Independent Statistics & Analysis
U.S. Energy Information Administration

Supporting Statement for Survey Clearance

Part B: Collections of Information Employing Statistical Methods

Form EIA-176, Annual Report of Natural and Supplemental Gas Supply and Disposition,

Form EIA-191, Monthly and Annual Underground Natural Gas Storage Report,

Form EIA-757, Natural Gas Processing Plant Survey,

Form EIA-857, Monthly Report of Natural Gas Purchases and Deliveries to Consumers,

Form EIA-910, Monthly Natural Gas Marketer Survey, and

Form EIA-912, Weekly Underground Natural Gas Storage Report.

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B. STATISTICAL METHODS

B.1. Respondent Universe

B.1.1. Form EIA-176

Form EIA-176 is a census survey collecting data from all known interstate and intrastate natural gas pipeline companies; natural gas distributors; underground natural gas storage operators; synthetic natural gas plant operators; field, well, and processing plant operators that transport gas across state borders and/or deliver gas directly to consumers; and marine terminals that import and export liquefied natural gas (LNG). There are currently approximately 2,050 active respondents filing the Form EIA-176. Respondents are required to complete all relevant data items on the form.

EIA has an established procedure for both follow-up of nonrespondents and for verification of data filed.

Data filed on Form EIA-176 are aggregated by computer and undergo a series of mathematical checks for reasonableness and accuracy. Because Form EIA-176 is a census survey, the data are not subjected to any statistical sampling procedures.

B.1.2. Form EIA-191

Form EIA-191 collects data from all underground natural gas storage operators. There are currently approximately 145 active respondents filing the Form EIA-191. Nonrespondents or late filers are contacted by telephone to assure timeliness of this monthly survey. Previous months' data are used for imputing for nonresponders. No other statistical procedures are employed.

B.1.3. Form EIA-910

Form EIA-910 surveys all active natural gas marketers selling to residential and/or commercial consumers in Georgia, New York, and Ohio. There are currently approximately 100 active respondents filing the Form EIA-910. Nonrespondents, late filers, or companies filing questionable data are contacted and required to file or resubmit questionable filings.

B.1.4. Form EIA-757

Form EIA-757, Schedule A is a census of approximately 600 active natural gas processing plant operators in the United States. Schedule B collects data only if there is a disruption of natural gas supplies. Respondents to Schedule B would be selected from those companies in the frame that are affected by the supply disruption. The selection of respondents to Schedule B, the frequency of the survey submissions, and the corresponding reporting due-date, will be determined at the time Schedule B is activated in response to the supply emergency. Factors that will be considered in identifying the respondents include: the geographic location of the supply emergency, the size and number of processing plants in the supply disruption area, and the utility of the information vis-à-vis the U.S. natural gas delivery system and the burden to respondents. The list of needed respondents to Schedule B would be determined at the time the Schedule is activated in response to a natural gas supply disruption.

B.1.5. Form EIA-857

Form EIA-857 is a sample of approximately 330 companies from a universe of approximately 1,300 companies delivering natural gas to consumers including local distribution companies, interstate pipelines, and intrastate pipelines that report on the survey for 2017. Data for nonrespondents are estimated using the classical ratio estimator, the same way out-of-sample cases are estimated.

B.1.6. Form EIA-912

Form EIA-912 is a sample drawn from the list of the approximately 145 respondents to Form EIA-191, *Monthly Underground Natural Gas Storage Report*, for the purpose of preparing estimates of natural gas working volumes in underground storage facilities in each of the five regions. Form EIA-191 is completed by all operators of underground natural gas storage facilities in the United States. Up to 95 of the 145 underground natural gas storage operators are in Form EIA-912 sample. Data for nonrespondents are imputed by treating the non-respondent as a company not reporting on weekly survey, or by using company-specific linear extrapolation based on the most recent data.

B.2. Sampling Methodology and Estimation Procedures

B.2.1. Methodology for Form EIA-857, Monthly Report of Natural Gas Purchases and Deliveries to Consumers

The Form EIA-857 implements a monthly sample survey of companies delivering natural gas to consumers. It includes interstate and intrastate pipeline companies and local distribution companies.

The survey provides data that are used each month to estimate the volume of natural gas delivered and the price for direct sales by utilities of natural gas by state to three consumer sectors: residential, commercial, and industrial.

