1R - 177

GENERAL CORRESPONDENCE

YEAR(S):

1998-2002

R.T. HICKS CONSULTANTS, LTD.
4665 Indian School Road NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

September 16, 2002

Wayne Price
New Mexico Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Proposed Ground Water Response: Conoco Federal #2, Lea County

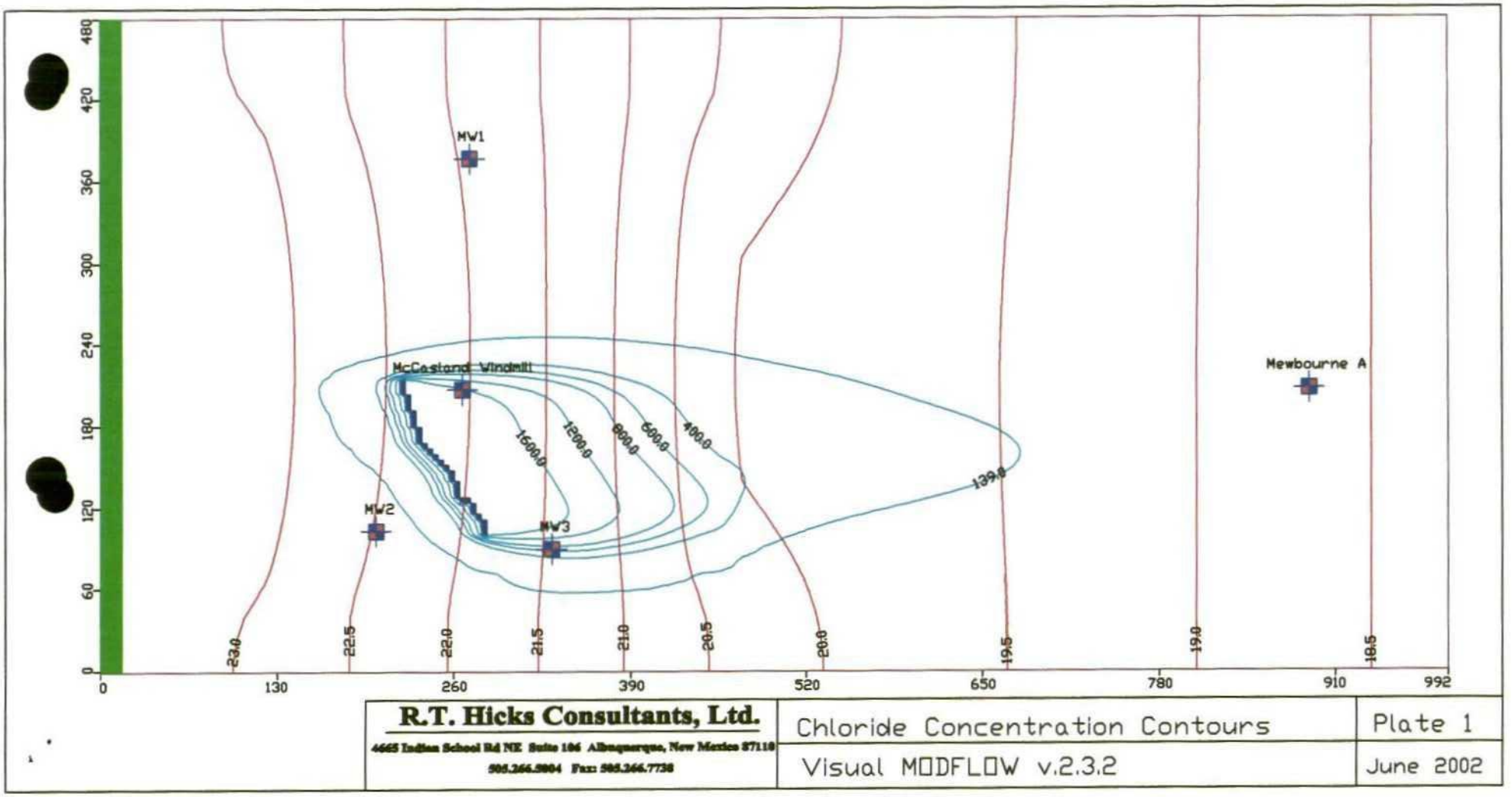
Dear Wayne:

I attach the output from the model discussed in our previous correspondence. I am certain that the submission will make more sense with this figure.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Mike Shepard, Mewbourne Oil Company
Richard Olson, Hinkle, Hensley, Shanor & Martin
Gary Larson, Hinkle, Hensley, Shanor & Martin



R.T. Hicks Consultants, Ltd. 4665 Indian School Rd NE Suite 106 Albuquerque, New Mexico 87110 505.266.5004 Fax: 505.266.7738	Chloride Concentration Contours Visual MODFLOW v.2.3.2	Plate 1 June 2002

R.T. HICKS CONSULTANTS, LTD.
4665 Indian School Road NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

September 11, 2002

Wayne Price
New Mexico Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Proposed Ground Water Remedy: Conoco Federal #2, Lea County

Dear Wayne:

For several years, Mewbourne Oil Company has devoted resources to investigating elevated concentrations of chloride and other inorganic compounds in a windmill well on the McCasland Ranch, which is adjacent to the above-referenced well (the plugged and abandoned Conoco Federal #2). The attached document, "*Supplemental Expert Report of Hicks Consultants Regarding Robert A. McCasland et. al. v. Mewbourne Oil Company*" (July 25, 2001), is the culmination of our investigative efforts. This document is an expert exhibit prepared for a trial that was to occur last Fall. We now understand that trial should occur in the Fall/Winter of 2002 or Spring of 2003. We believe this document and our previous submissions satisfy the New Mexico Oil Conservation Division request to investigate the cause of high chloride concentrations at this site. In this letter, we ask that NMOCD relieve Mewbourne of any further responsibility for the site.

Throughout our investigation, we could find no data to support a hypothesis that the unusually high chloride concentration of the windmill well water was a result of Conoco Federal #2, any action of Mewbourne Oil Company or Mark Production Company, or any action of their contractors. As stated in the July 2001 report, the cause of the chloride in ground water at the windmill site cannot be determined (see item E, page 5): but does not appear to be related to the actions of Mewbourne or its predecessors. On page 36 of our report, we suggest that the high chloride in the windmill may be natural. If one assumes that the high chloride observed in the windmill is natural and permanent, no engineered remedy (e.g. reverse osmosis, pump-and-dispose, etc.) would "clean up" the aquifer. A natural cause of elevated chloride in the McCasland Windmill Well represents a "worst case" scenario. If the chloride in the windmill well is man-made, it is not a permanent phenomenon and will dissipate over time.

Aquifer Simulation Modeling

The July 2001 report presents a MODFLOW simulation of a natural hydrogeologic phenomenon that could exist at the McCasland Windmill well site. Because the July 2001 report eliminates a casing leak as the cause of the elevated chloride, we recently ran a revised simulation to sutyd the hypothesis that the chloride in ground water is a natural phenomenon. In our MODFLOW simulation, we used the input parameters described in Section 5.3, Scenario 2 of

the July 2001 Report (see page 21) with the following exception. We eliminated an imaginary injection well (e.g. casing leak) as the release source. Instead, we assigned a constant concentration to certain model cells up gradient from the Windmill Well. We used a concentration of 2000 mg/l chloride for these cells, which is slightly higher than the average concentration of chloride observed in the McCasland Windmill Well. This assignment creates an infinite source term, which one would expect if the observed ground water quality were a natural phenomenon. We adjusted the size and location of the source term in order to create a result that agreed with the field data. In other words, we used the source term to "calibrate" our model.

The simulation showed that the magnitude and extent of chloride stabilized after 10 years. Therefore, the 30-year simulation is "steady state". The model predicts the ground water conditions as it was in the beginning, is now, and evermore shall be.

In the MODFLOW simulation, the source term is a line of constant concentration cells originating about 40 feet up gradient of the McCasland Windmill well and extending to the southeast (blue line). Such geometry is consistent with a fracture or channel scour that would expose anhydrite (and other evaporite minerals) that could exist within the underlying Dockum Group redbeds. We oriented this constant concentration zone to coincide with the observed "high area" in the Ogallala to the west of the site (see Plate 4 of the July 2001 report). Perhaps this high and dry area of the Ogallala reflects regional northwest-southeast trending geologic feature.

The predicted equilibrium concentration in MW-3 is 645-ppm chloride. Our March 27, 2001 sample showed 679 ppm chloride, an excellent agreement between the model prediction and field data. Down gradient from the source, the natural processes of dispersion and dilution effectively reduce chloride concentrations to 750 mg/l approximately 175 feet down gradient from the source. At this concentration, the total dissolved solids content (i.e. salinity) would be about 1500 mg/l, half of what we observe at the McCasland Windmill Well. Based upon data from the National Academy of Sciences, the NMSU Cooperative Extension Service states that 1000-2999 mg/l salinity is "very satisfactory for all classes of livestock and poultry" (see attachment). Therefore, a well for stock that produces water with salinity (TDS) of 1500 mg/l would meet the needs of the area. At a distance of about 300 feet down gradient, MODFLOW predicts a chloride concentration of 250 mg/l, the New Mexico Ground Water Standard. At Mew A, natural attenuation has effectively reduced the chloride concentration to background conditions. The prediction that Mew A is unaffected by chloride at the McCasland Windmill Well is also consistent with field data.

Finally, the model also shows that the two up gradient monitoring wells are not affected by the simulated natural source of high chlorides. This prediction is also consistent with field data.

Proposed Response

Regardless of the source of chloride, natural attenuation will reduce chloride concentrations in ground water to acceptable levels within several hundred feet east (down gradient) from the McCasland Windmill well. The MODFLOW simulations support this conclusion.

Although we found no evidence that Mewbourne Oil Company, its predecessors or contractors caused elevated chloride concentrations at the McCasland Windmill Well, Mewbourne Oil will support NMOCD's implementation of the following remedy:

1. Mewbourne Oil Company will donate the 4-inch diameter monitoring well, MEW A, to NMOCD.

2. NMOCD will monitor the ground water quality in the area as necessary to protect the "waters of the State."

3. Two up gradient 4-inch monitoring wells now exist within 100 feet of the cattle trough at the McCasland Windmill well. We recommend that NMOCD encourage Mr. McCasland to move the windmill and pump to one of these wells. Our simulation modeling supports the field observations that these two wells will not be affected by the zone of high chloride associated with the windmill well.

Recommendation

We recommend that NMOCD accept this information and determine that Mewbourne is not responsible for any further action at the site.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

Copy: Mike Shepard, Mewbourne Oil Company
Richard Olson, Hinkle, Hensley, Shanor & Martin
Gary Larson, Hinkle, Hensley, Shanor & Martin

R.T. HICKS CONSULTANTS, LTD.
4665 Indian School Road NE ▲ Suite 106 ▲ Albuquerque, NM 87110 ▲ 505.266.5004 ▲ Fax: 505.266.7738

Page 1 of 3

FAX

To: Wayne Price

Company: NMOCD

Fax: 505-476-3471

Phone: Date: ~~12/6/00 1:30PM~~ 4/17/01

Re: cc: Mike Shepard, Gary Wilson

From: Randall Hicks
e-mail r@rthicksconsult.com home page www.rthicksconsult.com

Comments:

Wayne -

April 30th looks good for us.

See you @ 1pm.

Randy

R.T. Hicks Consultants, Ltd.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

April 17, 2001

Mr. Wayne Price
New Mexico Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

RE: Conoco Federal #2, Mewbourne Oil

Dear Mr. Price:

R.T. Hicks Consultants, Ltd. (Hicks Consultants) completed the work elements outlined in our letter of March 19, 2001. Analytical results are pending. We pumped about 3000 gallons from the McCasland windmill well and disposed of this water through McClasky Oilfield Services. We found that the specific conductance (SC) of the pumped water did not change over time. The average of several SC measurements during the pumping program was 3,902 µmhos/cm with a standard deviation of 258 µmhos/cm. This average conductance suggests a TDS concentration of 2,300 mg/L. An estimate of TDS concentration can be calculated from conductance by multiplying the conductance by 0.59 (Hem,1985).

The McCasland water storage tank was nearly empty during the 2001 site visit. In 1999, Hicks Consultants noted that the storage tank contained approximately 6-8 feet of standing water. Our inspection of the storage tank in 2001 revealed leakage from the tank in several locations. We estimate the leakage rate at approximately 20-100 milliliters per min (less than 0.25 gallons per hour). This leakage may have caused the loss of the 6-8 feet of standing water observed in 1999. The conductance of water obtained from the storage tank suggests a TDS of 3,600 mg/l.

Based on measurements of conductance at monitor wells Mewbourne A, MW1, and MW2, the TDS of groundwater at these wells was approximately 435 mg/L, 500 mg/L and 500 mg/L, respectively. MW3 showed a higher TDS concentration of 1,500 mg/L

Our measurement of groundwater levels suggests a nearly flat hydraulic gradient. Without excellent elevation control, we cannot determine the direction of groundwater flow at this site.

We believe several additional work elements are necessary before we submit a final report. These work elements are:

1. On May 3 or 4, we will contract with a local firm capable of entering confined space to examine the interior of the McCasland water storage tank. We will obtain samples of any sludge or residual material for analysis of major cations, anions and TDS.
2. During this same field program, we will contract with a registered surveyor to obtain elevation and map coordinates for the McCasland windmill well, Mewbourne A, MW-1, MW-2 and MW-3.

Before we proceed with these work elements, we would like to meet with you to discuss any NMOCD questions or comments. Depending upon what we find in the storage tank, additional field programs may be necessary. We would like a proposed field program to meet all of the requirements of NMOCD necessary for closure of the regulatory file.

We look forward to meeting with you on April 30, 2001 at 1:00 pm. Thank you for your attention to this matter.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall Hicks
Principal

Copy: Mr. Richard Olson, Hinkle, Hensley, Shanoor & Martin
Mr. Garv Larson, Hinkle, Hensley, Shanoor & Martin
Mr. Mike Shepard, Mewbourne Oil

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

April 17, 2001

Mr. Wayne Price
New Mexico Conservation Division
1220 South St. Francis Drive
Santa Fe, New Mexico 87505

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2. During this same field program, we will contract with a registered surveyor to obtain elevation and map coordinates for the McCasland windmill well, Mewbourne A, MW-1, MW-2 and MW-3.

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We look forward to meeting with you on April 30, 2001 at 1:00 pm. Thank you for your attention to this matter.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall Hicks
Principal

Copy: Mr. Richard Olson, Hinkle, Hensley, Shanoor & Martin
Mr. Gary Larson, Hinkle, Hensley, Shanoor & Martin
Mr. Mike Shepard, Mewbourne Oil

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

November 15, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. 5051 4539

Mr. Robert McCasland
P.O. Box 206
Eunice, New Mexico 88231

Re: McCasland Windmill near Conoco Fed #2 (Groundwater Contamination)

Dear Mr. McCasland:

Please find enclosed a copy of the memorandum of meeting held at the request of Mewbourne Oil Company in Santa Fe on August 31, 2000. As a result of that meeting the OCD is recommending that you properly dispose of the water in the storage tank, repair the check valve and pump the well for a set length of time to determine if the groundwater quality will improve. If the contamination is minor in nature then pumping the well might be the best and quickest way to improve the quality of the water and return this well back into service for your ranching operations.

If you will contact the OCD (505-827-7155) before starting the pump test we can assist you in determining the water quality. Please note, if this fails to improve the groundwater quality from the windmill then OCD will continue its investigation.

Sincerely;

Wayne Price-Pet. Engr. Spec.

Cc: OCD Hobbs Office
Mewbourne Oil Co.

Attachments-1

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

October 17, 2000

Mr. Wayne Price
NMOCD
2040 South Pacecho
Santa Fe, NM 87505

RE: Mewbourne Oil Company-Conoco Federal #2 Groundwater Investigation

Dear Mr. Price:

This letter is to address the issues we discussed during our telephone conversation of October 1, 2000. The following is a list of those issues, as I remember them.

1. NMOCD will not require Mewbourne to submit an investigation workplan or conduct any further investigation until NMOCD reviews the results of a windmill-pumping program.
2. NMOCD will request that Mr. McCasland perform the windmill-pumping program.
3. NMOCD understands that Mr. McCasland must employ an appropriate technical protocol in conducting the program. The protocol should include several water sample analyses and monitoring of specific conductance. Bill Olson will assist you with developing the pumping protocol.
4. NMOCD will copy Mewbourne on any letters to Mr. McCasland. Mewbourne will have an opportunity to comment upon the proposed pumping protocol.
5. You stated that you are uncomfortable with pumping the windmill water directly onto the ground. You stated that you would suggest that Mr. McCasland empty the storage tank (perhaps by offering the water for nearby drilling activity). After re-filling the tank from the windmill, the pumped water may meet WQCC Standards. Discharge to the ground surface of such water is consistent with WQCC and NMOCD regulations.
6. I stated that Mr. McCasland must first fix the check valve or modify the pumping system to prevent backflow into the well.
7. You asked if Mewbourne would participate in the pumping program by paying for analyses, water disposal and/or other direct costs. You stated that you intend to request that Mr. McCasland implement the entire program. Depending upon the outcome of the discussion with Mr. McCasland, you stated that you might contact Mike Shepard with Mewbourne to discuss cost sharing

8. Mewbourne will be willing to pay for chemical analyses of the windmill water, and possibly other direct costs, in the event that Mr. McCasland will not.

Please call me if any of the above is not as you remember.

Sincerely,
R.T. Hicks Consultants Ltd.,

Randall T. Hicks
Principal

cc: Mike Shepard, Mewbourne
Gary Larson, Hinkle Law Firm

Price, Wayne

From: Price, Wayne
Sent: Friday, September 15, 2000 11:14 AM
To: 'Randy Hicks'
Cc: Gary Larson
Subject: RE: Mewbourne

831meet.doc

From: Randy Hicks[SMTP:R@rthicksconsult.com]
Sent: Thursday, September 14, 2000 4:52 PM
To: Price, Wayne
Cc: Gary Larson
Subject: Mewbourne

Wayne,

Thanks for your call back. Here is my email address. Please send the meeting summary to Gary Larson to (he is on the cc list of this email) as well. Thanks Wayne.

Randy

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

Memorandum of Meeting or Conversation

Telephone _____
Personal _X_____
E-Mail _____

Time: 1:30 pm
Date: Aug 31, 2000

Originating Party: Mewbourne Oil Co.- Michael Shepard, Gary Larson, Rich Olson, Randy Hicks

Other Parties: OCD- WPrice, BOlson, RCAnderson, JFord, Lyn Hebert

Subject: Conoco Fed #2 Groundwater Contamination

Discussion: Mewbourne gave a technical presentation as to why they should not be required to perform additional investigation work. They concluded that the contamination is minor and the source is the windmill water tank which is owned and was installed by the landowner. Mewbourne's consultant did agree that oilfield activity of this type could generate calcium and sodium chloride type water.

OCD pointed out that Mewbourne had not provided any technical evidence that demonstrated as to where the drilling pit was located, or how it was constructed, which could be a possible source of the contamination.

Conclusions or Agreements:

OCD agreed with Mewbourne's request that OCD will ask the landowner to pump the windmill to see if the contamination will diminish and clean its self up. Mewbourne also agreed that if this method doesn't work then additional investigation may have to be conducted by Mewbourne.

Signed: _____

CC: Mewbourne Oil Co.
Robert McCasland-Landowner

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

August 14, 2000

AUG 15 2000

Mr. Wayne Price
Environmental Engineer
New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Mewbourne Plugged and Abandoned Well Conoco Federal #2,
Section 30 T20S R39E, Lea County
Response to NMOCD Comments

Dear Mr. Price:

This letter is a detailed response to the clarifications that you requested regarding R.T. Hicks Consultants Environmental Site Assessment of the Conoco Federal #2 Lease site and the nearby McCasland Windmill. As explained herein, we conclude that further subsurface investigation of this site is not necessary. Therefore, we respectfully request an extension of time to submit an investigation plan until the NMOCD has an opportunity to review this supplemental information. We believe that the data and discussion presented in this letter and previous submissions will be sufficient to permit NMOCD to close the regulatory file for Conoco Federal #2 and obviate the need for further work.

Summary of Activities Conducted by Mewbourne

On January 21, 1998, Mr. Gary Wink filed a report on the above-referenced site. Mewbourne responded to this report in a letter dated April 4, 1998, which identified the following important facts:

- December 28, 1970 is the spud date for Conoco Federal #2.
- On January 21, 1971, a contractor injected 17,500 gallons of acid (probably hydrochloric acid) into the well. The acid strength ranged from 3% to 20%.
- Over 14 days, the well produced 92 barrels of oil and 349 barrels of formation water.
- On February 24, 1971, a contractor injected 2000 gallons of 15% acid. Water and oil recovered from subsequent swabbing flowed into a test tank.
- On March 1, 1974, Conoco Federal #2 was plugged and abandoned
- Analyses of the windmill water were not similar to produced brine

NMOCD responded to this letter on June 26, 1998, requiring "an investigation plan to determine if groundwater has been impacted with oilfield contaminants".

