10852854 9 SWD 4/9/01



YATES PETROLEUM CORPORATION

105 SOUTH FOURTH STREET
ARTESIA, NEW MEXICO 88210-2118
TELEPHONE (505) 748-1471



March 20, 2001

MAR 23 2001

State of New Mexico
OIL CONSERVATION DIVISION
2040 S. Pacheco Street
Santa Fe, NM 87505-5472

Dear Sir,

Enclosed please find a copy of form C-108 (Application for Authority to Inject) for the proposed Handicapper SWD #1 located in Unit B of Section 3-T10S-R26E, Chaves County, New Mexico. (30-005-63307)

Should you have any questions, please feel free to contact me at (505) 748-4182.

Sincerely,

James W. Pringle

James W. Pringle
Operations Engineer

JWP/th

Enclosure

STATE OF NEW MEXICO
ENERGY, MINERALS AND NATURAL RESOURCES DEPARTMENT

**OIL CONSERVATION DIVISION**
**2040 SOUTH PACHECO**
**SANTA FE, NEW MEXICO 87505**

FORM C-108
Revised 4-1-98

HANDICAPPER SWD #1

## APPLICATION FOR AUTHORIZATION TO INJECT

I. PURPOSE: _____Secondary Recovery _____Pressure Maintenance __X__Disposal _____Storage
Application qualifies for administrative approval? _____Yes _____No

II. OPERATOR: Yates Petroleum Corporation

ADDRESS: 105 South Fourth Street, Artesia, NM 88210

CONTACT PARTY: James W. Pringle PHONE: (505) 748-4182

III. WELL DATA: Complete the data required on the reverse side of this form for each well proposed for injection. Additional sheets may be attached if necessary.

IV. Is this an expansion of an existing project? _____Yes __X__No
If yes, give the Division order number authorizing the project: _____

MAR ?

V. Attach a map that identifies all wells and leases within two miles of any proposed injection well with a one-half mile radius circle drawn around each proposed injection well. This circle identifies the well's area of review.

VI. Attach a tabulation of data on all wells of public record within the area of review which penetrate the proposed injection zone. Such data shall include a description of each well's type, construction, date drilled, location, depth, record of completion, and a schematic of any plugged well illustrating all plugging detail.

VII. Attach data on the proposed operation, including:

1. Proposed average and maximum daily rate and volume of fluids to be injected;
2. Whether the system is open or closed;
3. Proposed average and maximum injection pressure;
4. Sources and an appropriate analysis of injection fluid and compatibility with the receiving formation if other than reinjected produced water; and,
5. If injection is for disposal purposes into a zone not productive of oil or gas at or within one mile of the proposed well, attach a chemical analysis of the disposal zone formation water (may be measured or inferred from existing literature, studies, nearby wells, etc.).

*VIII. Attach appropriate geologic data on the injection zone including appropriate lithologic detail, geologic name, thickness, and depth. Give the geologic name, and depth to bottom of all underground sources of drinking water (aquifers containing waters with total dissolved solids concentrations of 10,000 mg/l or less) overlying the proposed injection zone as well as any such sources known to be immediately underlying the injection interval.

IX. Describe the proposed stimulation program, if any.

*X. Attach appropriate logging and test data on the well. (If well logs have been filed with the Division, they need not be resubmitted).

*XI. Attach a chemical analysis of fresh water from two or more fresh water wells (if available and producing) within one mile of any injection or disposal well showing location of wells and dates samples were taken.

XII. Applicants for disposal wells must make an affirmative statement that they have examined available geologic and engineering data and find no evidence of open faults or any other hydrologic connection between the disposal zone and any underground sources of drinking water.

XIII. Applicants must complete the "Proof of Notice" section on the reverse side of this form.

XIV. Certification: I hereby certify that the information submitted with this application is true and correct to the best of my knowledge and belief.

NAME: James W. Pringle TITLE: Operations Engineer

SIGNATURE: James W. Pringle DATE: March 20, 2001

* If the information required under Sections VI, VIII, X, and XI above has been previously submitted, it need not be resubmitted. Please show the date and circumstances of the earlier submittal: _____

DISTRIBUTION: Original and one copy to Santa Fe with one copy to the appropriate District Office

III. WELL DATA

A. The following well data must be submitted for each injection well covered by this application. The data must be both in tabular and schematic form and shall include:

(1) Lease name; Well No.; Location by Section, Township and Range; and footage location within the section.

(2) Each casing string used with its size, setting depth, sacks of cement used, hole size, top of cement, and how such top was determined.

(3) A description of the tubing to be used including its size, lining material, and setting depth.

(4) The name, model, and setting depth of the packer used or a description of any other seal system or assembly used.

Division District Offices have supplies of Well Data Sheets which may be used or which may be used as models for this purpose. Applicants for several identical wells may submit a "typical data sheet" rather than submitting the data for each well.

B. The following must be submitted for each injection well covered by this application. All items must be addressed for the initial well. Responses for additional wells need be shown only when different. Information shown on schematics need not be repeated.

(1) The name of the injection formation and, if applicable, the field or pool name.

(2) The injection interval and whether it is perforated or open-hole.

(3) State if the well was drilled for injection or, if not, the original purpose of the well.

(4) Give the depths of any other perforated intervals and detail on the sacks of cement or bridge plugs used to seal off such perforations.

(5) Give the depth to and the name of the next higher and next lower oil or gas zone in the area of the well, if any.

XIV. PROOF OF NOTICE

All applicants must furnish proof that a copy of the application has been furnished, by certified or registered mail, to the owner of the surface of the land on which the well is to be located and to each leasehold operator within one-half mile of the well location.

Where an application is subject to administrative approval, a proof of publication must be submitted. Such proof shall consist of a copy of the legal advertisement which was published in the county in which the well is located. The contents of such advertisement must include:

(1) The name, address, phone number, and contact party for the applicant;

(2) The intended purpose of the injection well; with the exact location of single wells or the Section, Township, and Range location of multiple wells;

(3) The formation name and depth with expected maximum injection rates and pressures; and,

(4) A notation that interested parties must file objections or requests for hearing with the Oil Conservation Division, 2040 South Pacheco, Santa Fe, New Mexico 87505, within 15 days.

NO ACTION WILL BE TAKEN ON THE APPLICATION UNTIL PROPER PROOF OF NOTICE HAS BEEN SUBMITTED.

---

NOTICE: Surface owners or offset operators must file any objections or requests for hearing of administrative applications within 15 days from the date this application was mailed to them.

