



THE STATE
of **ALASKA**
GOVERNOR BILL WALKER

Department of Natural Resources

Division of Oil & Gas
Anchorage Office

550 W. 7th Avenue, Suite 1100
Anchorage, Alaska 99501-3560
Main: 907.269.8800
Fax: 907.269.8939

August 16, 2016

**CERTIFIED MAIL
RETURN RECEIPT REQUESTED**

Scott Digert
Manager of Reservoir Management
Alaska Resource
BP Exploration (Alaska) Inc.
PO Box 196612
Anchorage, AK 99519-6612

Re: Prudhoe Bay Unit, Greater Point McIntyre Area 2016 Plan of Development - Approval

Dear Mr. Digert:

On June 30, 2016, the Department of Natural Resources (DNR), Division of Oil and Gas (Division) timely received the proposed Prudhoe Bay Unit (PBU) – Greater Point McIntyre Areas (GPMA) 2016 Plan of Development (POD). The Division notified BP Exploration (Alaska) Inc. (BPXA) by email on July 11, 2016 that the Division had deemed the POD application complete. The Division met with BPXA and the other PBU working interest owners on June 24, 2016, for a presentation of the PBU GPMA annual agency review.

The GPMA consists of six participating areas (PA): Combined Niakuk, Lisburne, North Prudhoe Bay, Point McIntyre, Raven, and West Beach PAs. Initial production in the GPMA began with the Lisburne PA on December 15, 1986, which produces currently from the Wahoo and Alapah Formations. The Combined Niakuk, West Beach, North Prudhoe Bay, and Point McIntyre PAs all began sustained production between 1993 and 1994 with the North Prudhoe Bay and West Beach PAs having production shut-in since 2000 and 2001, respectively. The Point McIntyre PA (PMPA) and the Combined Niakuk PA continue to produce from the Cretaceous Kuparuk River Formation. The most recently formed PA in the GPMA, the Raven PA, produces from the Ivishak and Sag River formations and commenced sustained production in October 2005. Cumulatively, the PAs in the GPMA have produced approximately 763 million barrels of hydrocarbon liquids.

BPXA has been working to flatten production decline in the GPMA since production peaked at over 200,000 barrels of oil per day (BOPD) in 1996 and 1997. The current decline stemming strategies in the GPMA have involved wellwork and sidetrack drilling, improving enhanced oil recovery techniques, voidage replacement, and the Lisburne PA's gas cap water injection and peripheral water injection pilots. From April 1, 2015 – March 31, 2016, the GPMA average daily oil production rate was ~22,450 BOPD – an increase of approximately 500 barrels per day from the same period the previous year.

Summary of Past POD Period Development Work

The investment in the North Prudhoe 3D offshore seismic program in 2014 and the onshore program in early 2015 will direct potential new drilling and pilot projects for future GPMA PODs. The seismic program covers most of the acreage in the GPMA. It will provide refinement of the subsurface structural interpretation and should lead to new drill and sidetrack opportunities to access new and bypassed oil accumulations. The survey was completed during the beginning of the 2015 POD period and processing and interpretation work is anticipated to take up to two years, although preliminary processed data is currently being used. During the 2015 POD period, BPXA also conducted two rig workovers and more than 70 rate-adding jobs throughout the GPMA.

The Lisburne PA average daily production rate increased approximately 1,000 BOPD during the 2015-16 reporting period. A drilling program was initiated during the 2014 POD period in the Lisburne PA with three new drill wells. During the 2015 POD period, BPXA performed 31 rate adding non-rig interventions in 26 wells in the Lisburne PA. The 2015 POD activities in the Lisburne PA also consisted of continued surveillance of the seawater injection pilots and offset producer behavior. Historically, Lisburne production has outpaced gas re-injection in the gas cap and waterflood in the peripheral areas of the field. Low reservoir pressure and poor waterflood breakthrough to offset producers resulted in numerous shut-in producers which continues to persist. In order to mitigate low pressure areas, water injection pilot programs were initiated. In 2008, the Gas Cap Water Injection (GCWI) pilot well (L5-29) started injecting seawater into the gas cap for pressure maintenance.

BPXA also continues to monitor three water injection wells testing waterflood and pressure support behavior in peripheral areas of the field not supported by the gas cap. The southern periphery Wahoo injector (04-350) has water breakthrough in the offset producers (L3-22) after ~3.5 million barrels of water (mmbw) injection. The L5-13 and L5-15 wells were converted to seawater injection in March 2013 to aid in understanding waterflood response and for pressure maintenance in the midfield Wahoo Formation. The results could ultimately lead to justification of a larger-scale waterflood development. Recently, in March 2013, the NK-25 producer was converted and commenced water injection in the Alapah Formation. Monitoring over the past year shows pressure response in offset producer NK-26 with water breakthrough after 4.2 mmbw have been injected. Injection is suspended here, but will continue once a workover is performed on offset producer NK-26. The L5 pad injectors and NK-25 were shut-in periodically during the 2015 POD period due to seawater supply line problems.