On August 17, 1998, our office submitted an investigation plan to NMOCD. Hicks Consultants implemented the plan and submitted our report on this investigation on November 4, 1998. The report concluded that the observed high TDS in the adjacent windmill

could be due to (1) unintentional disposal of calcium chloride at the well site or (2) a natural phenomenon.

On March 9, 1999, NMOCD required a second groundwater investigation to "determine if any activities associated with the Mewbourne Conoco Federal #2 has caused groundwater contamination."

Hicks Consultants submitted a groundwater investigation work plan on April 8, 1999. After completion of the first task of the work plan, Hicks Consultants submitted an amended work plan on August 11, 1999. We submitted our report summarizing the results of the work plan implementation on September 3, 1999. This report concluded:

- Based upon site investigations including sampling and analysis, the soil near Conoco Federal #2 is not the source of the observed high TDS in the adjacent windmill.
- Calcium chloride and possibly other residual material exist in the water storage tank for the adjacent windmill and are the source of the observed high TDS in the adjacent windmill.
- Activities of Mewbourne did not cause the observed high TDS in the windmill adjacent to Conoco Federal #2

On June 16, 2000, NMOCD provided questions and comments to our Environmental Site Assessment of September 3, 1999 and required Mewbourne to "submit an investigation plan for OCD approval to delineate the groundwater contamination." Below we respond to the NMOCD's letter dated June 16, 2000. Our response restates the comments in the letter and sets out Mewborne responses in the order of the letter.

Response to NMOCD Comment 1

...The monitor well demonstrated that Ogallala water-bearing formation exists in the area and provided local water chemistry. The distance and location from the site windmill well does not adequately provide a good down-gradient measuring point for delineating down-gradient contamination. The site-specific groundwater direction or gradient was not property determined, the elevations of off-site wells were estimated and not surveyed.

We have confidence in our determination of the potentiometric surface. Therefore, we disagree with the contention that " the site specific groundwater direction or gradient was not property determined, the elevation of off-site wells were estimated and not surveyed."

As stated in the report, we employed the Hobbs Southeast USGS topographic map to provide estimates of the ground-level elevation at each windmill. We interpolated between contours to obtain surface elevations at each windmill. The contour interval for the Hobbs Southeast topographic map is 5 feet. According to the USGS, the contour lines are accurate to within half a foot.

To determine the groundwater elevation, we measured depth to water at the ports in the casing and subtracted the measured casing height. Using the field measurements and the

contour lines, we estimate a confidence level for our groundwater elevations as ± 3 feet. This figure is the sum of the USGS confidence interval (0.5 feet) and 2.5 feet, which is difference between contour intervals divided by two.

Using our calculated groundwater elevations, we determined the mean direction of groundwater flow to the southeast with an average hydraulic gradient of 0.003. Due to the relatively steep gradient and distance between windmills, an uncertainty of 3 feet could not significantly influence the determined direction of groundwater flow.

The greatest uncertainty in our calculated water table elevations is our interpolation between surface elevation contours. However, most of the windmills fall directly on a contour interval and the terrain is relatively flat, giving us greater confidence in our determined windmill surface elevations. Consequently, we conclude a survey of windmill elevations is unnecessary.

Second, Hicks Consultants, Mewbourne, and the NMOCD understood that the proposed monitoring well might not provide a precise analysis of groundwater directly down gradient from Conoco Federal #2. This fact was identified in the work plan and discussed with Mr. Price and Mr. Anderson of NMOCD before submission of the work plan. NMOCD then approved the work plan, including the proposed site for the monitor well. The rationale for not placing a monitor well directly down gradient from Conoco Federal #2 is simple: a reasonably accessible location does not exist. A large dune field lies south of Conoco Federal #2 precluding access without a significant construction project and attendant habitat destruction. Locating a monitor well at the edge of the well pad, only 60 feet from the windmill would accomplish little if the source of elevated TDS is the reserve pit, other on-site oilfield activity or backflow from the storage tank. Locating a monitor well 6000 feet down gradient from the windmill, where access exists, would accomplish nothing.
The monitoring well does demonstrate that the up gradient activities of Mewbourne have not caused any regional impairment of water quality.

Response to NMOCD Comment 2

The laboratory certificate of analysis indicates value units in mg/l, table 2. Values were in ug/l, OCD assumes this was a typographical error. None of the analyses contained values for pH...no hydrocarbon analysis was performed except on the monitor well 'A".

We corrected the typographical error in Table 2 and attached the table.

We measured a neutral pH in the field and neglected to report these values.

The August 17, 1998 work plan called for analyses for hydrocarbons. However, because we could obtain samples only from stock tanks, we elected to forgo hydrocarbon sampling. NMOCD did not object to this modification of our approach in the March 9, 1999 response to our initial report, and did not require analysis of hydrocarbons. We maintain that the groundwater quality issue concerns high salt concentrations. To date we have found no

evidence of hydrocarbons in soil or water. We conclude that sampling the windmills for hydrocarbons was neither necessary nor required by NMOCD.

Response to NMOCD Comment 3

Table 4 and Table 5 were referenced in the report but appeared in reverse order in the tables.

The typographical error is corrected in the attachment.

Response to NMOCD Comment 4

Mewbourne #2 & #4 water sample points were taken from cattle troughs and may not truly represent the groundwater conditions at those points. Sample point 2 appears to be producing from the Ogallala and water chemistry is very close to the Mewbourne "A" monitor well. Mewbourne #4 water sample point does not match "2" or "A", but appears to be somewhat similar to the McCasland contaminated windmill water.

The windmills were not actively pumping during the 1998-sampling event. We elected to obtain samples from the cattle troughs associated with each windmill. For the purposes of our study, the samples provide representative analyses of groundwater. We concede that evaporation from the trough would increase TDS slightly. However, evaporation does not change the position these waters would plot on tri-linear diagrams.

The McCasland windmill and Mew 4 appear similar with respect to conductance. Sulfate, not chloride, is the dominant anion in Mew 4. One explanation is that the holding tank at Mewbourne 4 contains residual salts (barium sulfate?) from oil field operations, causing elevated salinity in the trough. Alternative explanations are natural sulfate flux from the underlying redbeds or infiltration of sulfate-rich surface water at up gradient depressions (see USGS topographic map of area). Regardless of the source of sulfate, improper disposal of oil field waste by Mewbourne is not a probable cause of the elevated sulfate in Mew 4.

Response to NMOCD Comment 5

...Mew "A" monitor well appears to be water normally found in the Ogallala aquifer....The windmill has elevated calcium,[sodium and chloride]...OCD's result differs from Mewbourne's interpretation that the Ogallala water found in Mewbourne "A" monitor well has only 76.5 ppm of sodium where the windmill water has 244 ppm of sodium. This raises the questions, where did the extra sodium come from?...

We acknowledge that the sample from the McCasland windmill contains a larger mass sodium than the nearby Mewbourne A. However, in the windmill, calcium comprises 58% of the cations and sodium (plus potassium) is 31%. In Mewbourne A, calcium is 48% of the cations and 38% is sodium (plus potassium). Mewborne A may be considered sodium plus calcium, as stated in the NMOCD letter of June 16. The dominant cation in the windmill sample is calcium. We also acknowledge that NMOCD's comment causes us to conclude that some residual sodium chloride is present in the McCasland Windmill water storage tank.

We also include a revision of Plate 7. We found several typographical errors in our data entry. However, the diagram changed little after these corrections.

Response to NMOCD Comment 6

The report concludes, "The water storage tank used at the McCasland windmill well contains calcium chloride and other residual material from its former use as an oil field tank". OCD received documentation from the landowner claiming "the tank in question" had been cleaned prior to use.

NMOCD previously has required Mewbourne to conduct investigation activities into this matter that have cost Mewbourne more than $15,000. The investigative data generated by Mewbourne, the documented waste management practices of Mewbourne and sound hydrogeologic reasoning support our conclusion that the storage tank is the most probable source of the observed elevated TDS in the adjacent windmill. Moreover, not one iota of evidence supports the hypothesis that activities of Mewbourne caused the elevated TDS in the adjacent windmill. We conclude that, rather than imposing further investigation requirements on Mewbourne, the NMOCD either close the file on this matter or require the landowner to test our hypotheses presented in previous reports. Specifically, the landowner or NMOCD should:

- Fix the check valve at the subject windmill well and disconnect the existing tank.
- Install a sampling port on the windmill to facilitate sampling of groundwater before it enters any storage tank.
- Physically inspect the existing storage tank and demonstrate, to the satisfaction of NMOCD, that accumulated salt or other material is not present in the tank and the cause of the elevated TDS in the subject windmill.
- Continuously pump the windmill into a new tank for several months and monitor the specific conductance of the water.
- Prepare a report that discusses the hypothesis testing described above.
- If backflow from the storage tank is the source of the observed elevated TDS, implement an investigation to delineate the groundwater contamination.

Response to NMOCD Comment 7

One well file record supplied by Mewbourne indicated that surface casing...was set...at 1700 feet with 350 sacks cement circulated. OCD's preliminary calculations... show this would only be approximately 1119 feet. OCD questions whether the surface casing is property cemented. This could be a possible conduit for contamination to reach groundwater...

Other file records also indicated this well was acidized on a number of different occasions. The records do not indicate where or how these fluids were discharged...Calcium chloride [formed from acidizing calcium carbonate rock or cement with hydrochloric acid] is considered to be very soluble in water thus could be leached to the groundwater.

The daily drilling report for Conoco Federal #2 is attached. On 12-30-70, the log records a total depth of 1665 feet. On this day, the log states that 8 5/8-inch surface casing was cemented in place with 530 sacks of Trinity Lite Wate, 200 sacks regular cement with 2% CaCl and an additional 50 sacks circulated. If NMOCD employs 730 sacks of cement instead of 350, we believe your calculation will show sufficient grout to prevent communication between the Ogallala and other formations. The daily drilling report also states that the contractor performed a pressure test of the surface casing on 12-31-70 and found the results satisfactory.

We agree that the discharge of a sufficient volume of spent acidizing solution to an unlined reserve pit could result in the observed concentration of chloride, calcium, and sodium. However, the daily drilling report, shows that the well produced water (349 barrels) and oil (92 barrels) after the January 1971 acidification (see also Sundry Notice, April 30, 1971). It is apparent that this produced fluid flowed into a tank in order to obtain these precise measurements. After the February 1971 acidification, the daily drilling report (2-24-71) records specifically state that the produced fluid flowed to a test tank.

During the early 1970's standard practice in the industry was off-site disposal of formation water wherever the potential exists of a water-table aquifer. The formation water stored in the tanks after acidification was probably placed in the brine disposal system for the field. If industry standard practice was not followed at Conoco Federal #2, the formation water may have been discharged to the lined reserve pit. The 1967 NMOCC Order R-3221 prohibited discharge into unlined pits and Mewbourne followed standard industry practice at the time: lining reserve pits wherever water table aquifers may exist.

For the sake of argument, if Mewbourne discharged spent acidizing solution to a pit with a hole in the liner or a contractor accidentally discharged spent acidizing solution to the ground surface, such an incident would have occurred in 1971. We maintain that continued seepage of this discharge and impairment of groundwater quality after 29 years is essentially impossible. The vadose zone is dominantly sand. Any discharge in 1971 would have reached groundwater days or weeks after the initial release. Natural attenuation would effectively restore groundwater to ambient conditions after such an isolated and sudden insult.

Response to NMOCD Comment 8

The report concluded the area north of the Conoco Federal #2 was a reserve pit... There is the possibility that the reserve pit was not found or the contents have been removed. Additional soil samples of the area should be taken including background samples to assist in this determination.

In the attached aerial photographs from 1995 and 1974, we observe a right angle north and west of Conoco Federal #2. Note that the 1974 photograph (taken four days after completion of the plugging and abandonment of Conoco Federal #2) also shows the location of production equipment on the caliche pad. We conclude that these photographs provide ample evidence that the location of the former reserve pit was north of the former oil well. Such a location is consistent with the construction of the caliche pad on the south side of the

location and the absence of caliche on the north side of the location. These aerial photographs are consistent with our interpretation presented in the report.

It is possible that Mewbourne removed the contents of the reserve pit, although no record exists for such a removal.

Additional soil samples to determine the location of the reserve pit are unwarranted.

Response to NMOCD Comment 9

The windmill was completed open hole... This could be a possible conduit for leakage of surface contaminants to groundwater. The site investigation did not include the area south or east of the windmill or between the windmill and [the] abandoned oil well.

We fail to see how improper water well completion methods is the responsibility of Mewbourne. A more likely indicator of down-hole contamination from surface runoff would be bovine fecal coliform. We suggest that the landowner should test his water supply for bovine fecal coliform. If such contamination is discovered, we conclude that the landowner redesign his well in conformance with standard industry practice to prevent such infiltration of ranching waste.

The area south and east of the windmill drains to the south and east. Only 30-40 feet separate the windmill from the former oil well. The storage tank (see Figure 1 of our September 1999 report) occupies most of this area.

Response to NMOCD Conclusion

We maintain that the report submitted September 3, 1999 as supplemented by the data provided herein provides sufficient evidence to demonstrate that the storage tank at the subject site is the most likely source of elevated TDS in windmill water.

It is undisputed that the water derived from the McCasland windmill exceeds New Mexico Water Quality Control Commission regulatory standards. However, neither the landowner nor the NMOCD provided any evidence and our investigation has not revealed that past activities of Mewbourne caused the elevated TDS in the subject windmill. Nor does the documentation regarding tank cleaning effectively rebut the conclusions presented our report that the most probable cause of high TDS water at the subject windmill is ranching activities, not past oil exploration and production activities. The landowner has not provided sufficient evidence to prove that the storage tank is not the source of the contamination.

The report and the data submitted herein provide sufficient evidence to determine site specific hydrogeology for the subject site. The report clearly demonstrates that the vertical extent of so-called contamination extends from the storage tank, through the leaking check-valve and well casing to the underlying Ogallala aquifer. The investigations by Hicks Consultants found no evidence of drilling fluids, calcium chloride, or other oil field wastes in the area of the former reserve pit and well pad. Therefore, we conclude that the magnitude of the so-called vadose zone contamination is naught. No evidence supports Mewbourne as the source of the

so-called contamination of the subject windmill. Therefore, determination of the hydraulic parameters of the Ogallala in this area and the rate and direction of "contaminant" migration should not be the responsibility of Mewbourne.

Response to OCD Requirement

We conclude that Mewbourne need not conduct any additional investigation at the subject site. We further conclude that NMOCD has sufficient evidence to permit closure of the regulatory file for this matter. If NMOCD maintains the requirement for Mewbourne to conduct additional investigation after review of this document, we recommend that Mewbourne request a hearing to present these data and resolve this issue.

Mewborne representatives, including its legal counsel, are prepared to meet with NMOCD in the afternoon of August 31, 2000 to discuss this submittal. We hope the information presented in this letter will permit NMOCD to close the regulatory file for this Conoco Federal #2 site and eliminate the need for an August meeting or a hearing at a later date. Please contact me if you require clarification on any points presented herein.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

cc: Gary Larson, Esq.
Richard Olson, Esq.
Mike Shepard, Esq., Mewbourne

Table 2: McCasland Well Analytical Results - September 1, 1998

Lab ID			Mew #2	Mew #4	McCasland WM	McCasland WM	McCasland WM	McCasland Tank	Mewbourne A
Date			9/1/98	9/1/98	3/31/98	9/1/98	8/17/99	8/17/99	8/17/99
Ca	mg/l		99.3	310	700	749	411	916	86.3
Fe	mg/l		0.6	0.6		19.9	1.93	0.27	nd
Mg	mg/l		18.9	52.8	90	73.9	48.4	87.4	15
K	mg/l		17	15.5	7.4	8.3	6.2	9.4	4
Si	mg/l		23.7	22		21.8			
Na	mg/l		103	275	285	373	244	447	76.5
Zn	mg/l		ND	ND		3.8			
Cl	mg/l		114	453	1771	1930	1130	2450	121
Fl	mg/l		0.9	0.6		ND	nd	nd	nd
Nitrate	mg/l		0.5	0.5	3	1	1.6	2.2	3
Nitrite	mg/l		ND	ND		ND	nd	nd	nd
Ortho. P	mg/l		ND	1.9		ND			
Sulfate	mg/l		127	775	108	112	84.3	124	74.9
HCO3	mg/l		275	172	171	117	186	55.4	198
Conductivity	µmhos/cm		1160	3700		7800			
TDS					4113		2060	4270	547
					Milliequivalents per liter				
	Conversion Factor								
Ca+2	0.0499		4.96	15.47	34.93	37.38	20.51	45.71	4.31
Mg +2	0.08229		1.56	4.34	7.41	6.08	3.98	7.19	1.23
Na +K	0.0435	0.0256	4.92	12.36	12.59	16.44	10.77	19.68	3.43
HCO3 -1	0.01		2.75	1.72	1.71	1.17	1.86	0.55	1.98
SO4 -2	0.02082		2.64	16.14	2.25	2.33	1.76	2.58	1.56
Cl -1	0.02821		3.22	12.78	49.96	54.45	31.88	69.11	3.41
Total Cations			11.43	32.17	54.92	59.89	35.26	72.59	8.97
Total Anions			8.61	30.63	53.92	57.95	35.49	72.25	6.95
% Ca+2			43%	48%	64%	62%	58%	63%	48%
% Mg +2			14%	14%	13%	10%	11%	10%	14%
% Na + K			43%	38%	23%	27%	31%	27%	38%
% HCO3 -1			32%	6%	3%	2%	5%	1%	28%
% SO4 -2			31%	53%	4%	4%	5%	4%	22%
% Cl -1			37%	42%	93%	94%	90%	96%	49%

Table 3: Field Measurments for Mewbourne Oil Project

Well Name on Plate 4	Ground Elevation	Distance between ground and measuring point	Depth to Groundwater	Groundwater Elevation
McCasland Windmill	3558	1	78	3481
Mew #2	3545	1	55.5	3490.5
Mew #3	3540	1.5	57	3484.5
Mew #4	3572	1	58	3515
Mewbourne A	3553	1	72.99	3481.01

Table 4: Soil Conductance at Conoco Federal #2

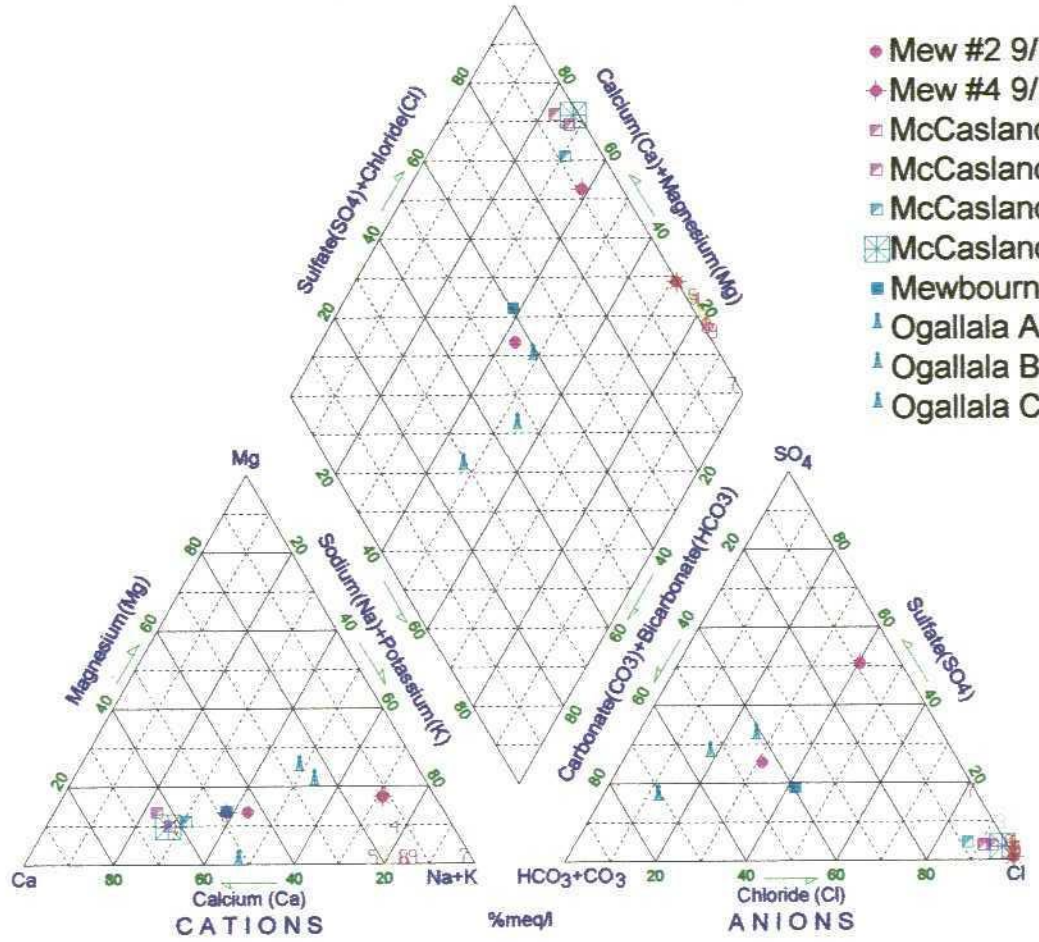
Sample Location	Depth	Conductivity uS/cm	Notes
Test Pit #1	5 ft	18.1	Submitted to Laboratory
	9 ft	6.6	
Test Pit #2	5 ft	13.5	
	9 ft	20.7	Submitted to Laboratory
Test Pit #3	5 ft	13	
	7 ft	18.2	Submitted to Laboratory
Test Pit #4	5 ft	13.4	
	7 ft	28	Submitted to Laboratory
Distilled Water	NA	3.1	