YATES PETROLEUM CORPORATION

105 SOUTH FOURTH STREET
ARTESIA, NEW MEXICO 88210-2118
TELEPHONE (505) 748-1471



March 20, 2001

Tim Gum
State of New Mexico
OIL CONSERVATION DIVISION
811 South First Street
Artesia, NM 88210

Dear Mr. Gum,

Enclosed please find a copy of form C-108 (Application for Authority to Inject) for the proposed Handicapper SWD #1 located in Unit B of Section 3-T10S-R26E, Chaves County, New Mexico.

Should you have any questions, please feel free to contact me at (505) 748-4182.

Sincerely,

James W. Pringle

James W. Pringle
Operations Engineer

JWP/th

Enclosure

# C-108 Application for Authorization to Inject
## Yates Petroleum Corporation
## Handicapper AWI State #1
## B 3-10S-26E
## Chaves County, New Mexico

I. The purpose of completing this well is for disposal of produced Ordovician, Penn, Wolfcamp, and Abo water into the Ordovician.

II. Operator: Yates Petroleum Corporation
105 South Fourth Street
Artesia, NM 88210
James W. Pringle (505) 748-4182

III. Well Data: See Attachment A

IV. This is not an expansion of an existing project.

V. See attached map, Attachment B.

VI. There are no wells within the area of review penetrating the proposed injection zone.

VII. 1. Proposed average daily injection volume approximately 2,500 BWPD. Maximum daily injection volume approximately 5,000 BWPD.

2. This will be a closed system.

3. Proposed average injection pressure—1000 psi.
Proposed maximum injection pressure--1300 psi.

4. Sources of injected water would be produced water from the Ordovician, Penn, Wolfcamp, and Abo. (Attachment C)

5. See Attachment C.

VIII. The injection interval is Ordovician from 6,038'–6,268'.

Underground water sources of drinking water are in the Alluvial fill from surface to 400'.

IX. The proposed disposal interval may be acidized with 15-20% HCL acid.

X. Logs were filed at your office when the well was drilled. Any new logs run after completing will also be submitted to your office.

XI. There are 2 windmills that exist within a one mile radius of the subject location. Chemical analysis is attached. (Attachment D)

XII. Available engineering and geologic data have been examined and no evidence of open faults or hydrologic connection between the disposal zone and any underground sources of drinking water have been found.

XIII. Proof of notice

A. There are no surface owners or offset operators to notify. Yates Petroleum Corporation owns all rights.

B. Copy of legal advertisement attached. (Attachment E)

XIV. Certification is signed.

# Yates Petroleum Corporation
# Handicapper SWD #1
# B-3-10S-26E

## Attachment A
## Page 1

III. Well Data

A. 1. Lease Name/Location:
Handicapper SWD #1
B 3-10S-26E
660'FNL & 1980'FEL

2. Casing Strings:
a. Proposed well condition.
See Attachment A – Proposed Status.
8 5/8" 24#, J-55, ST&C at 1,108' (circ).
5 1/2" 15.50#, J-55, ST&C at 6,478'.
2 7/8" plastic-coated tubing w/nickel plated arrowset I packer at 6,000'±.

3. Propose to use Guiberson or Baker plastic-coated or nickel-plated packer set at 6,000±.

B. 1. Injection Formation: Ordovician

2. Injection interval into cased hole perforations 6,038'–6,268'.

3. Well was originally drilled as an exploratory Ordovician well. Well will be a Ordovician water disposal well when work is completed.

4. Next higher (shallower) oil or gas zone within 2 miles—Penn Clastics
Next lower (deeper) oil or gas zone within 2 miles—None

WELLNAME: Handicapper SWD #1 FIELD: Foor Ranch

LOCATION: 660' FNL & 1980' FEL, Sec 3, T10S, R26E, Chaves Co, NM

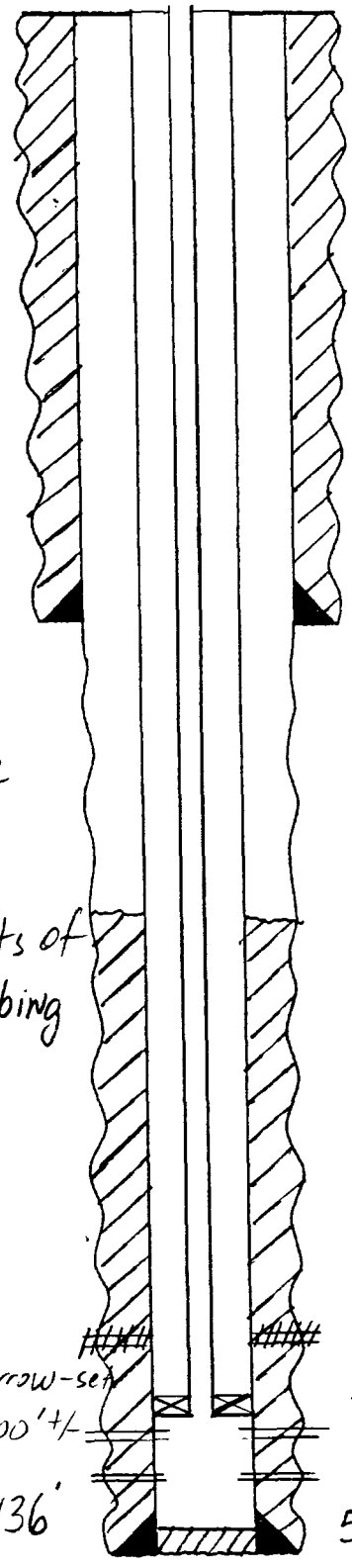
GL: 3834' ZERO: _____ AGL: _____ KB: 3,821'

SPUD DATE: 12/9/00 COMPLETION DATE: _____

COMMENTS: _____

| CASING PROGRAM | |
|---|---|
| SIZE/WT/GR/CONN | DEPTH SET |
| 8 5/8", 24.0 #/Ft, J-55, STC | 1,108' |
| | |
| 5 1/2", 15.50 #/Ft, J-55, STC | 6,478' |
| | |
| | |
| | |
| | |
| | |





12 1/4" hole

8 5/8" @ 1,108', CMTD w/ 700 SACKS
CMT CIRCULATED to surface

7 7/8" hole

TOC: 4,420' CBL

190 +/- joints of
2 7/8" IPC tubing

Wolfcamp
5,448' - 5,580'

