

EIA-914 Monthly Natural Gas Production Report

Data Analysis

October 2006

Introduction

EIA currently publishes preliminary estimates of monthly natural gas production as described in [How EIA Estimates Natural Gas Production](#). These official EIA estimates, derived from State reported data, are not considered timely or complete enough to meet customer needs. Pursuant to request for more timely data made by the Secretary of Energy in 2003, and using funding made available to improve natural gas data, the Office of Oil and Gas implemented in 2005 a new survey, Form EIA-914 *Monthly Natural Gas Production Report*, whose purpose is to improve the timeliness and accuracy of published monthly natural gas production information. The EIA-914 estimates are available 2 months earlier than previous estimates. EIA controls the timing of data submission, understands the data, can and does verify the survey data with the operators, and can continue to recalibrate and refine the system over time.

The EIA-914 survey has now collected the data for report months January through December 2005, and the results have been evaluated in accordance with the analysis plan set forth in the August 2005 [EIA-914 - Cat I Report to Administrator \(August 2005\)](#). As stated in that clearance package, the production estimates based on the survey data have been posted on the EIA Website [Form EIA-914 Monthly Natural Gas Production Report](#), but they are designated as “unofficial” and are separated from existing published natural gas production data. With the release of this data analysis report, which validates the quality and timeliness of the EIA-914 production estimates based on a review of the 2005 data, EIA will begin to use the current EIA-914 production estimates as the "official" EIA natural gas production data series for the EIA-914 areas. With approval of this estimation process, data from the EIA-914 will be accessible via the *Natural Gas Monthly (NGM)* and Natural Gas Navigator, in addition to the EIA-914 website.

Purpose

EIA-914 was developed to substantially improve the reliability, quality, and timeliness of our monthly natural gas production estimates for the Lower-48 States and major producing areas. Our targets were to have:

1. Releasable natural gas production estimates 60 days after the close of a report month,
2. A production estimate error within 1 to 5 percent for these 7 areas: Texas, Gulf of Mexico Federal Offshore (GOM), Wyoming, Oklahoma, New Mexico, Louisiana, and Other States (all remaining states, excluding Alaska), and
3. A production estimate error within 1 percent for the Lower-48 States.

Findings:

- Since June 30, 2005, the target of obtaining releasable natural gas production estimates 60 days after the close of the report month has been met.
- Generally, the EIA-914 estimates showed the same trend over time as estimates from the *NGM*.
- The typical percent differences between the EIA-914 estimates and estimates from previous methods (as reported in the *NGM*) are within the range of the historical average errors in the previous methods (errors in the previous methods are obtained by computing the difference between the initial estimate from the previous method and the final estimate).
- In some instances EIA-914 estimates are believed to be more accurate than previous methods due to known shortfalls in the previous methodologies.
- Differences between the first published EIA-914 regional estimates and later estimates tend to be small (under 3 percent).
- Target 3 was met in calibration tests, but it's still too early to know if the 1-percent target was met, because reliable final reported 2005 data for many states are not yet available. However, the high degree of success in the seven areas indicates a high probability that Target 3 can be met.

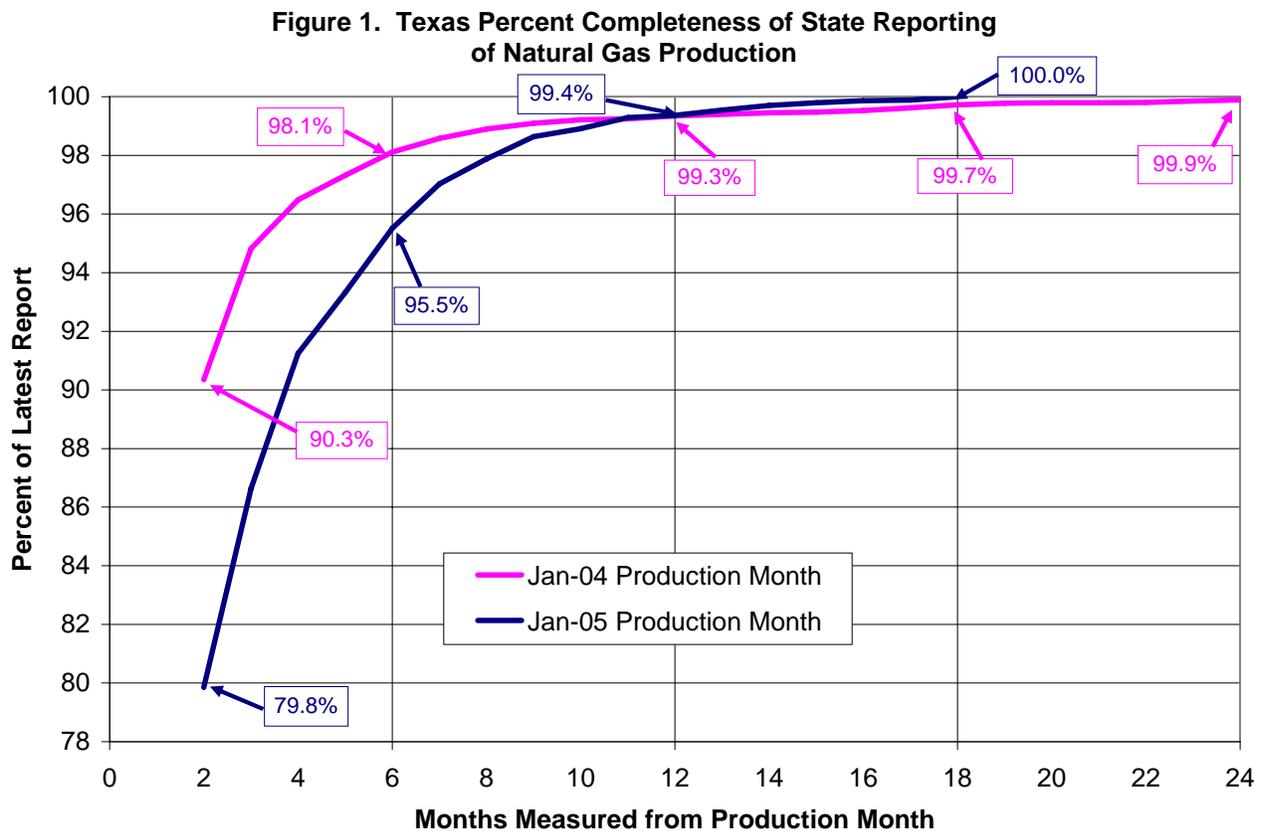
Reported Monthly State Production Data

Data on monthly natural gas production are often collected by more than one State agency for a variety of regulatory and taxation purposes. EIA eventually uses the data from the State agencies as its final revised estimates for State-level natural gas production. However, the preliminary monthly data released by most producing states are incomplete, and are generally revised upward over time as more data are reported to the State for that production month. This sequence of preliminary estimates approaches a final production volume (essentially complete reporting with most reporting errors corrected) for each production month over time. Using the preliminary monthly series for estimating final production is complicated and sometimes uncertain because the States and the Minerals Management Service (MMS) for GOM do not all release data at the same time for the same production month and there have been breaks in the time series or major changes in these data series. It may take years before the monthly State data have all significant errors corrected. For example, Texas and EIA have agreed to work together to correct Texas data for incorrectly reported carbon dioxide (CO₂) in 2004 and prior years discussed in [*Adjusted Estimates of Texas Natural Gas Production*](#).

EIA has observed that after 24 months the production data for a given production month in Texas are nearly complete and correct (final), as shown in Figure 1. After 12 months the production month reported value is usually over 99 percent complete. However, small changes keep trickling in and, Texas keeps track of and releases the aggregate monthly changes for all previous production months. For the January 2004 production month, the State report released 24 months later was still

missing about 0.1 percent of the data. Obviously, by February 2006, the January 2004 reported data were approaching the final rate for the production month, January 2004. The blue curve on Figure 1 shows the percent completeness for the production month January 2005. Two months from the end of the production month, it was only 79.8 percent complete (missing twice as much production as January 2004 after 2 months). After 6 months it was over 95 percent complete and over 99 percent complete after 12 months.

It is to the great credit of Texas and many other producing States that they do the hard work involved in continually updating and making available their detailed and aggregated monthly natural gas production databases and reports. This makes it possible for the public and EIA to eventually know accurate and complete production data and to understand how the preliminary State data evolves over time to final data.



There are no Oklahoma preliminary production data available until 4 or 5 months after the production month (see Figure 2). In sharp contrast, the EIA-914 estimates are made only 2 months after the production month ends. As shown in Figure 2, the percent completeness by month varies substantially for the two Oklahoma production months shown.

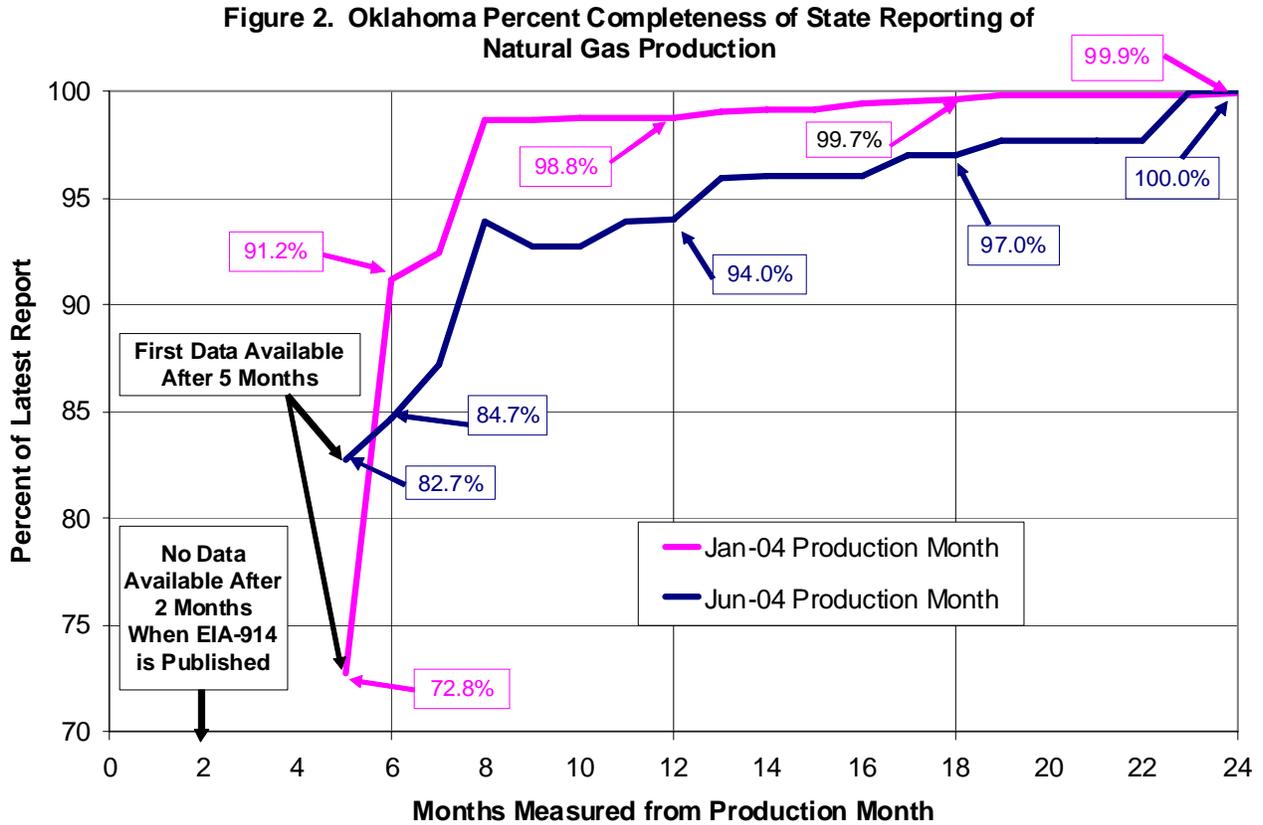
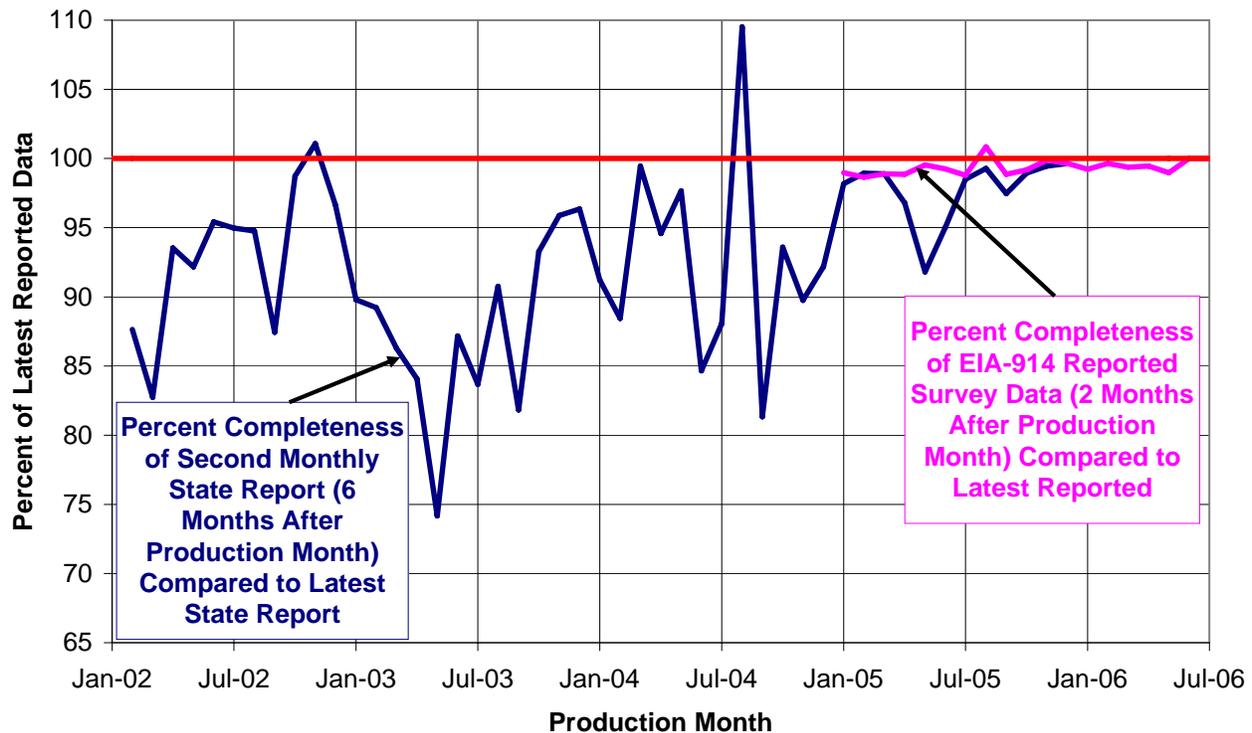


Figure 3 shows the percent completeness of State-reported Oklahoma data after 6 months. Note that the percent completeness was erratic with over 25 percent of production missing after 6 months for one production month and in another production month the volume reported after 6 months was nearly 10 percent high. EIA did not depend on the Oklahoma time series to make estimates in the past because of such volatility. In contrast, during 2005, the EIA-914 survey data were roughly 99 percent complete for each production month after only 2 months.