Table 5: Chemical Analyses of Soil at Conoco Federal #2

	Chloride	Fluoride	Sulfate	Calcium	Iron	Mg	K	Sodium
Test Pit #1, 6 feet deep	5.1	nd	23.8	2880	1390	1470	292	nd
Test Pit #2, 9 feet deep	6.2	1.9	31.1	413	2250	348	428	106
Test Pit #3, 7 feet deep	2.1	nd	9.8	257	1270	150	238	nd
Test Pit #4, 7 feet deep	15.4	nd	11.7	1530	1740	242	338	62.7

Plate 7

Piper Diagram of Ogallala Water and Oil Field Brine



- Mew #2 9/1/98
- Mew #4 9/1/98
- McCasland WM 3/31/98
- McCasland WM 9/1/98
- McCasland WM 8/17/99
- McCasland Tank 8/17/99
- Mewbourne A 8/17/99
- Ogallala A
- Ogallala B
- Ogallala C

1 Produced Water
2 Produced Water
3 Produced Water
4 Produced Water
5 Produced Water
6 Produced Water
7 Produced Water
8 Produced Water
9 Produced Water
1971, Con. #1

MARK PRODUCTION COMPANY
1108 SIMONS BUILDING
DALLAS, TEXAS 75201

CURTIS W. MEWBOURNE
PRESIDENT

748-0388
AREA CODE 214

DAILY DRILLING REPORT

D-K Abo Field
Conoco-Federal No. 2
1980'FEL & 660' FSL of Sec. 30-T20S-R39E
Lea County, New Mexico

12-18-70	Staked Location
12-19-70	Waiting on drilling permit
12-20-70	" " " "
12-21-70	Building Roads
12-22-70	Clearing Location
12-23-70	Clearing Location
12-24-70	Waiting on Drilling Rig
12-25-70	Waiting on Drilling Rig
12-26-70	Rigging Up Tri-Service Drilling Company
12-27-70	Rigging Up
12-28-70	Spudded @ 6:30 AM
12-29-70	Drlg. 1319' Dev. @ 358' - 1/2°, @ 671' - 1/2°, @ 968' - 1/4 °.
12-30-70	TD 1665' - W.O.C. Ran 1652' of 8-5/8" H-40, 24# casing set @ 1663'. Cemented by Dowell with 530 sacks Trinity Lite Wate, 200 sacks regular 2% CaCl - 2 centralizers on bottom - insert float - plug down @ 10 PM - circulated about 50 sacks.
12-31-70	Drlg. 2335' - salt & anhydrite MW 10.3# - Ph 9 - Dev. @ 1981 - 3/4 degree Pressure tested csg with 1000 psi for 30 min - held okay - drld plug & cement - started drlg formation 12-30-70.
1-1-71	Drlg. 3195' - anhydrite Dev. @ 2356' - 3/4 degree - @ 2793' - 3/4 degree - @ 2850' - 1 degree
1-2-71	Drlg. 3528' - anhydrite Drlg w/water - MW 10.3 - Ph 9.5 - Dev. 3235' - 3/4 degree - @ 3360' - 1-1/4
1-3-71	Drlg. 3820' - anhydrite & lime MW 10.3 - Ph 9 - Dev. @ 3695' - 3/4 degree
1-4-71	Drlg. 4150' - lime MW 10.3 - Ph 9.5

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Conoco-Federal No. 2
Lea County, New Mexico

1-5-71	Drlg. 4385' - lime & sand Drlg.w/brine water - MW 10.3# - Ph 9.5 Dev @ 4215' - 3/4 degree
1-6-71	Drlg. 4600' - lime & sand MW 10.3 - Ph 9.5 Dev - 3/4 degree
1-7-71	Drlg. 4965' - lime Drlg. w/brine water - MW 10.3# - Ph 9.5 Dev. @ 4625' - 3/4 degree
1-8-71	Drlg. 5347' - lime & sand Drlg w/brine water - MW 10.3# - Ph 9 Dev @ 5035' - 3/4 degree
1-9-71	Drlg. 5632' - lime Dev. @ 5450' - 1-1/4 degree Drlg. w/water - Ph 9.0
1-10-71	Drlg. 5888' - lime Dev. 5868' - 3/4 degree
1-11-71	Drlg. 6180' - lime
1-12-71	Drlg. 6401' - lime Drlg. w/water - Ph 9 T/SA 4330 (-760) - 12' high to Wilshire #1 T/Glorietta 5608 (-2038) - 2' high to Wilshire #1 7' high to Conoco #1
1-13-71	Drlg. 6635' - lime Dev. @ 6619' - 1-1/4 degree Drlg. w/water - MW 10.3 - Ph 9
1-14-71	Drlg. 6860'
1-15-71	Drlg. 7020' - lime & shale Dev. @ 6839' - 3/4 degree, @ 6990' - 3/4 degree MW 10.2# - Vis 35 - WL 19.8 - FC 1/32 - Ph 9
1-16-71	

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DAILY DRILLING REPORT

Conoco-Federal No. 2
Lea County, New Mexico

1-17-71 Drlg. 7295' -
Dev. 3/4 degree - MW 10.3# - Vix 36 - WL 14.6 - FC 1/32 - Ph 9

1-18-71 TD 7420' - lime.
MW 10.2 - Vis 37 - WL 13 - FC 1/32 - Ph 9
Finished hole @ 2 PM 1-17-71 - circ 2 hrs - pulled out & rigged up Welex - preparing to DST #1 @ 6925' - 7078' - opened tool w/fair blow - will take 15 min preflow and 1 hr initial shut-in.

1-19-71 Packer failed on DST #1 - pulled out and laid down test tool - went back in hole - circ 3 hrs - preparing to re-test - oil started flowing to pits with mud - decided to set pipe - pulled out of hole - rigged up and ran 224 jts of 4-1/2", 11.60# N-80 & J-55, ST&C & LTC casing (7173') - set @ 7170' - cemented with 390 sacks Class "C" w/5-1/2# salt/sack - plug down 2:15 AM 1-19-71 - set slips - cut off - welded threads on casing - released rig @ 6 AM.

1-20-71 Moving in completion unit - pressure tested casing with 2000 psi for 30 min - no drop - ran temperature survey - top of cement @ 5755'. Picked up tubing - tagged bottom - hooked up well head.

1-21-71 Displaced tbg - spotted acid over perforation zone 6943-7070' - pulled out of hole - perforations 6943' 6949' 6966' - 6969' - 6979' - 6992' - 6994' - 6999' - 7004' - 7006' - 7007' - 7015' - 7034' - 7047' - 7051' - 7057' - 7059' - 7062' - 7070' - 19 1/2" holes - ran packer & holddown - set pkr @ 6897' - treated with 1500 gals 15% - 8000 gals 20% - and 8000 gals 3% - breakdown press 2900 psi - max 5000 psi - treated @ 4900 psi - instant SIP 2575 psi - 5 min 2500 psi - 15 min 2400 psi - 1 hr 2275 psi.

1-22-71 SITP 1350 psi - opened 4:30 AM - flowed 32 bbl acid wtr - no show - started swabbing - started getting show of oil after total of 85 bbl fluid - gradual increase of 10-22% oil after 120 bbl - @ 4 PM fluid level 4000' - oil show of 12-15% after recovery of 168 bbl fluid.

1-23-71 TP 250 psi - fast bleed-off - no fluid - checked fluid @ 4000' - first swab showed 8% oil - swabbed 38 bbl in 4 hrs - showing 5-8% oil - fluid @ 5500' - total recovery 206 bbls.

1-24-71 shut-down

1-25-71 Pulling tubing and packer - preparing to install pumping unit.

1-26-71 Setting pumping unit.

1-27-71 Set pumping unit - testing.

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DAILY DRILLING REPORT

Conoco-Federal No. 2
Lea County, New Mexico

1-28-71 Pumped 12 hrs - made 47 BAW - total recovery 253 bbls.

1-29-71 Pumped 24 hrs - rec 110 bbls water and 5 bbls oil - 363 bbls total recovery - lack 200 bbls.

1-30-71 Pumped 99 BLW - 40 BLW to recover

1-31-71 Pumped 33 BO & 66 BW

2-1-71 Pumped 11 BO & 44 BW

2-2-71 Pumped 11 BO & 44 BW - gas to small to measure

2-3-71 Pumped 5-1/2 BO & 22 BW

2-4-71 Pumped 4 BO & 37 BW

2-5-71 Pumped 2-3/4 BO & 33 BW

2-6-71 Pumped 2-3/4 BO & 36 BW

2-7-71 Pumped 11 BO & 47 BW

2-8-71 Pumped 5-1/2 BO & 33 BW

2-9-71 Pumped 5-1/2 BO & 27 BW

2-24-71 Set HOWCo wireline plug over Drinkard - perforated Blinebry - 16 holes - Perforated @ 6072', 6095', 6115', 6131', 6136', 6167', 6190', 6231', 6272', 6284', 6298', 6302', 6327', 6355', 6377', 6386' - acidized w/2000 gals 15% acid - total load in formation, 100 bbls.

Breakdown pressure	2100 psi
Maximum treating pressure	4950 psi
Final treating pressure	3350 psi
Average treating pressure	3150 psi
Average treating rate	3.6 BPM
ISIP	2200 psi
10 min SIP	2150 psi
15 min SIP	1750 psi

Opened well & flwd to test tank @ 25 psi on 3/4" choke - flwd back 29 BAW & died - started swbg - after recovery of 60 bbl total fluid, first oil appeared - swbd 10 BTF next hr @ 10% oil - 8 BTF during next hr @ 20% oil - then 4-1/2 bbl @ 30% oil - last hr rec 1.2 bbl @ 40% oil - swbd dry & shut-in @ midnight.

2-25-71 SITP 90 psi - found 3600' fluid in hole - first swab run 40% oil - 2nd swab run 5% oil - rec 4.3 bbl fluid first hr - swbd down - shut-in for 1 hr and fluid rose 1000' in tbg - two swab runs during next hr recovered

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DAILY DRILLING REPORT

Conoco-Federal No. 2

Page 5

2-26-71 Sand fraced with 40,000 gals gelled water & 60,000# sand

Breakdown pressure	2300 psi
Maximum treating Press	3450 psi
Average treating press	3150 psi
Final treating press	3250 psi
ISIP	2200 psi
5 min SIP	2150 psi
Avg rate	22.8 BPM

Dropped 6 balls - good ball action - total load 1,200 bbl water.

2-27-71 SIP 1400 psi - flwd 326 bbl load wtr - ran sand pump - very little sand - ran tbg and shut-in for night.

2-28-71 Flwd 56 bbl load wtr - ran rods - put on pump @ 11:30 AM 2-28-71 - total of 821 bbl load water to recover.

3-1-71 Pumped 203 bbl load wtr - 582 bbls total recovery - 618 bbls to recover.

3-2-71 Pumped 153 bbl fluid - good trace of oil - 735 bbl load water recovered to date.

3-3-71 Pumped 153 bbl water with free oil and slight show of gas - total 888 BLW recovered to date.

3-4-71 Pumped 189 bbl water - 12% oil - total of 1077 BLW recovered to date.

3-5-71 Pumped 154 bbl fluid - 24% oil - 118 bbl wtr & 36 bbl oil - fair gas - recovered total load.

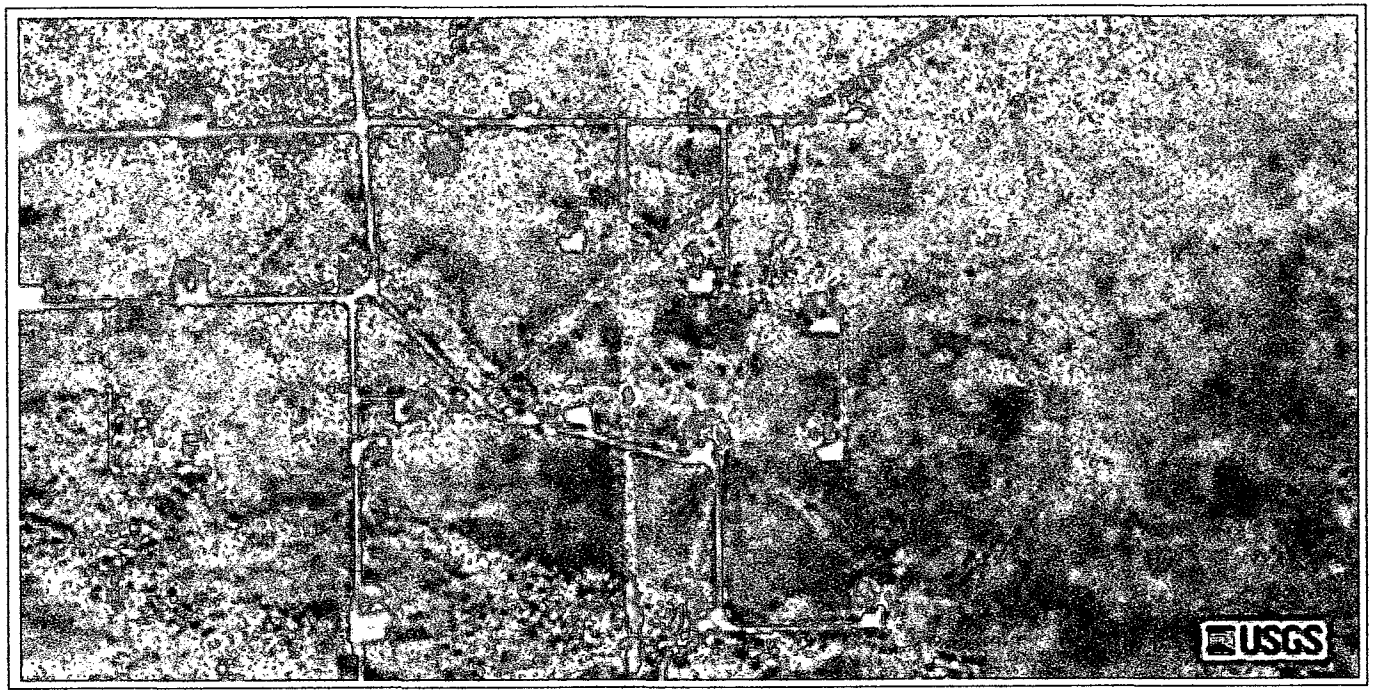
3-6-71 Turned to battery - pumped 41 bbl oil - 36.7 API corrected gravity.

3-7-71 Turned back to test tank - pumped estimated 34 bbl oil with 70% water-cut.

3-8-71 Pumped 118 bbl total fluid into test tank - 25-30% oil - estimated 32 bbl oil - 85 bbl water.

3-9-71 Potential Test - Pumped 101 bbl fluid - 75% water - Estimated 25 bbl oil and 76 bbl water

FINAL REPORT



Photograph Source: www.terraserver.com

N

No Scale

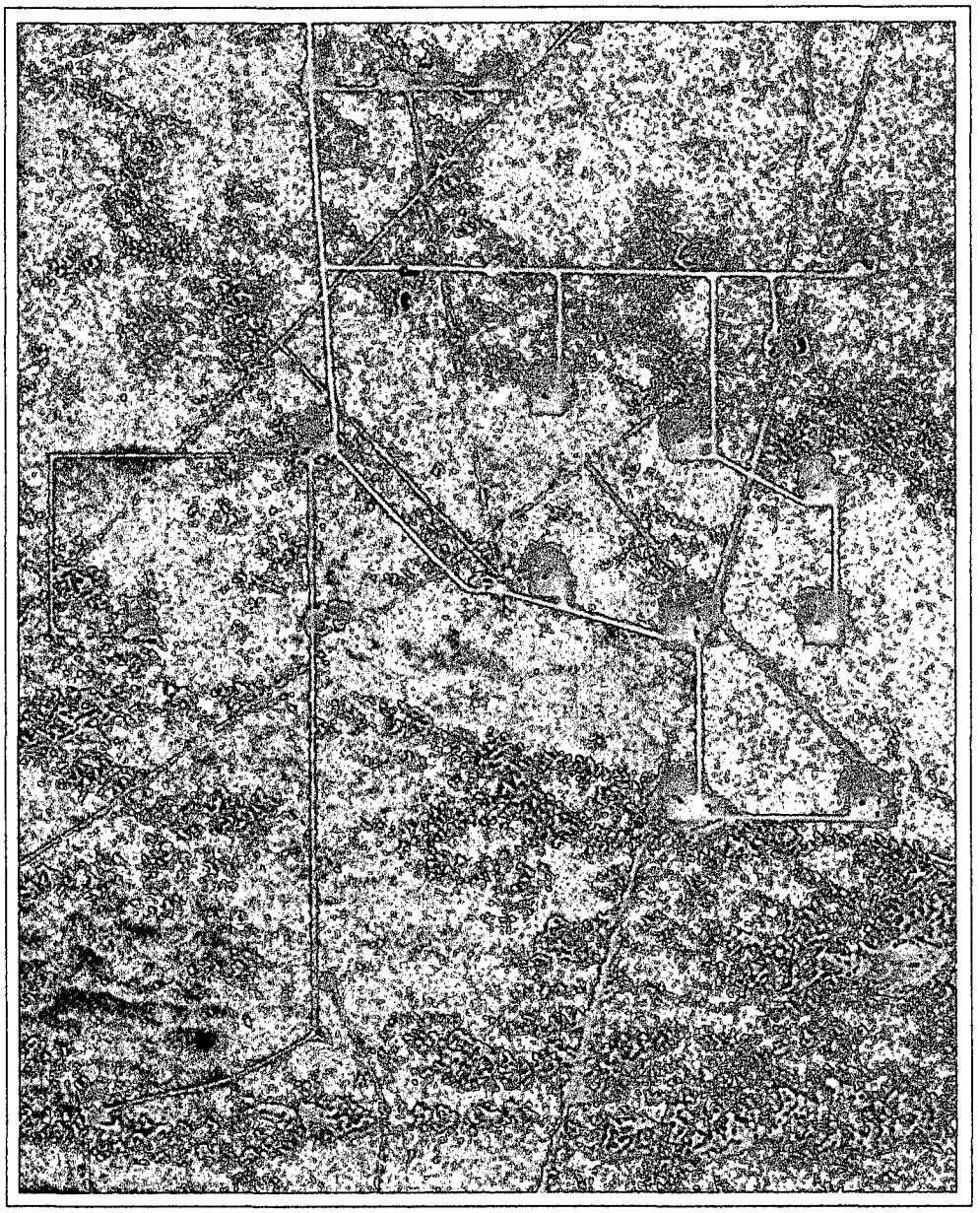
R.T. HICKS CONSULTANTS, LTD.
4665 Indian School Road NE Suite 106 Albuquerque, NM 87110
505.266.5004 Fax: 505.266.7738

Hinkle Law Firm

1995 Aerial Photograph, Conoco Federal #2

Plate 1

August 2000



Photograph Source: A40 35025 174-90

N

No Scale

R.T. HICKS CONSULTANTS, LTD.
4665 Indian School Road NE Suite 106 Albuquerque, NM 87110
505.266.5004 Fax: 505.266.7738

Hinkle Law Firm

Plate 2

Enlargement of 3-5-74
Aerial Photograph, Conoco Federal #2

August 2000

NEW MEXICO ENERGY, MINERALS and NATURAL RESOURCES DEPARTMENT

GARY E. JOHNSON
Governor
Jennifer A. Salisbury
Cabinet Secretary

Lori Wrotenbery
Director
Oil Conservation Division

June 16, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. 5051 5642

Mr. Mike Shepard
General Council
Mewbourne Oil Company
P.O. Box 7698
Tyler, Texas 75711

Re: Mewbourne Oil Company
Conoco Federal #2
Section 30-T20s-R39e

Dear Mr. Shepard:

The New Mexico Oil Conservation Division (NMOCD) is in receipt of the R.T. Hicks Consultants, LTD Environmental Site Assessment report dated September 3, 1999. The OCD has reviewed the report and has the following comments, conclusions and requirements:

Comment: The monitor well Mewbourne "A" was drilled in anticipation that it could replace the windmill in the future. OCD approved this request. The monitor well demonstrated that Ogallala water-bearing formation exists in the area and provided local water chemistry. The distance and location from the site windmill well does not adequately provide a good down-gradient measuring point for delineating down-gradient contamination. The site specific groundwater direction or gradient was not properly determined, the elevations of off-site wells were estimated at and not surveyed.