Ordovician
6,038' - 6,268'

will squeeze w/ 200+- sacks of cement in several intervals

Nickel plated Arrow-set I packer @ 6,000' +/-

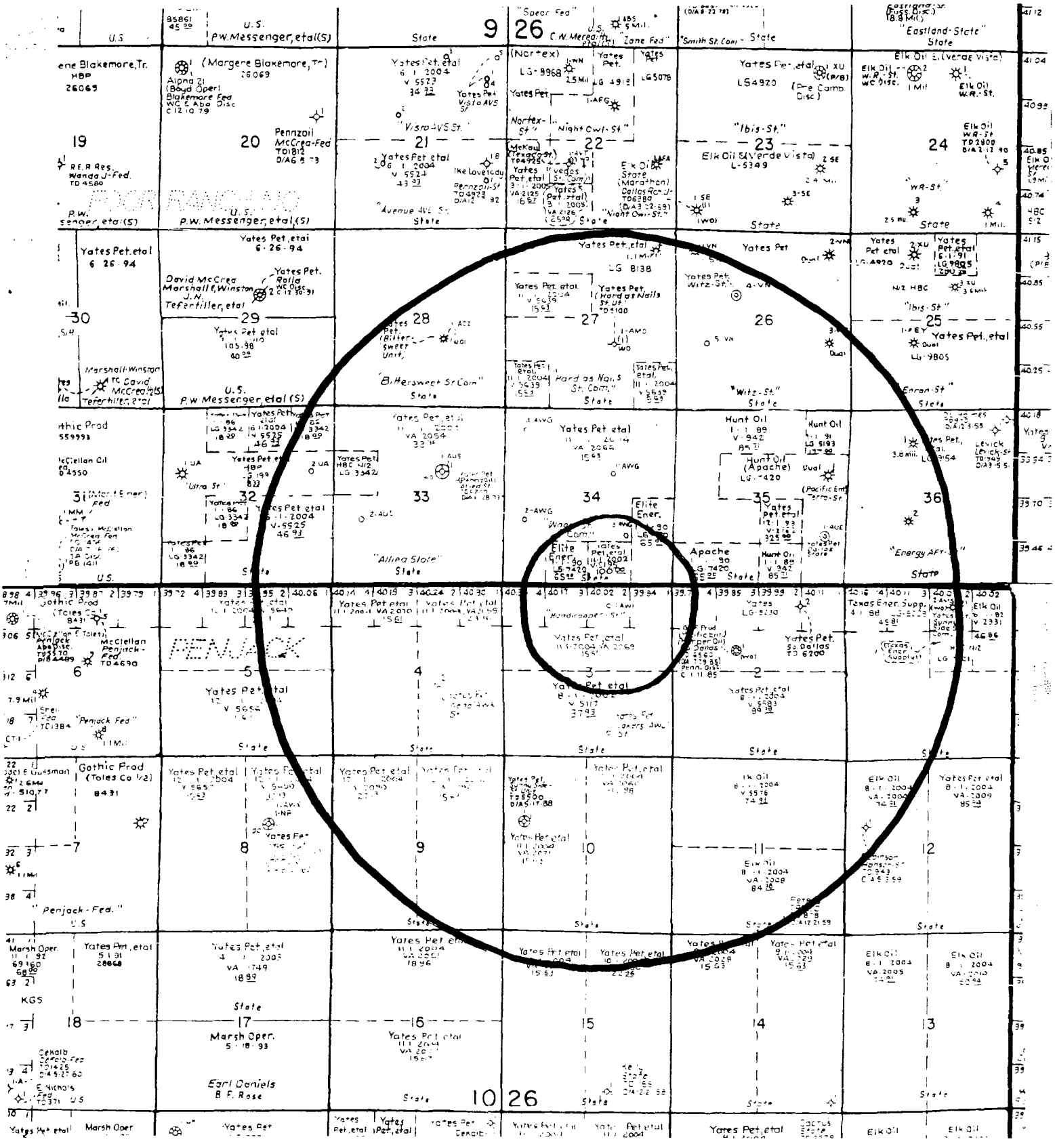
PBTD: 6,436'

5 1/2" @ 6,478', CMTD w/ 460 SACKS

TD: 6,478'

- SKETCH NOT TO SCALE -

DATE: 1/2/01




# YATES PETROLEUM CORPORATION

## HANDICAPPER SWD #1

## PROPOSED SALT WATER DISPOSAL WELL

## SEC. 3-T10S-R26E

## 660'FNL & 1980'FEL

## CHAVES COUNTY, NEW MEXICO

ATTACHMENT B

Schlumberger
Artesia Operating Center



| | | | |
|---|---|---|---|
| Company: | YATES | Report No.: | ASY2K084 |
| Lease & Well: | HANDICAPPER AWI STATE 1 | Service Point: | ANMLAB |
| County, State: | NM | Prepared by: | Ghania Ramdani |
| Formation: | | Prepared for: | MR. CURTIS PRIDDY |
| BHT (F): | | Date: | 1/31/01 |

Specific gravity: 1.152 @ 70 degrees F ph 6.00

**Anions**

| | Factor | ml | Sample | mg/l | Factor | me/l | Ionic Strength (mg/l) | Ionic Strength (me/l) | (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| Chlorides | 3545 | 5.0 | 0.1 | 177250 | 0.0282 | 4998.45 | 2.4815 | 2.4992 | 153863 |
| Sulfates | 20 | Less 200 | | 0 | 0.0208 | 0.00 | 0.0000 | 0.0000 | 0 |
| Carbonates | 492 | 4.6 | 10 | 226 | 0.0333 | 7.54 | 0.0075 | 0.0075 | 196 |
| Bicarbonates | 1000 | 1.0 | 10 | 100 | 0.0164 | 1.64 | 0.0008 | 0.0008 | 87 |

**Cations**

| | Factor | ml | Sample | mg/l | Factor | me/l | Ionic Strength (mg/l) | Ionic Strength (me/l) | (ppm) |
|---|---|---|---|---|---|---|---|---|---|
| Calcium | 401 | | | 0 | 0.0499 | 0.00 | 0.0000 | 0.0000 | 0 |
| Magnesium | 243 | 0.0 | 0 | 0 | 0.0823 | 0.00 | 0.0000 | 0.0000 | 0 |
| Iron | | | | 100 | 0.0358 | 3.58 | 0.0008 | 0.0018 | 87 |
| Sodium | 0 | 0 | 0 | 115036 | 0.0435 | 5004.05 | 2.5308 | 2.5020 | 99857 |

Total Dissolved Solids: 292711.9 10015.25

Total Ionic Strength: 5.0214 5.0114

**Calcium Carbonate Deposition**

Stiff-Davis Equation: Stability Index(SI) = pH - pCa - pAlk - K

pH= 6.00
pCa= #NUM!
pAlk= 2.33
K= 1.31

Total Ion Equivalent NaCl Concentration= 253991.1 ppm

SI= #NUM!