The sample for Form EIA-857 survey of *Monthly Report of Natural Gas Purchases and Deliveries to Consumers* is drawn from the frame for Form EIA-176 *Annual Report of Natural and Supplemental Gas Supply and Disposition*. If prior historical patterns continue through the renewal period 2018-2020, EIA projects Form EIA-176 frame will consist of approximately 2,050 suppliers in scope for Form EIA-857 and hence eligible for sampling. The sample was selected independently for each of the 50 states and the District of Columbia. Each selected company is required to complete and file the Form EIA-857 on a monthly basis

One of the purposes of the sample is to provide a ratio useful for adjusting the monthly state sector volumes in the sample to generate more accurate estimates of the actual state sector monthly volumes. In cases where at most two suppliers in a state service a particular sector, all suppliers are included in the cut off sample. In states with more than two suppliers in a sector, the cut off sample is constructed by adding suppliers in descending order of volume until the change in the ratio of interest is considered statistically insignificant.

The cutoff sample design typically yielded approximately 330 respondents for Form EIA-857 during 2014-2017. This should remain around the same for 2018-2020.

B.2.1.1. Estimation Procedures

Estimates of Volumes. To estimate the total gas sales and deliveries for the state, a ratio estimator is applied to the reported volumes in each state for the sampled companies.

Ratio estimators are calculated for each consumer sector — residential, commercial, and industrial — in each state where companies are sampled using annual data from the most recent submission of Form

EIA-176.

The formula for calculating the ratio estimator ($T_{.j}$) for the volume of gas in a state for consumer sector j is:

$$T_{.j} = \frac{\sum_{i \varepsilon S} y_{ij}}{\sum_{i \varepsilon S} x_{ij}}$$

where:

y_{ij} = the monthly volume within a state for sector j and company i that is an element of Form EIA-857 sample, s,

x_{ij} = the annual volume within a state for sector j and company i that is an element of Form EIA-857 sample, s.

The ratio estimator is applied as follows:

$$V_{.j} = T_{.j} * X_{.j} \qquad (2)$$

where:

$V_{.j}$ = the estimate of monthly gas volumes in a state for consumer sector *j*,

$X_{.j}$ = the annual volume within a state for sector j for all companies.

The estimation of residential and commercial consumption requires one additional step than the industrial sector. In this extra step the company level reported volumes are adjusted using sendout volume. Sendout is the total volume of gas dispatched for delivery during a calendar month. It should be

noted that the adjusted volumes for the residential and commercial sector are used in equation 2.

The adjustment is implemented by taking reported sendout and removing gas that is consumed in company operations and distribution use as well as gas delivered to electric power, industrial, and vehicle use sectors. The remaining gas is allocated to the residential and commercial sectors proportionally based on reported totals for the report month.

The formulas for adjusting the reported residential and commercial volumes at the company level are:

$$Radj = (SO*(1-Oth)-EP-IN)*\frac{R}{R+C} \qquad (3)$$

$$Cadj = (SO*(1-Oth)-EP-IN)*\frac{C}{R+C} \qquad (4)$$

where:

R_{adj} = sendout adjusted residential volume,

C_{adj} = sendout adjusted commercial volume,

SO = sendout volume,

Oth = ratio of annual distribution use and vehicle fuel to total deliveries,

EP = reported electric power volume,

IN = reported industrial volume,

R = reported residential volume,

C = reported commercial volume.

Computation of Natural Gas Prices. The following describes the current monthly price calculation EIA employs using data from Form EIA-857.

The natural gas volumes that are included in the computation of prices represent only those volumes associated with natural gas sales by natural gas companies except as explained below.

The price of natural gas within a state for sector j is calculated as follows:

$$P_j = \frac{R_j}{V_j} \qquad (5)$$

where:

P_j = the average price for gas sales within a state for consumer sector j,

R_j = the reported revenue from natural gas sales within a state for consumer sector j,

V_j = the reported volume of natural gas sales within a state for consumer sector j.

All average prices are weighted by their corresponding sales volume estimates when national average prices are computed.

The monthly average prices of natural gas to residential and commercial consumers in Georgia, New York, and Ohio are monthly average prices of natural gas, based on total sales (sales by local distribution companies and natural gas marketers). Volumes of gas delivered for the account of others to these consumer sectors are not included in the state or national average prices except in these states.