Comment: Table 2. Showed the general chemistry values of the water wells to be 1000 times less than what was actually measured. The laboratory certificate of analysis indicates value units in mg/l, table 2. Values were in ug/l, OCD assumes this was a typographic error. None of the analysis contained values for Ph. The windmill water, water tank and soil samples collected were only analyzied for General Chemistry and no hydrocarbon analysis was performed except on the monitor well "A'. Oilfield by-products such as oily residues, produced water, etc. can contain hydrocarbons.

Comment: Table 4 and Table 5 were referenced in the report but appeared in reverse order in the tables. OCD recognizes this as a typographic error.

Comment: Mewbourne #2 & #4 water sample points were taken from cattle troughs and may not truly represent the groundwater conditions at those points. Sample point 2 appears to be producing from the Ogallala and water chemistry is very close to the Mewbourne "A" monitor well. Mewbourne #4 water sample point does not match "2" or "A", but appears to be somewhat similar to the McCasland contaminated windmill water.

Comment: The report suggests that pure Calcium Chloride used for cement curing is the source of contamination from the water tank. A piper diagram was used to demonstrate that the waters are classified as being predominantly calcium and chloride. The analyticals for the Mew "A" monitor well appears to be water normally found in the Ogallala aquifer with Sodium (Na) = 76.5 ppm and Chloride (Cl) =121 ppm. The windmill has elevated Calcium (Ca) = 411 ppm, Na = 244 ppm and Cl = 1130 ppm. The report also utilizes a trilinear diagram to plot hydrochemical differences between analytical results of the different water samples in order to classify waters to determine their origin. Mewbourne states that the windmill water was classified as dominant Calcium Chloride water and is a result of Calcium Chloride water from the windmill storage tank and a mixture of Ogallala water.

OCD plotted these values and it appears the windmill water would be classified as (Calcium + Sodium) Chloride waters. OCD's result differs from Mewbourne's interpretation in that the ogallala water found in Mewbourne"A" monitor well has only 76.5 ppm of Sodium (Na) where the windmill water has 244 ppm of Sodium. This raises the questions, where did the extra sodium come from? Mewbourne should address this issue.

Comment: The report concludes, "The water storage tank used at the McCasland windmill well contains calcium chloride and other residual material from its former use as an oil filed tank". OCD received documentation from the landowner claiming "the tank in question" had been cleaned prior to use.

Comment: One well file record supplied by Mewbourne indicated that surface casing 8-5/8' 24# was set in a 12-1/4' hole at 1700 feet with 350 sacks cement circulated. OCD's preliminary calculations using (1.32 ft^3/sack) show this would only be approximately 1119 feet. OCD questions whether the surface casing is properly cemented. This could be a possible conduit for contamination to reach groundwater. This should be checked and verified.

Other file records also indicate this well was acidized on a number of different occasions. The records do not indicate where or how these fluids were discharged. Common practice in the oilfield was to produce these completion fluids into a reserve pit. Hydrochloric Acid (HCL) can react with the calcite (calcium carbonate) in the caliche to produce carbon dioxide gas and calcium chloride. Calcium chloride (CaCl) is considered to be very soluble in water thus could be leached to the groundwater.

Comment: The report concluded the area north of the Conoco Federal #2 was a reserve pit and the samples collected did not reveal evidence that a pit was actually in this area. The report mentioned that a pit liner was not found. OCD's experience in buried reserve pits normally reveal evidence of hydrocarbons and salts. There is the possibility that the reserve pit was not found or the contents have been removed. Additional soil samples of the area should be taken including background samples to assist in this determination.

Comment: The windmill was completed open hole. There is three feet of surface pipe for stability as confirmed by the landowner. This could be a possible conduit for leakage of surface contaminants to groundwater. The site investigation did not include the area south or east of the windmill or between the windmill and abandon oil well. This area is void of any vegetation and might be the contamination source area.

OCD CONCLUSION: The submitted report does not provide sufficient evidence demonstrating that the sole source of contamination i.e. calcium chloride was from the McCasland windmill water tank. There is groundwater underlying the Mewbourne site that exceeds the New Mexico Water Quality Control Commission Regulation standards and Mewbourne did not provide a sufficient number of vadose and groundwater monitoring points to determine the site specific hydrogeology, the vertical and horizontal extent and magnitude of vadose-zone and groundwater contamination, including hydraulic parameters, rate and direction of contaminants.

OCD REQUIREMENT: Mewbroune shall submit an investigation plan for OCD approval to delineate the groundwater contamination by August 15, 2000.

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155).

Sincerely Yours,

Wayne Price

Wayne Price-Pet. Engr. Spec.
Environmental Bureau

cc: OCD Hobbs Office
Mr. Bob McCasland

Price, Wayne

From: Price, Wayne
Sent: Tuesday, April 04, 2000 1:54 PM
To: Anderson, Roger; Wrotenbery, Lori
Subject: Mewbourne Oil Company-Request for response

This project was started when I was working in district I. The landowner filed a complaint concerning the groundwater quality. Gary Wink requested that I handle since groundwater contamination might be involved. OCD investigated and on June 26, 1998 requested that Mewbourne investigate this issue. Mewbourne was given 60 days to respond. Mewbourne responed to OCD's request on November 4, 1998. On March 9, 1999 OCD requested additional information due on April 15, 1999. Mewbourne submitted another work plan for OCD approval on April 14, 1999. OCD approved this plan on May 19, 1999 with a deadline of August 20, 1999. On August 11, 1999 Mewbourne submitted a revised plan and requested an extension until September 6, 1999. OCD approves via E-mail. OCD received the final investigation report on September 13, 1999.

During this interim period OCD had begun to rank sites for environmental priority. This site has not been rank due to the low priority it would receive. OCD has been in contact with the landowner and Mewbourne's consultant. It was assumed by OCD that both parties were communicating and this project was not considered high priority from either party. Also the landowner had requested from OCD that he have an opportunity to review the final report and submit comments before OCD made a decision. On March 6, 2000 the landowner informed the OCD that he had not received the final report and requested a copy. A copy was sent that day. On March 14, 2000 OCD received comments from the landowner. The evaluation process has begun and has been discussed with Roger. Jack Ford also has pulled the well file and is reviewing to determine if there was a problem with the well. We presently are waiting for Willie to return for his hydrologic input.

This case is extremely complicated as both parties are blaming the other for the contamination. Any decision we make will probably go to hearing.

On April 04, 2000 i returned Mr. Shepard call and found out that they have been sued for groundwater pollution. Mr. Shepard is requesting OCD to rule in their favor so the suit can dismissed.

OCD will attempt to respond within the next two weeks.

Robert McCasland
P.O. Box 206
Eunice, New Mexico 88231
Phone (505) 394-2553
Home Phone (505) 394-3022

March 14, 2000

NM Energy, Minerals and
Natural Resources Dept.
2040 South Pacheco Street
Santa Fe, NM 87505

Attn: Wayne Price

Re: Mewbourne Oil Company
Conoco Federal #2
Section 30-T20s-R39e

Dear Wayne:

Per our phone conversation, I am enclosing a copy of the invoice from Chaparral Service, Inc., for the sandblasting and coating of the tank in question. Note the date of the invoice is 1/11/89.

Thank you for your assistance in this matter. I look foward to hearing from you regarding the appropriate settlement of this matter.

Sincerely,

Robert McCasland

RAM/lhp

En.c (1)

ORIGINAL INVOICE

Chaparral SERVICE, INC.

31554

PHONE 394-2545
HOBBS 397-3044

P.O. DRAWER 1769

WEST TEXAS AVE.

EUNICE, NEW MEXICO 88231

TO: Dallas McCasland
Box 206
Eunice, NM 88231

W.O. No. _____

A.F.E. _____

LEASE _____

WELL _____

Furnished Equipment and labor to: sandblast, patch and coat a 500 bbl. tank.
material used is potable for drinking water

RECEIVED
MAR 17 2000
Environmental Bureau
Oil Conservation Division

Unit #	Driver:	Barrels Hauled	Time Out A.M. P.M.	Time In A.M. P.M.	Hours Charged	Loaded Highway Miles
23	Jose Serna					

Fresh Water or Brine Water Station:

	HOURS	PRICE PER HOUR	TOTAL
Transports w/Oper.			
Hot Oiler w/Oper.			
Kill Truck w/Oper.			
Vacuum Truck w/Oper.			
Trailer			
Truck			
Pick-Up			
Test Truck w/Oper.			

	HOURS	PRICE PER HOUR	TOTAL
Pusher			
Helper			
Per Verbal Quote			1350.00
Helper			
Welder			
Chemical			
Disposal Charge			
Fresh Water			
Brine Water			
Equipment			
Total			1350.00
5.125% Tax			69.19
Grand Total			1419.19

THIS IS YOUR INVOICE. PLEASE PAY TOTAL

Date 1/11/89

Customer's Signature _____

TERMS: NET 30 DAYS

Form 9-331
(May 1963)

COPY TO O.C.C.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: NM-079540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL [X] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME:

2. NAME OF OPERATOR: Mark Production Company

8. FARM OR LEASE NAME: Conoco-Federal

3. ADDRESS OF OPERATOR: 330 Citizens Bank Building, Tyler, Texas 75701

9. WELL NO.: 2

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FEL & 660' FSL of Sec. 30-T20S-R39E

10. FIELD AND POOL, OR WILDCAT: East Terry-Blinebry

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 30-T20S-R39E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3560' GR

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	[X]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

Started plugging operations February 13, 1974 and completed March 1, 1974
Loaded hole with mud between each plug

Set Plug #1	25 sacks	@ 6000'
Set Plug #2	35 sacks	@ 4100' 4-1/2" stub
Set Plug #3	35 sacks	@ 3000'
Set Plug #4	35 sacks	@ 1710'
Set Plug #5	10 sacks	@ Surface

Recovered 4051.30' 4-1/2" casing and 6000' 2-3/8" tubing.

RECEIVED
JAN - 1974
CONSERVATION COMM.
Santa Fe

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

SIGNED Gaylord Thompson TITLE Assistant Secretary DATE July 3, 1974

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

APPROVED
JAN 6 1976
ARTHUR R. BROWN
DISTRICT ENGINEER

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424

5. LEASE DESIGNATION AND SERIAL NO.: NM-079540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL [X] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME:

2. NAME OF OPERATOR: Mark Production Company

8. FARM OR LEASE NAME: Conoco-Federal

3. ADDRESS OF OPERATOR: 330 Citizens Bank Building, Tyler, Texas 75701

9. WELL NO.: 2

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FEL & 660' FSL of Sec. 30-T20S-R39E

10. FIELD AND POOL, OR WILDCAT: East Terry-Blinebry

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 30-T20S-R39E

14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.)	12. COUNTY OR PARISH	13. STATE
	3560' GR	Lea	New Mexico

16. **Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data**

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[XX]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[XX]	SHOOTING OR ACIDIZING	[ ]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

Well Uneconomical to Produce. Intend to plug by setting cement plugs as follows:

25 sacks	5970 - 6000'
35 sacks	Stub 4-1/2" - 5700'
35 sacks	4300 - 4400' - Top of San Andres
35 sacks	2900 - 3000' - Top of Yates
35 sacks	1610 - 1710'
10 sacks	At Top

APPROVED: **Hole must be filled with mud between plugs.**

Approval is subject to possible later requirement that pad and/or road be ripped and relevelled.

U. S. GEOLOGICAL SURVEY
OIL CONSERVATION COMM.
Santa Fe

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

SIGNED Dayton Thompson TITLE Assistant Secretary DATE February 11, 1974

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

APPROVED
FEB 15 1974
ARTHUR R. BROWN
DISTRICT ENGINEER

*See Instructions on Reverse Side

NO. OF COPIES RECEIVED		
DISTRIBUTION		
SANTA FE		
FILE		
U.S.G.S.		
LAND OFFICE		
TRANSPORTER OIL		
TRANSPORTER GAS		
OPERATOR		
PRORATION OFFICE		

NEW MEXICO OIL CONSERVATION COMMISSION

REQUEST FOR ALLOWABLE AND AUTHORIZATION TO TRANSPORT OIL AND NATURAL GAS

Form C-104
Supersedes Old C-104 and C-110
Effective 1-1-65

MAR 11 1971

I.

Operator: Mark Production Company

Address: 1108 Simons Building, Dallas, Texas 75201

Reason(s) for filing (Check proper box)

- New Well [X]
- Recompletion [ ]
- Change in Ownership [ ]
- Change in Transporter of: Oil [ ] Casinghead Gas [ ] Dry Gas [ ] Condensate [ ]

Other (Please explain)

If change of ownership give name and address of previous owner

CHANGE OK

EAST TATUM PENN

II. DESCRIPTION OF WELL AND LEASE

Lease Name	Well No.	Pool Name, Including Formation	Kind of Lease	Lease No.
Conoco-Federal	2	~~D-K~~	State, Federal or Fee Federal	NM-079540

Location

Unit Letter O, 1980 Feet From The East Line and 660 Feet From The South

Line of Section 30 Township 20 South Range 39 East, NMPM, Lea County

III. DESIGNATION OF TRANSPORTER OF OIL AND NATURAL GAS

Name of Authorized Transporter of Oil [X] or Condensate [ ]	Address (Give address to which approved copy of this form is to be sent)
The Permian Corporation	Box 3119, Midland, Texas
Name of Authorized Transporter of Casinghead Gas [XX] or Dry Gas [ ]	Address (Give address to which approved copy of this form is to be sent)
Skelly Oil Company	Box 1650, Tulsa, Oklahoma

If well produces oil or liquids, give location of tanks.	Unit	Sec.	Twp.	Rge.	Is gas actually connected? When
	J	30	20S	39E	Yes

If this production is commingled with that from any other lease or pool, give commingling order number:

IV. COMPLETION DATA

Designate Type of Completion – (X)	Oil Well	Gas Well	New Well	Workover	Deepen	Plug Back	Same Res'v.	Diff. Res'v.
	X		X					

Date Spudded	Date Compl. Ready to Prod.	Total Depth	P.B. T.D.
12-28-70	3-6-71	7420'	6495'

Elevations (DF, RKB, RT, GR, etc.)	Name of Producing Formation	Top Oil/Gas Pay	Tubing Depth
3560' GR	Blinebry	6072'	6015'

Perforations	Depth Casing Shoe
6072' - 6386' - 16 holes	--

TUBING, CASING, AND CEMENTING RECORD

HOLE SIZE	CASING & TUBING SIZE	DEPTH SET	SACKS CEMENT
12-3/4"	8-5/8"	1663'	730
7-7/8"	4-1/2"	7170'	390
	2-3/8"	6015'	

V. TEST DATA AND REQUEST FOR ALLOWABLE

(Test must be after recovery of total volume of load oil and must be equal to or exceed top allowable for this depth or be for full 24 hours)

OIL WELL

Date First New Oil Run To Tanks	Date of Test	Producing Method (Flow, pump, gas lift, etc.)	
3-6-71	3-9-71	Pumping	
Length of Test	**Tubing Pressure**	**Casing Pressure**	**Choke Size**
24 hrs	--	--	--
Actual Prod. During Test	**Oil-Bbls.**	**Water-Bbls.**	**Gas-MCF**
51 bbls	36	15	7.56

GAS WELL

Actual Prod. Test-MCF/D	Length of Test	Bbls. Condensate/MMCF	Gravity of Condensate
Testing Method (pitot, back pr.)	**Tubing Pressure (Shut-in)**	**Casing Pressure (Shut-in)**	**Choke Size**

VI. CERTIFICATE OF COMPLIANCE

I hereby certify that the rules and regulations of the Oil Conservation Commission have been complied with and that the information given above is true and complete to the best of my knowledge and belief.

Gaylord Thompson
(Signature)

Assistant Secretary
(Title)

March 10, 1971
(Date)

OIL CONSERVATION COMMISSION

APPROVED MAR 11 1971, 19

BY

TITLE SUPERVISOR DISTRICT

This form is to be filed in compliance with RULE 1104.

If this is a request for allowable for a newly drilled or deepened well, this form must be accompanied by a tabulation of the deviation tests taken on the well in accordance with RULE 111.

All sections of this form must be filled out completely for allowable on new and recompleted wells.

Fill out only Sections I, II, III, and VI for changes of owner, well name or number, or transporter, or other such change of condition.

Separate Forms C-104 must be filed for each pool in multiply completed wells.

January 21, 1971

TO: New Mexico Oil Commission

SUBJECT: Deviation Record COMPANY: Mark Prod [illegible]

WELL: Conoco Fed. #2 LOCATION: 660/S, 19[illegible], [illegible] R39E, Lea County, New Mexico

Depth (feet)	Deviation (Degrees)
358	1/2
673	1/2
986	1/4
1,310	1/2
1,660	1
1,981	3/4
2,356	3/4
2,793	3/4
3,235	3/4
3,695	3/4
4,055	3/4
4,215	3/4
4,625	3/4
5,035	3/4
5,450	1 1/4
5,868	1 3/4
6,225	3/4
6,619	1 1/4
6,839	3/4
6,990	3/4
7,295	3/4
7,420	3/4

TPI-S[illegible]
Drilling Contr[illegible]

Before me, the undersigned authority, on this day pers[illegible] W. L. Dawson, known to me to be the person and offic[illegible] subscribed to the foregoing instrument, and stated that [illegible] the direction and on behalf of the operator of the well [illegible] this instrument and that said well was no[illegible] the vertical.

W. L. Dawson

Subscribed and sworn to before [illegible] this 21 day [illegible]

Notary [illegible]

Midland [illegible]

REQUEST FOR TEMPORARY COMMINGLING

Form 9-330
(Rev. 5-63)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN DUPLICATE* (See other instructions on reverse side)

Form approved.
Budget Bureau No. 42 R355.5.