The Stiff-Davis equation predicts this water #NUM! have a tendency toward calcium carbonate deposition.

**Calcium Sulfate Deposition**

CaSO4 Solubility: S = 1000 (SQRT (X**2 + 4*K) - X)

Total Ionic Strength= 5.0214
Solubility Constant, K= 0.00290
X= 0.0000

S= 107.70 me/l

Laboratory analysis shows that this water contains 0.00 me/l, therfore the tendency towards calcium sulfate deposition does not exist.

# Permian Treating Chemicals
## WATER ANALYSIS REPORT

## SAMPLE

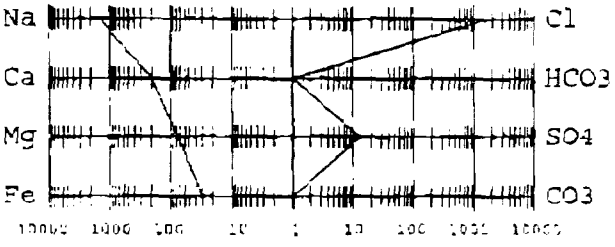
Oil Co. : **Yates Petroleum**
Lease : **Witz "UN"**
Well No. : **# 1**
Lab No. : **F:\ANALYSES\Mar1001.001**

Sample Loc. :
Date Analyzed: **10-March-2001**
Date Sampled :

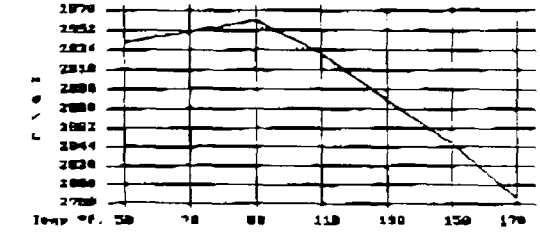
## ANALYSIS

| | | | | | | |
|---|---|---|---|---|---|---|
| 1. | pH | | | 4.080 | | |
| 2. | Specific Gravity 60/60 F. | | | 1.076 | | |
| 3. | $CaCO_3$ Saturation Index @ 80 F. | | | -3.568 | | |
| | @ 140 F. | | | -2.648 | | |
| | **Dissolved Gasses** | | | **MG/L** | **EQ. WT.** | ***MEQ/L** |
| 4. | Hydrogen Sulfide | | | Not Present | | |
| 5. | Carbon Dioxide | | | Not Determined | | |
| 6. | Dissolved Oxygen | | | Not Determined | | |
| | **Cations** | | | | | |
| 7. | Calcium | ($Ca^{++}$) | | 3,931 | / 20.1 = | 195.57 |
| 8. | Magnesium | ($Mg^{++}$) | | 894 | / 12.2 = | 73.28 |
| 9. | Sodium | ($Na^{+}$) | (Calculated) | 32,996 | / 23.0 = | 1,434.61 |
| 10. | Barium | ($Ba^{++}$) | | Not Determined | | |
| | **Anions** | | | | | |
| 11. | Hydroxyl | ($OH^{-}$) | | 0 | / 17.0 = | 0.00 |
| 12. | Carbonate | ($CO_3^{=}$) | | 0 | / 30.0 = | 0.00 |
| 13. | Bicarbonate | ($HCO_3^{-}$) | | 29 | / 61.1 = | 0.47 |
| 14. | Sulfate | ($SO_4^{=}$) | | 600 | / 48.8 = | 12.30 |
| 15. | Chloride | ($Cl^{-}$) | | 59,986 | / 35.5 = | 1,689.75 |
| 16. | Total Dissolved Solids | | | 98,436 | | |
| 17. | Total Iron (Fe) | | | 518 | / 18.2 = | 28.43 |
| 18. | Total Hardness As $CaCO_3$ | | | 13,498 | | |
| 19. | Resistivity @ 75 F. (Calculated) | | | 0.093 /cm. | | |

**LOGARITHMIC WATER PATTERN**
***meq/L.**




**Calcium Sulfate Solubility Profile**




**PROBABLE MINERAL COMPOSITION**

| COMPOUND | EQ. WT. | X *meq/L | = mg/L. |
|---|---|---|---|
| $Ca(HCO_3)_2$ | 81.04 | 0.47 | 38 |
| $CaSO_4$ | 68.07 | 12.30 | 837 |
| $CaCl_2$ | 55.50 | 182.80 | 10,146 |
| $Mg(HCO_3)_2$ | 73.17 | 0.00 | 0 |
| $MgSO_4$ | 60.19 | 0.00 | 0 |
| $MgCL_2$ | 47.62 | 73.28 | 3,490 |
| $NaHCO_3$ | 84.00 | 0.00 | 0 |
| $NaSO_4$ | 71.03 | 0.00 | 0 |
| NaCl | 58.46 | 1,433.67 | 83,812 |

***Milli Equivalents per Liter**

This water is moderately corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

# Permian Treating Chemicals
## WATER ANALYSIS REPORT

## SAMPLE

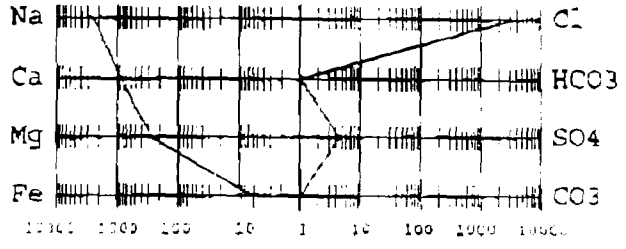
Oil Co. : **Yates Petroleum**
Lease : **Allied "AUS"**
Well No. : **# 2**
Lab No. : **F:\ANALYSES\Mar1001.001**

Sample Loc. :
Date Analyzed: **10-March-2001**
Date Sampled :

## ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| 1. | pH | | 4.980 | | |
| 2. | Specific Gravity 60/60 F. | | 1.158 | | |
| 3. | $CaCO_3$ Saturation Index | @ 80 F. | -1.006 | | |
| | | @ 140 F. | +0.354 | | |
| | **Dissolved Gasses** | | **MG/L** | **EQ. WT.** | ***MEQ/L** |
| 4. | Hydrogen Sulfide | | Not Present | | |
| 5. | Carbon Dioxide | | Not Determined | | |
| 6. | Dissolved Oxygen | | Not Determined | | |
| | **Cations** | | | | |
| 7. | Calcium | ($Ca^{++}$) | 17,198 | / 20.1 = | 855.62 |
| 8. | Magnesium | ($Mg^{++}$) | 3,279 | / 12.2 = | 268.77 |
| 9. | Sodium | ($Na^{+}$) (Calculated) | 55,227 | / 23.0 = | 2,401.17 |
| 10. | Barium | ($Ba^{++}$) | Below 10 | | |
| | **Anions** | | | | |
| 11. | Hydroxyl | ($OH^{-}$) | 0 | / 17.0 = | 0.00 |
| 12. | Carbonate | ($CO_3^{=}$) | 0 | / 30.0 = | 0.00 |
| 13. | Bicarbonate | ($HCO_3^{-}$) | 49 | / 61.1 = | 0.80 |
| 14. | Sulfate | ($SO_4^{=}$) | 210 | / 48.8 = | 4.30 |
| 15. | Chloride | ($Cl^{-}$) | 124,972 | / 35.5 = | 3,520.34 |
| 16. | Total Dissolved Solids | | 200,935 | | |
| 17. | Total Iron (Fe) | | 105 | / 18.2 = | 5.77 |
| 18. | Total Hardness As $CaCO_3$ | | 56,446 | | |
| 19. | Resistivity @ 75 F. (Calculated) | | 0.001 /cm. | | |

**LOGARITHMIC WATER PATTERN**
*meq/L.




**Calcium Sulfate Solubility Profile**

**PROBABLE MINERAL COMPOSITION**

| COMPOUND | EQ. WT. | X *meq/L | = mg/L. |
|---|---|---|---|
| $Ca(HCO_3)_2$ | 81.04 | 0.80 | 65 |
| $CaSO_4$ | 68.07 | 4.30 | 293 |
| $CaCl_2$ | 55.50 | 850.52 | 47,204 |
| $Mg(HCO_3)_2$ | 73.17 | 0.00 | 0 |
| $MgSO_4$ | 60.19 | 0.00 | 0 |
| $MgCl_2$ | 47.62 | 268.77 | 12,799 |
| $NaHCO_3$ | 84.00 | 0.00 | 0 |
| $NaSO_4$ | 71.03 | 0.00 | 0 |
| $NaCl$ | 58.46 | 2,401.05 | 140,385 |

*Milliequivalents per Liter

This water is moderately corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

# Permian Treating Chemicals
## WATER ANALYSIS REPORT

## SAMPLE

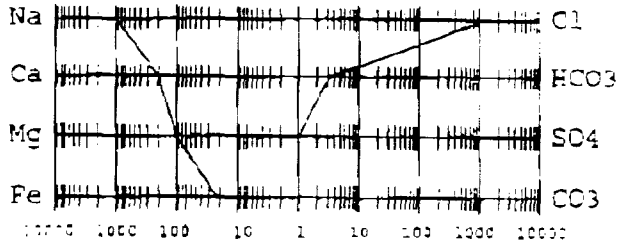
Oil Co. : **Yates Petroleum**
Lease : **Sandlewood "AEW"**
Well No. : **# 1**
Lab No. : **F:\ANALYSES\Mar1001.001**

Sample Loc. :
Date Analyzed: **10-March-2001**
Date Sampled :

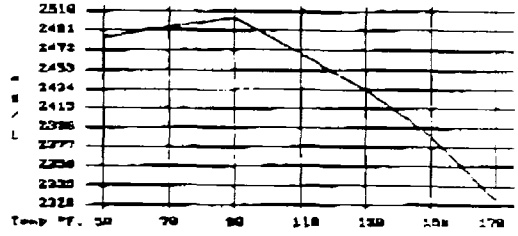
## ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| 1. | pH | | 4.490 | | |
| 2. | Specific Gravity 60/60 F. | | 1.058 | | |
| 3. | $CaCO_3$ Saturation Index @ 80 F. | | -2.403 | | |
| | @ 140 F. | | -1.483 | | |
| | **Dissolved Gasses** | | **MG/L** | **EQ. WT.** | ***MEQ/L** |
| 4. | Hydrogen Sulfide | | Not Present | | |
| 5. | Carbon Dioxide | | Not Determined | | |
| 6. | Dissolved Oxygen | | Not Determined | | |
| | **Cations** | | | | |
| 7. | Calcium | ($Ca^{++}$) | 3,931 | / 20.1 = | 195.57 |
| 8. | Magnesium | ($Mg^{++}$) | 1,192 | / 12.2 = | 97.70 |
| 9. | Sodium | ($Na^{+}$) (Calculated) | 21,187 | / 23.0 = | 921.17 |
| 10. | Barium | ($Ba^{++}$) | 25 | / 68.7 = | 0.36 |
| | **Anions** | | | | |
| 11. | Hydroxyl | ($OH^{-}$) | 0 | / 17.0 = | 0.00 |
| 12. | Carbonate | ($CO_3^{=}$) | 0 | / 30.0 = | 0.00 |
| 13. | Bicarbonate | ($HCO_3^{-}$) | 195 | / 61.1 = | 3.19 |
| 14. | Sulfate | ($SO_4^{=}$) | 0 | / 48.8 = | 0.00 |
| 15. | Chloride | ($Cl^{-}$) | 42,990 | / 35.5 = | 1,210.99 |
| 16. | Total Dissolved Solids | | 69,520 | | |
| 17. | Total Iron (Fe) | | 380 | / 18.2 = | 20.88 |
| 18. | Total Hardness As $CaCO_3$ | | 14,725 | | |
| 19. | Resistivity @ 75 F. (Calculated) | | 0.138 /cm. | | |

**LOGARITHMIC WATER PATTERN**
***meq/L.**




**Calcium Sulfate Solubility Profile**



**PROBABLE MINERAL COMPOSITION**

| COMPOUND | EQ. WT. | X *meq/L | = mg/L. |
|---|---|---|---|
| $Ca(HCO_3)_2$ | 81.04 | 3.19 | 259 |
| $CaSO_4$ | 68.07 | 0.00 | 0 |
| $CaCl_2$ | 55.50 | 192.38 | 10,677 |
| $Mg(HCO_3)_2$ | 73.17 | 0.00 | 0 |
| $MgSO_4$ | 60.19 | 0.00 | 0 |
| $MgCl_2$ | 47.62 | 97.70 | 4,653 |
| $NaHCO_3$ | 84.00 | 0.00 | 0 |
| $NaSO_4$ | 71.03 | 0.00 | 0 |
| NaCl | 58.46 | 920.90 | 53,836 |