The price of natural gas in the residential and commercial sectors where EIA-910 data are used is calculated as follows:

$$P_c = \left[\left(\frac{R_s}{V_s}\right)*\left(\frac{V_s}{V_s+V_t}\right)\right] + \left[\left(\frac{Rm_s}{Vm_s}\right)*\left(\frac{V_t}{V_s+V_t}\right)\right] \qquad (6)$$

where:

P_c = the combined average price for gas sales by local distribution companies and marketers within the state in sector s (residential or commercial),

R_s = the reported revenue from natural gas sales by local distribution companies within the state in sector *s* (residential or commercial),

V_s = the reported volume of natural gas sales by local distribution companies within the state in sector *s* (residential or commercial),

V_t = the reported volume of natural gas transported by local distribution companies for marketers within the state in sector *s* (residential or commercial),

(5

Rm_s = the reported revenue from natural gas sales by marketers within the state in sector *s* (residential or commercial),

Vm_s = the reported volume of natural gas sales by a marketer within the state in sector *s* (residential or commercial).

All natural gas prices to the residential sector represent onsystem sales volumes only except in states where EIA-910 data are used.

Imputation for Nonrespondents and Edit Failures. A volume for each delivered and transported consumer category is imputed for companies that fail to respond in time for inclusion in the published estimates (unit nonresponse) or for which reported volumes have failed the edit and not been confirmed or corrected (item nonresponse).

In order to simplify the imputation process, EIA has tested and implemented a new imputation method that treats missing or invalid data as nonsampled and estimate its value based on the method described above for "estimation procedures".

In the case of item nonresponse for sendout, the residential and commercial sectors default to the reported values. Item nonresponse for all other items is handled in the same manner as unit nonresponse.

Estimation of Revenue. The company's previous month's sector-specific price is multiplied by the corresponding sales volume to impute revenue for that sector.

Adjusting Monthly Data to Annual Data. After the annual data reported on the Form EIA-176 have been submitted, edited, and prepared for publication in the *Natural Gas Annual*, revisions are made to monthly data.

The revisions are made to the volumes and prices of natural gas delivered to consumers that have appeared in the *Natural Gas Monthly* (*NGM*) to match them to the annual values appearing in the *Natural Gas Annual*.

The revised monthly estimates allocate the difference between the sum of monthly estimates and the annual reports, according to the distribution of the estimated values across the months.

Before the final revisions are made, changes or additions to submitted data received after publication of the monthly estimate and not sufficiently large to require a revision to be published in the *NGM*, are used to derive an updated estimate of monthly consumption and revenues for each state's residential, commercial, or industrial natural gas consumption.

For each state, two numbers are revised, the estimated consumption and the estimated price per thousand cubic feet.

The formula for revising the estimated consumption is:

$$V^{i}_{jm} = V_{jm}\left(\frac{V_{ja}}{V'_{jm}}\right) \qquad\qquad (7)$$

where:

$V^*{}_{jm}$ = the final volume estimate for month m in consumer sector j,

V_{jm} = the estimated volume for month m in consumer sector j,

V_{ja} = the volume for the year reported on Form EIA-176,

V'_{jm} = the annual sum of estimated monthly volumes.

The price is calculated as described above in the Estimation Procedures section, using the final revised consumption estimate and a revised revenue estimate.

The formula for revising the estimated revenue is:

$$R^{*}_{jm} = R_{jm}\left(\frac{R_{ja}}{R'_{jm}}\right) \qquad (8)$$

where:

R^{*}_{jm} = the final revenue estimate for month m in consumer sector j,

R_{jm} = the estimated revenue for month m in consumer sector j,

R_{ja} = the revenue for the year reported on Form EIA-176,

R'_{jm} = the annual sum of estimated monthly revenues.

Revision of Volumes and Prices for Deliveries to Electric Power Sector. Revisions to monthly deliveries to the electric power sector are published throughout the year as they become available.

Reliability of Monthly Data. The monthly data published in this report are subject to two sources of error: nonsampling error and sampling error. Nonsampling errors occur in the collection and processing of the data.