5. LEASE DESIGNATION AND SERIAL NO.: NM-079540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Conoco-Federal

9. WELL NO.: 2

10. FIELD AND POOL, OR WILDCAT: ~~D-K~~ Wc

11. SEC., T., R., M., OR BLOCK AND SURVEY OR AREA: Sec. 30-T20S-R39E

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

WELL COMPLETION OR RECOMPLETION REPORT AND LOG*

1a. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] DRY [ ] Other

b. TYPE OF COMPLETION: NEW WELL [X] WORK OVER [ ] DEEP-EN [ ] PLUG BACK [ ] DIFF. RESVR. [ ] Other

2. NAME OF OPERATOR: Mark Production Company

3. ADDRESS OF OPERATOR: 1108 Simons Building, Dallas, Texas 75201

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements)*
At surface: 1980' FEL & 660' FSL of Sec. 30-T20S-R39E Lea County, New Mexico
At top prod. interval reported below: Same
At total depth:

14. PERMIT NO.:

DATE ISSUED: 12-3-70

15. DATE SPUDDED	16. DATE T.D. REACHED	17. DATE COMPL. (Ready to prod.)	18. ELEVATIONS (DF, RKB, RT, GR, ETC.)*	19. ELEV. CASINGHEAD
12-28-70	1-17-71	3-6-71	3560'	None

20. TOTAL DEPTH, MD & TVD	21. PLUG, BACK T.D., MD & TVD	22. IF MULTIPLE COMPL., HOW MANY*	23. INTERVALS DRILLED BY	ROTARY TOOLS	CABLE TOOLS
7420'	6695'		→	X	

24. PRODUCING INTERVAL(S), OF THIS COMPLETION—TOP, BOTTOM, NAME (MD AND TVD)*
6072' - 6386' - Blinebry

25. WAS DIRECTIONAL SURVEY MADE: No

26. TYPE ELECTRIC AND OTHER LOGS RUN
Acoustic Velocity and Fuzzo

27. WAS WELL CORED: No

28. CASING RECORD (Report all strings set in well)

CASING SIZE	WEIGHT, LB./FT.	DEPTH SET (MD)	HOLE SIZE	CEMENTING RECORD	AMOUNT PULLED
8-5/8"	24#	1663'	12-3/4"	730 sacks	
4-1/2"	11.6#	7170'	7-7/8"	390 sacks	

29. LINER RECORD

SIZE	TOP (MD)	BOTTOM (MD)	SACKS CEMENT*	SCREEN (MD)

30. TUBING RECORD

SIZE	DEPTH SET (MD)	PACKER SET (MD)
2-3/8"	6615'	No

31. PERFORATION RECORD (Interval, size and number)
6072' - 6386' - (16 - 1/2" holes)

32. ACID, SHOT, FRACTURE, CEMENT SQUEEZE, ETC.

DEPTH INTERVAL (MD)	AMOUNT AND KIND OF MATERIAL USED
6072-6386'	2,000 gals 15% acid
	40,000 gals and 60,000#

33.* PRODUCTION

DATE FIRST PRODUCTION	PRODUCTION METHOD (Flowing, gas lift, pumping—size and type of pump)	WELL STATUS (Producing or shut-in)
3-6-71	Pumping - American 228	Producing

DATE OF TEST	HOURS TESTED	CHOKE SIZE	PROD'N. FOR TEST PERIOD →	OIL—BBL.	GAS—MCF.	WATER—BBL.	GAS-OIL RATIO
3-9-71	24 hrs	--		36	7.36	15	210:1

FLOW. TUBING PRESS.	CASING PRESSURE	CALCULATED 24-HOUR RATE →	OIL—BBL.	GAS—MCF.	WATER—BBL.	OIL GRAVITY-API (CORR.)
--	--		36	7.36	15	36.7° API

DISPOSITION OF GAS (Sold, used for fuel, vented, etc.)
Sold

TEST WITNESSED BY: W. H. Creevy

LIST OF ATTACHMENTS
Acoustic Velocity, Deviation Record

I hereby certify that the foregoing and attached information is complete and correct as determined from all available records.

SIGNED: Gaylon Thompson TITLE: Assistant Secretary DATE: 3-9-71

*(See Instructions and Spaces for Additional Data on Reverse Side)

INSTRUCTIONS

General: This form is designed for submitting a complete and correct well completion report and log on all types of lands and leases to either a Federal agency or a State agency or both, pursuant to applicable Federal and/or State laws 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. See instructions on items 22 and 24, and 33, below regarding separate reports for separate completions.

If not filed prior to the time this summary record is submitted, copies of all currently available logs (drillers, geologists, sample and core analysis, all types electric, etc.), formation and pressure tests, and directional surveys, should be attached hereto, to the extent required by applicable Federal and/or State laws and regulations. All attachment should be listed on this form, see item 35.

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 18: Indicate which elevation is used as reference (where not otherwise shown) for depth measurements given in other spaces on this form and in any attachments.

Items 22 and 24: If this well is completed for separate production from more than one interval zone (multiple completion), so state in item 22, and in item 24 show the producing interval, or intervals, top(s), bottom(s) and name(s) (if any) for only the interval reported in item 33. Submit a separate report (page) on this form, adequately identified, for each additional interval to be separately produced, showing the additional data pertinent to such interval.

Item 29: *"Sacks Cement":* Attached supplemental records for this well should show the details of any multiple stage cementing and the location of the cementing tool.

Item 33: Submit a separate completion report on this form for each interval to be separately produced. (See instruction for items 22 and 24 above.)

37. SUMMARY OF POROUS ZONES: SHOW ALL IMPORTANT ZONES OF POROSITY AND CONTENTS THEREOF; CORED INTERVALS; AND ALL DRILL-STEM TESTS, INCLUDING DEPTH INTERVAL TESTED, CUSHION USED, TIME TOOL OPEN, FLOWING AND SHUT-IN PRESSURES, AND RECOVERIES				38. GEOLOGIC MARKERS		
FORMATION	TOP	BOTTOM	DESCRIPTION, CONTENTS, ETC.	NAME	TOP	
					MEAS. DEPTH	TRUE VERT. DEPTH
				San Andres	4335'	

U.S. GOVERNMENT PRINTING OFFICE : 1963—O-683636

January 21, 1971

TO: New Mexico Oil Commission

SUBJECT: Deviation Record COMPANY: Mark Production Co.

WELL: Conoco Fed. #2 LOCATION: 660/S, 1980/E, Sec. 30, T20S, R39E, Lea County, New Mexico

Depth (feet)	Deviation (degrees
358	1/2
673	1/2
986	1/4
1,310	1/2
1,660	1
1,981	3/4
2,356	3/4
2,793	3/4
3,235	3/4
3,695	3/4
4,055	3/4
4,215	3/4
4,625	3/4
5,035	3/4
5,450	1 1/4
5,868	1 3/4
6,225	3/4
6,619	1 1/4
6,839	3/4
6,990	3/4
7,295	3/4
7,420	3/4

TRI-SERVICE [illegible]
Drilling Contractor

Before me, the undersigned authority, on this day personally appeared W. L. Dawson, known to me to be the person and officer whose name is subscribed to the foregoing instrument, and states that he is authorized by the direction and on behalf of the operator of the well identified in this instrument and that such well was not intentionally deviated from the vertical.

W. L. Dawson

Subscribed and sworn to before me this 21 day of January, 1971.

Notary Public

Midland County, Texas

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved
Budget Bureau No. 42-R1424

SUNDRY NOTICES AND REPORTS ON WELLS

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

5. LEASE DESIGNATION AND SERIAL NO.: NM-078540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Conoco-Federal

9. WELL NO.: 2

10. FIELD AND POOL, OR WILDCAT: D-K

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 30-T20S-R39E

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

1. OIL WELL ☒ GAS WELL ☐ OTHER

2. NAME OF OPERATOR: Mark Production Company

3. ADDRESS OF OPERATOR: 1108 Simons Building, Dallas, Texas 75201

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FEL & 660' FSL of Sec. 30-T20S-R39E, Lea County, New Mexico

14. PERMIT NO.:

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3960'

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Plug Back			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

2-24-71 - set BOWCO wireline plug at 6495 feet - dropped two sacks cement on top of plug with bailer.

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

SIGNED [signature] TITLE Assistant Secretary DATE 2-25-71

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions on Reverse Side

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form Approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: NM-079540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL [X] GAS WELL [ ] OTHER

7. UNIT AGREEMENT NAME:

2. NAME OF OPERATOR: Mark Production Company

8. FARM OR LEASE NAME: Comsco-Federal

3. ADDRESS OF OPERATOR: 1108 Simons Building, Dallas, Texas 75201

9. WELL NO.: 2

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.) At surface: 1980' FEL & 660' FSL of Sec. 30-T20S-R39E Lea County, New Mexico

10. FIELD AND POOL, OR WILDCAT: ~~D-K~~ Blinebry

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 30-T20S-R39E

14. PERMIT NO.	15. ELEVATIONS (Show whether DF, RT, GR, etc.)	12. COUNTY OR PARISH	13. STATE
	3560' GR	Lea	New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	[ ]	PULL OR ALTER CASING	[ ]	WATER SHUT-OFF	[ ]	REPAIRING WELL	[ ]
FRACTURE TREAT	[ ]	MULTIPLE COMPLETE	[ ]	FRACTURE TREATMENT	[ ]	ALTERING CASING	[ ]
SHOOT OR ACIDIZE	[ ]	ABANDON*	[ ]	SHOOTING OR ACIDIZING	[X]	ABANDONMENT*	[ ]
REPAIR WELL	[ ]	CHANGE PLANS	[ ]	(Other)			
(Other)			[ ]	(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

1-21-71 Perforated Abo 6943' 6949' 6966' 6969' 6979' 6992' 6994' - 6999' 7004' 7006' 7007' 7015' 7034' 7047' 7051' 7057' 7059' 7062' 7070' - 19 - 1/2" holes - ran packer and set @ 6897' - treated with 1500 gals 15% acid - 8000 gals 20% and 8000 gals 3% - breakdown press 2900 psi - max 5000 psi - instant SIP 2575 psi - 15 min SIP 2400 psi - pumped 14 days - recovered 92 bbl oil and 349 bbl formation water.

2-24-71 Set HOWCo wireline plug @ 6495' - perforated Blinebry - 6072' - 6095' - 6115' - 6131' - 6136' - 6167' - 6190' - 6231' - 6272' - 6284' - 6298' - 6302' - 6327' - 6355' - 6377' - 6386'

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

SIGNED: Dayton E. Thompson TITLE: Assistant Secretary DATE: April 30, 1971

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

ACCEPTED FOR RECORD

*See Instructions on Reverse Side

COPY TO O. C. C.

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.: NM-079340

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL ☒ GAS WELL ☐ OTHER

7. UNIT AGREEMENT NAME:

2. NAME OF OPERATOR: Mark Production Company

8. FARM OR LEASE NAME: Conoco-Federal

3. ADDRESS OF OPERATOR: 1108 Stemmons Building, Dallas, Texas 75201

9. WELL NO.: 2

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements. See also space 17 below.) At surface: 1980' FSL & 660' FEL of Sec. 30-T20S-R38E, Lea County, New Mexico

10. FIELD AND POOL, OR WILDCAT: D-K Abo

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec. 30-T20S-R38E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.): 3560' GR

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☐	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other) Production String	☐		
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

1-19-71 - 4-1/2", 11.60# N-80 & J-55, STRC & LTC casing set @ 7170' and cemented with 350 sacks Class "C" cement. Tested casing with 2000 psi pressure for 30 minutes. No drop. Ran temperature survey. Top of cement at 5755'.

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

SIGNED: [signature] TITLE: Assistant Secretary DATE: 1-26-71

(This space for Federal or State office use)

APPROVED BY: _____ TITLE: _____

CONDITIONS OF APPROVAL, IF ANY:

ACCEPTED FOR RECORD
JAN 29 1971
U. S. GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

*See Instructions on Reverse Side

Form 9-331
(May 1963)

COPY TO U.S.G.S.

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE* (Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424.

5. LEASE DESIGNATION AND SERIAL NO.
NM-079540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

SUNDRY NOTICES AND REPORTS ON WELLS

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

1. OIL WELL ☒ GAS WELL ☐ OTHER

7. UNIT AGREEMENT NAME

2. NAME OF OPERATOR
Mark Production Company

8. FARM OR LEASE NAME
Conoco-Federal

3. ADDRESS OF OPERATOR
1106 Simms Building, Dallas, Texas 75201

9. WELL NO.
2

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.* See also space 17 below.)
At surface 1980' FNL & 660' FEL of Sec. 30-T20S-R39E
Lea County, New Mexico

10. FIELD AND POOL, OR WILDCAT
Wildcat Abo

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA
Sec. 30-T20S-R39E

14. PERMIT NO.

15. ELEVATIONS (Show whether DF, RT, GR, etc.)
3540' GR

12. COUNTY OR PARISH
Lea

13. STATE
New Mexico

16. Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF	☐	PULL OR ALTER CASING	☐	WATER SHUT-OFF	☒	REPAIRING WELL	☐
FRACTURE TREAT	☐	MULTIPLE COMPLETE	☐	FRACTURE TREATMENT	☐	ALTERING CASING	☐
SHOOT OR ACIDIZE	☐	ABANDON*	☐	SHOOTING OR ACIDIZING	☐	ABANDONMENT*	☐
REPAIR WELL	☐	CHANGE PLANS	☐	(Other)			
(Other)				(Note: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

8-5/8" 24# H-40 casing set @ 1663' and cemented with 730 sacks cement. Circulated cement to surface. Cement allowed to set 18 hours. Tested with 1000 psi pressure for 30 minutes - no drop. Well spudded 12-28-70.

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

SIGNED Hubert Thompson TITLE Assistant Secretary DATE 1-5-71

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

ACCEPTED FOR RECORD
JAN 11 1971
U. S. GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

*See Instructions on Reverse Side

Form 9-331 C
(May 1963)

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1425.

30-025-23656

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

APPLICATION FOR PERMIT TO DRILL, DEEPEN, OR PLUG BACK

1a. TYPE OF WORK: DRILL [X] DEEPEN [ ] PLUG BACK [ ]

b. TYPE OF WELL: OIL WELL [X] GAS WELL [ ] OTHER — SINGLE ZONE [ ] MULTIPLE ZONE [ ]

2. NAME OF OPERATOR: Mark Production Company

3. ADDRESS OF OPERATOR: 1108 Simms Building, Dallas, Texas 75201

4. LOCATION OF WELL (Report location clearly and in accordance with any State requirements.*)
At surface: 1980' FEL & 660' FSL of Sec. 30-T20S-R39E, Lea County, New Mexico
At proposed prod. zone: Same as above

5. LEASE DESIGNATION AND SERIAL NO.: NM-07540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME:

7. UNIT AGREEMENT NAME:

8. FARM OR LEASE NAME: Conoco-Federal

9. WELL NO.: 2

10. FIELD AND POOL, OR WILDCAT: D-K

11. SEC., T., R., M., OR BLK. AND SURVEY OR AREA: Sec 30-T20S-R39E

14. DISTANCE IN MILES AND DIRECTION FROM NEAREST TOWN OR POST OFFICE*: 11 miles southeast of Hobbs, New Mexico

12. COUNTY OR PARISH: Lea

13. STATE: New Mexico

15. DISTANCE FROM PROPOSED* LOCATION TO NEAREST PROPERTY OR LEASE LINE, FT. (Also to nearest drlg. line, if any)	660'	16. NO. OF ACRES IN LEASE: 80	17. NO. OF ACRES ASSIGNED TO THIS WELL: 40
18. DISTANCE FROM PROPOSED LOCATION* TO NEAREST WELL, DRILLING, COMPLETED, OR APPLIED FOR, ON THIS LEASE, FT.	1320'	19. PROPOSED DEPTH: 7,500	20. ROTARY OR CABLE TOOLS: Rotary

21. ELEVATIONS (Show whether DF, RT, GR, etc.): 3560' GR

22. APPROX. DATE WORK WILL START*: Approx 12-4-70

23. PROPOSED CASING AND CEMENTING PROGRAM

SIZE OF HOLE	SIZE OF CASING	WEIGHT PER FOOT	SETTING DEPTH	QUANTITY OF CEMENT
12-1/4-inch	8-5/8-inch	24#	1700'	350 sacks cement circulated
7-7/8-inch	4-1/2-inch	10.5# & 11.6#	7500'	390 sacks cement

Drill to 7,500 feet and complete from Drinkard oil zone between 6,900 feet and 7,[illegible] feet.

RECEIVED
[illegible]
U. S. GEOLOGICAL SURVEY
HOBBS, NEW MEXICO

IN ABOVE SPACE DESCRIBE PROPOSED PROGRAM: If proposal is to deepen or plug back, give data on present productive zone and proposed new productive zone. If proposal is to drill or deepen directionally, give pertinent data on subsurface locations and measured and true vertical depths. Give blowout preventer program, if any.

24.

SIGNED: Gaylord Thompson TITLE: Assistant Secretary DATE: November 10, 1970

(This space for Federal or State office use)

PERMIT NO. _____ APPROVAL DATE _____

APPROVED

APPROVED BY _____ TITLE _____ DATE _____

CONDITIONS OF APPROVAL, IF ANY:

*See Instructions On Reverse Side

NEW MEXICO OIL CONSERVATION COMMISSION

WELL LOCATION AND ACREAGE DEDICATION PLAT

Form C-102
Supersedes C-128
Effective 1-1-65

All distances must be from the outer boundaries of the Section

Operator	Lease	Well No.
MARK PRODUCTION COMPANY	CONOCO-FEDERAL	2

Unit Letter	Section	Township	Range	County
"O"	30	20-S	39-E	LEA

Actual Footage Location of Well: 660 feet from the SOUTH line and 1980 feet from the EAST line

Ground Level Elev.	Producing Formation	Pool	Dedicated Acreage
3558	ABO	D-K	40 Acres

1. Outline the acreage dedicated to the subject well by colored pencil or hachure marks on the plat below.

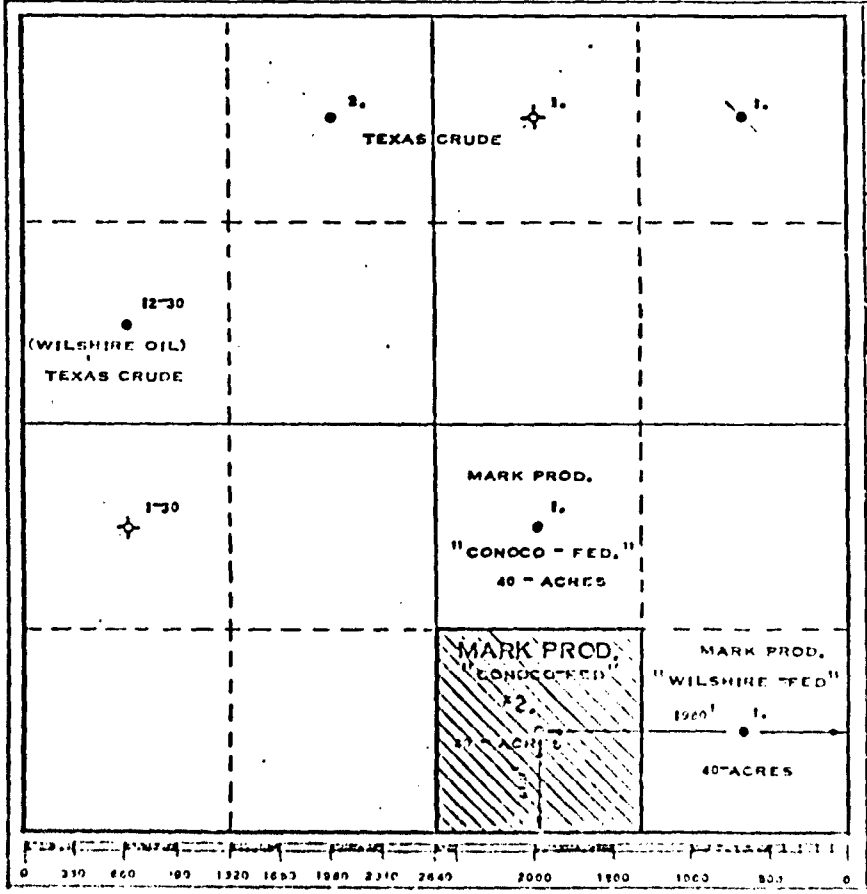
2. If more than one lease is dedicated to the well, outline each and identify the ownership thereof (both as to working interest and royalty).

3. If more than one lease of different ownership is dedicated to the well, have the interests of all owners been consolidated by communitization, unitization, force-pooling. etc?

☐ Yes ☐ No If answer is "yes," type of consolidation _____

If answer is "no," list the owners and tract descriptions which have actually been consolidated. (Use reverse side of this form if necessary.) _____

No allowable will be assigned to the well until all interests have been consolidated (by communitization, unitization, forced-pooling, or otherwise) or until a non-standard unit, eliminating such interests, has been approved by the Commission.



CERTIFICATION

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

Name: Curtis W. Newbourn

Position: President

Company: Mark Production Company

Date: November 23, 1970

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my knowledge and belief.

Date Surveyed: NOVEMBER 23, 1970

Registered Professional Engineer and/or Land Surveyor

Certificate No. 1510

COUNTY LEA FIELD Wildcat STATE NM 30-025-21626

OPR MARK PRODUCTION CO, MAP

2 Conoco - Federal

Sec 30, T-20-S, R-39-E CO ORD

660' FSL, 1980' FEL of Sec

Spd 12-28-70 CLASS E 35722

Cmp 3-6-71

FORMATION	DATUM	FORMATION	DATUM
TD 7420'; PBD 6500'			

CSG & SX - TUBING
8 5/8" at 1653' w/730 sx
4 1/2" at 7170' w/390 sx.

LOGS FL GR RA IND MC A

IP (Blinebry) Perfs 6072-6386' P 36 BOPD + 15 BW. Pot based on 24 hr test. GOR 210; Grav 36.7.