Figure 3. Comparison of Percent Completeness of Reported State Data and EIA-914 Survey Data for Oklahoma



The table below shows the percentage completeness of State-reported production over time for the production month January 2004 for each area. Two months after the production month several areas had less than 10 percent of the data reported. Six months after the production month, most areas had reported over 98 percent of their production (Oklahoma at 91.2 percent). At 12 months, only Oklahoma had reported less than 99 percent of their production. Small increments of production or corrections continued during the next 12 months. Texas-reported production increased over half of one percent from the 12- to 24-month report.

State Reported Data Months Measured From Production Month Percent Completeness					
Area	2 Months	6 Months	12 Months	18 Months	24 Months
Texas	90.3%	98.1%	99.3%	99.7%	99.9%
GOM	4.1%	98.8%	99.6%	99.5%	99.9%
Oklahoma	0.0%	91.2%	98.8%	99.6%	99.9%
Louisiana	33.8%	99.7%	100.0%	100.0%	100.0%
New Mexico	6.1%	98.9%	99.9%	99.9%	99.9%
Wyoming	28.7%	100.0%	100.0%	99.6%	100.0%

The relative regularity of the time series of reported data for Texas was carefully analyzed by EIA, and these analyses led to several methodologies that gave reasonably good estimates of final monthly Texas natural gas production. However, these methodologies give poor estimates of final production if the time series abruptly changes. The State of Texas changed their reporting system effective January 2005.

Many of the operators of the 37 enhanced oil recovery projects in Texas that depended on CO₂ injection had been including the resulting CO₂ production in their natural gas production reports of gross natural gas. Effective January 2005, the Railroad Commission of Texas told the operators to make sure they were not reporting this CO₂ production. This caused the January 2005 reported gross natural gas production in Texas to be about 7 percent lower than in December 2004, even though corrected Texas natural gas production was trending up. EIA revised its published 2004 monthly Texas production down to correct for CO₂ that should not have been reported in order to show the correct production trends.

For several States, the preliminary production time series could be successfully modeled. The time series models used by the Reserves and Production Division have evolved over time from ones that were analyst-driven to ones using sophisticated time series or other data driven models ([How EIA Estimates Natural Gas Production](#)). These models work well in most instances. For example, for Texas, the average absolute error for these estimates, when compared to final estimates from January 1997 through December 2002 was less than 2 percent. This is well within the 1-percent to 5-percent accuracy targets for the EIA-914 survey estimates. The majority of the Texas production estimates made during this 6-year period were made with analyst-driven models. Even though the estimates were obviously good enough, it was hard to defend them immediately if they were challenged because the system was complicated, hard to explain, and the data necessary to prove which early estimates of final production were best, were not available for a year or two. The time series method being used in 2004 and 2005 was recommended by the ASA Committee for Energy Statistics and gave somewhat better results than the time series method previously used by the Reserves and Production Division. However, Texas changed its production survey form and system effective January 2005.

With the initiation of the EIA-914 Natural Gas Production Survey, EIA set out to replace the current methods, documented in [How EIA Estimates Natural Gas Production](#), with a survey based data model that is applied systemically to specific States individually and collectively for the “other” States. The EIA-914 method is inherently superior to the previous methods because it is based on data collected in an EIA survey and it is not subject to errors caused by changes in State-run data collection and dissemination systems.

The use of EIA-914 production estimates has already been approved as the official data series for Texas. Early approval was necessary because the Texas Railroad Commission’s transition to a new reporting system caused misreporting by some operators and a change in the revision pattern of preliminary monthly production data provided by the Texas Railroad Commission previously used to estimate Texas production. The EIA-914 generated production estimates for Texas were found to be obviously more reliable. Details are contained in the full report [Adjusted Estimates of Texas Natural Gas Production](#). At this time, Texas production estimates, published in the *NGM*, are based on EIA-914 survey data.

In addition to Texas, RPD provides official production estimates for Oklahoma, Louisiana, and the GOM to the NGM. From January 1997 through December 2002, the average monthly absolute errors in the initial estimates for these three States were respectively, 6 percent, 6 percent, and 4 percent. The Natural Gas Division currently makes the initial natural gas production estimate for New Mexico from the EIA-895 survey data collected from the States and for Wyoming the current Natural Gas Division estimate is based on the latest available data from the Wyoming web site. From January 1997 through December 2002, the average monthly absolute error in the initial estimate was 4 percent for New Mexico and 13 percent for Wyoming. During this 6-year period, the initial Wyoming estimates published in the *NGM* were not very good. However, the Wyoming website data, available in 120 days and initially published in the *NGM* during 2005, have improved and appear to be within 1 percent of the expected final monthly estimates.

Analysis Results

Target 1: Releasable natural gas production estimates 60 days after the close of a report month:

Since June 30, 2005, the 60-day target has been routinely met. On October 30, August 2005 production estimates were released along with revisions to January through July 2005 estimates. The surveyed operator production-weighted response rate has been over 99 percent every month.

Target 2: A production estimate error within 1 to 5 percent for these 7 areas: Texas, GOM, Wyoming, Oklahoma, New Mexico, Louisiana, and Other States (all remaining States, excluding

Alaska): First, there is a fundamental question that has to be answered when a new survey is launched to replace another survey and/or system: **are we still basically collecting the same data that we had been collecting?** In the EIA-914 case, this is gross withdrawals of natural gas, and the answer is yes. This was confirmed in direct phone interviews with all large producers surveyed and most of the rest. In fact, these discussions resulted in more accurate production data being reported to EIA and in more accurate production data being reported by the operators to the states and the MMS as the survey progressed.

This was also confirmed when EIA-914 estimates were compared with estimates obtained from previous methods described in [How EIA Estimates Natural Gas Production](#). Month-to-month changes in State-level production obtained from the EIA-914 survey were compared to month-to-month changes obtained from the previous methods, and all results are found in the [EIA-914 Analysis Data](#) workbook, from which the following figures and tables were created. These data show that the EIA-914 production estimates are generally comparable to estimates for 2005 made using other methods, and the EIA-914 estimates are of the same general level and have the same general trends as estimates based on current state data.

As shown in figures and tables below, the typical percent differences between the EIA-914 estimates and estimates from previous methods (as reported in the *NGM*) are within the historical average errors in the previous methods. (Estimates from previous methods were used where actual reported data are not yet final.) Differences of 2 to 3 percent are acceptable; our target range was 1 to 5 percent. Also, a very active quality assurance program means that the operator reported data maintain a high level of accuracy. Before the EIA-914, some monthly preliminary estimates have been in error by 5, 10, 15, 20 percent or more. For example, the June 2004 first preliminary estimate for New Mexico was almost 20 percent low, as compared to the “final” value. In some instances,

the EIA-914 estimates are believed to be more accurate than previous methods due to known shortfalls in the previous methodologies.

Target 3 was met in calibration tests, but it's still too early to know if the 1-percent target was met, because reliable final reported 2005 data for many states are not yet available. However, the high degree of success in the seven areas indicates a high probability that Target 3 can be met.

The data from the EIA-914 survey are accurate for two reasons.

- Most operators are very conscientious about the data they submit on the EIA-914 survey form, and they make resubmissions for very small differences. Some operators have resubmitted data multiple times for all historical months just to make sure we had the most accurate data available even though their changes were insignificant.
- We discover errors through our quality control measures. For example, by checking what the operators report to the States, a few errors were found. Sources of these errors include: misunderstanding of the instructions; reporting data for the wrong area; difficulty assimilating data from a purchased company; and incorrect handling of CO₂ volumes from injection projects. For a few of these, the operators were reporting incorrectly to the State, but not to EIA. In this regard the EIA-914 survey has improved the quality of State data in two States, Texas and Wyoming.

The Web Table below is as presented on the EIA-914 webpage. It has the latest data and revisions as of the date of this document. For each major producing area, EIA-914 data were compared with the previous method as reported in the *NGM*, data on the State websites, and the average errors of the previous methods (the difference between the initial estimates and the final estimates).

Web Table: EIA-914 Estimated Gross Withdrawals of Natural Gas by Area, 2005 as Currently Presented on the EIA Web (Billion Cubic Feet per Day)

Area	Federal Offshore Gulf of Mexico		Louisiana		New Mexico		Oklahoma	
	Gross Withdrawals (Bcf/day)	% Change from Last Month	Gross Withdrawals (Bcf/day)	% Change from Last Month	Gross Withdrawals (Bcf/day)	% Change from Last Month	Gross Withdrawals (Bcf/day)	% Change from Last Month
Jan-05	10.065		3.747		4.503		4.532	
Feb-05	10.320	2.5	3.832	2.3	4.439	-1.4	4.575	0.9
Mar-05	10.530	2.0	3.902	1.8	4.379	-1.3	4.581	0.1
Apr-05	10.369	-1.5	3.943	1.1	4.425	1.0	4.558	-0.5
May-05	10.395	0.2	3.960	0.4	4.459	0.8	4.519	-0.9
Jun-05	10.196	-1.9	3.952	-0.2	4.414	-1.0	4.613	2.1
Jul-05	9.530	-6.5	3.841	-2.8	4.416	0.1	4.632	0.4
Aug-05	8.899	-6.6	3.722	-3.1	4.423	0.1	4.628	-0.1
Sep-05	4.591	-48.4	2.952	-20.7	4.438	0.4	4.670	0.9
Oct-05	4.519	-1.6	3.145	6.5	4.497	1.3	R4.707	0.8
Nov-05	R 6.555	45.1	R 3.512	11.7	R 4.399	-2.2	R4.663	-1.1
Dec-05	7.563	15.4	3.580	1.9	4.226	-3.9	4.580	-1.6

Area	Texas		Wyoming		Other States (Excluding Alaska)		Lower 48 States	
	Gross Withdrawals (Bcf/day)	% Change from Last Month	Gross Withdrawals (Bcf/day)	% Change from Last Month	Gross Withdrawals (Bcf/day)	% Change from Last Month	Gross Withdrawals (Bcf/day)	% Change from Last Month
Jan-05	15.755		5.417		10.699		54.718	
Feb-05	15.960	1.3	5.570	2.8	10.770	0.7	55.466	1.4
Mar-05	16.149	1.2	5.523	-0.8	10.751	-0.2	55.815	0.6
Apr-05	16.289	0.9	5.437	-1.6	10.605	-1.4	55.626	-0.3
May-05	16.208	-0.5	5.533	1.8	10.819	2.0	55.891	0.5
Jun-05	16.286	0.5	5.546	0.3	10.827	0.1	55.833	-0.1
Jul-05	16.224	-0.4	5.578	0.6	10.677	-1.4	54.898	-1.7
Aug-05	16.452	1.4	5.673	1.7	10.816	1.3	54.612	-0.5
Sep-05	15.796	-4.0	5.723	0.9	10.908	0.9	49.077	-10.1
Oct-05	16.531	4.7	5.827	1.8	11.010	0.9	50.235	2.4
Nov-05	R 16.769	1.4	R 5.976	2.6	R 11.185	1.6	R 53.049	5.6
Dec-05	16.562	-1.2	5.878	-1.6	10.986	-1.8	53.376	0.6

For each of the seven areas for which data are collected on the EIA-914 Report, the following figures are presented.

- Figure 1A through 7A show EIA-914 first estimates of gross natural gas production compared to gross estimates first published in the *NGM* (previous method) and the latest State data.
- Figures 1B through 7B show EIA-914 latest estimates of gross natural gas production and the latest State data.
- Figures 1C through 7C and Figure 4C.1 show the impact on EIA-914 based estimates, of corrections, proposed corrections, revisions, and resubmissions.
- Figures 1D through 7D show EIA-914 latest estimates of gross natural gas production, *NGM* first published gross natural gas production estimates with error bands, and the latest State data. (Figure 7D shows estimates based on State data rather than the State data.)

EIA-914 Comparisons for Texas

Figure 1A compares EIA-914 first gross estimates for Texas to *NGM* first published gross estimates (previous method) and the latest State data. The previous methods vary from State to State and are described in the document [*How EIA Estimates Natural Gas Production*](#). The first estimate of gross production can be significantly different from the latest or final estimate of gross production. Generally figures 1A through 7A show the convergence of the two methods as corrections and resubmissions associated with the survey start-up were entered. As mentioned earlier, Texas 914-based estimates have already been approved as official gross natural gas production estimates by EIA. After a startup period during which respondent submission errors were discovered and corrected, the two methods are closer.