Sampling error may be defined as the difference between the results obtained from a sample and the results that a complete enumeration would provide. The standard error statistic is a measurement of sampling error.

Standard Errors. A standard error of an estimate is a statistical measure that indicates how the estimate from the sample compares to the result from a complete enumeration.

The standard errors for monthly natural gas volume and price estimates by state are published monthly in the *Natural Gas Monthly*. They are constructed so that over the long run the true value is within two standard errors of its estimate 95% of the time. For volume estimates, the relative standard error (RSE) is published as a percent. Standard errors of prices are expressed in dollars.

The relative standard error of a natural gas volume estimate is the square root of the variance of the estimate divided by the published volume. The formula for calculating the variance of the volume

estimate is:

$$Var(V_{.j}) = \sigma_\epsilon^2 \sum_{i=n+1}^{N} x_{ij} + \left(\sigma_\epsilon^2 \big/ \sum_{i=1}^{n} x_{ij}\right)\left(\sum_{i=n+1}^{N} x_{ij}\right)^2 \qquad (9)$$

$$Var(V_{.j}) = \sigma_\epsilon^2 \sum_{i=n+1}^{N} x_{ij} + \left(\sigma_\epsilon^2 \big/ \sum_{i=1}^{n} x_{ij}\right)\left(\sum_{i=n+1}^{N} x_{ij}\right)^2$$

where:

$V_{.j}$ = the estimate of monthly gas volumes in a state for sector j,

$\sigma_\epsilon^2 = \sum_{i=1}^{n} \sigma_{0i}^2 \big/ (n-1), \ \sigma_\epsilon^2 = \sum_{i=1}^{n} \sigma_{0i}^2 \big/ (n-1),$ the sum of squared residuals,

$\sigma_{0i} = \dfrac{(y_{ij} - T_{.j} x_{ij})}{\sqrt{x_{ij}}}, \ \sigma_{0i} = \dfrac{(y_{ij} - T_{.j} x_{ij})}{\sqrt{x_{ij}}},$ the weighted residual for company i,

$T_{.j}$ = the ratio estimator defined in equation 1,

x_{ij} = the reported annual volume for company i in sector j,

y_{ij} = the reported monthly volume for company i in sector j,

n = sample size (i > n implies company i not in sample),

N = frame size.

As the price of natural gas is calculated as a quotient of revenue to volume, the approximate standard error of natural gas prices is derived using the variance properties of a quotient. The variance of revenue is calculated in the same manner as the volumes described in equation 9, with revenue substituted for volume. The formula is for calculating the approximate standard error of prices is below:

$$SE(P_j) = \sqrt{Var(P_j)} = \sqrt{Var\left(\frac{R_j}{V_j}\right)}$$

$$\i \sqrt{\left(\frac{E(R_j)}{E(V_j)}\right)^2 * \left(\frac{Var(R_j)}{E(R_j)^2} + \frac{Var(V_j)}{E(V_j)^2} - 2\left(\frac{Cov(R_j, V_j)}{E(R_j) * E(V_j)}\right)\right)} \qquad (10)$$

where:

P_j = natural gas price in sector j,

R_j = natural gas revenue in sector j,

V_j = natural gas volume in sector j,

$E(V_j)$ = expected value of volume in sector i, which is the $T._j * X_{ij}$ product in equation 2,

$E(R_j)$ = expected value of revenue in sector j calculated in the same manner as the $T._j * X_{ij}$ product in equation 2,

$Var(V_j)$ = the variance of volume in sector j calculated using equation 9,

$Var(R_j)$ = the variance of revenue in sector j calculated in the same manner as equation 9,

$Cov(V_{ij}, R_j)$ = the covariance between revenue and volume in sector.

B.2.2 Methodology for EIA-912, Weekly Natural Gas Storage Report

Sample Design

EIA prepares weekly estimates of working gas in storage using the methodology described below. The overall approach is to collect weekly survey data from a sample of operators of underground storage facilities and to prepare regional and national estimates based on the relationship between the weekly sample and the larger universe of storage operators reporting to EIA on the Form EIA-191, an existing monthly survey of the same population. The following describes the weekly survey form and survey processing procedures, the methodology for sample selection and estimation, and procedures relating to revisions and data security.