CONT. Tri-Service PROP DEPTH 7500' TYPE F L

DATE

F.R. 12-8-70; Opr's Elev. 3560' GL
PD 7500' RT (Abo)
Contractor - Tri-Service

3-18-71 AMEND FIELD NAME, Formerly reported as D-K.
1-4-71 Drlg. 4385'
1-11-71 Drlg. 6180'
1-19-71 TD 7420'; MORT
SP-DST 6925-7110', Pkrs failed
1-26-71 TD 7420'; PBD 7150'; Swbg
Perf 6943-7070' w/19 shots (overall)
Acid (6943-7070') 16,000 gals
2-1-71 TD 7420'; PBD 7150'; TO Pmp
2-8-71 TD 7420'; PBD 7150'; TO Pmp
2-15-71 TD 7420'; PBD 7150'; TO Pmp

LEA Wildcat NM Sec 30,T20S,R39E
MARK PRODUCTION CO. 2 Conoco - Federal Page #2

2-22-71	TD 7420'; PBD 7150'; Prep PB to Blinebry Ppd 14 BOPD + wtr (6943-7070')
3-2-71	TD 7420'; PBD 6500'; Ppg Load PB to 6500' Perf (Blinebry) 6072-6386' w/16 shots (over-all) Acid (6072-6386') 2000 gals Frac (6072-6386') 40,000 gals jelled brine w/ + 60,000# sd
3-8-71	TD 7420'; PBD 6500'; Ppg Load Ppd 39 BLO + small amt wtr in 24 hrs
3-15-71	TD 7420'; PBD 6500'; COMPLETE LOG TOP: San Andres 4335' Blinebry Discovery
3-18-71	COMPLETION REPORTED

LEA COUNTY NEW MEXICO D-K (BLINB) FIELD

Well: MARK PROD. CO. 2 Conoco-Federal Result: NEW OIL DISC WSD

Loc'n: 11 mi NE/Eunice; 660' FSL 1980' FEL sec 30-20S-39E; (Blinb disc. in D-K (ABO) Fld).

Spud: 12-28-70; Comp: 3-9-71; Elev: 3560' grd; TD: 7420'
Casing: 8 5/8" 1663'/730 sx, 4½" 7170'/390 sx
Prod Zone: (Blinb) T/Pay 6943, Prod thru perfs 6943-7070'/19 holes
IPP: 36 BOPD plus 15 BW, Grav 36.7, GOR 210-1
Comp Info: No cores or DST's; Perf 6943-7070'/19 holes; A/3200 gals; frac w/40,000 gals & 60,000# sd; P/30% oil & 70% wtr; P/36 BO & 15 BW/24 hrs; C/Tri-Service Drlg. Co.
Tops: (BL) San And 4335'
API No.: 30-025-[illegible]36

Petroleum Information CORPORATION (A Subsidiary of A.C. Nielsen Company)

Date: 4-14-71 Card No.: 11 rm

Form 9-331
(May 1963)

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

SUBMIT IN TRIPLICATE*
(Other instructions on reverse side)

Form approved.
Budget Bureau No. 42-R1424

5. LEASE DESIGNATION AND SERIAL NO.
NM-079540

6. IF INDIAN, ALLOTTEE OR TRIBE NAME

SUNDRY NOTICES AND REPORTS ON WELLS

16. **Check Appropriate Box To Indicate Nature of Notice, Report, or Other Data**

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
TEST WATER SHUT-OFF		PULL OR ALTER CASING	XX	WATER SHUT-OFF		REPAIRING WELL	
FRACTURE TREAT		MULTIPLE COMPLETE		FRACTURE TREATMENT		ALTERING CASING	
SHOOT OR ACIDIZE		ABANDON*	XX	SHOOTING OR ACIDIZING		ABANDONMENT*	
REPAIR WELL		CHANGE PLANS		(Other)			
(Other)				(NOTE: Report results of multiple completion on Well Completion or Recompletion Report and Log form.)			

17. 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.)*

Well Uneconomical to Produce. Intend to plug by setting cement plugs as follows:

25 sacks	5970 - 6000'
35 sacks	Stub 4-1/2" - 5700'
35 sacks	4300 - 4400' - Top of San Andres
35 sacks	2900 - 3000' - Top of Yates
35 sacks	1610 - 1710'
10 sacks	At Top

AGREEMENT: Hole must be filled with mud between plugs.

Approval is subject to possible later requirement that pad and/or road be ripped and relevelled.

MAR - 7 1974
OIL CONSERVATION COMM.
Santa Fe

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

SIGNED Dayton Thompson TITLE Assistant Secretary DATE February 11, 1974

(This space for Federal or State office use)

APPROVED BY _____ TITLE _____ DATE _____
CONDITIONS OF APPROVAL, IF ANY:

APPROVED
FEB 15 1974
ARTHUR R. BROWN
DISTRICT ENGINEER

*See Instructions on Reverse Side

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

March 6, 2000

CERTIFIED MAIL
RETURN RECEIPT NO. 50514645

Mr. Robert McCasland
P.O. box 206
Eunice, NM 88231

Re: Mewbourne Oil Company
Conoco Federal #2
Section 30-T20s-R39e

Dear Mr. McCasland:

Per your recent request, please find enclosed a copy of the Mewbourne Oil Company Environmental Site Assessment dated May 07, 1999 for the above captioned site. After you have had an opportunity to review the document, OCD would appreciate any information pertaining to the groundwater contamination at the site.

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155).

Sincerely Yours,

Wayne Price

Wayne Price-Pet. Engr. Spec.
Environmental Bureau

cc: OCD Hobbs Office

attachments-1

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

September 3, 1999

Mr. Wayne Price
Environmental Engineer
New Mexico Oil Conservation Division
2040 S. Pacheco
Santa Fe, New Mexico 87505

RE: Mewbourne Oil Company, Conoco Federal #2, Section 30 T20S R39E

Dear Mr. Price:

On behalf of Mewbourne Oil Company (Mewbourne), R.T. Hicks Consultants, Ltd. (Hicks Consultants) augmented the data from our initial investigation of the above-mentioned plugged and abandoned oil well by implementing the scope of work described in our April 4, 1999 workplan. The attached final report presents data from the August 16, 1999 field program as well as the data originally submitted on November 4, 1998.

We believe that the actions of Mewbourne and this report will permit resolution and closure of this issue. If you have any questions regarding this submission, please contact at our Albuquerque office. I will be unavailable from September 8 to September 28, 1999.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

cc: Gary Larson, Esq.
Mike Shepard, Mewbourne

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

Price, Wayne

From: Mail Delivery Subsystem[SMTP:MAILER-DAEMON@swcp.com]
Sent: Thursday, August 12, 1999 4:05 PM
To: Price, Wayne
Subject: Return receipt

ATT04163.TXT ATT04164.TXT

The original message was received at Thu, 12 Aug 1999 16:05:43 -0600 (MDT)
from xconn.state.nm.us [164.64.5.16]

----- The following addresses had successful delivery notifications -----
<R@rthicksconsult.com> (successfully delivered to mailbox)

----- Transcript of session follows -----
<R@rthicksconsult.com>... Successfully delivered

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

Price, Wayne

From: Price, Wayne
Sent: Thursday, August 12, 1999 3:53 PM
To: 'R@rthicksconsult.com'
Subject: Mewbourne Conoco Fed #2 sec 30-T20s-R39e

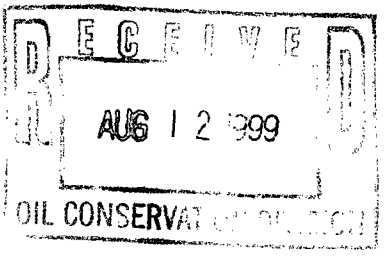
NMOCD is in receipt of your letter dated August 11, 1999. NMOCD approves of your changes from original plan.

Please be advised that NMOCD approval of this site does not relieve Mewbourne of liability should their operations fail to adequately investigate and remediate contamination that pose a threat to ground water, surface water, human health or the environment. In addition, NMOCD approval does not relieve Mewbourne of responsibility for compliance with any other federal, state, or local laws and/or regulations.

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

August 11, 1999



Mr. Wayne Price
Environmental Engineer
New Mexico Oil Conservation Division
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Mewbourne Plugged and Abandoned Well Conoco Federal #2,
Section 30 T20S R39E
Status Report and Request to Amend Work Plan

Dear Mr. Price:

This letter describes the work elements conducted to date, proposes a location for the proposed monitoring well and requests an extension to file the final report. Unfortunately, we experienced several scheduling conflicts with the drilling company originally contracted to construct the proposed monitor well. On July 28, we retained the services of Corky Glenn's Well Service. A conflict also prevented Mr. Glenn from drilling the well. Today, we retained the services of Eades Well Drilling. Assuming we obtain access to drill the proposed well on Mr. McCasland's property, we plan to spud the well on Monday, August 16, 1999.

After contacting Mr. McCasland and being referred to this attorney, Mewbourne's representatives have made several attempts to contact Mr. McCasland's attorney in order to gain permission to enter the property, but have not yet received a response. We hope to obtain permission to enter the property before August 16, 1999. If so, we should complete the well and obtain a sample of groundwater on August 17, 1999. As a result of this delay, laboratory analyses will not be complete prior to the deadline for submission of our report (August 19, 1999). Consequently, we request a three-week extension for submission of the final report (September 6, 1999)

On July 29, Mr. Glenn obtained the following depth to groundwater measurements and we used these data to calculate the water table elevations presented in Table 1.

Table 1: Depth to Water and Groundwater Elevations near Conoco Federal #2

Well Name on Plate 4	Ground Elevation	Distance between ground and measuring point	Depth to Groundwater	Groundwater Elevation
McCasland Supply	3555	1	78	3478
Mewbourne #2	3545	1	55.5	3490.5
Mewbourne #3	3540	1.5	57	3484.5
Mewbourne #4	3572	1	58	3515

We used Plate 4 of our November 4, 1998 Report to NMOCD to show these groundwater elevations (attached). The equipotential lines that show groundwater flow to the southeast. The southeast flow direction is consistent with published data (see Plate 2 of our November 4, 1998 letter).

As the attached *Sketch Map A* shows, a dune field precludes a location for the monitoring well directly down gradient of Conoco Federal #2. The closest accessible location directly down gradient of Conoco Federal #2 lies along a road, about 6500 feet southeast. As we both agreed in our conversation last week, this well location provides little or no benefit to our study. Therefore, these logistical issues caused us to select a location for the new well that is:

1. About 100 feet south and 400 feet east of Conoco Federal #2,
2. Accessible to a drilling rig without any road construction or undue surface damage,
3. Within the private property of Mr. McCasland, and
4. An acceptable location for a replacement windmill, if Mr. McCasland elects to abandon the existing windmill adjacent to Conoco Federal #2.

Although the location shown on *Sketch Map A* is not directly down gradient from Conoco Federal #2 (as projected based upon the attached potentiometric surface map), this location will provide the necessary data to resolve the outstanding environmental issues at Conoco Federal #2. We may find, after completion of the proposed new well, that the location is, in fact, down gradient from Conoco Federal #2. Our workplan also calls for taking several soil samples at Conoco Federal #2 to determine if calcium chloride exists beneath the location.

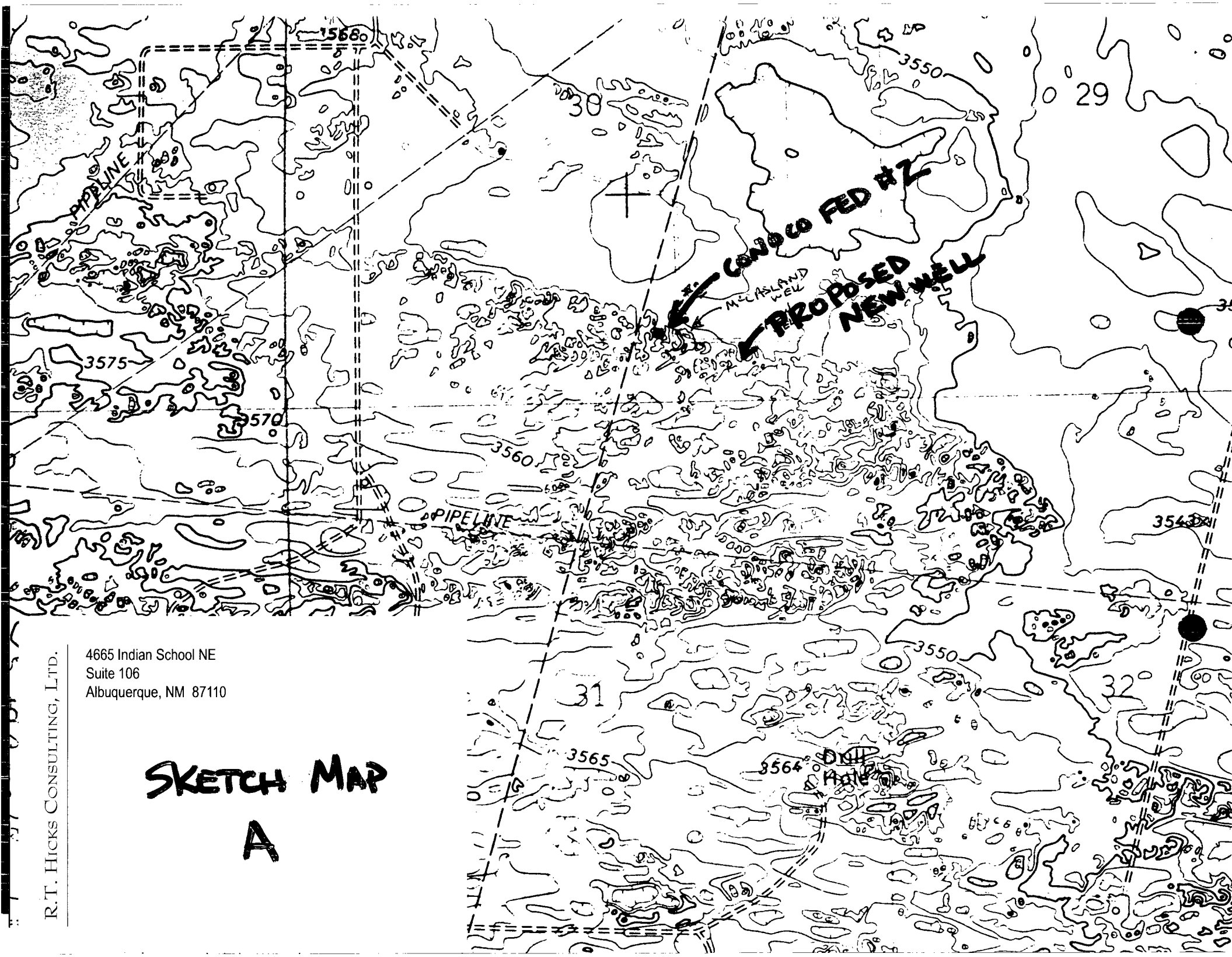
If NMOCD desires to inspect the well location, please contact Mr. Jerry Elgin of Mewbourne Oil in Hobbs (505-393-5905). We thank you for your attention to this matter and your consideration of an extension of time to file the final report. Please contact me if you have any questions regarding this submission. This letter serves as our 48-hour notification to NMOCD of our drilling program.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

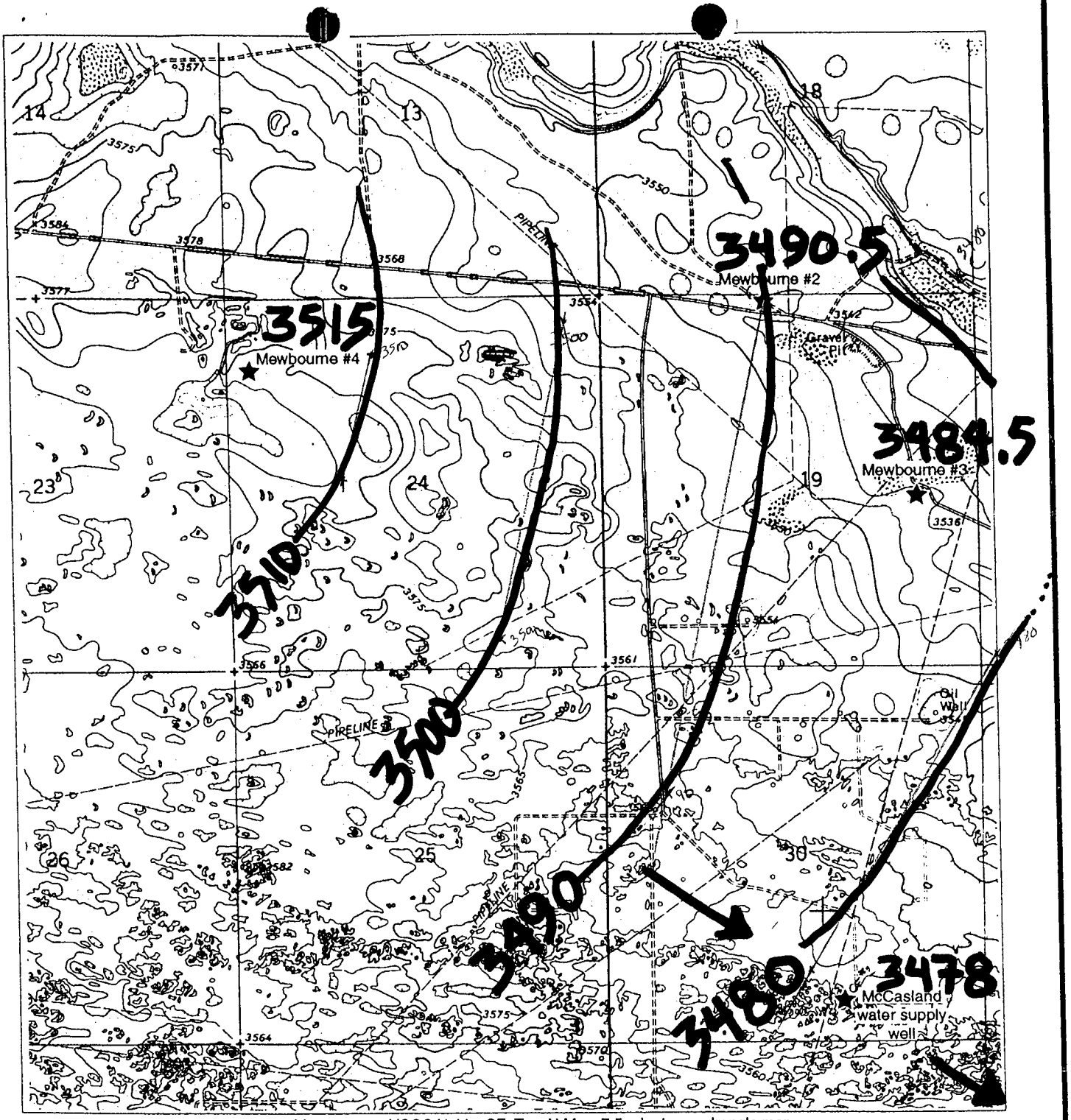
cc: Gary Larson, Esq.
Mike Sheppard, Mewbourne
Jerry Elgin, Mewbourne
Mr. Robert McCasland, PO Box 206, Eunice, New Mexico 88231

E-MAIL!
R@RTHICKSCONSULT.COM



R.T. Hicks Consulting, Ltd.
4665 Indian School NE
Suite 106
Albuquerque, NM 87110

SKETCH MAP A



Map source: USGS Hobbs SE, Tex.-N.Mex. 7.5 minute quadrangle map

T20S R39E

→ DIRECTION OF GROUNDWATER FLOW

R.T. HICKS CONSULTANTS, LTD. 4665 Indian School Road NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738	Mewbourne Oil	Plate 4
	Topographic Map	October 12, 1998

R.T. HICKS CONSULTANTS, LTD.

4665 Indian School NE Suite 106 Albuquerque, NM 87110 505.266.5004 Fax: 505.266.7738

April 14, 1999

Mr. Wayne Price
New Mexico Oil Conservation Division
Environmental Bureau
2040 South Pacheco Street
Santa Fe, New Mexico 87505

RE: Mewbourne Oil Company, Conoco Federal #2

Dear Mr. Price:

This letter reponds to NMOCD's March 9, 1999 request for Mewbourne Oil Company (Mewbourne) to conduct a groundwater investigation at the above-referenced site. On behalf of Mewbourne, R.T. Hicks Consultants, Ltd. developed the attached workplan.

We fully agree with NMOCD that the water produced by the McCasland water supply well located adjacent to Conoco Federal #2 is not consistent with nearby analyses of Ogallala fresh water. We also agree that anhydrite is not typically encountered within the Ogallala. In our recent telephone conversation, we also agreed that the driller's lithologic description for the water well adjacent to Conoco Federal #2 does not exhibit the level of detail necessary for a precise determination of the character of the saturated zone.

We continue to maintain that the source of calcium chloride in the McCasland water supply well near Conoco Federal #2 is either a surface release of calcium chloride during drilling and/or plugging activities or a natural phenomenon. Implementation of the attached workplan will address the issues raised above and allow us to determine the source of calcium chloride in groundwater.

