B. Collections of Information Employing Statistical Methods

B1. Description of the Survey Plan

Frames maintenance activities are conducted on a monthly and annual basis. Response to all PSRS surveys is mandatory.

Monthly Frames Maintenance

The monthly frames maintenance procedures focus on examining several frequently published industry periodicals that report changes in status (births, deaths, mergers and changes in ownership) of petroleum facilities producing, transporting, importing, and/or storing crude oil and petroleum products. These sources are augmented by articles in newspapers, letters from respondents indicating changes in status, and information received from survey systems operated by other offices. At the same time, the sample frames for the weekly surveys are also updated. A sample control meeting is conducted each month. This meeting focuses on changes in the current monthly data as it relates to the weekly surveys, changes in the weekly surveys that impact the monthly surveys, and changes in respondent reporting patterns. These meetings are conducted to assure a 90-percent coverage of the total for each item collected and each geographic region for each of the weekly surveys.

Annual Frames Maintenance

The annual frames maintenance is conducted to re-evaluate the consistency of frames between the Forms EIA-810 and EIA-820.

2. Sampling Methodology and Estimation Procedures

The frame of respondents is considered as the universe for all PSRS surveys with the exception of the following surveys:

EIA-800, “Weekly Refinery and Fractionator Report”
EIA-801, “Weekly Bulk Terminal Report”
EIA-802, “Weekly Product Pipeline Report”
EIA-803, “Weekly Crude Oil Stock Report”
EIA-804, “Weekly Imports Report”
EIA-805, “Weekly Bulk Terminal and Blenders Report”

a. Sampling Frame

The EIA weekly reporting system, as part of the PSRS, was designed to collect data similar to those collected monthly. The sample of companies that report weekly in the *Weekly Petroleum Supply Reporting System* (WPSRS) are selected from the universe of companies that report on the corresponding monthly forms.

The sampling frame for Form EIA-800 "Weekly Refinery Report" includes refineries reporting on Form EIA-810 "Monthly Refinery Report" as well as gas processing plants and fractionators reporting on Form EIA-816 "Monthly Natural Gas Liquids Report." Monthly reports on Form EIA-810 are required from operators of every operating and idle refinery located in the 50 States, District of Columbia, Virgin Islands, Puerto Rico, and other U.S. territories. Monthly reports on Form EIA-816 are required from operators of every operating and idle gas processing plant fractionator, and butane isomerization plant located in the 50 States and the District of Columbia.

The EIA-801 sampling frame consists of all companies reporting on the EIA-811, "Monthly Bulk Terminal Report." This includes every bulk terminal operating company located in the 50 States, the District of Columbia, Puerto Rico, and the Virgin Islands. A bulk terminal is primarily used for storage and/or marketing of petroleum products and has a total bulk storage capacity of 50,000 barrels or more, and/or receives petroleum products by tanker, barge, or pipeline. Bulk terminal facilities associated with a product pipeline are included.

The EIA-802 sampling frame consists of all companies reporting on the EIA-812, "Monthly Product Pipeline Report." This includes all petroleum product pipeline companies that transport refined petroleum products (including interstate, intrastate, and intracompany pipeline movements) in the 50 States and the District of Columbia.

The EIA-803 sampling frame consists of all companies reporting on the EIA-813, "Monthly Crude Oil Report." This includes all companies that carry or store 1,000 barrels or more of crude oil. Included are gathering and trunk pipeline companies (including interstate, intrastate, and intracompany pipelines), crude oil producers, terminal operators, storers of crude oil (except refineries), and companies transporting Alaskan crude oil by water in the 50 States and the District of Columbia.

The EIA-804 sampling frame consists of all companies reporting on the EIA-814, "Monthly Imports Report." This includes all companies, including subsidiary or affiliated companies, that import crude oil or petroleum products (1) into the 50 States and the District of Columbia, (2) into Puerto Rico, the Virgin Islands, Guam and other U.S. possessions (Midway Islands, Wake Island, American Samoa, and Northern Mariana Islands), and (3) from Puerto Rico, the Virgin Islands and other U.S. possessions into the 50 States and the District of Columbia. Imports into Foreign Trade Zones located in the 50 States and the District of Columbia are considered imports into the 50 States and the District of Columbia and must be reported.

