

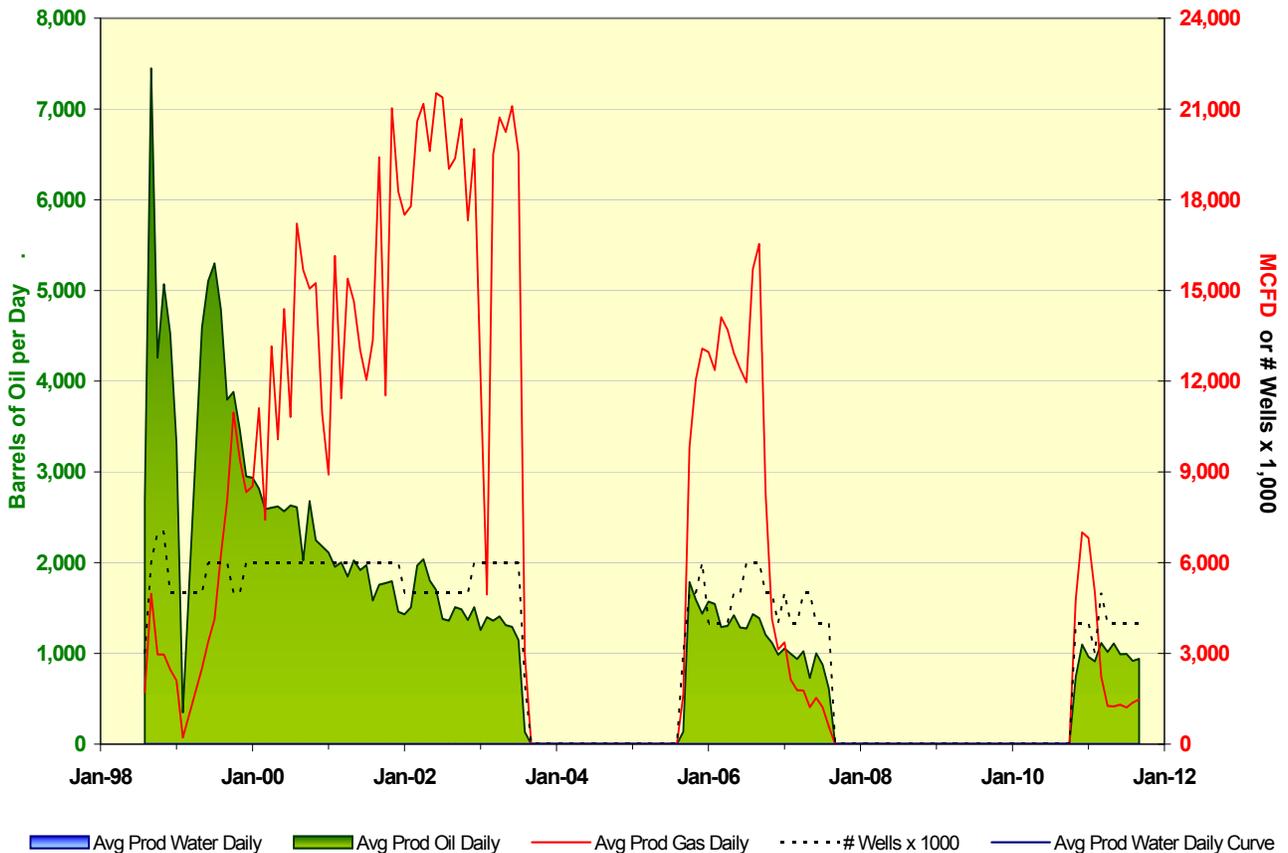
# Badami Oil Pool

## Summary

The Badami Oil Pool was discovered in 1990, and developed through a drilling program lasting from 1997 to 1998.<sup>1</sup> The pool has now been penetrated by 19 well bores, most of which are clustered near the center of the Badami Unit. There are 8 additional wells that lie inside of, or within 4 miles of, the unit boundaries.

The pool began regular production on August 23, 1998,<sup>2</sup> and peaked at average rate of 7,450 barrels of oil per day (BOPD) during September 1998.<sup>3</sup> However, production rapidly declined to 3,300 BOPD by January 1999, and the field was shut in from February 4<sup>4</sup> through April 30, 1999. After facilities were upgraded and remediated, production was restarted on May 1, 1999,<sup>5</sup> and jumped to an average of nearly 5,300 BOPD during July of 1999. However, by year-end 1999, it declined to an average of less than 3,000 BOPD, and by July 2003 field production averaged less than 1,300 BOPD from six wells.<sup>6</sup> In August 2003, the Regulatory Commission of Alaska approved BP's request to temporarily shut down the Badami oil pipeline and gas products pipeline for approximately two years.<sup>7</sup> BP shut-in production and placed the facilities in "warm shutdown" that same month.<sup>8</sup>