Figure 1A. Texas Gross Natural Gas Production Comparison

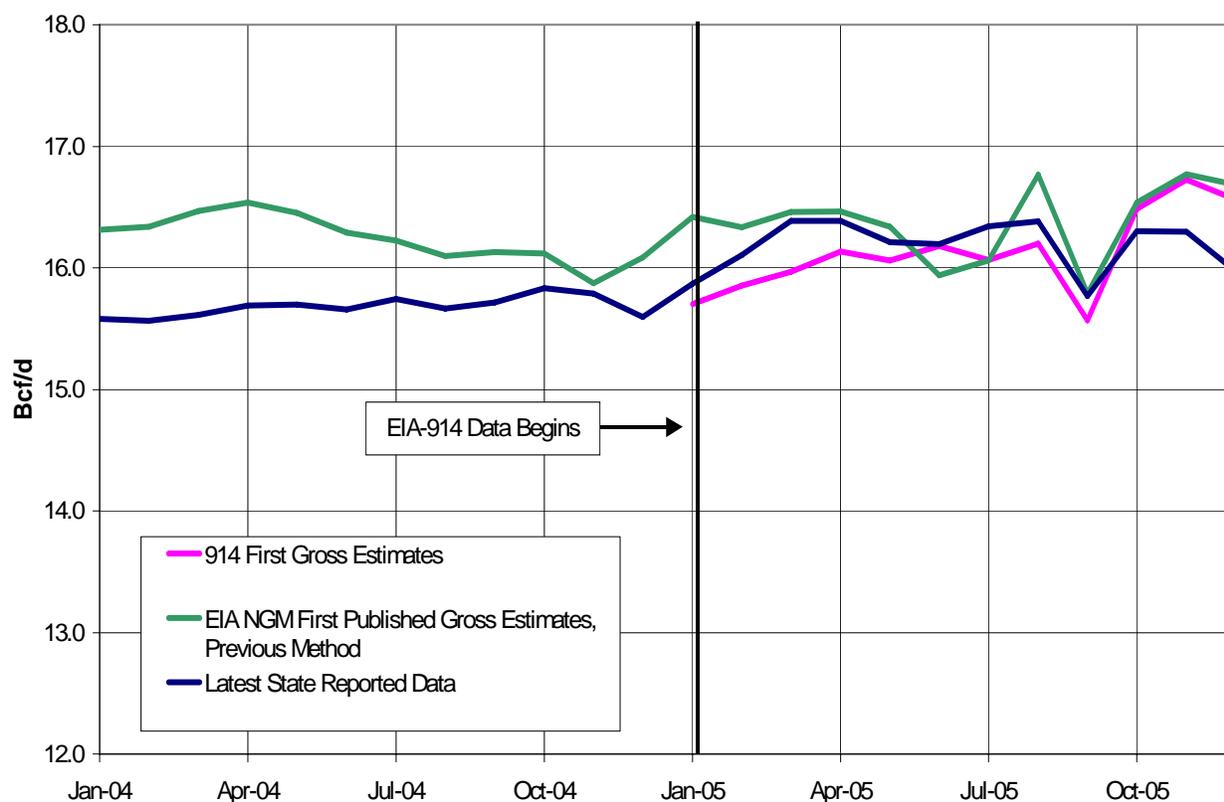


Table 1. Texas Gross Natural Gas Production Data

Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Reported Data Percent Change from Last Month
Jan-05	15.702	16.421	15.909			
Feb-05	15.853	16.333	16.157	0.96	-0.54	1.56
Mar-05	15.969	16.459	16.469	0.73	0.77	1.93
Apr-05	16.136	16.463	16.513	1.04	0.03	0.27
May-05	16.060	16.339	16.346	-0.47	-0.75	-1.01
Jun-05	16.177	15.939	16.363	0.73	-2.45	0.10
Jul-05	16.064	16.060	16.418	-0.70	0.76	0.34
Aug-05	16.200	16.766	16.419	0.84	4.40	0.00
Sep-05	15.568	15.788	15.670	-3.90	-5.84	-4.56
Oct-05	16.483	16.538	16.382	5.88	4.75	4.55
Nov-05	16.725	16.769	16.642	1.47		1.58
Dec-05	16.562	16.684		-0.98		

*Bcf/d = Billion cubic feet per day

Figure 1B compares the latest estimates based on the EIA-914 data with the latest State data. Figures 1B through 7B show that the EIA-914 estimates have the correct magnitude and trends.

Figure 1B. Texas Gross Natural Gas Production

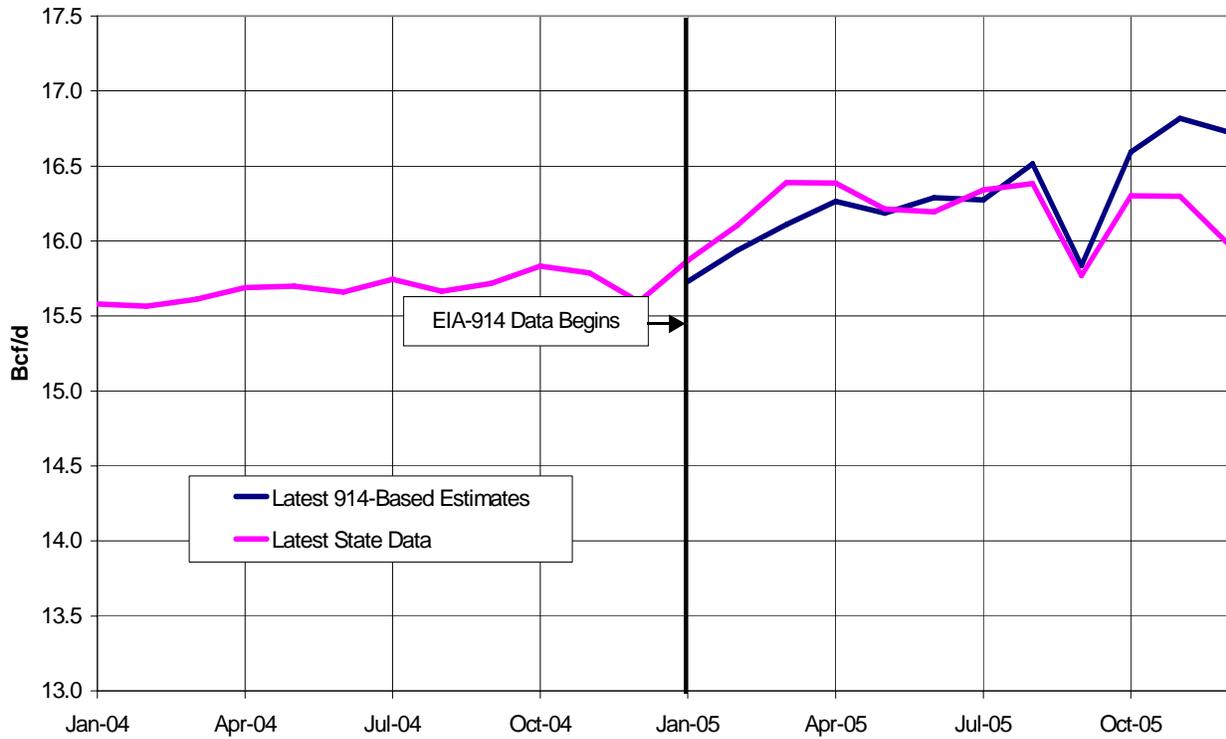


Figure 1C shows the first and latest EIA-914 derived estimates of gross production for Texas. Generally the differences between the first and latest estimates are due to resubmissions and corrections from operators. These tend to be small; however, there was a learning curve in the first few months of the survey for the operators. After the discovery and notification to the operators of errors, the resubmitted corrections brought the first and latest estimates closer together. Differences between the two estimates are less than 1.5 percent and usually much smaller reflecting very small reported revisions. In the following plots this is most noticeable in Texas, GOM, New Mexico, and Louisiana. Because the Other States estimate is derived from the estimates for the five main areas (excluding GOM), it too shows the first and latest estimates coming together.

Figure 1C. Texas 914-Based Gross Natural Gas Production Estimates

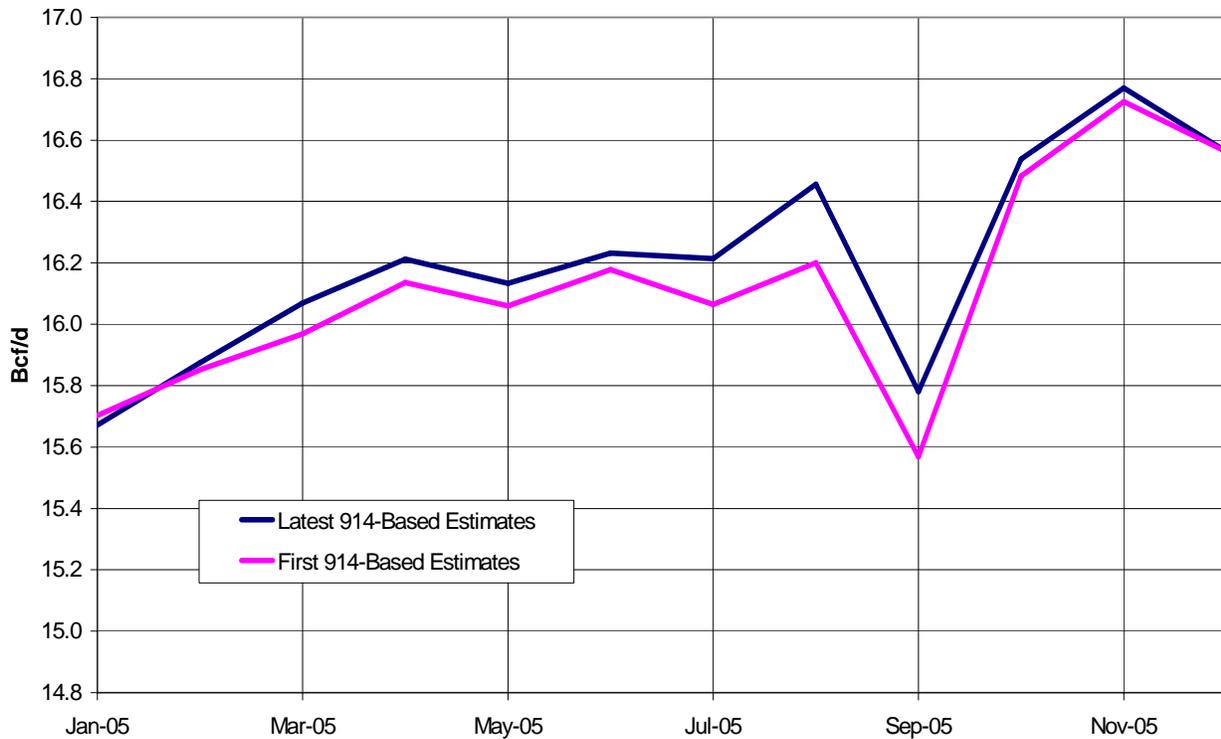
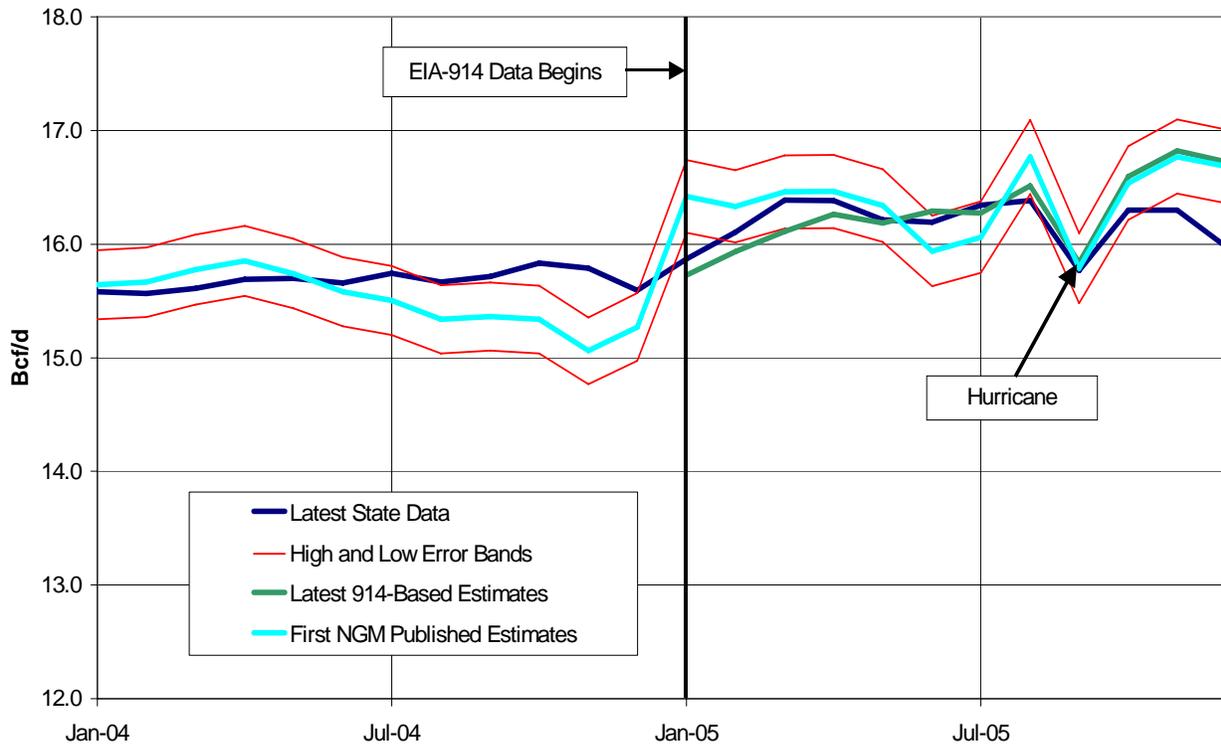


Figure 1D shows the average error bands for Texas. The error bands were constructed by determining the average absolute error for production estimates using previous methods for 6 years of estimates (1997 – 2002). The average absolute error was applied to the production estimates from the *NGM* as a positive and a negative and then plotted as an error band above and below the *NGM* production estimates. As can be seen in the following graph, the EIA-914 based estimates generally continue within the error bands around the estimates from the *NGM* while being published 2 months earlier.

Figure 1D. Texas Gross Natural Gas Production with 2-Percent Error Bands



The EIA-914 based estimates continue the trend of the previous methods and are contained within the error bands. Note that at the end of 2004 the errors of the first published estimates were more than the average error. Texas initiated a new production reporting system that temporarily caused revision submissions to lag behind their normal timing. This situation was recognized, and modifications were made to the standard previous methods to account for the changes in reporting. The resulting errors were more than average, but less than they would have been without the applied modifications. It's likely that much of the difference in the first quarter of 2005 between the EIA-914 based estimates and the *NGM* estimates was the result of the change in State reporting due to the implementation of Texas' new reporting system.

EIA-914 Comparisons for Oklahoma

Figure 2A shows the Oklahoma comparison of EIA-914 first gross estimates to *NGM* first published gross estimates (previous method) and the latest State data. In Oklahoma the previous method estimates are based on State reported data. Taken in context of great variability in preliminary data, the EIA-914 based estimates are in good agreement with the previous method estimates.

