

State of Alaska
Department of Revenue

Commissioner Bryan Butcher



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The Honorable Bill Thomas, Jr
Alaska State Representative
State Capitol Room 505
Juneau AK, 99801

March 15, 2011

The Honorable Bill Stoltze
Alaska State Representative
State Capitol Room 515
Juneau AK, 99801

SUBJECT: Response to Questions from House Finance Meeting on February 18, 2011

Dear Representatives Thomas and Stoltze:

The purpose of this document is in response to the follow-up questions from the House Finance Committee meeting on February 18, 2011. The requests/questions and responses follow.

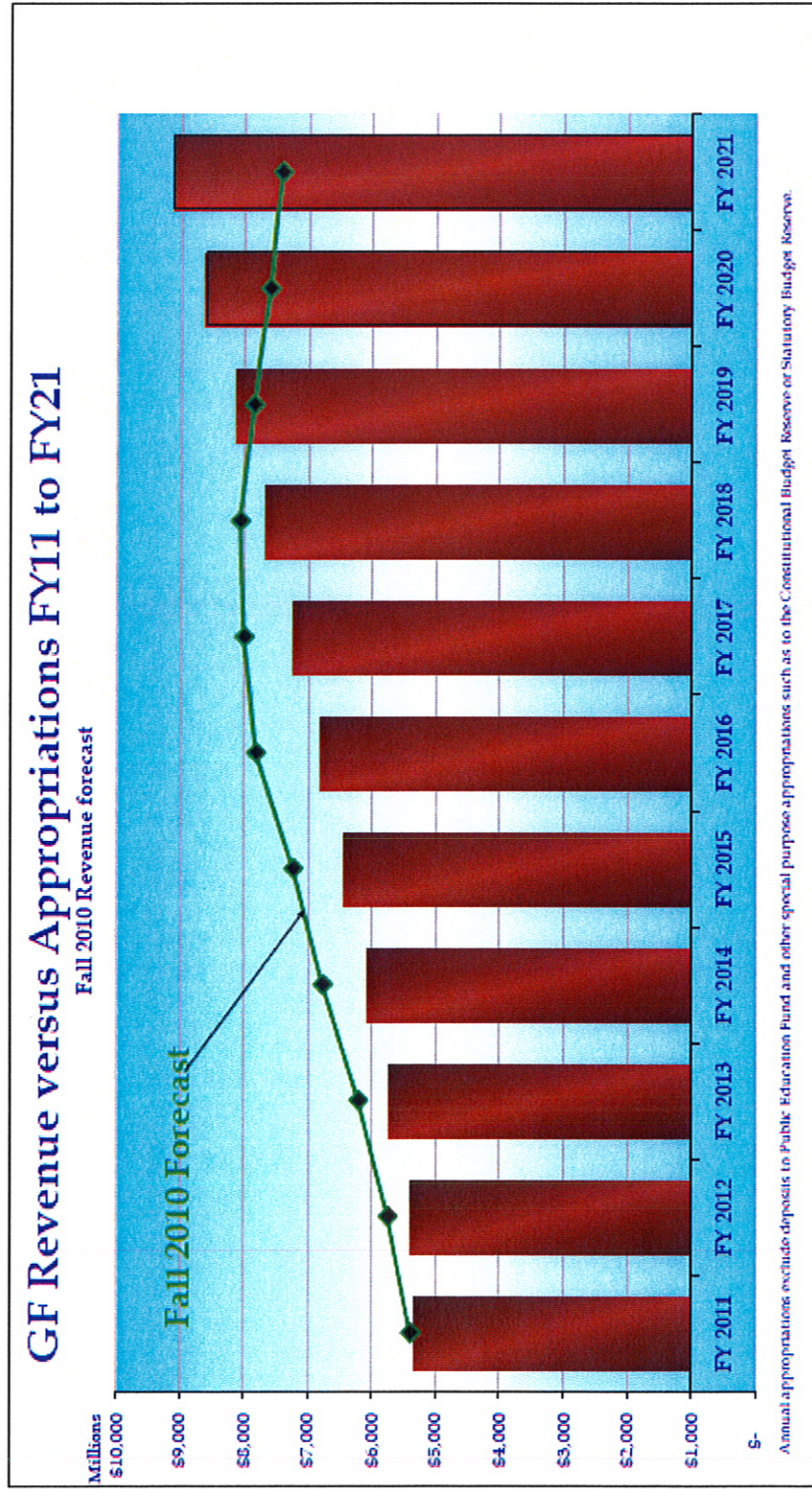
(1) Provide a picture of the 10-year outlook slide that uses a higher budget growth projection.