Average daily oil production in PMPA continued to decline with a decrease of nearly 1,000 BOPD year-to-year for the 2015-2016 reporting period. Active non-rig wellwork and scale inhibition programs continued in the PA during the last POD period. An important injector was brought back online (P1-14) with a successful rig workover (RWO) to repair a casing leak. MI will continue to be integral to the reservoir management plan. Ten patterns have received cycles of MI, and BPXA is assessing conversion to water or MI injection in three other PMPA wells based on limited MI supply. The 36-inch pipeline (STP-36) used for transporting production from the PM2 pad to Gathering Center 1 (GC1) was smart pigged in August 2014. A jumper was evaluated to avoid a 2-mile stretch of pipe; however, employing the jumper will require all the PM2 production to flow to GC1 rather than the previous split between Lisburne Processing

Center (LPC) and GC1. The pipeline was taken out of service in November 2011 and production is currently routed to the LPC. Returning the pipeline to service is crucial because routing PM2 production only to the LPC results in lower production levels from the PMPA due to pressure and gas handling limitations at the LPC.

Together, the Combined Niakuk PA and Raven PA have continued with their non-rig wellwork projects which slightly increased average daily oil production rates from the PAs during the last reporting period. At Combined Niakuk PA, BPXA plans to bring the NK-07A well back online after installation of a gas lift choke. An extended coil campaign for milling scale was performed on NK-08A, NK-09, NK-29, and L5-34. The NK-20A well will also be milled after a successful packer squeeze in 2015. At the Raven PA, rig and non-rig work continue to be under consideration on all three PA wells with surveillance and integrity screening activities possibly occurring in 2016.

The North Prudhoe Bay and West Beach PAs continue to be shut-in. The North Prudhoe Bay PA last underwent production testing in 2005 when it was determined that safety and environmental considerations prevented sustained production from the NPB ST 1(WB-03) well. The West Beach PA was last production tested in 2009 when the WB-04 and WB-05B flowed between 250-350 BOPD before production testing ceased and the wells were shut-in. The West Beach production pipelines are still awaiting internal pipeline integrity inspections. Production at the West Beach PA will not be restarted until the inspections are completed.

Development Work Proposed for 2016 POD

The Lisburne development program continues with two new wells planned (L1-13 and L5-12A) during the 2016 POD period. BPXA will continue to evaluate the three wells drilled during 2014-15 and explore the viability of additional drilling targets. Development work in the Lisburne PA will continue to focus on monitoring and interpreting the impacts of the waterflood pilots in the peripheral and mid-field Wahoo Formation and the Alapah Formation in the northeast corner of the PA. The L5 GCWI pilot project well (L5-29) requires AOGCC approval for extended gas cap water injection. BPXA is planning to submit that request this POD period. Evaluations for pressure response and water breakthrough at nearby producer wells will continue for the 04-350, L5-13, and L5-15. BPXA confirms pressure response and breakthrough at NK-26 from paired injector NK-25; however, NK-26 will require a rig workover before returning to service. The L4 pad export line has been shut-in since 2014 which shuts in 11 wells at the L4 pad. BPXA is evaluating line repair options and opportunities as a future project.

In the PMPA, the active non-rig wellwork and scale inhibitor programs will continue during the 2016 POD period. The management of MI will continue during the 2016 POD as MI is an integral part of Point McIntyre reservoir management. Critical to MI management is continuing maintenance of reservoir pressure above miscibility requirements and assessments of well conversions based on MI supply. Work to restart the 36-inch production pipeline (STP-36) between PM2 and GC1 is ongoing with a projected restart for Fall 2016. A jumper will be used to move PM2 pad production to STP-36 at the West Dock Staging Pad and on to GC-1. The production line will be brought back online gradually and a permanent pigging facility will be installed to regularly maintain the line. The production line has been out-of-service since November 2011, significantly reducing PMPA production and constraining the Lisburne

Processing Center's gas handling capabilities. No other major development work was proposed for PMPA in the 2016 POD.