Figure 2A. Oklahoma Gross Natural Gas Production Comparison

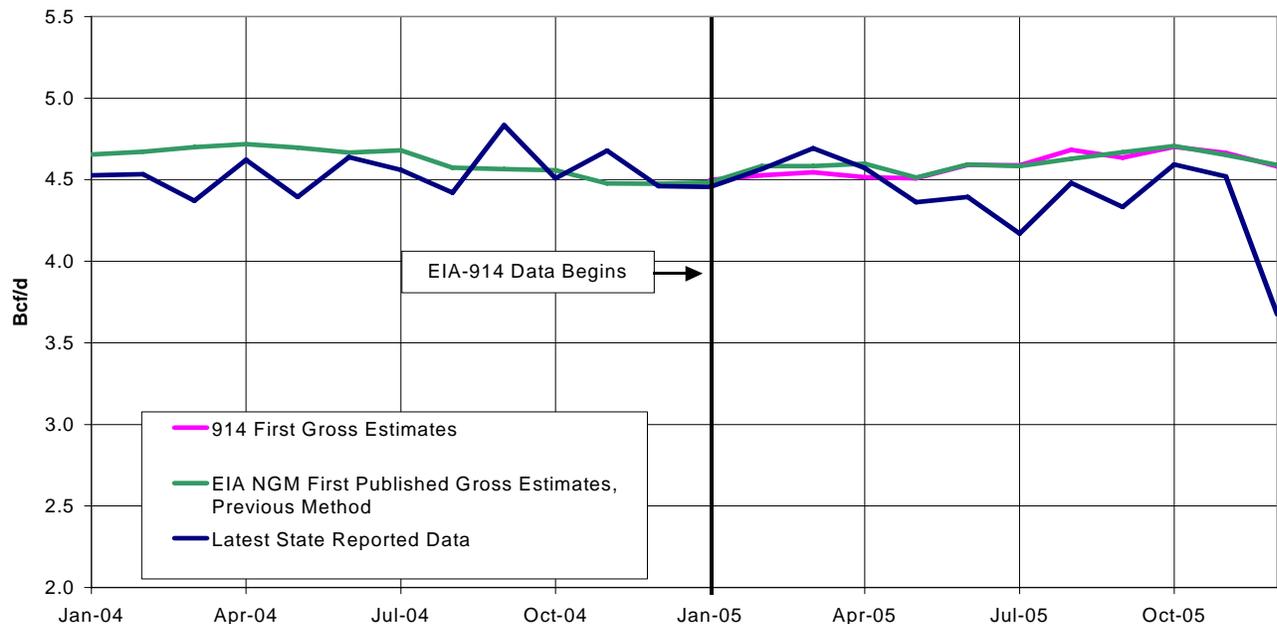


Table 2. Oklahoma Gross Natural Gas Production Data

Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Reported Data Percent Change from Last Month
Jan-05	4.499	4.484	4.545			
Feb-05	4.528	4.584	4.556	0.64	2.24	0.24
Mar-05	4.547	4.584	4.737	0.42	0.00	3.97
Apr-05	4.516	4.599	4.813	-0.66	0.33	1.60
May-05	4.509	4.513	4.713	-0.17	-1.86	-2.06
Jun-05	4.591	4.594	4.524	1.82	1.78	-4.01
Jul-05	4.588	4.585	4.414	-0.06	-0.20	-2.43
Aug-05	4.684	4.630	4.378	2.09	0.99	-0.83
Sep-05	4.635	4.670	4.734	-1.05	0.86	8.15
Oct-05	4.701	4.707	4.616	1.43	0.81	-2.50
Nov-05	4.665	4.653	4.953	-0.76	-1.16	7.31
Dec-05	4.580	4.591	4.968	-1.81	-1.32	0.30

*Bcf/d = Billion cubic feet per day

Figure 2B compares the latest Oklahoma State data to the 914-based estimates. The two methods generally have the same magnitude and the same trends. As shown in the graph the more recent State reported data can be erratic. The State data becomes more stable with time and revisions and shows less month-to-month variation. The very variable preliminary reported data in more recent months gradually smooth out as the data were cleaned up and corrected over time by the State. The EIA-914 routine revisions and resubmissions are relatively small.

Figure 2B. Oklahoma Gross Natural Gas Production

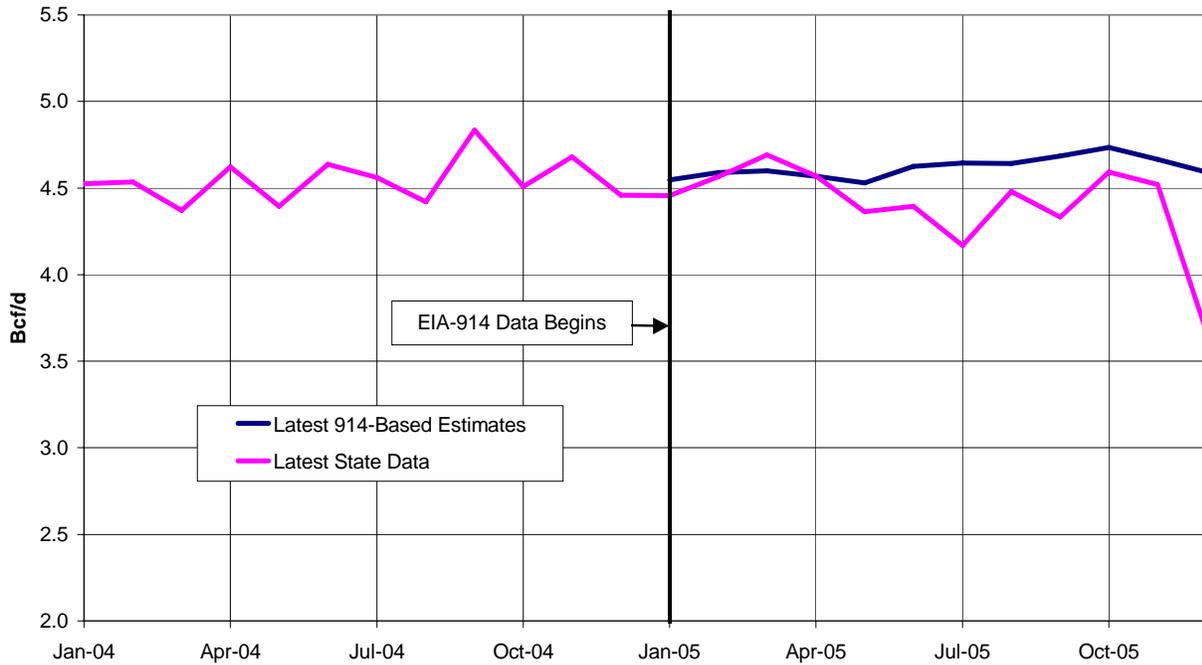


Figure 2C shows the first and latest EIA-914 based estimates for Oklahoma. Differences in the two estimates may be caused in part by operators reporting estimated volumes and then submitting a revision since the data are often not available to them within the required reporting timeframe.

Figure 2C. Oklahoma 914-Based Gross Natural Gas Production Estimates

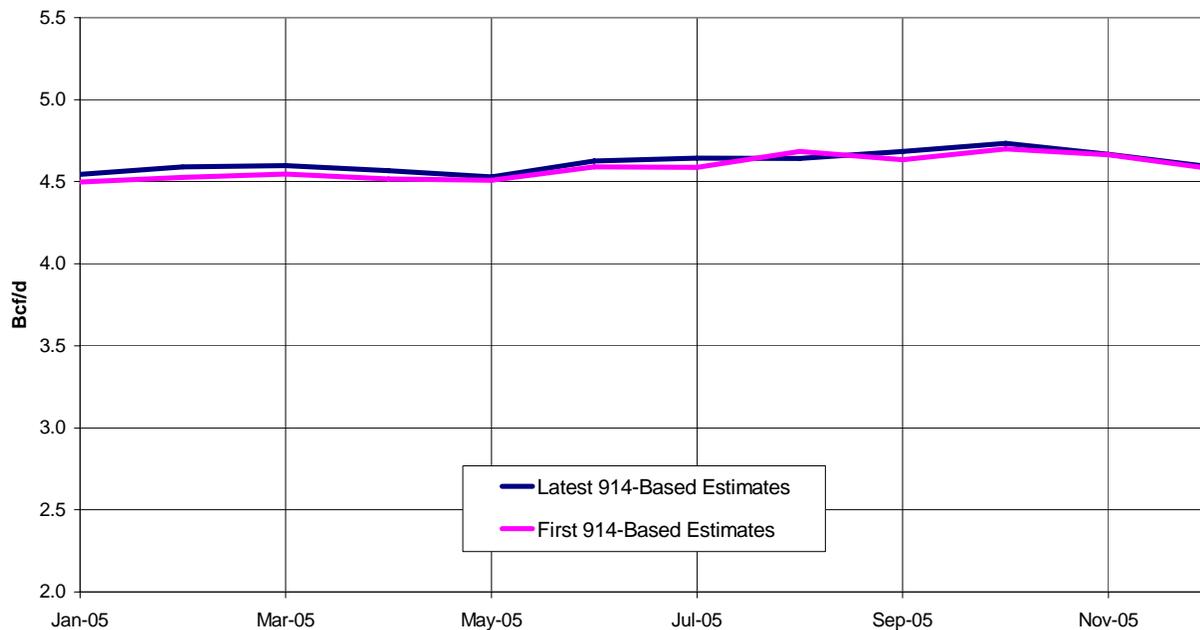
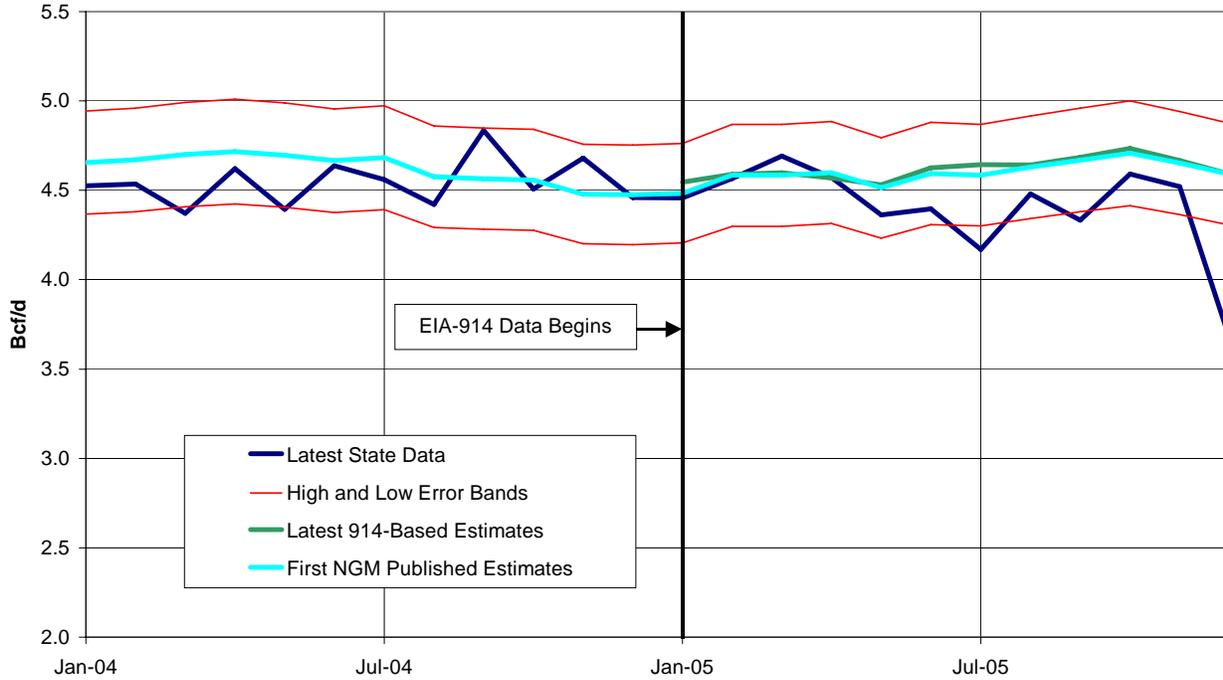


Figure 2D shows the average error bands for Oklahoma. The EIA-914 based estimates are roughly the same magnitude as the previous method's estimates and generally fall within the average error bands. The previous method estimates depend on State-reported data that can be erratic in the most recent months. The EIA-914 data appear to be relatively smooth.

Figure 2D. Oklahoma Gross Natural Gas Production with 6-Percent Error Bands



EIA-914 Comparisons for GOM

Figure 3A shows the GOM comparison of EIA-914 first gross estimates to NGM first published gross estimates (previous method) and the latest State data. Initially for the GOM, the difference between the previous method estimates and the EIA-914 based estimates was larger than shown in Figure 3A. An analysis of the data and estimating procedures of both methods led to the conclusion that the calibration of the previous method should be changed. This change in the previous method brought the two estimates closer together.

Figure 3A. Gulf of Mexico Federal Offshore Gross Natural Gas Production Comparison

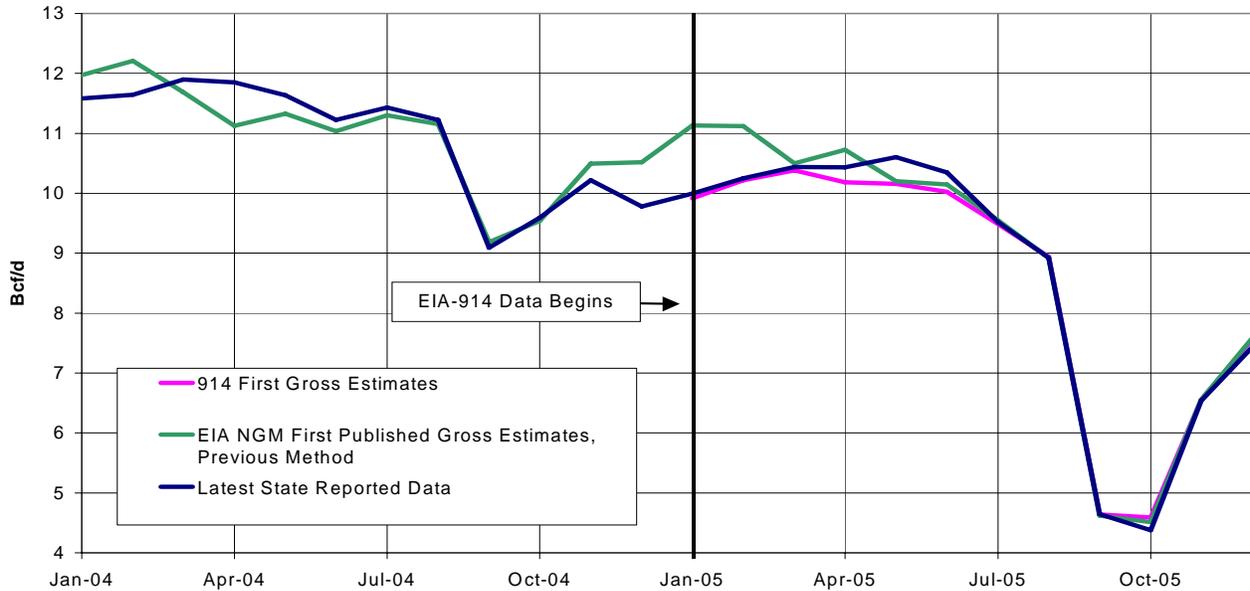


Table 3. Gulf of Mexico Gross Natural Gas Production Data

Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Reported Data Percent Change from Last Month
Jan-05	9.912	11.133	9.999			
Feb-05	10.220	11.121	10.248	3.10	-0.11	2.48
Mar-05	10.383	10.496	10.537	1.60	-5.62	2.82
Apr-05	10.185	10.723	10.712	-1.91	2.16	1.66
May-05	10.158	10.201	10.790	-0.27	-4.86	0.73
Jun-05	10.027	10.145	10.515	-1.29	-0.55	-2.55
Jul-05	9.492	9.551	9.778	-5.34	-5.86	-7.01
Aug-05	8.939	8.920	9.305	-5.82	-6.60	-4.84
Sep-05	4.641	4.618	4.777	-48.09	-48.23	-48.66
Oct-05	4.588	4.514		-1.14	-2.25	
Nov-05	6.552	6.558		42.82		
Dec-05	7.563	7.587		15.43		

*Bcf/d = Billion cubic feet per day

Figure 3B compares the latest MMS data to the EIA-914 based estimates. The two data series generally have the same magnitude and the same trends. The large month-to-month changes in the GOM are caused when production was shut in for hurricanes.