The 10-year outlook slide presented was taken directly from the FY 2012 10-year plan prepared by the Office of Management and Budget. The slide was intended to represent just one of many possibilities, based on the Fall 2010 revenue forecast. Expenditures in future years could be higher or lower than the 3% budget growth assumption presented. The 10-year plan included other scenarios based on higher and lower budget growth assumptions. The table on the following page, for example, compares revenue and expenditures using the Fall 2010 revenue forecast, and a 6% annual expenditure growth assumption. This table was taken from page 14 of the Executive Summary of the FY 2012 10-year plan.

The complete FY 2012 10-year plan can be found at the following website:
<http://omb.alaska.gov/html/information/10-year-plan/fy12-10-year-plan-current.html>. Any questions on the 10-year plan should be directed to the Office of Management and Budget

Note: The projections in the FY2012 plan are intended to be used as a planning tool. They do not represent a commitment by the Administration to propose spending nor bring in revenue at a particular level in FY2011, FY2012, or any future year.

Scenario 3: FY2012 Governor's Budget with 6% Annual Expenditure Growth



Appropriations projections in the plan do not represent a commitment by the Administration to propose spending or generate revenue at a particular level in FY2011, FY2012 or any future year. The 10 year forecast shows that unanticipated budget shortfalls during the 10-year period could be filled primarily through the use of reserve funds; however, other fiscal tools including spending reductions would likely be used in addition to, or in lieu of, reserve funds.

The plan will be revisited as conditions warrant.

(2) Provide information about the amount of storage capacity on the North Slope, and how much production was put into storage in the January shutdown, compared to production that was lost during the shutdown

Crude oil holding capacity at Pump Station 1 on the Trans-Alaska Pipeline System (TAPS) is listed as 420,000 barrels on page 36 of the Trans Alaska Pipeline System FACTS book, which can be found online.¹

During the January 2011 TAPS shutdowns 447,885 barrels of crude oil were put into storage tanks at Pump Station 1.

During the January TAPS shutdown the Department of Revenue provided a rough estimate of the revenue impact to the State from the actual reduced production level when compared to expected production levels for the period of the shutdown. The department estimated the TAPS shutdown reduced state revenues by approximately \$18 million per day in royalty and taxes.

(3) Provide a year-by-year production decline rate, and address where the oft-quoted “6% decline rate” might come from.

While it would be difficult to definitively identify the source of the “oft-quoted 6% decline rate,” mention of a 6% decline rate in North Slope production is attributed to Angus Walker of BP in the March 19, 2006 Petroleum News. This appears to be one of the first sources to refer to a 6% decline rate.

The North Slope is on a 6 percent decline rate with the existing tax system. The new tax system “is a huge additional tax burden on major producers on the North Slope,” Walker said, and BP is concerned that it may move production to a steeper decline than 6 percent. The goal should be to find a solution that gets us to 3 percent, he said, and that would require lower taxes, not higher taxes.

The change in production from year to year can be seen in the table below, including both increases and decreases in production over the years.

