

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

Re: APPLICATION OF BP) Conservation Order 329B
EXPLORATION (ALASKA) INC. to)
allow pilot commingling of the Niakuk) Prudhoe Bay Field
Oil Pool and Sag River Undefined Oil) Niakuk Oil Pool
Pool, Prudhoe Bay Field, North Slope,) Sag River Formation - Undefined Oil
Alaska) Pool
)
) November 9, 2005

IT APPEARING THAT:

1. By letter and application dated September 1, 2005, BP Exploration (Alaska) Inc. (“BPXA”) in its capacity as Niakuk Operator and Unit Operator of the Prudhoe Bay Unit (“PBU”) requested the Alaska Oil and gas Conservation Commission (“Commission”) to issue an order in conformance with 20 AAC 25.215(b) allowing commingling of production from the Niakuk Oil Pool (“NOP”) and Sag River Formation (undefined oil pool) (“SAG”) within Well NK-43.
2. The Commission published notice of opportunity for public hearing in the Anchorage Daily News on September 15, 2005 concerning BPXA’s application.
3. On October 17, 2005, BPXA submitted additional data and information supporting its application.
4. The Commission received no protests to BPXA’s application or requests for public hearing.
5. The Commission has sufficient information to proceed with a ruling on the application and a hearing is not required.

FINDINGS:

1. Request:

BPXA proposes to initiate a 180-day pilot project to commingle production from the SAG and the Kuparuk River Formation of the NOP in NK-43 wellbore. The bottomhole location of the well is in Section 29, T12N-R16E, Umiat Meridian. The Kuparuk interval in the well is from 13,113 to 13,258 feet measured depth (“md”) and the Sag interval is from 13,653 to 13,742 feet md.

2. Commission Authority:

Per 20 AAC 25.215 (b) “Commingling of production within the same wellbore from two or more pools is not permitted unless, after request, notice, and opportunity for public hearing in conformance with 20 AAC 25.540, the Commission (1) finds that waste will not occur, and that production from separate pools can be properly allocated; and (2) issues an order providing for commingling for wells completed from these pools within the field.”

3. Objectives:

The test will provide information that will be used in evaluation of further development of the Sag, including the feasibility of enhanced recovery projects. Production and geochemical data will be gathered to determine a reliable and acceptable production allocation methodology.

4. Well Performance:

Well NK-43 produced within the Sag from March to April 2001. Total production was 35.8 MSTB and average rate was about 500 BOPD and 8.1 MSCFGPD. A mechanical plug was placed above the Sag and the well was perforated in the NOP in May 2001. The well currently produces approximately 206 BOPD, 656 BWPD, and 514 MSCFGPD.

5. Benefits:

Additional longer term testing of the Sag is needed in this area of the reservoir for further evaluation of development options. A new well to the Sag would be a high-cost and high-risk option. A retest of the Sag in NK-43 requires commingling with the NOP, unless the current NOP perforations are shut-off. Abandonment of the NOP interval is not an acceptable option as this would result in a loss of existing developed reserves.

Production logs will be used to monitor whether crossflow occurs downhole between the NOP and Sag. Dynamic crossflow is not anticipated to be a problem as flowing bottomhole pressure will be significantly below reservoir pressure for each pool. Static crossflow may occur but is expected to be minimal because reservoir pressures are relatively close to one another. Even if crossflow does occur, loss of reserves is not anticipated. Rather, the commingling will provide synergistic benefits, which could increase rate and reserves from both the Sag and NOP. The higher GOR production of the Sag can provide lift to the NOP production. Also, the hotter NOP production will help heat the Sag production, lowering potential for hydrates.

Six months of pilot test production of the Sag without secondary recovery should not cause significant loss of reserves as the production will be small – roughly 40-90 MSTB and 560-1300 MMscf. The information gained from the pilot test will outweigh any reserves impact from lack of pressure support.

6. Sag River Reservoir Properties, Hydrocarbon Volumes:

The following summarizes reservoir properties of the Sag River.

Porosity	20%
N:G	55%
Sw	40%
Boi	1.96 rb/stb
Rsi	1600 scf/stb
Bgi	0.62 rb/Mscf
Oil Gravity	32 API
Condensate Gravity	49 API
Condensate Yield	65 bbl/MMSCF

Initial Reservoir Pressure 3915 psi

Original Oil in Place 6,426 MSTB (1,765 MSTB condensate)
Original Gas in Place 34,200 MMSCF (27,200 MMSCF free gas)

7. Allocation of Production:

The primary method for estimating NOP/Sag oil production splits will be geochemical analysis. In August 2005, BPXA contracted OilTracers LLC to test three different samples of NK-43 NOP and Sag oil mixtures for determining production splits. The geochemical fingerprints of the two oils are very different allowing identification of the source of the oil and determination of production splits. OilTracers LLC was not told the actual recombination ratios of the oils prior to their evaluation. The estimate of production ratios was highly accurate using the geochemical analysis (within +/- 1.5 to 2.5% error).