Figure 3B. Gulf of Mexico Federal Offshore Gross Natural Gas Production

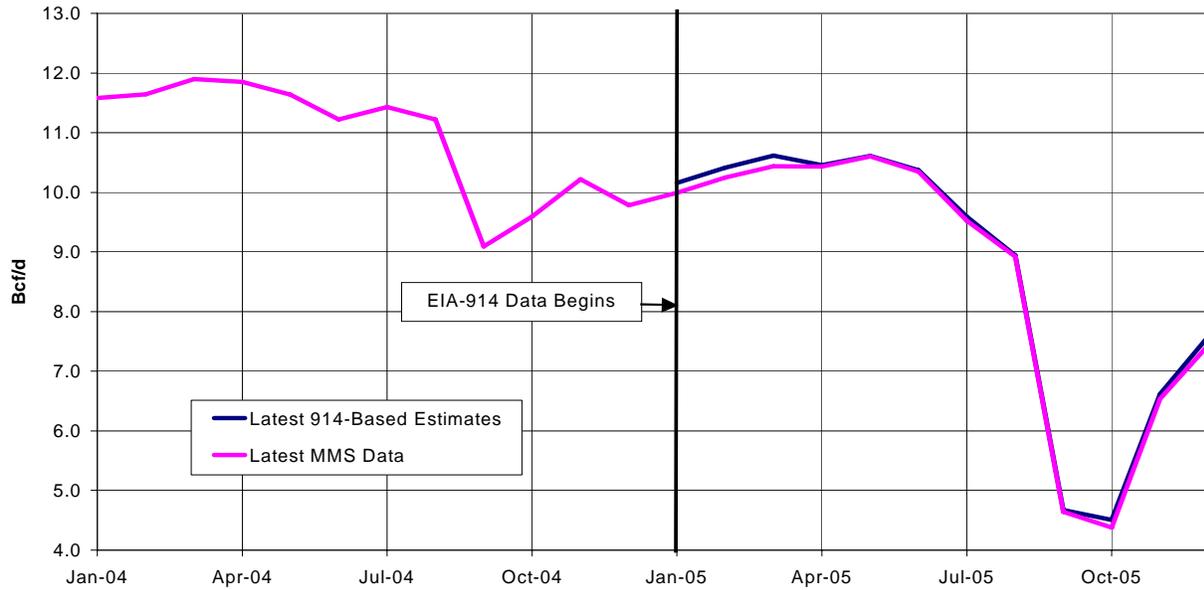


Figure 3C shows the first and latest EIA-914 derived estimates of gross production for the GOM. Generally the differences between the first and latest estimates are due to resubmissions and corrections from operators. These tend to be small; however, there was a learning curve in the first few months of the survey for the operators. After the discovery and notification to the operators of errors, the resubmitted corrections brought the first and latest estimates closer together.

**Figure 3C. Gulf of Mexico Federal Offshore
914-Based Gross Natural Gas Production Estimates**

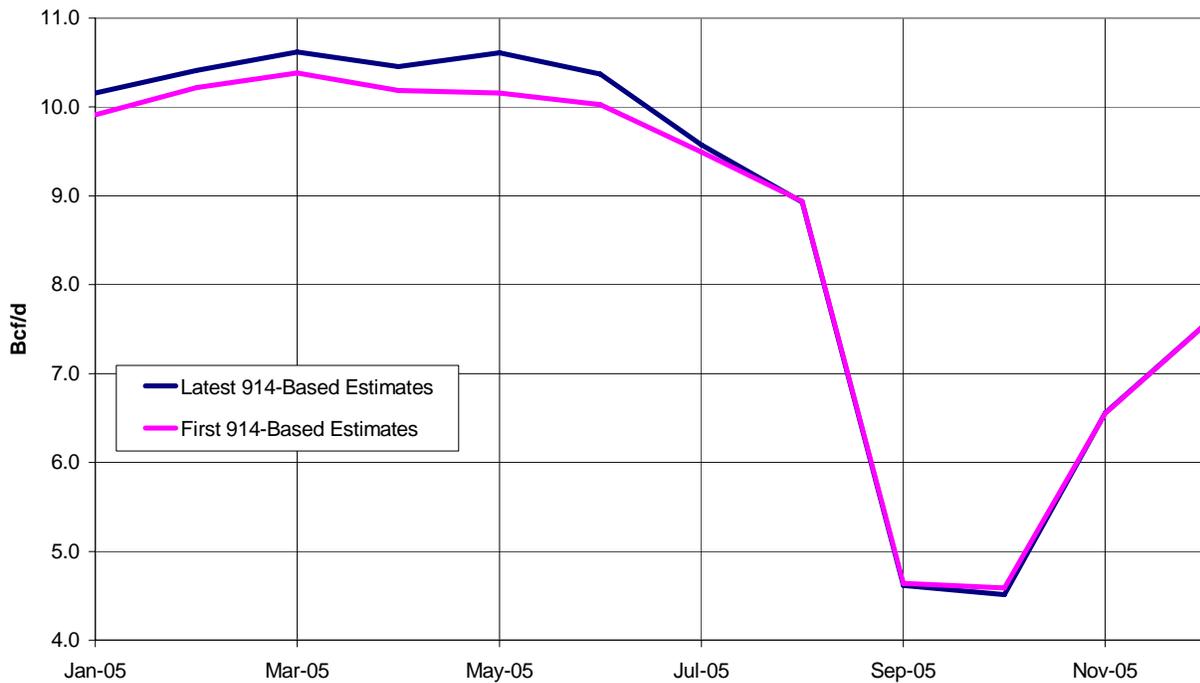
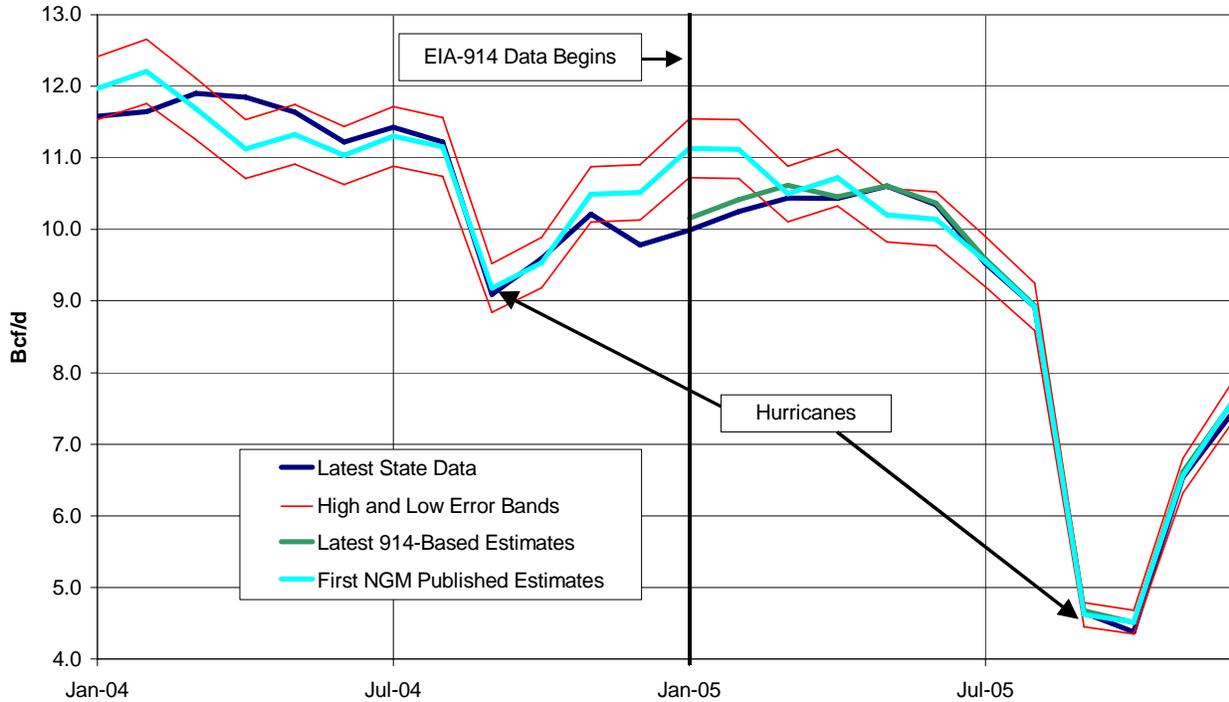


Figure 3D shows the average error bands for GOM. The error bands were constructed by determining the average absolute error for production estimates using previous methods for 6 years of estimates (1997 – 2002). The average absolute error was applied to the production estimates from the *NGM* as a positive and a negative and then plotted as an error band above and below the *NGM* production estimates. As can be seen in the following graph, the EIA-914 based estimates generally continue within the error bands around the estimates from the *NGM* while being published 2 months earlier.

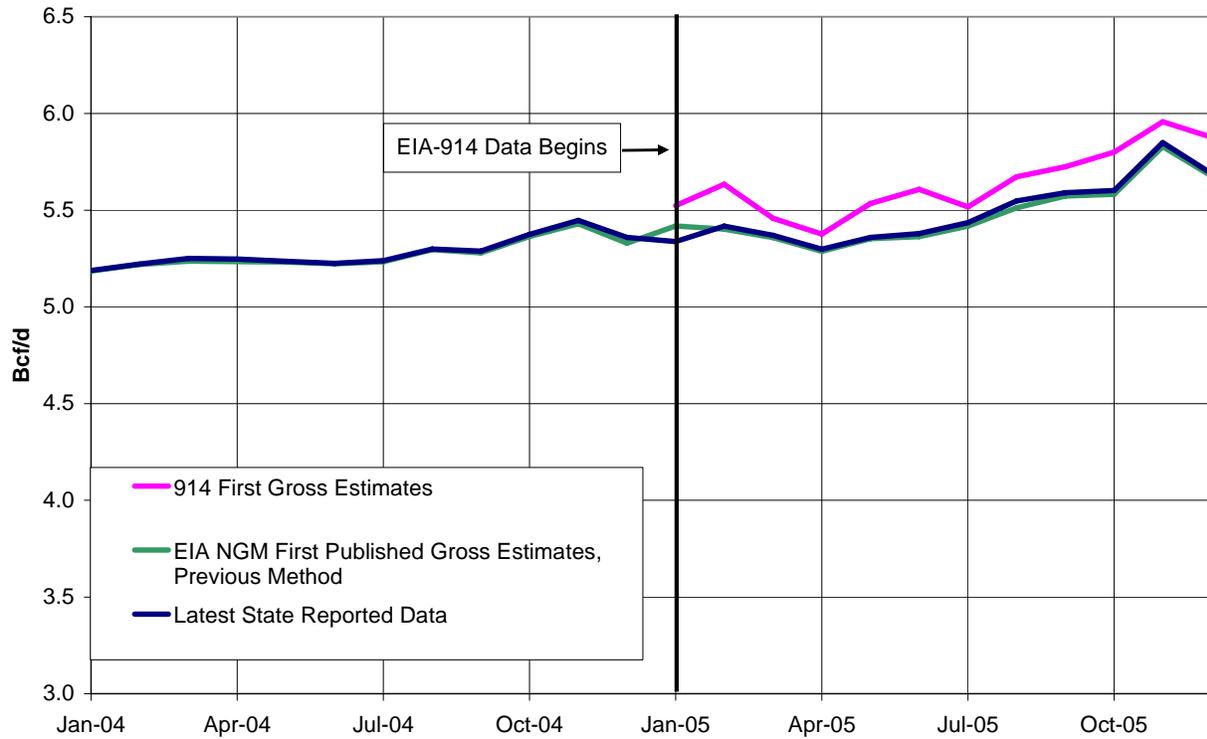
Figure 3D. Gulf of Mexico Federal Offshore Gross Natural Gas Production with 4-Percent Error Bands



EIA-914 Comparisons for Wyoming

Figure 4A shows the Wyoming comparison of EIA-914 first gross estimates to *NGM* first published gross estimates (previous method) and the latest State data. The estimates are generally running parallel. A few corrections and resubmissions were made in Wyoming. Some of the corrections that were made as a result of the EIA 914 survey interaction with respondents were actually made to the State reported data not the EIA-914 data.

Figure 4A. Wyoming Gross Natural Gas Production Comparison



Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Reported Data Percent Change from Last Month
Jan-05	5.524	5.419	5.336			
Feb-05	5.634	5.402	5.415	2.00	-0.31	1.48
Mar-05	5.458	5.359	5.370	-3.12	-0.80	-0.84
Apr-05	5.377	5.288	5.300	-1.50	-1.33	-1.30
May-05	5.534	5.352	5.357	2.93	1.23	1.08
Jun-05	5.607	5.363	5.369	1.32	0.20	0.23
Jul-05	5.517	5.417	5.425	-1.61	1.01	1.03
Aug-05	5.673	5.513	5.538	2.82	1.77	2.09
Sep-05	5.725	5.573	5.574	0.92	1.10	0.65
Oct-05	5.800	5.582	5.548	1.31	0.16	-0.48
Nov-05	5.958	5.829		2.72	4.42	
Dec-05	5.878	5.677		-1.34	-2.61	

*Bcf/d = Billion cubic feet per day

Figure 4B compares the latest Wyoming State data to the EIA-914 based estimates. The two methods generally have the same magnitude and the same trends. However, the EIA-914 estimates appeared to be 2 to 3 percent too high and were revised to correct deficiencies in the frame.

