

STATE OF ALASKA  
OIL AND GAS CONSERVATION COMMISSION  
3001 Porcupine Drive  
Anchorage, Alaska 99501-3192

Re: The REQUEST OF UNION OIL ) Aquifer Exemption Order No. 5  
COMPANY OF CALIFORNIA (“Unocal”) )  
for an Aquifer Exemption Order for a ) Pioneer Unit  
disposal well located in the Pioneer Unit in ) Pioneer Coalbed Methane Field  
the Matanuska-Sustina Valley in )  
Southcentral Alaska. )

June 29, 1999

IT APPEARING THAT:

1. Union Oil Company of California (“Unocal”) applied to the Alaska Oil and Gas Conservation Commission (“Commission”) on May 14, 1999 for an aquifer exemption for purposes of Class II disposal in the Pioneer Unit 1702-15DA WDW well (“WDW well”). Additional information requested by the Commission was received on June 9, 1999.
2. The Commission publish notice of an opportunity for public hearing in the Anchorage Daily News on May 18, 1999.
3. The Commission did not receive any protest or request for a public hearing.
4. The Commission has jurisdiction in this matter under AS 31.05.030(h), 20 AAC 25.440, and 40 CFR 147, Subpart C – Alaska.
5. The Commission submitted a copy of Unocal’s aquifer exemption application to the U.S. Environmental Protection Agency Region 10 (“EPA Region 10”) on May 20, 1999, and a copy of the proposed order on June 14, 1999, in accordance with Section 14 of the November 22, 1991 Memorandum of Agreement between EPA Region 10 and the Commission.
6. EPA Region 10 did not object to the requested Aquifer Exemption Order for the Pioneer Unit 1702-15DA WDW well.

FINDINGS:

1. Unocal plans to test the coalbed methane potential of the Pioneer Unit, which is located north of Knik Arm, in the Wasilla to Big Lake vicinity of the Matanuska-Susitna Valley. The Parks Highway run east to west through the center of the unit.
2. Unocal seeks authorization to inject Class II waste fluids into permeable sands and conglomerates of the Tyonek Formation, at depths below 2500 feet in its proposed Pioneer Unit 1702-15DA WDW well (June 9, 1999 letter).
3. The WDW well is proposed to be drilled approximately 1500 feet from the south line, 515 feet from the east line of Section 15, T17N, R2W, Seward Meridian. The well location is

in the southern portion of the unit, approximately centered east to west, in an area of the valley with relatively low population.

4. There are many water wells and a few oil wells in the Matauska-Susitna Valley.
5. To determine the total dissolved solids (“TDS”) content in formation waters at the proposed WDW well location, Unocal analyzed wireline log data, well cuttings descriptions and produced water analysis reports from 31 oil and gas exploratory wells within a 48 township (1,728 square mile) study area surrounding the Pioneer Unit; records from water wells within four miles of the Pioneer Unit boundary; and published data on the surficial geology and distribution of fresh water in the area.
6. Unocal utilized a method for calculating TDS content from wireline log data endorsed in EPA publication “Survey of Methods to Determine Total Dissolved Solids Concentration”(KEDA Project No. 30-956). Unocal refined the technique by calibrating log calculations with produced water samples in order to insure conservative estimates of TDS content.
7. The ARCO Big Lake Test (“BLT”) No. 1 well was drilled 6.8 miles due west of the proposed WDW well location.
8. The BLT No. 1 well encountered Pleistocene glacial deposits to a depth of 535 feet measured depth (“MD”) and Oligocene to Miocene-aged Tyonek Formation sediments to a depth of 5,745 feet MD. The BLT well appears to provide the most reliable control for estimating stratigraphic conditions at the WDW well location.
9. Salinity data from the BLT No. 1 well shows an abrupt change in TDS content at about 535 feet MD from less than 500 ppm to greater than 3,000 ppm, and salinity ranging from between 3,000 ppm to 13,000 ppm TDS between 1,500 feet to 4,000 feet MD.
10. The abrupt change in TDS content appears to correspond to the unconformable contact between Pleistocene-aged glacial deposits and the much older underlying Tyonek Formation.
11. The Tyonek Formation in the northern portion of the Cook Inlet Basin is composed of fluvial deposits that have a high degree of lateral lithologic variability.
12. Subsurface mapping throughout the Cook Inlet Basin has demonstrated that lithologic sequences dominated by fine-grained deposits and coals are generally more laterally continuous than coarse-grained intervals.
13. Over 700 feet of confining zone lithologies are present in the BLT No. 1 well between 535 feet and 2,790 feet MD, with the thickest confining zone being a predominantly shale interval between 2,520 feet and 2,790 feet MD.

