

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

Re: **The APPLICATION OF ARCO**) **Area Injection Order No. 18A**
 ALASKA Inc. (“ARCO”) for an) Colville River Field
 amendment of Area Injection Order) Colville River Unit
 No. 18 to allow disposal into certain) Alpine Oil Pool
 disposal intervals on an area basis in)
 the Colville River Field.)

April 18, 2000

IT APPEARING THAT:

1. By application dated February 3, 2000, ARCO Alaska, Inc. (“ARCO”) requested authorization from the Alaska Oil and Gas Conservation Commission (“Commission”) to amend Area Injection Order No. 18 to allow disposal of fluids into the disposal intervals specified in Disposal Injection Order No. 18 on an area basis.
2. Notice of opportunity for public hearing was published in the Anchorage Daily News on February 9, 2000.
3. The Commission did not receive a protest or a request for a public hearing.

FINDINGS:

1. Commission regulation 20 AAC 25.460 provides authority to issue an order governing underground injection of fluids on an area basis for all wells within the same field, facility site, reservoir, project, or similar area.
2. The Commission has issued Disposal Injection Order No. 18 on April 19, 1999 and Area Injection Order No. 18 on January 24, 2000. The findings, conclusions and administrative records are adopted by reference and incorporated into this order.
3. The Alpine Oil Pool (“AOP”) is located in the Colville River Delta area on Alaska’s North Slope.
4. ARCO is the only operator of all wells within one-quarter mile of the area proposed for disposal. The State of Alaska and Kuukpiik Corporation are the surface owners.
5. ARCO anticipates drilling up to five disposal wells into the disposal interval approved for Class II disposal operations in DIO No. 18.
6. The Commission issued Disposal Injection Order No. 18 for well WD-02. The well is currently operating as a Class I well under EPA UIC Area Permit AK-11003-A.

7. EPA UIC Area Permit AK-11003-A Part II.A.3 prohibits the drilling of offsetting wells into or below the arresting zone (lower Kingak) within the ¼ mile radius area of review unless directed by EPA.
8. Salinity calculations range from 15,000 to 18,000 milligrams per liter (“mg/L”) total dissolved solids (“TDS”) throughout the Cretaceous and older stratigraphic sections in the Colville Delta Area.
9. Disposal well design requirements include 16-inch conductor casing set at 75’ and cemented; surface holes drilled to a minimum of 2200’ TVDSS and either 9 5/8” or 7 5/8” casing set and cemented to surface; and production casing set near the base of the injection zone and cemented across and not less than 500’ measured depth above the Alpine formation. Single tubing strings between 2 7/8” and 4 ½” OD will be installed in each well. The tubing by casing annulus will be isolated within 200’ of the top of the uppermost injection interval.
10. The only wellbores penetrating the disposal interval will be those wellbores intended for disposal purposes. Since these wellbores will be fully cemented across both the injection and confining intervals, there are no past, present or planned penetrations of this interval that could provide communication channels to shallower intervals.
11. ARCO estimates that oil field waste fluids could total 4 million barrels over the life of the field. ARCO also anticipates disposal of as much as 14 million barrels of produced water before the initiation of waterflood operations re-injecting the produced water.
12. ARCO seeks to dispose of oil field waste fluids that may include drill cuttings and fluids, completion, workover and stimulation fluids, frac sand, produced water, crude oil, production vessel sludge/sand, natural gas liquids, rig wash and well cellar fluids, diesel/methanol used as freeze protectant, plant upset fluids, snowmelt, and any fresh or seawater necessary to enable disposal.
13. Daily injection volumes are not expected to exceed 2,500 barrels, and disposal rates are not expected to exceed 5 barrels per minute. A maximum injection pressure of 3200 psi is estimated.
14. ARCO plans to run a cement quality log to verify the cement quality and top of cement behind the production casing in any well prior to use as a disposal well.
15. ARCO will demonstrate the mechanical integrity of injection wells as specified in 20 AAC 25.412 prior to initiating injection operations.
16. The operator will comply with the requirements of 20 AAC 25.402 (d) & (e) to monitor tubing-casing annulus pressures of injection wells periodically during injection operations to ensure there is no leakage and that casing pressure remains less than 70% of minimum yield strength of the casing.
17. All existing wells drilled within the proposed project area have been constructed in accordance with 20 AAC 25.030. All wells abandoned in the proposed project area have been abandoned in accordance with 20 AAC 25.105 and 20 AAC 25.112 or an equivalent precursor regulation.

CONCLUSIONS:

1. The application requirements of 20 AAC 25.402 have been met.
2. An Area Injection Order is appropriate for the project area in accordance with 20 AAC 25.460.