Figure 4B. Wyoming Gross Natural Gas Production

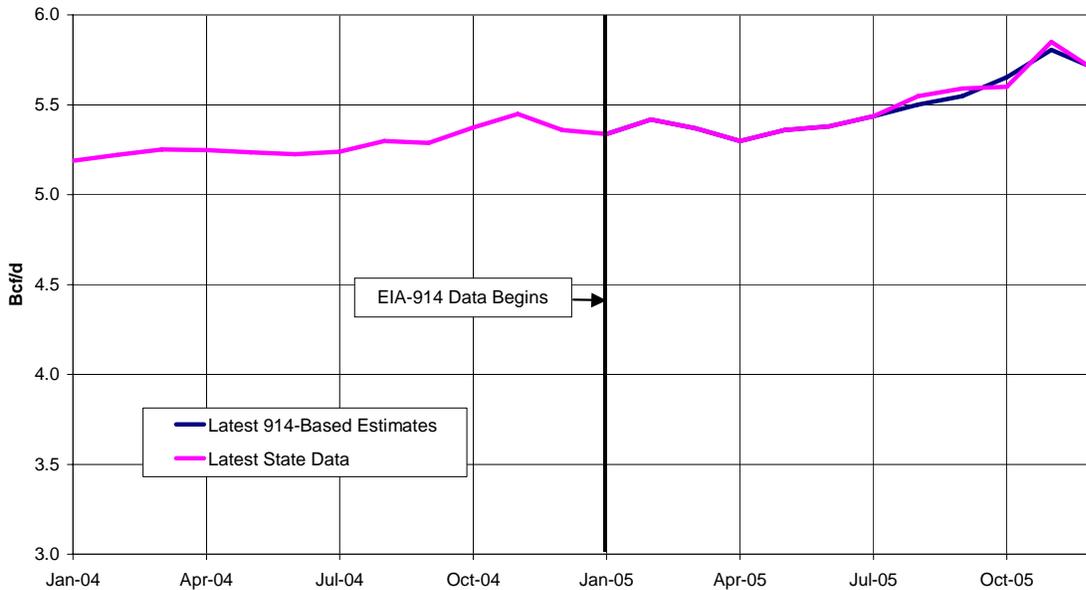


Figure 4C shows the first and latest EIA-914 based estimates for Wyoming. The last half of the year shows close agreement between the two estimates. The first half of the year indicates some small corrections and revisions that resulted from EIA-914 team analysis and feedback to the respondents.

Figure 4C. Wyoming 914-Based Gross Natural Gas Production Estimates

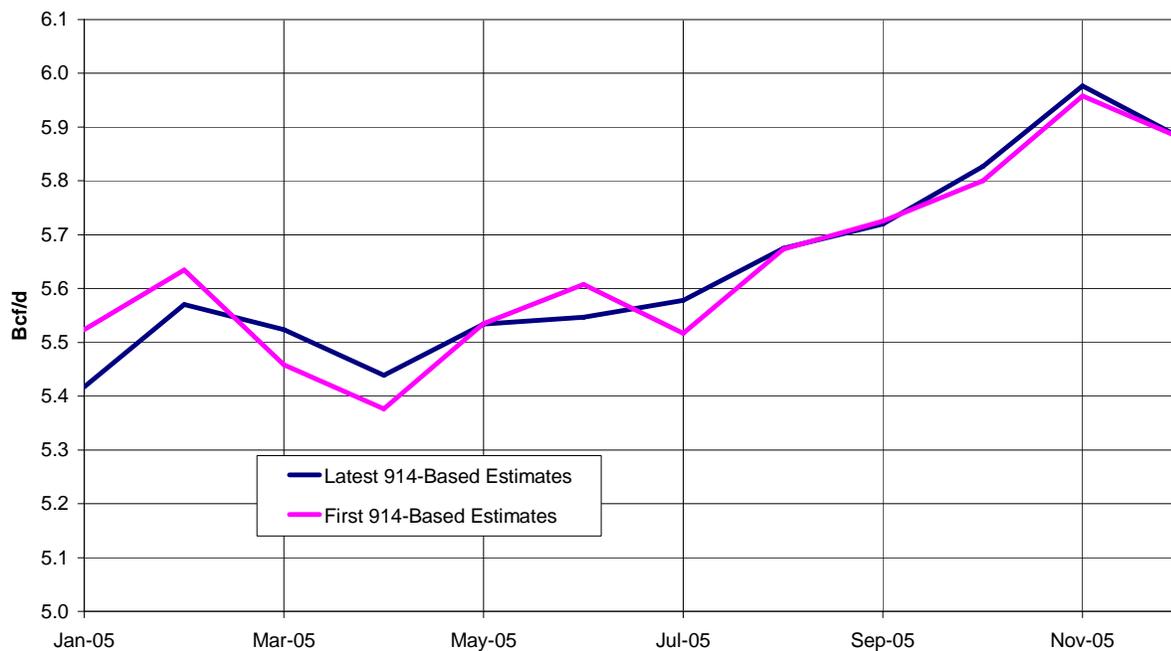
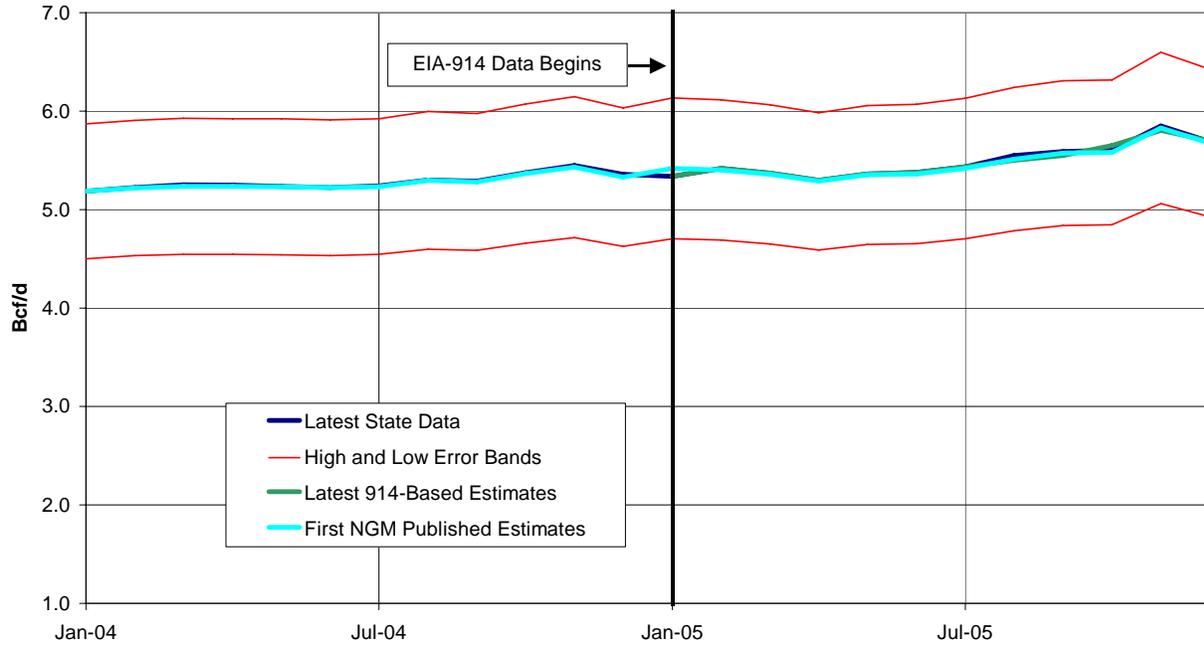


Figure 4D shows the average error bands for Wyoming. The EIA-914 based estimates are on trend with the previous estimates and remain well within the average error bands. The first published estimates in 2004 are also well within the average error bands although this hasn't always been the case as indicated by the wide 13-percent average error bands.

Figure 4D. Wyoming Gross Natural Gas Production with 13-Percent Error Bands



EIA-914 Comparisons for New Mexico

Figure 5A shows the New Mexico comparison of EIA-914 first gross estimates to *NGM* first published gross estimates (previous method) and the latest State data. The estimates are in agreement in New Mexico. An adjustment for CO₂ field production was made after comparing company data reported to the State and to the EIA-914 that identified a difference in handling the CO₂ field production reports.

Figure 5A. New Mexico Gross Natural Gas Production Comparison

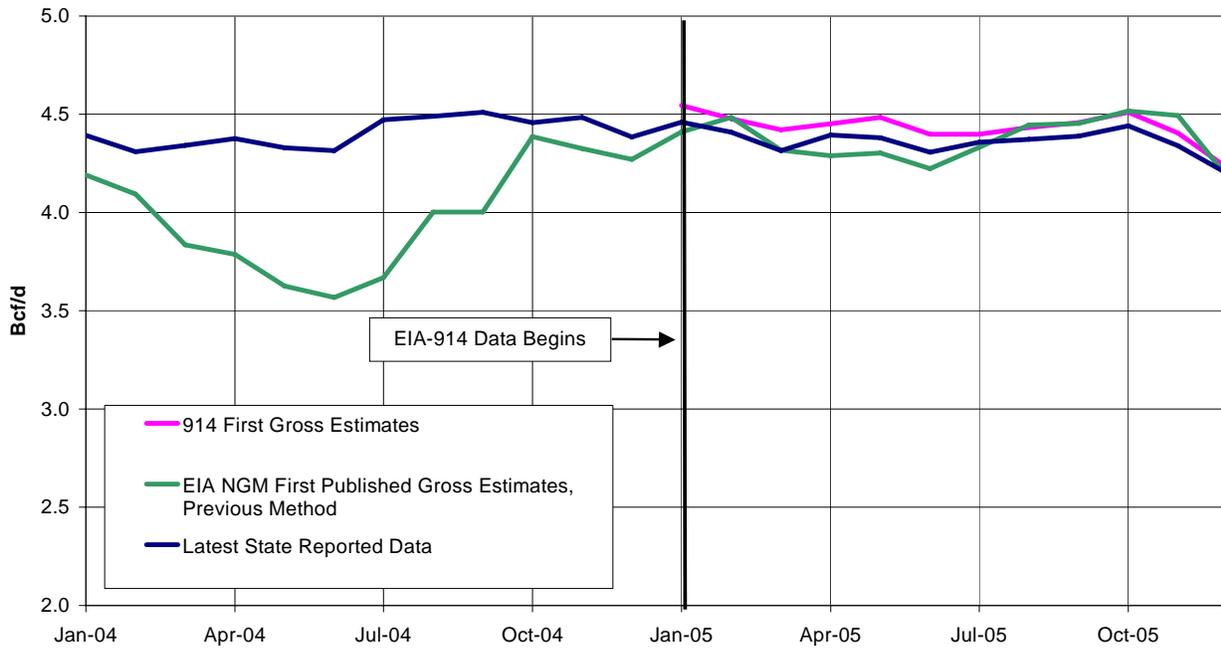


Table 5. New Mexico Gross Natural Gas Production Data

Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Reported Data Percent Change from Last Month
Jan-05	4.544	4.411	4.564			
Feb-05	4.478	4.484	4.503	-1.45	1.67	-1.34
Mar-05	4.421	4.318	4.419	-1.28	-3.72	-1.87
Apr-05	4.451	4.289	4.505	0.67	-0.66	1.94
May-05	4.484	4.302	4.494	0.74	0.30	-0.23
Jun-05	4.399	4.224	4.407	-1.89	-1.81	-1.96
Jul-05	4.398	4.331	4.464	-0.03	2.52	1.31
Aug-05	4.433	4.446	4.490	0.80	2.65	0.58
Sep-05	4.457	4.454	4.530	0.54	0.18	0.89
Oct-05	4.510	4.516	4.638	1.18	1.40	2.39
Nov-05	4.404	4.494		-2.34		
Dec-05	4.226	4.178		-4.04		

*Bcf/d = Billion cubic feet per day

Figure 5B compares the latest New Mexico State data to the 914-based estimates. The two data series generally have the same magnitude and the same trends.

Figure 5B. New Mexico Gross Natural Gas Production

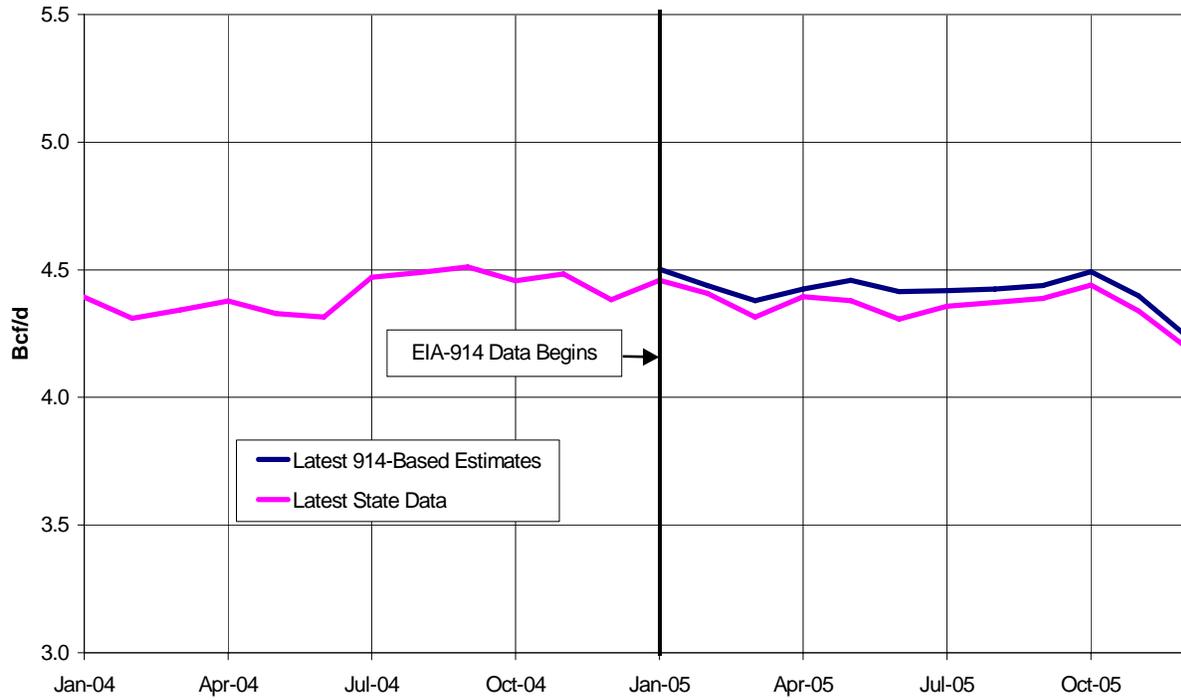


Figure 5C shows the first and latest EIA-914 based estimates for New Mexico. Early differences in the two estimates are due to the incorrect reporting of CO₂ volumes in addition to the normal startup corrections and revisions.