The EIA-805 sampling frame consists of all companies reporting on the EIA-815, "Monthly Bulk Terminal and Blenders Report." This includes all storage terminals which produce finished motor gasoline through the blending of various motor gasoline blending components, natural gas liquids, and oxygenates in the 50 States, the District of Columbia, Puerto Rico, the Virgin Islands, Guam and other U.S. possessions.

b. <u>Sample Design</u>

The sampling procedure used for all the sampled surveys is the cut-off method. In the cut-off method, companies are ranked from largest to smallest on the basis of quantities reported during some previous period. Companies are chosen for the sample beginning with the largest and adding companies until the total sample covers approximately 90 percent of the total volumes for each item and each geographic region for which data may be published.

To ensure 90-percent coverage of the total for each item collected and each geographic region for each weekly survey, a sample control meeting is conducted each month. This meeting focuses on changes in the current monthly frame due to sales, acquisitions, mergers, new reporters, and reactivations. Companies are added or removed from the weekly reporting samples based on the changes.

c. Imputation and Estimation Procedures

EIA-800 through EIA-805

After company reports have been checked and entered into the weekly database, values are imputed for companies that have not responded, reported incomplete data, or reported data that failed editing and could not be confirmed. The imputed values are calculated using exponentially smoothed means of recent weekly reported values for this specific company.

The equation for the exponential smoothing is:

$$Y_t = \alpha * y_t + (1 - \alpha) * Y_{t-1}$$

where
- Y_t is the prediction for week t+1 (using data through week t),
- y_t is week t's reported value,
- Y_{t-1} is the prediction for week t (using data through week t-1),
- α is a number between 0 and 1, chosen by survey/product/type

In the equation for exponential smoothing, the size of α controls the importance of last week's value relative to the aggregate of all weeks before that as represented by the prediction for last week. For example, if α = 0.8, then last week's value is much more important in predicting this week's value than all the previous week's values are since the weight of last week is 0.8 and the weight of the previous weeks collectively is 0.2. In general, the α values for the expected means of the non-zero responses are low for imports (last week is much less important than history) and much higher for production, inputs and stocks.

The imputed values are treated like reported values in the estimation procedure, which calculates ratio estimates of the weekly totals. First, the current week's data for a given product reported

by companies in a geographic region are summed (weekly sum, $W_{s.}$) Next, the most recent month's data for the product reported by those same companies are summed (monthly sum, $M_{s.}$). Finally, the most recent month's data for the product as reported by all companies, including adjustments
made in the monthly process, is summed (M_t). The current week's ratio estimate for that product for all companies, W_t, is given by:

$$W_t = (M_t / M_s) * W_s$$

The ratio (M_t / M_s) may be adjusted to account for very unusual events or industry changes not yet reflected in the lagged monthly data. For example, the hurricanes in September 2005 rendered the September data unrepresentative for purposes of applying the ratio to the *WPSR* in December 2005.

This procedure is used directly to estimate total weekly inputs to refineries and production. To estimate stocks of finished products, the preceding procedure is followed separately for refineries, bulk terminals, and pipelines. Total estimates are performed by summing over establishment types.

Weekly imports data are highly variable on a company-by-company basis or a week-to-week basis. Therefore, an exponentially smoothed ratio has been developed for weekly imports. The estimate of total weekly imports is the product of the smoothed ratio and the sum of the weekly reported values and imputed values.

For imports, the ratio is smoothed as follows:

$$R_t = \alpha * r_t + (1 - \alpha) * R_{t-1}$$

where R_t is the smoothed ratio for week t+1 (using ratios through week t),
r_t is week t's ratio of the most recent monthly total for all respondents to the monthly total of respondents from the weekly sample,
R_{t-1} is the smoothed ratio for week t (using ratios through week t-1),
α is a number between 0 and 1, chosen by product but not by PADD/Respondent ID.

When $M_s = 0$, then r_t is not defined for the week and the smoothed ratio is not updated, that is, the previous smoothed ratio is used as the multiplier.

