

STATE OF ALASKA
ALASKA OIL AND GAS CONSERVATION COMMISSION
333 West 7th Avenue, Suite 100
Anchorage, Alaska 99501

Re: THE APPLICATION of Union) Aquifer Exemption Order No. 6A
Oil Company of California for a depth)
extension of Aquifer Exemption Order) Sterling and Beluga Formations
No.6, which relates to portions of the) Ivan River Unit
Ivan River Unit within the Matanuska-)
Susitna Borough, Alaska.) December 5, 2008
)

IT APPEARING THAT:

1. Union Oil Company of California (Union), a wholly owned indirect subsidiary of Chevron Corporation, submitted an application for a depth extension of Aquifer Exemption Order (AEO) No. 6. Union's application dated July 15, 2008 was received by the Alaska Oil and Gas Conservation Commission (Commission) on July 17, 2008.
2. AEO 6 exempts those portions of freshwater aquifers lying between 2500 feet and 3420 feet measured depth in, and within ½-mile radius of, the Ivan River Unit (IRU) Well 14-31 for purposes of Class II underground injection activities.¹
3. The surface location of IRU Well 14-31 is located within Section 1, Township 13N, Range 9W, Seward Meridian.
4. Union's application requests a depth extension from 3420 feet to 6195 feet.
5. The Commission's jurisdiction in this matter is under AS 31.05.030(h) and 40 CFR 147, Subpart C – Alaska, and relates to 20 AAC 25.440.
6. The Commission published a public hearing notice, with a tentative hearing date of September 4, 2008, on the Commission's Web site on July 21, 2008, on the State of Alaska Online Notices on July 21, 2008, in the ANCHORAGE DAILY NEWS on July 22, 2008, and in the PENINSULA CLARION on July 24, 2008.
7. The Commission submitted a copy of Union's aquifer exemption application and related documents to the U.S. Environmental Protection Agency, Region 10 (EPA Region 10), on July 22, 2008.
8. The Commission received no comments, protests, or requests for a hearing. The public hearing was vacated on September 2, 2008.
9. Union submitted a disposal injection order (DIO) application on September 8, 2008, proposing the conversion of IRU 13-31 from gas production to Class II waste disposal service. IRU 13-31 penetrates the proposed disposal zone within the ½-mile exemption radius established by AEO 6.

¹ All depths presented herein are measured depths within IRU 14-31 unless otherwise noted.

10. On October 20, 2008, the Commission requested additional information from Union regarding water quality within the affected geologic strata.
11. On November 7, 2008, Union submitted a revised request for a depth extension of AEO 6. This revision changes the interval of the requested depth extension to the following: 3420 feet to 5435 feet in IRU 14-31.
12. On November 8, 2008, Union submitted the water quality information the Commission requested on October 20, 2008.
13. On November 14, 2008, the Commission requested further information from Union regarding water quality. Union responded with the requested information on that same day.
14. The information submitted by Union and public well history and well log records are the basis for this order.
15. On November 25, 2008 and in accordance with the memorandum of agreement between EPA and the Commission, a draft of this aquifer exemption order was sent to EPA Region 10. Information that supports the Commission's findings and conclusions were provided to EPA Region 10 on November 25 and November 26, 2008.
16. In correspondence dated December 4, 2008, EPA Region 10 concurred with the proposed depth extension of AEO 6 to 5435 feet in IRU 14-31.

FINDINGS:

1. Extent of Aquifer Exemption Area.

The IRU is on the west side of Cook Inlet within the Matanuska-Susitna Borough, approximately 45 miles due west of Anchorage. This gas field has been in production since July 1990. There are six wells within the IRU: one plugged and abandoned well, four gas production wells, and one disposal well (IRU 14-31) used for underground injection of Class II oilfield wastes. Union plans to convert shut-in gas producer IRU 13-31 to disposal injection service; the well was shut-in December 2007.

AEO 6 exempts aquifers within a ½-mile radius of, and between 2500 feet and 3420 feet in, IRU 14-31. Union requests a depth extension to allow for the deeper injection of Class II oilfield wastes into IRU 13-31. No change to the lateral extent of the exempted area is requested since IRU 13-31 is within the ½-mile exemption in AEO 6.

2. Formation Water Total Dissolved Solids.

Union calculated the total dissolved solids (TDS) concentrations in the affected aquifers within IRU 13-31 utilizing well log data and techniques that conform with EPA guidance document "Survey of Methods to Determine Total Dissolved Solids Concentrations," (KEDA Project No. 30-956). Union's analysis indicate that aquifers within IRU 13-31 that correlate to the interval between 3420 feet and 5156 feet within IRU 14-31 contain

TDS concentrations greater than 3,000 parts per million (ppm). Union's analysis also indicates aquifers within IRU 13-31 that correlate to the depth below 5156 feet in IRU 14-31 contain TDS concentrations of approximately 2,500 ppm.²

The Commission verified Union's analysis using EPA-recommended techniques and well log data from IRU Wells 14-31, 13-31, and 44-36. The results of the Union and Commission analyses are consistent. The Commission determined that aquifers equivalent to the interval from 3420 feet to 5163 feet in IRU 14-31 contain TDS concentrations exceeding 3,000 ppm. The Commission also found that aquifers below the equivalent of 5163 feet in IRU 14-31 contain TDS concentrations between about 2,000 ppm and 3,000 ppm.