% Change	Year
51.7%	1979
21.8%	1980
4.0%	1981
4.0%	1982
3.6%	1983
1.6%	1984
3.5%	1985
5.2%	1986
3.7%	1987

¹ http://www.akresource.org/curriculum_cd/energy/energyresources/alyeska.pdf

7.6%	1988
-2.9%	1989
-6.5%	1990
-1.1%	1991
-1.5%	1992
-6.3%	1993
-4.1%	1994
-1.9%	1995
-6.5%	1996
-5.2%	1997
-9.1%	1998
-9.1%	1999
-10.2%	2000
-3.9%	2001
1.7%	2002
-1.9%	2003
-1.7%	2004
-6.5%	2005
-7.9%	2006
-12.6%	2007
-2.4%	2008
-3.3%	2009
-7.1%	2010

(4) Provide analysis of our past production forecast accuracy. Based on the 5 factors affecting production forecasts, where have past forecast errors come from?

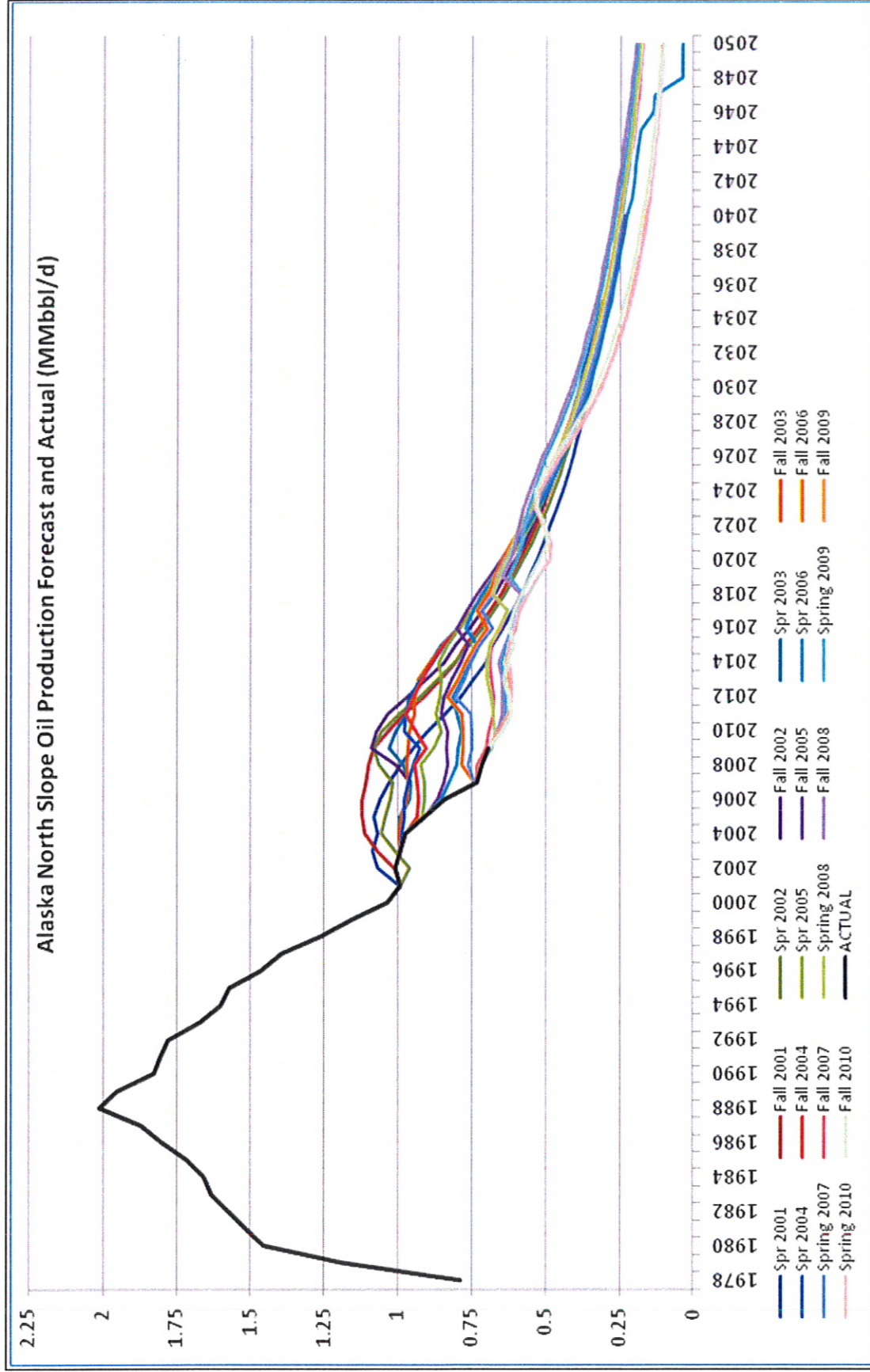
A chart showing Department of Revenue production forecasts from spring 2001 through fall 2010 and actual production can be found on the following page.