Survey Processing

The goal of the program is to provide weekly estimates of the level of working gas in underground storage for the Lower 48 states and five regions. The total volume of natural gas in underground storage reservoirs is classified as either base gas or working gas. Underground storage facilities may be reservoirs in depleted oil and gas fields, aquifers, or salt caverns.

The Form EIA-912 requests reports of the volumes of working gas in storage as of Friday at 9 a.m. Central Time of the previous week from a sample of underground natural gas storage operators. Respondents are asked to provide data representing working gas in storage fields their company operates in each of three regions of the United States. The five EIA storage regions are composed of the states below:

(1)   *South Central region*: Alabama, Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, and Texas;

(2)   *East region*: Connecticut, Delaware, District of Columbia, Florida, Georgia, Massachusetts, Maryland, Maine, New Hampshire, New Jersey, New York, North Carolina, Ohio, Pennsylvania, Rhode Island, South Carolina, Vermont, Virginia, and West Virginia;

(3)   *Midwest region*: Illinois, Indiana, Iowa, Kentucky, Michigan, Minnesota, Missouri, Tennessee and Wisconsin;

(4)   *Mountain region*: Arizona, Colorado, Idaho, Montana, Nebraska, Nevada, North Dakota, South Dakota, Utah, and Wyoming;

(5)   *Pacific region*: California, Oregon, and Washington.

Respondents are also instructed to submit revisions to data for previous weeks if those revisions are greater than 500 million cubic feet and to include notes explaining any unusual activity. Examples of unusual activity might include reclassification of working and base gas or changes in ownership or operation of storage fields.

EIA employs a number of editing processes to ensure that the data collected each week are accurate. For example, current week's data are compared with data reports for the previous week, to data reports from companies with facilities that are similar in size and type, and to compilations of the monthly data reports for the company's fields on EIA monthly storage form, EIA-191. EIA also employs secondary source information such as weather data and stock or net change predictions in evaluating the validity of reported data. Companies with responses outside the edit bounds or with notes about special issues are contacted by survey personnel for confirmation or correction. An explanation will be obtained and accommodated in the estimation process, if necessary.

Sampling and Estimation

The sample for Form EIA-912 is drawn from the list of respondents to Form EIA-191, *Monthly Underground Natural Gas Storage Report*, for the purpose of preparing estimates of natural gas in underground storage facilities in each of five regions. The Form EIA-191 is completed by all operators of underground natural gas storage fields in the United States. Approximately 145 underground natural gas storage operators report on Form EIA-191 for their operations at approximately 415 storage fields. To prepare the sampling frame for Form EIA-912 for each region, reported volumes of working gas in storage as reported on the Form EIA-191 are aggregated by storage operator and region.

For each region, two strata are formed: a certainty stratum from which all operators are selected and a noncertainty stratum from which other operators are selected with probability proportional to size. The certainty stratum consists of the larger operators in the region as well as all operators with storage fields in more than one region. The probability of selection for members of the noncertainty stratum is proportional to their working gas volume based on Form EIA-191 data. A stratified sample of companies is selected from the list of operators to achieve a target standard error of the estimate of working gas in storage that is no greater than 5 percent of the estimate for each region. The current sample of approximately 90 respondents accounts for more than 90 percent of the average reported working gas in storage in each region.

In the past, a special stratification was performed to distinguish salt and non-salt fields for the South Central region. Companies that operated at least one salt cavern field were designated salt companies if salt cavern operations constituted the majority of working gas storage volumes. However, because many companies in the region have significant volumes of both Salt and Nonsalt storage, EIA proposes to change this methodology by requesting that respondents allocate South Central Salt and Nonsalt volumes themselves on the survey form. Accordingly, sampling in the South Central Salt and Nonsalt regions will be performed in such a way that each of these strata achieve minimum coverage targets. This will increase the likelihood that respondents with both types of storage will be selected for the sample, as they will be eligible for selection in both strata.

The sample is reselected regularly with the new sample selected based on the working gas volumes submitted on Form EIA-191. Companies in the certainty stratum, because of their large size, may be expected to continue to qualify as certainty companies, but will be re-examined to determine if they still qualify for inclusion in the certainty stratum. Companies not qualifying for inclusion in the certainty stratum will be considered for sampling in the noncertainty stratum. Those selected from the noncertainty groups are subject to change during sample reselection.