Forms EIA-810 through 813, 815, 816, and 819

In any survey, non-response can be a major concern because the effects can cause serious bias in survey results. Non-response occurs whenever requested information is not obtained from all

units in a survey. Response rates for these surveys are generally 99 to 100 percent. Whenever survey responses are not received in time to be included in published statistics, the data are imputed. Although imputing for missing data may not eliminate the total error associated with non-response, it can serve to reduce the error. The data reported in the previous month are used as imputed values for missing data. Data are not imputed for the EIA-814 and 817 because these data series, by respondent, are highly variable.

d. Macro Editing

EIA-800 through 805

After the flagged respondent data have been resolved, preliminary tables are produced and used to identify anomalies. These tables show U.S. and PADD estimates for the current week and the prior 3 weeks and also show year-ago data for the same week along with 4 week average. Anomalies result in further review of respondent data which in turn may result in additional flagged data and imputation.

EIA-810 through 819

After the flagged respondent data have been resolved, preliminary tables are produced and used to identify anomalies. These tables show U.S. and PADD estimates for the current month and the prior 4 years. Anomalies result in further review of respondent data which in turn may result in additional flagged data and imputation. In addition, other adjustments are made to aggregate data from time to time. For example, unusual industry conditions, including fuel transitions, business practice shifts,

or hurricane dislocations, may generate reporting anomalies and require adjustments. Measurement error and frame deficiencies may occasionally result in inconsistencies when individual respondent data are aggregated to publication levels and require adjustment. Monthly supply data are reviewed throughout the year and some estimates may be replaced with newly available or resubmitted respondent data in the Petroleum Supply Annual (*PSA*).

e. Data Accuracy

The reliability of data is subject to two types of possible errors, non-sampling errors and sampling errors. Sampling errors occur because observations are made only on a sample, not on the entire population. Non-sampling errors can be attributed to many sources in the collection and processing of data such as, response coverage; a difference in interpretations of definitions or questions; mistakes in recording or coding the data from respondents; and other errors of collection and estimation. The accuracy of survey results is determined by the joint effects of sampling and non-sampling errors.

For the monthly surveys EIA-810 through 813, 815 through 817, 819 and the annual survey EIA-820, there is no sampling error because the surveys are based upon a complete census of the

frame. However, response error is the major factor affecting the accuracy of data. Response error, or reporting error, is the difference between the true value and the value reported on a survey form.

To aid in detecting and minimizing reporting errors, automated editing procedures are used to check current data. These checks include verifying the current data for consistency with past data, for internal consistency (e.g. totals equal sum of parts), examining orders of magnitude, and cell position. Data elements that fail edit criteria are flagged.

Monthly and weekly data are compared on a regular basis to rectify discrepancies in data. In addition, a comparison of PSRS data with sources outside of the Petroleum Division is performed each year. The results of this effort have been published in the feature article, "*Comparisons of Independent Petroleum Supply Statistics*" located on the Internet.

B3. Methods to Maximize Response Rate

To maximize response rates, forms are designed to be easily completed, and instructions are written to be clear, concise, and easily understood. Forms and instructions are made available on our website. Survey nonrespondents are contacted by telephone to discuss the requirement to file and any problems or questions that are delaying filing. Follow-up letters regarding the failure to file may be emailed to respondents. Specific schedules are followed for telephone calls and letters to nonrespondents for the various surveys. Every effort is made to assist respondents in completing the survey and submitting them in a timely manner. The response rate for weekly surveys averages above 97 percent. The response rate for monthly surveys is 99 to 100 percent.

4. Test Procedures

The petroleum surveys are established continuing surveys. Modifications to all of the existing forms were made by the 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.

5. Questions

Questions regarding the Petroleum Supply Reporting System may be directed to Sylvia Norris of the Department of Energy, Energy Information Administration, at (202) 586-6106. Questions regarding the EIA Forms Clearance process should be directed to Grace Sutherland at (202) 586-6264.

Appendix A

Sample E-Mail Notifications to Respondents

Sample EIA-820 Confirmation of Contact Information email notification:

Dear <CONTACT>

Thank you for your company's participation in last year's "Annual Refinery Report" (Form EIA-820). We are sending this letter to request you verify the company Respondent Information contained in our records. Your timely response to this survey has enabled us to meet our legislative mandates to provide timely, high quality regional petroleum supply information to Federal and State agencies, and to a wide variety of customers in the private sector, including those in your company. Your continued cooperation is essential for us to continue to provide this service in the future.

