
Total Solids, calculated less carbonate	17,965	mg/L
Total Solids, calculated	18,315	mg/L
Total Solids, NaCl equivalents	17,390	mg/L

System Conditions

System Operation	Normal	
Sample Temperature, 'F	90	F
Sample pH, standard units	7	Units

Dissolved Gases

Dissolved Oxygen	0.0	ppm
Carbon Dioxide	0.0	mg/L
Total Sulfide, (TS)	0.0	mg/L
Sulfide Ion, (S)	0	mg/L
Dissolved Hydrogen Sulfide, (TS-S)	0	mg/L

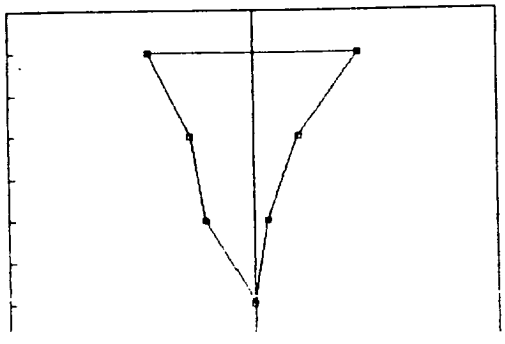
Other Properties

Specific Gravity, measured	1.0130	
Specific Gravity, calculated	1.0134	
Resistivity, measured	0	ohm/m^3
Ionic strength	0.334	

Microbiological

Sulfate Reducing Bacteria	nd
Aerobic Bacteria	nd

Water Analysis Pattern



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County: SAN JUAN	Field: SAN JUAN
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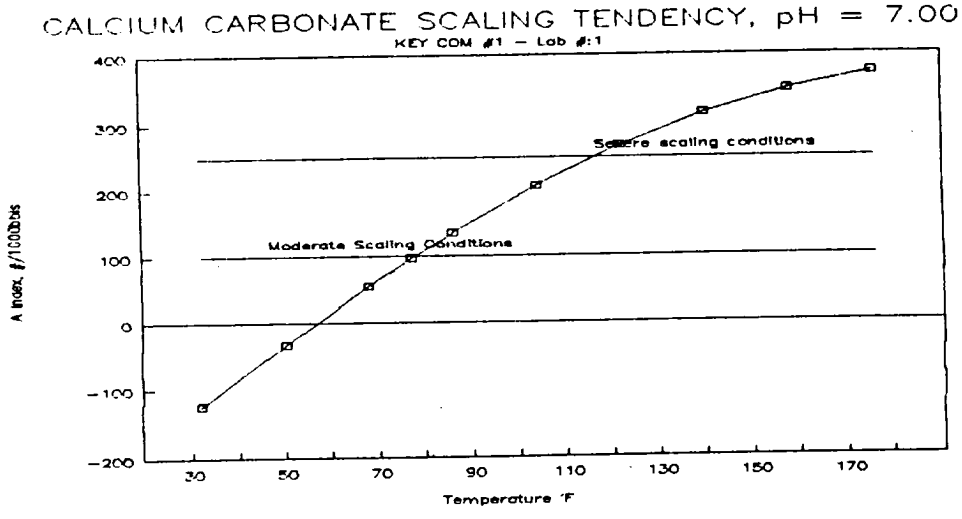
Lab #: 1	Formation: 25% DAK/ 75% GAL
Date: 10/20/92	Depth: 5200

Unichem Intl. Stiff–Davis Technique

Calcium Carbonate Scale Precipitation Calculations

Temperature C	Temperature F	Stiff Davis Index	Aggressivity Index
0	32	-0.21	-125
10	50	-0.06	-33
20	68	0.12	55
25	77	0.21	97
30	86	0.32	136
40	104	0.54	208
50	122	0.79	267
60	140	1.07 *	314 *
70	158	1.37	349
80	176	1.70	373



NOTE: Stiff Davis Index

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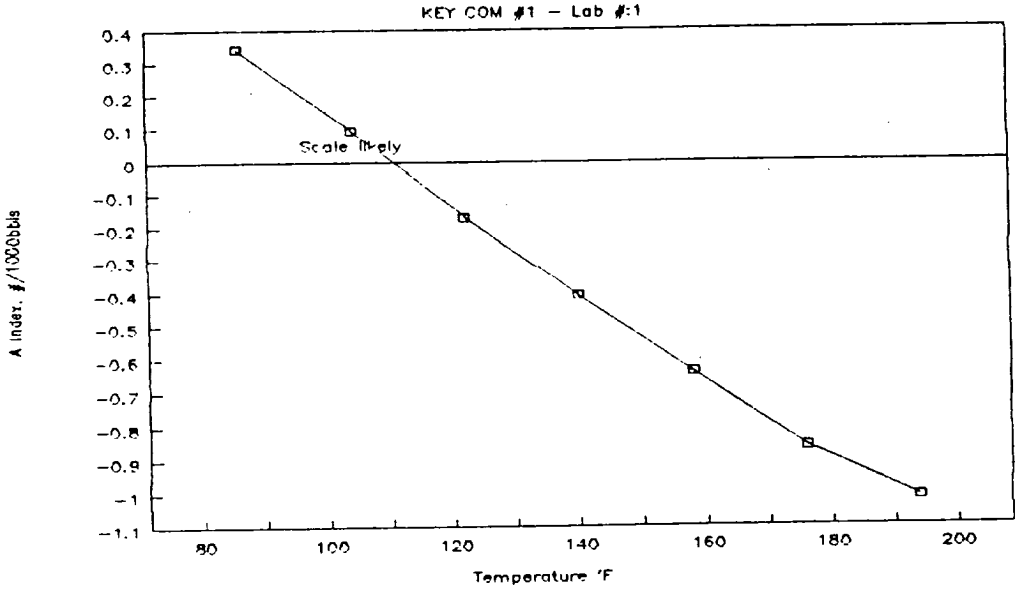
County: SAN JUAN	Field: SAN JUAN
State: NM	Location: KEY COM #1
Lab #: 1	Formation: 25% DAK/ 75% GAL
Date: 10/20/92	Depth: 5200

Unichem Intl. Skillman Method

Barium Sulfate Scale Precipitation Calculations

Temperature		SOLUBILITY				S		A
C	F	Actual		Calculated		Index		Index
30	86	0.06553	-	0.05713	=	0.00840		0.343
40	104	0.06553	-	0.06325	=	0.00228		0.093
50	122	0.06553	-	0.06972	=	-0.00419		-0.171
60	140	0.06553	-	0.07556	=	-0.01003	*	-0.410
70	158	0.06553	-	0.08121	=	-0.01568		-0.641
80	176	0.06553	-	0.08667	=	-0.02114		-0.864
90	194	0.06553	-	0.09035	=	-0.02482		-1.014

BARIUM SULFATE SCALING TENDENCY, pH = 7.00



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