The method of estimation uses both a 12-month moving average of working gas volumes (based on the latest published Form EIA-191 monthly data), and the latest EIA-912 weekly data. The trends exhibited by the data from the weekly sample group are used to estimate the latest weekly values for the storage operators not reporting on Form EIA-912. Each individual company outside the weekly sample is considered based on its own past history in the monthly data from Form EIA-191 survey and the weekly

behavior of sampled companies within the same stratum. These company-level weekly estimates of working gas stocks for the reporting and non-reporting operators are summed to form the weekly estimated total for each of the four noncertainty strata.

More specifically, for each company in Form EIA-191 frame, 12-month equal-weighted moving averages and corresponding standard deviations and coefficients of seasonal variation are computed as described below. For each weekly reporting company i, we calculate a company-level ratio, $r_{i,t}$, of the weekly stock volume reported in Form EIA-912 for week t ($w_{i,t}$) to the most recent available 12-month moving average of reported monthly stock volumes.

$$r_{i,t} = \frac{w_{i,t}}{\overline{m}_{i,T}},$$

$$\overline{m}_{i,T} = \frac{1}{12}\sum_{k=T-11}^{T} m_{i,k}$$

where , and T represents the reference month for the most recent available monthly stock volume $m_{i,T}$ reported by company i. (Usually month T is 2 or 3 months prior to the month that includes week t.) For each sampling stratum k, let $R_{k,t}$ represent the median value of $r_{i,t}$ for all weekly-reporting companies i in the stratum. In addition to the mean ($\overline{m}_{i,T}$), the standard deviation across months ($\hat{\sigma}_{i,T}$) and a coefficient of seasonal variation ($c_{i,T}$) are calculated for $\overline{m}_{i,T}$:

$$\hat{\sigma}_{i,T} = \sqrt{\frac{1}{12}\left(\sum_{k=T-11}^{T}\left[m_{i,k}-\overline{m}_{i,T}\right]^2\right)} \quad , \text{and} \quad c_{i,T} = \frac{\hat{\sigma}_{i,T}}{\overline{m}_{i,T}}.$$

Let j denote a company in stratum k that is not in the weekly-reporting sample, and let

$$\overline{m}_{j,T} = \frac{1}{12}\sum_{k=T-11}^{T} m_{j,k}$$

. We compute $\hat{\sigma}_{j,T}$ and $c_{j,T}$ as described above for the weekly-reporting units. Let $C_{k,t}$ denote the median of the $c_{i,T}$ for weekly-reporting companies in stratum k. The volume of natural gas stored by company j in week t is estimated as

$$\hat{w}_{j,t} = \overline{m}_{j,T} R_{k,t}^{p(c_j)},$$

$$p(j) = \frac{c_{j\mathcal{T}}}{C_{k\mathcal{T}}}$$

where , a factor representing the seasonal pattern of company j relative to that of weekly-reporting companies in stratum k.

The company-level estimation equation captures the seasonal variation of a specific company relative to that of weekly-reporting companies in its stratum. The generality of the estimation equation makes it quite flexible and capable of representing a wide variety of possibilities. For example, if a given company has no variation over the previous 12 months for which data are available, so that $c_{j\mathcal{T}} = 0$, the estimation equation implies that the latest weekly volume is equal to the 12-month moving average ($\hat{w}_{jt} = \overline{m}_{j\mathcal{T}}$). If the company's variation matches the median pattern of its stratum, then $c_{j\mathcal{T}} = C_{k\mathcal{T}}$, and the estimation equation implies that the latest weekly volume is equal to the strict moving average estimator ($\hat{w}_{jt} = \overline{m}_{j\mathcal{T}} R_{kt}$).

EIA estimates current working gas inventory for a region as the sum of two total components: the total volume of the reporting companies and the total of the estimated volumes for companies not reporting on the weekly (the Producing-Salt and Producing-Nonsalt strata are combined to obtain the Producing region total). For each stratum k, the estimated volume of working gas stored in week t is computed as:

$$\hat{Y}_{kt} = \sum_{i=1}^{n_k} w_{it} + \sum_{j=1}^{N_k - n_k} \hat{w}_{jt}$$

, where M_k is the number of companies in stratum k, and n_k is the number of weekly-reporting companies. Estimates for the Producing region are computed by adding the estimates from the Producing-Salt and Producing-Nonsalt strata.