Sincerely,
R.T. Hicks Consultants, Ltd.

Randall T. Hicks
Principal

cc w/enclosures:
Mr. Mike Shepard, Mewbourne
Mr. Gary Larson, Esq.

R.T. Hicks Consultants, Ltd,

Memo

To: Wayne Price

From: Randall Hicks

CC: Mike Shepard, Gary Larson

Date: 04/08/99

Re: Conoco Federal #2

Introduction

The November 4, 1998 report from R.T. Hicks Consultants, Ltd. submitted to Mr. Wayne Price of NMOCD provides background information on the site. NMOCD's June 26, 1998 letter to Mewbourne Oil Company also provides additional data.

Existing data and new information derived from implementation of this Work Plan will permit testing of the hypotheses listed in Table 1. For each hypothesis test, we have designed the data collection program to determine if the null hypothesis is correct. If the data cannot prove the null hypothesis, the program also collects data to permit acceptance of the alternate hypothesis.

Proposed Field Program

We propose four tasks, completed during a single field campaign. We will conduct the field program in May, after NMOCD approval of this workplan.

Task 1: Water Level Survey
Our previous work experience north of Jal, New Mexico shows that the potentiometric surface map from Nicholson and Clebsh (1961) accurately predicts the direction of groundwater flow. This map is reproduced for the subject site in Plate 2 of our November 4, 1998 submission to NMOCD. According to this map, groundwater flows south-southeast near Conoco Federal #2.

Plate 4 of the November 4, 1998 submission identifies three water wells (Mewbourne #2, #3 and #4) within 2 miles of the McCasland water supply well adjacent to Conoco

Federal #2. With the permission of the well owner, we will instruct Scarbourough Drilling Company to measure the depth to water in each well, including the McCasland water supply well. Scarborough will create permanent access ports that permit introduction of water level probes without interference with the water pumps.

We will use the United States Geologic Survey topographic map to determine the elevation of each windmill. Determination of the water table is simple subtraction. These data will permit construction of a site specific water table map that accurately predicts the local groundwater flow direction. We will compare the results of this survey with Plate 2 of our November 4, 1998 submission.

During this survey, Scarborough Drilling will evaluate the area 750 feet south and southeast of the McCasland water supply well adjacent to Conoco Federal #2. The purpose of this evaluation is to identify logical sites for a monitor well directly down gradient from Conoco Federal #2.

The accurate water table map will allow us to select a construction site for a groundwater monitor well directly down gradient from Conoco Federal #2. To facilitate obtaining the consent of the landowner, we propose to locate this well not on BLM land but on property owned by the McCasland family. We estimate the downgradient distance from Conoco Federal #2 to the McCasland property line to be 750 ft. We will locate the monitor well on McCasland property as close as possible to Conoco Federal #2. However, access through the sand dunes south of Conoco Federal #2 is a logistical constraint that will affect selection of the final drill site.

On the site specific water table map, we will identify the proposed location of the monitor well. Photographs of the area south of Conoco Federal #2 will identify the location of the proposed well relative to Conoco Federal #2. We will submit the results of this water level survey, site evaluation and proposed location of the monitor well to the NMOCD before we move ahead with the additional tasks: soil sampling and monitor well installation.

Task 2: Soil Sampling

If the source of calcum chloride observed in the McCasland water well adjacent to Conoco Federal #2 is a past surface release of calcium choride used for drilling and/or plugging of Conoco Federal #2, then near surface soils should provide some evidence of this release.

We will use a hand auger or other method to obtain soil samples from the area near Conoco Federal #2. We will attempt to locate the former reserve pit as well as other logical places where the drilling and/or plugging contractor may have stored or discarded calcium chloride. We will obtain samples from at least three boring locations and no more than six boring locations. One boring location will be "background", far-removed from any oil field activities but within 500 feet of Conoco Federal #2.

We will obtain samples from depths of 2 feet, 5 feet and 10 feet. After visual examination of each sample, we will mix about 500 mg of soil in 1 liter of water and measure the electrical conductivity of the fluid. We will submit at least three samples to the laboratory for analysis of major cations and anions.

We will also visually observe the moisture content of the soil samples and determine if overflow from the windmill or associated stock tank contributes to excessive moisture in the shallow (less than 10 feet deep) soils.

Sampling protocol will follow ASTM Standard Designation D4700-91. Laboratory protocol will follow EPA Methods.

The data from this task will assist in testing Null Hypotheses #1 and #5 and Alternate Hypothesis #5.

Task 3: Monitor Well Installation

After obtaining NMOCD approval for the site, Scarborough Drilling Company will construct the monitor well using mud-rotary techniques. After boring a 8-inch hole to the top of the Red Beds (Chinle Formation), we will circulate the drilling fluid to clean the hole and test the hole stablilty. After the hole is stable, Scarborough will install 15 feet of 4-inch PVC slotted screen and blank casing. We will place the top of the screen 5 feet above the water table, as defined by the site specific water table map. We will follow ASTM Standard Designation D 5092-95 for completion of the monitor well. Scarborough will develop the well by overpumping and bailing until the produced water is free of drilling fluids, sand and silt.

Mr. Randall Hicks, a professional geologist in several states, will oversee drilling of the monitor well. He will evaluate cuttings to determine the lithology of the underlying unit. Mr. Hicks may elect to obtain a core sample of the saturated unit if cutting proves unsatisfactory for determining lithology or if the soil sampling results suggest that chemical analysis of the saturated porous media would assist hypothesis testing.

Data from this task will assist in testing Null Hypotheses #2 and #3 and Alternate Hypotheses #1, #2 and #3.

Groundwater Sampling

We will sample the newly-constructed monitor well after well development. We will also obtain samples from the four existing water supply wells shown on Plate 4 of our November 4, 1998 submission. We will follow ASTM Standard Designation D5903-96 for groundwater sampling.

We will submit each sample to the laboratory for analyses of major cations and anions, as was done in our September 1998 field program. The laboratory employs EPA Methods.

Data from this task will assist in testing Null Hypothesis #4 and Alternate Hypothesis #4.

Final Report

We will summarize the results of our field program in a Final Investigation Report. The report will include a site-specific potentiometric surface map, an identification of groundwater flow from Conoco Federal #2, a site map showing locations of soil borings, results of all soil testing, results of water analyses and our coclusions and recommendations.

If the newly-drilled monitor well produces water of significantly better quality than the water supply well adjacent to Conoco Federal #2, then Mewbourne will release the monitor well to the surface leaseholder for use as a new supply well.

Table 1 Working Hypotheses

Null Hypothesis	Alternate Hypothesis
1. The source of calcum chloride observed in the McCasland water well adjacent to Conoco Federal #2 is a past surface release of calcium choride used for drilling and/or plugging of Conoco Federal #2.	1. The source of calcum chloride observed in the McCasland water well adjacent to Conoco Federal #2 is a natural phenomenon related to water production from anydrite units.
2. The McCasland water well adjacent to Conoco Federal #2 produces water from the Ogallala Formation.	2. The McCasland water well adjacent to Conoco Federal #2 produces water from the Triassic Chinle Formation (Red Beds).
3. The McCasland water well adjacent to Conoco Federal #2 produces water from an anhydrite unit.	3. The McCasland water well adjacent to Conoco Federal #2 produces water from sand and/or gravel.
4. The extent of water quality impairment is less than 500 feet down gradient.	4. The extent of water quality impairment is greater than 500 feet down gradient.
5. Overflow of water from the windmill causes downward migration of calcium chloride from near surface soils to groundwater.	5. Overflow of water from the windmill does not cause downward migration of calcium chloride from near surface soils to groundwater.

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
2040 South Pacheco Street
Santa Fe, New Mexico 87505
(505) 827-7131

March 9, 1999

CERTIFIED MAIL
RETURN RECEIPT NO. Z 357 870 116

Mr. Mike Shepard
General Council
Mewbourne Oil Company
P.O. Box 7698
Tyler, Texas 75711

Re: Mewbourne Oil Company
Conoco Federal #2
Section 30-T20s-R39e

Dear Mr. Shepard:

The New Mexico Oil Conservation Division (NMOCD) is in receipt of the Mewbourne Oil Company's preliminary investigation report dated November 4, 1998 submitted by R.T. Hicks Consultants, Ltd. on behalf of Mewbourne Oil Company.

The report shows that the contaminated water well in question is developed in the Ogallala formation. The investigation report also concludes there might be another source of contamination (i.e. Calcium Chloride CaCl), and that the water well in question is high in Chlorides which may or may not be contamination from oilfield produced waters, and that two water well drilling logs indicated a possible naturally occurring anhydrite ($CaSO_4$) found above the base of the Ogallala or above the top of the Triassic red beds.

The NMOCD's does not totally discount the above findings, however historical groundwater and hydrogeologic data consistently shows that the majority of Ogallala fresh water in this area normally does not contain chlorides, and that anhydrite is not normally found above the Triassic red beds. **Therefore NMOCD hereby requires Mewbourne Oil Company to submit to NMOCD for approval a groundwater investigation plan to determine if any activities associated with the Mewbourne Conoco Federal #2 has caused groundwater contamination. Please submit this plan by April 15, 1999 to the OCD Santa Fe Office with a copy provided to the OCD Hobbs District Office.**

If you require any further information or assistance please do not hesitate to write or call me at (505-827-7155).

Sincerely Yours,

Wayne Price-Environmental Bureau

cc: OCD Hobbs Office
Robert McCasland-Landowner

NEW MEXICO ENERGY, MINERALS
& NATURAL RESOURCES DEPARTMENT

OIL CONSERVATION DIVISION
DISTRICT I HOBBS
PO BOX 1980, Hobbs, NM 88241
(505) 393-6161
FAX (505) 393-0720

Jennifer A. Salisbury
CABINET SECRETARY

June 26, 1998

Mr. Ross D. Murphy
Mewbourne Oil Company (MOC)
P.O. Box 5270
Hobbs, NM 88241

Re: Conoco Federal #2
1980 FEL, 600 FSL Sec 30-Ts20s-R39e
Lea County, NM

Subject: Groundwater Quality problem at above location on Bob McCasland land.

Dear Mr. Murphy:

New Mexico Oil Conservation Division (NMOCD) is in receipt of your response dated April 4, 1998 concerning the above referenced location and subject matter. Bob McCasland land owner has made an inquiry concerning a water quality problem with one of his windmills located in very close proximity (30-40 feet) to the Conoco Federal #2 which is on a lease operated by your company. This well has been reported to have been P&A as per your documentation.

Your documentation indicated this well produced at one time out of the Blineberry formation and you submitted 1971 water analysis of the formation water. You also submitted 1998 water analysis of the windmill in question. In addition you had made field checks of windmills north of this location with an observation that this water is fresh. The supporting documentation also had an expressed opinion that the windmill water was not contaminated with produced water from the underlying formation. Your documentation also included certain well records and hand sketches of the completion and plugging procedure used.

The NMOCD has evaluated your response and has the following comments.

1. The NMOCD has researched local geology maps, groundwater data, fresh water well locations and has made subsequent field trips to confirm the local geology. The windmill in question is located on top the Ogallala formation (see enclosed maps). While not having the well logs of this specific well it does appear it is producing out of the Ogallala formation, as is other local wells. However, there is a nearby boundary near the well which differs between saturated Tertiary and Quaternary and possible dry Triassic rocks. This is an indication the well in question lies within the saturated boundary of the fresh water Ogallala.

2. The NMOCD reduced the chemical data from both analysis into an ionic balance form in order to classify the waters in question. We utilized a Trilinear Diagram to assist us in this area. The results indicated that both waters (1971 & 1998) fall into the same classification as being described as Chloride + Sulfate waters with differing amounts of Calcium + magnesium (see attached charts & data). Since both waters fell into the same classification it was appropriate to determine if simple dilution or contamination from the more mineralized water impacted the less mineralized water.

The NMOCD relied upon historical ground water information of record and utilized the "Chemical Criteria for Recognition of Brine Contamination found in the Ground-Water Report #6 for Lea County, NM (Nichloson & Clebsch)." The Sulfate/Chloride ratio test was used to determine if the fresher water had indications of contamination from the more mineralized water. Generally speaking when the ratio of the ions of concern measured in (meq/l) are less than .1 this is an indication of contamination from Permian age formation in which the Blinberry is considered.

Please note the ratios of the waters were found to be .011 (1971) and .04 (1998) both much less than the statistical data of .1 limit. (See attached chart Fig. 29)

3. The contention that the windmill is completed in the top of the Triassic "Red Beds" and thus would cause the water to be low quality might be true in some areas, but historical groundwater data reflects that Triassic red bed formations found in the Dockum group has Sulfate to Chlorides ratios usually grater than 2. The analyticals for 1998 has a ratio of .04. Tertiary & Quaternary formations such as, for example the shallow Ogallala, has ratios between .1 and 2.0. The water found in 1998 does not demonstrate significant Sulfate tendencies as pointed out on the bottom right Anion Triliner diagram chart, thus would not be classified as "GYP" water as found.

The above interpretations indicate that shallow groundwater has possibly been contaminated with oilfield waste and/or waters that contain oilfield contaminants from other formations exceeding the NM Groundwater standards. Since Mewbourne Oil Company (MOC) is the current operator of this lease the NMOCD is requesting MOC to perform the following function.

*** **Please submit to NMOCD for approval an investigation plan to determine if groundwater has been impacted with oilfield contaminants. Please submit this plan within 60 days of receipt of this letter.**

Please note pursuant to NMOCD rules and regulations MOC is required to notify the NMOCD Bureau Chief (505-827-7152) upon discovery of groundwater contamination that exceeds the NM groundwater standards found in the NM WQCC regulations and referenced in NMOCD rule 19.

If you require any further information or assistance please do not hesitate to call (505-393-6161) or write this office.

Sincerely Yours,

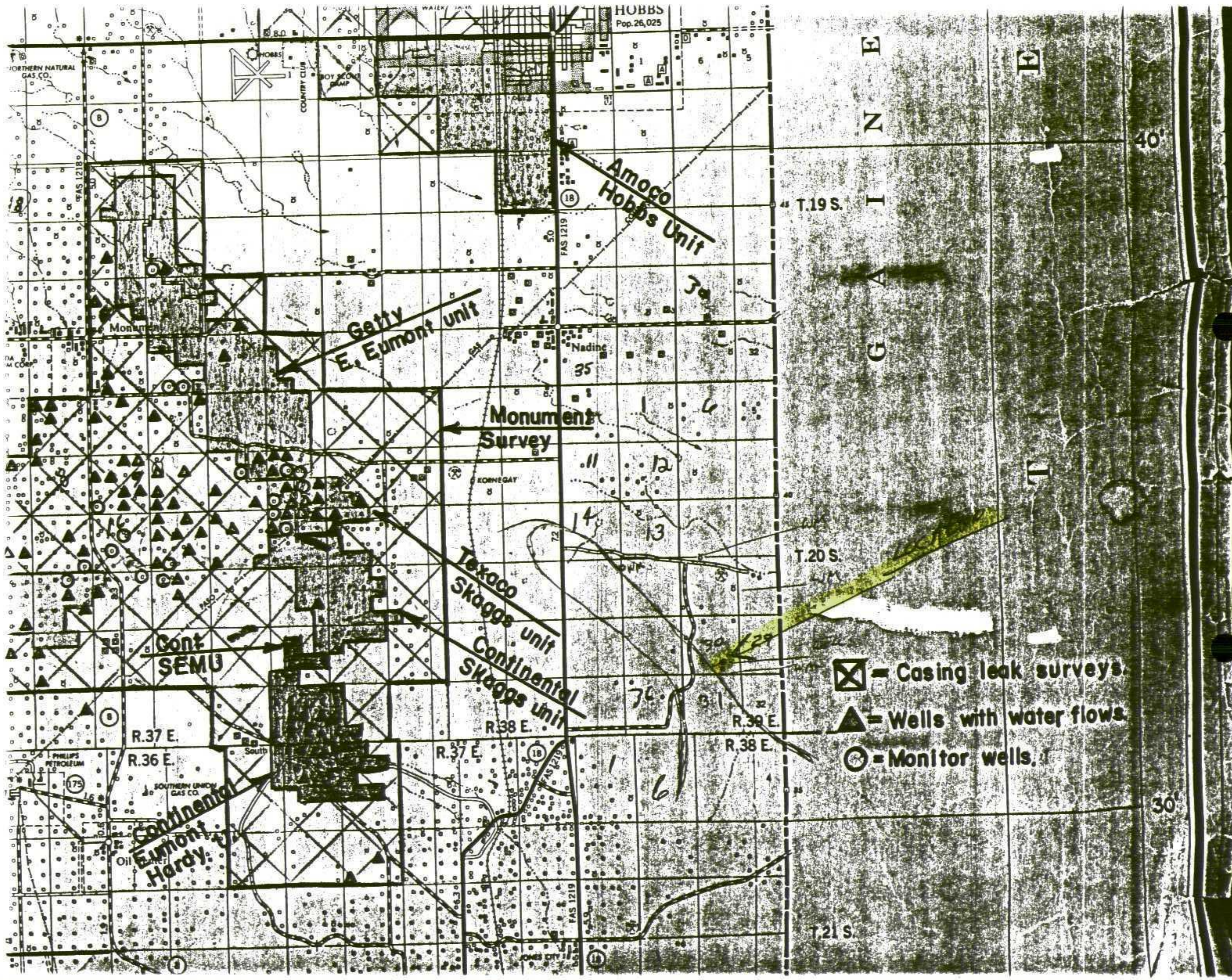
Wayne Price

Wayne Price-Environmental Engineer

cc: Chris Williams-NMOCD District I Supervisor
Bill Olson-Environmental Bureau, Santa Fe, NM
Mr. Bob McCasland-Landowner

file: wp98/mewbourn

attachments- yes


HOBBS
Pop. 26,025
Amoco
Hobbs Unit
Getty
E. Eumont unit
Monument
Survey
Texaco
Skaggs unit
Continental
Skaggs unit
Cont
SEMU
Continental
Eumont
Hardy U.
T.19 S.
T.20 S.
T.21 S.
R.36 E.
R.37 E.
R.38 E.
R.39 E.
40'
30'
Nadine
Monument
KORNEGAY
JONES CITY
PHILLIPS PETROLEUM
SOUTHERN UNION GAS CO.
NORTHERN NATURAL GAS CO.
COUNTRY CLUB
BOY SCOUT CAMP
FAS 1219
FAS 1218
= Casing leak surveys.
= Wells with water flows.
= Monitor wells.