### Average Daily Production Rates



Regular production from the Badami Pool resumed in September 2005. In October of that year, the pool averaged 1,785 BOPD from five producing wells, but by December average oil production declined to 1,437 BOPD from six producing wells. By July 2007, average oil production declined to 876 BOPD from four producing wells. BP shut the field in to recharge during late August 2007.<sup>9,10</sup> BP joined with Savant Alaska, a subsidiary of Savant Resources LLC, in April 2008 to conduct engineering, permitting and inspection operations with the intent of restarting Badami.<sup>11</sup> Late in 2008, Arctic Slope Regional Corporation joined with BP and Savant to revitalize production from the pool by drilling horizontal wells and hydraulically fracturing them.<sup>12</sup> The pool was returned to regular production in November 2010, and for the first six months of 2011 the pool averaged 1,020 BOPD with no water cut.<sup>13</sup>

## Geology

The Badami reservoir consists of a series of turbidite sandstones assigned to the Tertiary-aged Canning Formation. These sandstones were deposited as amalgamated channel sands<sup>14</sup> within mud-dominated submarine fan systems.<sup>15</sup> Published descriptions suggest the reservoirs are complex, comprising 61 identified fans laid down during seven depositional events, with thin<sup>16</sup> and discontinuous<sup>17</sup> reservoir quality sands. No well has encountered all of the identified fan systems. The Badami #1 reportedly has the most complete section.<sup>18</sup> The Badami Oil Pool is defined as the accumulation of hydrocarbons common to and correlating with the interval between the measured depths of 9,500 feet and 11,500 feet in the Badami No. 1 well.<sup>19</sup> The reservoir sandstone is very fine-to-fine grained and moderately sorted.<sup>20</sup> Porosity ranges from 15 to 21 percent, permeability ranges from 1 to 400 md,<sup>21</sup> and oil gravity ranges from 19 to 29 degrees API<sup>22</sup> (21 to 30 degrees according to operator supplied reservoir statistics<sup>23</sup>).

SFD

Revised 10/21/2011

---

<sup>1</sup> Bredar, W., 1997, Testimony before the Alaska Oil and Gas Conservation Commission in support of the Application of BP Exploration (Alaska) Inc. to Define the Badami Oil Pool and Establish Well Spacing for Development, July 16, 1997, Conservation Order 402 File, p. 9

<sup>2</sup> Repp, S.A., 1999, Badami Development, 1999, SPE Paper 54604, SPE Western Regional Meeting, Anchorage, Alaska, 26-28 May 1999

<sup>3</sup> Alaska Oil and Gas Conservation Commission, 2004, Production Database

<sup>4</sup> Nelson, K., 1999, BP suspends Badami production, Petroleum News, Vol. 4, No. 2, February 28, 1999

<sup>5</sup> Nelson, K., 1999, Aggressive work aimed at making Badami productive, Petroleum News, Vol. 4, No. 6

<sup>6</sup> Alaska Oil and Gas Conservation Commission, 2004, Production Database

<sup>7</sup> Petroleum News, 2003, Badami pipeline shutdown approved, Petroleum News, Vol. 8, No. 32, August 10, 2003

<sup>8</sup> Cashman, K., 2003, BP to Mothball Badami, Petroleum News, Vol. 8, No. 25, June 22, 2003

<sup>9</sup> Alaska Oil and Gas Conservation Commission, 2009, Production Database

<sup>10</sup> Nelson, K., 2007, BP to Shutdown Badami for Recharge, Petroleum News, Vol. 12, No. 34, August 26, 2007

<sup>11</sup> Lidji, E. and Cashman, K., 2008, BP and Savant Looking at Badami Restart, Petroleum News, V. 13, No. 28, July 13, 2008

<sup>12</sup> Lidji, E., 2008, The Explorers 2008: Savant and ASRC Taking on Badami; Petroleum News, V. 13, No. 47, November 23, 2008, Lidji, E., 2008, The Explorers 2008: Savant and ASRC Taking on Badami; Petroleum News, V. 13, No. 47, November 23, 2008

<sup>13</sup> Alaska Oil and Gas Conservation Commission, 2011, Production Database

<sup>14</sup> Nelson, K., 1999, BP's Badami production at half expected rate, Petroleum News, Vol. 3, No. 10, October 28, 1998

<sup>15</sup> Bredar, W., 1997, cited above, p. 8 - 9

<sup>16</sup> Nelson, K., 1999, Aggressive work aimed at making Badami productive, Petroleum News, Vol. 4, No. 6

<sup>17</sup> Alaska Oil and Gas Conservation Commission, 1997, Conservation Order No. 402, Badami Oil Field, Badami Oil Pool

<sup>18</sup> Bredar, W., 1997, cited above, p. 31

<sup>19</sup> Alaska Oil and Gas Conservation Commission, 1997, Conservation Order No. 402, cited above

<sup>20</sup> EXLOG, 1990, Mud Log Sample Descriptions, Badami No. 1 Well; Alaska Oil and Gas Conservation Commission Well File No. 189-117

<sup>21</sup> BP, 2003, Reservoir Properties supplied by Operator for Alaska Oil and Gas Conservation Commission 2003 Annual Report

<sup>22</sup> Nelson, K., 1999, BP's Badami production at half expected rate, Petroleum News, Vol. 3, No. 10, October 28, 1998

<sup>23</sup> BP, 2003, Reservoir Properties supplied by Operator for Alaska Oil and Gas Conservation Commission 2003 Annual Report