Figure 5C. New Mexico 914-Based Gross Natural Gas Production Estimates

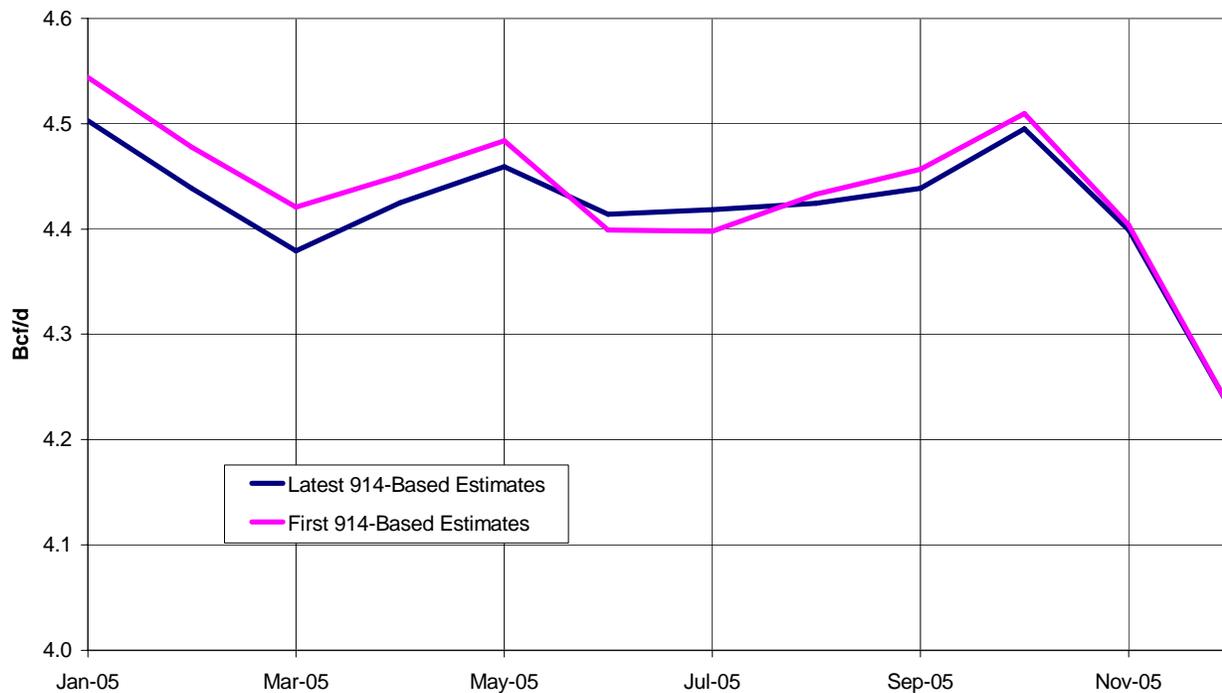
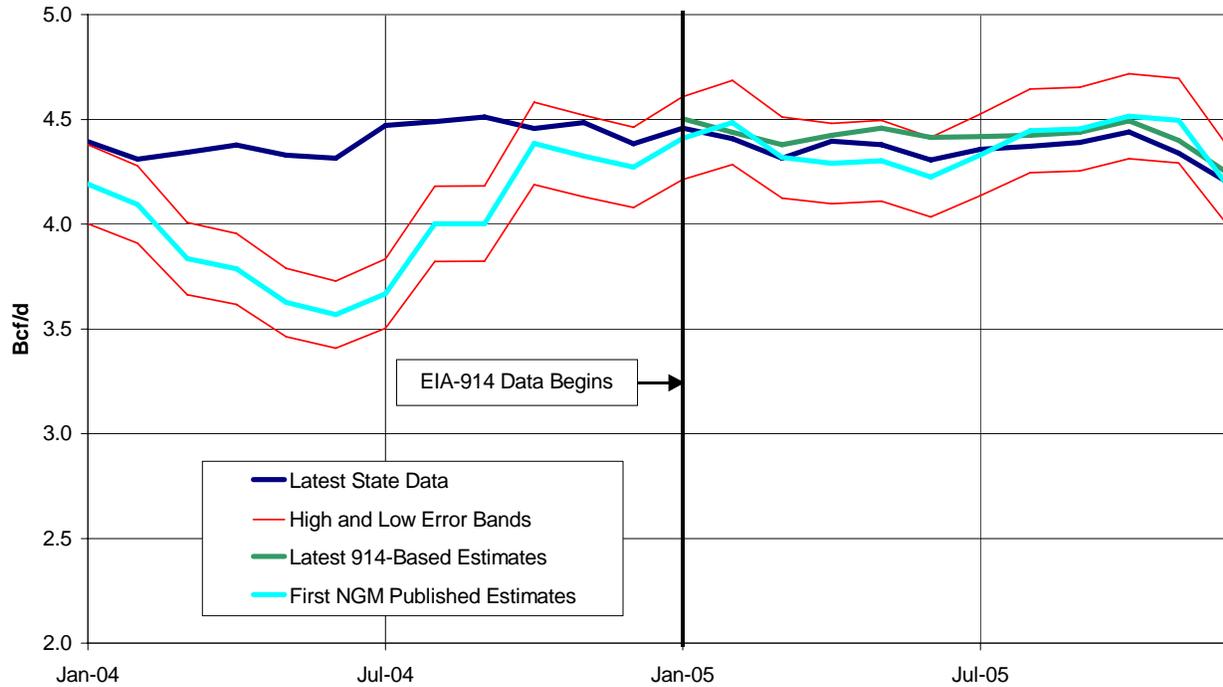


Figure 5D shows the average error bands for New Mexico. The EIA-914 based estimates continue on trend from the previous method estimates and are well within the average error bands. Note that in 2004 the first published estimates were in error by almost 20 percent in June.

Figure 5D. New Mexico Gross Natural Gas Production with 4-Percent Error Bands



EIA-914 Comparisons for Louisiana

Figure 6A shows the Louisiana comparison of EIA-914 first gross estimates to *NGM* first published gross estimates (previous method) and the latest State data. In Louisiana, the difference between the EIA-914 based estimates and the previous method estimates was more than expected early in 2005. However, in recent months the estimates have come together. There were some small corrections and revisions to the EIA-914 submissions.

Figure 6A. Louisiana Gross Natural Gas Production Comparison

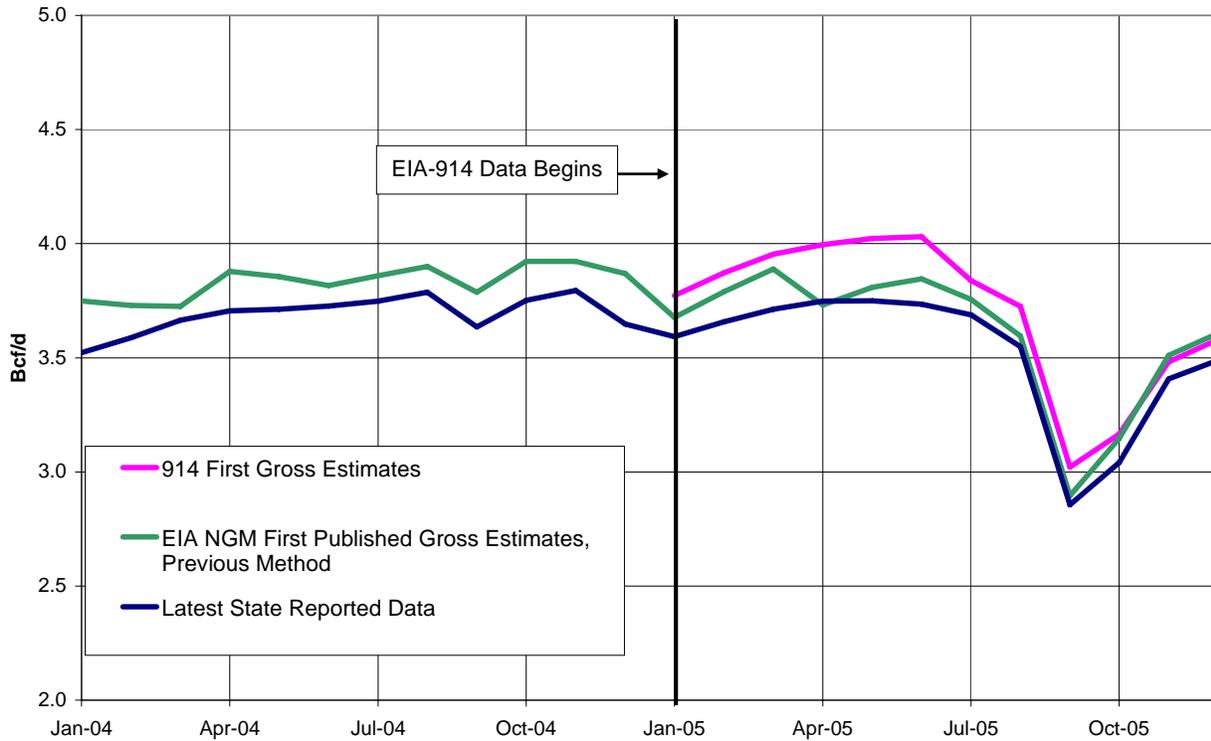


Table 6. Louisiana Gross Natural Gas Production Data						
Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Reported Data Percent Change from Last Month
Jan-05	3.772	3.677	3.676			
Feb-05	3.872	3.789	3.730	2.66	3.04	1.49
Mar-05	3.954	3.889	3.786	2.11	2.65	1.50
Apr-05	3.995	3.731	3.823	1.03	-4.07	0.97
May-05	4.023	3.809	3.823	0.70	2.09	0.00
Jun-05	4.031	3.846	3.796	0.19	0.96	-0.72
Jul-05	3.838	3.755	3.742	-4.78	-2.35	-1.41
Aug-05	3.726	3.596	3.614	-2.93	-4.24	-3.42
Sep-05	3.021	2.896	2.901	-18.91	-19.48	-19.72
Oct-05	3.165	3.147		4.77	8.68	
Nov-05	3.482	3.510		9.99		
Dec-05	3.580	3.608		2.83		

*Bcf/d = Billion cubic feet per day

Figure 6B compares the latest Louisiana State data to the 914-based estimates. The two methods generally have the same magnitude and the same trends. The large month-to-month changes in Louisiana are real. They are caused when production was shut in for hurricanes.

Figure 6B. Louisiana Gross Natural Gas Production

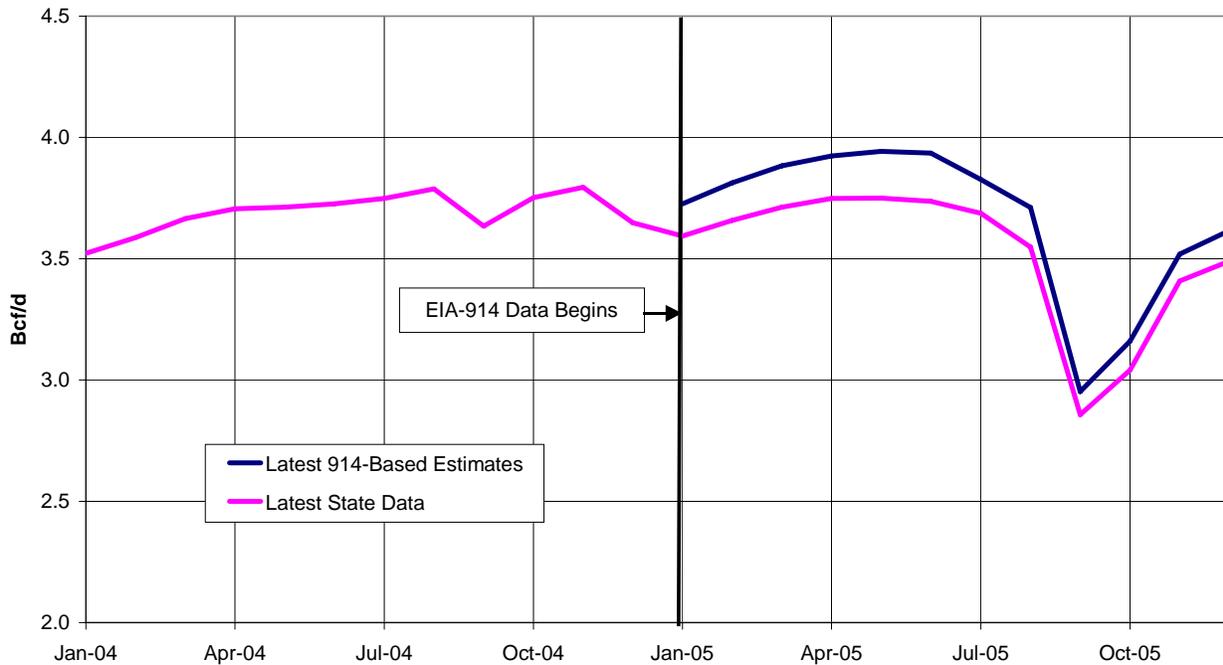


Figure 6C shows the first and latest EIA-914 based estimates for Louisiana. Early differences in the two estimates are due to some small corrections and the normal revisions expected in the beginning of a new survey.