The estimate for the Lower 48 states is the sum of the estimates for the five regions.

The estimation technique is not model-based. However, specific 12-month moving averages and their associated coefficients of seasonal variation are updated with the most recent month's data as the data become available. Additional adjustments to the working gas data will be incorporated on an ongoing basis as necessary. Some examples are discussed below.

Reclassification of Base and Working Gas by a Sample Company. Occasionally, operators of storage fields decide to change the classification of some of the gas in the storage field from base gas to working gas or from working gas to base gas. Because Form EIA-912 is a survey of working gas, this reclassification leads to an apparent change in the volume of available gas. A reclassification of significant size is handled by including the reclassified working gas volume in the data used for the calculations of the 12-month moving average and the coefficient of variation. When EIA observes such a

change in classification, EIA notifies report users of this change in inventory levels with a note about the reclassification if the effect of the reclassification and other changes are 4 billion cubic feet or more.

Purchase or Sale of Storage Field. The adjustments to the estimation system will vary depending on whether the company is in the sample company or nonsample company groups.

Startup or Shutdown of a Field. Field shutdowns are handled by simply eliminating the company's record, in the case of a single-field company, or by removing the associated volume from the 12-month moving average for the appropriate company. In the case of a field startup, the moving average is based on the available information from Form EIA-191 survey, so a complete 12-month average is not formed until a year's worth of data is reported on Form EIA-191. Field startups with working gas volumes exceeding a certain threshold level will become part of Form EIA-912 sample.

Negative Values. Although not a common occurrence, from time to time a company may report a negative working gas value, which may be caused by removal of base gas from storage in anticipation of sale or abandonment of a storage field or withdrawal from base gas at the end of the withdrawal season. When confirmed negative values are received for a field expected to be shut down, a value of zero is entered into the database. If the report is caused by temporary withdrawals from base gas, such as occurred toward the end of winter 2002-2003, EIA announces the occurrence and describes the adopted changes in estimation procedures at that time.

Imputation

Occurrences of non-response or data quality issues of individual companies are addressed through implicit or explicit imputation. Imputation of company data values for any stratum occurs either by treating the nonrespondent as a company not reporting on the weekly or by using company-specific linear extrapolation methods based on the most recent data in which relative changes for the stratum as a whole are applied to the nonresponding company's previous week's reported inventory level.

Weekly Report

The result of estimation for the most recent and current weeks, any revision to the estimates for the prior week, and historical data to use for comparisons are presented in the *Weekly Natural Gas Storage Report*, which will be posted at 10:30 a.m. on Thursday on the EIA web site at http://ir.eia.gov/ngs/ngs.html except for certain weeks in which Federal Holidays occur.

Revisions

Revisions may be presented for the most recent estimates of working gas in storage under a number of

circumstances that occur after release of the estimates. These include:

(1)   A respondent revises previously submitted data (respondents are requested to submit revisions if the change is greater than 500 million cubic feet);

(2)   A respondent submits late data for the week;

(3)   A respondent reports a change in field operating status.

General EIA Weekly Natural Gas Storage Report (WNGSR) Revisions Policy

Revisions generally are disseminated in the WNGSR according to the established schedule and shall occur when the effect of reported changes is at least 4 billion cubic feet (Bcf) at either a regional or national level. If a revision is made, changes to all regions shall be recorded. In order to provide more transparency to users of the WNGSR, EIA lowered revision threshold to 4 Bcf at a regional or national level during the last clearance cycle. This threshold of 4 Bcf also applies to the publication of reclassifications between working and base gas.

Although all respondents' changes shall be entered into EIA's database for editing, imputation, and other analytic purposes, the changes shall only lead to a published revision when it is at least .4 Bcf. In the event of a cumulative revision of 10 Bcf or more at either a regional or national level, a special release of the WNGSR may occur as described below.