3. Suitability of IRU Sediments Below 2500 Feet as Drinking Water Aquifers.

20 AAC 25.440(a)(1)(B) provides that the Commission may grant a freshwater aquifer exemption regardless of total dissolved solids content if the aquifer does not and cannot now, and will not in the future, serve as a source of drinking water because it "is situated at a depth or location that makes recovery of water for drinking water purposes economically or technologically impractical."

AEO 6 concludes that the portions of aquifers between 2500 feet and 3420 feet in IRU 14-31 are not reasonably expected to serve as underground sources of drinking water based on depth and water quality. The TDS data indicates a trend reversal toward less TDS as the well gets deeper. Extending the aquifer exemption depth to the equivalent of 5435 feet in IRU 14-31 is unlikely to affect potential drinking water supplies since increased lifting costs are associated with deeper zones, and suitable sources of drinking water are available on the surface and within the shallow subsurface.

CONCLUSIONS:

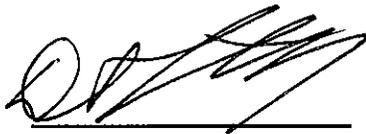
1. The findings and conclusions of AEO 6 remain valid. AEO 6 properly exempts for purposes of Class II underground injection activities the portions of freshwater aquifers between 2500 feet and 3420 feet and within a ½-mile radius of IRU 14-31;
2. All known and foreseeable ground water consumption from the IRU vicinity is consistent with usable ground water resources above 200 feet;
3. The TDS content of the water within a ½-mile radius and within strata equivalent to those between 3420 feet and 5163 feet in IRU 14-31 is greater than 3,000 ppm. Strata equivalent to those below 5163 feet in IRU 14-31 contain TDS concentrations between about 2,000 ppm and 3,000 ppm;
4. Those portions of aquifers at an interval equivalent to between 3420 feet and 5435 feet within IRU 14-31 are at depths that make recovery of the water for drinking water purposes economically impractical now or in the future;

² To minimize confusion, affected aquifers and strata in nearby wells are specified as equivalent depths within IRU 14-31, which is the reference well for AEO 6.

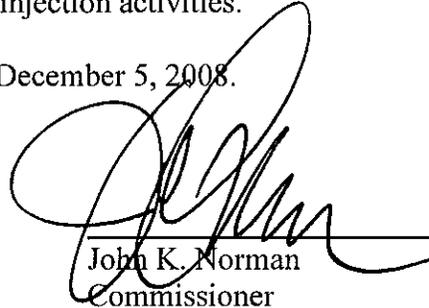
5. Those portions of aquifers within a ½-mile radius around the IRU 14-31 wellbore and below 2,500 feet qualify as exempt freshwater aquifers under 20 AAC 25.440(a)(1)(B) or 20 AAC 25.440(a)(2) or both; and
6. The stratigraphic sequence and maintenance of the mechanical integrity of the wells within a ½-mile radius of IRU 14-31 will prevent the movement of fluids into underground sources of drinking water.

NOW, THEREFORE, IT IS ORDERED THAT the aquifers or portions of aquifers between 2500 feet and 5435 feet in, and within a ½-mile radius of, IRU Well 14-31 are exempt for purposes of Class II underground injection activities.

ENTERED at Anchorage, Alaska, and dated December 5, 2008.



Daniel T. Seamount, Jr.
Chair



John K. Norman
Commissioner



RECONSIDERATION AND APPEAL NOTICE

As provided in AS 31.05.080(a), within 20 days after written notice of the entry of this order or decision, or such further time as the Commission grants for good cause shown, a person affected by it may file with the Commission an application for reconsideration of the matter determined by it. If the notice was mailed, then the period of time shall be 23 days. An application for reconsideration must set out the respect in which the order or decision is believed to be erroneous.

The Commission shall grant or refuse the application for reconsideration in whole or in part within 10 days after it is filed. Failure to act on it within 10-days is a denial of reconsideration. If the Commission denies reconsideration, upon denial, this order or decision and the denial of reconsideration are FINAL and may be appealed to superior court. The appeal MUST be filed within 33 days after the date on which the Commission mails, OR 30 days if the Commission otherwise distributes, the order or decision denying reconsideration, UNLESS the denial is by inaction, in which case the appeal MUST be filed within 40 days after the date on which the application for reconsideration was filed.

If the Commission grants an application for reconsideration, this order or decision does not become final. Rather, the order or decision on reconsideration will be the FINAL order or decision of the Commission, and it may be appealed to superior court. That appeal MUST be filed within 33 days after the date on which the Commission mails, OR 30 days if the Commission otherwise distributes, the order or decision on reconsideration. As provided in AS 31.05.080(b), "[t]he questions reviewed on appeal are limited to the questions presented to the Commission by the application for reconsideration."

In computing a period of time above, the date of the event or default after which the designated period begins to run is not included in the period; the last day of the period is included, unless it falls on a weekend or state holiday, in which event the period runs until 5:00 p.m. on the next day that does not fall on a weekend or state holiday.