3. No underground sources of drinking water (“USDW’s”) exist beneath the permafrost in the Colville River Unit area.
4. No wells may be drilled into or below the arresting zone (lower Kingak) for the wells covered in the ¼ mile radius area of review under EPA permit AK-11003-A.
5. The proposed injection operations will be conducted in permeable strata, which reasonably can be expected to accept injected fluids at pressures less than the fracture pressure of the confining strata.
6. Disposal will be limited to produced water and oil field wastes that the Commission determines are suitable for disposal in a Class II well.
7. Well mechanical integrity will be demonstrated in accordance with 20 AAC 25.412 prior to initiation of injection operations.
8. The mechanical integrity of each injection well will be tested at least every four years after an initial test. Wells used for grind and inject purposes must be tested every two years.
9. Tubing-casing annulus pressure and injection rates will be monitored at least weekly for disclosure of possible abnormalities in operational conditions.
10. An amendment to Area Injection Order 18 to enable additional disposal wells will not cause waste nor jeopardize correlative rights.

NOW, THEREFORE, IT IS ORDERED that: (1) Area Injection Order #18A supercedes Disposal Injection Order #18 dated April 19, 1999 and Area Injection Order #18 dated January 24, 2000; and (2) the following rules govern Class II injection and disposal operations in the affected area described below:

UMIAT MERIDIAN

T11N R4E Section 1, 2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 21, 22, 23, 24, 25, 26, 27.

T11N R5E Sections 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 29, and 30.

T12N R4E Sections 24, 25, 26, 27, 33, 34, 35 and 36.

T12N R5E Sections 13, 14, 15, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35 and 36.

Rule 1 Authorized Injection Strata for Enhanced Recovery

Within the affected area, fluids may be injected for purposes of pressure maintenance and enhanced recovery into strata that are common to and correlate with the interval between the measured depths of 6876 and 6976 feet in the Bergschrund No. 1 well.

Rule 2 Authorized Injection Strata for Disposal

Within the affected area, Class II fluids may be injected for purposes of disposal into strata that are common to and correlate with the interval between the measured depths of 8432 and 9540 feet in the Sohio Alaska Petroleum Company Nechelik No. 1 well.

Rule 3 Fluid Injection Wells

The underground injection of fluids must be through a well permitted for drilling as a service well for injection in conformance with 20 AAC 25.005 or through a well approved for conversion to a service well for injection in conformance with 20 AAC 25.280.

Rule 4 Monitoring the Tubing-Casing Annulus Pressure Variations

The tubing-casing annulus pressure and injection rate of each injection well must be checked at least weekly to ensure there is no leakage and that it does not exceed a pressure that will subject the casing to a hoop stress greater than 70% of the casing's minimum yield strength.

Rule 5 Reporting the Tubing-Casing Annulus Pressure Variations

Tubing-casing annulus pressure variations between consecutive observations need not be reported to the Commission unless well integrity failure is indicated as in Rule 7 below.

Rule 6 Demonstration of Tubing-Casing Annulus Mechanical Integrity

A schedule must be developed and coordinated with the Commission that ensures that the tubing-casing annulus for each injection well is pressure tested prior to initiating injection and at least once every four years thereafter. For slurry injection wells, the tubing/casing annulus must be tested every two years for mechanical integrity. A test surface pressure of 1500 psi or 0.25 psi/ft. multiplied by the vertical depth of the packer, whichever is greater, will be used. The test pressure must show a stabilizing trend and must not decline more than 10% in a thirty-minute period. The Commission must be notified at least twenty-four (24) hours in advance to enable a representative to witness pressure tests.

Rule 7 Well Integrity Failure

Whenever operating pressure observations, injection rates, or pressure tests indicate pressure communication or leakage of any casing, tubing or packer, the operator must notify the Commission on the first working day following the observation, obtain Commission approval of a plan for corrective action, and obtain Commission approval to continue injection.

Rule 8 Plugging and Abandonment of Injection Wells

An injection well located within the affected area must not be plugged or abandoned unless approved by the Commission in accordance with 20 AAC 25.105.

Rule 9 Surveillance

For slurry injection wells, a baseline temperature survey from surface to total depth, initial step rate test to pressure equal or exceeding maximum injection pressure and pressure falloff are required prior to sustained disposal injection. Regular fill depth tags are required at least once annually or as warranted following consultation with the Commission. Operating parameters including disposal rate, pressure, annuli pressures and volume of slurry pumped must be monitored and reported according to the requirements of 20 AAC 25.432.

For slurry injection wells, an annual performance report will be required including rate and pressure performance, surveillance logging, fill depth, survey results, and volumetric analysis of the disposal storage volume, estimate of fracture growth, if any, and updates of operational plans. Report submission must be on or before April 1, in conjunction with the Alpine Pool Annual Reservoir Report.

Rule 10 Notification

The operator must notify the Commission if it learns of any improper Class II injection. Additionally, notification requirements of any other State or Federal agency remain the operators' responsibility.

Rule 11 Administrative Action

Upon request, the Commission may administratively amend any rule stated above as long as the operator demonstrates to the Commission's satisfaction that sound engineering practices are maintained and the amendment will not result in an increased risk of fluid movement into a USDW.

DONE at Anchorage, Alaska and dated April 18, 2000.

Robert N. Christenson, P.E., Chair
Alaska Oil and Gas Conservation Commission

Camillé Oechsli Taylor, Commissioner
Alaska Oil and Gas Conservation Commission

Daniel T. Seamount Jr., Commissioner
Alaska Oil and Gas Conservation Commission

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).