It is now time to prepare for the Form EIA-820 for the Report Year 2008. Because the Form EIA-820 is an annual survey the Respondent Information we have in our records may have changed since last year's filing. The following is what we currently show in our records.

EIA ID Number: <ID>
Company Name: <NAME1>
Refinery/Site Name: <NAME2>

Contact Name: <CONTACT>
Phone Number: <PHONE>
Fax Number: <FAX>
Email Address: <EMAIL>

We request that you verify that the information shown above is either "CORRECT" or has changes. Please reply to this email by December 10, 2008 in order that future correspondence concerning this years Form EIA-820 is sent to the correct person in your company.

The due date for filing the Form EIA-820 is February 16, 2009. The person shown as the "Contact Name" (listed above) will receive an email approximately eight weeks before the due date. This email will direct them to EIA internet links to access copies of this year's EIA-820 survey form and updated form instructions.

If you have any questions regarding this request or the Form EIA-820 survey, please contact Julie Harris at (202) 586-6281. Thank you in advance for your continued cooperation in our data

collection efforts.

Sincerely,

Susan Harris
Petroleum Survey Management Team
Petroleum Division
Office of Oil and Gas
Energy Information Administration

Sample EIA-820 email notification:

Dear Respondent:

It's time again to complete Energy Information Administration (EIA) Form EIA-820 "Annual Refinery Report" for the U.S. refinery or refineries operated by your company. This includes refineries located in U.S. territories. We will use the data from your report(s) to compile statistics showing U.S. refinery capacity as of January 1, 2008 and projected capacity for January 1, 2009 as well as fuels consumed and crude oil receipts by method of transportation.

Refinery statistics collected using Form EIA-820 will be posted on the EIA Website (http://www.eia.doe.gov) for use by people who make business and public policy decisions affecting your company and the refining industry as well as U.S. energy security, the economy, and the environment. Reporting on Form EIA-820 is mandatory because it is important for us to compile and present complete, accurate, and timely information.

Your report must be completed and sent to EIA by February 15, 2008.

Our records indicate you are the person assigned by your company to complete Form EIA-820 for the following refinery or refineries. Please let me know immediately if you are not the person responsible for completing Form EIA-820 for any or all of the refineries listed so that I can contact the appropriate person.

EIA ID Number Company Name Site Name
<DUPLICATE_ID_NAME1_NAME2>

Materials needed to complete Form EIA-820 (survey form, instructions, and definitions) are available on the EIA website at the following address.

http://www.eia.doe.gov/oil_gas/petroleum/survey_forms/pet_survey_forms.html

The EIA-820 survey form may be downloaded in portable document format (PDF) or as a spreadsheet (.xls) file. Completed forms may be returned to EIA by facsimile, email or secure file transfer.

If you choose to use the spreadsheet file, you will first need to copy the file to your local computer. Data cannot be entered into the spreadsheet interactively on the EIA web site. You will receive a pop-up security warning regarding macros when you open the local copy of the EIA-820 spreadsheet file. You must select the option to enable macros in order to use the spreadsheet.

The following options are available for sending your completed Form EIA-820 report(s) to EIA.

- Facsimile: (202) 586-1076 or (202) 586-6323
- Email: oog.surveys@eia.doe.gov
- Secure File Transfer: https://idc.eia.doe.gov/upload/noticeoog.jsp

Please note that facsimile and email are not secure transmission methods and there is some possibility your data could be compromised. The secure file transfer option uses an industry-standard encryption process to prevent anyone outside of EIA from viewing your data. This is the same method commonly used for conducting business transactions over the Internet. Microsoft Internet Explorer 5.5 or newer or Netscape 4.77 or newer are recommended when using secure file transfer.

Please let me know if I can be of any help as you complete the Annual Refinery Report. I can be contacted by email at julie.harris@eia.doe.gov or by phone at 202-586-6281.
Thank you for your cooperation in this important matter.

Sincerely,

Julie M. Harris
Industry Economist
Petroleum Division, Office of Oil and Gas
Energy Information Administration