Figure 6C. Louisiana 914-Based Gross Natural Gas Production Estimates

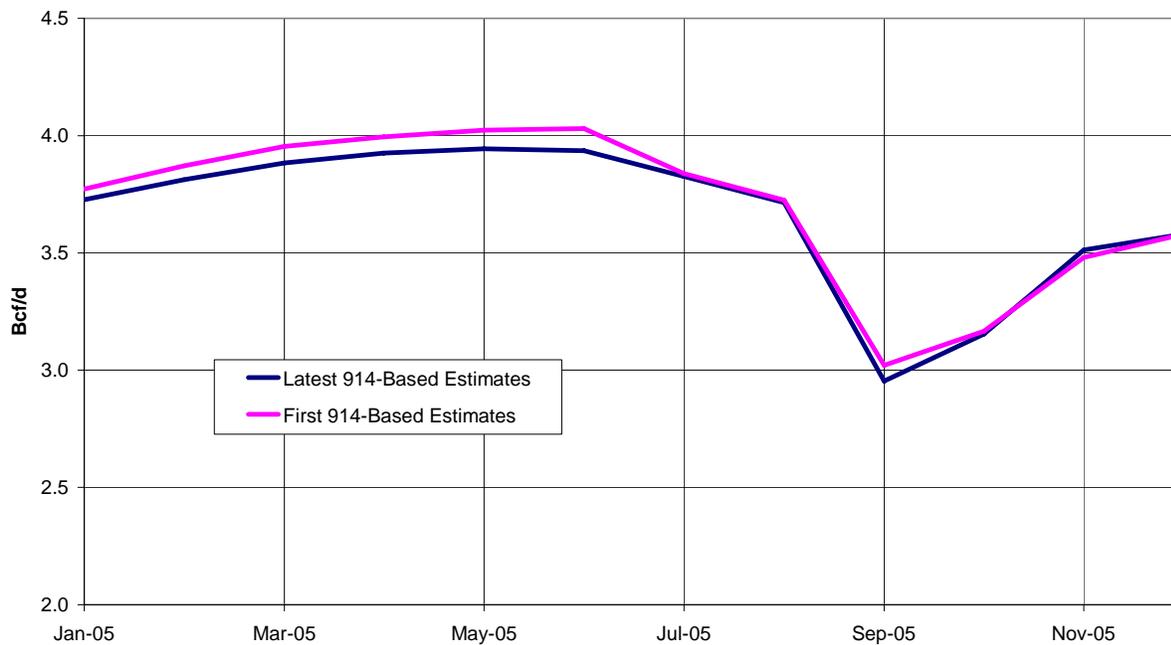
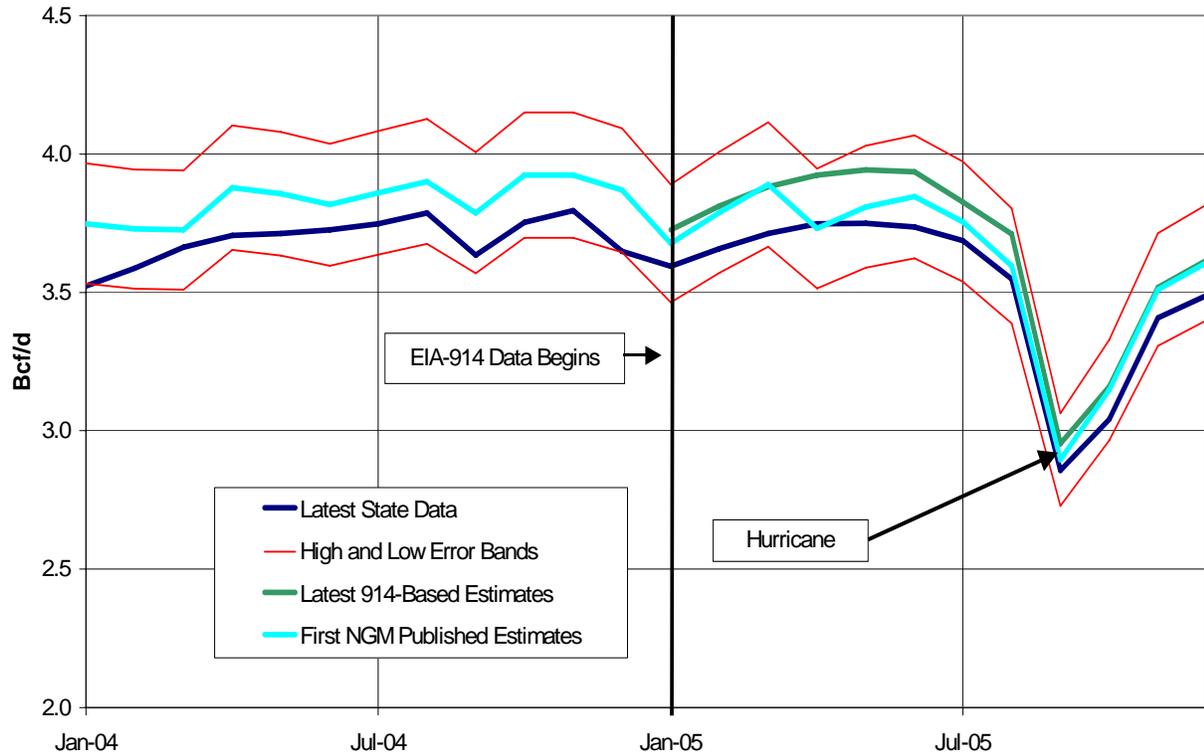


Figure 6D shows the error bands for Louisiana. The EIA-914 based estimates follow the trend of the previous estimates in 2004. Hurricanes in the fall of 2005 dramatically reduced the State's production. The first published estimates in 2004 are within the average error bands including the hurricane event in the fall.

Figure 6D. Louisiana Gross Natural Gas Production with 6-Percent Error Bands



EIA-914 Comparisons for Other States

Figure 7A shows the Other States comparison of EIA-914 first gross estimates to *NGM* first published gross estimates (previous method) and the latest estimates based on current State data. (Actual State production data are not available for the Other States as they are for the previous States figures.) The two estimates generally show the same magnitude. The estimates from the previous method are somewhat erratic while the EIA-914 based estimates are smoother.

**Figure 7A. Other States (Excluding Alaska)
Gross Natural Gas Production Comparison**

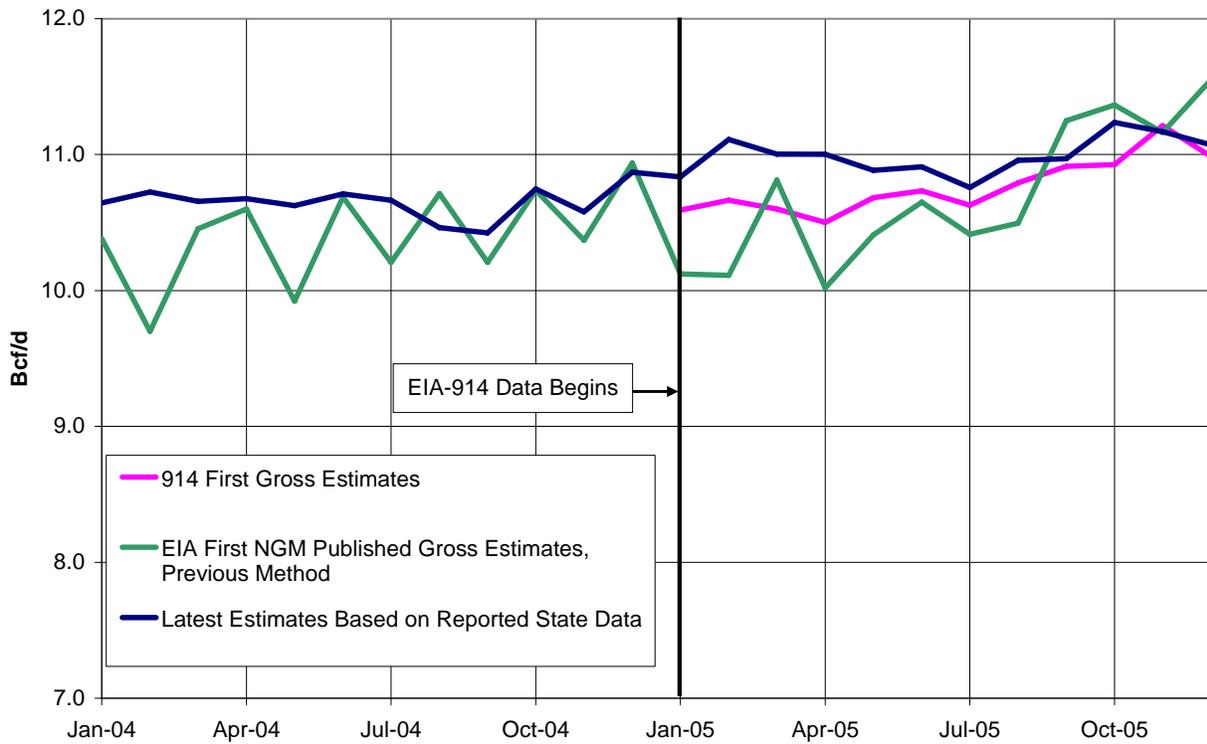


Table 7. Other States Gross Natural Gas Production Data

Report Month	1st 914 Estimate, (Bcf/d)*	1st NGM Published Estimate, (Bcf/d)*	Latest State Reported Data, @ 14.73 psia (Bcf/d)*	1st 914 Estimate Percent Change from Last Month	1st NGM Estimate Percent Change from Last Month	Latest State Data Estimate Percent Change from Last Month
Jan-05	10.591	10.122	10.836			
Feb-05	10.664	10.112	11.112	0.69	-0.10	2.54
Mar-05	10.600	10.812	11.003	-0.60	6.92	-0.97
Apr-05	10.501	10.019	11.002	-0.94	-7.34	-0.01
May-05	10.682	10.409	10.883	1.72	3.90	-1.08
Jun-05	10.734	10.650	10.911	0.48	2.32	0.25
Jul-05	10.627	10.413	10.758	-0.99	-2.23	-1.40
Aug-05	10.791	10.496	10.958	1.54	0.79	1.85
Sep-05	10.913	11.250	10.970	1.13	7.19	0.11
Oct-05	10.926	11.366	11.237	0.12	1.03	2.44
Nov-05	11.214	11.162	11.170	2.64	-1.79	-0.60
Dec-05	10.986	11.552	11.072	-2.03	3.49	-0.88

*Bcf/d = Billion cubic feet per day

Figure 7B compares the latest State data estimates for the Other States to the 914-based estimates. (Actual State production data are not available for the Other States as they are for the previous States figures.) The two methods generally have the same magnitude and the same trends. Since the Other States estimates are based on the five main surveyed States, they exhibit a similar pattern.

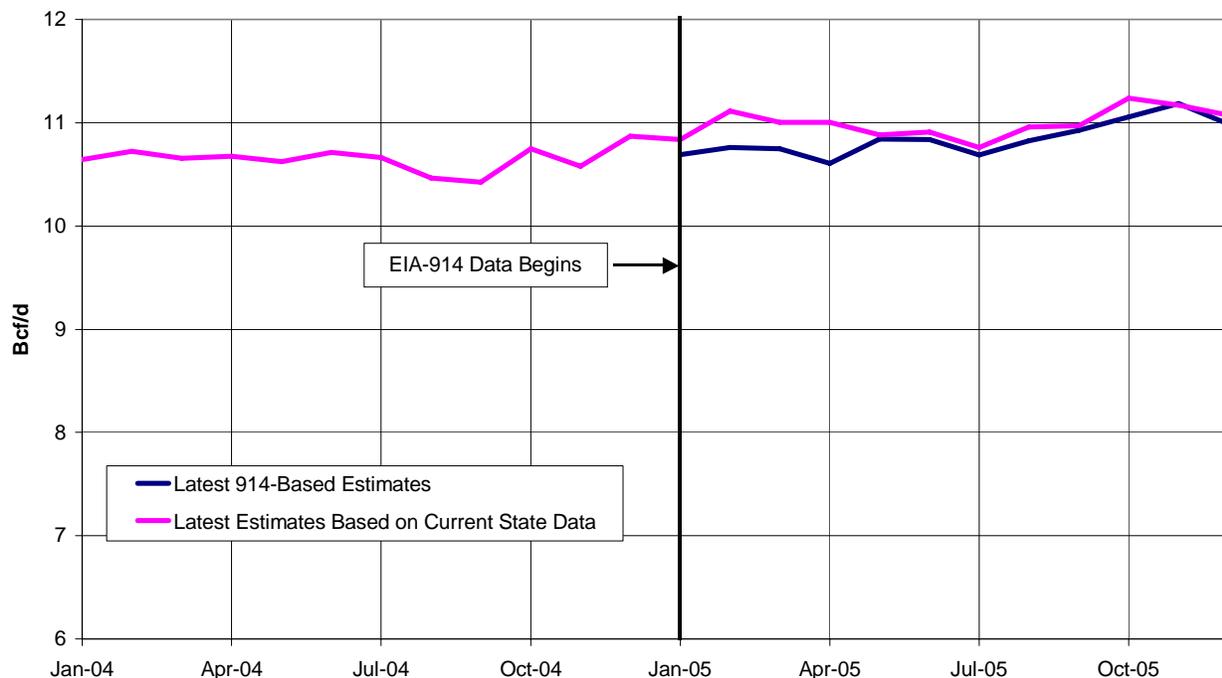
Figure 7B. Other States Gross Natural Gas Production

Figure 7C shows the first and latest EIA-914 based estimates for the Other States. Since the Other States estimates are based on the five main States they show the same pattern of converging estimates reflecting startup corrections and revisions.

Figure 7C. Other States 914-Based Gross Natural Gas Production Estimates

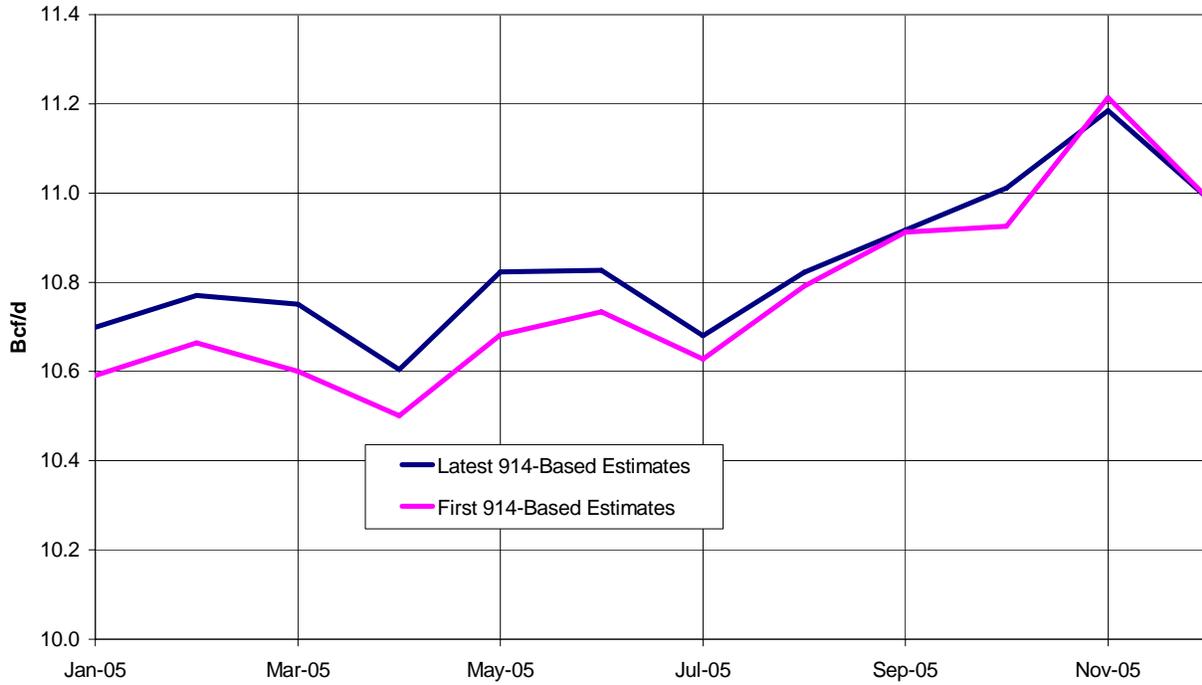


Figure 7D shows the average error bands for the Other States. The EIA-914 based estimates are generally on trend and the same magnitude as the latest previous estimates and generally within the average error bands. The separation that appears early in 2005 fades later in the year as the two estimates converge. The latest estimates based on State data in 2005 are likely to have revisions in the future. (Actual State production data are not available for the Other States as they are for the previous figures.)

Figure 7D. Other States Gross Natural Gas Production with 4-Percent Error Bands