The majority of revenue comes from oil production. The department's revenue forecast is driven primarily by two inputs: oil production and oil price. The following discussion briefly discusses the department's history in forecasting these two variables.

Production Forecasting

Recently, inquiries have been made regarding the accuracy and reliability of historical oil production forecasts published by the Department. The response that follows will examine factors that may have contributed to differences in forecast vs. actual production for Alaska's North Slope (ANS).

The department's production forecasts (both past and present) are based solely on technically recoverable barrels without the added complexity and uncertainty of predicting future oil prices in the equation. The production forecasts for the last ten years or more have been overestimated.



The Department of Revenue relies on historical production data as well as both public and private information as the basis for its biannual production forecast. Because forecasts are directly affected by the quality of the input data, the Department of Revenue production forecasts are sensitive to data provided both publicly and privately by the field operators.

It is important to define both what is involved in a production forecast and what is not. In general terms, a forecast is simply an opinion of future oil production. In addition to the quality of the input data, the uncertainty of the forecast will also depend on the methods employed by the forecaster. Historically, the Department engaged a single contractor to conduct its forecasts until 2009. This contractor relied on a certain method to produce his forecasts. Beginning in 2009 a new contractor was engaged to perform the forecasts and relies on a different methodology to forecast production.

It is also necessary to understand from the outset that, under both current and former methodologies, the production forecasts conducted for and under the directive of the Department have been based only on technically recoverable oil. The forecasts do not include any analysis of whether or not barrels that are technically recoverable are also economically recoverable. This is reasonable given that near term oil production should be relatively certain. Involving an analysis that included economically recoverable barrels would add another layer of complexity and uncertainty to the forecast and require that the department, in essence, predict the future value of a barrel of oil. At the same time this added uncertainty would not provide any cure for near term production overestimates.

As previously mentioned, the accuracy of the forecast will be highly dependent on the methods used by the person making the forecast. In this regard, the current methods employed by the department's staff and contractor have changed significantly from the previous contractor. The result has been that the near term forecasts have been within about 2% of actual production during that same time period.

Perhaps one of the most significant changes in methodology relates to the use of a well-by-well analysis to forecast production and decline curves as used in the current practice, whereas in the past, forecasting had been done on an area-wide or field basis. While the well-by-well basis is more time and labor intensive, the methodology reveals trends that are not observable on an area-wide basis.

Current practice also includes internal staff in addition to the contractor. The department performs in-depth analysis of production trends, forecast to forecast by field, and comparisons of forecasted production to actual, among other analyses.

Another factor that has likely had a material impact and is currently employed in the new methodology is the magnitude of the exponent, or "b factor" used to calculate the production decline curve. As the "b factor" increases, the production forecast increases in a non-linear fashion. The factor previously used had been as high as 1.4 and has now been reduced to be less than 1.0 in current practice. There is a large body of empirical evidence indicating that hyperbolic exponents should never be greater than 1.0 in any field.

By employing a method of forecasting that adheres to strict and standard petroleum engineering principles the department now excludes barrels that may fall into a high risk area of eventually being brought into future production. For example, both back out barrels and certain recovery projects that have not been tested and proven could be subject to many variables that may or may not lead to their ultimate production. Accordingly, these volumes are now only included in the department's forecast if they are shown to be in place and have demonstrated a response.