EIA WNGSR Policy to Allow Unscheduled Release of Revisions

The unscheduled release of revisions to weekly estimates of working gas held in underground storage shall occur when the cumulative effect of data changes or corrections is at least 10 Bcf for the current or prior week. A new provision to this policy is proposed for the current collection where EIA will not process revisions on an unscheduled basis unless the effect of the net change between the current and most recent week is 10 Bcf or more, instead of a cumulative 10 Bcf that could have been building over several weeks. For example, if one or more respondents submits revisions to the previous week's report, totaling 10 Bcf, to previously submitted data, but the changes are the result of errors that have been accumulating over several weeks and do not affect flows of working natural gas into or out of storage in the most recent two reported weekly periods by more than 10 Bcf, the unscheduled data release will not occur and the revisions will be published with the next regularly scheduled release.

Revisions shall be disseminated on a Federal workday between 2:00 p.m. and 2:10 p.m. (Eastern Time) following notice of the pending release to the public between 1:00 p.m. and 1:10 p.m. (Eastern Time). If a revision is made, changes to all affected regions shall be recorded in the 2:00-2:10 p.m. release. Public notification will occur in a number of ways including a website notice of the impending release of revised data that will replace the current WNGSR, e-mail notification to selected media, and an e-mail

notice that will be sent to all users of *WNGSR* data who have signed onto a free distribution service. There are two special circumstances related to handling certain data changes in the *WNGSR*. First, this unscheduled release policy will not apply to data changes resulting from changes in the estimation methodology or parameters because those changes will be announced in advance. Second, reclassification of gas (between working gas and base gas inventories) will be reported only in regularly-scheduled releases of the *WNGSR*. The policy for unscheduled releases of revisions was announced in April 2005 as a *Federal Register* notice (70 FR 21406-08) and modified in the May 2014 *Federal Register* notice (79 FR 60456).

Security

Several steps have been taken to assure protection and security of respondent data and estimates during data processing and report preparation. One example is that respondent data can be submitted using the secure file transfer (SFT) e-mail system to EIA. SFT is based on the secure hypertext transfer protocol (HTTPS), an industry standard method to send information over the web using a secure, encrypted process. All information is protected by 128-bit encryption to maintain the privacy and protection of transmitted data. See Section A11 for a discussion on protection of the data.

For Form EIA-912, a number of additional actions regarding data security also have been taken. One example is the decision to operate the data processing and estimation system on computers that are not connected to the EIA network. When estimates are ready to be released on the EIA website, they are transferred to the EIA network on disks. This prevents unauthorized access of the estimates by hacking into the EIA system and it also prevents accidental early release of data.

B.3 Maximizing Response Rates

Follow-up procedures for non-response consist of an email message or a reminder phone call to all companies that do not return a completed survey form by the due date. This initial re-contact is followed by repeated email messages and/or phone calls until a response is received. Frequent late response or non-response may result in an official letter issued to the company, as well as a conference call or in-person discussion with the respondent's management to impress upon them the importance of timely and accurate data submissions.

The natural gas surveys as a whole presently have a response rate of approximately 98%. Table 1 shows the response rates for 2016 for each survey in this package except Form EIA-757 that was last activated in 2015.

Table 1 Response rates for 2016

Survey	Response Rate	Frequency of Reporting
Form EIA-912	> 99%	Weekly
Form EIA-857	99%	Monthly
Form EIA-910	100%	Monthly
Form EIA-191	97%	Monthly
Form EIA-176	98%	Annual
Form EIA-757*	100%	Triannual

*This survey was last activated in 2015

B.4 Test Procedures

The natural gas surveys are established continuing surveys. Modifications to all of the existing forms were made by EIA staff in conjunction with discussions with industry representatives and consultations through the Federal Register notice discussed earlier. These actions served as a test of the availability of data and the clarity of instructions of the survey forms, as well as the proposed modifications.

Additionally, EIA, subscribes to third-party data sources such as Bentek Energy, Natural Gas Intelligence, PointLogic, Genscape, and trade press for the purpose of data quality assurance. EIA uses these tools to maintain survey frames, identify data quality issues, and inform decisions to contact respondents for data quality follow-up.

B.5 Statistical Consultations

For information concerning the Natural Gas Data Collection Program, please contact Michael Kopalek, Operations Research Analyst, Office of Petroleum and Biofuels Statistics (PBS), at 202-586-4001, or Michael.Kopalek@eia.gov.

For information concerning this request for OMB approval, please contact Tom Broene, Mathematical Statistician, Office of Survey Development and Statistical Integration, at 202-586-5774, or Thomas.Broene@eia.gov.