***Milli Equivalents per Liter**

Barium is present. Do not mix this water with a Sulfate-Bearing water without proper inhibition.
This water is moderately corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

# Permian Treating Chemicals
## WATER ANALYSIS REPORT

## SAMPLE

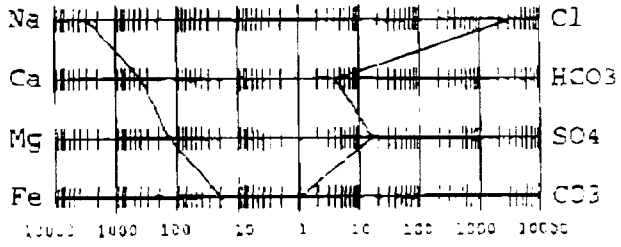
Oil Co. : **Yates Petroleum**
Lease : **Morton ''82''**
Well No. : **# 5**
Lab No. : **F:\ANALYSES\Mar1001.001**

Sample Loc. :
Date Analyzed: **10-March-2001**
Date Sampled :

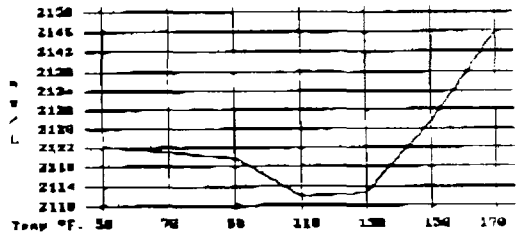
## ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| 1. | pH | | 5.630 | | |
| 2. | Specific Gravity 60/60 F. | | 1.143 | | |
| 3. | $CaCO_3$ Saturation Index | @ 80 F. | -0.285 | | |
| | | @ 140 F. | +0.815 | | |
| | **Dissolved Gasses** | | **MG/L** | **EQ. WT.** | ***MEQ/L** |
| 4. | Hydrogen Sulfide | | **Not Present** | | |
| 5. | Carbon Dioxide | | **Not Determined** | | |
| 6. | Dissolved Oxygen | | **Not Determined** | | |
| | **Cations** | | | | |
| 7. | Calcium | ($Ca^{++}$) | 7,174 | / 20.1 = | **356.92** |
| 8. | Magnesium | ($Mg^{++}$) | 1,610 | / 12.2 = | **131.97** |
| 9. | Sodium | ($Na^{+}$) (Calculated) | 63,744 | / 23.0 = | **2,771.48** |
| 10. | Barium | ($Ba^{++}$) | **Not Determined** | | |
| | **Anions** | | | | |
| 11. | Hydroxyl | ($OH^{-}$) | 0 | / 17.0 = | **0.00** |
| 12. | Carbonate | ($CO_3^{=}$) | 0 | / 30.0 = | **0.00** |
| 13. | Bicarbonate | ($HCO_3^{-}$) | 244 | / 61.1 = | **3.99** |
| 14. | Sulfate | ($SO_4^{=}$) | 775 | / 48.8 = | **15.88** |
| 15. | Chloride | ($Cl^{-}$) | 114,974 | / 35.5 = | **3,238.70** |
| 16. | Total Dissolved Solids | | 188,521 | | |
| 17. | Total Iron (Fe) | | 343 | / 18.2 = | **18.82** |
| 18. | Total Hardness As $CaCO_3$ | | 24,542 | | |
| 19. | Resistivity @ 75 F. (Calculated) | | 0.007 /cm. | | |

**LOGARITHMIC WATER PATTERN**
***meq/L.**




**Calcium Sulfate Solubility Profile**




**PROBABLE MINERAL COMPOSITION**

| COMPOUND | EQ. WT. | X *meq/L = | mg/L. |
|---|---|---|---|
| $Ca(HCO_3)_2$ | 81.04 | 3.99 | 324 |
| $CaSO_4$ | 68.07 | 15.88 | 1,081 |
| $CaCl_2$ | 55.50 | 337.04 | 18,706 |
| $Mg(HCO_3)_2$ | 73.17 | 0.00 | 0 |
| $MgSO_4$ | 60.19 | 0.00 | 0 |
| $MgCl_2$ | 47.62 | 131.97 | 6,284 |
| $NaHCO_3$ | 84.00 | 0.00 | 0 |
| $NaSO_4$ | 71.03 | 0.00 | 0 |
| NaCl | 58.46 | 2,769.70 | 161,916 |

***Milli Equivalents per Liter**

This water is somewhat corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

# Permian Treating Chemicals
## WATER ANALYSIS REPORT

## SAMPLE

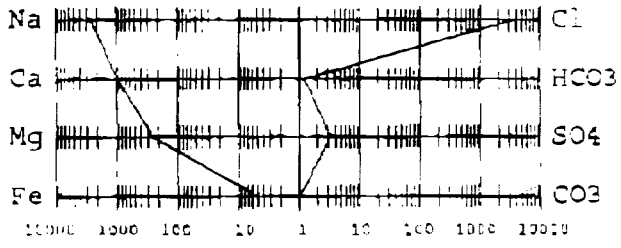
Oil Co. : **Yates Petroleum**
Lease : **Witz "UN"**
Well No. : **# 4**
Lab No. : **F:\ANALYSES\Mar1001.001**

Sample Loc. :
Date Analyzed: **10-March-2001**
Date Sampled :