Some factors are beyond the state's control. A standard practice is to go to the producer's and ask when new fields may come on line. A good example is Liberty, which had originally been predicted to begin production in 2011. However, recent events and decisions by the company have delayed start-up until somewhere around 2013. Even though the Liberty pool is in federal waters, facilities are located onshore and production will flow through TAPS and had been included by the state in forecasting total ANS production. When setbacks in timing such as Liberty are unforeseeable, they will by definition, show up as errors in any forecast at a later date.

Below are three additional examples:

1. Aurora Field

“BP Exploration (Alaska) Inc. said Feb. 23 that production is expected to increase to a peak rate of 15,000 to 20,000 barrels per day as field development continues.” *“Aurora field begins production.” 2/28/01 Petroleum News*

- Production at Aurora peaked at an average of 10,447 barrels per day in 2006 according to DNR – just over half of the highest estimate by BP in 2001.

2. Polaris Field

“BP will develop Polaris with water flood, which is expected to improve total recovery to 15-30 percent of original oil in place, with production rates expected to peak at 12,000-15,000 barrels of oil per day from water injection...” *“BP applies for pool rules for viscous Schrader Bluff Polaris accumulation: Company tells AOGCC western Prudhoe satellite will be developed with water flood, EOR test deferred; initial wells proving up productivity, but hydrate formation causing problems in keeping wells operating; Ugnu sand included.” 12/29/02 Petroleum News*

- Through 2009 production at the Polaris field had not reached the levels predicted by BP in 2002. Specifically, production at the Polaris field peaked at an average of 4,764 barrels per day in 2008 – approximately 60% less than BP predicted in 2002.

3. West Sak Field

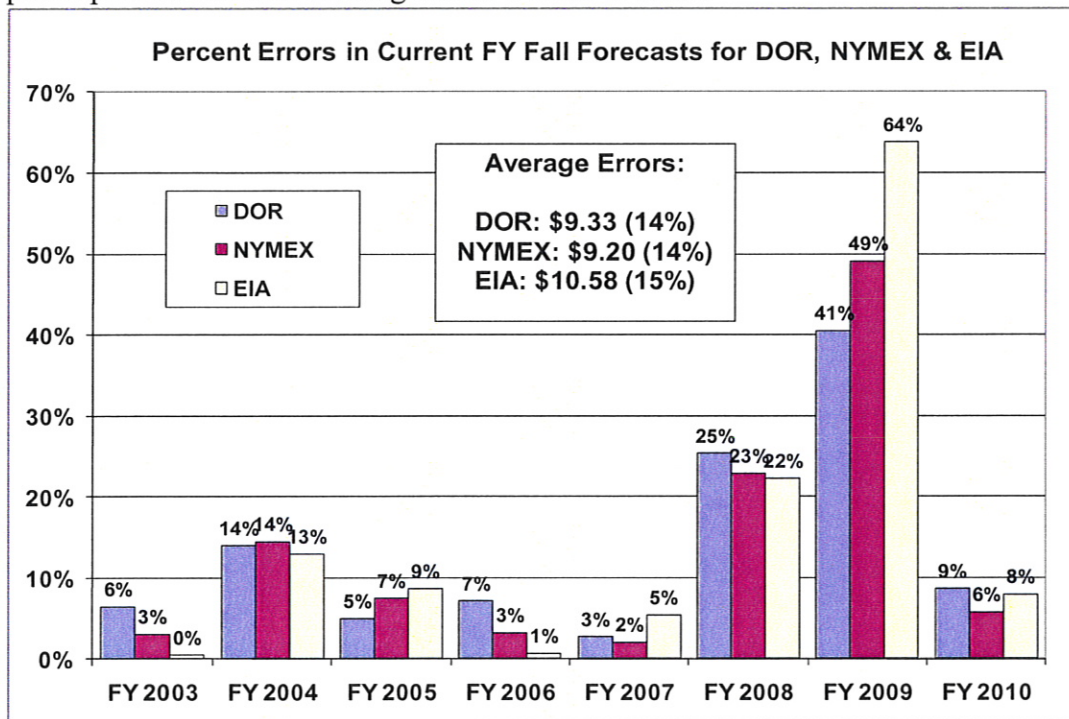
“The companies said production of West Sak oil is now at about 10,000 barrels per day, and with the Drill Site 1E and 1J project, production is expected to reach approximately 45,000 bpd by 2007.” *“\$500 million West Sak heavy oil project approved.” 8/15/2004 Petroleum News*