BPXA proposes to perform geochemical sampling and analysis once per month. BPXA also proposes to run one production log early in the pilot testing to determine if significant dynamic and/or static crossflows occur downhole between the Sag and the NOP.

Evaluation of the allocation technique is a major objective of this test, and the Commission must be assured of proper allocation. The use of chemical tracers for determination of production from separate pools commingled within a single wellbore has never before been applied for Alaska state production reporting purposes. However, the technique has been used for years for reservoir management and to estimate flow splits from different sand intervals within the Shrader Reservoir at Milne Point and the Kuparuk and Prudhoe Bay units.

The Commission has previously approved production commingling in some Cook Inlet fields (e.g. McArthur River Field) using well tests and production logs to allocate production. The use of the geochemical fingerprinting technique in combination with production logs and well tests will allow for proper oil allocation so long as frequent production measurements are obtained.

Accuracy of allocation is largely dependent upon the frequency of the production measurements. The Commission believes geochemical sampling, production logging and well testing should be conducted more frequently than proposed by BPXA to meet the objectives of the test and to satisfy the requirements of 20 AAC 25.215 (b)(1). An appropriate frequency for well testing is weekly during the first 2 months of production and at least twice per month thereafter. The well tests must be of sufficient duration and have sufficient stabilization periods to ensure representative tests. Oil samples should be collected and geochemical analysis should be performed on these samples at the time of each well test to ensure accurate allocation of oil production. In order to determine if crossflow is a problem and to allocate water and gas production, at least three production logs should be obtained over the six month test period.

The working interest owners of the Prudhoe Bay Unit have integrated their interests through unitization. The royalty owner is the State of Alaska and royalty rate is uniform for the pools. Hence, there are no correlative rights issues associated with the proposed production allocation.

CONCLUSIONS:

1. The proposed commingling of Sag and NOP production will provide valuable information for future development decisions for the Sag.
2. Correlative rights will not be negatively impacted by the proposed 6-month pilot test.
3. The use of geochemical fingerprinting in combination with production logs and frequent well tests will allow for proper oil allocation so long as frequent production measurements are obtained as prescribed in this order.
4. No waste will occur as a result of this test.

NOW, THEREFORE, IT IS ORDERED:

Conservation Order 329A is temporarily amended as follows:

1. Within the NK-43 wellbore, production from the Niakuk Oil Pool may be commingled with the Sag River Undefined Oil Pool
2. Lisburne Production Center allocation factors for oil, gas, and water must be used to allocate production to NK-43 in accordance with Rule 6 of CO 329.
3. During the first 2 months of production, well tests must be conducted weekly. During the remaining test period well tests must be conducted at least two times per month. The well tests must be of sufficient duration and have sufficient stabilization periods to ensure representative tests.
4. NK-43 well test production will be allocated between the Sag River Undefined Oil Pool and the Niakuk Oil Pool using the following information:
 - a. During every well test, an oil sample must be taken from NK-43. Geochemical analysis must be performed on these samples to determine oil production splits of Sag River Undefined Oil Pool and Niakuk Oil Pool production.

- b. A minimum of three production logs must be run in NK-43 and evaluated over the six month interval of the pilot test to determine splits of Sag River and Niakuk Oil Pool water and gas production.
5. Bottomhole shut-in reservoir pressure must be measured at the beginning and end of the pilot testing period.
6. The operator shall submit a monthly report and file(s) containing daily allocation data, daily test data, results of geochemical analysis and results of production logs used for purposes of allocation. Volumes reported on Form 10-405 in accordance with 20 AAC 25.230 (b) must break out Sag River Undefined Oil Pool and Niakuk Oil Pool allocated production within NK-43.
7. Within two months of the end of the pilot test period, the Operator shall provide a written report of the results of the test to the Commission.
8. Unless notice and public hearing are otherwise required, the Commission may administratively waive the requirements of any rule stated above or administratively amend any rule as long as the change does not promote waste or jeopardize correlative rights, is based on sound engineering and geoscience principles, and will not result in an increased risk of fluid movement into freshwater.
9. This Order shall expire on July 1, 2006.

DONE at Anchorage, Alaska and dated November 9, 2005.

John K. Norman
Chairman

Daniel T. Seamount, Jr.
Commissioner

Cathy P. Foerster
Commissioner

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).