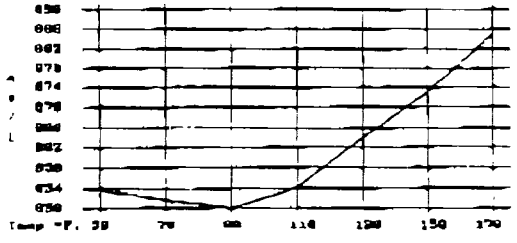
## ANALYSIS

| | | | | | |
|---|---|---|---|---|---|
| 1. | pH | | 5.150 | | |
| 2. | Specific Gravity 60/60 F. | | 1.158 | | |
| 3. | $CaCO_3$ Saturation Index | @ 80 F. | -0.581 | | |
| | | @ 140 F. | +0.839 | | |
| | **Dissolved Gasses** | | **MG/L** | **EQ. WT.** | ***MEQ/L** |
| 4. | Hydrogen Sulfide | | Not Present | | |
| 5. | Carbon Dioxide | | Not Determined | | |
| 6. | Dissolved Oxygen | | Not Determined | | |
| | **Cations** | | | | |
| 7. | Calcium | ($Ca^{++}$) | 18,181 | / 20.1 = | 904.53 |
| 8. | Magnesium | ($Mg^{++}$) | 2,981 | / 12.2 = | 244.34 |
| 9. | Sodium | ($Na^{+}$) (Calculated) | 54,646 | / 23.0 = | 2,375.91 |
| 10. | Barium | ($Ba^{++}$) | Below 10 | | |
| | **Anions** | | | | |
| 11. | Hydroxyl | ($OH^{-}$) | 0 | / 17.0 = | 0.00 |
| 12. | Carbonate | ($CO_3^{=}$) | 0 | / 30.0 = | 0.00 |
| 13. | Bicarbonate | ($HCO_3^{-}$) | 73 | / 61.1 = | 1.19 |
| 14. | Sulfate | ($SO_4^{=}$) | 155 | / 48.8 = | 3.18 |
| 15. | Chloride | ($Cl^{-}$) | 124,972 | / 35.5 = | 3,520.34 |
| 16. | Total Dissolved Solids | | 201,008 | | |
| 17 | Total Iron (Fe) | | 83 | / 18.2 = | 4.53 |
| 18. | Total Hardness As $CaCO_3$ | | 57,673 | | |
| 19. | Resistivity @ 75 F. (Calculated) | | 0.001 /cm. | | |

**LOGARITHMIC WATER PATTERN**
***meq/L.**




**Calcium Sulfate Solubility Profile**




**PROBABLE MINERAL COMPOSITION**

| COMPOUND | EQ. WT. | X *meq/L | = mg/L. |
|---|---|---|---|
| $Ca(HCO_3)_2$ | 81.04 | 1.19 | 97 |
| $CaSO_4$ | 68.07 | 3.18 | 216 |
| $CaCl_2$ | 55.50 | 900.16 | 49,959 |
| $Mg(HCO_3)_2$ | 73.17 | 0.00 | 0 |
| $MgSO_4$ | 60.19 | 0.00 | 0 |
| $MgCL_2$ | 47.62 | 244.34 | 11 |
| $NaHCO_3$ | 84.00 | 0.00 | 0 |
| $NaSO_4$ | 71.03 | 0.00 | 0 |
| NaCl | 58.46 | 2,375.84 | 138,891 |

***Milli Equivalents per Liter**

This water is somewhat corrosive due to the pH observed on analysis.
The corrosivity is increased by the content of mineral salts in solution.

**MILLER CHEMICALS, INC.**
Post Office Box 298
Artesia, N.M. 88211-0298
(505) 746-1919 Artesia Office
(505) 393-2893 Hobbs Office
(505) 746-1918 Fax

## WATER ANALYSIS REPORT

Company : YATES PETROLEUM
Address : ARTESIA, NM
Lease : WINDMILL-3/4 MILE NORTH
Well : OF HANDKAPER"AWI" #1
Sample Pt. : UNKNOWN

Date : 2/20/01
Date Sampled : UNKNOWN
Analysis No. : 00223

| | ANALYSIS | | mg/L | | meq/L |
|---|---|---|---|---|---|
| 1. | pH | 7.0 | | | |
| 2. | H2S | 0 | | | |
| 3. | Specific Gravity | 1.000 | | | |
| 4. | Total Dissolved Solids | | 4270.4 | | |
| 5. | Suspended Solids | | NR | | |
| 6. | Dissolved Oxygen | | NR | | |
| 7. | Dissolved CO2 | | NR | | |
| 8. | Oil In Water | | NR | | |
| 9. | Phenolphthalein Alkalinity (CaCO3) | | | | |
| 10. | Methyl Orange Alkalinity (CaCO3) | | | | |
| 11. | Bicarbonate | HCO3 | 159.0 | HCO3 | 2.6 |
| 12. | Chloride | Cl | 1278.0 | Cl | 36.1 |
| 13. | Sulfate | SO4 | 1500.0 | SO4 | 31.2 |
| 14. | Calcium | Ca | 680.0 | Ca | 33.9 |
| 15. | Magnesium | Mg | 194.8 | Mg | 16.0 |
| 16. | Sodium (calculated) | Na | 458.4 | Na | 19.9 |
| 17. | Iron | Fe | 0.3 | | |
| 18. | Barium | Ba | NR | | |
| 19. | Strontium | Sr | NR | | |
| 20. | Total Hardness (CaCO3) | | 2500.0 | | |

## PROBABLE MINERAL COMPOSITION

*milli equivalents per Liter

```
+------+                      +------+
|   34| *Ca <----- *HCO3      |    3|
|------|   /------->          |------|
|   16| *Mg -----> *SO4       |   31|
|------|     <---------/      |------|
|   20| *Na -----> *Cl        |   36|
+------+                      +------+
```

Saturation Values Dist. Water 20 C

| | |
|---|---|
| CaCO3 | 13 mg/L |
| CaSO4 * 2H2O | 2090 mg/L |
| BaSO4 | 2.4 mg/L |

| Compound | Equiv wt | X meq/L | = mg/L |
|---|---|---|---|
| Ca(HCO3)2 | 81.0 | 2.6 | 211 |
| CaSO4 | 68.1 | 31.2 | 2126 |
| CaCl2 | 55.5 | 0.1 | 9 |
| Mg(HCO3)2 | 73.2 | | |
| MgSO4 | 60.2 | | |
| MgCl2 | 47.6 | 16.0 | 763 |
| NaHCO3 | 54.0 | | |
| Na2SO4 | 71.0 | | |
| NaCl | 58.4 | 19.9 | 1165 |

REMARKS:

# SCALE TENDENCY REPORT

| | | | |
|---|---|---|---|
| Company | : YATES PETROLEUM | Date | : 2/20/01 |
| Address | : ARTESIA, NM | Date Sampled | : UNKNOWN |
| Lease | : WINDMILL-3/4 MILE NORTH | | Analysis No. : 00223 |
| Well | : CF HANDKAPER"AWI" #1 | Analyst | : A. MILLER |
| Sample Pt. | : UNKNOWN | | |

## STABILITY INDEX CALCULATIONS
(Stiff-Davis Method)
CaCO3 Scaling Tendency

S.I. = 0.2 at 70 deg. F or 21 deg. C
S.I. = 0.2 at 90 deg. F or 32 deg. C
S.I. = 0.2 at 110 deg. F or 43 deg. C
S.I. = 0.3 at 130 deg. F or 54 deg. C
S.I. = 0.3 at 150 deg. F or 66 deg. C