- According to DNR, production at West Sak was just over 11,000 barrels per day in 2004. In 2007 West Sak produced an average of 17,575 barrels per day or less than 40% of the rate forecast by BP in 2004. As of 2009, production at West Sak still has not reached 20,000 barrels a day.

Because the Department of Revenue relies, at least in part, on information provided by the operators of each field in order to forecast production, bias or error inherent in the operator's view of future production often translates into the forecast variances by the Department of Revenue. In short, the forecast is limited by the quality of the data inputs, the methodologies used, and unforeseen events. Incorporating internal staff, the additional in-depth analysis and controls, and sound petroleum engineering methods are steps taken by the department to improve the quality of the production forecast.

(5) Provide analysis of our past price forecast accuracy, compared to outside experts.

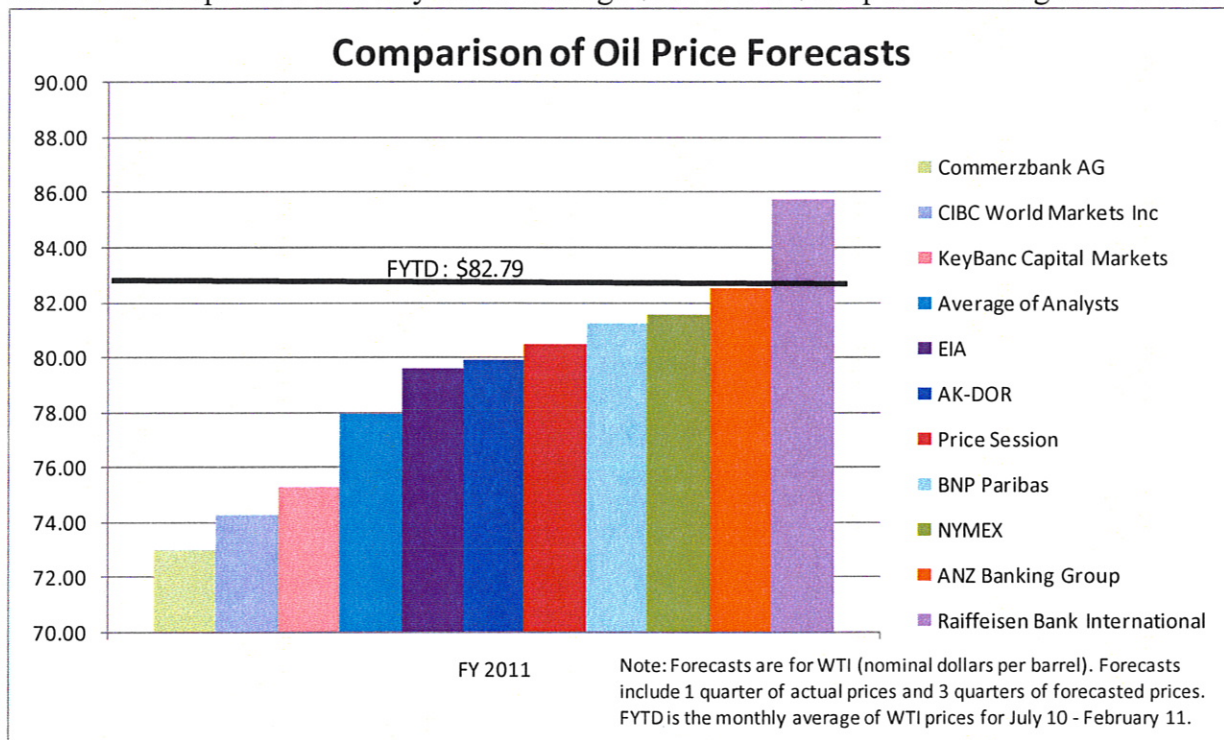
The chart below compares the department's fall oil price forecast accuracy to the accuracy of NYMEX futures prices and the Energy Information Administration (EIA) forecasts. It shows the absolute percent error in forecasting the current fiscal year oil price from FY 2003 to FY 2010. On average, the department's forecast is no more or less accurate than forecasts by the EIA or forecasts generated with NYMEX futures prices. All three forecasts did not anticipate the sudden price spike and crash occurring from FY 2008 to 2009.