3925

Water-table contour in Tertiary or Quaternary rocks

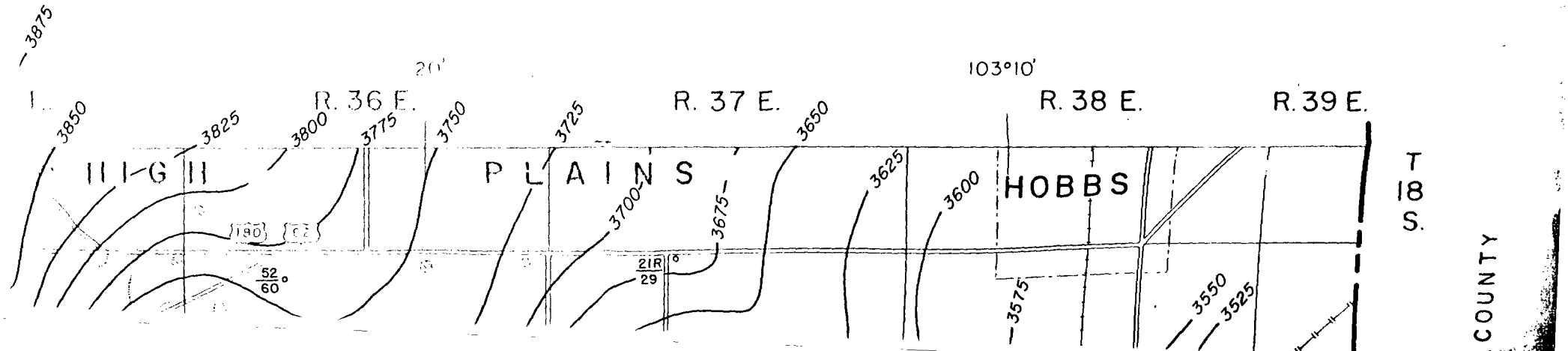
Dashed where inferred or uncertain. Contour interval 25 feet. Datum mean sea level

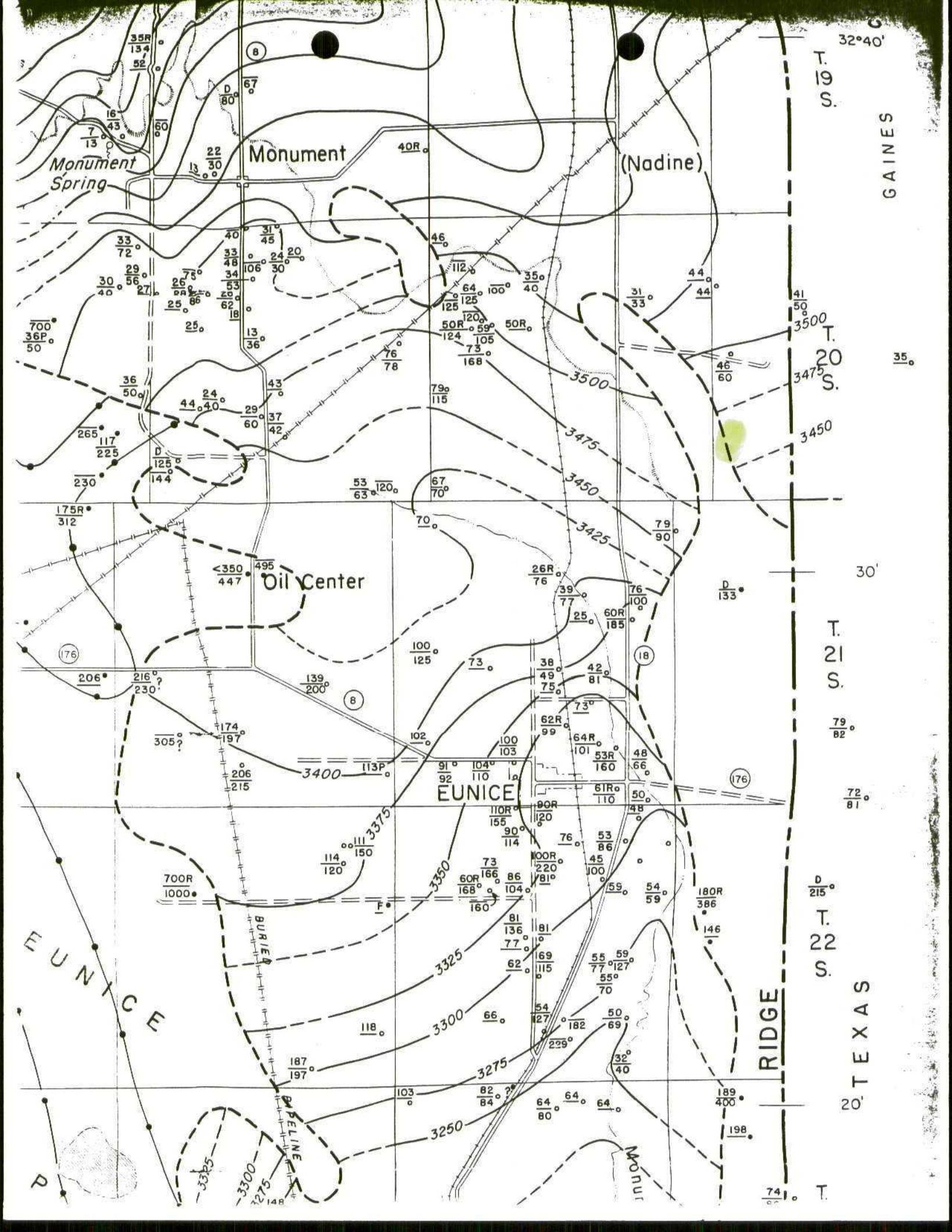
3500

Water-table or piezometric contour on water body in Triassic aquifers

Dashed where inferred or uncertain. Contour interval 100 feet. Datum mean sea level

Approximate position of boundary between Triassic rocks and saturated Tertiary and Quaternary rocks




Monument
Monument Spring
(Nadine)
Oil Center
EUNICE
BURIED PIPELINE
EUNICE
RIDGE
GAINES
TEXAS
T. 19 S.
T. 20 S.
T. 21 S.
T. 22 S.
32°40'
30'
20'
3500
3475
3450
3425
3400
3375
3350
3325
3300
3275
3250

EXPLANATION

Pleistocene and Recent

Sand

Thin cover of drift sand in most places; locally dunes 20-40 feet high

Qal

Alluvium

Sand and gravel along dry washes; silt and sand in lake beds; includes some wind-deposited sand around depressions

Pliocene

To

Ogallala formation

Chiefly sand, poorly to well-cemented with calcium carbonate; contains some clay, silt, and gravel; capped in most places by caliche

QUATERNARY

TERTIARY

CRETACEOUS

TRIASSIC

Ku

Cretaceous rocks, undifferentiated

Slumped blocks of buff, tan, or white fossiliferous limestone

Upper Triassic

TRC

TRS

TRd

Dockum group

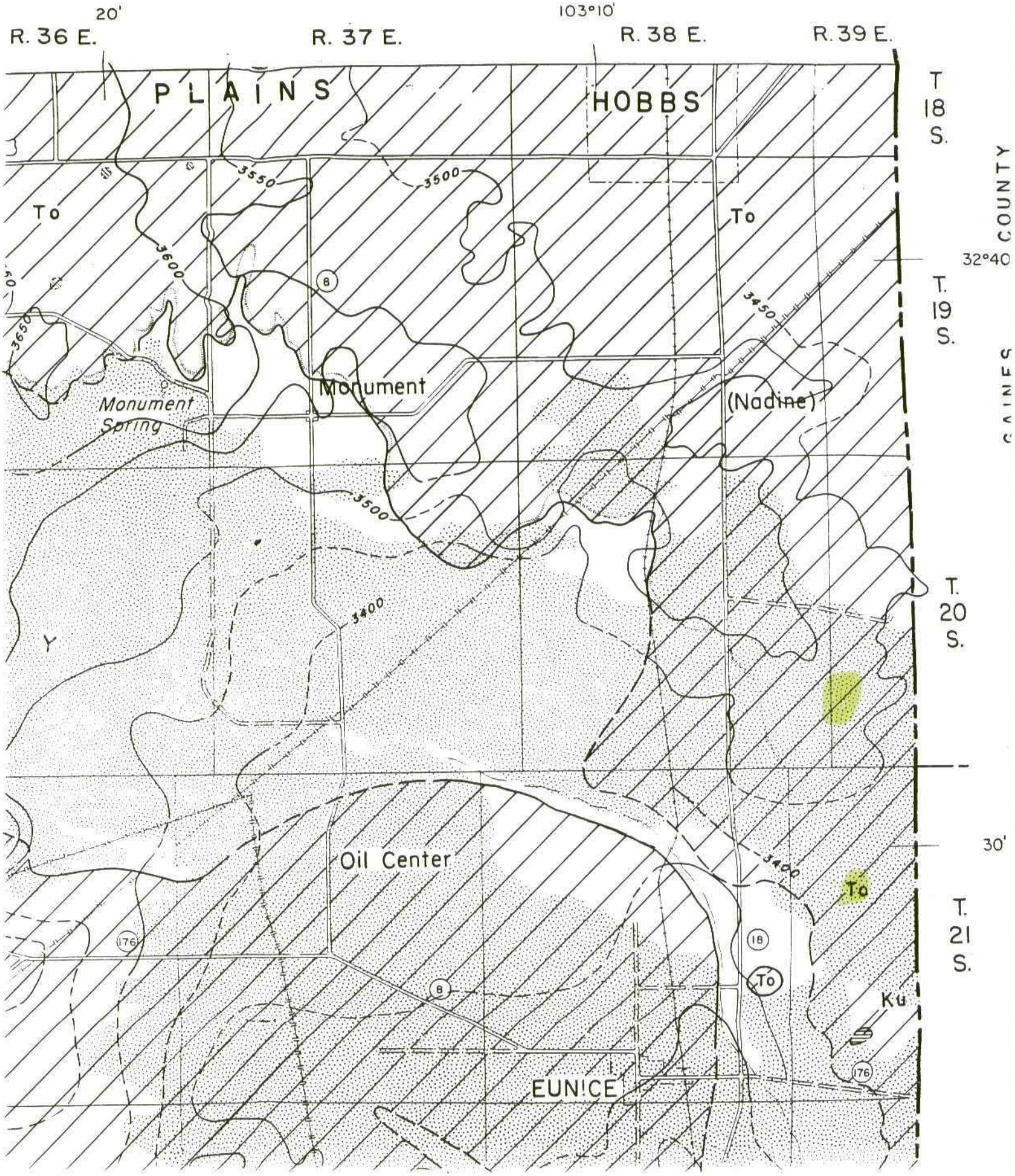
TRC–*Chinle formation, red and green claystone, minor siltstone, and fine-grained sandstone;* TRS–*Santa Rosa sandstone, red to white poorly sorted, coarse-grained, crossbedded sandstone;* TRd–*rocks of the Dockum group, undifferentiated*

3500

Contours on the red-bed surface

Dashed where approximate or inferred. Contour interval 50 feet. Datum mean sea level

mean sea level



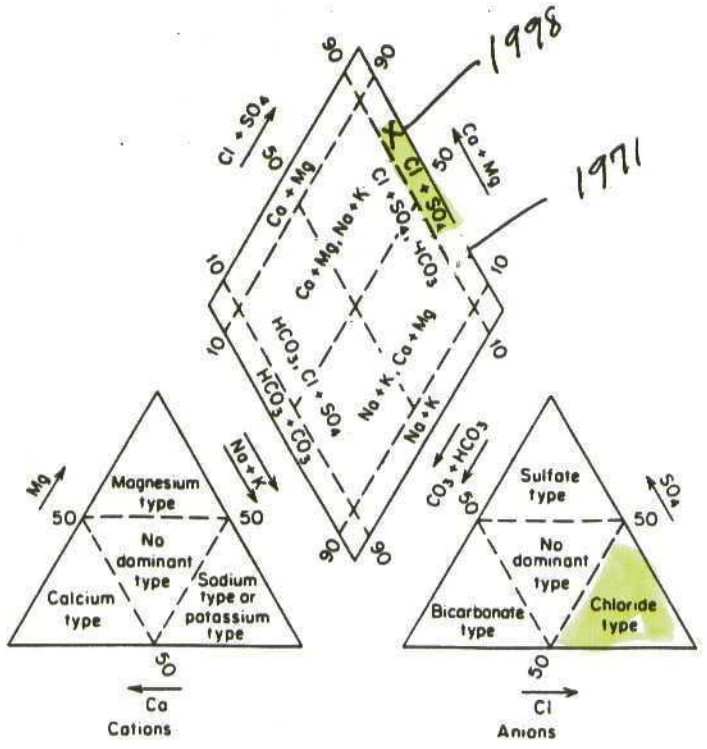


Figure A1-16 Chemical Classification Diagram. This diagram may be used in conjunction with a trilinear plot(s), such as that shown in Figure A1-12, to designate water types.
(after Morgan and Winner, 1962 and Back, 1966; in many texts related to hydrology such as Freeze and Cherry, 1979)

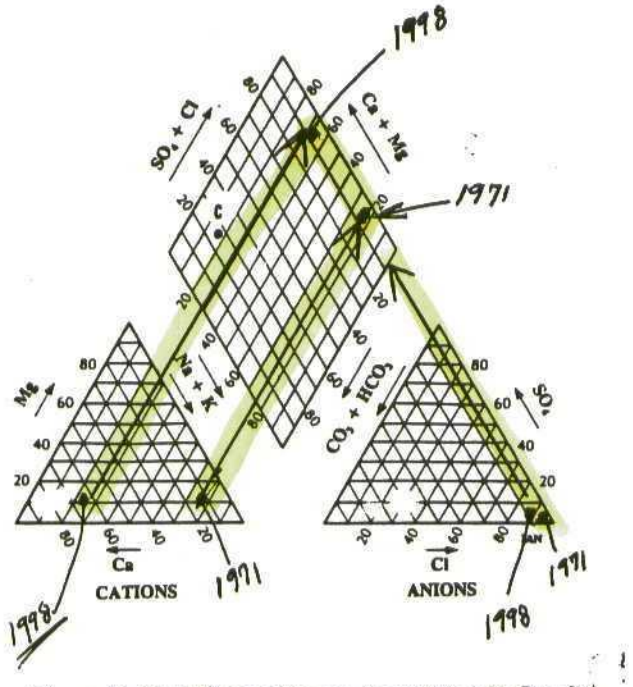
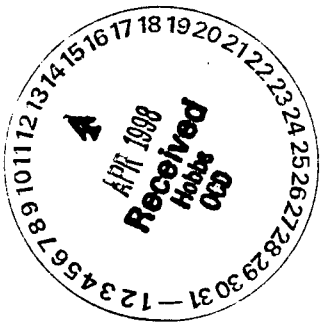


Figure A1-12 Trilinear Diagram for Plotting the Results of Chemical Tests.

ATTACHMENT 5

Item	1971 Sample	1998 Sample
Sodium	58745 mg/L	285 mg/L
Calcium	7199	700
Magnesium	4014	90
Pottasium	NR	7.4
NO3	NR	3
Chlorides	113462	1771
SO4 (sulfates)	1700	108
CO3	NR	0
HCO3 (bicarbonates)	243	171
ph	6.2	7.23
TDS (total disolved solids)	NR	4113



Anions

$SO_4^{(-2)}$ $32 + 64 + 16(4) = 98$ g/mole

$Cl^{(-1)}$ $= 35.95$ g/mole

$HCO_3^{(-1)}$ $1 + 12 + 16(3) = 61$ g/mole

CO_3 $= 60$ g/mole

Cations

Ca^{+2} $40.08 = 40.08$ g/mole

Mg^{+2} $24.305 = 24.305$

$Pot(K)^{+1}$ $39.0 = 39.09$

Na^{+1} ~~22.98~~ $= 22.98$

$$\text{meq/L} = \frac{\text{mg/L} \times \text{VAL}}{\text{mole wt}} = \frac{19 \times 2}{98} = .387$$

Ex $SO_4 = 19$ mg/L

$Cl = 99$ $\frac{99 \times 1}{35.95} = 1.38$

1971 SAMPLE

CATS		
SO(Na)	$\frac{58748 \times 1}{40\ 22.98} =$	~~8987~~ 2556
CAL	$\frac{7199 \times 2}{40.08} =$	359
Mg	$40/4 \times 2 / 24.305 =$	330
Pot		
TOTAL		3245

ANIONS		
Cl	$\frac{113,462 \times 1}{35.45} =$	3200
SO_4	$\frac{1700 \times 2}{98} =$	35
HCO_3	$\frac{243 \times 1}{61} =$	4
		3239

TOTAL AVG 3242

1978 SAMPLE

CATS		
SO(Na)	$\frac{285 \times 1}{22.98} =$	12
Ca	$\frac{700 \times 2}{40.08} =$	35
Mg	$\frac{70 \times 2}{24.305} =$	7
Pot(K)	$\frac{7.4 \times 1}{39} =$	~~.2~~ 0
	TOTAL	54

ANIONS		
Cl	$\frac{1771 \times 1}{35.45} =$	50
SO_4	$\frac{108 \times 2}{98} =$	2
HCO_3	$\frac{171 \times 1}{61} =$	3
	TOTAL AVG = 54.5	TOTAL = 55

1971 TOTAL Avg = 3242 | 1998 = 54.5

SOD (Na)	$\frac{2556}{3242}$ =	79%		SOD (Na) =	$\frac{12}{54.5}$ =	23%
CA	$\frac{359}{3242}$ =	11%		Ca =	$\frac{35}{54.5}$ =	64%
Mg + K	$\frac{330}{3242}$ =	10%		Mg =	$\frac{7}{54.5}$ =	13%
		100%				100%
CL	$\frac{3200}{3242}$ =	99%		CL =	$\frac{50}{54.5}$ =	90%
SO_4	$\frac{35}{3242}$ =	1%		SO_4 =	$\frac{2}{54.5}$ =	4%
HCO_3	$\frac{4}{3242}$ =	<1%		HCO_3	$\frac{3}{54.5}$ =	6%
		100%				100%

WATER IS IN <u>CL + SO_4</u> RANGE

∴ WILL USE SO_4/CL RATIO'S BY NICHOLSON/CLEBSCH
LEA CO. GROUND WATER

AGE TRIASSIC ROCKS SO_4/CL > 2

PALEOZOIC " SO_4/CL < .25 USUALLY LESS < .1

TERTIARY " >.1 — <2.0
& QUATERNARY

1971 $\frac{35}{3200}$ = .011 1998 $\frac{2}{50}$ = .04

.011 < .04 < .1 <u>PALEOZOIC</u> <u>CONTAMINATION</u>!
+ (PERMIAN OR TRIASSIC BELOW DOCKUM GROUP)

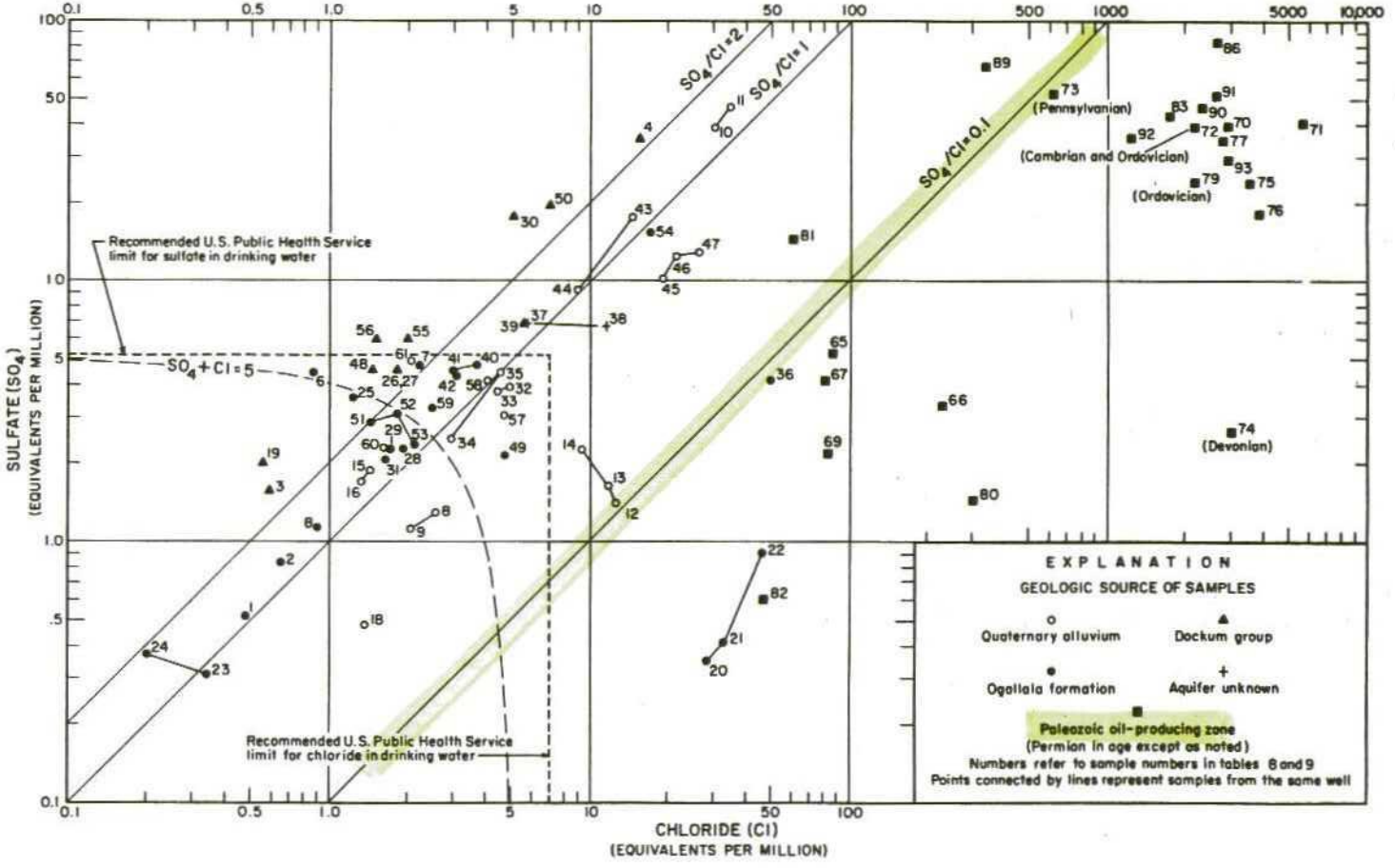


Figure 19.--Relation of sulfate to chloride in samples of ground water from southern Lea County, N. Mex.

Figure 29

RELATION OF SULFATE TO CHLORIDE IN SAMPLES OF GROUND WATER FROM SOUTHERN LEA COUNTY, N. MEX.