**********

## CALCIUM SULFATE SCALING TENDENCY CALCULATIONS
(Skillman-McDonald-Stiff Method)
Calcium Sulfate

S = 2068 at 70 deg. F or 21 deg C
S = 2106 at 90 deg. F or 32 deg C
S = 2117 at 110 deg. F or 43 deg C
S = 2102 at 130 deg. F or 54 deg C
S = 2076 at 150 deg. F or 66 deg C

Respectfully submitted,
A. MILLER

MCI
CHEMICALS and CONSULTING

**MILLER CHEMICALS, INC.**
Post Office Box 298
Artesia, N.M. 88211-0298
(505) 746-1919 Artesia Office
(505) 393-2893 Hobbs Office
(505) 746-1918 Fax

## WATER ANALYSIS REPORT

Company : YATES PETROLEUM
Address : ARTESIA, NM
Lease : WINDMILL-1.5 MILES S
Well : OF HANDKAPER"AWI" #1
Sample Pt. : UNKNOWN

Date : 2/20/01
Date Sampled : UNKNOWN
Analysis No. : 00224

| | ANALYSIS | | mg/L | | meq/L |
|---|---|---|---|---|---|
| 1. | pH | 7.3 | | | |
| 2. | H2S | 0 | | | |
| 3. | Specific Gravity | 1.004 | | | |
| 4. | Total Dissolved Solids | | 5207.4 | | |
| 5. | Suspended Solids | | NR | | |
| 6. | Dissolved Oxygen | | NR | | |
| 7. | Dissolved CO2 | | NR | | |
| 8. | Oil In Water | | NR | | |
| 9. | Phenolphthalein Alkalinity (CaCO3) | | | | |
| 10. | Methyl Orange Alkalinity (CaCO3) | | | | |
| 11. | Bicarbonate | HCO3 | 195.0 | HCO3 | 3.2 |
| 12. | Chloride | Cl | 1064.0 | Cl | 30.0 |
| 13. | Sulfate | SO4 | 2501.0 | SO4 | 52.1 |
| 14. | Calcium | Ca | 840.0 | Ca | 41.9 |
| 15. | Magnesium | Mg | 431.7 | Mg | 36.0 |
| 16. | Sodium (calculated) | Na | 169.4 | Na | 7.4 |
| 17. | Iron | Fe | 0.3 | | |
| 18. | Barium | Ba | NR | | |
| 19. | Strontium | Sr | NR | | |
| 20. | Total Hardness (CaCO3) | | 3900.0 | | |

## PROBABLE MINERAL COMPOSITION

| *milli equivalents per Liter | | | Compound | Equiv wt | X meq/L | = mg/L |
|---|---|---|---|---|---|---|
| 42 | *Ca <----- *HCO3 | 3 | Ca(HCO3)2 | 81.0 | 3.2 | 259 |
| | /-------> | | CaSO4 | 68.1 | 38.7 | 2635 |
| 36 | *Mg -----> *SO4 | 52 | CaCl2 | 55.5 | | |
| | <---------/ | | Mg(HCO3)2 | 73.2 | | |
| 7 | *Na -----> *Cl | 30 | MgSO4 | 60.2 | 13.3 | 803 |
| | | | MgCl2 | 47.6 | 22.7 | 1079 |
| Saturation Values Dist. Water 20 C | | | NaHCO3 | 84.0 | | |
| CaCO3 | 13 mg/L | | Na2SO4 | 71.0 | | |
| CaSO4 * 2H2O | 2090 mg/L | | NaCl | 58.4 | 7.4 | 431 |
| BaSO4 | 2.4 mg/L | | | | | |

REMARKS:

# SCALE TENDENCY REPORT

| | | | |
|---|---|---|---|
| Company | : YATES PETROLEUM | Date | : 2/20/01 |
| Address | : ARTESIA, NM | Date Sampled | : UNKNOWN |
| Lease | : WINDMILL-1.5 MILES S | Analysis No. | : 00224 |
| Well | : OF HANDKAPER "AWI" #1 | Analyst | : A. MILLER |
| Sample Pt. | : UNKNOWN | | |

## STABILITY INDEX CALCULATIONS
(Stiff-Davis Method)
CaCO3 Scaling Tendency

S.I. = 0.3 at 70 deg. F or 21 deg. C
S.I. = 0.3 at 90 deg. F or 32 deg. C
S.I. = 0.3 at 110 deg. F or 43 deg. C
S.I. = 0.4 at 130 deg. F or 54 deg. C
S.I. = 0.4 at 150 deg. F or 66 deg. C

**********

## CALCIUM SULFATE SCALING TENDENCY CALCULATIONS
(Skillman-McDonald-Stiff Method)
Calcium Sulfate

S = 2151 at 70 deg. F or 21 deg C
S = 2200 at 90 deg. F or 32 deg C
S = 2218 at 110 deg. F or 43 deg C
S = 2205 at 130 deg. F or 54 deg C
S = 2179 at 150 deg. F or 66 deg C

Respectfully submitted,
A. MILLER

YATES PETROLEUM CORPORATION

105 SOUTH FOURTH STREET
ARTESIA, NEW MEXICO 88210-2118
TELEPHONE (505) 748-1471



March 20, 2001

Roswell Daily Record
P. O. Box 1897
Roswell, NM 88202

Gentlemen:

Yates Petroleum Corporation desires to place a public notice in your newspaper for one day. The notice is enclosed.

Please place this notice in your paper on Sunday, March 25, 2001, and forward a copy of it along with your billing as soon as possible to:

Yates Petroleum Corporation
105 South Fourth Street
Artesia, NM 88210
Attn: James W. Pringle

If you have any questions, please contact me at 748-4182. Thank you for your cooperation in this matter.

Sincerely,

James W. Pringle

James W. Pringle
Operations Engineer

JWP/th

Enclosure

ATTACHMENT E

Legal Notice

Yates Petroleum Corporation, 105 South Fourth Street, Artesia, NM 88210, has filed form C-108 (Application for Authorization to Inject) with the New Mexico Oil Conservation Division seeking administrative approval for an injection well. The proposed well, the "Handicapper SWD #1" located 660'FNL & 1980'FEL of Section 3, Township 10 South, Range 26 East of Chaves County, New Mexico, will be used for salt water disposal. Disposal waters from the Ordovician, Penn, Wolfcamp, and Abo will be re-injected into the Ordovician at a depth of 6,038'-6,268' with a maximum pressure of 1300 psi and a maximum rate of 5,000 BWPD.

All interested parties opposing the aforementioned must file objections or requests for a hearing with the Oil Conservation Division, 2040 S. Pacheco Street, Santa Fe, NM 87505-5472, within 15 days. Additional information can be obtained by contacting James W. Pringle at (505) 748-4182.