(6) In terms of future price projections, provide a chart showing all analyst forecasts so the committee can see where the high and low expectations are.

The chart below shows the department's fall forecast of WTI (nominal dollars per barrel) for FY 2011 along with forecasts from various other groups. The chart includes the average of several oil market analysts and individual forecasts from select analysts that tended to be more bullish or bearish than others. All forecasts were created in fall 2010 when WTI was priced around the high \$70s to low \$80s per barrel range.

As is evident from the chart, there was a range of views on where oil prices would be headed in FY 2011. Most forecasters, however, did not anticipate the sudden rise in oil prices that did occur in FY 2011. The department's forecast was consistent with the view of other forecasters, which was that prices would stay within the high \$70s to low \$80s per barrel range for FY 2011.



(7) Provide the number of PERS and TERS participants.

The most recent actuarial valuations for PERS and TERS provide the following statistics:

TRS:

- 58 Member Employers
- 2 Defined Benefit (DB) Tiers
 - 10,255 retirees
 - 884 terminated members entitled to future benefits
 - 8,226 actives (78.4%)
 - 19,365 total members
- 1 Defined Contribution (DC) Tier
 - 0 retirees
 - 394 terminated members entitled to future benefits
 - 2,269 actives (21.6%)
 - 2,663 total members

PERS:

- 160 Member Employers
 - 3 Defined Benefit (DB) Tiers
 - 25,015 retirees
 - 6,566 terminated members entitled to future benefits
 - 27,565 actives (74.55%)
 - 59,146 total members
- 1 Defined Contribution (DC) Tier
 - 0 retirees
 - 304 terminated members entitled to future benefits
 - 9,412 actives (25.45%)
 - 9,716 total members

(Clarification) Based on committee discussion, we would like to clarify that capital credits are accounted for in two groups – (1) credits applied against tax liabilities; and (2) credits for explorers/producers that have no tax liability against which to apply the credits.

For production tax accounting purposes, credits against production tax fall into two basic groups: (1) credits applied against tax liabilities; and (2) credits for explorers/producers that have no tax liability against which to apply the credits.

Credits in group (1) – those applied against tax liabilities – are included in the production tax calculation because they are a direct deduction from the total production tax revenue anticipated in a given time frame. For this group, producers simply subtract the number of credits from their before credit tax liability and make a payment on that net amount. That is why this group of credits is included in the income statement format shown in Appendix D-1 of the Fall 2010 Revenue Sources Book.

Credits in group (2) – those credits for explorers/producers that have no tax liability against which to apply the credits – for accounting purposes are not a direct deduction from the total production tax revenue anticipated in a given time frame. Credits in this group are normally turned into transferable tax credit certificates and either sold to another producer or refunded by the state. State refunds for these certificates are made through the Oil and Gas Tax Credit Fund, established at AS 43.55.028. This fund consists of money that is appropriated to it from the legislature, usually from general funds. As such, refunds made from this fund are considered to be budget items as opposed to revenue items, and are not part of the production tax revenue forecast. For that reason, credits that are certificated are not included in the income statement format shown in Appendix D-1 of the Fall 2010 Revenue Sources Book.

We hope our responses fully answer your questions.

Sincerely,

A handwritten signature in black ink, appearing to read "Bruce Tangeman", with a long horizontal flourish extending to the right.

Bruce Tangeman
Deputy Commissioner