14. The proposed WDW well disposal zone will be within that portion of the Tyonek Formation that is confined by the stratigraphic equivalents of 2520 feet and 2790 feet MD interval in the BLT No. 1 well.
15. The TDS content of formation waters in the proposed WDW well disposal zone is expected to be greater than 6,000 ppm.
16. Unocal proposes to verify actual TDS content of disposal zone in the proposed WDW well by obtaining uncontaminated water samples following the wells completion and prior to disposal operations.
17. Records from the Division of Mining and Water Management, Department of Natural Resources, show that most water wells in study area are less than 300 feet deep, and that within four miles of the unit boundary only 10 water wells exist with a depth greater than 400 feet, with the deepest at 605 feet.
18. Five water wells are present within a half-mile radius of the proposed WDW well, the deepest of which is 140 feet.
19. Unocal intends to obtain baseline chemical analyses of water chemistry from the adjacent water wells prior to initiating disposal operations in the WDW well.
20. The Commission's authority to act in this matter is embodied in 40 CFR 147 Subpart C, the Alaska Oil and Gas Conservation Act (AS 31.05), and the Alaska Administrative Code (20 AAC 25.005 through 20 AAC 25.570).

CONCLUSIONS:

1. Drinking water with TDS content less than 500 ppm is present to a depth of approximately 535 feet in the vicinity of the proposed WDW well.
2. The portion of the aquifer proposed for disposal operations in the WDW well will likely have a TDS content greater than 3,000 ppm but less than 10,000 ppm.
3. The portion of the aquifer proposed for disposal operations in the WDW well does not now serve as a source of drinking water, and cannot reasonably be expected to supply a public water system because it is situated at a depth that makes recovery for drinking water purposes economically impractical and because better quality water exists abundantly at a much shallower depth.
4. In the vicinity of the proposed WDW well, those portions of aquifers common to and which correlate with the interval below 2790 feet in the BLT No. 1 well qualify as exempt freshwater aquifers under 20 AAC 25.440(a)(2).

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NOW, THEREFORE, IT IS ORDERED THAT those portions of aquifers common to and which correlate with the interval below 2,790 feet MD in the BLT No. 1 well in the following tracts of land are exempt under 20 AAC 25.440.

Seward Meridian

T17N R2W Sections: 14, 15, 22 and 23.

DONE at Anchorage, Alaska and dated June 29, 1999.

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Robert N. Christenson, P.E., Chairman

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David W. Johnston, Commissioner

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Camillé Oechsli, Commissioner

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AS 31.05.080 provides that within 20 days after receipt of written notice of the entry of an order, a person affected by it may file with the Commission an application for rehearing. A request for rehearing must be received by 4:30 PM on the 23rd day following the date of the order, or next working day if a holiday or weekend, to be timely filed. The Commission shall grant or refuse the application in whole or in part within 10 days. The Commission can refuse an application by not acting on it within the 10-day period. An affected person has 30 days from the date the Commission refuses the application or mails (or otherwise distributes) an order upon rehearing, both being the final order of the Commission, to appeal the decision to Superior Court. Where a request for rehearing is denied by nonaction of the Commission, the 30 day period for appeal to Superior Court runs from the date on which the request is deemed denied (i.e., 10th day after the application for rehearing was filed).