Seismic processing from the North Prudhoe 3D seismic program and well evaluations have been initiated and will continue through the 2016 POD period. BPXA expects the new data to improve structure mapping and understanding of subsurface areas of interest for technical evaluation of drilling options for all the eastern PBU PAs. The West Beach PA has been shut-in since 2009 due to complications with the production line from the WB-04 and WB-05B wells. BPXA has ordered equipment for a "smart pig" run to assess the integrity of the 12" production line and 6" test line in preparation for possible restart of production at the WBPA. No projects or well work is planned in 2016-17 for the North Prudhoe Bay PA which remains shut-in. Similarly, there are no plans for new wells or projects at the Raven and Combined Niakuk PAs during the 2016 POD period.

In a letter dated January 14, 2016, DNR Commissioner Mark Myers requested information concerning marketing of unit production and facility access and sharing to be addressed in the POD. By letter dated March 31, 2016, BPXA responded that as PBU Operator, BPXA is not involved in marketing of hydrocarbons from the PBU. All oil production from the PAs in the GPMA is delivered via in-field flowlines to Pump Station 1 on the TransAlaska Pipeline System and each PBU owner markets its own share of hydrocarbons. Gas is not available to market in the GPMA because most of the gas produced from the GPMA is used to reinject for enhanced oil recovery projects at the PMPA and Lisburne PA with the remainder consumed as fuel to run the field. Heavy and viscous oil resources are not present in the GPMA.

The PBU owners also provided an extensive list of facility and infrastructure sharing agreements for road and dock use, equipment and services, and associated processing facilities. The unit operator and working interest owners have procedures to address access and use of unit and non-unit facilities located in the area of the PBU by third parties. Third parties desiring facility access sign a use agreement.

Consideration of 11 AAC 83.303 Provisions

When considering a POD, the Division must consider the criteria in 11 AAC 83.303(a) and (b). Accordingly, the Division considered the public interest, conservation of natural resources, prevention of economic and physical waste, protection of all interested parties including the state, environmental costs and benefits, geological and engineering characteristics of the reservoirs or potential hydrocarbon accumulations, prior exploration activities, plans for exploration or development, economic costs and benefits to the state, and any other relevant factors, including mitigation measures. 11 AAC 83.303(a)-(b).

In approving prior PODs for the PBU GPMA, the Division considered 11 AAC 83.303 and found the POD(s) promoted conservation of natural resources, promoted prevention of waste, and protected the parties' interests. The Division incorporates by reference those findings.

Processing and interpretation of the North Prudhoe 3D seismic survey has started and BPXA is expecting the survey data will be used to identify drilling opportunities throughout the GPMA. The survey data may assist with infill and peripheral drilling locations in the Combined Niakuk,

Point McIntyre, and Raven PAs. BPXA will also use the data to make decisions on reactivating the shut-in West Beach and North Prudhoe Bay PAs. The seismic program was a substantial investment to further assess state resources and, eventually, maximize the recovery from mature reservoirs. Production from the GPMA has stabilized with a slight increase in year-over-year average daily production during the 2015 POD period. The Lisburne development program will continue in 2016 with two new drill wells (L1-13 and L5-12A) and continuation of the water injection pilots. The state has an interest in BPXA solving the complexities of the Lisburne reservoir to increase recovery and extend the life of the field. Finally, BPXA has started to progress efforts to repair pipelines in the GPMA. The STP-36 production line is planned to be back online in 2016. This action should increase oil production in the PMPA and revenues to the State. Planned development activities have increased for the 2016 POD period with the expectation that the findings from the new 3D seismic survey will accelerate development further in the future.

Decision

Having considered the 11 AAC 83.303 (a) and (b) criteria, the Division finds that the 2016 POD complies with the provisions of 11 AAC 83.303. Accordingly, the 2016 POD is approved for the period October 1, 2016 through September 30, 2017.

This approval is only for a general plan of development. Specific field operations will require an approved Plan of Operations. Under 11 AAC 83.343, the 2017 POD is due on July 2, 2017, ninety (90) days before the 2016 POD expires.

An eligible person affected by this decision may appeal it, in accordance with 11 AAC 02. Any appeal must be received within 20 calendar days after the date of "issuance" of this decision, as defined in 11 AAC 02.040(c) and (d), and may be mailed or delivered to Andrew Mack, Acting Commissioner, Department of Natural Resources, 550 W. 7th Avenue, Suite 1400, Anchorage, Alaska 99501; faxed to 1-907-269-8918; or sent by electronic mail to dnr.appeals@alaska.gov. This decision takes effect immediately. An eligible person must first appeal this decision in accordance with 11 AAC 02 before appealing this decision to Superior Court. A copy of 11 AAC 02 may be obtained from any regional information office of the Department of Natural Resources.

If you have questions regarding this decision, please contact Kyle Smith with the Division at 269-8807, or via email at kyle.smith@alaska.gov.

Sincerely,



Corri A. Feige
Director

cc: DOL